MITSUBISHI MATERIALS

C010B

CUTTING TOOLS 2023 - 2024

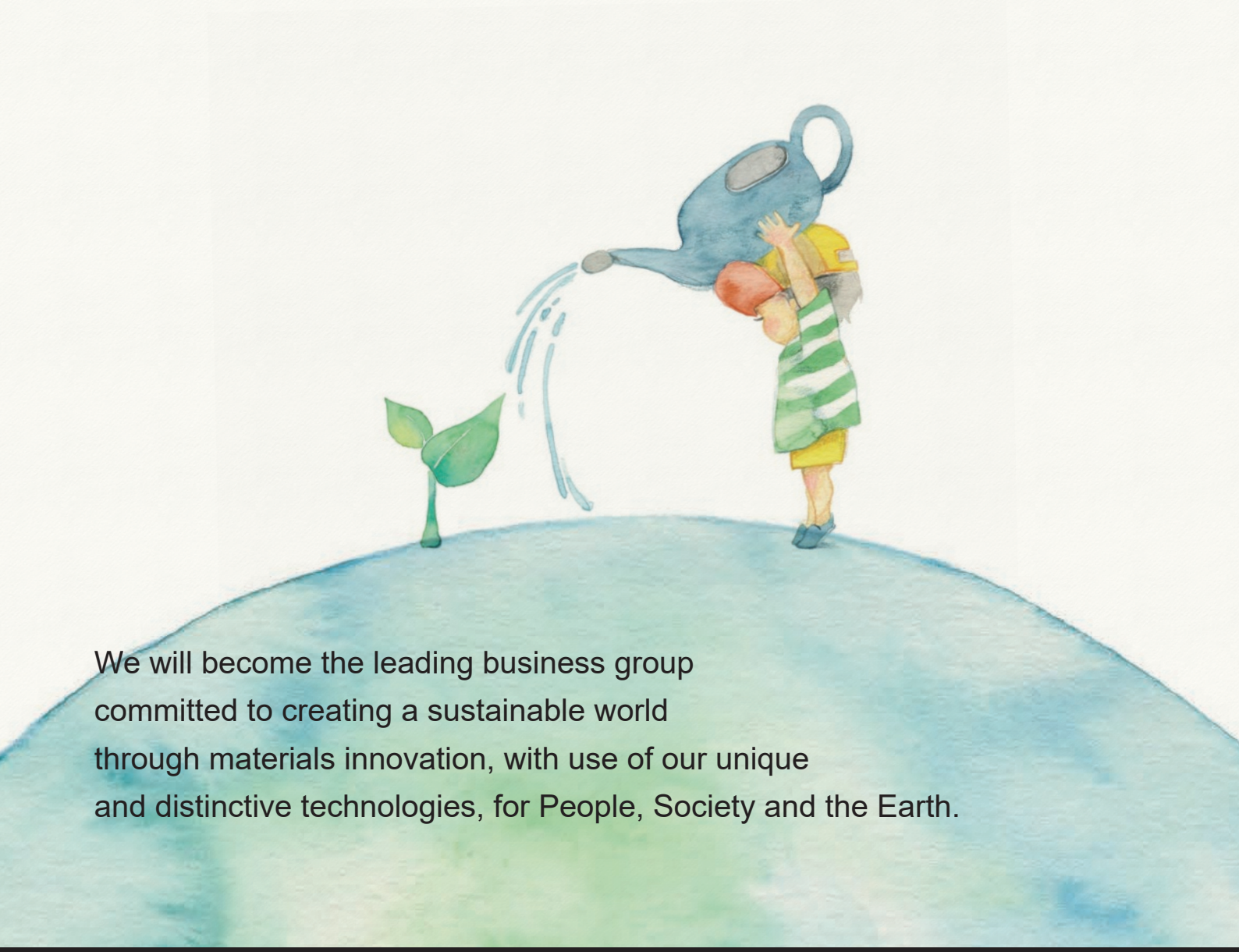
TURNING TOOLS
MILLING TOOLS
DRILLING TOOLS



DIA EDGE

MITSUBISHI MATERIALS

For People, Society and the Earth



We will become the leading business group
committed to creating a sustainable world
through materials innovation, with use of our unique
and distinctive technologies, for People, Society and the Earth.

STATEMENT

YOUR GLOBAL CRAFTSMAN STUDIO

Mitsubishi Materials is not just a tool manufacturer

We are committed to responding promptly to customers' challenges and to actively contribute to their success with the dedication of a professional craftsman.

We will strive to become the only tool manufacturer globally offering "your personal craftsman studio", a unique service for our customers.

It is the place where you can:
Find state-of-the-art technologies and products.
Find solutions, anytime, from anywhere in the world.
Share our excitement about the latest technology trends and product innovation.

It is the studio where we think, share, create and develop together with our customers, exciting solutions to meet their specific needs.

YOUR GLOBAL CRAFTSMAN STUDIO
MITSUBISHI MATERIALS

The meaning of our logo
Our logo shows people, standing on a circle, holding hands. The circle represents the earth. Holding hands reflect our commitment to grow and succeed "hand in hand" with our customers and closely work with them to improve performance across the globe. The shape of the logo embodies a variety of ideas. It captures the image of "cutting tools" combined with the dominant letter "M" of the Mitsubishi Materials brand name. It also depicts a flame that symbolises our passion for craftsmanship.

Now available!

A magazine for communication to
encourage excitement about manufacturing

YOUR GLOBAL CRAFTSMAN STUDIO

Access the MMC Magazine here
https://www.mitsubishicarbide.com/en/magazine



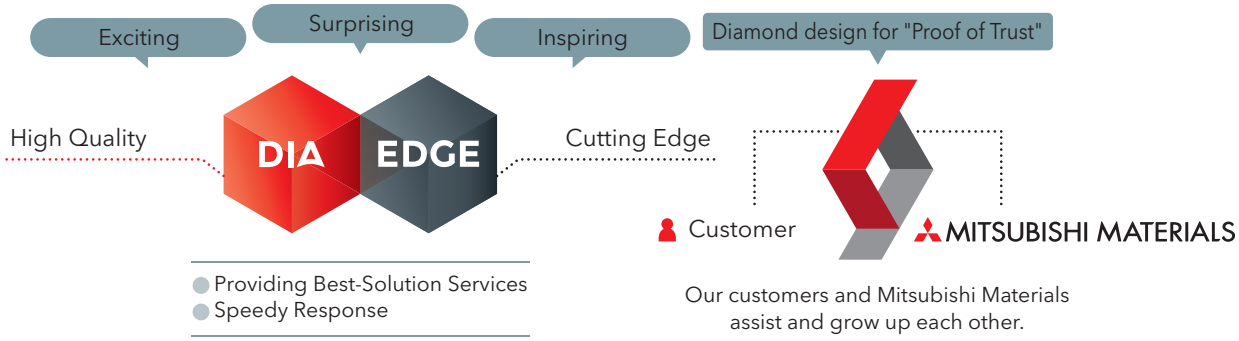
PRODUCT BRAND

With "DIAEDGE," Mitsubishi Materials Metalworking Solutions Company will aim to become the leading company in carbide product business while sharing ideas, creations and feelings with customers through the provision of optimised carbide product solutions and services.

DIA EDGE

Together with our customers, creating a better future

Announcing DIAEDGE, our new brand of tools
that brings together our cutting-edge technologies, exciting all who use them.
Our aim is not only to offer value with our tools,
but to think together with our customers, share inspiration with them,
and continue to take on new challenges.



Environmentally Friendly Products

The following products are environmentally friendly products certified by the Japan Cutting & Wear-resistant Tool Association.

Mitsubishi Materials, as part of the machine tool industry, aims to create tools that are certified by the Japan Cutting & Wear-resistant Tool Association, that are unique to the industry and that are in harmony with the environment while considering the overall global environment and fulfilling the company's social responsibilities.

Example of the Environmental Mark



Evaluation Criteria for Environmental Mark

★★★	80 points or greater
★★	79–60 points
★	59–40 points

TURNING TOOLS



CVD Coated Grade
for Steel Turning
MC6125
★★★
» A035



CVD Coated Grade
for Steel Turning
MC6115
★★★
» A034



PVD Coated Carbide Grade
for High Precision and Small Parts Machining
MS9025
★★★
» D002



PVD Coated Carbide Grade
for Machining Difficult-to-Cut Materials
MP9025
★★
» A036



CBN Grade
for Sintered Alloys and Cast Iron
MB4120
★
» B005



PVD Coated Carbide Grade
for Carbon Steel Turning
MS6015
★★
» D002

ROTATING TOOLS



Face Milling Cutter for Cast Iron Machining
with an Adjustable Run-Out System
WSF406W
★★
» L084



Cutter for Machining Aluminium Alloys
AXD4000A
★★
» L202



Ultra-High Efficiency Milling Cutter
for Al Machining and Cast Iron Finishing
FMAX Compact
★★
» L089



Double-Sided Insert Type
Shoulder Milling Cutter
WWX400
★★★
» L100



Multi-Functional Indexable Cutter
for High Efficiency Milling
VPX Series
★★★
» L156, L162



Side Cutter Series
VAS500
★★
» L130



Double-Sided Insert Type
High Feed Radius Milling Cutter
WJX14
★★★
» L250



Multi-Corner Insert Type
Face Milling Cutter
AHX440S
★★★
» L062



Side Cutter Series
VAS400
★★
» L128



Cermet Grade for Milling
MX3030
★★★
» L024

DRILLING



Carbide Solid Drill Series
for Swiss Type and Small CNC Lathe Machines
DWAE
★★
» N030



Solid Carbide Drill
for Centering and Chamfering
DLE
★★
» N020



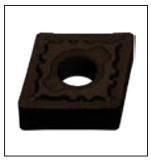
Solid Carbide Drill
for CFRP Machining
MC Drill Series
★★
» N112—N117



PVD Coated CBN Grade
for Cast Iron Turning
BC5110

☆☆

» B007



CVD Coated Grade
for Steel Turning
MC6035

☆☆☆

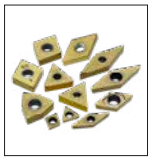
» A034



Holder for Grooving and
Cutting Off
GW Series

☆☆☆

» F122



Coated CBN Grade
for High Hardened Steel Turning
BC8220

☆☆☆

» B006



Radius Cutter
for Machining Difficult-to-Cut Materials
ARP Series

☆☆

» L264



Ultra-High Efficiency Milling Cutter
for Al Machining and Cast Iron Finishing
FMAX

☆☆

» L091



Ceramic End Mills

☆☆☆

» J310



Low Cutting Resistance, Double-Sided
Insert Face Mill for General Machining
WSX445

☆☆☆

» L040



Duplex Radius End Mill
for High Feed Machining
VFFDRB

☆☆☆

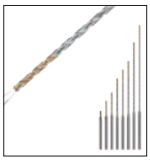
» J300



PVD Coated Grade
for Stainless Milling
MP7130/MP7140

☆☆☆

» L022



Solid Carbide Drills
TRISTAR Drill Series
DVAS Mini Size

☆☆☆

» N038

About Mitsubishi Materials ESG Activities
https://mmc.disclosure.site/en/

Our Approach to ESG and CSR

Mitsubishi Materials Corporation's Initiatives on Material Issues

CSR Direction

1. Respecting relationships with people

“Reinforcing ties to stakeholders”

2. Respecting promises made to society

“Ensuring thorough compliance and risk management practices”

3. Respecting the Earth

“Reducing environmental impact”

About ESG Report

This report provides easily understandable and comprehensive information, for persons interested on the approaches, initiatives, results, issues and current direction of the Mitsubishi Materials Group with regard to sustainable management.

Tool Solutions

INSERT GRADES

MC6100 Series

» A011
» A016
» A034
» A035

CVD Coated Grade for Steel Turning

Info **P**

MC6115

Improves high-speed machining and process efficiency with a dramatic increase in resistance to heat and wear



MC6125

First Recommendation for Steel Turning Increases tool life with a stable performance over a wider range of applications



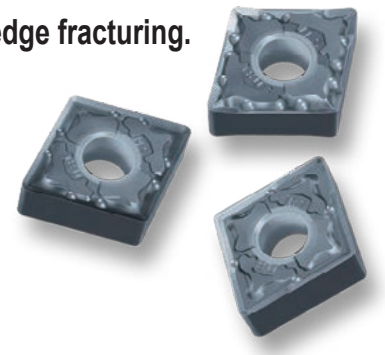
MP9000/MT9000 Series

» A022
» A036
» A021

ISO Turning Inserts for Difficult-to-Cut Materials

Info **S**

The high Al-rich (Al,Ti)N single layer coating significantly reduces edge fracturing.



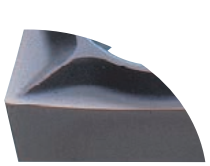
PVD Coated Grade

MP9005/MP9015/MP9025

Carbide Grade (Uncoated)

MT9005/MT9015

Expansion of G-Class Positive Insert Items!





FS/FS-P Breaker for Finish Cutting





LS/LS-P Breaker for Light Cutting

MS6015/MS7025/MS9025 Series

» D002

PVD Coated Carbide Grade
for High Precision and Small Parts Machining

MS Series

Info

P

Greater Enhancement of Turning Inserts for Machining of Small Parts
By selecting the optimum grade for each workpiece material, a stable surface finish and dimensional accuracy are achieved

MS6015

Achieves stable finished surfaces and excellent dimensional accuracy when turning pure iron, carbon steel and free cutting steel

MS7025

Dramatically improved welding and wear resistance in low feed machining with a more precise nano-multilayer coating

MS9025

Effective reduction of notch wear of stainless steel with a balance of wear and fracture resistance



BC8200/MB8100 Series

» B006
» B010

CBN-Series for Hardened Steel Turning

H

COATED CBN MATERIALS

Info

BC8210 Continuous and Light Interrupted Cutting

Outstanding Tool Life with High-Speed Machining

BC8220 General cutting

Achieves Impressive Tool Life Over a Wide Range of Cutting Conditions



BC8200 Series

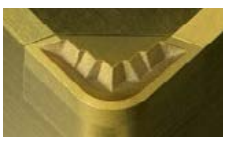
CBN Grade (Uncoated)

Info

MB8110 Finish Cutting

MB8120 High Efficiency Machining

MB8130 General cutting



BR Breaker
(BC8220)



BM Breaker



BF Breaker

Tool Solutions

CUTTING OFF AND GROOVING SYSTEM

GY/GW Series

» D004
» F004
» F016
» F122

Holder for High Precision Machining of Small Parts

Info

The new geometry with an extremely high rigidity suppresses vibrations and dimensional changes thereby solving problems during cutting off!

GY series Square type holder

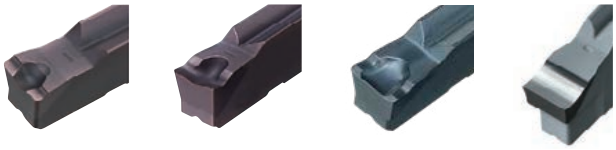
For Cutting Off and Grooving
Maximum Grooving Depth : 34mm



Shank Diameter ; 10×10−
Cutting Width : 1.5mm−

A breaker system made for a wide variety of inserts that can be used for machining a huge range of applications

● For Cutting Off and Grooving



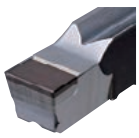
GU Breaker (Gummy Steel)
GS Breaker (Low feeds)
GM Breaker (Medium feeds)
GL Breaker (Aluminium Alloys)

● Cutting Off



R/L05-GM Breaker (Medium feeds)

● Grooving



GFGS Breaker (Hardened Steel)

● Copying/ For Recessing



BM Breaker (Copying/For Recessing)

● For Multifunctional Grooving



MF Breaker (For Finish Machining)



MS Breaker (Low feeds)



MM Breaker (Medium feeds)

GW series Square type holder

Cutting Off
Maximum Grooving Depth : 76mm



Shank Diameter ; 16×16−
Cutting Width : 2.0mm−

A Breaker System Offering Excellent Chip Disposal Properties



GS Breaker (Low feeds)



GM Breaker (Medium feeds)

GY Series

» F094
» F010

PSC Holder for Cutting Off and Grooving

Info

The double taper and face contact uses the precision machined polygon geometry to provide high clamping rigidity.



00° type holder



90° type holder

Easy exchange between different sizes and types of applications by simply changing the blade
A breaker system made for a wide variety of inserts that can be used for machining a huge range of applications.

Tool Solutions

MILLING CUTTER

WJX Series

» L257
» L242
» L250

Double-Sided Insert Type
High Feed Radius Milling Cutter

Info

With a low resistance L Breaker and a reinforced cutting edge R Breaker added, the new WJX09 Small Insert Type enables higher feed rates by increasing the number of blades!



WWX Series

» L100

Double-Sided Insert Type
Shoulder Milling Cutter

Info

The optimised "X-type" insert realizes stable and high-quality machining This new evolution of the shoulder mill allows for greater stability and high-quality machining!



Strong X Geometry

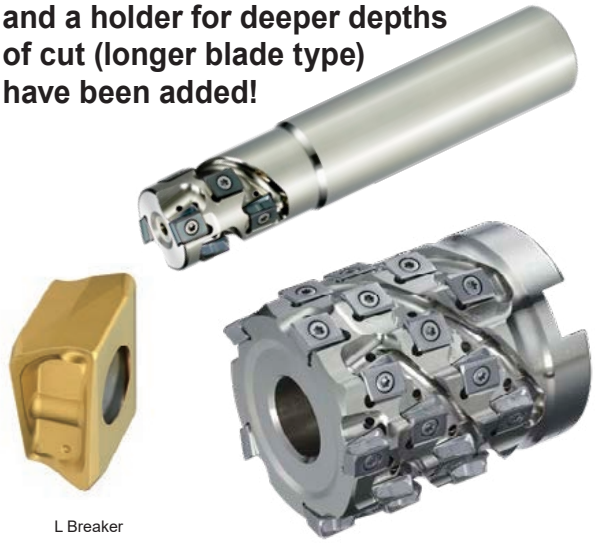
VPX Series

» L156
» L162
» L165

Multi-Functional Cutter
for High Efficiency Machining

Info

In order to expand the applications of the VPX300, a low resistance type L breaker and a holder for deeper depths of cut (longer blade type) have been added!



L Breaker

WSF406W

» L084

Face Milling Cutter for Cast Iron Machining
with an Adjustable Run-Out System

Info

A New Generation of High Efficiency Cast Iron Machining is Achieved with Low Cutting Resistance and an Adjustable Run-Out System!



SOLID END MILLS / EXCHANGEABLE HEAD END MILLS

MSplus Series

» J074
» J098
» J138
» D005

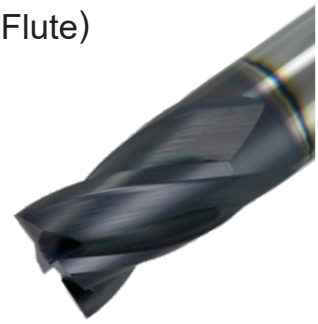
End Mill for Swiss Type Automatic Lathes

Info

Enhanced Burr Reduction and Fracture Resistance to Solve Typical Swiss Lathe Machining Problems!

MP2ES (2 Flute)
MP3ES (3 Flute)
MP4EC (4 Flute)





IMPACT MIRACLE REVOLUTION

» J283
» J195

For Machining of Hardened Steels
IMPACT MIRACLE

Info

Revolutionary Machining of Hardened Steel
New coating provides outstanding tool life
Lineup expansion with the addition of a new series!

4 Flute, Precision Corner-Radius End Mill
VFRPSRB



2 Flute, Ball Nose, Long Neck End Mill
VFR2XLB



iMX End Mill Series

» K058
» K046
» K004

Exchangeable Head End Mills **"Carbide"(Head)+"Carbide"(Holder) Double Face Contact Type**

Info

The 4 flute, lollipop head with coolant hole, B4WH-S, and the 4 flute, roughing head with coolant hole, RC4F-C, for machining of titanium alloys have been added to the series!



iMX-B4WH-S



iMX-RC4F-C



SMART MIRACLE Series

» J236 » J187
» J281 » J312
» J279 » J005

Vibration Control End Mills for Machining Difficult-to-Cut Materials

Addition of Lollipop and Radius End Mills for the Series!

Multi-Functional Lollipop End Mill
VQ4WB



Duplex Radius End Mill
VQFDRB



Vibration Control, Corner Radius End Mills
VQHVRB



Long Neck Ball Nose End Mill
VQ2XLB



Corner Radius End Mill
for High Efficiency Titanium Alloys Machining
VQT5MVRB (with coolant hole)



SMART MIRACLE Series

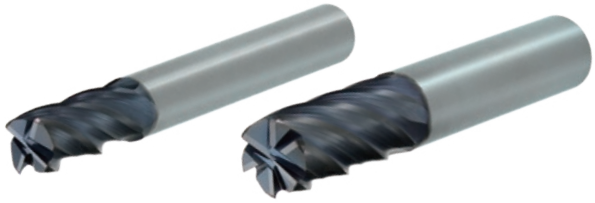
» J185
» J239
» J241
» J277

End Mill for Machining Heat Resistant Super Alloys

2, 4 Flute, Ball Nose, Medium Cut Length End Mill
VQN2MB/4MB/4MBF



4, 6 Flute, Corner Radius, Medium Cut Length End Mill (M)
VQN4/6MVRB



Alimaster Series

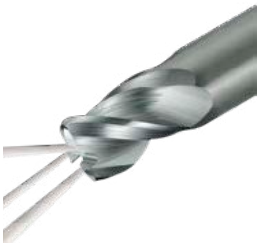
» J114
» J255
» J113
» J251

High Efficiency Machining of Aluminium Alloys

Highly efficient machining is possible with optimised cutting edge geometry and helical internal coolant holes!

DLC Coating
DLC3SA, DLC3SARB

Uncoated
A3SA, A3SARB





Tool Solutions

DRILLING

DVAS Series TRISTAR Drill Series

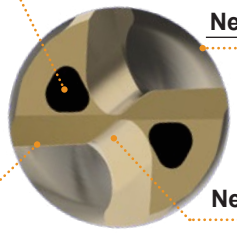
» N004
» N038
» D005

Info

Solid Carbide Drills

FAST, RELIABLE and ACCURATE
New standards enabled by the Five Technologies!
~Faster cycle times and higher accuracy~

- Large coolant holes reduce tool damage due to the improved cooling effect thereby greatly improving tool life
- New cutting edge geometry that significantly improves fracture resistance and a new coated grade with excellent wear resistance
- New XR point thinning for high efficiency machining





For Small Diameter
Ø1.0–Ø2.9mm

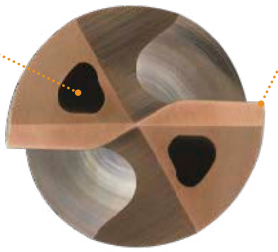
DSA Series

» N075
» N080

Info

Solid Carbide Drill for Machining Heat Resistant Super Alloys

For Long Tool Life when Machining Heat Resistant Super Alloys!
The specially designed margins for machining heat resistant alloys minimize the contact area and prevent work hardening



DSAS
Internal Coolant





Leading Drill Series

» N005
» N020
» N182
» D005

Solid Drills for Centering and Chamfering

Info

A mini size of Ø1.0mm–Ø2.5mm has been added to Solid Carbide DLE Series of drills. The GKCD has also been added to the Cobalt HSS Solid Drills achieving excellent cost performance on low feed and low speed applications and can be used in a wide range of materials!

Solid Carbide

DLE





DC : Ø1.0mm–Ø16.0mm
SIG : 60°, 90°, 120°, 145°

Cobalt High-Speed Steel

GKCD





DC : Ø3.0mm–Ø20.0mm
SIG : 60°, 90°, 120°

DWA E Series

» N030
» D005

Carbide Solid Drill Series
for Swiss Type and Small CNC Lathe Machines

Info

Adopts an optimal flute length with a low cutting resistance ideal for Swiss-type automatic and small CNC lathes!





Improved tool rigidity



DC : Ø1.0mm–Ø14.0mm
L/D : 2, 4

MFE Series

» N005
» N025

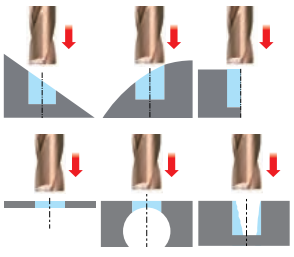
Solid Carbide Flat Bottom Drills

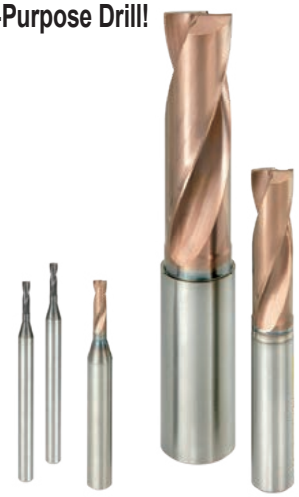
Info

Process shortening with high efficiency drilling in various types of machining
Highly Popular Versatile All-Purpose Drill!

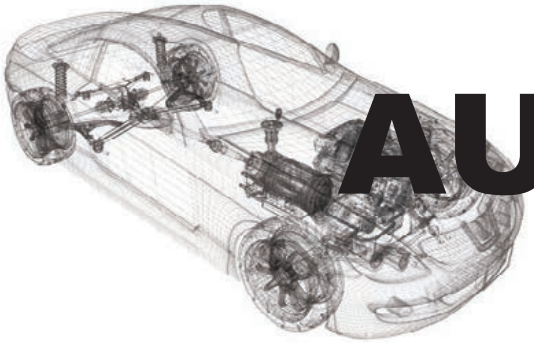


Examples of counter boring, drilling, and reforming





DC : Ø0.75mm–Ø20.0mm
L/D : 2



AUTOMOTIVE

We offer high performance cutting tools that use the latest technology to meet the needs of the automotive industry.

https://www.mitsubishicarbide.com/en/solution/industry/automotive

ENGINE Cylinder Block



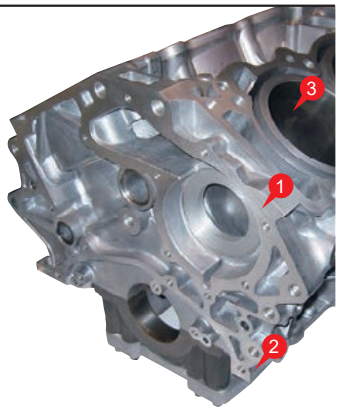
1 FMAX » L089
Face Milling Cutter for High Efficiency Finish Cutting of Aluminium Alloys



2 VAS » L126
Exchangeable Inserts Side Cutter Series



3 BMR » L332
Boring Cutter



ENGINE Cylinder Head



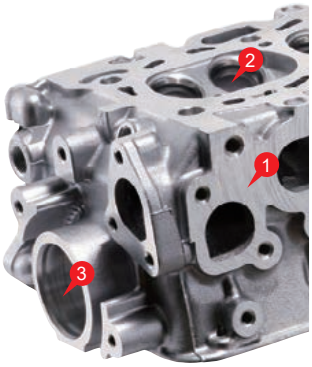
1 FMAX » L089
Face Milling Cutter for High Efficiency Finish Cutting of Aluminium Alloys



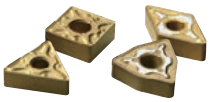
2 HVF » M002
Hydro Clamp Valve Finisher



3 Cam Holes Reamer
High Precision Drilling Reamer with Guide Pad



ENGINE Crank Shaft/ Cam Shaft



1 MC6115 / MC6125 » A034
Inserts for Steel Turning



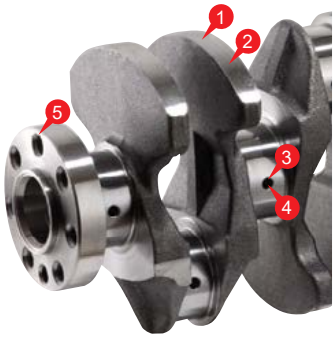
3 MFE » N026
Solid Carbide Flat Bottom Drills



2 MC5100 Series » A034
Insert Series for Machining Ordinary Cast Irons and Ductile Cast Irons



4 MVS » N050
Long Type Drill for Deep Hole Drilling





5 DLE » N020
Solid Carbide Leading Drill for Chamfering



AXLE Steering Knuckle



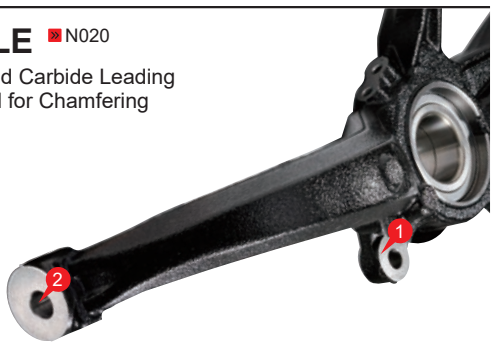
1 VAS » L126
Exchangeable Inserts Side Cutter Series



2 MVS » N050
Long Type Drill for Deep Hole Drilling



2 DLE » N020
Solid Carbide Leading Drill for Chamfering



TRANSMISSION
Transmission Case / Valve Body



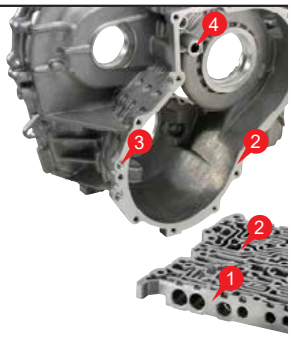
❶ **FMAX** » L089
❷ Face Milling Cutter for High Efficiency Finish Cutting of Aluminium Alloys



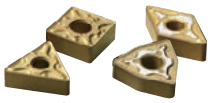
❸ **MAS** » N104
Solid Carbide Drill for High Efficiency Machining of Aluminium Alloys



❹ **Straight Flute Drill**
Solid Carbide Drill for High Precision Drilling



TRANSMISSION
Gears / Epicyclic Carriers



❶ **MC6115 / MC6125** » A034
Inserts for Steel Turning



❷ **BC8210 / BC8220** » B006
Coated CBN Insert for Turning Hardened Steel

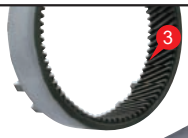
❸ **Mono Block Helical Broach**



❹ **Hob Cutter**



❹ **Skiving Cutter**



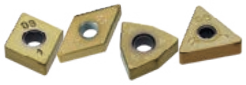




TRANSMISSION
Shaft / CVT Pulley



❶ **MC6115 / MC6125** » A034
Inserts for Steel Turning



❷ **BC8210 / BC8220** » B006
Coated CBN Insert for Turning Hardened Steel



❸ **GY** » F004
Grooving System





TURBO CHARGER
Waste Gate Valve



❶ **MP9000 Series** » A036
Special Breakers for Difficult-to-Cut Materials



❷ **DOUBLE CLAMP HOLDER** » C002
One Action High Rigidity General Purpose Tool Holder



TURBO CHARGER
Turbine Housing



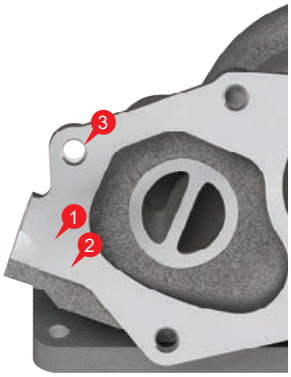
❶ **MP9005 / MP9015 / MP9120 / MP9130** » L022
Insert for Titanium Alloys and Heat Resistant Alloys



❷ **VPX** » L156
Multi-Functional Cutter for High Efficiency Machining



❸ **MH515** » A035
CVD Coated Carbide Grade



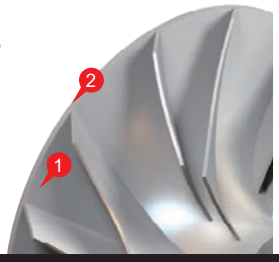
TURBO CHARGER
Compressor Impeller



❶ **DLC4LATB** » J328
Taper Ball End Mill for Aluminium Impellers



❷ **AZ Breaker** » A058
Breakers for Aluminium Alloy Turning



SMALL PARTS

COLLAR/SLEEVE for TURBO CHARGER



1 MMS » N082
Solid Carbide Drill with Internal Coolant Hole



2 MS9025 / MS7025 FS-P/LS-P Breaker » A036
PVD Coated Carbide Insert for High Precision and Small Parts Machining





3 MICRO-MINI TWIN » E027
Boring and Turning Tool

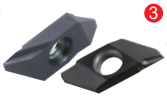


4 GY / GW » F016 » F126
Cutting Off and Grooving Tool for High Precision and Small Parts Machining

TURBINE IMPELLER SHAFT



1 MP9000 Series » A036
Special Breakers for Difficult-to-Cut Materials



3 BTAT » D014
Tools for External Back Turning





2 GT Series » D018
Tools for External Grooving



4 MMT Series » G023
Threading Tools



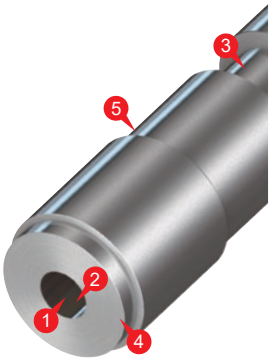
SLEEVE for INJECTOR



1 DVAS for Small Diameters » N039
Solid Carbide Drill with Internal Coolant Hole



3 GY Series » F016
Grooving Tool for High Precision and Small Parts Machining





1 MFE for Small Diameters » N025
Solid Carbide Flat Bottom Drills



4 GW Series » F126
Cutting Off Tool for High Precision and Small Parts Machining



1 DLE for Small Diameters » N020
Solid Carbide Leading Drill for Chamfering



5 MS9025 / MS7025 FS-P/LS-P Breaker » A036
PVD Coated Carbide Insert for High Precision and Small Parts Machining



2 MICRO-MINI TWIN » E027
Boring and Turning Tool



MEDICAL

We provide cutting tools and total applications most suitable for machining of difficult-to-cut materials used in medical parts.

https://www.mitsubishicarbide.com/en/solution/industry/medical

HIP-SYSTEM
Titanium Alloys
Co-Cr-Mo Alloys



❶ **VQMHVRB / VQMHVRBF** » J270 » J275

Radius End Mills



❸ **MT9015 / MP9005 / MP9015** » A036 » A039

Special Breakers for Difficult-to-Cut Materials





❷ **MVS** » N050

Solid Carbide Drill with Internal Coolant Hole

KNEE-SYSTEM
Titanium Alloys
Co-Cr-Mo Alloys



❶ **VQT6UR** » J332

Barrel End Mills



❶ **VQMHVRB / VQMHVRBF** » J270 » J275

Radius End Mills



❶ **iMX-B6HV / iMX-B4WH-S** » K056 » K058

Exchangeable Head End Mills



BONE PLATES
Titanium Alloys
Stainless Steel



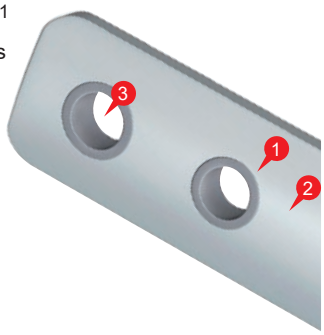
❶ **VQ4WB** » J236

Lollipop End Mill



❷ **VQFDRB** » J281

Duplex Corner Radius End Mill for High-Speed Cutting





❷ **VQ4SVB** » J234

Ball Nose End Mills



❸ **MFE** » N026

Solid Carbide Flat Bottom Drills

SCREWS
Titanium Alloys
Stainless Steel



❶ **MVS** » N050

Long Type Drill for Deep Hole Drilling



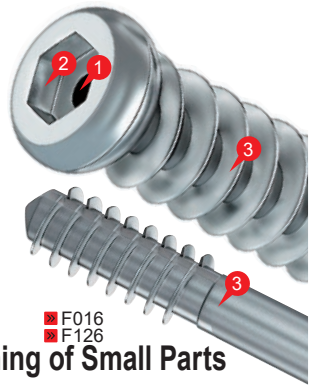
❷ **VQXL** » J149

Long Neck End Mill for Small Diameters

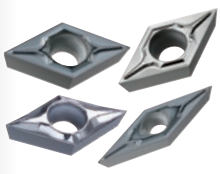


❷ **MPXLRB** » J261

Long Neck Solid Carbide End Mill



❸ **Holder for High Precision Machining of Small Parts** » F016 » F126

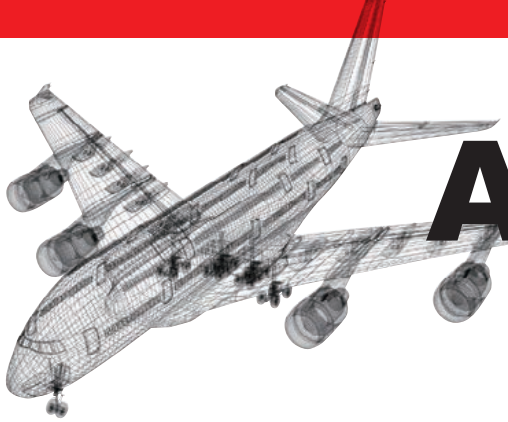


❸ **MP9005 / MP9015 / MS9025 / MT9005 / MT9015** » A036 » A039

ISO Turning Inserts for Difficult-to-Cut Materials







AEROSPACE

We offer the latest cutting tools that enable high efficiency machining of difficult-to-cut parts to meet the needs of the aerospace industry.

https://www.mitsubishicarbide.com/en/solution/industry/aerospace

LANDING GEAR
Main Cylinder
Titanium Alloys



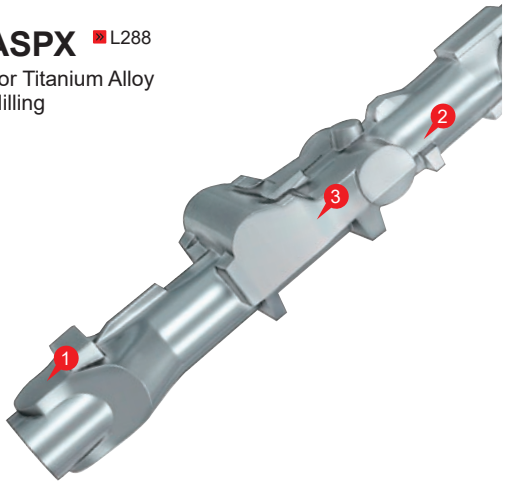
❶ **ARP** » L264
Radius Cutter



❸ **ASPX** » L288
For Titanium Alloy Milling



❷ **SMART MIRACLE END MILL SERIES** » J270



ENGINE
Combustion Case
Heat Resistant Super Alloys (HRSA)



❶ **GY** » F004
Grooving System



❸ **VQN** » J185 » J277
End Mill for Machining Heat Resistant Super Alloys



❷ **VPX** » L156



ENGINE
Blisk
Titanium Alloys



❶ **VQT6UR** » J332
Barrel End Mills



❶ **SMART MIRACLE END MILL SERIES** » J234



❶ **iMX** » K046
Exchangeable Head End Mills



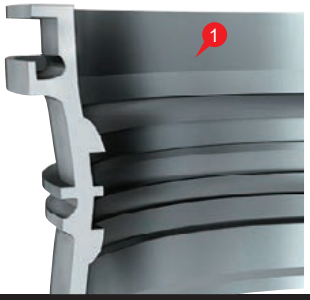
ENGINE
Fan Case
Titanium Alloys



❶ **PSC Holder** » F094
Polygon Taper Shank Holder



❶ **MT9005 / MT9015** » A039
Insert for Machining Titanium Alloys



ENGINE
Shaft
Heat Resistant Super Alloys (HRSA)
Maraging Steel



1 HSK-T » H004



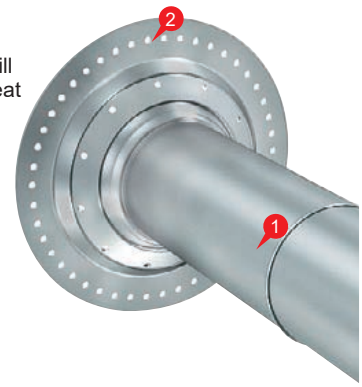
1 MP9005 / MP9015 / MP9025 » A036

Special Breakers for Difficult-to-Cut Materials



2 DSA » N075

Solid Carbide Drill for Machining Heat Resistant Super Alloys



AIR FRAME
Flap Track
Titanium Alloys



1 AJX » L228

High Feed Radius Milling Cutter



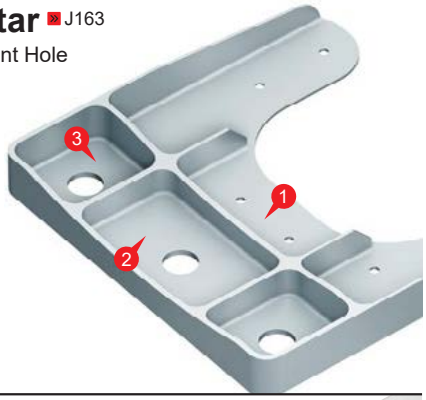
2 VQT5MVRB » J312

End Mill for High Efficiency Machining with Internal Coolant Holes



3 CoolStar » J163

Multi-coolant Hole End Mill



AIR FRAME
Hinge
Stainless Steel



1 iMX » K036

Exchangeable Head End Mills



2 VPX » L156



3 MMS » N082

Solid Carbide Drill with Internal Coolant Hole



AIR FRAME
Wing Rib
Aluminium Alloys

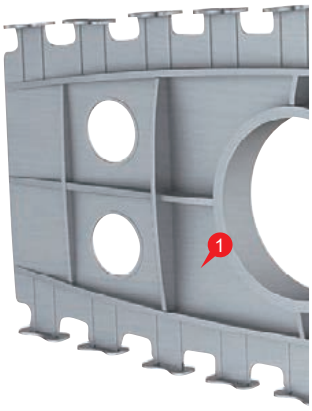


1 AXD » L194



1 iMX » K021 » K040

Exchangeable Head End Mills





1 Alimaster » J114 » J251

End Mill for High Efficiency Machining with Internal Coolant Holes

AIR FRAME
CFRP Wing
Carbon Fibre Reinforced Plastics



1 MC Drill Series » N112

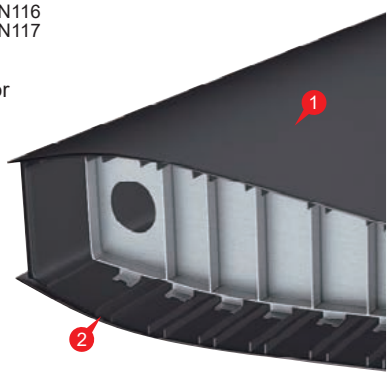


1 MCCH/ MCAH » N116 » N117

Carbide Drill for Hand Tools



2 DFC4JC / DFCJRT » J161 » J170



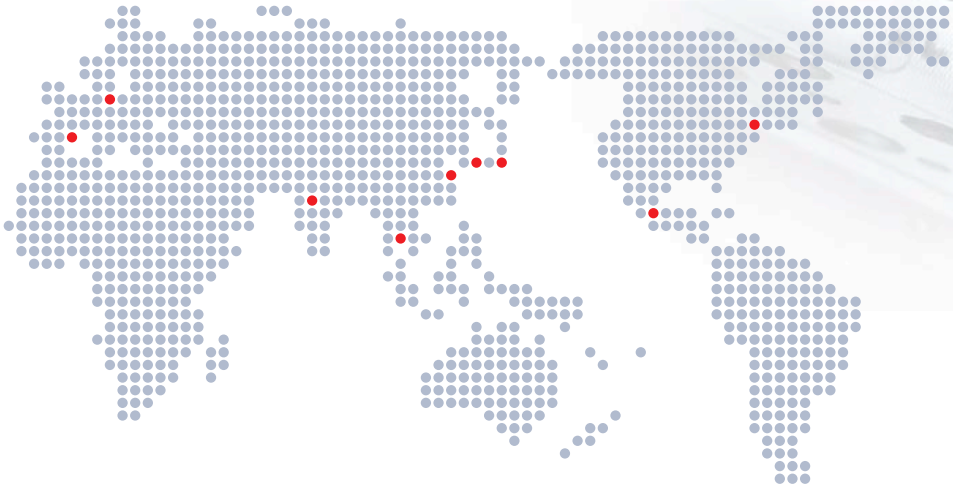
Customer Service

Cutting Solution Service

Machining Technology Centre

RESPONSIVE, ATTRACTIVE, PROACTIVE

Mitsubishi Materials Corporation, Metalworking Solutions Company, offers a "Comprehensive Craftsman Studio" which addresses the individual needs and requirements of our customers in order to make their business successful. Here the Machining Technology Centre is the base at the front lines. It is fully equipped with advanced machines, measuring instruments, extensive cutting data, knowledge, technologies as well as having a team of highly-experienced technical staff members. All of which allows Mitsubishi Materials Corporation to offer the best solution and services for our valued customers.





MTEC Saitama (East Japan Technical Centre)



MTEC Gifu (Central Japan Technical Centre)



MTEC TianJin (CHINA)



MTEC Valencia (SPAIN)



MTEC Stuttgart (GERMANY)



MTEC North Carolina (USA)



MTEC Bangkok (THAILAND)



MTEC Pune (India)



MTEC Querétaro (MEXICO)

We try answering any questions and demands from customers around the world and providing detailed solutions as well as meeting customers' expectations along with a sustainable growth of technical skills and services.



We identify the potential needs of customers and develop innovative tools to cultivate new markets for widening future business possibilities.

Showing and demonstrating, Attractive events and practical seminars present the new possibilities in machining which evoke a feeling of curiosity.

1 TRAINING

Practical "Hands-on" training with real demonstrations

- **Cutting Academy**
- **e-learning**
- Regional seminar
- Requested Seminar

2 CUTTING TEST

Visualizing your machining

- Test Cutting
- Selection of optimal machining conditions
- Improvements in tool life and machining quality
- Predictive tests before line input
- High-speed camera/ Cutting force/ 3D measuring device etc.

3 TECHNICAL SUPPORT

"RESPONSIVE", with the provision of technical services

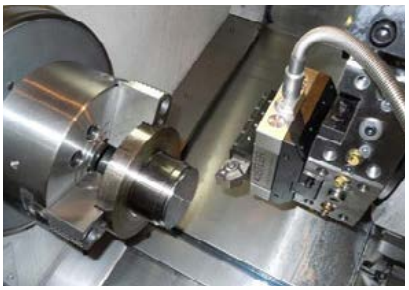
- Production line diagnosis/ Process improvement
- Tooling
- Cutting Simulation
- Telephone Technical Counseling

https://www.mitsubishicarbide.com/en/solution/purpose

For details, please contact your nearest sales office. (Refer to "Domestic Sales Offices" at the end of the catalogue)













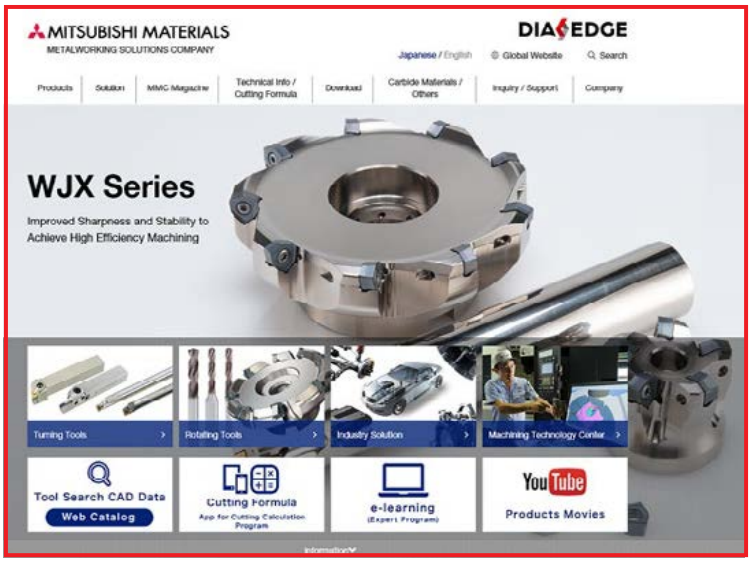
Customer Service

Web Service

Mitsubishi Materials' Website

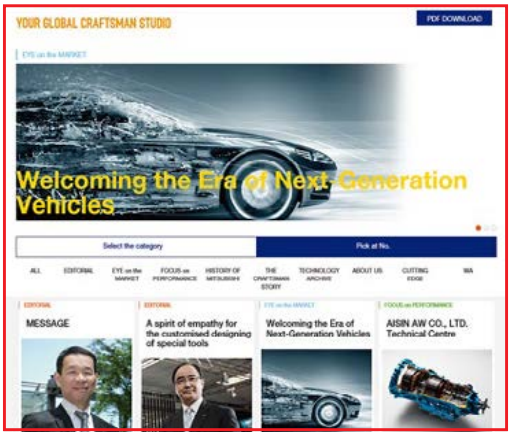
- We deliver latest solution technical information, exhibitions and event information.
- You can view various promotional leaflets as well as the PDF version of the General Catalogue on the website.

Renewal Scheduled for Fall 2022

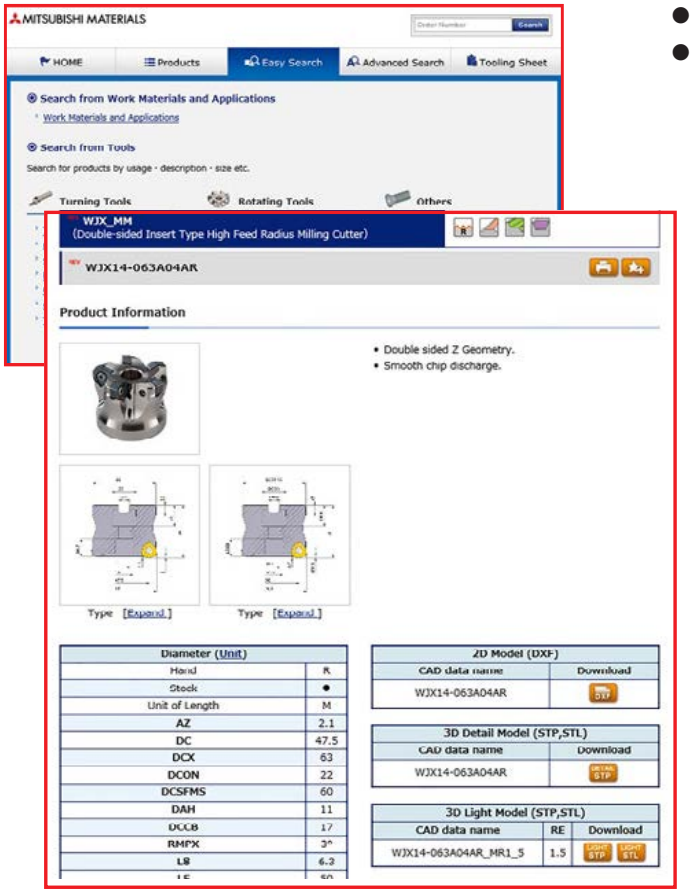


https://www.mitsubishicarbide.com/en/

Access to the website here

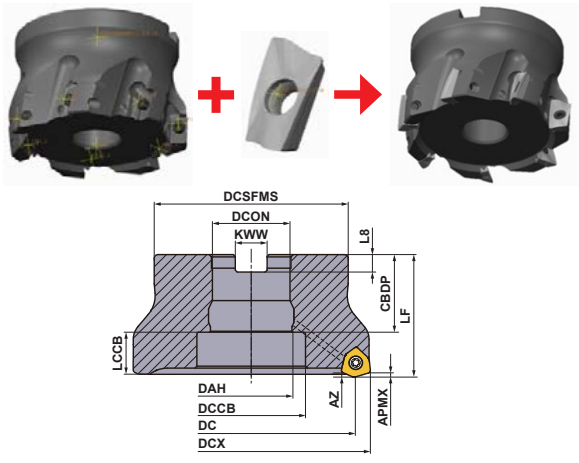


Mitsubishi Materials' Web Catalogue



- You can search for materials and cutting applications.
- We are constantly updating various CAD data corresponding to ISO 13399.
  - 2D Model (DXF)
  - 3D Detail Model (STP)
  - 3D Light Model (STP/STL)

3D Detail Model (STP) Example



https://www.mitsubishicarbide.net/mht/enuk/

Access to the web catalogue here

2023-2024

CONTENTS

	INDEX, NOTES	1
TURNING TOOLS	TURNING INSERTS	A
	CBN & PCD TURNING INSERTS	B
	EXTERNAL TURNING TOOLS	C
	SMALL TOOLS	D
	BORING BARS	E
	GROOVING/CUTTING OFF	F
	THREADING	G
	HSK-T TOOLS	H
	BRAZED TOOLS	I
ROTATING TOOLS	SOLID END MILLS	J
	EXCHANGEABLE HEAD END MILLS	K
	INDEXABLE MILLING	L
	TOOLING SYSTEM	M
	DRILLING	N
	SPARE PARTS	P
	TECHNICAL DATA	Q

DIA EDGE

SAFETY OF CUTTING TOOL PRODUCTS

1. Use of Cutting Tool Products

Packages of Mitsubishi products carry a safety warning label. However, tools are not labeled with detailed warning indications. Please read the "Safety of Cutting Tool Products" in this catalogue before handling cutting tool products and cemented carbide materials. Moreover, as a part of your workers' safety education, please notify the contents of the "Safety of Cutting Tool Products" to all workers.

2. Basic Characteristics of Hard Tool Materials

In Terms of "Safety of Cutting Tool Products"

Hard Tool Materials : General term for tool materials like cemented carbide alloy, cermet, ceramics, sintered CBN, sintered diamond, high speed steel and alloy steel, etc.

Physical Characteristics

Appearance : Varies depending on the type of material. Eg. grey, black, gold, etc.
Smell : None
Hardness, Specific Gravity :

Hard Tool Materials	Hardness (HV)	Specific Gravity	Hard Tool Materials	Hardness (HV)	Specific Gravity
High Speed Steel (HSS)	200－1200kg/mm^2	7－9	Sintered CBN	2000－5000kg/mm^2	3－5
Cemented Carbide	500－3000kg/mm^2	9－16	Sintered Diamond	8000－12000kg/mm^2	3－5
Cermet	500－3000kg/mm^2	5－9	Alloy Steel	200－1200kg/mm^2	7－9
Ceramics	1000－4000kg/mm^2	2－7	Diamond Electroforming Product	8000－12000kg/mm^2	3－5

Constituents

Carbide, nitride, carbon nitride, oxide, such as W, Ti, Al, Si, Ta, B, V and metals such as Fe, Co, Ni, Cr, Mo.

3. Safety of Cutting Tool Products

○Hard tool materials have a large specific gravity. Thus, they require special attention as heavy materials when the size or quantity is large.

○Cutting tool products generate dust and mist during grinding operations or heating. This dust and mist can be harmful when coming in contact with the eyes or skin, or if substantial quantities are swallowed. When grinding and machining, it is recommended to use local exhaust ventilation and respirators, a dust protective mask, glasses, gloves etc. If dust makes contact with the hands, thoroughly wash the affected area with soap and water. Don't eat in the exposed area, and wash hands thoroughly before eating. Remove dust from the clothing by a cleaning or washing, but don't shake off.

○Cobalt and nickel contained in carbide or other cutting tool materials are reported as possibly carcinogenic to humans. It is also reported that cobalt and nickel dust and mist can affect the skin, respiratory organs and heart through repeated or prolonged contact.

○For further information, please refer to Safety Data Sheet.

https://www.mitsubishicarbide.com/en/download/safety

4. Handling Cutting Tool Products

○Surface conditions affect toughness of cutting tools. Therefore, use a diamond grinding wheel for finishing.

○Hard tool materials are extremely hard and brittle at the same time. Thus, they may be broken by shocks and tightening with excess force.

○Hard tool materials and ferrous materials have different thermal expansion ratios. Shrinkage or swell fit products may suffer from cracks when applied temperature is higher or lower than the appropriate temperature for the tool.

○Pay special attention on storing hard tool materials. Toughness of hard tool materials is lowered when they corrode due to coolant and other liquid.

○When brazing hard tool materials, if the temperature is too high or too low from the melting point of the brazing material, loosening and breakage may occur.

○After regrinding cutting tools, make sure that there are no cracks.

○Machining hard tool materials on EDM may cause cracks on the surface due to electrons remaining after the EDM operation, resulting in lowering of the toughness. Eliminate these cracks by grinding, etc.

SUGGESTIONS ON HOW TO USE CUTTING TOOLS

Products	Hazard	Countermeasure
All Cutting Tools	◎Cutting tools have sharp cutting edges. Handling them with bare hands may cause injuries.	✱Take precautions such as wearing gloves especially when handling tools and during installation.
	◎Improper use of tools and application of inappropriate cutting conditions may cause the tool to break and be expelled from the machine providing risk of injury.	✱Ensure safety guards and goggles are used. ✱Refer to handling explanatory notes and catalogues. Use tools under recommended cutting conditions.
	◎Impact load and rapid increase of cutting resistance due to excessive wear may cause the tool to break and be expelled from the machine providing risk of injury.	✱Ensure safety guards and goggles are used. ✱Exchange tools before excessive wear occurs.
	◎Cutting tools and workpieces become extremely hot during cutting. Touching them with bare hands may cause burns.	✱Take precautions such as wearing gloves.
	◎Expelled hot chips produced in cutting produces risk of injuries and burns.	✱Ensure safety guards and goggles are used. ✱During swarf removal and machine cleaning ensure the machine is stopped and wear gloves. Please use tools, such as cutting nippers and cutting clippers.
	◎In cutting, sparks, hot chips and heat generation caused by tool breakage provides a risk of igniting a fire.	✱Avoid using cutting tools in places where there is a possibility of igniting a fire. ✱In case of using non-water soluble oil, make sure to have a fire prevention countermeasure.
	◎Using machines, chucks, and tools with poor balance at high revolutions may cause tools to break providing risk of injuries.	✱Ensure safety guards and goggles are used. ✱Check the machine for vibration, chattering, and abnormal noise.
	◎Handling machined parts with burrs using bare hands may cause injuries.	✱Wear gloves.
Indexable Inserts Type Tools	◎If inserts and spare parts are not held securely, they may become loose and be expelled producing risk of injuries.	✱Clean insert locating seat and spare parts before setting inserts. ✱Use the tool provided for setting inserts, and ensure the inserts and spare parts are clamped securely. Do not use the tool provided for things other than prescribed inserts and spare parts.
	◎Clamping inserts and spare parts too tightly by using tools such as extension pipes may cause them to break and be expelled.	✱Do not use extra tools for more leverage. Only use the tool provided.
	◎When applying high cutting speed, spare parts and inserts may be expelled due to centrifugal force. Pay special attention on each safety guidline.	✱Refer to the handling explanatory notes and catalogues. Use tools under recommended cutting conditions.
Cutters and Other Rotating Tools	◎Milling cutters have sharp edges. Handling them with bare hands may cause injuries.	✱Take precautions such as wearing gloves.
	◎Poor balance or off center revolving of tools may cause vibration and chattering which could cause the tool to break and be expelled.	✱Apply cutting speed within the range of recommended cutting conditions. ✱Adjust accuracy and balance of spindles and bearings periodically to prevent off center revolving and chattering caused by wear on these parts.
Drilling Tools	◎Through cutting in cases when the workpiece revolves may produce a disk shaped peice with sharp edges when the cutting tool breaks through.	✱Ensure safety guards and goggles are used. Also install a cover on the chuck.
	◎Drills with an extremely small diameter have a very sharp point which may puncture the skin if not handled carefully. If the drill breaks during cutting, the broken pieces may be expelled.	✱Handle with care. Take precautions such as wearing gloves and goggles.
Brazed Tools	◎Weakening of the braze and breakage of inserts may cause injury.	✱Before using them, ensure they are brazed securely. ✱Do not use them under conditions which produce very high temperature.
Others	◎Machine and tools may be damaged if they are used for purposes other than the prescribed application.	✱Use them strictly for the prescribed application.

INFORMATION

This catalogue completes the basic precautions for safety use of our company's products.
For further information, please refer to the guideline, catalogues or contact us. We are not responsible for any accidents causing by modifying tools without our permission.

USING THIS CATALOGUE

1. This information in this catalogue is as of August 2022.

2. Please note that products in this catalogue are continuously reviewed and updated. The products therefore may be changed in the future and thus become different from the catalogue.

3. Stock status is mentioned for the products in this catalogue. However, please note that the products here may be replaced by new grades and products in the future.

   Note 1) Please contact us for dimensions not mentioned in this catalogue.
   Note 2) Please contact us regarding order numbers and grades that are not mentioned in this catalogue.

4. Stock status indication

   ● : Inventory maintained. **□ : Non stock, produced to order only.** **▲: Inventory maintained. To be replaced by new products.**

HOW TO USE THIS CATALOGUE

In this catalogue, our company's cutting tools are broadly divided into two types: turning tools and rotating tools, with separate respective sections for each machining method. Please select the search method that matches your requirements when using the catalogue.

1. **Search for tool types from the CONTENTS.**

2. **To find the series of products from the index of the inside title**.
   Index of each block are listed on each inside title.

3. **To find the product according to application.**
   The classification page of each block provides the series of products to be selected according to applications and purposes.

4. **Search using the alphabetical index.**
   All tools are listed in the alphabetical index at the front of the catalogue.

5. **How to use the block sections.**
   A usage guide for each block is shown on the left of each index (not for all blocks). Refer to this page to know how to read the product information and how the page is organised.

OTHER WAYS TO USE THE CATALOGUE

The following PR materials are also available in addition to this catalogue, for use as necessary.

1. **Catalogues for individual products**
   • Access the following URL and download "Tool News" for the applicable cutting tool.
   Information about tool features and examples of cutting applications are available in greater detail.

https://www.mitsubishicarbide.com/en/download/tools_news

INDEX

INDEX FOR TOOL NUMBER

A 5
B 5
C 6
D 8
E 9
F 9
G 10
H 10
I 11
J 11
K 11
L 11
M 12
N 13
O 15
P 15
Q 15
R 16
S 16
T 18
U 19
V 19
W 20
X 21
Z 21
NUMBER / OTHERS... 21



INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
A		
A3SA	Carbide end mill	J113
A3SARB	Carbide end mill	J251
A50UMWLNR08	M type boring bar	E047
ABS○○○-ES-M	Parts for ABS head	M026, M027
ABS○○○-ES-M○	Parts for ABS head	M026, M027
ABS○○-F○	Screw (For ABS adapter)	M025
ABS○○○-FS-W	Parts for ABS adapter	M025
ABS○○○M	ABS head	M026
ABS○○○W	Parts for ABS adapter	M025
AD-BM10	Banjo adapter	F131
A○○○-DCLNR/L12	DOUBLE CLAMP DIMPLE BAR	E021
A○○○-DDUNR/L15	DOUBLE CLAMP DIMPLE BAR	E021
AD-G1/8	Adapter	F131
A○○○-DSKNR/L12	DOUBLE CLAMP DIMPLE BAR	E022
A○○○-DTFNR/L16	DOUBLE CLAMP DIMPLE BAR	E022
A○○○-DVUNR/L16	DOUBLE CLAMP DIMPLE BAR	E023
ADW04	Adjustable run-out system (For WSF406W type cutter)	L084
A○○○-DWLNR/L○○	DOUBLE CLAMP DIMPLE BAR	E023
AEMW○○○○○○ER	Insert (For BAE type cutter)	L344
AF5000 type	Spare parts (For AF5000 type face mill)	P029
AHX440S-○○○○○○○R	AHX440S type face mill	L062, L063
AHX440SR○○○○○○A	AHX440S type face mill	L062
AHX475S-○○○○○○AR	AHX475S type face mill	L067
AHX475SR○○○○○○A	AHX475S type face mill	L067
AHX640SR○○○○○○○	AHX640S type face mill	L071
AHX640S-○○○○○○○R	AHX640S type face mill	L071, L072
AHX640WR/L○○○○○○	AHX640W type face mill	L079
AHX640W-○○○○○○R/L	AHX640W type face mill	L080
AJS○○○○T○○	Clamp screw	P004
AJX○○R○○○○○○	AJX type face mill	L228
AJX○○-○○○○○○R	AJX type face mill	L228, L229
AJX○○R○○○AM○○○○	AJX type end mill	L233
AJX○○R○○○SA○○S/SS/L/EL	AJX type end mill	L231, L232
AMS○	Clamp bridge	P016
A○○○MWLN type	Spare parts (For M type boring bar)	P026
AOGT1236○○PEFR-GM	Insert (For APX3000 type cutter)	L139, L144
AOMT1236○○PEER-○	Insert (For APX3000 type cutter)	L139, L144
AOMT1848○○PEER-○	Insert (For APX3000 type cutter)	L149, L154
AOX445-063A04R	AOX445 type face mill	L087
AOX445R○○○○○○	AOX445 type face mill	L087
AOX445R○○○S32	AOX445 type end mill	L087
A○○○PCLNR/L○○	P type boring bar	E044
A○○○PCLNR/L○○	Spare parts (For P type boring bar)	P026
A○○○PDQNR/L15	P type boring bar	E045
A○○○PDUNR/L○○	P type boring bar	E044
A○○○PDZNR/L15	P type boring bar	E046
APGT1135PDFR-G2	Insert (For BAP300 type cutter)	L123, L344
APGT1604PDFR-G2	Insert (For BAP400 type cutter)	L344
APMT1135PDER-○○	Insert (For BAP300/SRM2 type cutter)	L123, L311, L344
APMT1604PDER-○○	Insert (For BAP400/SRM2 type cutter)	L311, L317, L344
A○○○PSKNR/L○○	P type boring bar	E043
A○○○PSKNR/L○○	Spare parts (For P type boring bar)	P026
A○○○PTFNR/L○○	P type boring bar	E043
A○○○PWLNR/L06	P type boring bar	E045
APX3000-○○○A○○RA	APX3000 type face mill	L137
APX3000R○○○○○○A	APX3000 type face mill	L137
APX3000R○○○M○○A○○	APX3000 type end mill	L138
APX3000R○○○SA○○○A	APX3000 type end mill	L136
APX3K-○○○A○○A○○○RA	APX3000 type end mill	L143
APX3KR○○○○S○○○○○○○A	APX3000 type end mill	L142
APX4000-○○○A○○RA	APX4000 type face mill	L147
APX4000R○○○○○○A	APX4000 type face mill	L147
APX4000R○○○M○○A○○	APX4000 type end mill	L148
APX4000R○○○SA○○○A	APX4000 type end mill	L146
APX4K-○○○A○○A○○○RA	APX4000 type end mill	L153
APX4KR06316CA056A	APX4000 type end mill	L153
APX4KR○○○○SA42S056A	APX4000 type end mill	L152
APX4KR○○○○WA508○○○○A	APX4000 type end mill	L152
AQXR○○○M○○A○○	AQX type end mill	L222
AQXR○○○SA/N○○S/L	AQX type end mill	L220, L221
ARP6PR○○○○○○A	ARP type face mill	L264
ARP○P-○○○○○○AR	ARP type face mill	L264
ARP○PR○○○○AM○○○○	ARP type end mill	L267
ARP○PR○○○○SA○○○	ARP type end mill	L266
ARX○○R○○○M○○A○○	ARX type end mill	L271
ARX○○R○○○SA○○S/LW	ARX type end mill	L270, L271
ASPX4-○○○A○○A○○○RA○○	ASPX type end mill	L288
ASPX4R0805H○○○A127SA	ASPX type end mill	L289
ASS○	Spring (For SXZC/AJX/PMC/BRE/CV type cutter)	C031, L230, L232, L233, L326
ASX400	ASX400 type side cutter	L135
ASX400R○○○○○○	ASX400 type face mill	L116
ASX400-○○○○○○R	ASX400 type face mill	L116, L117
ASX400R○○○AM16○○	ASX400 type end mill	L119
ASX400R○○○S○○	ASX400 type end mill	L118
ASX445R○○○○○○	ASX445 type face mill	L054
ASX445-○○○○○○R	ASX445 type face mill	L054, L055
ASX445R○○○S○○	ASX445 type end mill	L056
AXD4000A-050A04RD/E	AXD4000A type face mill	L202
AXD4000-○○○A○○RA/B	AXD4000 type face mill	L195
AXD4000R○○○○○○A/B	AXD4000 type face mill	L195
AXD4000R○○○SA○○○A/B	AXD4000 type end mill	L194
AXD7000-○○○A○○RA/B	AXD7000 type face mill	L208, L209
AXD7000R○○○○○○A/B	AXD7000 type face mill	L208
AXD7000R○○○○○A-H63A	AXD7000 type end mill (For HSK-T)	L209
AXD7000R○○○SA○○SA/B	AXD7000 type end mill	L208
B		
B○○○○○	Spare parts (For D type boring bar)	P026
B1○○○○	Arbor (For D type boring head)	E050, F146, G043
BAE type	Spare parts (For BAE type end mill)	P035
BAP300 type	Spare parts (For BAP300 type face mill)	P029
BAP300 type	Spare parts (For BAP300 type end mill)	P035
BAP300R○○○LS○○	BAP300 type end mill	L122
BAP300R○○○S○○	BAP300 type end mill	L122
BAP3500 type	Spare parts (For BAP3500 type end mill)	P035

ORDER NUMBER	PRODUCT NAME	PAGE
BAP400 type	Spare parts (For BAP400 type face mill)	P029
BAP400 type	Spare parts (For BAP400 type end mill)	P035
BB-G1/8	Banjo bolt	F131
BC○	Clamp set (For BC type cartridge)	M009
BC○○	Clamp set (For BC type cartridge)	M009
BCP○○○	Shim pin	P015
BF407 type	Spare parts (For BF407 type face mill)	P029
BF-CCGT○○○○○○TS2	Insert (Class G tolerance)	B041
BF-CNGM○○○○○○TAWS2	Insert (Class G tolerance)	B024
BF-CNGM○○○○○○TS2	Insert (Class G tolerance)	B024
BF-CNGM○○○○○○TSWS2	Insert (Class G tolerance)	B024
BF-DCGT○○○○○○TS2	Insert (Class G tolerance)	B045
BF-DNGM○○○○○○TAWS2	Insert (Class G tolerance)	B029
BF-DNGM○○○○○○TS2	Insert (Class G tolerance)	B029
BF-DNGM○○○○○○TSWS2	Insert (Class G tolerance)	B029
BM-CCGT○○○○○○TA2	Insert (Class G tolerance)	B041
BM-CNGM○○○○○○TA2	Insert (Class G tolerance)	B024
BM-DCGT○○○○○○TA2	Insert (Class G tolerance)	B045
BM-DNGM○○○○○○TA2	Insert (Class G tolerance)	B029
BMR	BMR bore boring cutter	L332
BM-TNGM○○○○○○TA3	Insert (Class G tolerance)	B033
BN425 type	Spare parts (For BN425 type face mill)	P029
BOE type	Spare parts (For BOE type end mill)	P036
BOE type	Spare parts (For BOE type face mill)	P029
BOES○○○	Set bolt	P010
BR-CNGM○○○○○○TA2	Insert (Class G tolerance)	B024
BR-DNGM○○○○○○TA2	Insert (Class G tolerance)	B029
BRE type	Spare parts (For BRE type end mill)	P036
BRP○P-○○○A○○R	BRP type face mill	L276
BRP○PR○○○○○○	BRP type face mill	L276
BRP○○R○○○S○○	BRP type end mill	L274, L275
BSP type	Spare parts (For BSP type end mill)	P036
BSX300 type	Spare parts (For BSX300 type end mill)	P036
BSX400 type	Spare parts (For BSX400 type face mill)	P030
BSX400 type	Spare parts (For BSX400 type end mill)	P036
BSX500 type	Spare parts (For BSX500 type face mill)	P030
BSX500 type	Spare parts (For BSX500 type end mill)	P036
BTAHR/L○○○○-50	Small tools holder (External back turning)	D014
BTAT605000RX	Insert for external back turning	D014
BTAT○○○○○○MR-B	Insert for external back turning	D014
BTAT○○○○○MR-SMB	Insert for external back turning	D014
BTAT○○○○○○R/L-B	Insert for external back turning	D014
BTAT○○○○○○○-SMB	Insert for external back turning	D014
BTBT○○○○○○MR-B	Insert for external back turning	D015
BTBT○○○○○○MR-SMB	Insert for external back turning	D015
BTBT○○○○○○R/L	Insert for external back turning	D015
BTBT○○○○○○R/L-B	Insert for external back turning	D015
BTBT○○○○○○R/L-SMB	Insert for external back turning	D015
BTVHR○○○○-○○	Small tools holder (External back turning)	D016
BTVHR○○○○-○○F	Small tools holder (External back turning)	D016
BTVT○○○○○○R-B	Insert for external back turning	D016
BXD4000R○○○○○○A/B	BXD4000 type face mill	L216
BXD4000-○○○○○○RA/B	BXD4000 type face mill	L216, L217
BXD4000R○○○SA○○○A/B	BXD4000 type end mill	L218
BXD7000 type	Spare parts (For BXD7000 type end mill)	P036
BXD7000 type	Spare parts (For BXD7000 type face mill)	P030
BZC400 type	Spare parts (For BZC400 type end mill)	P036
BZC400 type	Spare parts (For BZC400 type face mill)	P030

C

ORDER NUMBER	PRODUCT NAME	PAGE
C○	Clamp set	E034
C2MA	Carbide end mill	J092
C2MHA	Carbide end mill	J094
C3SA	Carbide end mill	J116
C3SARB	Carbide end mill	J253
C4LATB	Carbide end mill (For impellers)	J330
CBJ/MPR○○○S○○	CBJP/CBMP type end mill	L322
CB○○RS	MICRO-MINI TWIN	E027
CB○○RS-○○	MICRO-MINI TWIN	E027
CB○○RS-B	MICRO-MINI TWIN	E027
CB○○RS-○○B	MICRO-MINI TWIN	E027
CBT○○	Breaker piece	P016
CCET○○○○○○R/L-SN	Insert (Class E tolerance)	A120
CCET○○○○○○R/L-SR	Insert (Class E tolerance)	A119
CCET○○○○○○R/LW-SN	Insert (Class E tolerance)	A120
CCGH○○○○○○MR/L-F	Insert (Class G tolerance)	A115
CCGH○○○○○○R/L-F	Insert (Class G tolerance)	A115
CCGT○○○○○○-AZ	Insert (Class G tolerance)	A115
CCGT○○○○○○-FJ	Insert (Class G tolerance)	A114
CCGT○○○○○○M-FS	Insert (Class G tolerance)	A114
CCGT○○○○○○M-FS-P	Insert (Class G tolerance)	A114
CCGT○○○○○○M-LS	Insert (Class G tolerance)	A116
CCGT○○○○○○M-LS-P	Insert (Class G tolerance)	A116
CCGT○○○○○○MR/L-F	Insert (Class G tolerance)	A115
CCGT○○○○○○MR/L-SN	Insert (Class G tolerance)	A119
CCGT○○○○○○MR/L-SS	Insert (Class G tolerance)	A117
CCGT○○○○○○M-SMG	Insert (Class G tolerance)	A120
CCGT○○○○○○R/L-F	Insert (Class G tolerance)	A115
CCGT○○○○○○R/L-SN	Insert (Class G tolerance)	A119
CCGT○○○○○○R/L-SS	Insert (Class G tolerance)	A117
CCGW○○○○○○	Insert (Class G tolerance)	A121
CCK○○	Clamp bridge	P016
CCMH○○○○○○-MV	Insert (Class M tolerance)	A118
CCMH○○○○○○-SV	Insert (Class M tolerance)	A116
CCMT○○○○○○	Insert (Class M tolerance)	A118
CCMT○○○○○○-FM	Insert (Class M tolerance)	A114
CCMT○○○○○○-FP	Insert (Class M tolerance)	A114
CCMT○○○○○○-FV	Insert (Class M tolerance)	A114
CCMT○○○○○○-LM	Insert (Class M tolerance)	A116
CCMT○○○○○○-LP	Insert (Class M tolerance)	A115
CCMT○○○○○○-LS	Insert (Class M tolerance)	A116
CCMT○○○○○○-MK	Insert (Class M tolerance)	A117
CCMT○○○○○○-MM	Insert (Class M tolerance)	A117
CCMT○○○○○○-MP	Insert (Class M tolerance)	A117
CCMT○○○○○○-MS	Insert (Class M tolerance)	A118
CCMT○○○○○○-MW	Insert (Class M tolerance)	A118
CCMT○○○○○○-SW	Insert (Class M tolerance)	A116
CCMW○○○○○○	Insert (Class M tolerance)	A121, B042, B059
CCMX○○○○○○EN-○	Insert (For DCCC type cutter)	L281
CCP○○	Shim pin	P015
CE4SRB	Ceramic radius end mill	J310
CE6SRB	Ceramic radius end mill	J310

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
CESPR○○○S○○	CESP type end mill	L318
CFSPR○○○S○○	CFSP type end mill	L318
CG○○○○RS-○○○	MICRO-MINI TWIN	F140
CGSPR○○○S○○	CGSP type end mill	L318
C○-GYHER/LM00-M25R/L	GY PSC holder	F094-F095
C○-GYHER/LM50-M25R/L	GY PSC holder	F098-F099
C○-GYHER/LM90-M25R/L	GY PSC holder	F096-F097
CKW6	Clamp bridge	P016
CMRA	Carbide end mill	J346
CNGA○○○○○○	Insert (Class G tolerance)	B025
CNGG○○○○○○-FJ	Insert (Class G tolerance)	A074
CNGG○○○○○○-MJ	Insert (Class G tolerance)	A075
CNGN○○○○○○	Insert (Class G tolerance)	B038
CNMA○○○○○○	Insert (Class M tolerance)	A080, B025, B055
CNMG○○○○○○	Insert (Class M tolerance)	A078
CNMG○○○○○○-FH	Insert (Class M tolerance)	A074
CNMG○○○○○○-FP	Insert (Class M tolerance)	A074
CNMG○○○○○○-FS	Insert (Class M tolerance)	A074
CNMG○○○○○○-FY	Insert (Class M tolerance)	A074
CNMG○○○○○○-GH	Insert (Class M tolerance)	A079
CNMG○○○○○○-GJ	Insert (Class M tolerance)	A079
CNMG○○○○○○-GK	Insert (Class M tolerance)	A077
CNMG○○○○○○-GM	Insert (Class M tolerance)	A077
CNMG○○○○○○-LK	Insert (Class M tolerance)	A075
CNMG○○○○○○-LM	Insert (Class M tolerance)	A075
CNMG○○○○○○-LP	Insert (Class M tolerance)	A074
CNMG○○○○○○-LS	Insert (Class M tolerance)	A075
CNMG○○○○○○-MA	Insert (Class M tolerance)	A077
CNMG○○○○○○-MH	Insert (Class M tolerance)	A077
CNMG○○○○○○-MJ	Insert (Class M tolerance)	A075
CNMG○○○○○○-MK	Insert (Class M tolerance)	A076
CNMG○○○○○○-MM	Insert (Class M tolerance)	A076
CNMG○○○○○○-MP	Insert (Class M tolerance)	A076
CNMG○○○○○○-MS	Insert (Class M tolerance)	A076, A077
CNMG○○○○○○-MW	Insert (Class M tolerance)	A078
CNMG○○○○○○-RK	Insert (Class M tolerance)	A079
CNMG○○○○○○-RM	Insert (Class M tolerance)	A078
CNMG○○○○○○-RP	Insert (Class M tolerance)	A078
CNMG○○○○○○-RS	Insert (Class M tolerance)	A079
CNMG○○○○○○-SA	Insert (Class M tolerance)	A075
CNMG○○○○○○-SH	Insert (Class M tolerance)	A075
CNMG○○○○○○-SW	Insert (Class M tolerance)	A075
CNMG○○○○○○-SY	Insert (Class M tolerance)	A075
CNMM○○○○○○-HL	Insert (Class M tolerance)	A079
CNMM○○○○○○-HM	Insert (Class M tolerance)	A080
CNMM○○○○○○-HR	Insert (Class M tolerance)	A080
CNMM○○○○○○-HV	Insert (Class M tolerance)	A080
CNMM○○○○○○-HX	Insert (Class M tolerance)	A079
CNMM○○○○○○-HZ	Insert (Class M tolerance)	A080
CNMN○○○○○○	Insert (Class M tolerance)	A111
CPGT○○○○○○	Insert (Class G tolerance)	A122, B059
CPGT○○○○○○R/L-F	Insert (Class G tolerance)	A122
CPMH○○○○○○-FV	Insert (Class M tolerance)	A122
CPMH○○○○○○-MV	Insert (Class M tolerance)	A123
CPMH○○○○○○R/L-F	Insert (Class M tolerance)	A122
CPMH○○○○○○-SV	Insert (Class M tolerance)	A122

ORDER NUMBER	PRODUCT NAME	PAGE
CPMT○○○○ZPEN-M○	Insert (For PMR type cutter)	L331, L344
CPMX○○○○○○	Insert (Class M tolerance)	A123
CPT○○	Side lock plate (For WP type holder/M type boring bar)	C017, E047
CR○	Stop ring	G023, G032, H016
C○○○R-BLS	MICRO-MINI boring bar (Solid carbide)	E030, F139
CRN2MB	CRN end mill	J208
CRN2MRB	CRN end mill	J248
CRN2MS	CRN end mill	J085
CRN2XL	CRN end mill	J087
CRN2XLB	CRN end mill	J210
CRN2XLRB	CRN end mill	J249
CRN4JC	CRN end mill	J159
CR○○RS-01	MICRO-MINI TWIN	E028
CR○○RS-01B	MICRO-MINI TWIN	E028
CS○	Clamp screw	P004
CS-1/8-○○○○○	Coolant hose kit	F131
CS300590T	Plug	F129
CS5015060T	Clamp screw	P004
CSBP type	Spare parts (For MC type holder)	P019
C○○○SCLC type	Spare parts (For S type boring bar)	P026
C○○○SCLCR○○	S type boring bar/MICRO-MINI (Carbide shank)	E024, E038
C○○○SCZC type	Spare parts (For S type boring bar)	P026
C○○○SDQCR○○	S type boring bar (Carbide shank)	E039
C○○○SDUC type	Spare parts (For S type boring bar)	P026
C○○○SDUCR○○	S type boring bar (Carbide shank)	E037
C○○○SDZC type	Spare parts (For S type boring bar)	P026
CSKP type	Spare parts (For MC type holder)	P019
CSKPR○○CA○○	BC type cartridge	M008
CSRA	Carbide end mill	J344
C○○○SSKC type	Spare parts (For S type boring bar)	P026
CSSN type	Spare parts (For MC type holder)	P019
CSSP type	Spare parts (For MC type holder)	P019
CSSPR○○CA○○	BC type cartridge	M008
CS○○○T	Clamp screw	P004
CS○○○○○○T	Clamp screw	P004
C○○○STFCR○○	S type boring bar (Carbide shank)	E036
CSTN type	Spare parts (For MC type holder)	P019
C○○○STUCR06	MICRO-DEX boring bar (Carbide shank)	E025
CSVHR/L○○○○	Small tools holder (For cam tool posts)	D027
C○○○SVQCR○○	S type boring bar (Carbide shank)	E040
CSVTB○○○R-B	Insert for external back turning	D028
CSVTB○○○R/L	Insert for external back turning	D028
CSVTBXL	Insert for external back turning	D028
CSVTC○○○○R-B	Insert for external cutting off	D028
CSVTC○○○○R/L	Insert for external cutting off	D028
CSVTF○○○R/L	Insert for external front turning	D027
CSVTF○○○R/L-B	Insert for external front turning	D027
CSVTFXL	Insert for external front turning, Copying	D027
CSVTG○○○○○R/L	Insert for grooving	D029
CSVTT○○○○○RR/L	Insert for threading	D029
C○○○SVUC type	Spare parts (For S type boring bar)	P026
C○○○SWUBR○○	MICRO-DEX boring bar (Carbide shank)	E024
CTAHR1010-120S	Small tools holder (For external cutting off)	D020

ORDER NUMBER	PRODUCT NAME	PAGE
CTAHR/L○○○○-120	Small tools holder (For external cutting off)	D020
CTAN type	Spare parts (For MC type holder)	P019
CTAP type	Spare parts (For MC type holder)	P019
CTAT○○○○○○○○○-B	Insert for cutting off	D021
CTAT○○○○○○○○○-B○	Insert for cutting off	D021
CTAT○○○○○○○RR/LL	Insert for cutting off	D021
CTBHR/L○○○○-○○○	Small tools holder (For external cutting off)	D015, D022
CTBT○○○○○○○R/L○-B	Insert for cutting off	D022
CTCH type	Spare parts (For CTCH type holder)	P018
CTCP type	Spare parts (For MC type holder)	P019
CTDH type	Spare parts (For CTDH type holder)	P018
CTEH type	Spare parts (For CTEH type holder)	P018
CTE○○T○○○	Shim (For MMTE holder)	P012
CTFP type	Spare parts (For MC type holder)	P019
CTGN type	Spare parts (For MC type holder)	P019
CTGP type	Spare parts (For MC type holder)	P019
CTI○○T○○○	Shim (For MMTI holder)	P012
CT○○RS-M○○	MICRO-MINI TWIN	G037
CV type	Spare parts (For CV type end mill)	P037
CV20 type	Spare parts (For CV20 type end mill)	P037
CWAF10R○	Wedge	L097
CWAHX640WN	Wedge	L081
CWAOX445N	Wedge	L088
CWS○	Wedge	L337, P031
CWS42SER/L	Wedge	L339
CWS42SPR/L	Wedge	L335
CWSF406N	Wedge	L084

D

ORDER NUMBER	PRODUCT NAME	PAGE
DC2SB	Diamond coating end mill	J213
DC2XLB	Diamond coating end mill	J215
DCBSS	Diamond coated drill, For hard brittle materials	N142
DCCCR○○○○S○○	DCCC type end mill	L280
DCET○○○○○○R/L-SN	Insert (Class E tolerance)	A129
DCET○○○○○○R/L-SR	Insert (Class E tolerance)	A127
DCET○○○○○○R/LW-SN	Insert (Class E tolerance)	A129
DCGT11T○○○MR-SRF	Insert (Class G tolerance)	A125
DCGT○○○○○○-AZ	Insert (Class G tolerance)	A124
DCGT○○○○○○M-FS	Insert (Class G tolerance)	A124
DCGT○○○○○○M-FS-P	Insert (Class G tolerance)	A124
DCGT○○○○○○M-LS	Insert (Class G tolerance)	A125
DCGT○○○○○○M-LS-P	Insert (Class G tolerance)	A125
DCGT○○○○○○MR/L-SN	Insert (Class G tolerance)	A128
DCGT○○○○○○MR/L-SS	Insert (Class G tolerance)	A126
DCGT○○○○○○M-SMG	Insert (Class G tolerance)	A129
DCGT○○○○○○R/L-F	Insert (Class G tolerance)	A125
DCGT○○○○○○R/L-SN	Insert (Class G tolerance)	A128
DCGT○○○○○○R/L-SS	Insert (Class G tolerance)	A126
DCGW○○○○○○	Insert (Class G tolerance)	A129
DCK○○○○	Clamp bridge	P016
DCLNR/L○○○○○○○	DOUBLE CLAMP type holder	C008
DCMT○○○○○○	Insert (Class M tolerance)	A127
DCMT○○○○○○-FM	Insert (Class M tolerance)	A124
DCMT○○○○○○-FP	Insert (Class M tolerance)	A124
DCMT○○○○○○-FV	Insert (Class M tolerance)	A124
DCMT○○○○○○-LM	Insert (Class M tolerance)	A125
DCMT○○○○○○-LP	Insert (Class M tolerance)	A125
DCMT○○○○○○-LS	Insert (Class M tolerance)	A125
DCMT○○○○○○-MK	Insert (Class M tolerance)	A127
DCMT○○○○○○-MM	Insert (Class M tolerance)	A127
DCMT○○○○○○-MP	Insert (Class M tolerance)	A126
DCMT○○○○○○-MS	Insert (Class M tolerance)	A127
DCMT○○○○○○-MV	Insert (Class M tolerance)	A127
DCMT○○○○○○-SV	Insert (Class M tolerance)	A125
DCMW○○○○○○	Insert (Class M tolerance)	A129, B045, B060
DCS○	Spring	C008, C010, C016, C019, E021, H006
DCSD type	Spare parts (For DCSD type end mill)	P037
DCSN type	Spare parts (For DCSN type end mill)	P037
DCSSM	Diamond coated drill, Medium, For non-ferrous material	N140
DCSSS	Diamond coated drill, Short, For non-ferrous material	N140
DCSVN32	Shim	P012
DC○○○○T	Clamp screw	P004
DCTU type	Spare parts (For D type boring head)	P024
DDJNR/L○○○○○○○	DOUBLE CLAMP type holder	C010
DEGX○○○○○○R/L	Insert (For AL type holder)	A130
DEGX○○○○○○R/L-F	Insert (For AL type holder)	A130, B066
DF2XLB	Diamond coated end mill	J217
DF2XLBF	Diamond coated end mill	J220
DF4JC	Diamond coated end mill	J160
DFC4JC	DFC type end mill	J161
DFCJRT	DFC type end mill	J170
DG type	Spare parts (For DG type holder)	P023
DLC3SA	DLC coated end mill	J114
DLC3SARB	DLC coated end mill	J255
DLC4LATB	DLC coated end mill	J328
DLE○○○○S○○○P○○○	Leading drills	N020
DNGA○○○○○○	Insert (Class G tolerance)	A087, B030, B055
DNGG○○○○○○-FJ	Insert (Class G tolerance)	A081
DNGG○○○○○○-R/L	Insert (Class G tolerance)	A086
DNGM○○○○○○-MJ	Insert (Class G tolerance)	A083
DNGN○○○○○○	Insert (Class G tolerance)	B038
DNMA○○○○○○	Insert (Class M tolerance)	A087
DNMG○○○○○○	Insert (Class M tolerance)	A085
DNMG○○○○○○-FH	Insert (Class M tolerance)	A081
DNMG○○○○○○-FP	Insert (Class M tolerance)	A081
DNMG○○○○○○-FS	Insert (Class M tolerance)	A081
DNMG○○○○○○-FY	Insert (Class M tolerance)	A081
DNMG○○○○○○-GH	Insert (Class M tolerance)	A087
DNMG○○○○○○-GJ	Insert (Class M tolerance)	A087
DNMG○○○○○○-GK	Insert (Class M tolerance)	A085
DNMG○○○○○○-GM	Insert (Class M tolerance)	A085
DNMG○○○○○○-LK	Insert (Class M tolerance)	A082
DNMG○○○○○○-LM	Insert (Class M tolerance)	A082
DNMG○○○○○○-LP	Insert (Class M tolerance)	A082
DNMG○○○○○○-LS	Insert (Class M tolerance)	A082
DNMG○○○○○○-MA	Insert (Class M tolerance)	A085
DNMG○○○○○○-MH	Insert (Class M tolerance)	A085

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
DNMG○○○○○○-MJ	Insert (Class M tolerance)	A083
DNMG○○○○○○-MK	Insert (Class M tolerance)	A084
DNMG○○○○○○-MM	Insert (Class M tolerance)	A084
DNMG○○○○○○-MP	Insert (Class M tolerance)	A084
DNMG○○○○○○-MS	Insert (Class M tolerance)	A084
DNMG○○○○○○-RK	Insert (Class M tolerance)	A086
DNMG○○○○○○-RM	Insert (Class M tolerance)	A086
DNMG○○○○○○-RP	Insert (Class M tolerance)	A086
DNMG○○○○○○-RS	Insert (Class M tolerance)	A086
DNMG○○○○○○-SA	Insert (Class M tolerance)	A083
DNMG○○○○○○-SH	Insert (Class M tolerance)	A083
DNMG○○○○○○-SY	Insert (Class M tolerance)	A083
DNMM○○○○○○-HL	Insert (Class M tolerance)	A087
DNMM○○○○○○-HZ	Insert (Class M tolerance)	A087
DNMX○○○○○○-MW	Insert (Class M tolerance)	A085
DNMX○○○○○○-SW	Insert (Class M tolerance)	A083
DPCL type	Spare parts (For D type boring head)	P024
DPCL○○○R	D type boring head	E049
DPDH type	Spare parts (For D type boring head)	P024
DPDH○○○R	D type boring head	E049
DPDU type	Spare parts (For D type boring head)	P024
DPDU○○○R	D type boring head	E048
DPDZ type	Spare parts (For D type boring head)	P024
DPSK type	Spare parts (For D type boring head)	P024
DPT type	Spare parts (For D type boring head)	P024
DPT2○○○R	D type boring head	G042
DPT4○○○R	D type boring head	F146
DPTF type	Spare parts (For D type boring head)	P024
DPTF○○○R	D type boring head	E048
DPVP type	Spare parts (For D type boring head)	P024
DPVP○○○R	D type boring head	E050
DSAE○○○○X03S○○○	DSAE type drill (External coolant)	N080
DSAS○○○○X○○S○○○	DSAS type drill (Internal coolant)	N075
DTGNR/L○○○○○○○	DOUBLE CLAMP type holder	C016
DVAS○○○○X○○S○○○	DVAS type drill (Internal coolant, Mini-size)	N038
DVAS○○○○X○○S○○○	DVAS type drill (Internal coolant, Mini-size)	N039
DVJNR/L○○○○○○○	DOUBLE CLAMP type holder	C019
DVPNR/L○○○○○○○	DOUBLE CLAMP type holder	C021
DVVNN○○○○○○○	DOUBLE CLAMP type holder	C020
DWAE○○○○X○○S○○○	DWAE type drill (External coolant)	N031
DWAE○○○○X○○S○○○	DWAE type drill (External coolant, Mini-size)	N030
DWLNR/L○○○○○○○	DOUBLE CLAMP type holder	C022

E

E○○	Stop ring	C019, E050, F146, G042
E404 type	Spare parts (For E404 type face mill)	P030
ECMP type	Spare parts (For ECMP type end mill)	P037
EGHR type	Spare parts (For EG type holder)	P018
EPSS	Straight shank drill, Plate pal	N228
E○○○SCLP type	Spare parts (For COBRA boring bar)	P024
E○○○STFP type	Spare parts (For COBRA boring bar)	P024
ETHR type	Spare parts (For ET type holder)	P018
ET○NR/L	Spare parts (For SL type holder)	P021

ORDER NUMBER	PRODUCT NAME	PAGE

F

FA○	Boring unit (Angular type)	M012
FA○-FAPN○○○	Boring unit (Angular type)	M012
FA○-FASC○○○	Boring unit (Angular type)	M012
FA○-FASP○○○	Boring unit (Angular type)	M012
FAPN○○	Cartridge (For boring unit)	M012
FASC○○	Cartridge (For boring unit)	M012
FASP○○	Cartridge (For boring unit)	M012
FBE2 type	Spare parts (For FBE2 type end mill)	P040
FBP415 type	Spare parts (For FBP415 type face mill)	P030
FC400890T	Clamp screw	P004
FCDG4 type	Spare parts (For F type boring bar)	P025
FCL5 type	Spare parts (For F type boring bar)	P025
FCSK type	Spare parts (For F type boring bar)	P025
FCTU type	Spare parts (For F type boring bar)	P025
FCTU○○○R/L	FCTU type boring bar	E034
FE404R/L○○○○○	FE404 type face mill	L338
FF3000 type	Spare parts (For FF3000 type end mill)	P037
FF3000R○○○○○	FF3000 type face mill	L098
FFAWR	Adjusting wedge (For FF3000 type face mill)	L098
FFCSR	Cartridge (For FF3000 type face mill)	L098
FFL	Lever (For FF3000 type face mill)	L098
FFLB	Lever screw (For FF3000 type face mill)	L098
FFP	Lock pin (For FF3000 type face mill)	L098
FFRP	Radial spring (For FF3000 type face mill)	L098
FFSS	Shim (For FF3000 type face mill)	L098
FFW	Washer (For FF3000 type face mill)	L098
FMAX-○○○A○○R	FMAX type face mill	L090
FMAX-○○○B○○R	FMAX type face mill	L092
FMAXR○○○○○○	FMAX type face mill	L091
FMAXR○○○○○CLW	FMAX type face mill	L089
FN548 type	Spare parts (For FN548 type face mill)	P031
FP490R/L○○○○○	FP490 type face mill	L334
FP590R/L○○○○○	FP590 type face mill	L336
FSCLC○○○○R-○○E-○/○	DIMPLE BAR (Carbide shank)	E009
FSCLC○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E008
FSCLC○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E009
FSCLC○○○○R/L-○○S	DIMPLE BAR	E008
FSCLP○○○○R-○○E-○/○	DIMPLE BAR (Carbide shank)	E009
FSCLP○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E008
FSCLP○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E009
FSCLP○○○○R/L-○○S	DIMPLE BAR	E008
FSDQC○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E014
FSDQC○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E015
FSDQC○○○○R/L-○○S	DIMPLE BAR	E014
FSDUC○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E012
FSDUC○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E013
FSDUC○○○○R/L-○○S	DIMPLE BAR	E012
FSL5○○○R	FSL5 type boring bar	F144, G040
FSTE type	Spare parts (For FSTE type end mill)	P038
FSTUP○○○○R-○○E-○/○	DIMPLE BAR (Carbide shank)	E011
FSTUP○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E010
FSTUP○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E011
FSTUP○○○○R/L-○○S	DIMPLE BAR	E010

ORDER NUMBER	PRODUCT NAME	PAGE
FSTU○○○R/L	FSTU type boring bar	E033
FSVJB○○○○R/L-○○S	DIMPLE BAR	E020
FSVJC○○○○R/L-○○S	DIMPLE BAR	E020
FSVPB○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E019
FSVPB○○○○R/L-○○S	DIMPLE BAR	E019
FSVPC○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E019
FSVPC○○○○R/L-○○S	DIMPLE BAR	E019
FSVUB○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E018
FSVUB○○○○R/L-○○S	DIMPLE BAR	E018
FSVUC○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E018
FSVUC○○○○R/L-○○S	DIMPLE BAR	E018
FSWL○○○R/L○	FSWL type boring bar	E035
FSWUB○○○○R-○○E-○/○	DIMPLE BAR (Carbide shank)	E017
FSWUB○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E016
FSWUB○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E017
FSWUB○○○○R/L-○○S	DIMPLE BAR	E016
FSWUP○○○○R-○○E-○/○	DIMPLE BAR (Carbide shank)	E017
FSWUP○○○○R/L-○○A	DIMPLE BAR (Steel shank)	E016
FSWUP○○○○R/L-○○E	DIMPLE BAR (Carbide shank)	E017
FSWUP○○○○R/L-○○S	DIMPLE BAR	E016
FV○	Boring unit (Vertical type)	M012
FV○-FVPN○○	Boring unit (Vertical type)	M012
FV○-FVSC○○	Boring unit (Vertical type)	M012
FV○-FVSP○○	Boring unit (Vertical type)	M012
FVPN○○	Cartridge (For boring unit)	M012
FVSC○○	Cartridge (For boring unit)	M012
FVSP○○	Cartridge (For boring unit)	M012

G

GBE	GBE type end mill	J349
GCMT○○○○○○-U○	Insert (For TAF type drill)	N171, N175
GDCN2004PDFR3	Insert (For NF10000/QF10000 type cutter)	L097
GKCDD○○○P○○○	Leading drills	N182
GOER1401ZXFR2	Insert (For FMAX type cutter)	L093
GOER1408PXFR2-8	Insert (For FMAX type cutter)	L093
GOER○○○○PXFR2	Insert (For FMAX type cutter)	L093
GPMT○○○○○○-U○	Insert (For TAF type drill)	N171
GSD	Straight shank drill, TiN	N210
GTD	Taper shank drill, TiN	N229
GT○HR/L○○○○-○○○	Small tools holder (External grooving)	D018
GTTD	Taper shank drill, TiN, For steel frame	N241
GT○TR/L	Insert for grooving	D019
GT○T○○○○○○○R/L-E	Insert for grooving	D019
GT○T○○○○○○○R/L-U	Insert for grooving	D018
GT○T○○○○○○○R-VT	Insert for grooving	D019
GW04005F	Clamp Screw	F128
GW1B○○○○○020N	Insert (For GW holder)	F130
GW1M○○○○○○○○N-GM	Insert (For GW holder)	F130
GW1M○○○○○○○○N-GS	Insert (For GW holder)	F130
GW1M○○○○○○○○R05-GS	Insert (For GW holder)	F130
GW1M○○○○○○○○R08-GS	Insert (For GW holder)	F130
GW1M○○○○○○○○R/L05-GM	Inserts for GW blade (For cutting off)	F130
GWB○○NA2-○○○	GW blade	F128
GWCW○	Clamp Bridge	F129
GWSL	Straight shank drill, TiN, Extra long	N222
GWSR/L○○○○○○00-○○○	GW holder	F126-F127
GWSS	Straight shank drill, TiN, Convolute flute	N220
GWTBN○○○○-B○○	Tool block (For GW blade)	F129
GWTBN○○○○-B○○-C	Tool block (For GW blade)	F129
GWTS	Taper shank drill, TiN, Convolute flute	N240
GWW○○○○○	Washer	F128
GWY39L	Wrench	P003
GY05016S	Clamp screw	P004
GY06013M	Clamp screw	P004
GY1B○○○○○○○○N	Insert (For GY holder)	F014
GY1G○○○○○○○○N-GFGS	Insert (For GY holder)	B054, F012
GY1M○○○○○○○○N-GM	Insert (For GY holder)	F011
GY1M○○○○○○○○R/L05-GM	Insert (For GY holder)	F012
GY2B○○○○○○○○N	Insert (For GY holder)	F014
GY2G○○○○○○○○N-GL	Insert (For GY holder)	F011
GY2G○○○○○○○○N-MF	Insert (For GY holder)	F012
GY2M○○○○○○○○N-BM	Insert (For GY holder)	F013
GY2M○○○○○○○○N-GM	Insert (For GY holder)	F011
GY2M○○○○○○○○N-GS	Insert (For GY holder)	F011
GY2M○○○○○○○○N-GU	Insert (For GY holder)	F011
GY2M○○○○○○○○N-MM	Insert (For GY holder)	F013
GY2M○○○○○○○○N-MS	Insert (For GY holder)	F013
GY2M○○○○○○○○R/L05-GM	Insert (For GY holder)	F012
GYAR/L○○○90○-○○○	GY holder	F086-F093
GYDR/L○○○90○-M○○R/L	GY holder	F086-F093
GYHR/L○○○○○00-M○○R/L	GY holder	F022-F033
GYHR/L○○○○○00-M○○R/L	GY holder	F044-F075
GYHR/L○○○○○50-M○○R/L	GY holder	F042-F043
GYHR/L○○○○○90-M○○R/L	GY holder	F036-F041
GYHR/L○○○○○90-M○○R/L	GY holder	F076-F085
GYM○○R/L○-○○○	Modular blade	F022-F032, F036-F040, F086-F092, F094-F097
GYM○○R/L○-○○○-○○○	Modular blade	F044-F084
GYM○○R/LC-○005	Modular blade	F042, F099
GYPR/L○○○○○00-K25	GY holder	F034-F035
GYQR/L○○○○○00-○○○	GY holder	F022-F033
GYSR/L○○○○○○00-○○○	GY holder	F016-F019
GYSR/L○○○○JX00-○○○	GY holder	F020-F021

H

H○○ type	Spare parts (For MK cartridge)	P028
H100TH-B○○-○○○	HSK boring bar holder	H022
H100TH-EN3232R/L-130	HSK boring bar holder	H020
H100TH-EV3232R/L-180	HSK boring bar holder	H019
H63TH-A○○○DCLNR/L12	HSK DCLN type holder	H008
H63TH-B○○-○○	HSK boring bar holder	H021
H63TH-DCLNL-L12-3	HSK DCLN type holder	H008
H63TH-DCLNR/L-DX12	HSK DCLN type holder	H006
H63TH-DCMNN-○12	HSK DCMN type holder	H007
H63TH-DDJNL-L15-3	HSK DDJN type holder	H011
H63TH-DDJNR/L-DX15	HSK DDJN type holder	H009
H63TH-DDNNN-○15	HSK DDNN type holder	H010
H63TH-DG type	Spare parts (For HSK-DG)	P023
H63TH-EN2525R/L-115	HSK boring bar holder	H020
H63TH-EV2020R/L-105-3	HSK boring bar holder	H021
H63TH-EV2525R/L-112	HSK boring bar holder	H019

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
H63TH-MGHR/L-DX43○○	HSK MG type holder	H014
H63TH-MMTENR-○16	HSK MMTE type holder	H016
H63TH-MMTER-DX16	HSK MMTE type holder	H016
H63TH-MTHR/L-DX43	HSK MTH type holder	H017
H63TH-PCLNR/L-DX12	HSK PCLN type holder	H006
H63TH-PCMNN-○12	HSK PCMN type holder	H007
H63TH-PDJNR/L-DX15	HSK PDJN type holder	H009
H63TH-PDNNN-○15	HSK PDNN type holder	H010
H63TH-PRDCN-○12	HSK PRDC type holder	H012
H63TH-PRGCR/L-DX12	HSK PRGC type holder	H012
H63TH-SVPBR/L-DX16	HSK SVPB type holder	H013
H63TH-SVVBN-○16	HSK SVVB type holder	H013
HBH○○○○○	Clamp screw	P002, P005
HBHA○○○○○	Clamp screw	P002
HDS○○○○○	Clamp screw	P010
HFC○○○○○	Shim pin	P005
HFF○○○○○H	Set bolt	P010
HGJ-PT1/8	Plug	F129
HGM-PT○/○	Plug E043, H007, H010, H012, H013, H016	
HKY○○○	Wrench	P003
HLS○	Lever spring	L324, M007, M013
HNMX1206E○○○-R	Insert (For BMR type boring cutter)	L333
HOSE-1/8-○○○	Coolant hose	F131
HP○○	Clamp pin	E043
HP3	Spring (For FF3000 type face mill)	L098
HR○○	Spanner	M013
HSC○○○○○	Clamp screw	P002, P005
HSC○○○○○	Clamp screw	P010
HSC○○○○○H	Set bolt	P010
HSCX○○○○○H	Set bolt	P010
HSD04004H○○	Coolant nozzle (For VFX5/6 type cutter)	P017
HSD05004S	Plug	F095, F097, F098, F129
HSK-○○○○M	HSK type taper tool number	M029
HSP○○○○○	Clamp screw	P002, P005
HSS○○○○○	Clamp screw	P002, P005
HVF06-HSK63A○○○A○	Valve finisher	M002
HVS060519	Reamer adjustment screws	P011
HY○	Unit screw	P005
HY-A1	Unit screw	P005
HY-V1	Unit screw	P005

I

ORDER NUMBER	PRODUCT NAME	PAGE
iMX-B2S	Indexable head end mill	K048
iMX-B3FV	Indexable head end mill	K050
iMX-B4HV	Indexable head end mill	K052
iMX-B4HV-E	Indexable head end mill	K053
iMX-B4S	Indexable head end mill	K049
iMX-B4WH-S	Indexable head end mill	K058
iMX-B6HV	Indexable head end mill	K056
iMX-C10HV	Indexable head end mill	K034
iMX-C10T-C	Indexable head end mill	K043
iMX-C12HV	Indexable head end mill	K034
iMX-C12T-C	Indexable head end mill	K043
iMX-C15T-C	Indexable head end mill	K043
iMX-C3A	Indexable head end mill	K040
iMX-C4FD-C	Indexable head end mill	K036
iMX-C4FV	Indexable head end mill	K038
iMX-C4HV	Indexable head end mill	K024
iMX-C4HV-S	Indexable head end mill	K026
iMX-C6HV	Indexable head end mill	K034
iMX-C6HV-C	Indexable head end mill	K032
iMX-C8T-C	Indexable head end mill	K043
iMX-CH3L	Indexable head end mill	K060
iMX-CH6V	Indexable head end mill	K062
iMX○○-○○○○○○○L○○○C	Indexable head end mill	K064
iMX○○-○○○○○○○L○○○S	Indexable head end mill	K065
iMX-R4F	Indexable head end mill	K044
iMX-RC4F-C	Indexable head end mill	K046
iMX-S3A	Indexable head end mill	K021
iMX-S3HV	Indexable head end mill	K010
iMX-S4HV	Indexable head end mill	K014
iMX-S4HV-S	Indexable head end mill	K015
IMX○○-WR	Wrench (For indexable head end mill)	P003

J

ORDER NUMBER	PRODUCT NAME	PAGE
JDMT○○○○○○ZDER-JL	Insert (For AJX/PMC type cutter)	L235
JDMT○○○○○○ZDSR-JM	Insert (For AJX/PMC type cutter)	L235, L327
JDMT○○○○○○ZDSR-ST	Insert (For AJX/PMC type cutter)	L235, L327
JDMW○○○○○○ZDSR-FT	Insert (For AJX/PMC type cutter)	L235, L327
JFS○○○○-○○	JUST FIT SLEEVE (JFS)	N177
JOMT○○○○○○ZZER-JL	Insert (For AJX type cutter)	L235
JOMT○○○○○○ZZSR-JM	Insert (For AJX/PMC type cutter)	L235, L327
JOMU○○○○○○ZZER-○	Insert (For WJX09/14 type cutter)	L245, L252
JOMW○○○○○○ZZSR-FT	Insert (For AJX/PMC type cutter)	L235, L327
JPGX1404○○○PPER-JM	Insert (For ASPX type cutter)	L290
JPMT○○○○○○-○	Insert (For TAB/CBJP type cutter)	L323, L345
JPMX○○○○○○-○○	Insert (For SPX type end mill)	L285

K

ORDER NUMBER	PRODUCT NAME	PAGE
K○○ type	Spare parts (For MK cartridge)	P028
KGBN○○-○○	Tool block (For UG type holder)	P023
KKC type	Spare parts (For MH type holder)	P020
KS○	Axial screw	P004
KS○○	Clamp screw	P004
KSD	Straight shank drill, Cobalt HSS, For stainless steel	N218
KSMGR○○S○○	KSMG type end mill	L324
KSN3	Micro adjustment Nut	P011
KSS2	Large adjustment screw	P011
KTD	Taper shank drill, Cobalt HSS	N234
K-XDGX1750○○PD○R-G○	Insert kit (For AXD4000A type cutter)	L205

L

ORDER NUMBER	PRODUCT NAME	PAGE
LDCN190412R	Insert (For AF5000 type face mill)	L350
LLCL○○	Clamp lever	P015
LLCL○○○	Clamp lever	P015
LLCS○○○	Clamp screw	P005
LLCS○○○S	Clamp screw	P005
LLP○○	Shim pin	P015
LLR○	Radial screw	P005
LLSCN○○	Shim	P012
LLSCN3T3	Shim	P012

ORDER NUMBER	PRODUCT NAME	PAGE
LLSCP○○	Shim	P012
LLSDN○○	Shim	P012
LLSDP42	Shim	P012
LLSRN○○○	Shim	P012
LLSSN○○	Shim	P013
LLSSP○○	Shim	P013
LLSTN○○	Shim	P013
LLSTP○○	Shim	P013
LLSWN○○	Shim	P013
LLSWN○○○	Shim	P013
LLSWP○○	Shim	P013
LNGU0906○○PNER/L-M	Insert (For VAS300 type cutter)	L127
LNGU1308○○PNER/L-○	Insert (For VAS400 type cutter)	L129
LNGU1710○○PNER/L-R	Insert (For VAS500 type cutter)	L131
LOGU○○○○○○○○PN○R-○	Insert (For VPX200/300 type cutter)	L161, L167
LRB○○○	Insert for brazed tool holder (MITSUBISHI standard)	I004
LS○	Clamp screw	P006
LS○○	Clamp screw	P006
LS0622T	Clamp screw	P006
LSD	Straight shank drill, Extra long	N225
LSE445 type	Spare parts (For LSE445 type face mill)	P031
LS○○T	Clamp screw	P006
LTD	Taper shank drill, Extra long	N236

M

MAE○○○○MB	MAE type drill (External coolant)	N108
MAS○○○○LB/MB	MAS type drill (Internal coolant)	N104
MBA○○○○○H	Clamp screw	P010
MCAH○○○○X○○S○○○	MCAH type drill	N117
MCA○○○○X○○S○○○	MCA type drill	N113
MCCH○○○○X○○S○○○	MCCH type drill	N116
MCC○○○○X○○S○○○	MCC type drill	N112
MCLNR○○○○○○○	DOUBLE CLAMP type holder (For heavy cutting)	C009
MCT○○○○X○○S○○○	MCT type drill	N114
MCW○○○○X○○S○○○	MCW type drill	N115
MES○	Spring	C017, E039, F136, G028, H014, H017
MFE○○○○X○○S○○○	Solid carbide flat bottom drill	N026
MFE○○○○X○○S○○○	Solid carbide flat bottom drill	N025
MG type	Spare parts (For MG type holder)	P020
MG2 type	Spare parts (For MG2 type holder)	P020
MG200 type	Spare parts (For MG200 type end mill)	P038
MG245 type	Spare parts (For MG245 type end mill)	P038
MG300 type	Spare parts (For MG300 type end mill)	P038
MG300 type	Spare parts (For MG300 type face mill)	P031
MG345 type	Spare parts (For MG345 type end mill)	P038
MG345 type	Spare parts (For MG345 type face mill)	P031
MG400 type	Spare parts (For MG400 type face mill)	P031
MG445 type	Spare parts (For MG445 type face mill)	P031
MGD○○	Driver	N137
MGEEW○○○○AFTR	Insert (For MG245/345/445 type cutter)	L345
MGEEW○○○○PFTR	Insert (For MG200/300/400 type cutter)	L345
MGHR/L○○○○○○○○○○	MG holder	F136
MGP445 type	Spare parts (For MGP445 type face mill)	P031
MGS○○○○L○○○B	Solid gun drill	N136
MGTL○○○○○	Insert (For D type boring head/KSMG type end mill)	F147, L325
MGTR/L○○○○○	Insert (For MG holder)	F137, H015
MHS○○○○L○○○B	MHS type drill (Internal coolant)	N088
MK1KS	Anti-seize lubricant	P017
MLCP42	Shim	P013
MLDP42	Shim	P013
MLG○○○○L	Insert (For FSL5 type boring bar)	F145, G041
MLSP42	Shim	P013
MLT○○○○L	Insert (For FSL5 type boring bar)	F145, G041
MLTP32	Shim	P013
MMS○○○○X○DB	MMS type drill (Internal coolant)	N082
MMT○○ER○○○○○○○	Insert (For MMTE holder)	G024-G027
MMTER○○○○○○○-○	MMTE holder	G023
MMT○○IR○○○○○○○	Insert (For MMTI boring bar)	G033-G036
MMTIR○○○○A○○○-○○○○	MMTI boring bar	G032
MNS○○○○LB	MNS type drill (Internal coolant)	N098
MNS○○○○X○○DB	MNS type drill (Internal coolant)	N098
MP2ES	MS Plus end mill	J074
MP2MB	MS Plus end mill	J173
MP2SB	MS Plus end mill	J172
MP2SDB	MS Plus end mill	J175
MP2SSB	MS Plus end mill	J171
MP2XLB	MS Plus end mill	J177
MP3ES	MS Plus end mill	J098
MP3XB	MS Plus end mill	J222
MP4EC	MS Plus end mill	J138
MP6	Shim pin	P015
MPJHV	MS Plus end mill	J122
MPMHV	MS Plus end mill	J118
MPMHVRB	MS Plus end mill	J257
MPMT○○○○○○	Insert (For CBMP/ECMP/TAB type end mill)	L323, L345
MPMW○○○○○○	Insert (For TSMP type cutter)	L321
MPMX120412-○○	Insert (For SPX type end mill)	L285
MPXLRB	MS Plus end mill	J261
MR	HSS end mill	J376
MS2ES	MSTAR end mill	J077
MS2JS	MSTAR end mill	J062
MS2LS	MSTAR end mill	J064
MS2MD	MSTAR end mill	J060
MS2MRB	MSTAR end mill	J245
MS2MS	MSTAR end mill	J057
MS2SS	MSTAR end mill	J056
MS2XL	MSTAR end mill	J066
MS2XL6	MSTAR end mill	J070
MS3ES	MSTAR end mill	J101
MS4EC	MSTAR end mill	J141
MS4JC	MSTAR end mill	J132
MS4MC	MSTAR end mill	J130
MS4MRB	MSTAR end mill	J267
MS4SC	MSTAR end mill	J128
MS4XL	MSTAR end mill	J134
MSBNR○○○○○○○	DOUBLE CLAMP type holder (For heavy cutting)	C012

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
MSCN63	Shim	P013
MSD445 type	Spare parts (For MSD445 type face mill)	P031
MSE445 type	Spare parts (For MSE445 type face mill)	P031
MSE445 type	Spare parts (For MSE445 type end mill)	P038
MSE○○○○SB	MSE type drill	N119
MSMHD	MSTAR end mill	J125
MSMHZD	MSTAR end mill	J096
MSP0300SB	MSP type starting drill	N118
MSSHD	MSTAR end mill	J124
MSSN63	Shim	P013
MSSNR○○○○○○○	DOUBLE CLAMP type holder (For heavy cutting)	C014
MT1R/L○○○○○○	MT1 type holder	G028
MT2 type	Spare parts (For MT2 type holder)	P020
MTEN type	Spare parts (For WP type holder)	P022
MTENN○○○○○○○	WP type holder	C018
MTHR/L○○○○○○	MT holder	G028
MTJN type	Spare parts (For WP type holder)	P022
MTJNR/L○○○○○○○	WP type holder	C017
MTK○R/L	Clamp bridge	P016
MTNN type	Spare parts (For WP type holder)	P022
MTQN type	Spare parts (For WP type holder)	P022
MTQNR/L○○○○○○○○	WP type holder	C018
MTTR/L○○○○○○	Insert (For MT holder/D type boring head)	G029, G043, H018
MVE○○○○X○○S○○○	MVE type drill (External coolant)	N068
MVS○○○○X○○S○○○	MVS type drill (Internal coolant)	N050
MVS○○○○X○○S○○○	MVS type drill (Internal coolant)	N046
MVS○○○○X○○S○○○	MVS type drill (Internal coolant, Mini-size)	N048
MVS○○○○X○○S○○○PL	MVS type drill (Internal coolant)	N046
MVX○○○○X○F○○	MVX type drill (Internal coolant)	N160
MWLN type	Spare parts (For WP type holder)	P022
MWS○○○○LB/SB/XB	MWS type drill (Internal coolant)	N122
MWS○○○○X○○DB	MWS type drill (Internal coolant)	N124
MZE○○○○MA/SA/SB	MZE type drill (External coolant)	N130

N

ORDER NUMBER	PRODUCT NAME	PAGE
NA type	Spare parts (For boring unit)	P027
NAPN type	Spare parts (For boring unit)	P027
NASP type	Spare parts (For boring unit)	P027
NF10000R○○○○○	NF10000 type face mill	L096
NKY15S	Wrench	P003
NNMU130508ZE○-○	Insert (For AHX440S type cutter)	L064
NNMU130532ZEN-○	Insert (For AHX440S/475S type cutter)	L064, L068
NNMU200608ZEN-○○	Insert (For AHX640S/640W type cutter)	L073, L081
NNMU2007○○ZE○-○○	Insert (For AHX640S type cutter)	L073
NP-CCGW○○○○○○FA2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○FBWL2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○FS	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○FS2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○FSWS2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○GA2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○GAWS2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○GBWL2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○GH2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○GS	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○GS2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○GSWS2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○SE2	Insert (Class G tolerance)	B041
NP-CCGW○○○○○○SF2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○TA2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○TH2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○TS2	Insert (Class G tolerance)	B040
NP-CCGW○○○○○○VA2	Insert (Class G tolerance)	B040
NP-CCMH○○○○○○○	Insert (Class M tolerance)	B059
NP-CCMW○○○○○○○	Insert (Class M tolerance)	B059
NP-CNGA○○○○○○FBWL2	Insert (Class G tolerance)	B024
NP-CNGA○○○○○○FS2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○FS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○FSWS2	Insert (Class G tolerance)	B024
NP-CNGA○○○○○○FSWS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○GA2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○GA4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○GAWS2	Insert (Class G tolerance)	B024
NP-CNGA○○○○○○GAWS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○GBWL2	Insert (Class G tolerance)	B024
NP-CNGA○○○○○○GH2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○GH4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○GS2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○GS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○GSWS2	Insert (Class G tolerance)	B024
NP-CNGA○○○○○○GSWS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○SE2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○SF2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○TA2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○TA4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○TH2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○TH4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○TS2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○TS4	Insert (Class G tolerance)	B022
NP-CNGA○○○○○○VA2	Insert (Class G tolerance)	B023
NP-CNGA○○○○○○VA4	Insert (Class G tolerance)	B022
NP-CNMA○○○○○○F	Insert (Class M tolerance)	B025
NP-CNMA○○○○○○GS	Insert (Class M tolerance)	B025
NP-CNMA○○○○○○T	Insert (Class M tolerance)	B025
NP-CNMM○○○○○○R/L-F	Insert (Class M tolerance)	B055
NP-CPGB○○○○○○FS2	Insert (Class G tolerance)	B043
NP-CPGB○○○○○○GA2	Insert (Class G tolerance)	B043
NP-CPGB○○○○○○GS2	Insert (Class G tolerance)	B043
NP-CPGB○○○○○○SE2	Insert (Class G tolerance)	B043
NP-CPGB○○○○○○TA2	Insert (Class G tolerance)	B043
NP-CPGB○○○○○○VA2	Insert (Class G tolerance)	B043
NP-CPMH○○○○○○○	Insert (Class M tolerance)	B059
NP-DCGW○○○○○○FA2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○FS2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○GA2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○GH2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○GS	Insert (Class G tolerance)	B045
NP-DCGW○○○○○○GS2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○SE2	Insert (Class G tolerance)	B044

ORDER NUMBER	PRODUCT NAME	PAGE
NP-DCGW○○○○○○SF2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○TA2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○TH2	Insert (Class G tolerance)	B044
NP-DCGW○○○○○○VA2	Insert (Class G tolerance)	B044
NP-DCMT○○○○○○R/L-F	Insert (Class M tolerance)	B060
NP-DNGA○○○○○○FS2	Insert (Class G tolerance)	B027
NP-DNGA○○○○○○FS4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○GA2	Insert (Class G tolerance)	B027
NP-DNGA○○○○○○GA4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○GAWS2JR/L	Insert (Class G tolerance)	B029
NP-DNGA○○○○○○GH2	Insert (Class G tolerance)	B027
NP-DNGA○○○○○○GH4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○GS2	Insert (Class G tolerance)	B027
NP-DNGA○○○○○○GS4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○GSWS2JR/L	Insert (Class G tolerance)	B029
NP-DNGA○○○○○○SE2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○SF2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○TA2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○TA4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○TH2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○TH4	Insert (Class G tolerance)	B027
NP-DNGA○○○○○○TS2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○TS4	Insert (Class G tolerance)	B026
NP-DNGA○○○○○○VA2	Insert (Class G tolerance)	B028
NP-DNGA○○○○○○VA4	Insert (Class G tolerance)	B026
NP-DNMA○○○○○○F	Insert (Class M tolerance)	B030
NP-DNMA○○○○○○GS	Insert (Class M tolerance)	B030
NP-DNMA○○○○○○T	Insert (Class M tolerance)	B030
NP-DNMM○○○○○○R/L-F	Insert (Class M tolerance)	B055
NP-GDCN2004PDSR3	Insert (For NF10000 type cutter)	L097
NP-GDCW1240PDFR2	Insert (For V10000 type face mill)	L350
NP-GOEN○○○○PXSR05	Insert (For FMAX type cutter)	L093
NP-SNGA○○○○○○FS2	Insert (Class G tolerance)	B031
NP-SNGA○○○○○○GA2	Insert (Class G tolerance)	B031
NP-SNGA○○○○○○GS2	Insert (Class G tolerance)	B031
NP-SNGA○○○○○○SE2	Insert (Class G tolerance)	B031
NP-SNGA○○○○○○SF2	Insert (Class G tolerance)	B031
NP-SNGA○○○○○○TS2	Insert (Class G tolerance)	B031
NP-SNMA○○○○○○F	Insert (Class M tolerance)	B031
NP-SNMA○○○○○○GS	Insert (Class M tolerance)	B031
NP-SNMA○○○○○○T	Insert (Class M tolerance)	B031
NP-SNMM○○○○○○R/L-F	Insert (Class M tolerance)	B056
NP-SPGN○○○○○○GS2	Insert (Class G tolerance)	B052
NP-TCGW○○○○○○FA3	Insert (Class G tolerance)	B046
NP-TCGW○○○○○○FS3	Insert (Class G tolerance)	B046
NP-TCGW○○○○○○GS3	Insert (Class G tolerance)	B046
NP-TCGW○○○○○○SE3	Insert (Class G tolerance)	B046
NP-TCGW○○○○○○SF3	Insert (Class G tolerance)	B046
NP-TNGA○○○○○○FS3	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○FS6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GA3	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GA6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GH3	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GH6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GS3	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○GS6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○SE3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○SF3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○TA3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○TA6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○TH3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○TH6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○TS3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○TS6	Insert (Class G tolerance)	B032
NP-TNGA○○○○○○VA3	Insert (Class G tolerance)	B033
NP-TNGA○○○○○○VA6	Insert (Class G tolerance)	B032
NP-TNMA○○○○○○F	Insert (Class M tolerance)	B033
NP-TNMA○○○○○○GS	Insert (Class M tolerance)	B033
NP-TNMA○○○○○○T	Insert (Class M tolerance)	B033
NP-TNMM○○○○○○R/L-F	Insert (Class M tolerance)	B056
NP-TPGB○○○○○○FS3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○GA3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○GH3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○GS3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○SE3	Insert (Class G tolerance)	B048
NP-TPGB○○○○○○SF3	Insert (Class G tolerance)	B048
NP-TPGB○○○○○○TA3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○TH3	Insert (Class G tolerance)	B047
NP-TPGB○○○○○○VA3	Insert (Class G tolerance)	B047
NP-TPGX○○○○○○F	Insert (Class G tolerance)	B048
NP-TPGX○○○○○○T	Insert (Class G tolerance)	B048
NP-TPMH○○○○○○R/L-F	Insert (Class M tolerance)	B062
NP-TPMX○○○○○○R/L-F	Insert (Class M tolerance)	B062
NP-VBGT○○○○○○R-F	Insert (Class G tolerance)	B064
NP-VBGW○○○○○○FS2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○GA2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○GH2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○GS2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○SE2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○SF2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○TA2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○TH2	Insert (Class G tolerance)	B049
NP-VBGW○○○○○○VA2	Insert (Class G tolerance)	B049
NP-VCGT○○○○○○R-F	Insert (Class G tolerance)	B064
NP-VCGW○○○○○○FS2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○GA2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○GH2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○GS2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○TA2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○TH2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○TS2	Insert (Class G tolerance)	B050
NP-VCGW○○○○○○VA2	Insert (Class G tolerance)	B050
NP-VNGA○○○○○○FS2	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○FS4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GA2	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GA4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GH2	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GH4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GS2	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○GS4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○SE2	Insert (Class G tolerance)	B036
NP-VNGA○○○○○○SF2	Insert (Class G tolerance)	B036

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
NP-VNGA○○○○○○TA2	Insert (Class G tolerance)	B036
NP-VNGA○○○○○○TA4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○TH2	Insert (Class G tolerance)	B036
NP-VNGA○○○○○○TH4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○TS2	Insert (Class G tolerance)	B036
NP-VNGA○○○○○○TS4	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○VA2	Insert (Class G tolerance)	B035
NP-VNGA○○○○○○VA4	Insert (Class G tolerance)	B035
NP-VNMA○○○○○○F	Insert (Class M tolerance)	B036
NP-VNMA○○○○○○GS	Insert (Class M tolerance)	B036
NP-VNMA○○○○○○T	Insert (Class M tolerance)	B036
NP-VNMM○○○○○○R/L-F	Insert (Class M tolerance)	B057
NP-WCMW○○○○○○FA	Insert (Class M tolerance)	B051
NP-WNGA○○○○○○FS3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○FS6	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○GA3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○GH3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○GS3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○GS6	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○GSWS3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○SE3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○SF3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○TA3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○TH3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○TS3	Insert (Class G tolerance)	B037
NP-WNGA○○○○○○TS6	Insert (Class G tolerance)	B037
NPX type	Spare parts (For NPX type drill)	P044
NR10000 type	Spare parts (For NR10000 type face mill)	P031
NS○○○	Clamp screw	P006
NSE300 type	Spare parts (For NSE300 type face mill)	P032
NSE300 type	Spare parts (For NSE300 type end mill)	P038
NSE400 type	Spare parts (For NSE400 type face mill)	P032
NSE400 type	Spare parts (For NSE400 type end mill)	P038
NS○○○W	Clamp screw	P006
NTF type	Spare parts (For F type boring bar)	P025
NV type	Spare parts (For boring unit)	P027
NVPN type	Spare parts (For boring unit)	P027
NVSP type	Spare parts (For boring unit)	P027
NZ22042080S	Nozzle	F095, F097, F098

O

OCTACUT○○○○○○○	OCTACUT type face mill	L259, L260
OCTACUT○○○S32○○	OCTACUT type end mill	L258
OEMX○○○○E○R1	Insert (For OCTACUT type cutter)	L261
OEMX○○○○E○R1-JS	Insert (For OCTACUT type cutter)	L261
ORGW○○○N9	O-ring	F129

P

P425 type	Spare parts (For P425 type face mill)	P032
P525 type	Spare parts (For P525 type face mill)	P032
P○○○AM	Pin	E043
PCBN type	Spare parts (For LL type holder)	P019
PCBNR/L○○○○○○○	LL type holder	C009
PCFN type	Spare parts (For LL type holder)	P019
PCLN type	Spare parts (For LL type holder)	P019
PCLNR/L○○○○○○○	LL type holder	C008
PCLNR/L○○CA○○	LL type cartridge	M006
PDHNR/L○○○○○○○	LL type holder	C011
PDJNR/L○○○○○○○	LL type holder	C010
PDNN type	Spare parts (For LL type holder)	P019
PMC○○R○○○AM○○○○	PMC type end mill	L326
PMF○○○○○A○○R	PMF type end mill	L328
PMFA○○R	Cartridge (For PMF type end mill)	L328
PMR type	Spare parts (For PMR type end mill)	P038
PMR○○○○○○A○○R	PMR type end mill	L330
PMR○○○○○○○R	PMR type end mill	L330
PRDC type	Spare parts (For LL type holder)	P019
PRDCN○○○○○○○	LL type holder	C025
PRGC type	Spare parts (For LL type holder)	P019
PRGCR/L○○○○○○○	LL type holder	C025
P○○S	Lock pin	P016
PS○○	Shim	P013
PSBN type	Spare parts (For LL type holder)	P019
PSBNR/L○○○○○○○	LL type holder	C012
PSDNN○○○○○○○	LL type holder	C014
PSKN type	Spare parts (For LL type holder)	P019
PSKN type	Spare parts (For LL cartridge)	P028
PSKNR/L○○○○○○○	LL type holder	C015
PSKNR/L○○CA○○	LL type cartridge	M006
PSSN type	Spare parts (For LL type holder)	P019
PSSN type	Spare parts (For LL cartridge)	P028
PSSNR/L○○○○○○○	LL type holder	C013
PSSNR/L○○CA○○	LL type cartridge	M006
PSTNR/L○○○○○○○	LL type holder	C013
PSYN type	Spare parts (For LL cartridge)	P028
PSYNR○○CA○○	LL type cartridge	M006
PT○○	Shim	P014
PTAN type	Spare parts (For LL type holder)	P019
PTBN type	Spare parts (For LL type holder)	P019
PTFE type	Spare parts (For AL type holder)	P022
PTFN type	Spare parts (For LL type holder)	P019
PTFNR/L○○○○○○○	LL type holder	C017
PTFNR/L○○CA○○	LL type cartridge	M006
PTGE type	Spare parts (For AL type holder)	P022
PTGN type	Spare parts (For LL type holder)	P019
PTGNR/L○○○○○○○	LL type holder	C016
PTGNR/L○○CA○○	LL type cartridge	M006
PTTN type	Spare parts (For LL type holder)	P019
PTTNR○○CA○○	LL type cartridge	M006
PV○○○	Shim	P014
PVJNR/L○○○○○○○	MP type holder	C019
PVPN type	Spare parts (For MP type holder)	P020
PVPNR/L○○○○○○○	MP type holder	C021
PVVN type	Spare parts (For MP type holder)	P020
PVVNN○○○○○○○	MP type holder	C020
PWLNR/L○○○○○○○	LL type holder	C022

Q

QB○○○○○○○	Q type quick change	M023
QBF407 type	Spare parts (For QBF407 type face mill)	P032
QBP415 type	Spare parts (For QBP415 type face mill)	P032
QF10000 type	Spare parts (For QF10000 type face mill)	P032

ORDER NUMBER	PRODUCT NAME	PAGE
QFA○○○○○○	T type quick change	M021
QFA○○○○○B○R/L	Q type quick change	M020
QFA○○○○○N○R/L	Q type quick change	M020
QFB○○○○○○R/L	Q type quick change	M021
QOGT○○○○R-G1	Insert (For AQX type cutter)	L223
QOMT○○○○R-M2	Insert (For AQX type cutter)	L223
QSE415 type	Spare parts (For QSE415 type face mill)	P033
R		
RBH○○○○N	Round type holder (For MICRO-DEX/MICROMINI type boring bar)	E026, E031, F142, G039
RCGT○○○○M0-AZ	Insert (Class G tolerance)	A131
RCMT○○○○M0	Insert (Class M tolerance)	A131
RCMX○○○○M0	Insert (Class M tolerance)	A131
RCMX○○○○M0-RR	Insert (Class M tolerance)	A131
RDMW○○○○M0E	Insert (For ARX type cutter)	L270
REMX1705SN	Insert (For OCTACUT type cutter)	L261
REMX○○○○EN-JS	Insert (For OCTACUT type cutter)	L261
RGEN2004M0○N	Insert (For SG20 type cutter)	L345
RKY25S	Wrench	P003
RNGN○○○○○○	Insert (Class G tolerance)	B038
RNMG○○○○○○	Insert (Class M tolerance)	A088
RPH/MT○○○○M0E4-○	Insert (For ARP type cutter)	L267
RPMT○○○○M0E-JS	Insert (For BRP type cutter)	L277
RPMW○○○○M0○	Insert (For BRP type cutter)	L277
RS○○○○T	Clamp screw	P006
RTG○○○	Insert (For TL type holder)	A154, C035
S		
S○	Clamp screw	P006
S2SDA	HSS end mill	J363
SBA○○○-ES-M	Parts for ABS head	M027
SBA○○○-ES-M○	Parts for ABS head	M027
SBAHR○○○○	Boring holder	D030
SBAT○○○○○○L	Insert (For SBAHR type holder)	D030
SBAT○○○○○○L-B	Insert (For SBAHR type holder)	D030
SBH○○○○R	Square type holder (For MICRO-DEX/MICROMINI type boring bar)	E032, F143, G038
SBR○○○	MI holder	M017
SCACR/L○○○○○○○-SM	Small tools holder (External front turning)	D010
SCLCR/L○○○○○○○	SP type holder	C023
SCLCR/L○○○○○○○-SM	Small tools holder (External front turning)	D010
SC○○M○○S10-BT○○	Arbors for screw-in tools	L342
SC○○M○○S○○-HSK63A	Arbors for screw-in tools	L342
SC○○M○○S○○○S/L	Arbors for screw-in tools	L341
SC○○M○○S○○○SW/LW	Arbors for screw-in tools	L341
SCMT○○○○○○	Insert (Class M tolerance)	A133
SCMT○○○○○○-FM	Insert (Class M tolerance)	A132
SCMT○○○○○○-FP	Insert (Class M tolerance)	A132
SCMT○○○○○○-FV	Insert (Class M tolerance)	A132
SCMT○○○○○○-LM	Insert (Class M tolerance)	A132
SCMT○○○○○○-LP	Insert (Class M tolerance)	A132
SCMT○○○○○○-MK	Insert (Class M tolerance)	A133
SCMT○○○○○○-MM	Insert (Class M tolerance)	A133
SCMT○○○○○○-MP	Insert (Class M tolerance)	A132
SCMT○○○○○○-MS	Insert (Class M tolerance)	A133
SCMW○○○○○○	Insert (Class M tolerance)	A133
SD	Straight shank drill	N212
SD	Straight shank drill	N214
SD○○	Set bolt	P006
SDEN1203AEN	Insert (For FMSD type cutter)	L345
SDFC type	Spare parts (For SP type holder)	P021
SDJC type	Spare parts (For SP type holder)	P021
SDJCR/L○○○○○○○	SP type holder	C024
SDJCR/L○○○○○○○-SM	Small tools holder (External front turning)	D011
SDJER/L○○○○○○○	AL type holder	C032
SDLS	Long shank straight drill	N215
SDNCN○○○○○○○	SP type holder	C024
SDNCR/L○○○○○○○-SM	Small tools holder (External front turning)	D011
SDNEN○○○○○○○	AL type holder	C032
SDXC type	Spare parts (For SP type holder)	P021
SE300 type	Spare parts (For SE300 type face mill)	P033
SE300 type	Spare parts (For SE300 type end mill)	P039
SE400 type	Spare parts (For SE400 type face mill)	P033
SE415 type	Spare parts (For SE415 type face mill)	P033
SE445 type	Spare parts (For SE445 type face mill)	P033
SE515 type	Spare parts (For SE515 type face mill)	P033
SE545 type	Spare parts (For SE545 type face mill)	P034
SEA42C10GR/L	Insert (For E404/FE404 type cutter)	L339, L345
SECN○○○○AFTN1	Insert (For SE445 type cutter)	L345
SECN○○○○EF○R1	Insert (For SE415/515 type cutter)	L346
SED2KMG	Key way slotting end mill	J089
SED2KPG	Key way slotting end mill	J090
SEEN○○○○AF○N1	Insert (For SE445/545 type cutter)	L345, L346
SEEN○○○○EF○R1	Insert (For SE415/515 type cutter)	L346
SEER1203EFER-JS	Insert (For SE415 type cutter)	L346
SEER○○○○AFEN-JS	Insert (For SE445/545 type cutter)	L346
SEET13T3AGEN-JL	Insert (For ASX445 type cutter)	L057
SEF○○○	Setting fixture	L340
SEG4SA	Carbide end mill	J162
SEGT13T3AGFN-JP	Insert (For ASX445 type cutter)	L057
SEMT13T3AGSN-○○	Insert (For ASX445 type cutter)	L057
SEPDM	HSS milling shank drill	N186
SEPDS	HSS milling shank drill	N184
SETH type	Spare parts (For SET type holder)	P021
SETK○○	Clamp bridge	P016
SETS○○	Clamp screw	P006
SFAN1203ZFFR/L2	Insert (For BF407/QBF407 type cutter)	L346
SFCN1203ZFFR/L2	Insert (For BF407/QBF407 type cutter)	L346
SG20 type	Spare parts (For SG20 type face mill)	P033
SH○○○-FSDUCL○○	Small tools holders (For opposite tool posts)	D026
SHP400 type	Spare parts (For SHP400 type face mill)	P034
SHP400 type	Spare parts (For SHP400 type end mill)	P039
SL32○○-90	Sleeve (For H100THB32-135)	H022
SLCS○○○	Clamp screw	P006
SL-ONEN120404ASN	Insert (For AOX445 type cutter)	L088
SMGHR○○○○○○○	SMG holder	F138, G030
SMGTR○○○○○○○	Insert (For SMG holder)	F138, G031
SMTTR○○○○○○○○	Insert (For SMG holder)	F138, G031
SNC43B2○	Insert (For DN/BN425 type face mill)	L346

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
SNGA○○○○○○	Insert (Class G tolerance)	A094, B031, B056
SNGG○○○○○○R/L	Insert (Class G tolerance)	A092
SNGN○○○○○○	Insert (Class G tolerance)	A112, B039, B058
SNGU○○○○○○AN○R/L-○	Insert (For WSX445 type cutter)	L045
SNMA○○○○○○	Insert (Class M tolerance)	A094
SNMF43B2G	Insert (For DN/BN425 type face mill)	L347
SNMG○○○○○○	Insert (Class M tolerance)	A092
SNMG○○○○○○-FH	Insert (Class M tolerance)	A089
SNMG○○○○○○-FP	Insert (Class M tolerance)	A089
SNMG○○○○○○-FS	Insert (Class M tolerance)	A089
SNMG○○○○○○-GH	Insert (Class M tolerance)	A093
SNMG○○○○○○-GK	Insert (Class M tolerance)	A091
SNMG○○○○○○-GM	Insert (Class M tolerance)	A091
SNMG○○○○○○-LK	Insert (Class M tolerance)	A089
SNMG○○○○○○-LM	Insert (Class M tolerance)	A089
SNMG○○○○○○-LP	Insert (Class M tolerance)	A089
SNMG○○○○○○-MA	Insert (Class M tolerance)	A091
SNMG○○○○○○-MH	Insert (Class M tolerance)	A091
SNMG○○○○○○-MK	Insert (Class M tolerance)	A091
SNMG○○○○○○-MM	Insert (Class M tolerance)	A090
SNMG○○○○○○-MP	Insert (Class M tolerance)	A090
SNMG○○○○○○-MS	Insert (Class M tolerance)	A091
SNMG○○○○○○-RK	Insert (Class M tolerance)	A093
SNMG○○○○○○-RM	Insert (Class M tolerance)	A092
SNMG○○○○○○-RP	Insert (Class M tolerance)	A092
SNMG○○○○○○-RS	Insert (Class M tolerance)	A093
SNMG○○○○○○-SA	Insert (Class M tolerance)	A090
SNMG○○○○○○-SH	Insert (Class M tolerance)	A090
SNMG○○○○○○-SY	Insert (Class M tolerance)	A090
SNMM○○○○○○-HL	Insert (Class M tolerance)	A093
SNMM○○○○○○-HM	Insert (Class M tolerance)	A094
SNMM○○○○○○-HR	Insert (Class M tolerance)	A093
SNMM○○○○○○-HV	Insert (Class M tolerance)	A093
SNMM○○○○○○-HX	Insert (Class M tolerance)	A093
SNMM○○○○○○-HZ	Insert (Class M tolerance)	A094
SNMN○○○○○○	Insert (Class M tolerance)	A112, L347
SNMU1206C05ZNER-M	Insert (For WSF406W type cutter)	L085
SNMU○○○○○○ANER/L-○	Insert (For WSX445 type cutter)	L045
SNTF type	Spare parts (For F type boring bar)	P025
SOET12T308PEER-JL	Insert (For ASX400 type cutter)	L120
SOGT12T308PEFR-JP	Insert (For ASX400 type cutter)	L120
SOGX○○○○○○-○○	Insert (For MVX type drill)	N167
SOMT12T3○○PEER/L-○○	Insert (For ASX400 type cutter)	L120, L135
SOMX○○○○○○-○○	Insert (For MVX type drill)	N167
SONX1206PER/L	Insert (For VOX400/VOS400 type cutter)	L114, L134
SPC○53Z	Insert (For FF3000 type cutter)	L099
SPEN1203EEER/L1	Insert (For FBP415 type cutter)	L347
SPEN1203EETR1	Insert (For FBP415 type cutter)	L350
SPEN○○○A	Insert (For FP490/590 type cutter)	L335, L337
SPEN○○○○EDR	Insert (For corner angle 15° type cutter)	L347
SPER1203EEER-JS	Insert (For FBP415 type cutter)	L347
SPGN○○○○○○	Insert (Class G tolerance)	A155, B052, B068, L347
SPGR○○○○○○R	Insert (Class G tolerance)	A155
SPGX○○○○○○	Insert (Class G tolerance)	A134, B060
SPGX1204100PPER-JM	Insert (For ASPX type cutter)	L290
SPMN○○○○○○	Insert (Class M tolerance)	A155, L347
SPMN○○○○○○T	Insert (Class M tolerance)	A155, L347
SPMR○○○○○○	Insert (Class M tolerance)	A155
SPMT○○○○○○	Insert (Class M tolerance)	A134
SPMT120408-A	Insert (For TBE1 type cutter)	L348
SPMW○○○○○○	Insert (Class M tolerance)	A134, L319
SPMX120408-○○	Insert (For SPX type cutter)	L285
SPNN1203EEER/L1	Insert (For FBP415 type cutter)	L347
SPSVN32	Shim	P014
SPX4-○○○A24A058RA	SPX type end mill	L284
SPX4R○○○○○○A058A	SPX type end mill	L284
SPX4R○○○○○BT50N○○	SPX type end mill	L283
SPX4R○○○○○MT5N○	SPX type end mill	L283
SPX4R○○○○○WN○○	SPX type end mill	L283
SRBT○○	Insert (For SRF type cutter)	L302
SRDC type	Spare parts (For SP type holder)	P021
SRDCN○○○○○○○	SP type holder	C026
SRE type	Spare parts (For SRE type end mill)	P039
SRFH○○AM○○○○	SRF/SUF type end mill	L301, L305
SRFH○○S○○○	SRF/SUF type end mill	L300, L304
SRFH○○S○○○W	SRF/SUF type end mill (Carbide shank)	L301, L305
SRFT○○	Insert (For SRF type cutter)	L302
SRGC type	Spare parts (For SP type holder)	P021
SRG○○C/E	Insert (For SRM2 type cutter)	L311, L317
SRGCR/L○○○○○○○	SP type holder	C026
SRM2○○○AM○○S/L○○	SRM2 type end mill	L310
SRM2○○○M/S/WNL○	SRM2 type end mill	L316
SRM2○○○S○○	SRM2 type end mill	L308, L309
SRM○○C/E-M	Insert (For SRM2 type cutter)	L311
SRSG type	Spare parts (For SR type holder)	P021
SRXC type	Spare parts (For SP type holder)	P021
SSBC type	Spare parts (For SP type holder)	P021
S○○○SCLCR/L○○	S type boring bar (Steel shank)	E038
S○○○SCLP type	Spare parts (For COBRA boring bar)	P024
S○○○SCZC type	Spare parts (For S type boring bar)	P026
S○○○SCZCR/L○○	S type boring bar (Steel shank)	E042
S○○○SDQC type	Spare parts (For S type boring bar)	P026
S○○○SDQCR/L○○	S type boring bar (Steel shank)	E039
S○○○SDUCR/L○○	S type boring bar (Steel shank)	E037
S○○○SDZC type	Spare parts (For S type boring bar)	P026
SSKP type	Spare parts (For SS cartridge)	P028
SSKPR○○CA○○	SS type cartridge	M010
SSSCR/L○○○○○○○	SP type holder	C027
S○○○SSKC type	Spare parts (For S type boring bar)	P026
S○○○SSKCR/L○○	S type boring bar (Steel shank)	E041
SSSP type	Spare parts (For SS cartridge)	P028
SSSPR○○CA○○	SS type cartridge	M010
S○○○STFCR/L○○	S type boring bar (Steel shank)	E036
S○○○STFER/L16	AL type boring bar (Steel shank)	E051
S○○○STFPR type	Spare parts (For COBRA boring bar)	P024
SSTP type	Spare parts (For SS cartridge)	P028
S○○○SVQCR/L○○	S type boring bar (Steel shank)	E040
S○○○SVUCR/L○○	S type boring bar (Steel shank)	E041
S○○○SWLP type	Spare parts (For COBRA boring bar)	P024

ORDER NUMBER	PRODUCT NAME	PAGE
SSYP type	Spare parts (For SS cartridge)	P028
SSYPR○○CA○○	SS type cartridge	M010
STASX○○○N	Shim	P014
STAW○N○○○○S○○	STAW type drill (General use)	N144
STAWN○○○○T	Insert (For STAW type drill)	N148
STAWN○○○○TH	Insert (For STAW type drill)	N147
STAW○S○○○○S○○	STAW type drill (General use)	N144
STFER/L○○○○○○○	AL type holder	C033
STFP type	Spare parts (For SS cartridge)	P028
STFPR/L○○CA○○	SS type cartridge	M010
STGCR/L○○○○○○○	SP type holder	C028
STGER/L○○○○○○○	AL type holder	C033
STGP type	Spare parts (For SS cartridge)	P028
STGPR○○CA○○	SS type cartridge	M010
STLG type	Spare parts (For STLG type end mill)	P039
STPMR○N	Shim	P014
STSP type	Spare parts (For SS cartridge)	P028
STTP type	Spare parts (For SS cartridge)	P028
STTPR○○CA○○	SS type cartridge	M010
SUFT○○R○○	Insert (For SUF type cutter)	L306
SVJBR/L○○○○○○○-SM	Small tools holder (External front turning)	D012
SVJC type	Spare parts (For SP type holder)	P021
SVJCR/L○○○○○○○	SP type holder	C029
SVJCR/L○○○○○○○-SM	Small tools holder (External front turning)	D013
SVJDR/L○○○○○○○	AL type holder	C034
SVLPR/L○○○○○○○-SM	Small tools holder (External front turning)	D012
SVPC type	Spare parts (For SP type holder)	P021
SVPCR/L○○○○○○○	SP type holder	C030
SVPD type	Spare parts (For AL type holder)	P022
SVPPR/L○○○○○○○-SM	Small tools holder (External front turning)	D013
SVVBR/L○○○○○○○-SM	Small tools holder (External front turning)	D013
SVVC type	Spare parts (For SP type holder)	P021
SVVCN○○○○○○○	SP type holder	C029
SVVDN type	Spare parts (For AL type holder)	P022
SXZCR/L○○○○○○○○	Profile type holder	C031

T

TAB type	Spare parts (For TAB type drill)	P044
TAFL/M/S○○○○F○○	TAF type drill	N171
TAGS/M type	Spare parts (For TAGS/TAGM type drill)	P043
TASS type	Spare parts (For TASS type drill)	P042
TAW type	Spare parts (For TAW type drill)	P045
TAWBH○○○○T	Insert (For TAW type drill)	N159
TAW○B○○○○S32	TAW type drill (For bridge construction)	N159
TAWC12T301-45GM	Insert (For TAW type drill chamfering module)	N157
TAWNH○○○○T	Insert (For TAW type drill)	N156
TAW○N○○○○S○○	TAW type drill (General use)	N151
TBE1 type	Spare parts (For TBE1 type end mill)	P040
TBE2 type	Spare parts (For TBE2 type end mill)	P040
TBGN○○○○○○	Insert (Class G tolerance)	B053
TCGN○○○○○○	Insert (Class G tolerance)	A156
TCGT○○○○○○-AZ	Insert (Class G tolerance)	A135
TCGT○○○○○○MR/L-F	Insert (Class G tolerance)	A135
TCGT○○○○○○R/L-F	Insert (Class G tolerance)	A135
TCGW○○○○○○	Insert (Class G tolerance)	A137, B061
TCMT○○○○○○	Insert (Class M tolerance)	A137
TCMT○○○○○○-FM	Insert (Class M tolerance)	A135
TCMT○○○○○○-FP	Insert (Class M tolerance)	A135
TCMT○○○○○○-FV	Insert (Class M tolerance)	A135
TCMT○○○○○○-LM	Insert (Class M tolerance)	A136
TCMT○○○○○○-LP	Insert (Class M tolerance)	A136
TCMT○○○○○○-LS	Insert (Class M tolerance)	A136
TCMT○○○○○○-MK	Insert (Class M tolerance)	A137
TCMT○○○○○○-MM	Insert (Class M tolerance)	A137
TCMT○○○○○○-MP	Insert (Class M tolerance)	A136
TCMT○○○○○○-MS	Insert (Class M tolerance)	A137
TCMW○○○○○○	Insert (Class M tolerance)	A137, B046, B061
TD	Taper shank drill	N230
TECN1603PE○R1W	Insert (For NSE300/SE300 type cutter)	L348
TECN○○○○PE○R1	Insert (For NSE300/NSE400 type cutter)	L348
TEEN○○○○PE○R1	Insert (For NSE300/NSE400 type cutter)	L348
TEER○○○○PEER-JS	Insert (For NSE300/400/SE300 type cutter)	L348
TEGX○○○○○○	Insert (For AL type holder)	B066
TEGX○○○○○○R/L	Insert (For AL type holder)	A138, B066
TFS○○○○○	Embedded seat screw (For MMTI boring bar)	G032
TIP○○○	Wrench	P003
TKY○○○	Wrench	P003
TLHR○○○○	TL type holder	C035
TNGA○○○○○○	Insert (Class G tolerance)	A101, B033, B056
TNGG○○○○○○R/L	Insert (Class G tolerance)	A099
TNGG○○○○○○-R/L-F	Insert (Class G tolerance)	A095
TNGG○○○○○○-R/L-FS	Insert (Class G tolerance)	A095
TNGG○○○○○○-R/L-K	Insert (Class G tolerance)	A097
TNGN○○○○○○	Insert (Class G tolerance)	A113, B039
TNMA○○○○○○	Insert (Class M tolerance)	A101
TNMG○○○○○○	Insert (Class M tolerance)	A099
TNMG○○○○○○-FH	Insert (Class M tolerance)	A095
TNMG○○○○○○-FP	Insert (Class M tolerance)	A095
TNMG○○○○○○-FS	Insert (Class M tolerance)	A095
TNMG○○○○○○-FY	Insert (Class M tolerance)	A095
TNMG○○○○○○-GH	Insert (Class M tolerance)	A101
TNMG○○○○○○-GK	Insert (Class M tolerance)	A098
TNMG○○○○○○-GM	Insert (Class M tolerance)	A098
TNMG○○○○○○-LK	Insert (Class M tolerance)	A096
TNMG○○○○○○-LM	Insert (Class M tolerance)	A096
TNMG○○○○○○-LP	Insert (Class M tolerance)	A096
TNMG○○○○○○-LS	Insert (Class M tolerance)	A096
TNMG○○○○○○-MA	Insert (Class M tolerance)	A098
TNMG○○○○○○-MH	Insert (Class M tolerance)	A098
TNMG○○○○○○-MJ	Insert (Class M tolerance)	A097
TNMG○○○○○○-MK	Insert (Class M tolerance)	A097
TNMG○○○○○○-MM	Insert (Class M tolerance)	A097
TNMG○○○○○○-MP	Insert (Class M tolerance)	A097
TNMG○○○○○○-MS	Insert (Class M tolerance)	A097-A098
TNMG○○○○○○-RK	Insert (Class M tolerance)	A100
TNMG○○○○○○-R/L-2G	Insert (Class M tolerance)	A099
TNMG○○○○○○-R/L-ES	Insert (Class M tolerance)	A099
TNMG○○○○○○-RM	Insert (Class M tolerance)	A100
TNMG○○○○○○-RP	Insert (Class M tolerance)	A100

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
TNMG○○○○○○-RS	Insert (Class M tolerance)	A100
TNMG○○○○○○-SA	Insert (Class M tolerance)	A096
TNMG○○○○○○-SH	Insert (Class M tolerance)	A096
TNMG○○○○○○-SY	Insert (Class M tolerance)	A097
TNMM○○○○○○-HL	Insert (Class M tolerance)	A101
TNMM○○○○○○-HZ	Insert (Class M tolerance)	A101
TNMN○○○○○○	Insert (Class M tolerance)	A113
TNMX○○○○○○-MW	Insert (Class M tolerance)	A099
TNMX○○○○○○-SW	Insert (Class M tolerance)	A097
TPEN○○○○P○R	Insert (For corner angle 0° type cutter)	L348
TPEW○○○○ZP○R2	Insert (For PMF type cutter)	L328
TPGH○○○○○○R/L-FS	Insert (Class G tolerance)	A139
TPGN○○○○○○	Insert (Class G tolerance)	A157, B053, B068
TPGR○○○○○○R/L	Insert (Class G tolerance)	A157
TPGT○○○○○○R/L-F	Insert (Class G tolerance)	B062
TPGV○○○○○○R/L-F	Insert (Class G tolerance)	B063
TPGX○○○○○○	Insert (Class G tolerance)	A141, B048, B063
TPGX○○○○○○R/L	Insert (Class G tolerance)	A140
TPMH○○○○○○-FV	Insert (Class M tolerance)	A139
TPMH○○○○○○-MV	Insert (Class M tolerance)	A141
TPMH○○○○○○-SV	Insert (Class M tolerance)	A140
TPMN○○○○○○	Insert (Class M tolerance)	A157, L348
TPMR○○○○○○	Insert (Class M tolerance)	A157
TPMX○○○○○○	Insert (Class M tolerance)	A141
TPMX○○○○○○L	Insert (Class M tolerance)	A140
TPS○○	Clamp screw	P007
TPS○○○	Clamp screw	P007
TPS○○○○	Clamp screw	P007
TRM2 type	Spare parts (For TRM2 type end mill)	P041
TRM4 type	Spare parts (For TRM4 type end mill)	P041
TS○	Clamp screw	P008
TS○○	Clamp screw	P008
TS○○○	Clamp screw	P008
TS○○○○	Clamp screw	P008
TSMPR○○○S○○	TSMP type end mill	L320
TSS○○○○○	Radial screw	P008
TSS04505S	Clamp screw	P008
TTAHR/L○○○○	Small tools holder (External threading)	D024
TTAT○○○○○○○R/L○-B	Insert for threading	D024
TTD	Taper shank drill, For steel frame	N242

U

UG type	Spare parts (For UG type holder)	P023

V

V10000 type	Spare parts (For V10000 type face mill)	P034
VA2MS	VIOLET end mill	J354
VA2SS	VIOLET end mill	J352
VA4MC	VIOLET end mill	J364
VAMFPR	VIOLET end mill	J372
VAMR	VIOLET end mill	J374
VAPDJ	VIOLET drill	N197
VAPDM	VIOLET drill	N193
VAPDMSUS	VIOLET drill	N202
VAPDS	VIOLET drill	N188
VAPDSCB	VIOLET drill	N206
VAPDSSUS	VIOLET drill	N199
VAS300	VAS300 type side cutter	L126
VAS400	VAS400 type side cutter	L128
VAS500	VAS500 type side cutter	L130
VASFPR	VIOLET end mill	J370
VBET○○○○○○R/L-SN	Insert (Class E tolerance)	A144
VBET○○○○○○R/L-SR	Insert (Class E tolerance)	A144
VBET○○○○○○R/LW-SN	Insert (Class E tolerance)	A144
VBGT○○○○○○R/L-F	Insert (Class G tolerance)	A142
VBMT○○○○○○-FM	Insert (Class M tolerance)	A142
VBMT○○○○○○-FP	Insert (Class M tolerance)	A142
VBMT○○○○○○-FV	Insert (Class M tolerance)	A142
VBMT○○○○○○-LM	Insert (Class M tolerance)	A142
VBMT○○○○○○-LP	Insert (Class M tolerance)	A142
VBMT○○○○○○-LS	Insert (Class M tolerance)	A143
VBMT○○○○○○-MK	Insert (Class M tolerance)	A143
VBMT○○○○○○-MM	Insert (Class M tolerance)	A143
VBMT○○○○○○-MP	Insert (Class M tolerance)	A143
VBMT○○○○○○-MS	Insert (Class M tolerance)	A143
VBMT○○○○○○-MV	Insert (Class M tolerance)	A143
VBMT○○○○○○-SV	Insert (Class M tolerance)	A143
VBMW○○○○○○	Insert (Class M tolerance)	A144
VC2C	MIRACLE end mill	J348
VC4JRB	MIRACLE end mill	J308
VC4STB	MIRACLE end mill	J324
VCGT○○○○○○-AZ	Insert (Class G tolerance)	A145
VCGT○○○○○○M-LS	Insert (Class G tolerance)	A146
VCGT○○○○○○M-LS-P	Insert (Class G tolerance)	A146
VCGT○○○○○○R/L-F	Insert (Class G tolerance)	A145
VCGW○○○○○○	Insert (Class G tolerance)	B064
VCLD	MIRACLE end mill	J168
VCMDSC	MIRACLE end mill	J157
VCMT○○○○○○	Insert (Class M tolerance)	A147
VCMT○○○○○○-FM	Insert (Class M tolerance)	A145
VCMT○○○○○○-FP	Insert (Class M tolerance)	A145
VCMT○○○○○○-FV	Insert (Class M tolerance)	A145
VCMT○○○○○○-LM	Insert (Class M tolerance)	A146
VCMT○○○○○○-LP	Insert (Class M tolerance)	A145
VCMT○○○○○○-LS	Insert (Class M tolerance)	A146
VCMT○○○○○○-MK	Insert (Class M tolerance)	A147
VCMT○○○○○○-MM	Insert (Class M tolerance)	A147
VCMT○○○○○○-MP	Insert (Class M tolerance)	A146
VCMT○○○○○○-MS	Insert (Class M tolerance)	A147
VCMT○○○○○○-MV	Insert (Class M tolerance)	A147
VCMT○○○○○○-SV	Insert (Class M tolerance)	A146
VCMW○○○○○○	Insert (Class M tolerance)	A147
VCPSRB	MIRACLE end mill	J302, J306
VDGX○○○○○○R/L	Insert (Class G tolerance)	A148
VDGX○○○○○○R/L-F	Insert (Class G tolerance)	B067
VF2MD	IMPACT MIRACLE end mill	J079
VF2MV	IMPACT MIRACLE end mill	J081
VF2WB	IMPACT MIRACLE end mill	J199
VF2XL	IMPACT MIRACLE end mill	J083
VF2XLB	IMPACT MIRACLE end mill	J202
VF2XLBS	IMPACT MIRACLE end mill	J200
VF3XB	IMPACT MIRACLE end mill	J228

ORDER NUMBER	PRODUCT NAME	PAGE
VF4MB	IMPACT MIRACLE end mill	J243
VF4MD	IMPACT MIRACLE end mill	J153
VF4MV	IMPACT MIRACLE end mill	J155
VF6MHV	IMPACT MIRACLE end mill	J164
VF6MHVRB	IMPACT MIRACLE end mill	J316
VF6SVRCH	IMPACT MIRACLE end mill	J343
VF8MHVCH	IMPACT MIRACLE end mill	J169
VF8MHVRBCH	IMPACT MIRACLE end mill	J322
VFFDRB	IMPACT MIRACLE end mill	J300
VFHVRB	IMPACT MIRACLE end mill	J290, J296
VFMD	IMPACT MIRACLE end mill	J166
VFMDRB	IMPACT MIRACLE end mill	J320
VFMFPR	IMPACT MIRACLE end mill	J342
VFMHVCH	IMPACT MIRACLE end mill	J156
VFMHVRBCH	IMPACT MIRACLE end mill	J288
VFR2SB	IMPACT MIRACLE REVOLUTION end mill	J191
VFR2SBF	IMPACT MIRACLE REVOLUTION end mill	J193
VFR2SSB	IMPACT MIRACLE REVOLUTION end mill	J189
VFR2XLB	IMPACT MIRACLE REVOLUTION end mill	J195
VFRPSRB	IMPACT MIRACLE REVOLUTION end mill	J283
VFSD	IMPACT MIRACLE end mill	J165
VFSDRB	IMPACT MIRACLE end mill	J318
VFSFPR	IMPACT MIRACLE end mill	J339
VFSFPRCH	IMPACT MIRACLE end mill	J341
VFX5-○○○○○○A○○○R	VFX5 type end mill	L292
VFX6-○○○A○○A○○○R	VFX6 type end mill	L296
VIP400 type	Spare parts (VIP400 type face mill)	P034
VIP445 type	Spare parts (VIP445 type face mill)	P034
VIPER type	Spare parts (VIPER type end mill)	P039
VNGA○○○○○○	Insert (Class G tolerance)	A105, B036, B057
VNGG○○○○○○-FJ	Insert (Class G tolerance)	A102
VNGG○○○○○○R/L	Insert (Class G tolerance)	A105
VNGG○○○○○○-R/L-F	Insert (Class G tolerance)	A102
VNGM○○○○○○-MJ	Insert (Class G tolerance)	A103
VNMA○○○○○○	Insert (Class M tolerance)	A105
VNMG○○○○○○	Insert (Class M tolerance)	A105
VNMG○○○○○○-FH	Insert (Class M tolerance)	A102
VNMG○○○○○○-FP	Insert (Class M tolerance)	A102
VNMG○○○○○○-FS	Insert (Class M tolerance)	A102
VNMG○○○○○○-GK	Insert (Class M tolerance)	A104
VNMG○○○○○○-GM	Insert (Class M tolerance)	A104
VNMG○○○○○○-LK	Insert (Class M tolerance)	A103
VNMG○○○○○○-LM	Insert (Class M tolerance)	A103
VNMG○○○○○○-LP	Insert (Class M tolerance)	A102
VNMG○○○○○○-LS	Insert (Class M tolerance)	A103
VNMG○○○○○○-MA	Insert (Class M tolerance)	A104
VNMG○○○○○○-MH	Insert (Class M tolerance)	A105
VNMG○○○○○○-MJ	Insert (Class M tolerance)	A103
VNMG○○○○○○-MK	Insert (Class M tolerance)	A104
VNMG○○○○○○-MM	Insert (Class M tolerance)	A103
VNMG○○○○○○-MP	Insert (Class M tolerance)	A103
VNMG○○○○○○-MS	Insert (Class M tolerance)	A104
VNMG○○○○○○-SA	Insert (Class M tolerance)	A103
VNMG○○○○○○-SH	Insert (Class M tolerance)	A103
VOS400	VOS400 type side cutter	L134
VOX400R○○○○○○	VOX400 type face mill	L112
VOX400-○○○○○○R	VOX400 type face mill	L112, L113
VPET○○○○○○R/L-SRF	Insert (Class E tolerance)	A149
VPGT○○○○○○M-SMG	Insert (Class G tolerance)	A149
VPX200-○○○A○○AR	VPX200 type face mill	L158
VPX200-○○○A○○A○○○R○○	VPX200 type face mill	L160
VPX200R○○○○AM○○○○	VPX200 type end mill	L157
VPX200R○○○○SA○○S○○○○○	VPX200 type end mill	L159
VPX200R○○○○SA○○S/L	VPX200 type end mill	L156
VPX300-○○○A○○A○○○R○○	VPX300 type face mill	L166
VPX300-○○○A○○AR	VPX300 type face mill	L164
VPX300R08005CA○○○○○	VPX300 type face mill	L166
VPX300R402SA32S○○○○○	VPX300 type end mill	L165
VPX300R○○○○AM○○○○	VPX300 type end mill	L163
VPX300R○○○○○CA	VPX300 type face mill	L164
VPX300R○○○○SA○○S/L	VPX300 type end mill	L162
VQ2XLB	SMART MIRACLE end mill	J187
VQ4SVB	SMART MIRACLE end mill	J234
VQ4WB	SMART MIRACLE end mill	J236
VQ6MHVCH	SMART MIRACLE end mill	J163
VQ6MHVRBCH	SMART MIRACLE end mill	J314
VQFDRB	SMART MIRACLE end mill	J281
VQHVRB	SMART MIRACLE end mill	J279
VQJHV	SMART MIRACLE end mill	J147
VQMHV	SMART MIRACLE end mill	J143
VQMHVRB	SMART MIRACLE end mill	J270
VQMHVRBF	SMART MIRACLE end mill	J275
VQMHZV	SMART MIRACLE end mill	J103
VQMHZVOH	SMART MIRACLE end mill	J109
VQN2MB	SMART MIRACLE end mill	J185
VQN4MB	SMART MIRACLE end mill	J239
VQN4MBF	SMART MIRACLE end mill	J241
VQN4MVRB	SMART MIRACLE end mill	J277
VQN6MVRB	SMART MIRACLE end mill	J277
VQSVR	SMART MIRACLE end mill	J336
VQT5MVRB	SMART MIRACLE end mill	J312
VQT6UR	SMART MIRACLE barrel end mill	J333
VQXL	SMART MIRACLE end mill	J149
VSD	VIOLET drill	N208

W

ORDER NUMBER	PRODUCT NAME	PAGE
WA-M10	Washer	F131
WBGT○○○○○○R/L-F	Insert (Class G tolerance)	A150
WBMT○○○○○○R/L-MV	Insert (Class M tolerance)	A150
WCGT○○○○○○R/L	Insert (Class G tolerance)	A151
WCMT○○○○○○	Insert (Class M tolerance)	A151
WCMT○○○○○○-MP	Insert (Class M tolerance)	A151
WCMW○○○○○○	Insert (Class M tolerance)	B065
WCS○○○○○○H	Shim screw	P008
WEC○○AF○R5C	Wiper insert (For SE445/545 type cutter)	L349
WEC○○EF○R5C	Wiper insert (For SE415/515 type cutter)	L349
WEEW13T3AG○R○C	Wiper insert (For ASX445 type cutter)	L058

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
WJX09-○○○○○○AR	WJX09 type face mill	L242
WJX09R○○○○○○A	WJX09 type face mill	L242, L243
WJX09R○○○○AM○○○○	WJX09 type end mill	L244
WJX09R○○○○SA○○S/L/EL	WJX09 type end mill	L244
WJX14-○○○○○○AR	WJX14 type face mill	L250
WJX14R○○○○○○A	WJX14 type face mill	L250
WJX14R○○○○SA42S/L	WJX14 type end mill	L252
WNEU1305ZEN4C-M	Wiper insert (For AHX440S type cutter)	L064
WNEU2006ZEN7C-WK	Wiper insert (For AHX640S/640W type cutter)	L073, L081
WNEU2007ZEN7C-○○	Wiper insert (For AHX640S type cutter)	L073
WNGU1206ZNER5C-M	Wiper insert (For WSF406W type cutter)	L085
WNGU1406ANEN8C-M	Wiper insert (For WSX445 type cutter)	L045
WNMA○○○○○○	Insert (Class M tolerance)	A110
WNMG○○○○○○	Insert (Class M tolerance)	A109
WNMG○○○○○○-FH	Insert (Class M tolerance)	A106
WNMG○○○○○○-FP	Insert (Class M tolerance)	A106
WNMG○○○○○○-FS	Insert (Class M tolerance)	A106
WNMG○○○○○○-FY	Insert (Class M tolerance)	A106
WNMG○○○○○○-GH	Insert (Class M tolerance)	A110
WNMG○○○○○○-GJ	Insert (Class M tolerance)	A110
WNMG○○○○○○-GK	Insert (Class M tolerance)	A109
WNMG○○○○○○-GM	Insert (Class M tolerance)	A109
WNMG○○○○○○-LK	Insert (Class M tolerance)	A107
WNMG○○○○○○-LM	Insert (Class M tolerance)	A106
WNMG○○○○○○-LP	Insert (Class M tolerance)	A106
WNMG○○○○○○-LS	Insert (Class M tolerance)	A107
WNMG○○○○○○-MA	Insert (Class M tolerance)	A109
WNMG○○○○○○-MH	Insert (Class M tolerance)	A109
WNMG○○○○○○-MJ	Insert (Class M tolerance)	A107
WNMG○○○○○○-MK	Insert (Class M tolerance)	A108
WNMG○○○○○○-MM	Insert (Class M tolerance)	A108
WNMG○○○○○○-MP	Insert (Class M tolerance)	A108
WNMG○○○○○○-MS	Insert (Class M tolerance)	A108
WNMG○○○○○○-MW	Insert (Class M tolerance)	A109
WNMG○○○○○○-RK	Insert (Class M tolerance)	A110
WNMG○○○○○○-RM	Insert (Class M tolerance)	A110
WNMG○○○○○○-RP	Insert (Class M tolerance)	A109
WNMG○○○○○○-RS	Insert (Class M tolerance)	A110
WNMG○○○○○○-SA	Insert (Class M tolerance)	A107
WNMG○○○○○○-SH	Insert (Class M tolerance)	A107
WNMG○○○○○○-SW	Insert (Class M tolerance)	A107
WNMG○○○○○○-SY	Insert (Class M tolerance)	A107
WOEW12T308PE○R8C	Wiper insert (For ASX400 type cutter)	L120
WOEX1206PER5C	Wiper insert (For VOX400 type cutter)	L114
WPC42EEER/L10C	Wiper insert (For FBP415/QBP415 type cutter)	L349
WPGT○○○○○○	Insert (Class G tolerance)	B065
WPGT○○○○○○R/L-FS	Insert (Class G tolerance)	A152
WPMT○○○○○○-MV	Insert (Class M tolerance)	A152
WPSTN○○	Shim	P014
WPT4405	Plate (For TAW type drill)	N151, N159
W○○-S1	Seal washer	L288, L293, L297
W○-S1	Seal washer	L293
WSF406WR○○○○○○N	WSF406W type face mill	L084
WS○○LH	Stopper	P017
WS○○○○○○T	Clamp screw	P009
WS○○○○○○TPS	Clamp screw	P009
WS○○○○○○TPS-○○LH	Spare parts set	N150
WSX445L○○○○○○○	WSX445 type face mill	L041
WSX445-○○○○○○○L	WSX445 type face mill	L043
WSX445R○○○○○○○	WSX445 type face mill	L040
WSX445-○○○○○○○R	WSX445 type face mill	L040, L042
WSX445R○○○○SA32M	WSX445 type end mill	L044
WWX400R○○○○○○○	WWX400 type face mill	L100
WWX400-○○○○○○○R	WWX400 type face mill	L101
WWX400R○○○○SA32M	WWX400 type end mill	L103

X

XCMT○○○○○○-SVX	Insert (Class M tolerance)	A153
XDGT1550PD○R-G○○	Insert (For BXD4000 type cutter)	L219
XDGX1750○○PD○R-G○	Insert (For AXD4000/AXD4000A type cutter)	L196, L204
XDGX2270○○PDER-GLA	Insert (For AXD7000 type cutter)	L210
XDGX2270○○PDFR-GL	Insert (For AXD7000 type cutter)	L210
XNMU16○○○○R-○S	Insert (For VFX5 type cutter)	L294
XNMU19○○○○R-○S	Insert (For VFX6 type cutter)	L298

Z

ZCMX○○○○○○ER-○	Insert (For DCCC type cutter)	L281
ZR type	Spare parts (For ZR type end mill)	P039

NUMBER / OTHERS

01-○	Insert (For brazed tools holder)	I002
02-○	Insert (For brazed tools holder)	I002
03-○	Insert (For brazed tools holder)	I002
04-○	Insert (For brazed tools holder)	I002
05-○	Insert (For brazed tools holder)	I002
06-○	Insert (For brazed tools holder)	I002
07-○	Insert (For brazed tools holder)	I003
08-○	Insert (For brazed tools holder)	I003
09E1	Insert (For brazed tools holder)	I003
31-○	31 type brazed tools holder	I005
32-○	32 type brazed tools holder	I005
33-○	33 type brazed tools holder	I005
34-○	34 type brazed tools holder	I005
35-○	35 type brazed tools holder	I005
36-○	36 type brazed tools holder	I005
37-○	37 type brazed tools holder	I006
38-○	38 type brazed tools holder	I006
39-○	39 type brazed tools holder	I006
40-○	40 type brazed tools holder	I006
41-○	41 type brazed tools holder	I006
42-○	42 type brazed tools holder	I006
43-○	43 type brazed tools holder	I006
47-○	47 type brazed tools holder	I007
49-○	49 type brazed tools holder	I007
51-○	51 type brazed tools holder	I007
95-○	95 type brazed tools holder	I007
1LA	HSS end mill	J351
1MA	HSS end mill	J350
2LS	HSS end mill	J360

ORDER NUMBER	PRODUCT NAME	PAGE
2MK	HSS end mill	J362
2MS	HSS end mill	J358
2NGU1406ZNER6C-M	Wiper insert (For WWX400 type cutter)	L105
2SS	HSS end mill	J356
3KD	Triangular shank drill, (Type 6.5)(Type 10)(Type 13)	N243
4LC	HSS end mill	J368
4MC	HSS end mill	J366
6NGU○○○○○○○PN○R-○	Insert (For WWX400 type cutter)	L104
6NMU○○○○○○○PNER-○	Insert (For WWX400 type cutter)	L104
GUN REAMER		N180
GUN REAMER with diamond compound		N181

ORDER NUMBER	PRODUCT NAME	PAGE

Memo

Memo

HOW TO READ THE STANDARD OF TURNING INSERTS

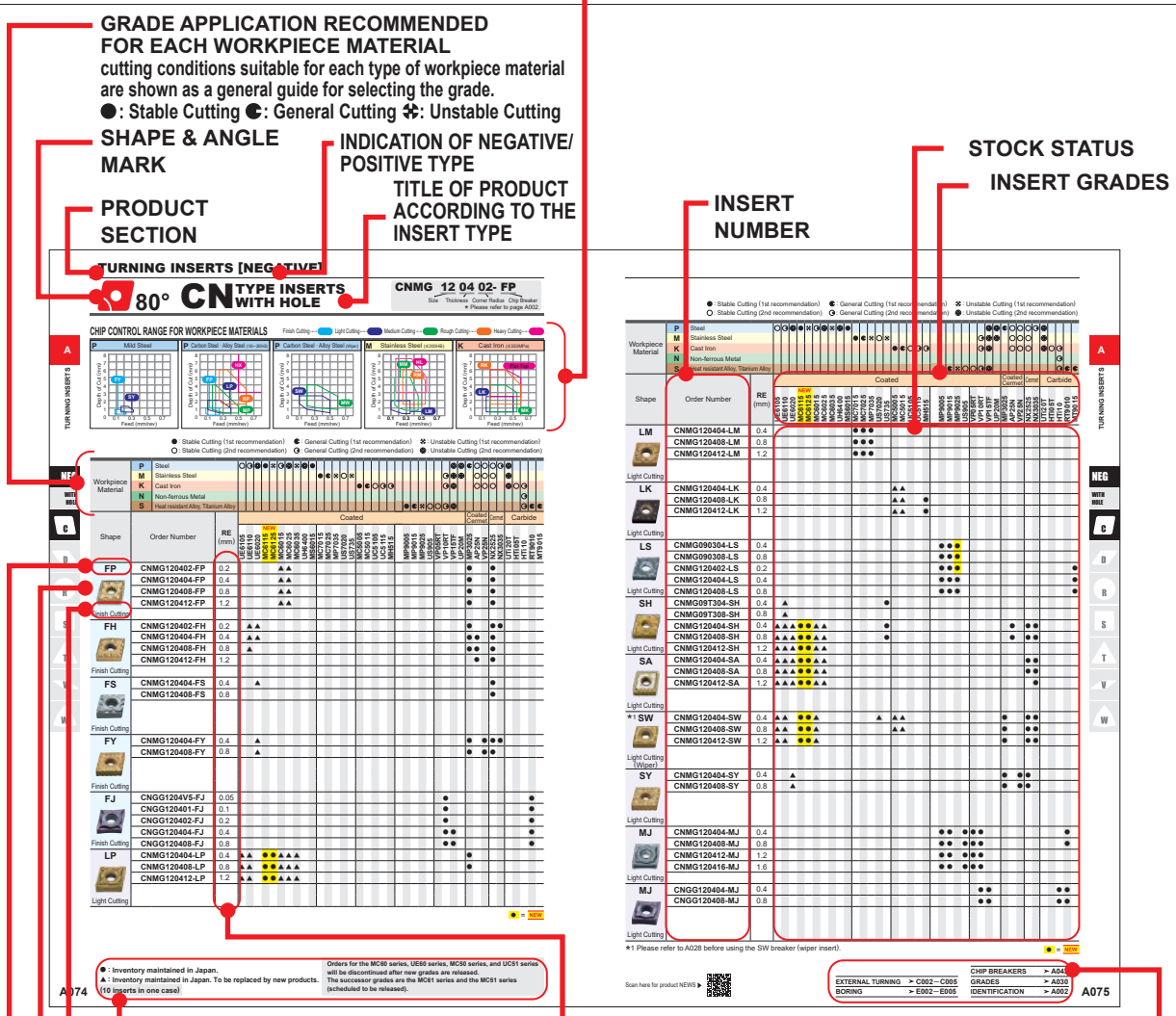
●How this section page is organised

①Organised according to turning insert shape.
(Refer to the index on the next page.)
②Inserts are arranged in order of :
• Negative inserts (with hole→without hole)
• Positive inserts (with hole→without hole)
③Breakers are arranged in order of :
Finish Cutting→Light Cutting→Medium Cutting →Rough Cutting→Heavy Cutting

●Graph of chip control by workpiece material

Shows recommended chip breakers and chip control range according to workpiece material and cutting application. Graphs are coloured according to cutting applications (Finish→Light→Medium→Rough→Heavy) and contain recommended breakers for each application.

Finish Cutting : Light Cutting : Medium Cutting :
Rough Cutting : Heavy Cutting :



●To Order : Please specify
①insert number and ②grade.

TURNING TOOLS

INSERT STANDARDS
INSERT GRADES

IDENTIFICATION ····· A002
HOLE GEOMETRY ····· A004
PRECISION BREAKER SYSTEM ····· A006
TOOL NAVI ····· A009
OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING ··· A010
PRECISION BREAKER SYSTEM ····· A026
WIPER INSERT ····· A028
GRADES FOR TURNING ····· A030
TURNING APPLICATION RANGE ····· A031
COATED CARBIDE (CVD) ····· A034
COATED CARBIDE (PVD) ····· A036
CERMET ····· A037
COATED CERMET ····· A038
CEMENTED CARBIDE ····· A039
MICRO-GRAIN CEMENTED CARBIDE ····· A040
CLASSIFICATION OF INSERTS ····· A042

STANDARD OF INSERTS

NEGATIVE INSERTS WITH HOLE

CN○○TYPE···RHOMBIC 80° ····· A074
DN○○TYPE···RHOMBIC 55° ····· A081
RN○○TYPE···ROUND ····· A088
SN○○TYPE···SQUARE 90° ····· A089
TN○○TYPE···TRIANGULAR 60° ····· A095
VN○○TYPE···RHOMBIC 35° ····· A102
WN○○TYPE···TRIGON 80° ····· A106

NEGATIVE INSERTS WITHOUT HOLE

CN○○TYPE···RHOMBIC 80° ····· A111
SN○○TYPE···SQUARE 90° ····· A112
TN○○TYPE···TRIANGULAR 60° ····· A113

POSITIVE INSERTS WITH HOLE

CC○○TYPE···RHOMBIC 80° ····· A114
CP○○TYPE···RHOMBIC 80° ····· A122
DC○○TYPE···RHOMBIC 55° ····· A124
DE○○TYPE···RHOMBIC 55° ····· A130
RC○○TYPE···ROUND ····· A131
SC○○TYPE···SQUARE 90° ····· A132
SP○○TYPE···SQUARE 90° ····· A134
TC○○TYPE···TRIANGULAR 60° ····· A135
TE○○TYPE···TRIANGULAR 60° ····· A138
TP○○TYPE···TRIANGULAR 60° ····· A139
VB○○TYPE···RHOMBIC 35° ····· A142
VC○○TYPE···RHOMBIC 35° ····· A145
VD○○TYPE···RHOMBIC 35° ····· A148
VP○○TYPE···RHOMBIC 35° ····· A149
WB○○TYPE···TRIGON 80° ····· A150
WC○○TYPE···TRIGON 80° ····· A151
WP○○TYPE···TRIGON 80° ····· A152
XC○○TYPE···RHOMBIC 25° ····· A153

POSITIVE INSERTS WITHOUT HOLE

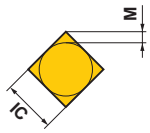
RTG TYPE ····· A154
SP○○TYPE···SQUARE 90° ····· A155
TC○○TYPE···TRIANGULAR 60° ····· A156
TP○○TYPE···TRIANGULAR 60° ····· A157

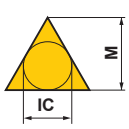


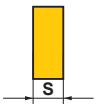
IDENTIFICATION

Symbol	Insert Shape
H	Hexagonal
O	Octagonal
P	Pentagonal
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
E	Rhombic 75°
F	Rhombic 50°
M	Rhombic 86°
V	Rhombic 35°
W	Trigon
L	Rectangular
A	Parallelogram 85°
B	Parallelogram 82°
K	Parallelogram 55°
R	Round
X	Special Design

① Insert Shape









Triangular insert with a facet (Secondary Cutting Edge)

③ Tolerance Class

Symbol	Tolerance of Nose Height **M** (mm)	Tolerance of Inscribed Circle **IC** (mm)	Tolerance of Thickness **S** (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05–±0.15	±0.025
K*	±0.013	±0.05–±0.15	±0.025
L*	±0.025	±0.05–±0.15	±0.025
M*	±0.08–±0.18	±0.05–±0.15	±0.13
N*	±0.08–±0.18	±0.05–±0.15	±0.025
U*	±0.13–±0.38	±0.08–±0.25	±0.13

The surface of insert with * mark is sintered.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	–
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	–
12.70	±0.13	±0.13	±0.13	±0.15	–	–
15.875	±0.15	±0.15	±0.15	±0.18	–	–
19.05	±0.15	±0.15	±0.15	±0.18	–	–
25.40	–	±0.18	–	–	–	–
31.75	–	±0.20	–	–	–	–

●Tolerance of Inscribed Circle **IC** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	–
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	–	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	–	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	–	±0.10
25.40	–	±0.13	–	–	–	±0.13
31.75	–	±0.15	–	–	–	±0.15

③ Tolerance Class

① ③

C **N** **M** **G**

② ④

② Normal Clearance

Symbol	Normal Clearance
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other Normal Clearance
Major Normal Clearance	

④ Fixing and/or for Chip Breaker

Metric

Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40–60°)	No		A	With Hole	Cylindrical Hole	No	
T	With Hole		One Sided		M	With Hole	Cylindrical Hole	Single Sided	
Q	With Hole	Cylindrical Hole + Double Countersink (40–60°)	No		G	With Hole	Cylindrical Hole	Double-Sided	
U	With Hole		Double-Sided		N	Without Hole	–	No	
B	With Hole	Cylindrical Hole + One Countersink (70–90°)	No		R	Without Hole	–	Single Sided	
H	With Hole		One Sided		F	Without Hole	–	Double-Sided	
C	With Hole	Cylindrical Hole + Double Countersink (70–90°)	No		X	–	–	–	Special Design
J	With Hole		Double-Sided						

Symbol R	Symbol W	Symbol V	Symbol D	Symbol C	Symbol S	Symbol T	Diameter of Inscribed Circle (mm)
	02		04	03	03	06	3.97
	L3	08	05	04	04	08	4.76
	03	09	06	05	05	09	5.56
06							6.00
	04	11	07	06	06	11	6.35
	05	13	09	08	07	13	7.94
08							8.00
09	06	16	11	09	09	16	9.525
10							10.00
12							12.00
	08	22	15	12	12	22	12.70
15	10		19	16	15	27	15.875
16							16.00
19	13		23	19	19	33	19.05
20							20.00
			27	22	22	38	22.225
25							25.00
25			31	25	25	44	25.40
31			38	32	31	54	31.75
32							32.00

⑤ Insert Size



*Thickness is from the bottom of the insert to the top of the cutting edge.

Symbol	Thickness (mm)
S1	1.39
01	1.59
T0	1.79
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
06	6.35
07	7.94
09	9.52

⑥ Insert Thickness

⑤	⑥	⑦	⑧	⑨	⑩
12	04	08	(E)	(N)	- MP

⑦ Insert Corner Configuration

Symbol	Corner Radius (mm)
00	Sharp Nose
V3	0.03
V5	0.05
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
28	2.8
32	3.2
00 : Inch M0 : Metric	Round Insert

* The insert RE value with a negative corner radius indicates the maximum corner radius. Numerical values will have changed from the previous catalogue (C009).

⑧ Cutting Edge Symbol

Figure	Feature	Symbol
	Sharp Cutting Edges	F
	Round Cutting Edges	E
	Chamfered Cutting Edges	T
	Chamfered and Rounded Cutting Edges	S
–	(-) Corner R tolerance	M

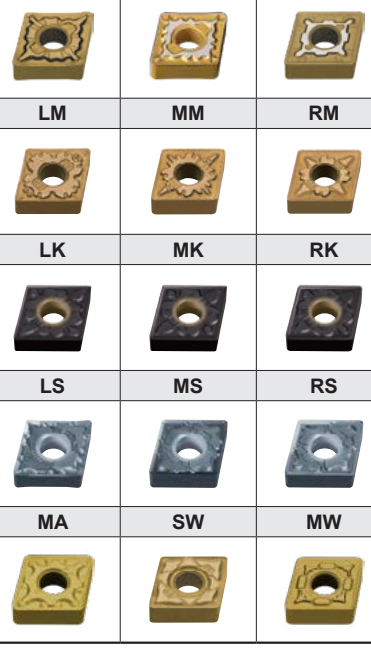
Mitsubishi Materials omits the honing symbol.

⑨ Cutting Direction

Figure	Hand	Symbol
	Right	R
	Left	L
	Neutral	N

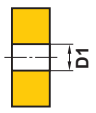
⑩ Chip Breaker

LP	MP	RP
LM	MM	RM
LK	MK	RK
LS	MS	RS
MA	SW	MW



The table above is shown as a sample reference.

HOLE GEOMETRY

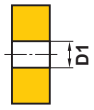
Type A	Type B	Type C	Type D
			

NEGATIVE

Insert Number		Dimensions (mm) D1	Hole Type
CNGA CNGG CNGM CNMA CNMG CNMM	0903○○	3.81	A
	09T3○○	3.81	A
	0904○○	3.81	A
	1204○○	5.16	A
	1606○○	6.35	A
	1906○○	7.93	A
	2509○○	9.12	A
DNGA DNGG DNGM DNMA DNMG DNMM DNMX	1104○○	3.81	A
	1504○○	5.16	A
	1506○○	5.16	A
SNGA SNGG SNMA SNMG SNMM	0903○○	3.81	A
	1204○○	5.16	A
	1506○○	6.35	A
	1906○○	7.93	A
	2507○○	9.12	A
	2509○○	9.12	A
TNGA TNGG TNGM TNMA TNMG TNMM TNMX	1103○○	2.26	A
	1603○○	3.81	A
	1604○○	3.81	A
	2204○○	5.16	A
	2706○○	6.35	A
	3309○○	7.93	A
VNGA VNGM VNGG VNMA VNMG VNMM	1604○○	3.81	A
WNGA WNMA WNMG	0603○○	3.81	A
	06T3○○	3.81	A
	0604○○	3.81	A
	0804○○	5.16	A
	1006○○	6.35	A
RNMG	090300	3.81	A
	120400	5.16	A
	150600	6.35	A
	190600	7.93	A
	250900	9.12	A
	310900	12.7	A

POSITIVE

Insert Number		Dimensions (mm) D1	Hole Type
CCET	0602○○	2.8	B
	09T3○○	4.4	B
CCGB CCMB CCGH CCMH	0602○○	2.8	B
CCGT	03S1○○	2.0	B
	04T0○○	2.4	B
	0602○○	2.8	B
	09T3○○	4.4	B
	1204○○	5.5	B
CCMT	0602○○	2.8	B
	0803○○	3.4	B
	09T3○○	4.4	B
	1204○○	5.5	B
CCGW CCMW	03S1○○	2.0	B
	04T0○○	2.4	B
	0602○○	2.8	B
	09T3○○	4.4	B
	1204○○	5.5	B
CPGT	0802○○	3.4	B
	0903○○	4.4	B
CPGB CPMB CPMH	0802○○	3.5	D
	0903○○	4.5	D
CPMX CPMH (Standard)	0802○○	3.5	D
	0903○○	4.6	D
DCET DCGT	0702○○	2.8	B
	11T3○○	4.4	B
DCGW DCMW DCMT	0702○○	2.8	B
	11T3○○	4.4	B
	1504○○	5.5	B
DEGX	1504○○	5.1	C
RCMX	1003M0	3.6	D
	1204M0	4.2	D
	1606M0	5.2	D
	2006M0	6.5	D
	2507M0	7.2	D
	3209M0	9.5	D

Type A	Type B	Type C	Type D
			

POSITIVE

Insert Number		Dimensions (mm) D1	Hole Type
RCGT RCMT	0602M0	2.8	B
	0803M0	3.4	B
	10T3M0	4.4	B
SCMT SCMW	09T3○○	4.4	B
	1204○○	5.5	B
SPMW	0903○○	4.6	B
	1203○○	5.7	B
SPMT	0903○○	4.4	B
	1203○○	5.5	B
SPGX	0903○○	4.8	D
	1203○○	5.9	D
TCGT TCMT TCGW TCMW	0601○○	2.3	B
	0802○○	2.3	B
	0902○○	2.5	B
	1102○○	2.8	B
	1303○○	3.4	B
	16T3○○	4.4	B
TEGX	1603○○	4.4	D
TPGX	0802○○	2.5	C
	0902○○	3.0	C
	1103○○	3.5	C
	1603○○	4.8	D
	1604○○	4.8	D
TPMX	0902○○	3.2 *	C
	1103○○	3.7	C
	1103○○R/L	3.5	C
	1603○○	4.8	D
TPGB TPMB TPGH TPMH	0802○○	2.4	D
	0902○○	2.9	D
	1103○○	3.4	D
	1603○○	4.4	D
TPGT	1603○○	4.4	B
TPGV	0902○○	2.8	B
	1103○○	3.4	B

* D1 of MD220 is 3.0.

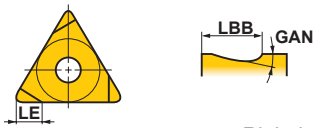
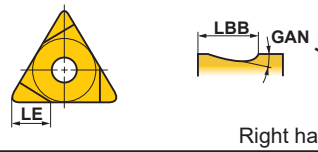
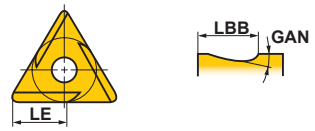
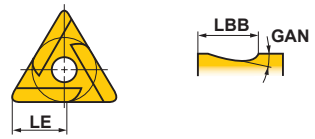
Insert Number		Dimensions (mm) D1	Hole Type
VBET VBGT VBMT VBGW	1103○○	2.9	B
	1604○○	4.4	B
VCGT VCMT VCGW VCMW	0802○○	2.4	B
	1103○○	2.8	B
	1303○○	3.4	B
	1604○○	4.4	B
VDGX	1603○○	4.5	D
VPET VPGT	0802○○	2.42	B
	1103○○	2.85	B
WBGT WBMT	0201○○	2.3	B
	L302○○	2.3	B
WCGT WCMT WCGW WCMW	0201○○	2.3	B
	L302○○	2.3	B
	0402○○	2.8	B
	06T3○○	4.4	B
WPGT WPMT	0402○○	2.8	B
	0603○○	4.4	B
XCMT	1503○○	2.8	B

PRECISION BREAKER SYSTEM

STANDARD OF INSERTS WITH PRECISION GRADES

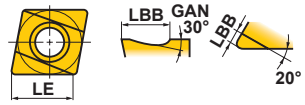
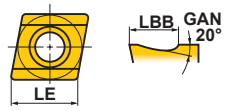
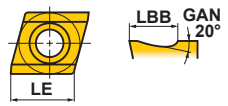
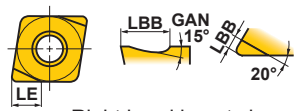
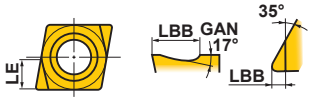
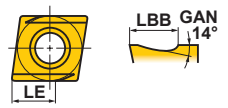
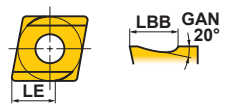
●NEGATIVE INSERTS

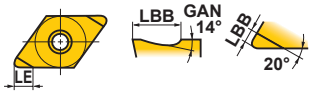
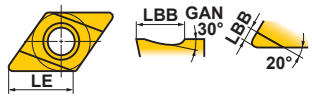
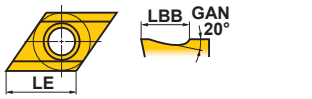
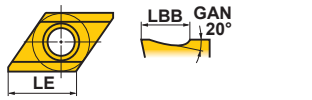
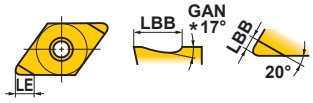
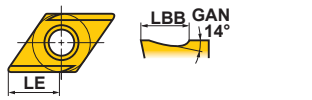
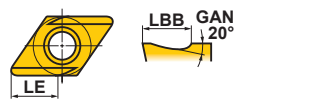
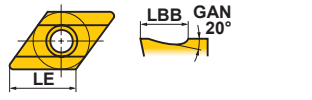
Unit : mm

Geometry	Insert Number	LBB	LE	GAN
 Right hand insert shown.	**DNGG150404R/L**	2.8	14.9	15°
	DNGG150408R/L	2.8	14.3	15°
	DNGG150604R/L	2.8	14.9	15°
	DNGG150608R/L	2.8	14.3	15°
 Right hand insert shown.	**SNGG090304R/L**	1.8	1.6	15°
	SNGG090308R/L	1.8	1.6	15°
	SNGG120404R/L	2.3	3.7	15°
	SNGG120408R/L	2.3	3.7	15°
 Right hand insert shown.	**TNGG160402R/L-FS**	1.3	2.7	15°
	TNGG160404R/L-FS	1.3	2.8	15°
	TNGG160408R/L-FS	1.3	3.1	15°
 Right hand insert shown.	**TNGG160402R/L-F**	2.5	5.1	15°
	TNGG160404R/L-F	2.5	5.2	15°
	TNGG160408R/L-F	2.5	5.5	15°
 Right hand insert shown.	**TNGG160402R/L-K**	1.5	7.1	15°
	TNGG160404R/L-K	1.5	5.4	15°
	TNGG160408R/L-K	1.5	5.1	15°
 Right hand insert shown.	**TNGG110302R/L**	1.3	3.2	15°
	TNGG110304R/L	1.3	3.0	15°
	TNGG110308R/L	1.3	2.7	15°
	TNGG160304R/L	2.3	5.4	15°
	TNGG160402R/L	1.3	8.7	15°
	TNGG160404R/L	2.3	5.4	15°
	TNGG160408R/L	2.3	5.1	15°
	TNGG220404R/L	2.8	9.4	15°
	TNGG220408R/L	2.8	9.1	15°
 Right hand insert shown.	**VNGG160404R/L**	1.8	15.6	15°
 Right hand insert shown.	**VNGG160402R/L-F**	2.5	7.4	15°
	VNGG160404R/L-F	2.5	7.6	15°

●POSITIVE INSERTS

Unit : mm

Geometry	Insert Number	LBB	LE
 Right hand insert shown.	CCET0602V3R/L-SR	2.2	6.4
	CCET060201R/L-SR	2.2	6.3
	CCET060202R/L-SR	2.2	6.2
	CCET060204R/L-SR	2.2	6.0
	CCET09T3V3R/L-SR	3.2	9.6
	CCET09T301R/L-SR	3.2	9.5
	CCET09T302R/L-SR	3.2	9.4
	CCET09T304R/L-SR	3.2	9.2
 Right hand insert shown.	CCET060200R/L-SN	1.0	6.4
	CCET0602V3R/L-SN	1.0	6.4
	CCET060201R/L-SN	1.0	6.3
	CCET060202R/L-SN	1.0	6.2
	CCET060204R/L-SN	1.0	6.0
	CCET09T300R/L-SN	1.5	9.6
	CCET09T3V3R/L-SN	1.5	9.6
	CCET09T301R/L-SN	1.5	9.5
	CCET09T302R/L-SN	1.5	9.4
	CCET09T304R/L-SN	1.5	9.2
 Right hand insert shown.	CCET0602V3R/LW-SN	1.0	6.4
	CCET09T3V3R/LW-SN	1.5	9.6
 Right hand insert shown.	CCGH060202(M)R/L-F	1.2	3.6
	CCGH060204(M)R/L-F	1.4	4.4
 Left hand insert shown.	CCGT03S1V3L-F	0.8	1.4
	CCGT03S101(M)R/L-F	0.8	1.4
	CCGT03S102(M)R/L-F	0.8	1.5
	CCGT03S104(M)R/L-F	0.8	1.6
	CCGT04T0V3L-F	1.0	1.7
	CCGT04T001(M)R/L-F	1.0	1.8
	CCGT04T002(M)R/L-F	1.0	1.8
	CCGT04T004(M)R/L-F	1.0	2.0
 Right hand insert shown.	CCGT0602V3R/L-SS	1.0	3.0
	CCGT060201(M)R/L-SS	1.0	3.0
	CCGT060202(M)R/L-SS	1.0	3.0
	CCGT09T3V3R/L-SS	1.0	5.0
	CCGT09T301(M)R/L-SS	1.0	5.0
	CCGT09T302(M)R/L-SS	1.0	5.0
	CCGT09T304MR/L-SS	1.0	5.0
 Right hand insert shown.	CCGT0602V3R-SN	1.0	3.0
	CCGT060201(M)R/L-SN	1.0	3.0
	CCGT060202(M)R/L-SN	1.0	3.0
	CCGT09T3V3R/L-SN	1.5	5.0
	CCGT09T301(M)R/L-SN	1.5	5.0
	CCGT09T302(M)R/L-SN	1.5	5.0
	CCGT09T304(M)R/L-SN	1.5	5.0
 Right hand insert shown.	CPGT080204R/L-F	1.8	5.5
	CPGT090302R/L-F	1.8	5.4
	CPGT090304R/L-F	1.8	5.5

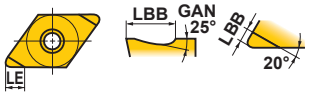
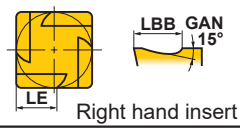
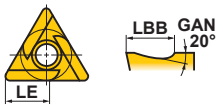
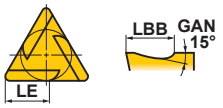
Geometry	Insert Number	LBB	LE
 Right hand insert shown.	DCGT11T301MR-SRF	1.0	3.1
	DCGT11T302MR-SRF	1.0	3.2
	DCGT11T304MR-SRF	1.0	3.4
 Right hand insert shown.	DCET0702V3R/L-SR	2.5	7.7
	DCET070201R/L-SR	2.5	7.6
	DCET070202R/L-SR	2.5	7.4
	DCET070204R/L-SR	2.5	7.1
	DCET11T3V3R/L-SR	3.7	11.6
	DCET11T301R/L-SR	3.7	11.4
	DCET11T302R/L-SR	3.7	11.3
	DCET11T304R/L-SR	3.7	11.0
 Right hand insert shown.	DCET070200R/L-SN	1.0	7.7
	DCET0702V3R/L-SN	1.0	7.7
	DCET070201R/L-SN	1.0	7.6
	DCET070202R/L-SN	1.0	7.4
	DCET070204R/L-SN	1.0	7.1
	DCET11T300R/L-SN	1.5	11.6
	DCET11T3V3R/L-SN	1.5	11.6
	DCET11T301R/L-SN	1.5	11.4
	DCET11T302R/L-SN	1.5	11.3
	DCET11T304R/L-SN	1.5	11.0
 Right hand insert shown.	DCET0702V3R/LW-SN	1.0	7.7
	DCET11T3V3R/LW-SN	1.5	11.6
 *DCGT11T3○○type : 14° Right hand insert shown.	DCGT070202R/L-F	1.0	3.0
	DCGT070204R/L-F	1.0	3.2
	DCGT11T302R/L-F	1.0	3.0
	DCGT11T304R/L-F	1.0	3.2
 Right hand insert shown.	DCGT0702V3R/L-SS	1.0	3.5
	DCGT070201R/L-SS	1.0	3.5
	DCGT070202(M)R/L-SS	1.0	3.5
	DCGT11T3V3R-SS	1.0	6.5
	DCGT11T301(M)R/L-SS	1.0	6.5
	DCGT11T302(M)R/L-SS	1.0	6.5
	DCGT11T304MR/L-SS	1.0	6.5
 Right hand insert shown.	DCGT0702V3R-SN	1.0	3.5
	DCGT070201(M)R/L-SN	1.0	3.5
	DCGT070202(M)R/L-SN	1.0	3.5
	DCGT11T3V3R/L-SN	1.5	6.5
	DCGT11T301(M)R/L-SN	1.5	6.5
	DCGT11T302(M)R/L-SN	1.5	6.5
	DCGT11T304(M)R/L-SN	1.5	6.5
 Right hand insert shown.	DEGX150402R/L	2.8	15.2
	DEGX150404R/L	2.8	14.9

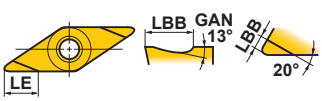
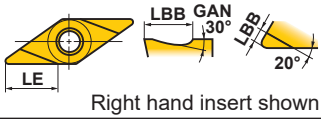
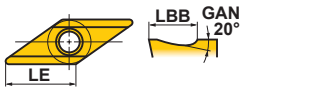
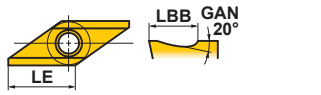
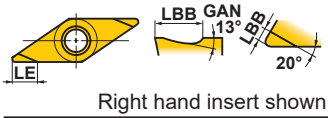
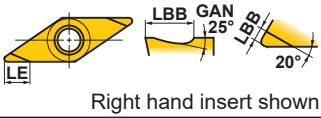
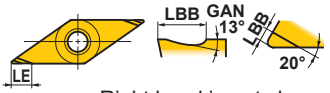
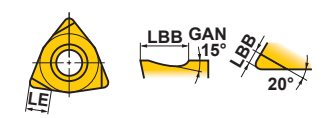
PRECISION BREAKER SYSTEM

STANDARD OF INSERTS WITH PRECISION GRADES

●POSITIVE INSERTS

Unit : mm

Geometry	Insert Number	LBB	LE
 Right hand insert shown.	DEGX150402R/L-F	2.5	7.4
	DEGX150404R/L-F	2.5	7.6
 Right hand insert shown.	SPGR090304R	1.8	1.6
 Left hand insert shown.	TCGT0601V3L-F	1.0	2.9
	TCGT060101L-F	1.0	3.0
	TCGT060102R/L-F	1.0	3.0
	TCGT060104R/L-F	1.0	3.2
 Right hand insert shown.	TEGX160302R/L	2.0	6.0
	TEGX160304R/L	2.0	6.0
 ✱TPGH1603□□type : 14° Right hand insert shown.	TPGH080202R/L-FS	0.9	2.7
	TPGH080204R/L-FS	0.9	2.9
	TPGH090202R/L-FS	1.0	3.0
	TPGH090204R/L-FS	1.0	3.2
	TPGH110302R/L-FS	1.4	4.2
	TPGH110304R/L-FS	1.4	4.4
	TPGH160304R/L-FS	2.0	6.1
	TPGH160308R/L-FS	2.0	6.5
 Right hand insert shown.	TPGR110304R/L	1.3	3.0
	TPGR160304R/L	2.3	5.4
	TPGR160308R/L	2.3	5.1
 Right hand insert shown.	TPGX080202R/L	1.3	3.9
	TPGX080204R/L	1.3	4.1
	TPGX090202R/L	1.6	4.8
	TPGX090204R/L	1.6	5.0
	TPGX090208R/L	1.4	4.7
	TPGX110302L	1.8	5.4
	TPGX110304R/L	1.8	5.5
	TPGX110308R/L	1.8	5.9

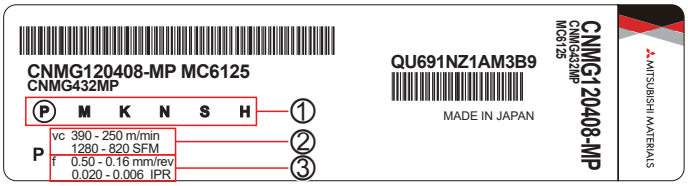
Geometry	Insert Number	LBB	LE
 Right hand insert shown.	VBGT110302R/L-F	1.0	3.0
	VBGT110304R/L-F	1.0	3.2
	VBGT160402R/L-F	1.5	4.5
	VBGT160404R/L-F	1.5	4.7
 Right hand insert shown.	VBET1103V3R/L-SR	2.5	7.3
	VBET110301R/L-SR	2.5	7.3
	VBET110302R/L-SR	2.5	7.4
	VBET110304R/L-SR	2.5	7.6
 Right hand insert shown.	VBET110300R/L-SN	1.0	11.0
	VBET1103V3R/L-SN	1.0	11.0
	VBET110301R/L-SN	1.0	10.8
	VBET110302R/L-SN	1.0	10.5
	VBET110304R/L-SN	1.0	11.0
 Right hand insert shown.	VBET1103V3R/LW-SN	1.0	11.0
 Right hand insert shown.	VCGT080202R/L-F	0.8	2.5
	VCGT080204R/L-F	0.8	2.6
 Right hand insert shown.	VDGX160302R/L	2.0	6.0
	VDGX160304R/L	2.0	6.1
 Right hand insert shown.	VPET080201R/L-SRF	0.8	2.4
	VPET080202R/L-SRF	0.8	2.5
	VPET1103V3R/L-SRF	1.0	2.9
	VPET110301R/L-SRF	1.0	3.0
	VPET110302R/L-SRF	1.0	3.0
 Right hand insert shown.	WBGT0201V3L-F	1.0	2.0
	WBGT020101L-F	1.0	2.0
	WBGT020102L-F	1.0	2.1
	WBGT020104L-F	1.0	2.2
	WBGTL302V3L-F	1.0	2.0
	WBGTL30201L-F	1.0	2.0
	WBGTL30202R/L-F	1.0	2.1
	WBGTL30204R/L-F	1.0	2.2
 Right hand insert shown.	WCGT020102R/L	1.0	2.1
	WCGT020104R/L	1.0	2.2
	WCGTL30202L	1.0	2.1
	WCGTL30204L	1.0	2.2
 Right hand insert shown.	WPGT040204R/L-FS	1.0	3.2
	WPGT060304R/L-FS	1.0	3.2

TOOL NAVI

■ OUTLINE

TOOL NAVI supports customers with information and suitable cutting conditions for each workpiece material by selecting an optimal indexable insert together with optional tools.

■ LABEL INDICATION



*1 The above is an example. There may be inserts recommended for multiple workpiece materials.
*2 Please contact us for recommended cutting conditions using coefficient values other than the above.

①Workpiece materials

P : Steel (Reference Material : Carbon steel, alloy steel 180HB)
M : Stainless steel (Reference Material : Austenitic stainless steel 180HB)
K : Cast iron (Reference Material : Gray cast iron, ductile cast iron 180HB)
N : Aluminium alloy, non-ferrous metal
S : Reference Material : Titanium alloy 320HB, Ni, Co-Based Alloy 400HB
H : Hardened steel 60HRC

②Cutting speed standards

Workpiece Material	Tool Life		Workpiece Material	Hardness
	Performance	Life		
P	15min	90min	Carbon steel, alloy steel	180HB
M	15min	90min	Stainless steel	180HB
K	15min	90min	Cast iron	180HB
S	5min	25min	Titanium alloy	320HB
			Ni, Co-Based alloy	400HB
H	10min	80min	Hardened steel	60HRC

③Feed rate

Minimum and maximum feed rate settings are based on the chip control range of the chip breaker.

*3. N :Life based on each grade. For stable choose the performance cutting speed and for unstable choose the tool life feed rate.
*4. Tool life is based on the following (VB wear). Some materials include elements other than this.
PMKS ··· VB=0.3mm
H ··· VB=0.1mm

■ TOOL LIFE

Cutting speed has a large effect on tool life. TOOL NAVI is based on Taylor's equation (relationship $vc\ T^n=C$ between tool grade, cutting conditions, and tool life). Therefore, performance speed and tool life are found for each workpiece material. When requiring a different tool life, obtain coefficient values of the grade used from the charts below. Multiply the coefficient values by the cutting speed to calculate a new cutting speed.

● P Grade (Steel) cutting speed coefficient values.

Grade \ Tool Life	15min	30min	45min	60min	90min
MC6115	1.00	0.82	0.72	0.67	0.59
MC6125	1.00	0.83	0.75	0.69	0.62
MC6035	1.00	0.88	0.82	0.78	0.73
MP3025	1.00	0.85	0.77	0.72	0.65
NX2525	1.00	0.87	0.80	0.76	0.70

● K Grade (Cast Iron) cutting speed coefficient values.

Grade \ Tool Life	15min	30min	45min	60min	90min
MC5005	1.00	0.83	0.75	0.70	0.63
MC5015	1.00	0.83	0.75	0.69	0.62

● M Grade (Stainless Steel) cutting speed coefficient values.

Grade \ Tool Life	15min	30min	45min	60min	90min
MC7015	1.00	0.83	0.75	0.70	0.63
MC7025	1.00	0.90	0.84	0.80	0.75
MP7035	1.00	0.84	0.76	0.71	0.62
US735	1.00	0.78	0.68	0.61	0.53

(ex.) Medium cutting of steel
First recommendation : MC6125
Indexable inserts : CNMG120408-MP
Recommended cutting speed : vc=390m/min
(Tool life : 15min.)

⬇

Tool life required by the customer : 30min.

390×0.83≒323m/min

■ HARDNESS OF THE WORKPIECE MATERIAL

Hardness of the workpiece material also affects tool life. MITSUBISHI's TOOL NAVI suggests cutting speed variations when hardness differs. Obtain the suitable coefficient value for each type of workpiece material from the chart below. Multiply the coefficient value by the recommended cutting speed of the grade used to calculate a new cutting speed.

Workpiece Material	Soft ← (Hardness of Workpiece) → Hard											
	120HB	140HB	160HB	180HB	200HB	220HB	240HB	260HB	280HB	300HB	320HB	340HB
P	1.34	1.19	1.08	1.00	0.92	0.85	0.80	0.75	0.71	0.68	0.64	0.61
M	1.41	1.23	1.10	1.00	0.91	0.85	0.78	0.72	0.68	0.64	0.61	0.58
K	1.27	1.19	1.09	1.00	0.97	0.91	0.88	0.85	0.81	0.78	0.75	0.72

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING

●Selection of optimum inserts for turning

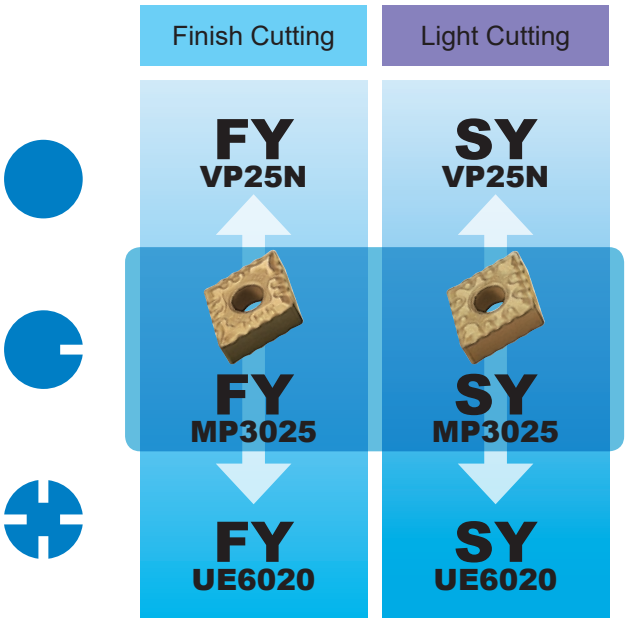
The following diagrams show the optimal combination of suitable grades and chip breakers for each application area in turning for each type of workpiece material.

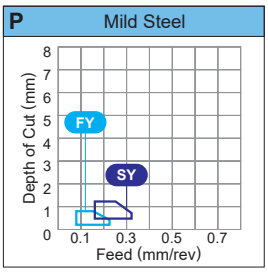
■CUTTING CONDITIONS

Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component Cutting
General Cutting	
Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity Cutting

■CUTTING AREA

- F Finish Cutting
- L Light Cutting
- M Medium Cutting
- R Rough Cutting
- H Heavy Cutting



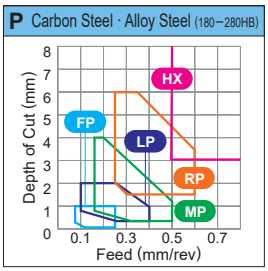


P Mild Steel (Ex : SS400, S10C)

NEGATIVE INSERTS

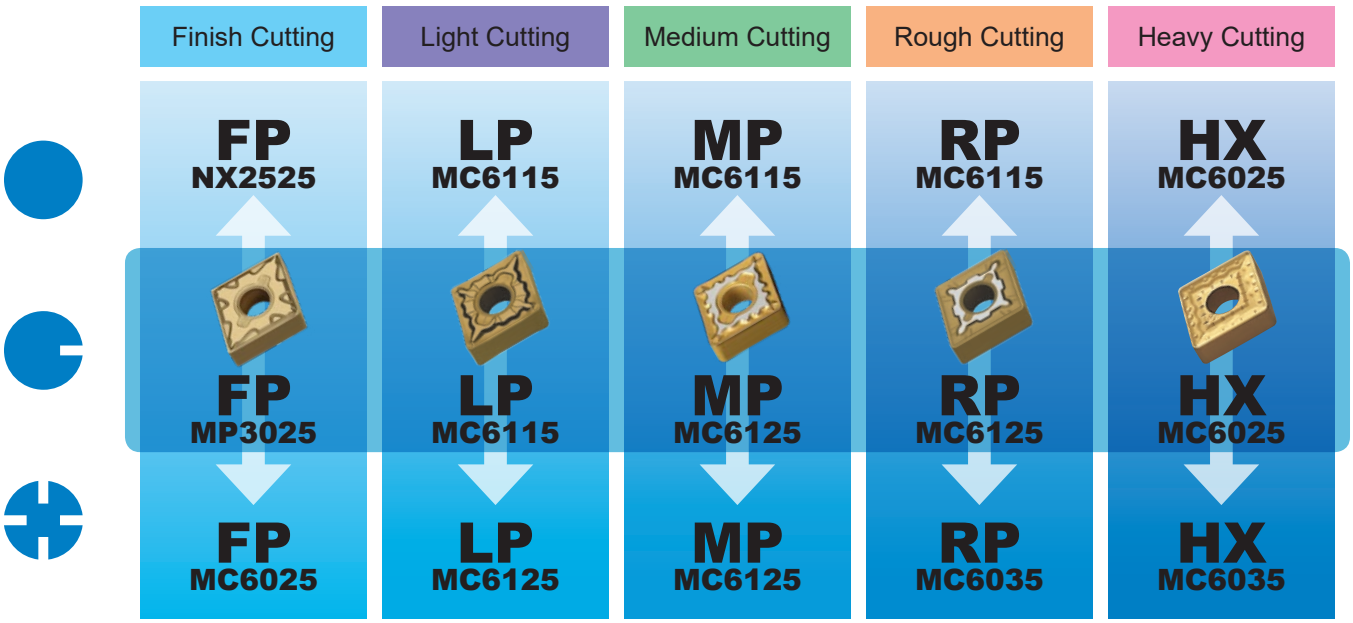
vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FY	VP25N	285—450	0.09—0.23	0.20—0.80
	L	SY	VP25N	260—410	0.16—0.33	0.50—1.20
General Cutting	F	FY	MP3025	275—425	0.09—0.23	0.20—0.80
	L	SY	MP3025	255—385	0.16—0.33	0.50—1.20
Unstable Cutting	F	FY	UE6020	285—465	0.09—0.23	0.20—0.80
	L	SY	UE6020	260—425	0.16—0.33	0.50—1.20



- Stable Cutting
- General Cutting
- Unstable Cutting

- F Finish Cutting
- L Light Cutting
- M Medium Cutting
- R Rough Cutting
- H Heavy Cutting



P Carbon Steel • Alloy Steel (Ex : S45C, SCM440)

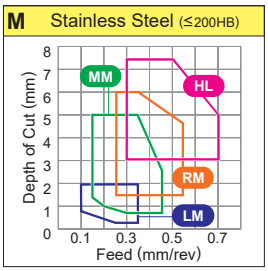
NEGATIVE INSERTS

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FP	NX2525	210–300	0.08–0.25	0.10–1.00
	L	LP	MC6115	250–480	0.10–0.40	0.30–2.00
	M	MP	MC6115	230–440	0.16–0.50	0.30–4.00
	R	RP	MC6115	215–415	0.25–0.60	1.50–6.00
	H	HX	MC6025	165–265	0.50–1.26	3.00–11.00
General Cutting	F	FP	MP3025	215–330	0.08–0.25	0.10–1.00
	L	LP	MC6115	250–480	0.10–0.40	0.30–2.00
	M	MP	MC6125	250–390	0.16–0.50	0.30–4.00
	R	RP	MC6125	235–370	0.25–0.60	1.50–6.00
	H	HX	MC6025	165–265	0.50–1.26	3.00–11.00
Unstable Cutting	F	FP	MC6025	230–375	0.08–0.25	0.10–1.00
	L	LP	MC6125	275–425	0.10–0.40	0.30–2.00
	M	MP	MC6125	250–390	0.16–0.50	0.30–4.00
	R	RP	MC6035	160–225	0.25–0.60	1.50–6.00
	H	HX	MC6035	140–200	0.50–1.26	3.00–11.00

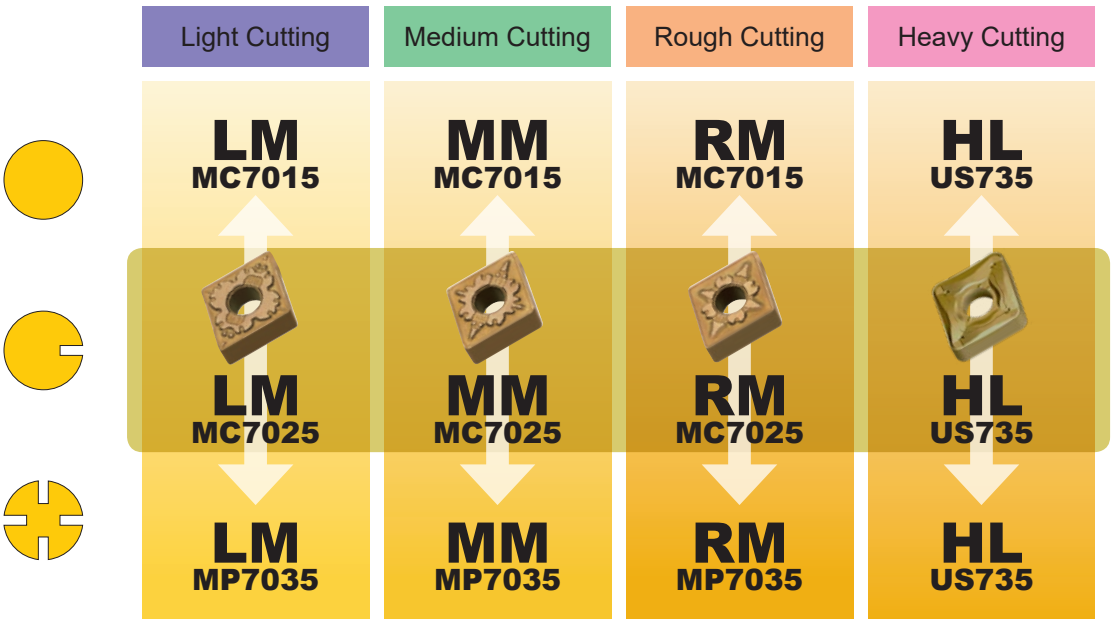
Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



- Stable Cutting
- General Cutting
- Unstable Cutting

- L Light Cutting
- M Medium Cutting
- R Rough Cutting
- H Heavy Cutting

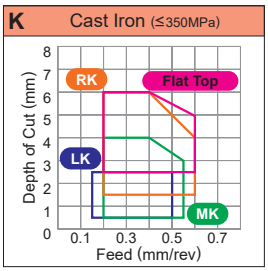


M Stainless Steel (Ex : SUS304, SUS316)

NEGATIVE INSERTS

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	L	LM	MC7015	180—285	0.10—0.35	0.30—2.00
	M	MM	MC7015	165—260	0.15—0.45	0.70—5.00
	R	RM	MC7015	155—245	0.25—0.55	1.50—6.00
	H	HL	US735	75—140	0.30—0.70	3.00—7.50
General Cutting	L	LM	MC7025	165—220	0.10—0.35	0.30—2.00
	M	MM	MC7025	150—200	0.15—0.45	0.70—5.00
	R	RM	MC7025	140—190	0.25—0.55	1.50—6.00
	H	HL	US735	75—140	0.30—0.70	3.00—7.50
Unstable Cutting	L	LM	MP7035	95—155	0.10—0.35	0.30—2.00
	M	MM	MP7035	90—145	0.15—0.45	0.70—5.00
	R	RM	MP7035	85—135	0.25—0.55	1.50—6.00
	H	HL	US735	75—140	0.30—0.70	3.00—7.50



Stable Cutting	L Light Cutting
General Cutting	M Medium Cutting
Unstable Cutting	R Rough Cutting
	H Heavy Cutting



K Cast Iron • Ductile Cast Iron (Ex : FC300)

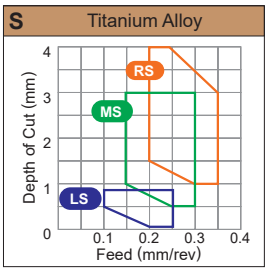
NEGATIVE INSERTS

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	L	**LK**	**MC5005**	230—365	0.10—0.50	0.50—2.50
	M	**MK**	**MC5005**	210—335	0.20—0.55	0.50—4.00
	R	**RK**	**MC5005**	195—315	0.20—0.60	1.50—6.00
	H	**Flat Top**	**MC5005**	195—315	0.20—0.60	2.50—6.00
General Cutting	L	**LK**	**MC5015**	205—335	0.10—0.50	0.50—2.50
	M	**MK**	**MC5015**	190—305	0.20—0.55	0.50—4.00
	R	**RK**	**MC5015**	180—285	0.20—0.60	1.50—6.00
	H	**Flat Top**	**MC5015**	180—285	0.20—0.60	2.50—6.00
Unstable Cutting	L	**LK**	**MC5015**	205—335	0.10—0.50	0.50—2.50
	M	**MK**	**MC5015**	190—305	0.20—0.55	0.50—4.00
	R	**RK**	**MC5015**	180—285	0.20—0.60	1.50—6.00
	H	**Flat Top**	**MC5015**	180—285	0.20—0.60	2.50—6.00

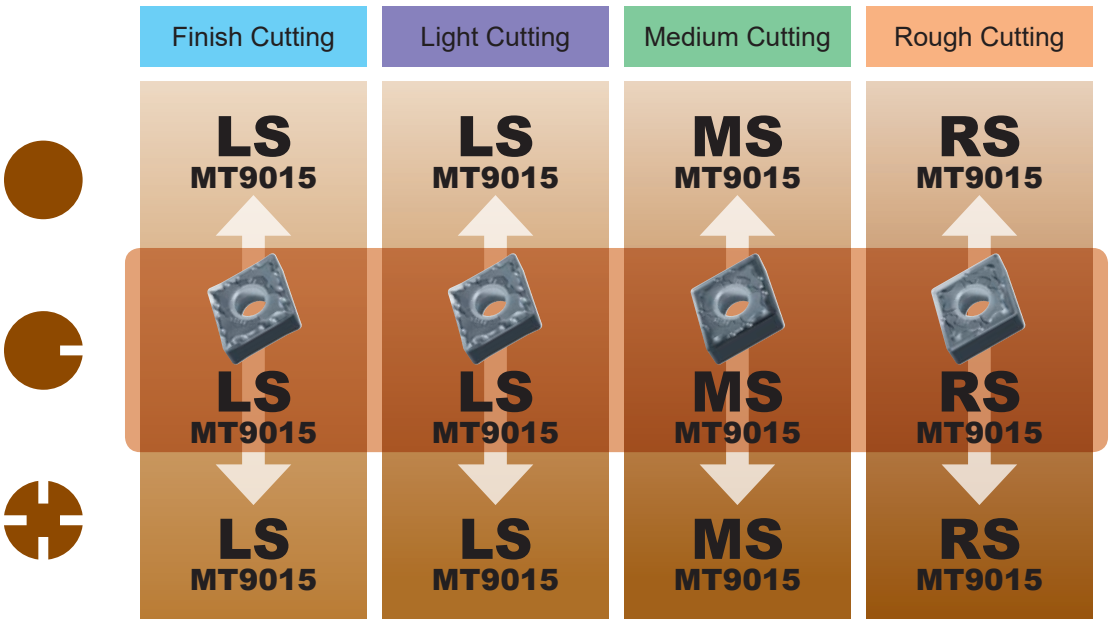
Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



- Stable Cutting
- General Cutting
- Unstable Cutting

- F Finish Cutting
- L Light Cutting
- M Medium Cutting
- R Rough Cutting

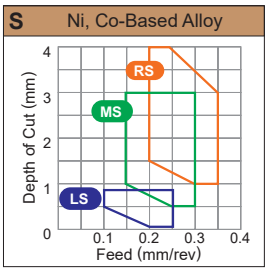


S Titanium Alloy (Ex : Ti-6Al-4V)

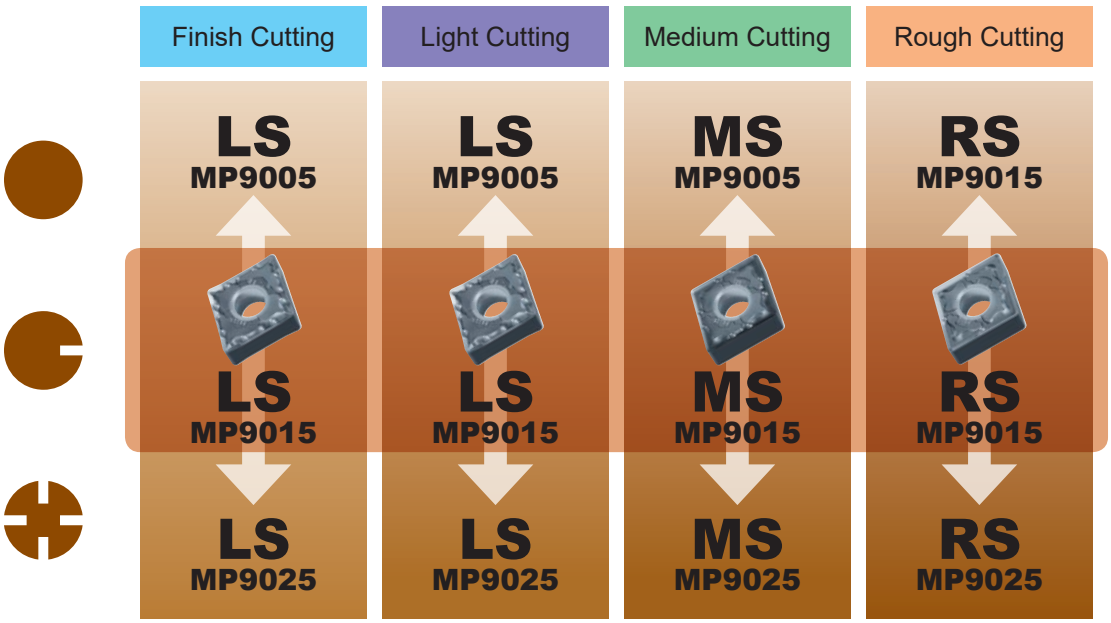
NEGATIVE INSERTS

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	L	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	M	MS	MT9015	40—80	0.15—0.30	0.50—3.00
	R	RS	MT9015	35—75	0.20—0.35	1.00—4.00
General Cutting	F	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	L	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	M	MS	MT9015	40—80	0.15—0.30	0.50—3.00
	R	RS	MT9015	35—75	0.20—0.35	1.00—4.00
Unstable Cutting	F	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	L	LS	MT9015	40—85	0.10—0.25	0.20—0.80
	M	MS	MT9015	40—80	0.15—0.30	0.50—3.00
	R	RS	MT9015	35—75	0.20—0.35	1.00—4.00



● Stable Cutting	F Finish Cutting
◔ General Cutting	L Light Cutting
✚ Unstable Cutting	M Medium Cutting
	R Rough Cutting



S Ni, Co-Based Alloy (Ex : Inconel718)

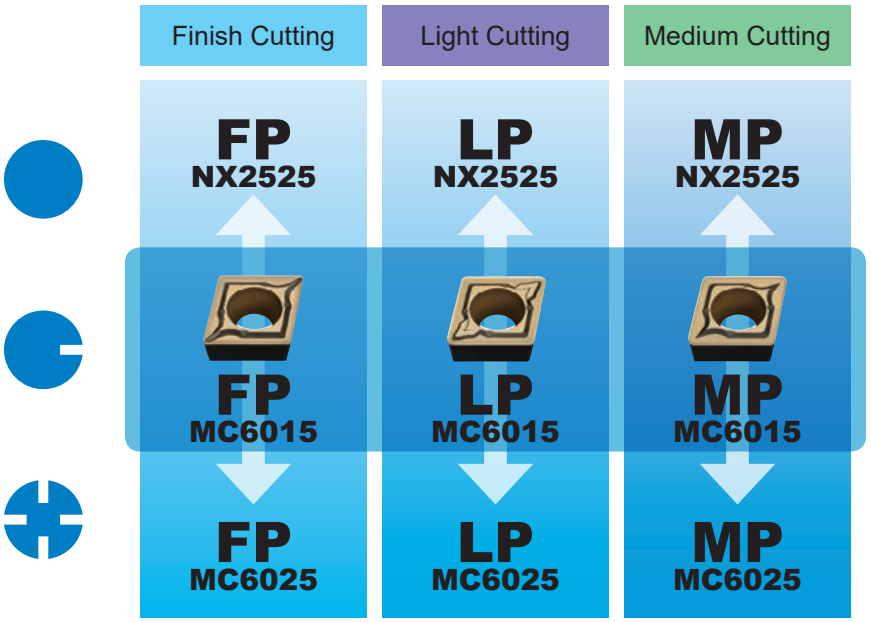
NEGATIVE INSERTS

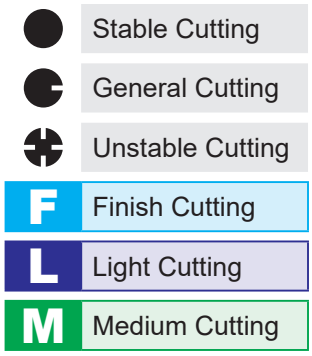
vc : Cutting Speed
f : Feed
ap : Depth of Cut

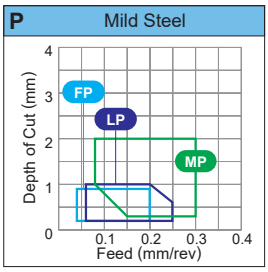
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	F	LS	MP9005	55—110	0.10—0.25	0.20—0.80
	L	LS	MP9005	30—110	0.10—0.25	0.20—0.80
	M	MS	MP9005	50—100	0.10—0.25	0.50—4.00
	R	RS	MP9015	35—75	0.20—0.35	1.00—4.00
◔ General Cutting	F	LS	MP9015	40—85	0.10—0.25	0.20—0.80
	L	LS	MP9015	40—85	0.10—0.25	0.20—0.80
	M	MS	MP9015	40—80	0.15—0.30	0.50—3.00
	R	RS	MP9015	35—75	0.20—0.35	1.00—4.00
✚ Unstable Cutting	F	LS	MP9025	30—45	0.10—0.25	0.20—0.80
	L	LS	MP9025	30—45	0.10—0.25	0.20—0.80
	M	MS	MP9025	30—45	0.15—0.30	0.50—3.00
	R	RS	MP9025	25—40	0.20—0.35	1.00—4.00

Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING





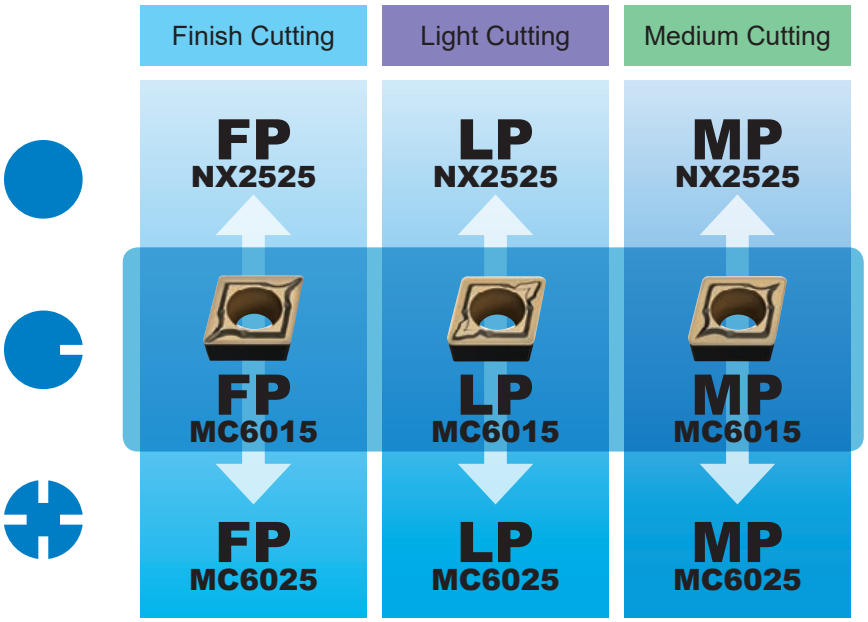


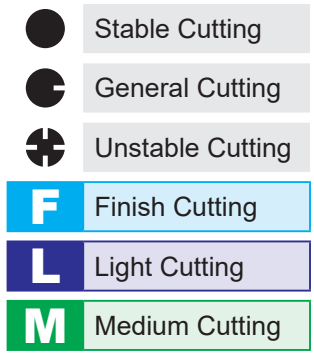
P Mild Steel (Ex : SS400, S10C)

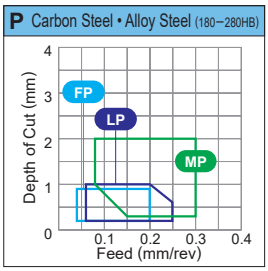
7°POSITIVE INSERTS WITH HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FP	NX2525	225–320	0.04–0.20	0.20–0.90
	L	LP	NX2525	225–320	0.06–0.25	0.20–1.00
	M	MP	NX2525	185–270	0.08–0.30	0.30–2.00
General Cutting	F	FP	MC6015	250–425	0.04–0.20	0.20–0.90
	L	LP	MC6015	250–425	0.06–0.25	0.20–1.00
	M	MP	MC6015	210–355	0.08–0.30	0.30–2.00
Unstable Cutting	F	FP	MC6025	250–405	0.04–0.20	0.20–0.90
	L	LP	MC6025	250–405	0.06–0.25	0.20–1.00
	M	MP	MC6025	210–340	0.08–0.30	0.30–2.00







P Carbon Steel • Alloy Steel (Ex : S45C, SCM440)

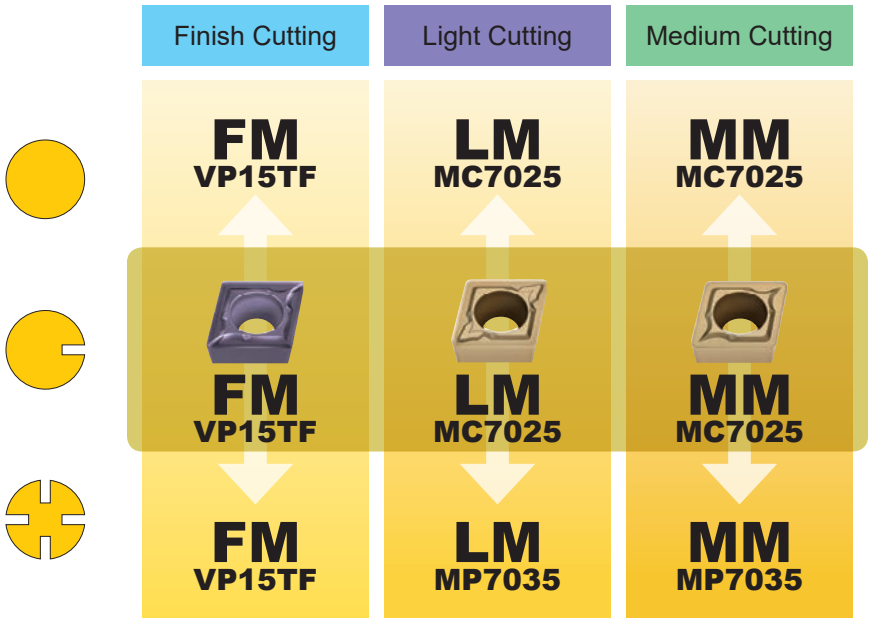
7°POSITIVE INSERTS WITH HOLE

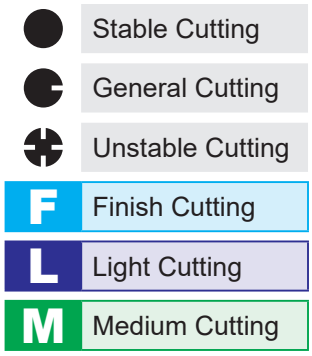
vc : Cutting Speed
f : Feed
ap : Depth of Cut

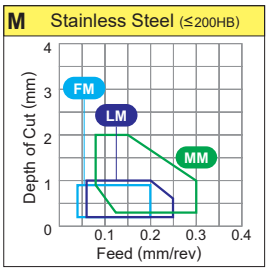
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FP	NX2525	165–240	0.04–0.20	0.20–0.90
	L	LP	NX2525	165–240	0.06–0.25	0.20–1.00
	M	MP	NX2525	140–200	0.08–0.30	0.30–2.00
General Cutting	F	FP	MC6015	185–315	0.04–0.20	0.20–0.90
	L	LP	MC6015	185–315	0.06–0.25	0.20–1.00
	M	MP	MC6015	155–260	0.08–0.30	0.30–2.00
Unstable Cutting	F	FP	MC6025	185–300	0.04–0.20	0.20–0.90
	L	LP	MC6025	185–300	0.06–0.25	0.20–1.00
	M	MP	MC6025	155–250	0.08–0.30	0.30–2.00

Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING





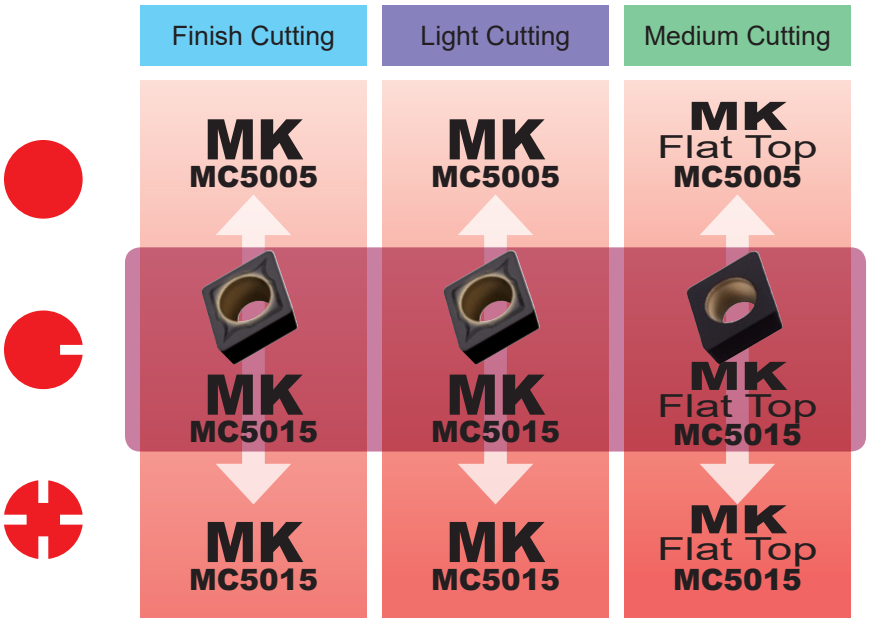


M Stainless Steel (Ex : SUS304, SUS316)

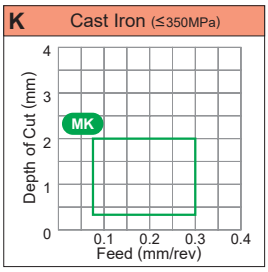
7°POSITIVE INSERTS WITH HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FM	VP15TF	75—125	0.04—0.20	0.20—0.90
	L	LM	MC7025	140—190	0.06—0.25	0.20—1.00
	M	MM	MC7025	120—160	0.08—0.30	0.30—2.00
General Cutting	F	FM	VP15TF	75—125	0.04—0.20	0.20—0.90
	L	LM	MC7025	140—190	0.06—0.25	0.20—1.00
	M	MM	MC7025	120—160	0.08—0.30	0.30—2.00
Unstable Cutting	F	FM	VP15TF	75—125	0.04—0.20	0.20—0.90
	L	LM	MP7035	85—135	0.06—0.25	0.20—1.00
	M	MM	MP7035	70—115	0.08—0.30	0.30—2.00



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting



K Cast Iron • Ductile Cast Iron (Ex : FC300)

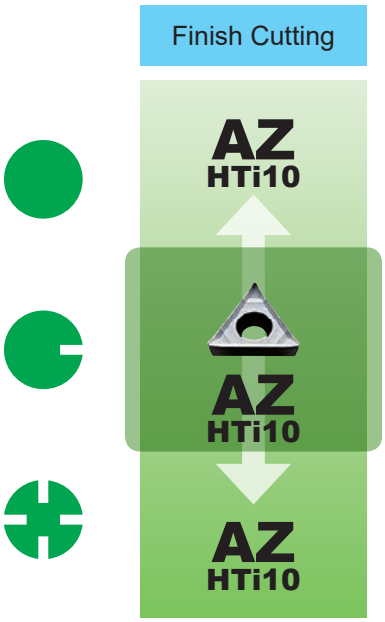
7°POSITIVE INSERTS WITH HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	**MK**	**MC5005**	165—265	0.08—0.30	0.30—2.00
	L	**MK**	**MC5005**	165—265	0.08—0.30	0.30—2.00
	M	**MK, Flat Top**	**MC5005**	165—265	0.08—0.30	0.30—2.00
General Cutting	F	**MK**	**MC5015**	150—240	0.08—0.30	0.30—2.00
	L	**MK**	**MC5015**	150—240	0.08—0.30	0.30—2.00
	M	**MK, Flat Top**	**MC5015**	150—240	0.08—0.30	0.30—2.00
Unstable Cutting	F	**MK**	**MC5015**	150—240	0.08—0.30	0.30—2.00
	L	**MK**	**MC5015**	150—240	0.08—0.30	0.30—2.00
	M	**MK, Flat Top**	**MC5015**	150—240	0.08—0.30	0.30—2.00

Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting

N Aluminium Alloy (Ex : A6061, A7075)

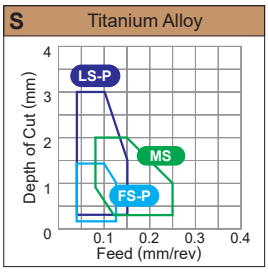
7°POSITIVE INSERTS WITH HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	**AZ**	**HTi10**	300—700	0.10—0.40	0.20—3.00
General Cutting	F	**AZ**	**HTi10**	300—700	0.10—0.40	0.20—3.00
Unstable Cutting	F	**AZ**	**HTi10**	300—700	0.10—0.40	0.20—3.00



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting



S Titanium Alloy (Ex : Ti-6Al-4V)

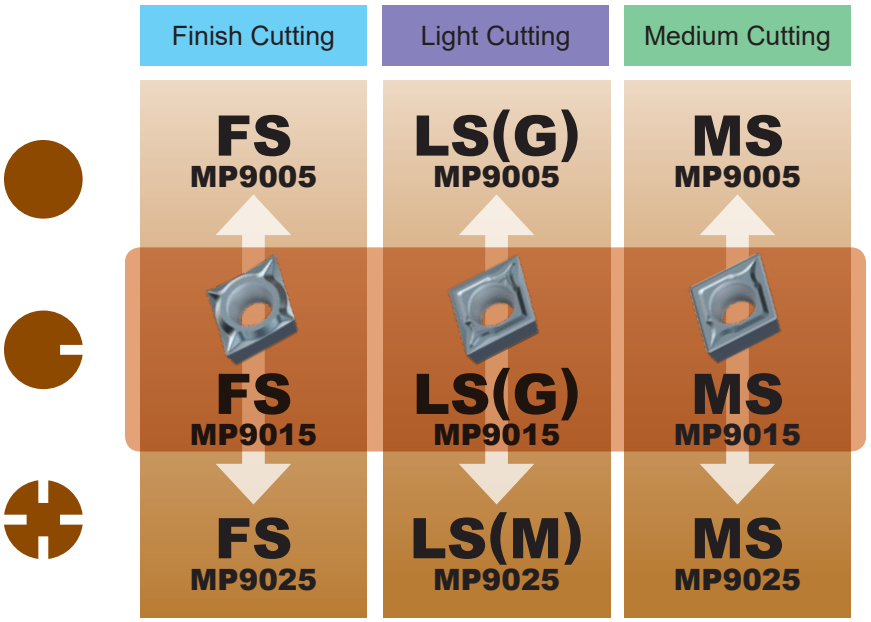
7°POSITIVE INSERTS WITH HOLE

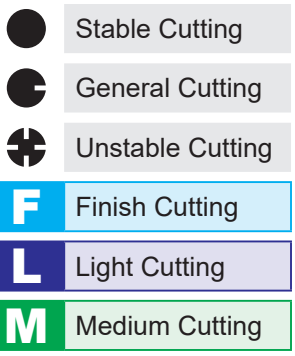
vc : Cutting Speed
f : Feed
ap : Depth of Cut

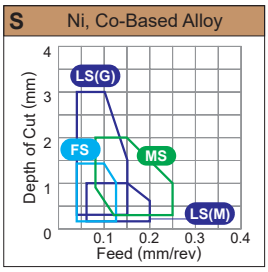
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FS-P	MT9005	40—80	0.04—0.12	0.20—1.40
	L	LS-P	MT9005	40—80	0.04—0.15	0.30—3.00
	M	MS	MT9005	35—65	0.08—0.25	0.30—2.00
General Cutting	F	FS-P	MT9005	40—80	0.04—0.12	0.20—1.40
	L	LS-P	MT9005	40—80	0.04—0.15	0.30—3.00
	M	MS	MT9005	35—65	0.08—0.25	0.30—2.00
Unstable Cutting	F	FS-P	MT9005	40—80	0.04—0.12	0.20—1.40
	L	LS-P	MT9005	40—80	0.04—0.15	0.30—3.00
	M	MS	MT9005	35—65	0.08—0.25	0.30—2.00

Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING





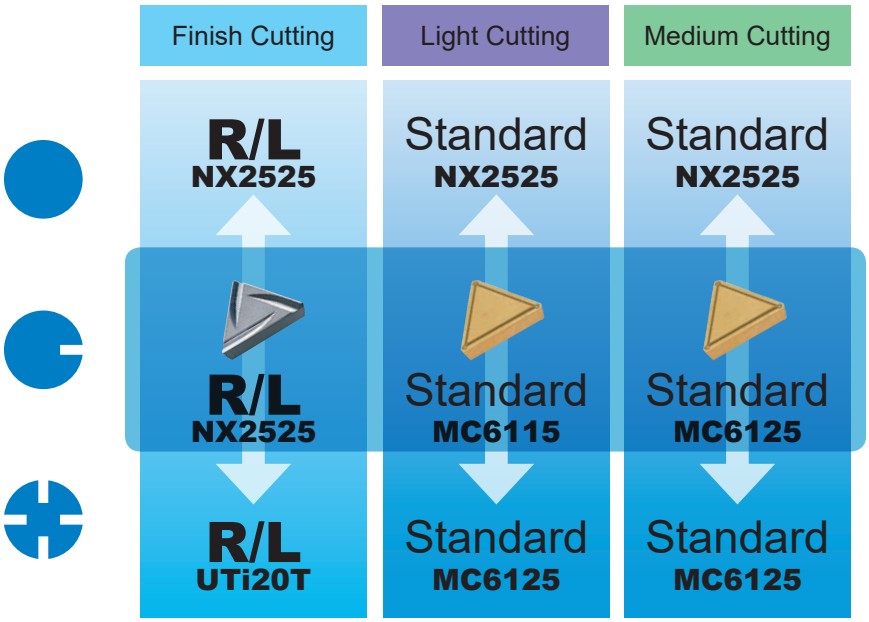


S Ni, Co-Based Alloy (Ex : Inconel718)

7°POSITIVE INSERTS WITH HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	FS	MP9005	45—95	0.04—0.12	0.20—1.40
	L	LS(G)	MP9005	45—95	0.04—0.15	0.30—3.00
	M	MS	MP9005	40—80	0.08—0.25	0.30—2.00
General Cutting	F	FS	MP9015	35—75	0.04—0.12	0.20—1.40
	L	LS(G)	MP9015	35—75	0.04—0.15	0.30—3.00
	M	MS	MP9015	30—60	0.08—0.25	0.30—2.00
Unstable Cutting	F	FS	MP9025	25—40	0.04—0.12	0.20—1.40
	L	LS(M)	MP9025	25—40	0.06—0.20	0.20—1.00
	M	MS	MP9025	20—35	0.08—0.25	0.30—2.00



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting

P Mild Steel (Ex : SS400, S10C)

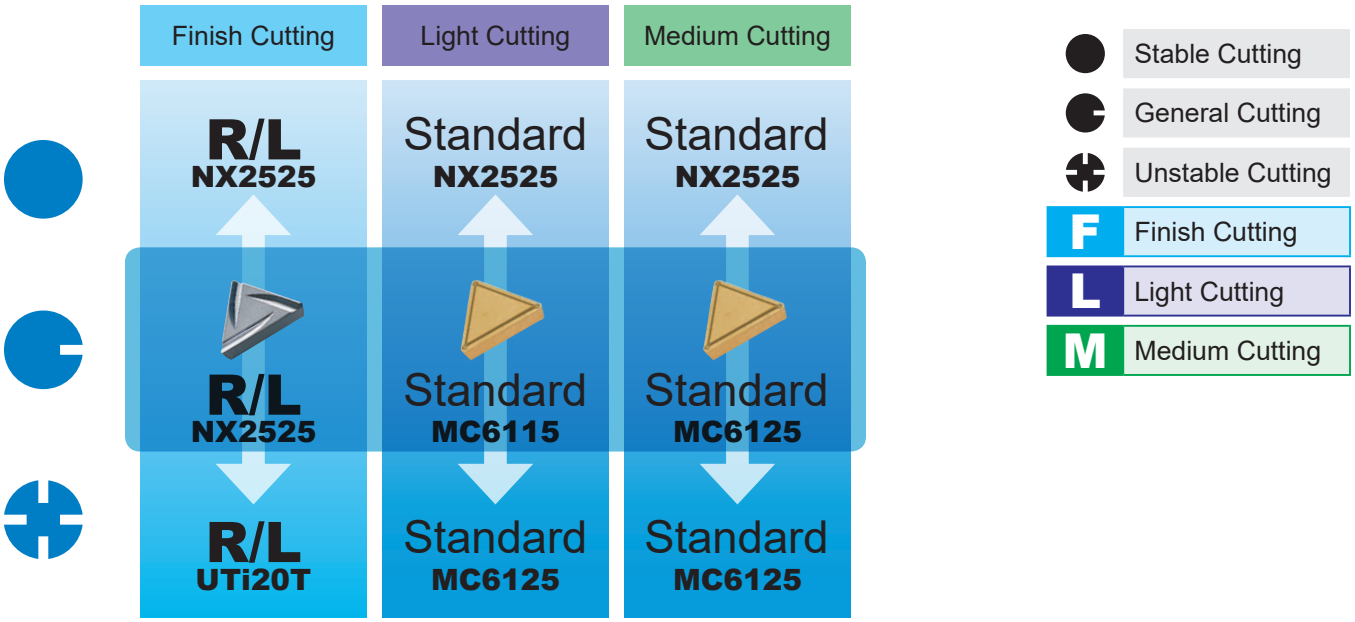
11°POSITIVE INSERTS WITHOUT HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	1st Recommendation				
		Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	**R/L**	**NX2525**	225—320	0.06—0.25	0.30—1.50
	L	**Standard**	**NX2525**	185—270	0.08—0.30	0.30—2.00
	M	**Standard**	**NX2525**	185—270	0.08—0.30	0.30—2.00
General Cutting	F	**R/L**	**NX2525**	225—320	0.06—0.25	0.30—1.50
	L	**Standard**	**MC6115**	245—475	0.08—0.30	0.30—2.00
	M	**Standard**	**MC6125**	270—420	0.08—0.30	0.30—2.00
Unstable Cutting	F	**R/L**	**UTi20T**	115—165	0.06—0.25	0.30—1.50
	L	**Standard**	**MC6125**	270—420	0.08—0.30	0.30—2.00
	M	**Standard**	**MC6125**	270—420	0.08—0.30	0.30—2.00

Detailed information regarding each grade is available on the website. ▶

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING

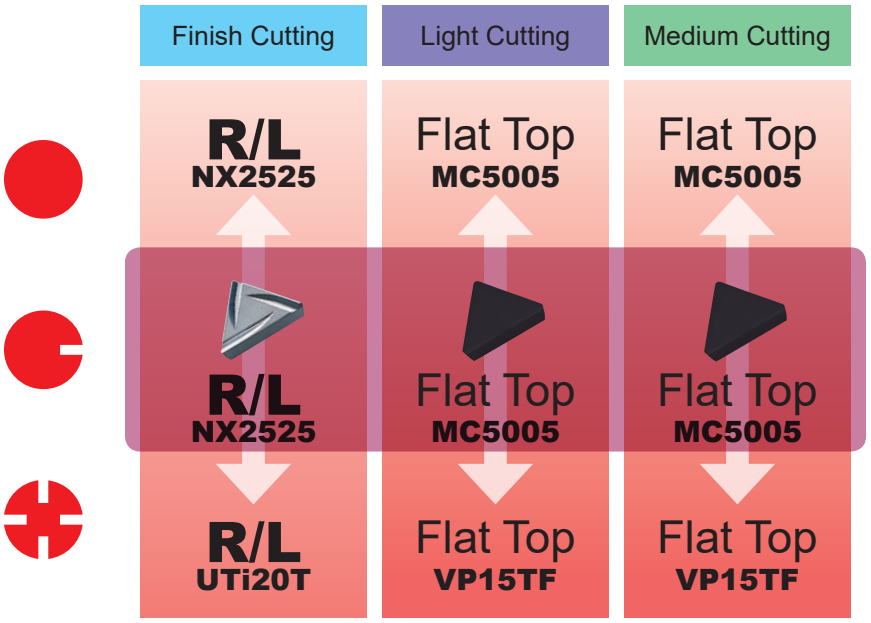


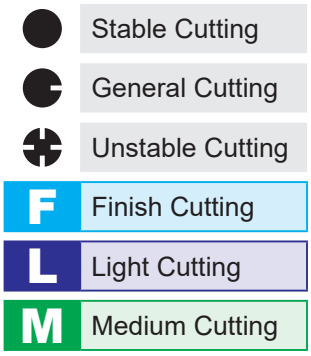
P Carbon Steel • Alloy Steel (Ex : S45C, SCM440)

11°POSITIVE INSERTS WITHOUT HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

	Cutting Area	1st Recommendation				
		Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	**R/L**	**NX2525**	165—240	0.06—0.25	0.30—1.50
	L	**Standard**	**NX2525**	140—200	0.08—0.30	0.30—2.00
	M	**Standard**	**NX2525**	140—200	0.08—0.30	0.30—2.00
General Cutting	F	**R/L**	**NX2525**	165—240	0.06—0.25	0.30—1.50
	L	**Standard**	**MC6115**	180—350	0.08—0.30	0.30—2.00
	M	**Standard**	**MC6125**	200—310	0.08—0.30	0.30—2.00
Unstable Cutting	F	**R/L**	**UTi20T**	85—120	0.06—0.25	0.30—1.50
	L	**Standard**	**MC6125**	200—310	0.08—0.30	0.30—2.00
	M	**Standard**	**MC6125**	200—310	0.08—0.30	0.30—2.00





K Cast Iron • Ductile Cast Iron (Ex : FC300)

11°POSITIVE INSERTS WITHOUT HOLE

vc : Cutting Speed
f : Feed
ap : Depth of Cut

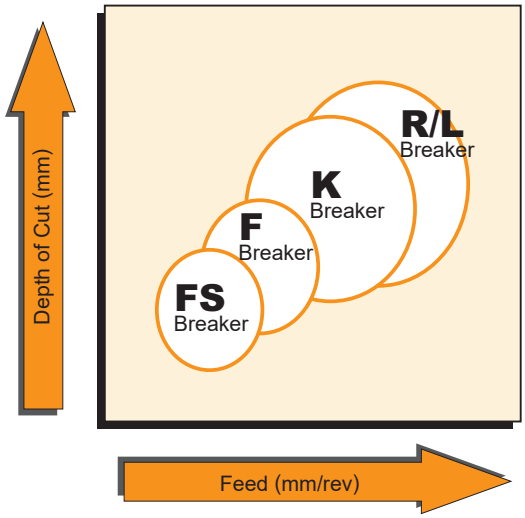
	Cutting Area	1st Recommendation				
		Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	**R/L**	**NX2525**	145—200	0.06—0.25	0.30—1.50
	L	**Flat Top**	**MC5005**	165—265	0.08—0.30	0.30—2.00
	M	**Flat Top**	**MC5005**	165—265	0.08—0.30	0.30—2.00
General Cutting	F	**R/L**	**NX2525**	145—200	0.06—0.25	0.30—1.50
	L	**Flat Top**	**MC5015**	150—240	0.08—0.30	0.30—2.00
	M	**Flat Top**	**MC5015**	150—240	0.08—0.30	0.30—2.00
Unstable Cutting	F	**R/L**	**UTi20T**	70—105	0.06—0.25	0.30—1.50
	L	**Flat Top**	**VP15TF**	115—160	0.08—0.30	0.30—2.00
	M	**Flat Top**	**VP15TF**	115—160	0.08—0.30	0.30—2.00

Detailed information regarding each grade is available on the website. ▶

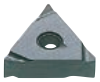
PRECISION BREAKER SYSTEM

ANGULAR AND PARALLEL CHIP BREAKERS (NEGATIVE INSERTS)

■CHIP CONTROL RANGE

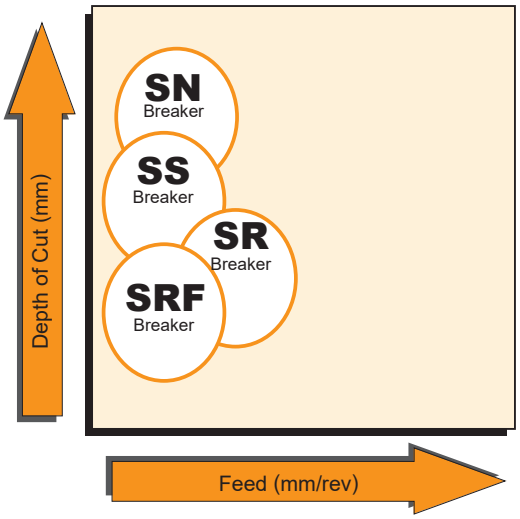


■FEATURES OF CHIP BREAKER

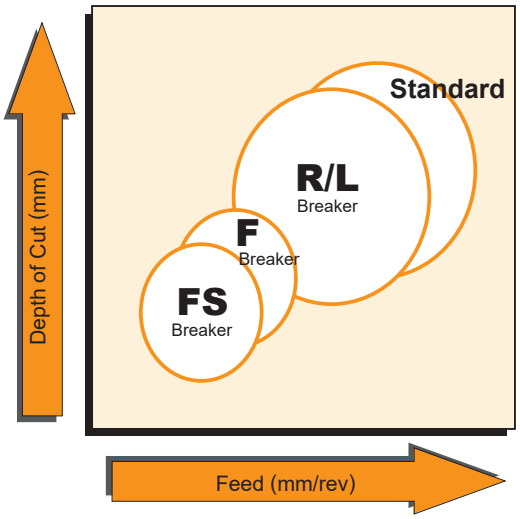
Breaker	Features	DNGG Type	SNGG Type	TNGG Type	VNGG Type
FS	● For precision finishing. ● Small width lead breaker for good chip control. ● Sharp cutting edge gives a good surface finish.	—	—		—
F	● For finish cutting. ● Lead breaker controls chip flow. ● Sharp cutting edge gives a good surface finish.	—	—		—
K	● Parallel breaker for light cutting. ● Excellent chip control for low to medium feed rates.	—	—		—
R/L	● Parallel breaker for medium cutting. ● Good chip control for medium feed rates.				

ANGULAR AND PARALLEL CHIP BREAKERS (POSITIVE INSERTS)

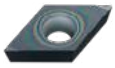
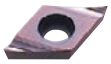
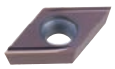
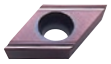
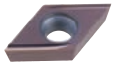
■For turning small, high precision parts



■For general turning



■FEATURES OF CHIP BREAKER

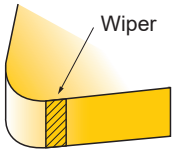
Breaker	Features	**CCET** Type	**CCGT** Type	**DCET** Type	**DCGT** Type	**VBET** Type
SRF	●The wide lead breaker for medium cutting is suitable for automatic lathe machining. ●The insert design for low resistance controls chip flow.	—	—	—		
SR	●The wide lead breaker for medium cutting is suitable for automatic lathe machining. ●The insert design for low resistance controls chip flow.		—		—	
SS	●The parallel breaker for light cutting is suitable for automatic lathe machining. ●Excellent chip control at low feed rates.	—		—		—
SN	●The parallel breaker for general purpose is suitable for automatic lathe machining. ●Excellent chip control for low to medium feed rates.					

Breaker	Features	**CCGH/CCGT** Type	**CPGT** Type	**DCGT** Type	**TPGH** Type	**TCGT** Type	**VBGT/VCGT** Type	**WBGT** Type	**WCGT** Type	**WPGT** Type
FS	●For precision finishing. ●Small width lead breaker for excellent chip control. ●Sharp cutting edge gives a good surface finish.	—	—	—		—	—	—	—	
F	●For finish cutting. ●Lead breaker controls chip flow. ●Sharp cutting edge gives a good surface finish.				—				—	—
R/L	●Lead breaker for light cutting. ●Good chip control for low to medium feed rates.	—	—	—	—	—	—	—		—
Standard	●For light cutting. ●Good chip control for low to medium feed rates.	—		—	—	—	—	—	—	—

WIPER INSERT

What is a Wiper Insert?

- A wiper insert is designed with a wiper edge that is situated where the straight edge meets the corner radius.
- In comparison to conventional breakers, the surface finish does not deteriorate even if the feed rate is doubled.
- Machining at high feed rates improves cutting efficiency.



●Improving Surface Finish
Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

●Improving Efficiency
High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

●Increased Tool Life
When changed to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore delaying the progression of wear and increasing the tool life of the insert.

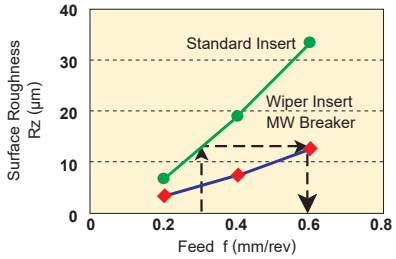
●Improving Chip Control
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

Wiper insert + High feed (The feed rate is doubled.)

Finished surface Same surface roughness

Standard insert + Conventional feed condition

*Please use a wiper insert at high feed rate.



<Cutting Conditions>
Workpiece : JIS S45C
Insert : CNMG120408-○○
Cutting Speed=200m/min
Depth of Cut=1.5mm
Feed Speed=0.2−0.6mm/rev
Wet Outer Diameter Cutting

<Ex>The surface roughness does not deteriorate even if the feed rate is doubled (0.3→0.6)!

■A wiper insert + machining at high feed rate
- Reduced machining time (per workpieces)
- Increased number of workpieces (per definitive time period)
- Improving chip control

■A wiper insert + machining at conventional feed rate
- Eliminating the finishing step by roughing and finishing together (Separate roughing and finishing steps → Single-step machining)

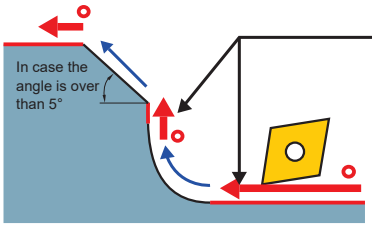
- Reducing cycle times
- Increased productivity
- Avoiding Line-Stoppage

<The Realization of Reduced Costs!!>

■ Estimate of finished surface roughness when using a wiper insert

The effects of wiper inserts on external machining, boring and facing.

*The surface roughness when machining at corner R or taper angle over 5°, is the same as machining with standard inserts.



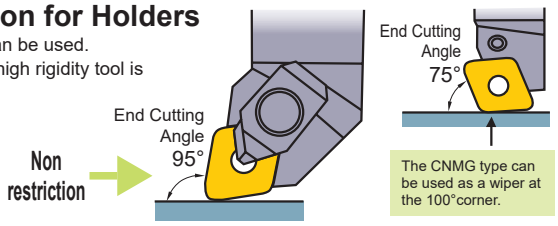
Rz(W)=Rz×0.5

Rz(W) = Finished surface roughness when using a wiper insert.
Rz : Finished surface roughness from conventional conditions. (When using a standard insert)

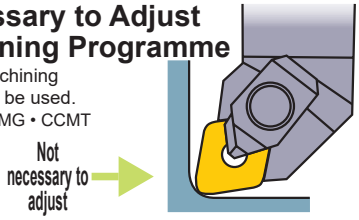
Effective uses of a wiper insert
Non effective uses of a wiper insert

■ Special attention is not necessary when using CNMG • WNMG • CCMT types.

●No Restriction for Holders
Standard holders can be used.
(*A double clamp, high rigidity tool is recommended.)



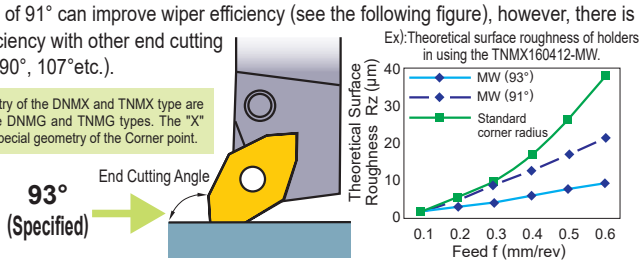
■Not Necessary to Adjust the Machining Programme
Conventional machining programmes can be used. (The CNMG • WNMG • CCMT types are based on the ISO/ANSI.)



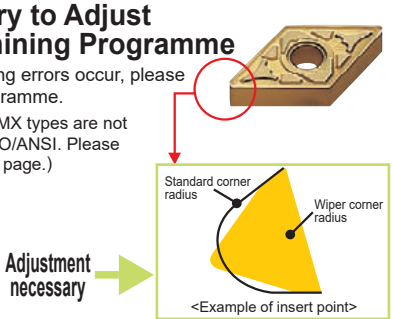
■ Special attention is necessary when using the DNMX • TNMX types due to the special top face geometry.

●Restriction for Holders
Use a holder with an end cutting angle of 93° improving wiper efficiency. A holder with an end cutting angle of 91° can improve wiper efficiency (see the following figure), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107°etc.).

The hole geometry of the DNMX and TNMX type are the same as the DNMG and TNMG types. The "X" represents the special geometry of the Corner point.



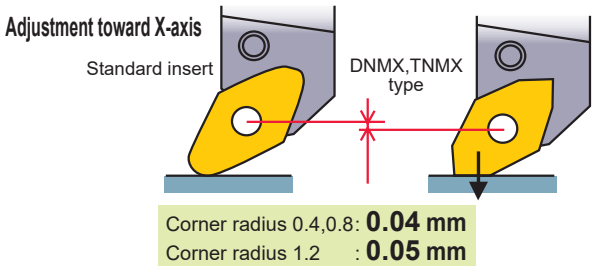
●Necessary to Adjust the Machining Programme
When machining errors occur, please adjust the programme.
(The DNMX•TNMX types are not based on the ISO/ANSI. Please refer to the next page.)



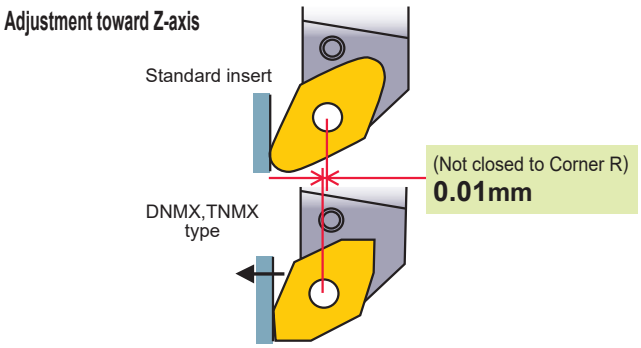
■Adjustment of machining programmes for DNMX • TNMX types

Basic Process) Adjusting Toward X-axis and Z-axis

Adjusting the differential between a standard insert and Z-axis / X-axis.



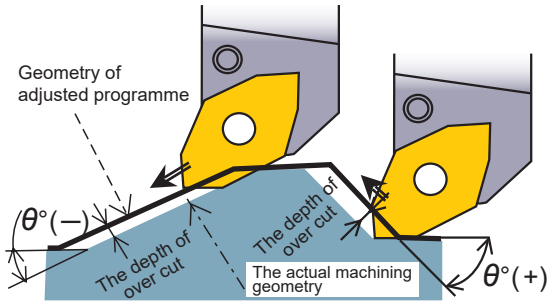
Corner radius 0.4,0.8: **0.04 mm**
Corner radius 1.2 : **0.05 mm**



A) Adjusting a Taper *Necessary to maintain a correct taper.

Adjust the relief angle toward the normal line.

Note1) Adjust the angle toward the normal line in the case where the adjustment number is negative (θ =60°—70°) and is not machined completely.



Classification

Corner Radius	Taper Angle θ°															
	-25—-15	-10	-5	**0**	5	10	15	20—35	40	45	50	55	60—65	70	75—85	**90**
1.2	0.04	0.03	0.01	**0**	0.02	0.03	0.04	0.05	0.04	0.04	0.02	0.01	-0.01	0	0.01	**0**
0.8	0.03	0.02	0.01	**0**	0.01	0.02	0.03	0.04	0.03	0.03	0.02	0	-0.01	0	0.01	**0**
0.4	0.02	0.01	0.01	**0**	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	-0.01	-0.01	0	**0**

Numerical Values) +numbers:adjustment of relief angle, -numbers:adjustment of drive-in angle (mm)

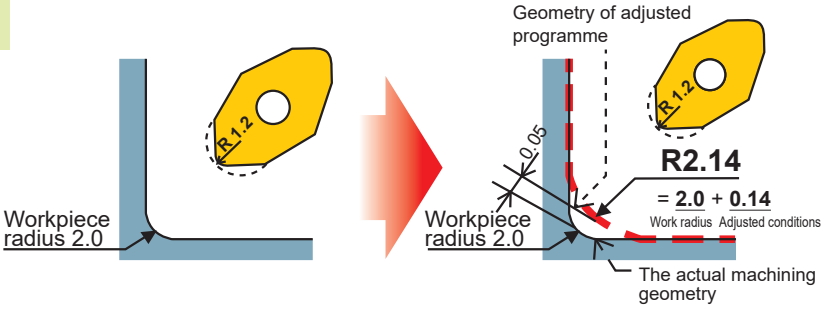
B) Adjusting a Corner R *Necessary to maintain a correct corner radius.

Adjust the work diameter same as the taper to prevent over-cut.

The value of adjustment to work R
= Work R + the adjustment value
*No adjusting the corner radius in this case.

The corner radius of the insert	The adjustment amount on the workpiece radius.
Corner Radius 0.4 →	Work Radius**+0.05**(mm)
Corner Radius 0.8 →	Work Radius**+0.11**(mm)
Corner Radius 1.2 →	Work Radius**+0.14**(mm)

Ex) In case of machining R 2.0 when using a corner R 1.2 type insert.



The Easy-to-correct Method

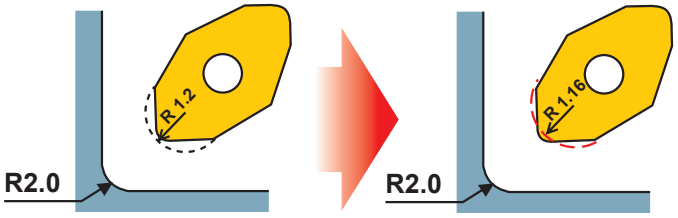
In correcting corner radius:
It is not necessary to adjust the machining programme, however, machining errors can occur within max. ±0.03mm due to correcting by an approximate number.

Corner Radius Correction Input the correction number of each corner radius.

The value of corrected corner radius
= approximation
*No adjusting the machining the programme in this case.

The corner radius of a insert	The value of corrected corner radius = approximation
Corner Radius 0.4 →	**R0.36**(mm)
Corner Radius 0.8 →	**R0.76**(mm)
Corner Radius 1.2 →	**R1.16**(mm)

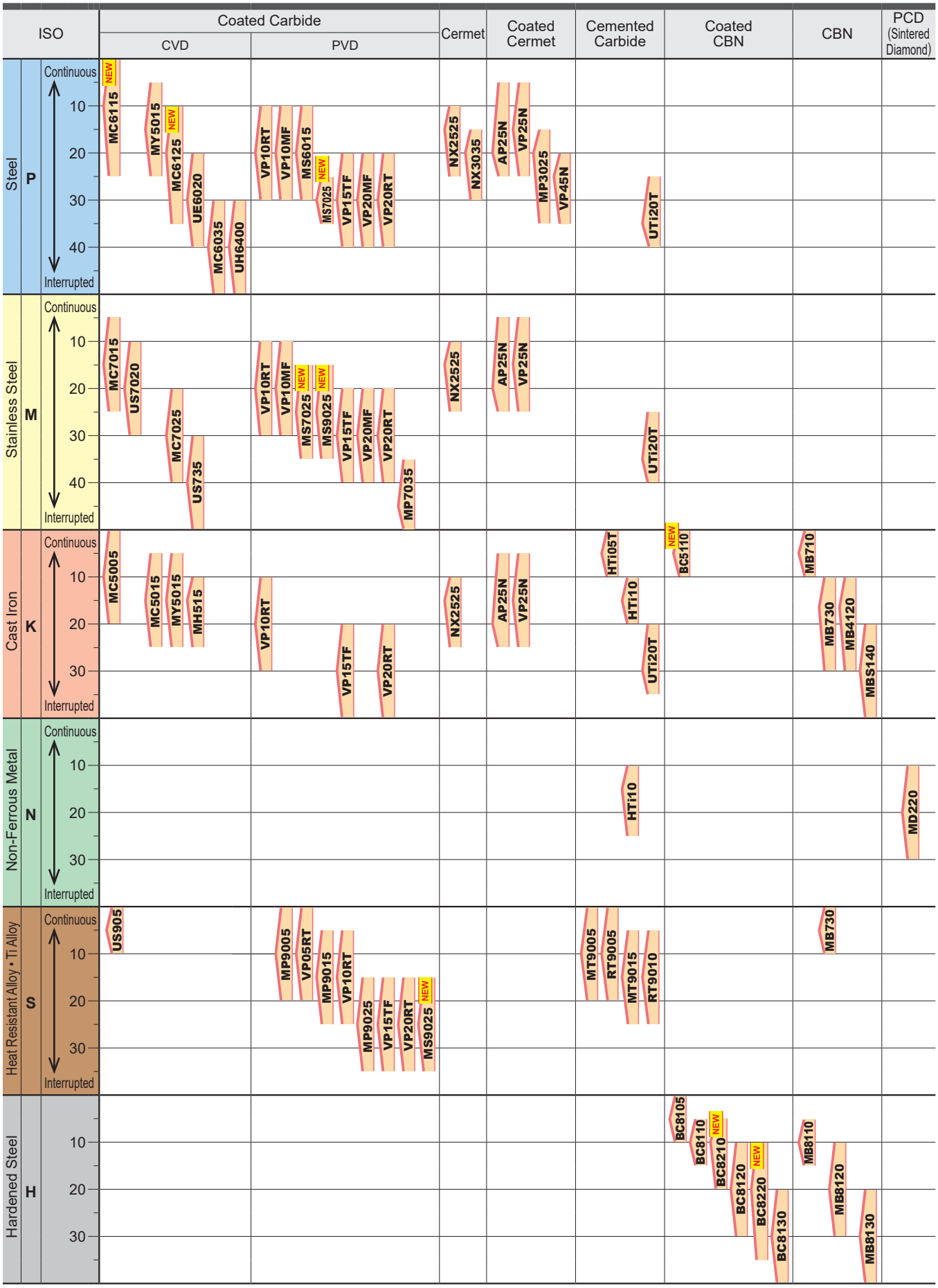
Ex) In the case of machining a corner with a radius R 2.0 when using an insert with a corner radius R 1.2.



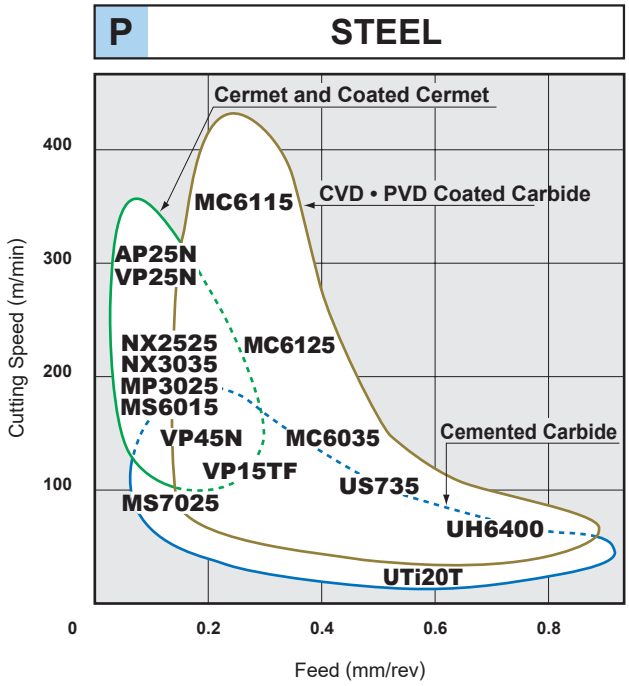
Note 1) The value of correction is same for both DNMX and TNMX. Discriminate them by the size of corner radius.

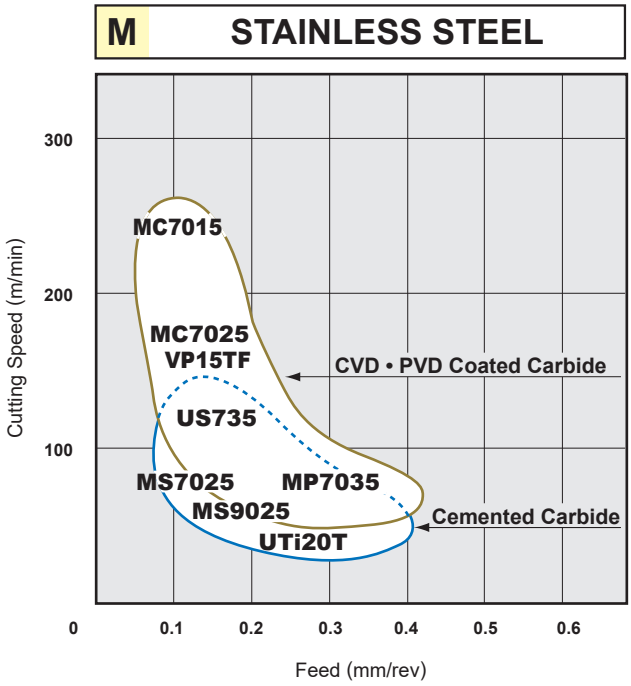
GRADES FOR TURNING

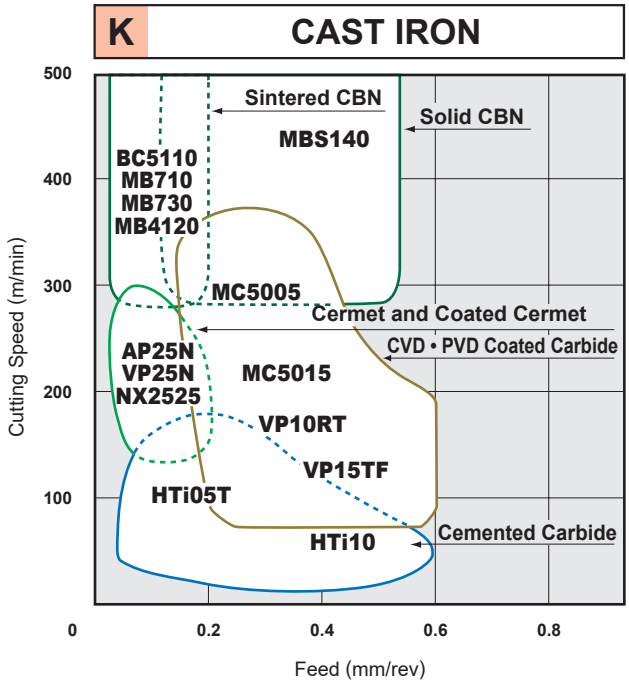
●INDEXABLE INSERT GRADES FOR TURNING

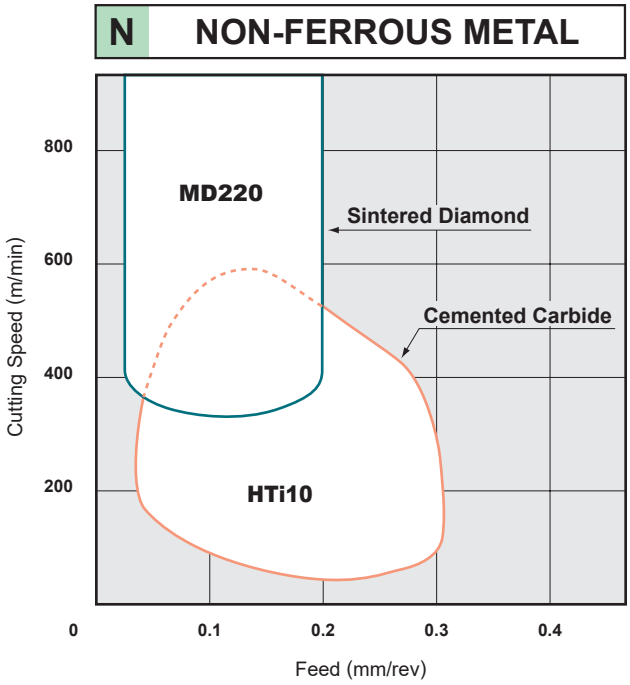


TURNING APPLICATION RANGE







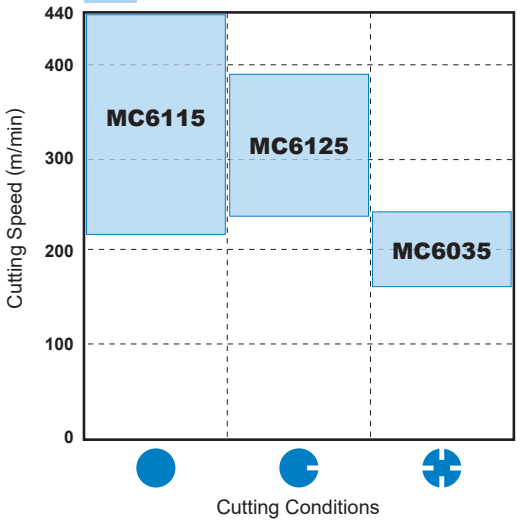


Detailed information regarding each grade is available on the website. ▶

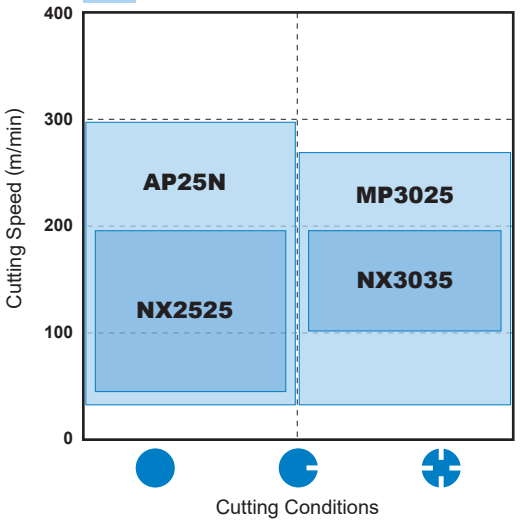
TURNING APPLICATION RANGE

●Recommendation of insert grade based on cutting speed and conditions for each workpiece.

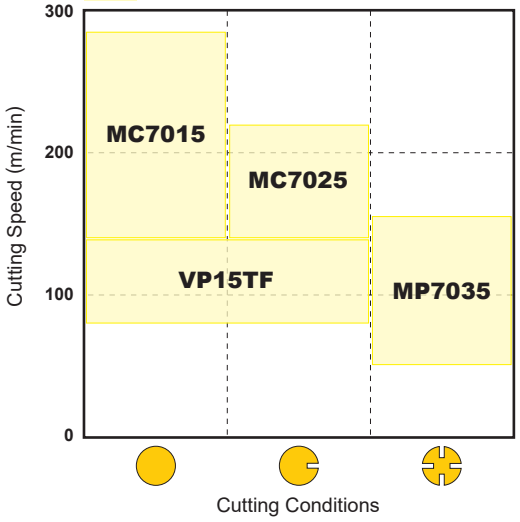
P STEEL (Medium to Rough Cutting)



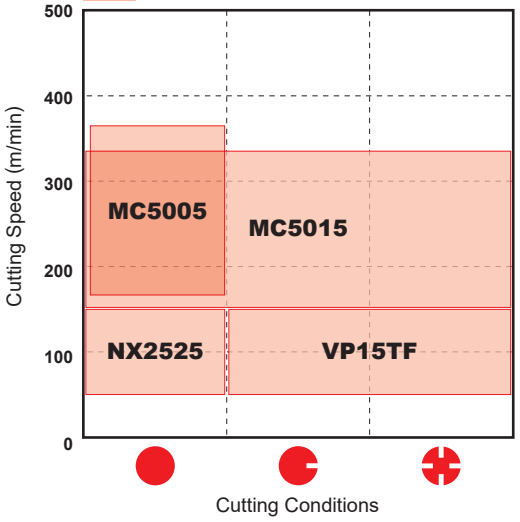
P STEEL (Finish Cutting)



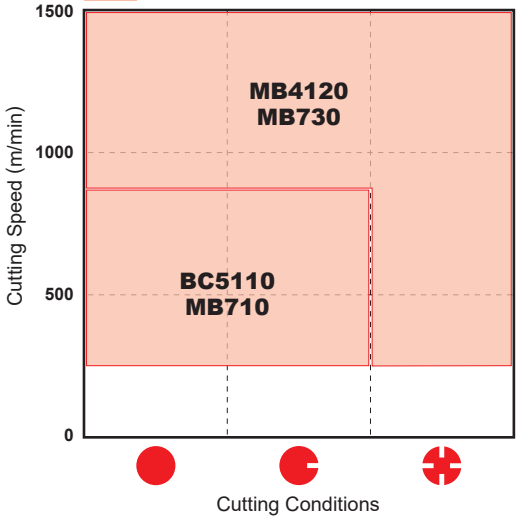
M STAINLESS STEEL



K CAST IRON



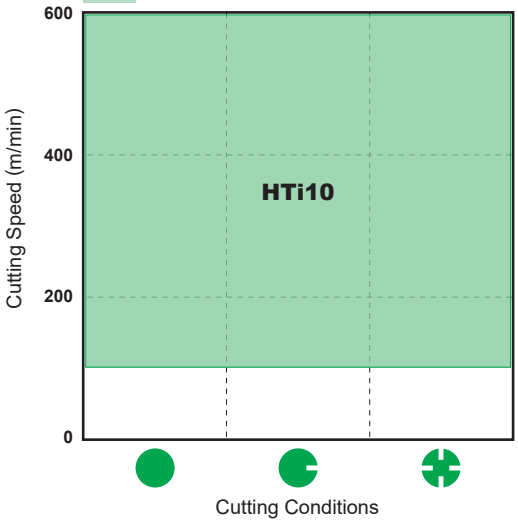
K CAST IRON (CBN)



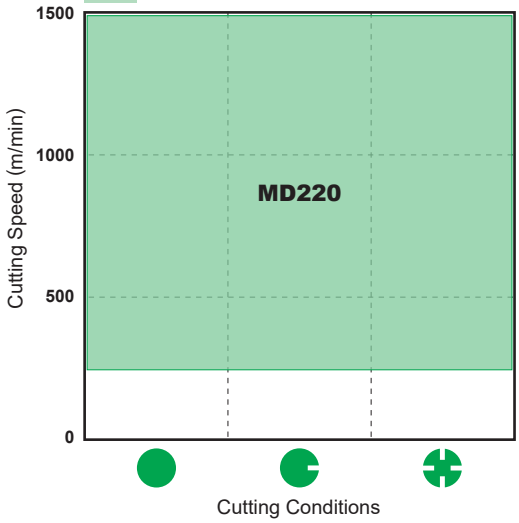
CUTTING CONDITIONS

- Stable Cutting — Continuous Cutting, Constant Depth of Cut, Pre-Machined, Securely Clamped Component Cutting
- General Cutting
- Unstable Cutting — Heavy Interrupted Cutting, Irregular Depth of Cut, Low Clamping Rigidity Cutting

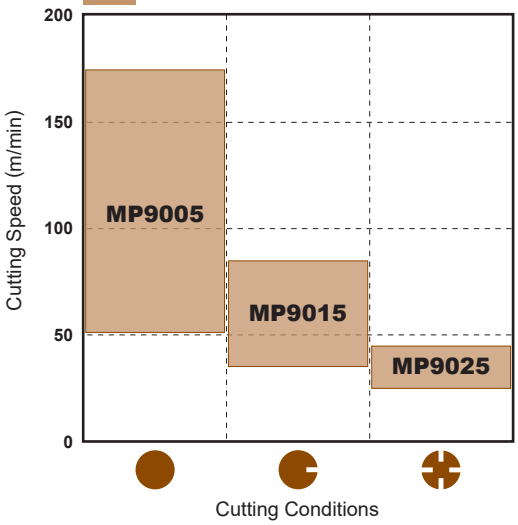
N NON-FERROUS METAL



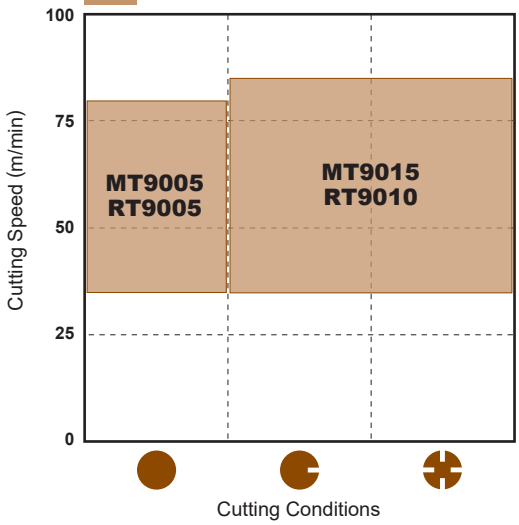
N NON-FERROUS METAL (PCD)



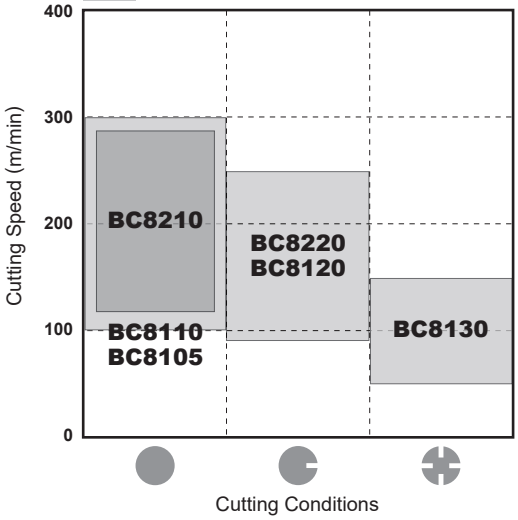
S HEAT RESISTANT ALLOY



S TITANIUM ALLOY



H HARDENED MATERIALS (CBN)



Detailed information regarding each grade is available on the website. ▶

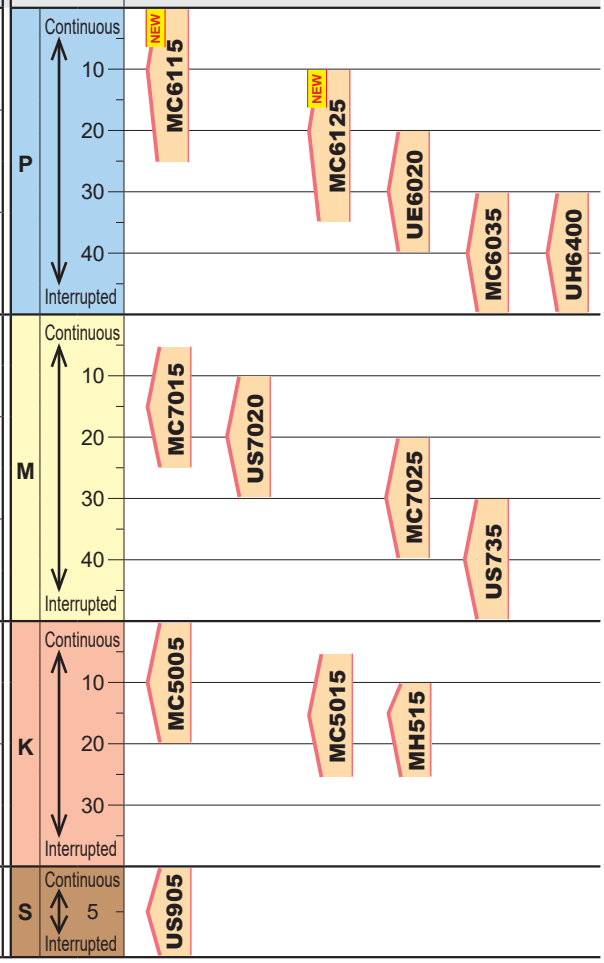
COATED CARBIDE (CVD)

- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide range of applications and thus reduces the number of tools required.

■ SELECTION STANDARD

●TURNING

	Workpiece Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)
P	Steel	Continuous Cutting	NEW MC6115	340 (215 – 480)
			NEW MC6125	330 (210 – 465)
		Interrupted Cutting	MC6035	180 (115 – 260)
M	Stainless Steel	Continuous Cutting	MC7015	220 (155 – 285)
			MC7025	180 (140 – 220)
		Continuous and Interrupted Cutting	US735	130 (75 – 185)
K	Cast Iron Ductile Cast Iron	Continuous Cutting	MC5005	260 (165 – 365)
		Interrupted Cutting	MC5015	240 (150 – 335)
S	Heat Resistant Alloy	Continuous and Interrupted Cutting	US905	70 (45 – 95)



Dramatic increase in stability and wear resistance, enabled by utilising the improved coating adhesion and crystal orientation technology.

MC6115



- Gold colour assists easy identification of edge use.
- Outstanding wear resistance especially at high temperatures.
- Strong adhesion between the tough coating layers.
- Coating for high wear resistance.



■ Super Nano Texture Technology

The standard Nano Texture Technology has been improved and developed to be an industry leading standard for crystal growth of Al_2O_3 coatings. This Super Nano Texture Technology increases tool life and wear resistance due to the fine, dense crystal growth process.

■ Super TOUGH-Grip

The Super TOUGH-Grip layer has finer crystal grains that enhance the strength of the adhesion between the coating layers.

■ GRADE CHARACTERISTICS

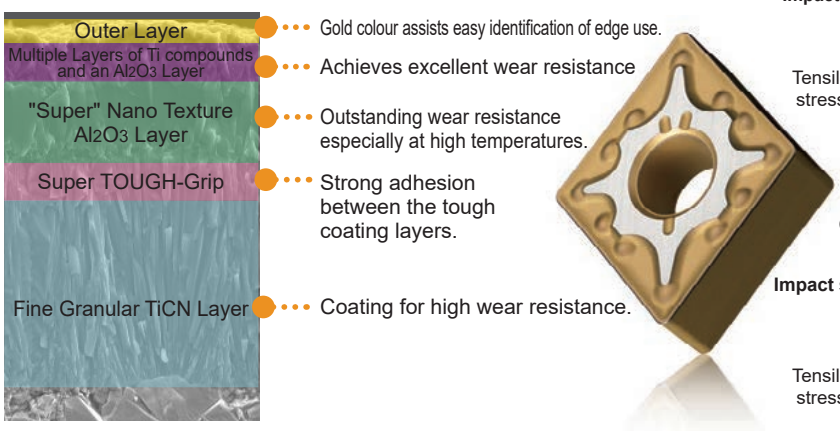
Workpiece Material		Grade	Substrate	Coating Layer	
			Hardness (HRA)	Composition	Thickness
P	Steel	NEW **MC6115**	90.8	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
		NEW **MC6125**	90.0	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
		UE6020	90.0	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
		MC6035	89.5	TiCN-Al_2O_3	Thick
		UH6400	89.5	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
M	Stainless Steel	**MC7015**	90.7	TiCN-Al_2O_3-TiN	Thin
		US7020	90.5	TiCN-Al_2O_3-TiN	Thin
		MC7025	89.4	TiCN-Al_2O_3-TiN	Thin
		US735	89.0	Ti Compound	Thin
K	Cast Iron Ductile Cast Iron	**MC5005**	91.0	TiCN-Al_2O_3	Thick
		MC5015	91.0	TiCN-Al_2O_3	Thick
	Heat Resistant Cast Steel	**MH515**	91.0	TiCN-Al_2O_3	Thick
S	Heat Resistant Alloy	**US905**	92.2	TiCN-Al_2O_3-TiN	Thin

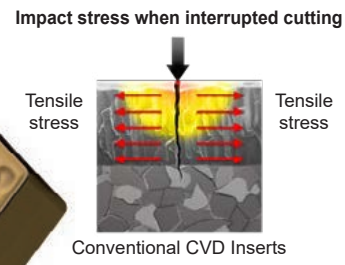
Note 1) Hardness shows representative value of the substrate.

Reducing the effect of severe fracturing

Cracks that occur during unstable machining are prevented due to the relaxing of the tensile stress in the coating. MC6100 series has an 80% reduction in coating tensile stress compared to conventional CVD inserts.

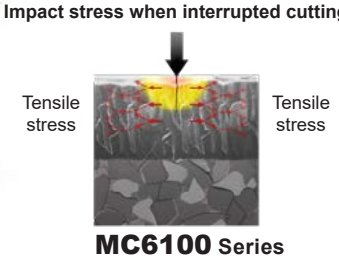
MC6125





Cracks are generated in the surface of coatings during machining. They propagate through the coating into the substrate due to the large tensile stress in the coating structure. This creates one of the main causes of sudden insert breakage.

Relaxing of the Tensile Stress



MC6100 Series

MC6100 series has a much lower level of stress than conventional CVD coatings due to the surface treatment. This divides the force of impacts during machining and protects from sudden fracturing.

Detailed information regarding each grade is available on the website. ▶

COATED CARBIDE (PVD)

- PVD coating prolongs tool life under the same cutting conditions compared to uncoated carbide.
- Coating of tools with sharp edges is possible without softening or changing the edge quality of the substrate.

■ SELECTION STANDARD

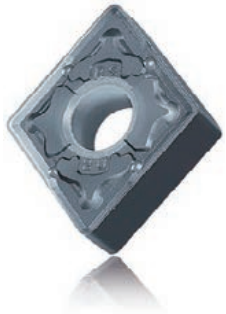
●TURNING

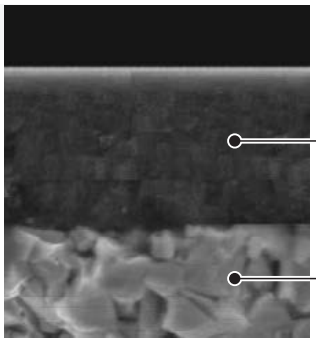
Workpiece Material		Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P	Steel	**VP10RT**	120 (100 — 150)	P	VP10RT, MS6015, NEW MS7025, VP15TF
		VP15TF	100 (50 — 150)		
M	Stainless Steel	**VP10RT**	120 (100 — 150)	M	VP10RT, NEW MS7025, NEW MS9025, VP15TF, MP7035
		VP15TF	100 (80 — 135)		
		MP7035	120 (85 — 155)		
K	Cast Iron	**VP10RT**	120 (100 — 150)	K	VP10RT, VP15TF
		VP15TF	120 (100 — 150)		
S	Heat Resistant Alloy	**MP9005**	80 (50 — 110)	S	MP9005, VP05RT, MP9015, VP10RT, MP9025, NEW MS9025, VP15TF
		MP9015	60 (35 — 85)		
		MP9025	30 (25 — 45)		

Continuous 10 20 30 40 Interrupted

ISO Turning Inserts for Difficult-to-Cut Materials

MP9005/MP9015/MP9025





ISO Grade	Grade	Concept	Application
S01	**MP9005**	Top-quality grade focusing on wear resistance	Heat Resistant Alloy Finish-Medium Cutting
S10	**MP9015**	First recommendation for general applications	Heat Resistant Alloy Medium-Rough Cutting
S30	**MP9025**	Prevents severe damage for increased stability	Heat Resistant Alloy Interrupted • Light-Rough Cutting

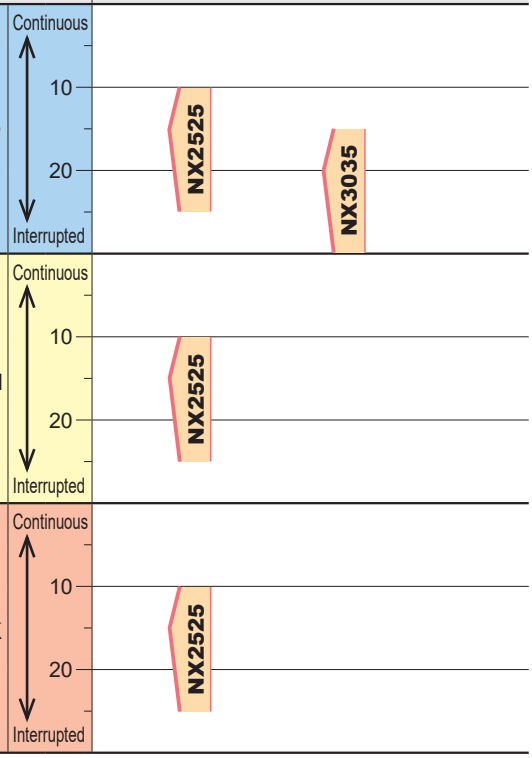
CERMET

- The optimised alloy structure and special alloy binder improves both wear and fracture resistance.
- It covers a wide range of applications and reduces the number of tools required.
- NX3035 for wet cutting.
- NX2525 for dry cutting.

■SELECTION STANDARD

●TURNING

Workpiece Material		Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P	Steel	Continuous Cutting	**NX2525**	230 (175 — 300)	P	NX2525
		Interrupted Cutting	**NX3035**	220 (170 — 285)		NX3035
M	Stainless Steel	Continuous Cutting	**NX2525**	100 (65 — 135)	M	NX2525
K	Cast Iron Ductile Cast Iron	Finishing	**NX2525**	170 (130 — 210)	K	NX2525



■GRADE CHARACTERISTICS

Grade	Hardness (HRA)
NX2525	92.2
NX3035	91.5

Note 1) Hardness shows representative value of the substrate.

Detailed information regarding each grade is available on the website. ▶

COATED CERMET

●Coated cermet (PVD coating) has superior wear and fracture resistance, and therefore provides a stable cutting performance.

■SELECTION STANDARD

●TURNING

Workpiece Material		Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P	Steel	Continuous Cutting	**VP25N AP25N**	270 (200 — 345)	P	VP25N, AP25N, MP3025, VP45N
		Interrupted Cutting	**MP3025**	250 (180 — 330)		
K	Cast Iron Ductile Cast Iron	Finishing	**VP25N AP25N**	190 (155 — 225)	K	VP25N, AP25N

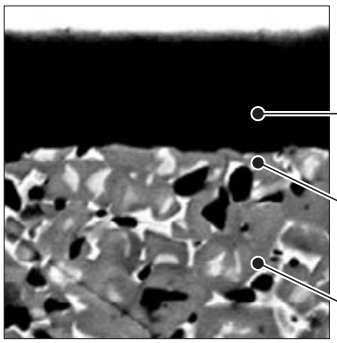
ISO: Continuous 10 20 30 Interrupted

Effective for production of small parts.

MP3025

MP3025 provides improved adhesion for coating layer due to the newly-developed special substrate. Uniform flank wear allows prolonged machining that maintains excellent surface finish.





Ti-compound PVD coating provides excellent wear and welding resistance.

Substrate surface provides excellent adhesion strength for coating layer.

Substrate with superior fracture resistance and thermal shock resistance.

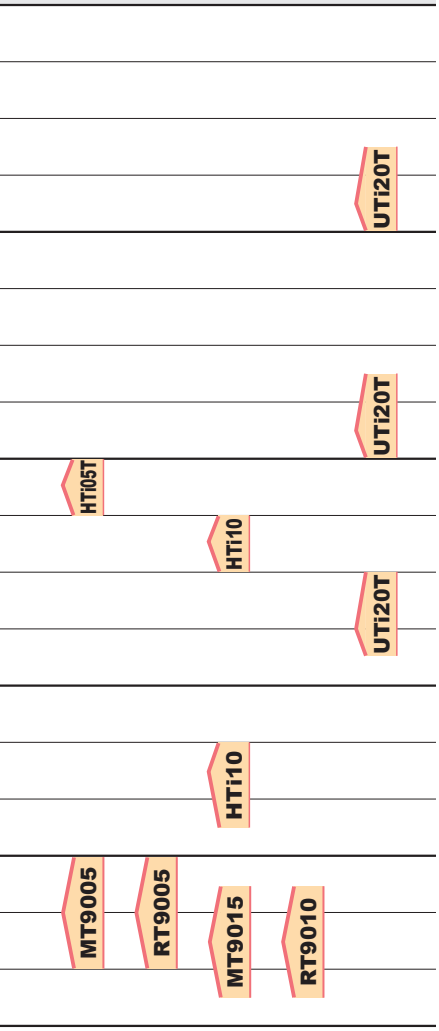
CEMENTED CARBIDE

●UTi grades are available for steel and cast iron. HTi grades are available for non-ferrous and non-metal materials and are also suitable for cast iron.

■SELECTION STANDARD

●TURNING

Workpiece Material		Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P	Steel	**UTi20T**	110 (90 — 130)	P	UTi20T
M	Stainless Steel	**UTi20T**	100 (80 — 115)	M	UTi20T
K	Cast Iron	**HTi05T**	120 (80 — 165)	K	HTi05T
		HTi10	100 (75 — 135)		HTi10
		UTi20T	80 (60 — 110)		UTi20T
N	Non-Ferrous Metal	**HTi10**	500 (300 — 700)	N	HTi10
S	Heat Resistant Alloy Ti Alloy	**MT9005 RT9005**	50 (35 — 80)	S	MT9005 RT9005
		MT9015 RT9010	60 (35 — 85)		MT9015 RT9010



■MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Workpiece Material
P M	WC-TiC-TaC-Co	Heat / deformation resistance.	Carbon steel, alloy steel, stainless steel and cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, non-ferrous metals, and non-metal
S	WC-Co	High heat resistance and wear resistance.	Heat resistant alloy, Ti alloy

■GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)
P M	**UTi20T**	90.5
K N	**HTi05T**	92.5
	HTi10	92.0
S	**MT9005/RT9005**	92.2
	MT9015/RT9010	91.8

Note 1) Hardness shows representative value of the substrate.

Detailed information regarding each grade is available on the website. ▶

MICRO-GRAIN CEMENTED CARBIDE (SOLID TOOLS)

●Compared to normal cemented carbide, micro-grain types have higher wear resistance and toughness.

■SELECTION STANDARD

Cutting Tool	Recommended Grade	Workpiece Material
PCB Miniature Drill	**SF10** **MF10** **MF20**	Non-Metal
Solid Carbide Drill Turning Inserts Milling Inserts	**TF15**	Steel • Cast Iron
Solid End Mill	**HTi10** **TF15** **MF10**	Steel • Cast Iron
Gear Hob Reamer Tap etc.	**TF15** **MF20** **MF30**	Steel • Cast Iron, etc.

■GRADE CHARACTERISTICS

Grade	Grade Characteristics *		ISO	Wear Resistance	Fracture Resistance	Corrosion Resistance
	Hardness(HRA)	T.R.S (GPa)				
HTi10	92.0	3.2	K10	◎	○	○
TF15	91.0	4.0	K20	◎	○	◎
SF10	92.7	3.8	K01	◎	○	◎
MF10	93.0	4.0	K01	◎	○	◎
MF20	92.0	4.4	K10	○	◎	◎
MF30	90.7	4.3	K20	○	◎	◎

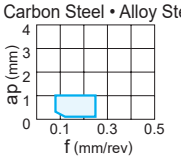
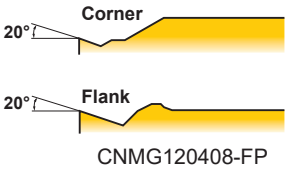
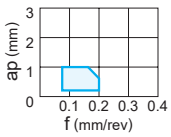
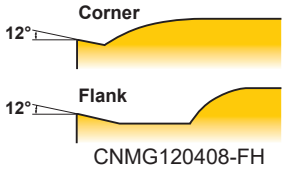
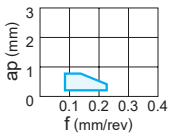
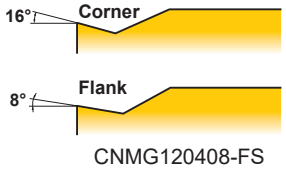
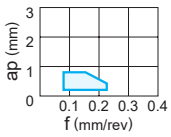
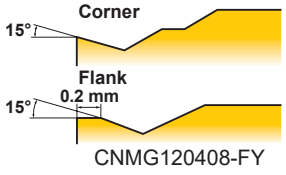
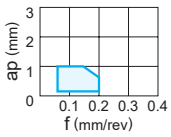
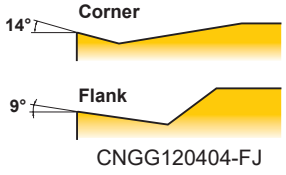
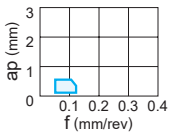
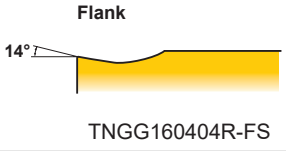
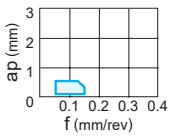
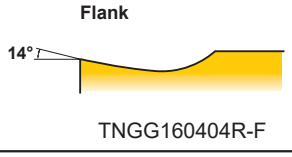
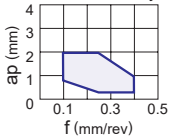
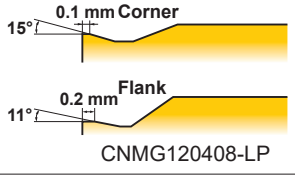
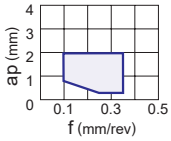
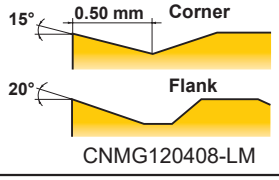
* After HIP

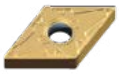
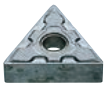
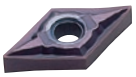
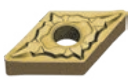
Note 1) Hardness shows representative value of the substrate.

Memo

CLASSIFICATION

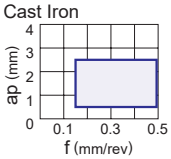
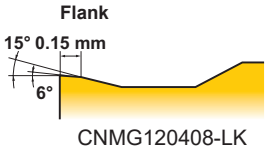
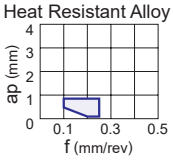
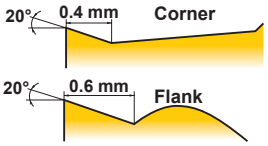
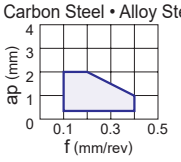
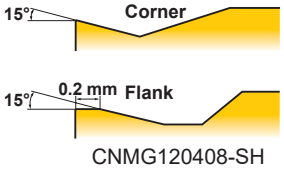
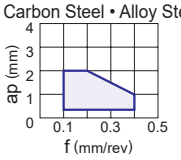
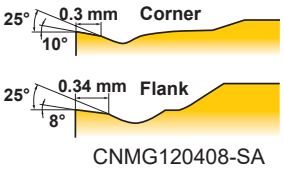
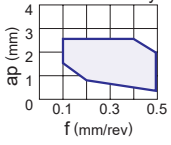
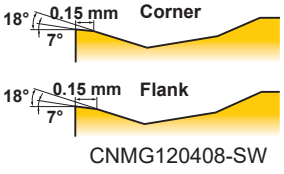
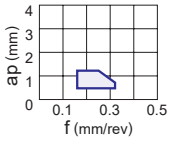
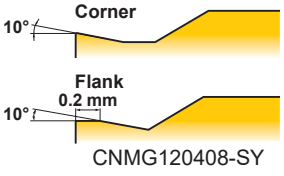
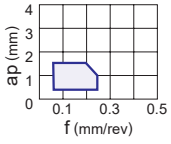
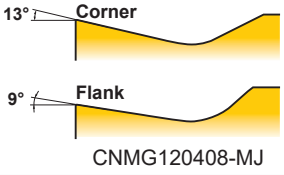
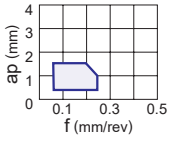
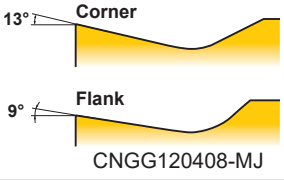
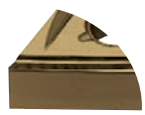
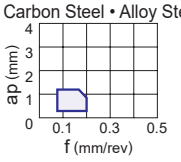
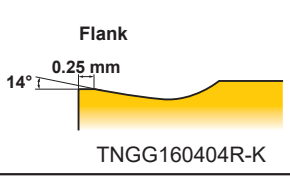
NEGATIVE INSERTS WITH HOLE

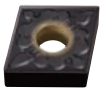
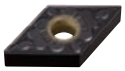
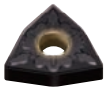
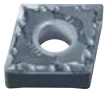
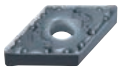
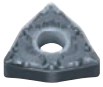
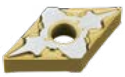
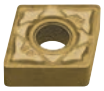
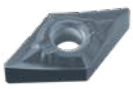
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M	FP 	**First recommendation for finishing carbon steel and alloy steel** Controls chip clogging during high-feed cutting and prevents chips of soft workpiece materials from running onto their surfaces. Large rake angle suppress chatter vibration and deformation in machining of low rigidity workpiece material.	Carbon Steel • Alloy Steel   CNMG120408-FP
		FH 	**First recommendation for finishing carbon steel and alloy steel** Stable chip control even at small depths of cut.	Carbon Steel • Alloy Steel   CNMG120408-FH
		FS 	**Alternative chip breaker for finishing mild steel** Stable chip control even at small depths of cut. Sharp edge gives best performance.	Mild Steel   CNMG120408-FS
		FY 	**First recommendation for finishing mild steel** Effectively controls adhesive chips. Suitable for mild steel finishing.	Mild Steel   CNMG120408-FY
	G	FJ 	**Alternative chip breaker for finishing difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces good cutting surface. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CNGG120404-FJ
		R/L-FS 	**Chip breaker for precise finishing** A narrow lead chip breaker for good chip control. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel   TNGG160404R-FS
		R/L-F 	**Chip breaker for finishing** Lead chip breaker controls chip flow. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel   TNGG160404R-F
Light Cutting	M	LP 	**First recommendation for light cutting of carbon steel and alloy steel** Stable chip control at light cutting range. The curved edge allows smooth chip discharge.	Carbon Steel • Alloy Steel   CNMG120408-LP
		LM 	**First recommendation for light cutting of stainless steel** Stable chip control at light cutting range. Breaker with high rake angle provides excellent burr control.	Stainless Steel   CNMG120408-LM

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMG_FP  A074	DNMG_FP  A081	SNMG_FP  A089	TNMG_FP  A095	VNMG_FP  A102	WNMG_FP  A106		FP 
	CNMG_FH  A074	DNMG_FH  A081	SNMG_FH  A089	TNMG_FH  A095	VNMG_FH  A102	WNMG_FH  A106		FH 
	CNMG_FS  A074	DNMG_FS  A081	SNMG_FS  A089	TNMG_FS  A095	VNMG_FS  A102	WNMG_FS  A106		FS 
	CNMG_FY  A074	DNMG_FY  A081		TNMG_FY  A095		WNMG_FY  A106		FY 
	CNGG_FJ  A074	DNGG_FJ  A081			VNGG_FJ  A102			FJ 
				TNGG_R/L-FS  A095				R/L-FS 
				TNGG_R/L-F  A095	VNGG_R/L-F  A102			R/L-F 
	CNMG_LP  A074	DNMG_LP  A082	SNMG_LP  A089	TNMG_LP  A096	VNMG_LP  A102	WNMG_LP A106		LP
	CNMG_LM A075	DNMG_LM A082	SNMG_LM A089	TNMG_LM A096	VNMG_LM A103	WNMG_LM A106		LM

CLASSIFICATION

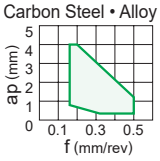
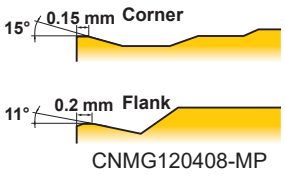
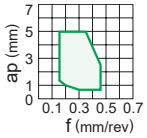
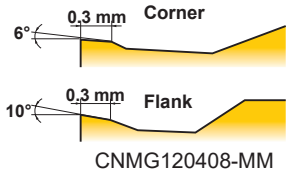
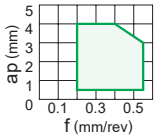
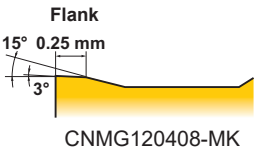
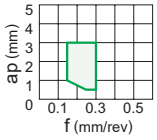
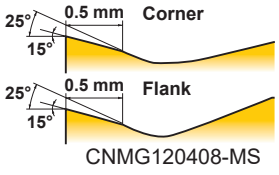
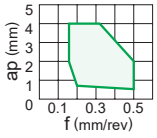
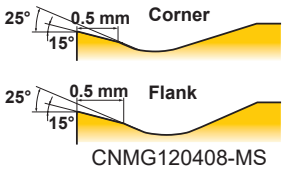
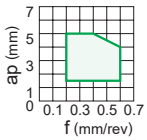
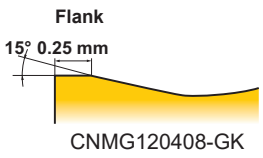
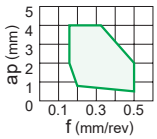
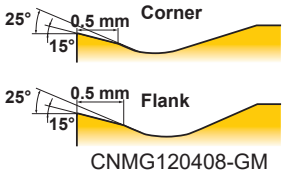
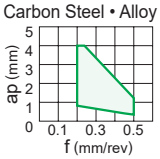
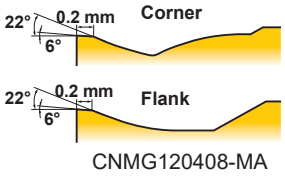
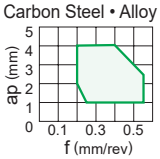
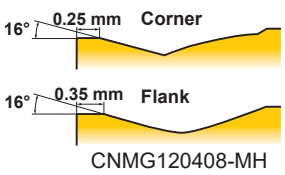
NEGATIVE INSERTS WITH HOLE

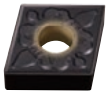
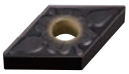
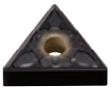
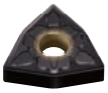
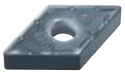
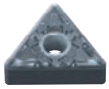
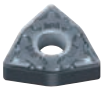
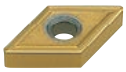
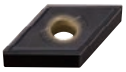
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M	LK 	**First recommendation for light cutting of cast iron** Narrow positive land provides low cutting resistance and excellent finish.	Cast Iron   CNMG120408-LK
		LS 	**First recommendation for light cutting of difficult-to-cut materials** **Alternative chip breaker for light cutting of stainless steel** Enhanced chip disposal for depths of cut smaller than the corner R.	Heat Resistant Alloy   CNMG120408-LS
		SH 	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Can be used at low depths of cut and high feed rates. The curved edge allows smooth chip discharge. Recommended for workpieces in the 160—250HB range.	Carbon Steel • Alloy Steel   CNMG120408-SH
		SA 	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Superior chip control at small depths of cut. Covers copying and back turning with wavy edge. Recommended for workpieces in the 200—300HB range.	Carbon Steel • Alloy Steel   CNMG120408-SA
		SW 	**Wiper insert for light cutting of carbon steel, alloy steel, stainless steel and cast iron** In comparison to conventional chip breakers, the surface finish is maintained even if the feed per revolution is doubled. Wiper design for increased productivity and improved surface finish.	Carbon Steel • Alloy Steel   CNMG120408-SW
		SY 	**First recommendation for light cutting of mild steel** Effectively controls adhesive chips. Suitable for mild steel light cutting.	Mild Steel   CNMG120408-SY
		MJ 	**Alternative chip breaker for light cutting of difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Excellent notch wear resistance for light to medium cutting.	Difficult-to-Cut Materials   CNMG120408-MJ
	G	MJ 	**Alternative chip breaker for light cutting of difficult-to-cut materials** Double-sided chip breaker, Single sided chip breaker (D type, V type). The sharp edge produces a good surface finish. Ideal for heat resistant alloys and titanium alloys. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CNGG120408-MJ
		R/L-K 	**Chip breaker for Light cutting** Parallel chip breaker. Excellent chip control at low to medium feed rates.	Carbon Steel • Alloy Steel   TNGG160404R-K

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMG_LK  A075	DNMG_LK  A082	SNMG_LK  A089	TNMG_LK  A096	VNMG_LK  A103	WNMG_LK  A107		LK 
	CNMG_LS  A075	DNMG_LS  A082		TNMG_LS  A096	VNMG_LS  A103	WNMG_LS  A107		LS 
	CNMG_SH  A075	DNMG_SH  A083	SNMG_SH  A090	TNMG_SH  A096	VNMG_SH  A103	WNMG_SH  A107		SH 
	CNMG_SA  A075	DNMG_SA  A083	SNMG_SA  A090	TNMG_SA  A096	VNMG_SA  A103	WNMG_SA  A107		SA 
	CNMG_SW  A075	DNMX_SW  A083		TNMX_SW  A097		WNMG_SW  A107		SW 
	CNMG_SY  A075	DNMG_SY  A083	SNMG_SY  A090	TNMG_SY  A097		WNMG_SY  A107		SY 
	CNMG_MJ  A075	DNMG_MJ  A083		TNMG_MJ A097	VNMG_MJ A103	WNMG_MJ A107		MJ(M)
	CNGG_MJ A075	DNGM_MJ A083			VNGM_MJ A103			MJ(G)
				TNGG_R/L-K A097				R/L-K

CLASSIFICATION

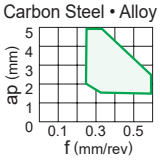
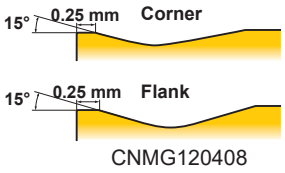
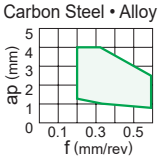
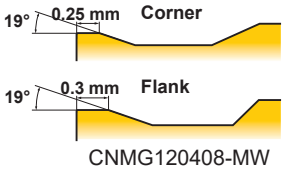
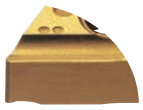
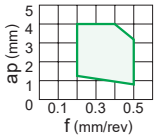
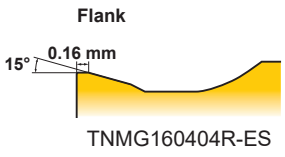
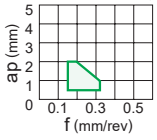
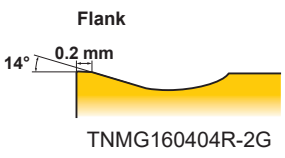
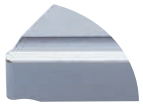
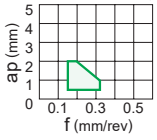
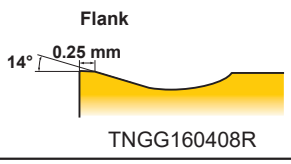
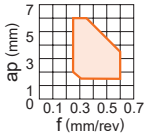
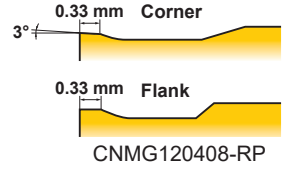
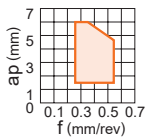
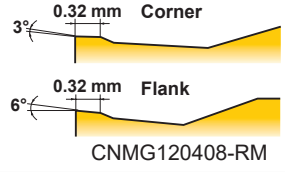
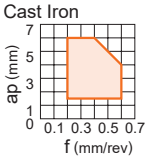
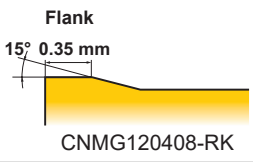
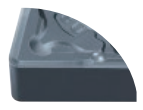
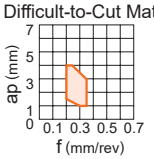
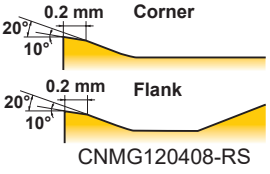
NEGATIVE INSERTS WITH HOLE

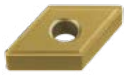
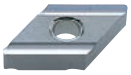
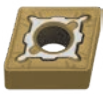
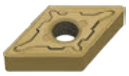
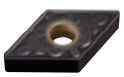
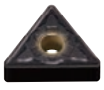
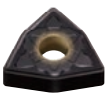
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M	**MP** 	**First recommendation for medium cutting of carbon steel and alloy steel** Suitable for medium to light cutting. Breaker geometry appropriate for copying and back turning. Cutting edge geometry for an optimum balance of sharpness and fracture resistance.	Carbon Steel • Alloy Steel   CNMG120408-MP
		MM 	**First recommendation for medium cutting of stainless steel** Optimised land geometry by simulation analysis technology controls the plastic deformation of the corner and achieves the long tool life.	Stainless Steel   CNMG120408-MM
		MK 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron   CNMG120408-MK
		MS 	**First recommendation for medium cutting of difficult-to-cut materials,** **Alternative chip breaker for medium cutting of stainless steel.** A large two-step rake corner creates chips without squeezing and entangled shapes. Applicable to MP9005, MP9015, MP9025, MT9015	Difficult-to-Cut Materials   CNMG120408-MS
	M	**MS** 	**Alternative chip breaker for medium cutting of stainless steel and difficult-to-cut materials** The sharp edge gives best performance. Flat top breaker shape offers high edge strength. Applicable to grades other than MP9005, MP9015, MP9025, MT9015	Stainless Steel   CNMG120408-MS
		GK 	**Alternative chip breaker for medium cutting for cast iron** Breakers are suitable for a wide range of applications. Maintenance of high stability by the flat-land.	Cast Iron   CNMG120408-GK
		GM 	**Alternative chip breaker for light to medium cutting of stainless steel** Alternative chip breaker of main chip breaker LM and MM. Excellent notch wear resistance for light to medium cutting.	Stainless Steel   CNMG120408-GM
		MA 	**Multi-assist chip breaker** Ideal for general cutting applications. Positive land provides sharp cutting action.	Carbon Steel • Alloy Steel   CNMG120408-MA
		MH 	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Flat land offers high edge strength. Good chip control with suitable chip pocket.	Carbon Steel • Alloy Steel   CNMG120408-MH

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMG_MP  A076	DNMG_MP  A084	SNMG_MP  A090	TNMG_MP  A097	VNMG_MP  A103	WNMG_MP  A108		MP 
	CNMG_MM  A076	DNMG_MM  A084	SNMG_MM  A090	TNMG_MM  A097	VNMG_MM  A103	WNMG_MM  A108		MM 
	CNMG_MK  A076	DNMG_MK  A084	SNMG_MK  A091	TNMG_MK  A097	VNMG_MK  A104	WNMG_MK  A108		MK 
	CNMG_MS  A076	DNMG_MS  A084	SNMG_MS  A091	TNMG_MS  A097	VNMG_MS  A104	WNMG_MS  A108		MS 
	CNMG_MS  A077	DNMG_MS  A084	SNMG_MS  A091	TNMG_MS  A098	VNMG_MS  A104	WNMG_MS  A108		MS 
	CNMG_GK  A077	DNMG_GK  A085	SNMG_GK  A091	TNMG_GK  A098	VNMG_GK  A104	WNMG_GK A109		GK
	CNMG_GM A077	DNMG_GM A085	SNMG_GM A091	TNMG_GM A098	VNMG_GM A104	WNMG_GM A109		GM
	CNMG_MA A077	DNMG_MA A085	SNMG_MA A091	TNMG_MA A098	VNMG_MA A104	WNMG_MA A109		MA
	CNMG_MH A077	DNMG_MH A085	SNMG_MH A091	TNMG_MH A098	VNMG_MH A105	WNMG_MH A109		MH

CLASSIFICATION

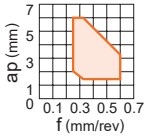
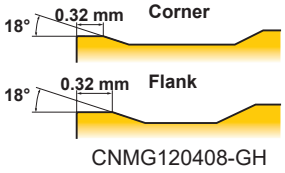
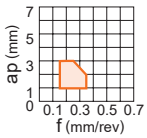
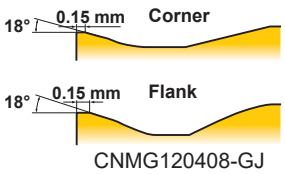
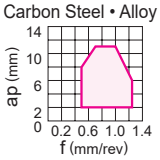
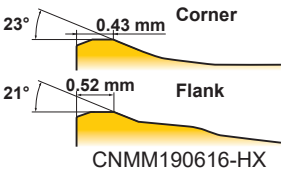
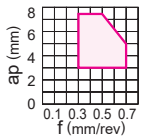
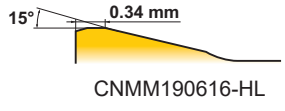
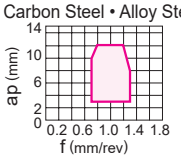
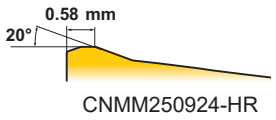
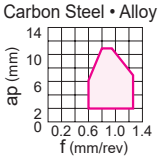
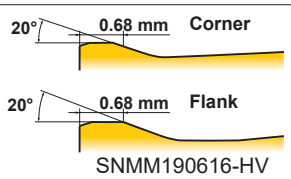
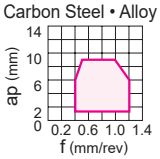
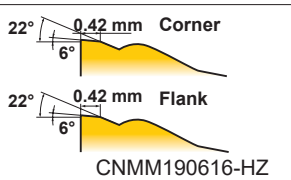
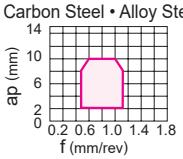
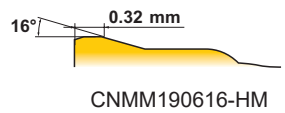
NEGATIVE INSERTS WITH HOLE

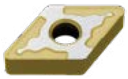
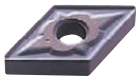
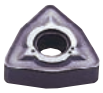
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M	**Standard** 	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Flat land offers high edge strength. Flat top breaker shape offers high edge strength.	Carbon Steel • Alloy Steel   CNMG120408
		MW 	**Wiper insert for medium cutting carbon steel, alloy steel, stainless steel and cast iron** The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel • Alloy Steel   CNMG120408-MW
		R/L-ES 	**Alternative chip breaker for medium cutting of stainless steel** Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control.	Stainless Steel   TNMG160404R-ES
		R/L-2G 	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control. Precision chip breaker.	Carbon Steel • Alloy Steel   TNMG160404R-2G
	G	**R/L** 	**Medium cutting** Parallel chip breaker. Good chip control for medium feed rates.	Carbon Steel • Alloy Steel   TNGG160408R
Rough Cutting	M	**RP** 	**First recommendation for rough cutting of carbon steel and alloy steel** For interrupted cuts and removing scale. Good balance of cutting edge strength and low cutting resistance because of suitable rake angle.	Carbon Steel • Alloy Steel   CNMG120408-RP
		RM 	**First recommendation for rough cutting of stainless steel** Excellent fracture resistance at interrupted cutting due to the optimum land angle and honing geometry.	Stainless Steel   CNMG120408-RM
		RK 	**First recommendation for rough cutting of cast iron** Seating surface and wide land 3 or more times that of conventional products and provides high cutting stability for interrupted machining and scale removal.	Cast Iron   CNMG120408-RK
		RS 	**First recommendation for rough cutting of difficult-to-cut materials** **Alternative chip breaker for rough cutting of stainless steels** Positive land increases welding resistance and suppresses chip welding and abrasion at low speed cutting.	Difficult-to-Cut Materials   CNMG120408-RS

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMG  A078	DNMG  A085	SNMG  A092	TNMG  A099	VNMG  A105	WNMG  A109	RNMG  A088	Standard 
	CNMG_MW  A078	DNMX_MW  A085		TNMX_MW  A099		WNMG_MW  A109		MW 
				TNMG_R/L-ES  A099				R/L-ES 
				TNMG_R/L-2G  A099				R/L-2G 
		DNGG_R/L  A086	SNGG_R/L  A092	TNGG_R/L  A099	VNGG_R/L  A105			R/L 
	CNMG_RP  A078	DNMG_RP  A086	SNMG_RP  A092	TNMG_RP  A100		WNMG_RP  A109		RP 
	CNMG_RM  A078	DNMG_RM  A086	SNMG_RM  A092	TNMG_RM  A100		WNMG_RM  A110		RM 
	CNMG_RK  A079	DNMG_RK  A086	SNMG_RK  A093	TNMG_RK  A100		WNMG_RK  A110		RK 
	CNMG_RS A079	DNMG_RS A086	SNMG_RS A093	TNMG_RS A100		WNMG_RS A110		RS

CLASSIFICATION

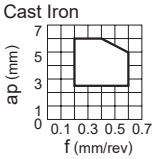
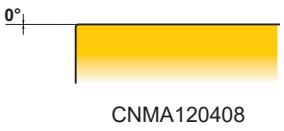
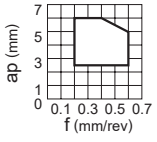
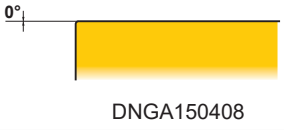
NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Rough Cutting	M	**GH** 	**Alternative chip breaker for rough cutting of carbon steel, alloy steel and cast iron** For interrupted cuts and removing scale. A combination of wide land and a large chip pocket allows high feed rates.	Carbon Steel • Alloy Steel   CNMG120408-GH
		GJ 	**Alternative chip breaker for rough cutting of difficult-to-cut materials** Excellent balance of edge sharpness and strength. Edge geometry with high face wear resistance.	Difficult-to-Cut Materials   CNMG120408-GJ
Heavy Cutting	M	**HX** 	**First recommendation for heavy cutting of carbon steel and alloy steel** Covers the medium range of the heavy cutting region. Owing to the straight edge and chamfer, it gives a balance of sharpness and strength. Variable land and a wavy chip breaker for good chip control.	Carbon Steel • Alloy Steel   CNMM190616-HX
		HL 	**First recommendation for heavy cutting of stainless steel** **Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Low resistance due to narrow flat land. Achieves high chip breaking ability.	Stainless Steel   CNMM190616-HL
		HR 	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** High cutting edge strength. Excellent chip discharge even with high feed and high depth of cut.	Carbon Steel • Alloy Steel   CNMM250924-HR
		HV 	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Covers the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chip breaker prevents chip jamming.	Carbon Steel • Alloy Steel   SNMM190616-HV
		HZ 	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Covers the lower end of the heavy cutting region. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.	Carbon Steel • Alloy Steel   CNMM190616-HZ
		HM 	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel and stainless steel** Flat land provides outstanding balance between cutting edge strength and sharpness.	Carbon Steel • Alloy Steel   CNMM190616-HM

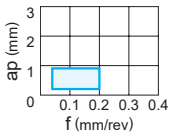
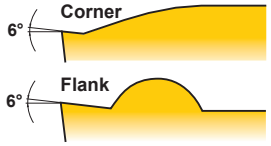
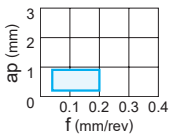
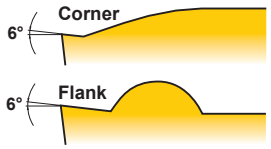
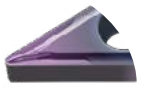
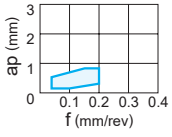
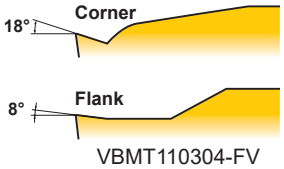
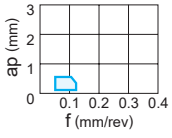
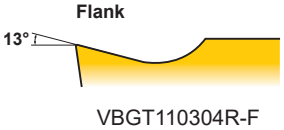
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMG_GH  A079	DNMG_GH  A087	SNMG_GH  A093	TNMG_GH  A101		WNMG_GH  A110		GH 
	CNMG_GJ  A079	DNMG_GJ  A087				WNMG_GJ  A110		GJ 
	CNMM_HX  A079		SNMM_HX  A093					HX 
	CNMM_HL  A079	DNMM_HL  A087	SNMM_HL  A093	TNMM_HL  A101				HL 
	CNMM_HR  A080		SNMM_HR  A093					HR 
	CNMM_HV  A080		SNMM_HV  A093					HV 
	CNMM_HZ  A080	DNMM_HZ  A087	SNMM_HZ  A094	TNMM_HZ  A101				HZ 
	CNMM_HM  A080		SNMM_HM  A094					HM 

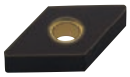
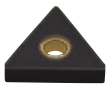
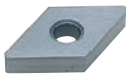
CLASSIFICATION

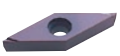
NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	M	**Flat Top** 	**First recommendation for heavy cutting of cast iron** Flat Top. Most effective for unstable machining due to its high edge strength.	Cast Iron   CNMA120408
	G	**Flat Top** 	**For heavy cutting of cast iron** Flat Top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   DNGA150408

5° POSITIVE INSERTS WITH HOLE

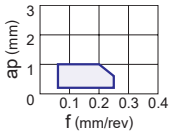
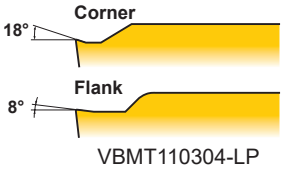
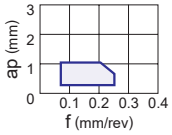
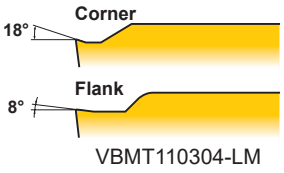
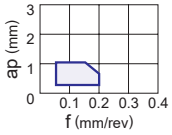
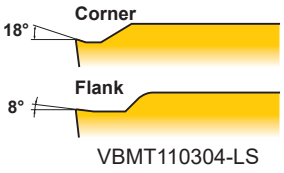
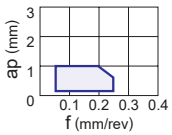
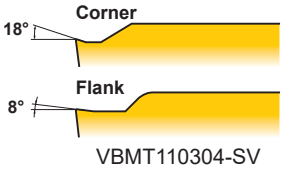
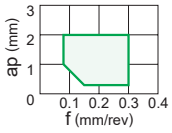
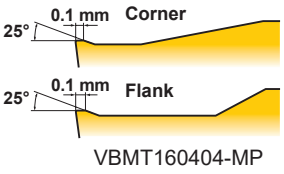
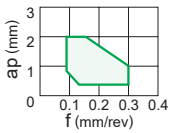
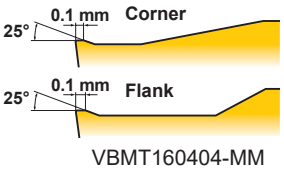
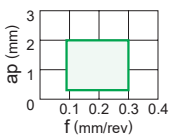
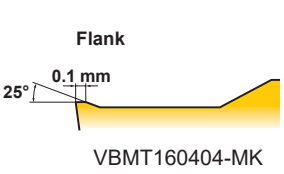
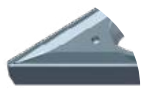
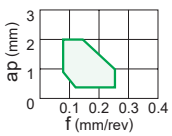
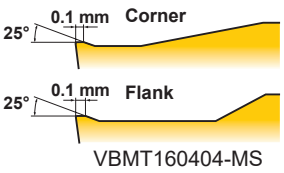
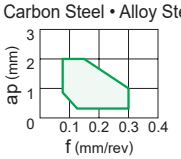
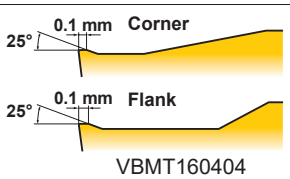
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M	**FP** 	**First recommendation for finishing carbon steel, alloy steel and mild steel** Breaker protrusion at the corner tip controls chips even at small depths of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel • Alloy Steel   VBMT110304-FP
		FM 	**First recommendation for finishing stainless steel** Breaker protrusion at the corner tip controls chips even at small depths of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel   VBMT110304-FM
		FV 	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel   VBMT110304-FV
	G	**R/L-F** 	**Finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   VBGT110304R-F

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CNMA  A080	DNMA  A087	SNMA  A094	TNMA  A101	VNMA  A105	WNMA  A110		Flat Top(M) 
		DNGA  A087	SNGA  A094	TNGA  A101	VNGA  A105			Flat Top(G) 

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
					VBMT_FP  A142			FP 
					VBMT_FM  A142			FM 
					VBMT_FV  A142			FV 
					VBGT_R/L-F  A142	WBGT_R/L-F  A150		R/L-F 

CLASSIFICATION

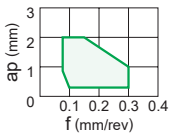
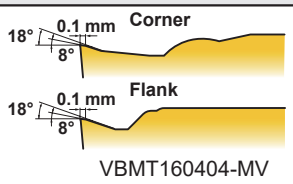
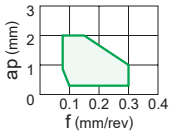
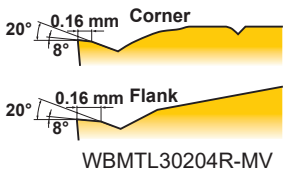
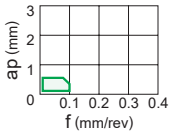
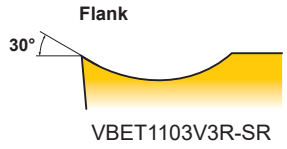
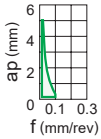
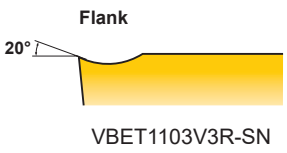
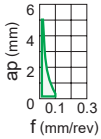
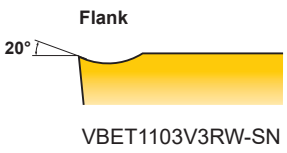
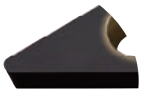
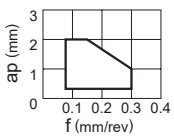
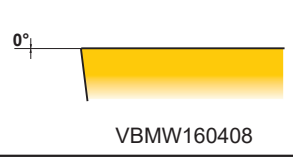
5° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M	**LP** 	**First recommendation for light cutting of carbon steel, alloy steel and mild steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel • Alloy Steel   VBMT110304-LP
		LM 	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel   VBMT110304-LM
		LS 	**First recommendation for light cutting of difficult-to-cut materials** Prevents welding of the insert and controls white turbidity of the surface finish.	Difficult-to-Cut Materials   VBMT110304-LS
		SV 	**Alternative chip breaker for carbon steel, alloy steel and stainless steel** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel   VBMT110304-SV
Medium Cutting	M	**MP** 	**First recommendation for medium cutting of carbon steel, alloy steel and mild steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Carbon Steel • Alloy Steel   VBMT160404-MP
		MM 	**First recommendation for medium cutting of stainless steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Stainless Steel   VBMT160404-MM
		MK 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron   VBMT160404-MK
		MS 	**First recommendation for medium cutting of difficult-to-cut materials** A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Difficult-to-Cut Materials   VBMT160404-MS
		Standard 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel and stainless steel** Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel • Alloy Steel   VBMT160404

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
					VBMT_LP  A142			LP 
					VBMT_LM  A142			LM 
					VBMT_LS  A143			LS 
					VBMT_SV  A143			SV 
					VBMT_MP  A143			MP 
					VBMT_MM  A143			MM 
					VBMT_MK  A143			MK 
					VBMT_MS  A143			MS 
					VBMT  A143			Standard 

CLASSIFICATION

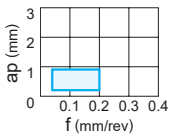
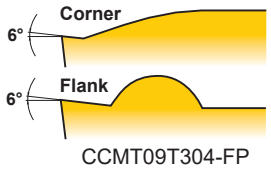
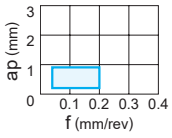
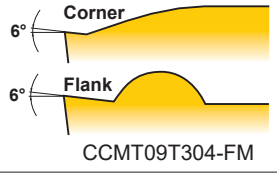
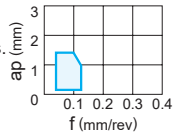
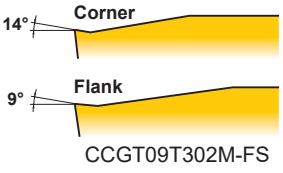
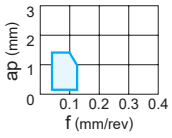
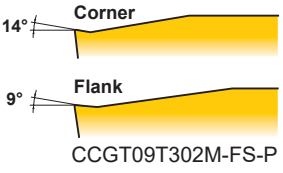
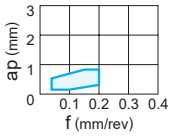
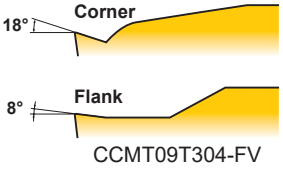
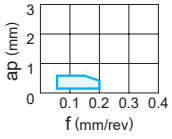
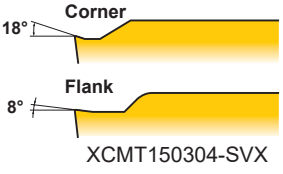
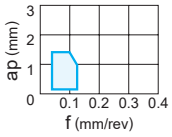
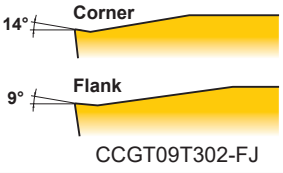
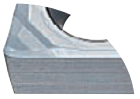
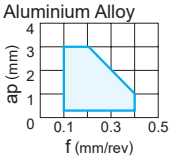
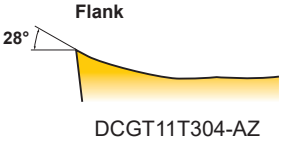
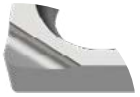
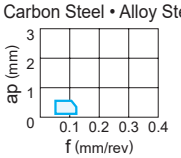
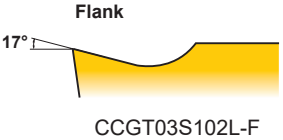
5° POSITIVE INSERTS WITH HOLE

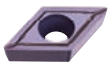
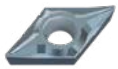
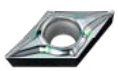
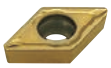
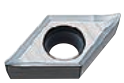
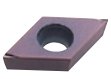
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M	**MV** 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel   VBMT160404-MV
		R/L-MV 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel   WBMTL30204R-MV
	E	**R/L-SR** 	**Chip breaker for medium cutting of automatic lathe machining** A wide lead chip breaker. Insert designed for low resistance chip control.	Carbon Steel • Alloy Steel   VBET1103V3R-SR
		R/L-SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control for low to medium feed rates.	Carbon Steel • Alloy Steel   VBET1103V3R-SN
		R/LW-SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control for low to medium feed rates. The wiper produces good cutting surface.	Carbon Steel • Alloy Steel   VBET1103V3RW-SN
For Cast Iron	M	**Flat Top** 	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron   VBMW160408

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
					VBMT_MV  A143			MV 
						WBMT_R/L-MV  A150		R/L-MV 
					VBET_R/L-SR  A144			R/L-SR 
					VBET_R/L-SN  A144			R/L-SN 
					VBET_R/LW-SN  A144			R/LW-SN 
					VBMW  A144			Flat Top 

CLASSIFICATION

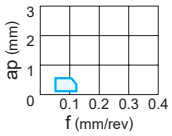
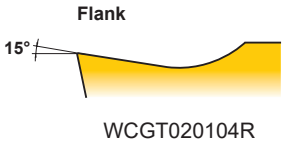
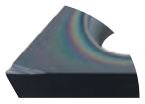
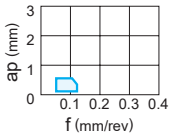
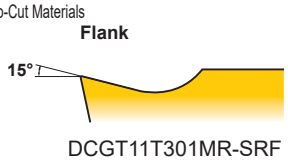
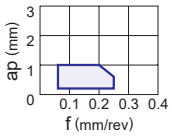
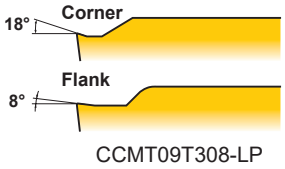
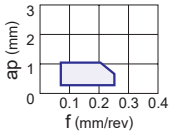
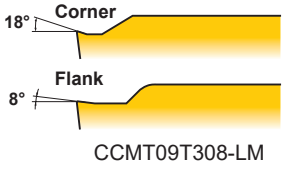
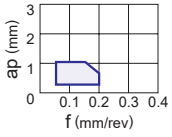
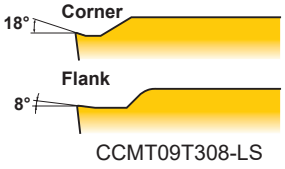
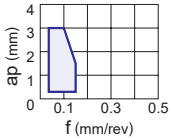
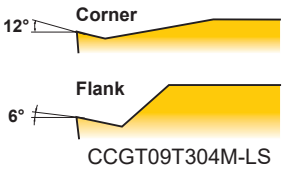
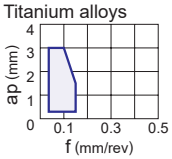
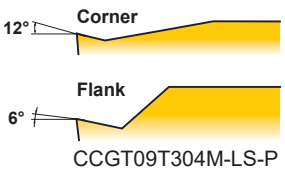
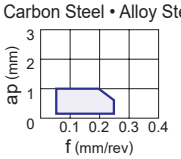
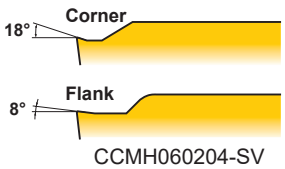
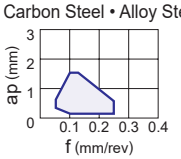
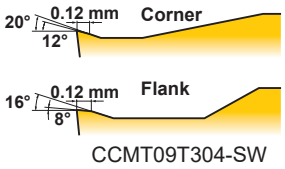
7° POSITIVE INSERTS WITH HOLE

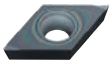
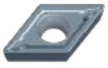
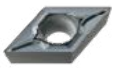
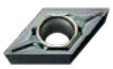
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M	FP 	**First recommendation for finishing carbon steel, alloy steel and mild steel** Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel • Alloy Steel   CCMT09T304-FP
		FM 	**First recommendation for finishing stainless steel** Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel   CCMT09T304-FM
	G	FS 	**First recommendation for finishing difficult-to-cut materials** Ideal for heat resistant alloys, titanium alloy and Cobalt chromium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CCGT09T302M-FS
		FS-P 	**First recommendation for finishing titanium alloys** Ideal for titanium alloys and Copper alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloys   CCGT09T302M-FS-P
	M	FV 	**Alternative chip breaker for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel   CCMT09T304-FV
		SVX 	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Chip control is improved by having a chip breaker geometry suitable for copying.	Carbon Steel • Alloy Steel   XCMT150304-SVX
	G	FJ 	**Alternative chip breaker for finishing difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CCGT09T302-FJ
		AZ 	**Chip breaker for for aluminium alloy** The high rake angle and 3D curved cutting edge provides sharpness at the cutting point. Additionally the 3D shape of the rake face enables excellent chip control. Lapping of the top surface gives a mirror finish for improved welding resistance.	Aluminium Alloy   DCGT11T304-AZ
		R/L-F 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   CCGT03S102L-F

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round	Breaker Name and Cross Section
	CCMT_FP  A114	DCMT_FP  A124	SCMT_FP  A132	TCMT_FP  A135	VCMT_FP  A145				FP 
	CCMT_FM  A114	DCMT_FM  A124	SCMT_FM  A132	TCMT_FM  A135	VCMT_FM  A145				FM 
	CCGT_FS  A114	DCGT_FS  A124							FS 
	CCGT_FS-P  A114	DCGT_FS-P  A124							FS-P 
	CCMT_FV  A114	DCMT_FV  A124	SCMT_FV  A132	TCMT_FV  A135	VCMT_FV  A145				FV 
							XCMT_SVX  A153		SVX 
	CCGT_FJ  A114								FJ 
	CCGT_AZ  A115	DCGT_AZ  A124		TCGT_AZ  A135	VCGT_AZ  A145			RCGT_AZ  A131	AZ 
	CCGT_R/L-F CCGH_R/L-F  A115	DCGT_R/L-F  A125		TCGT_R/L-F  A135	VCGT_R/L-F  A145				R/L-F 

CLASSIFICATION

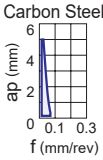
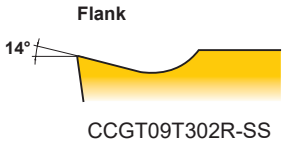
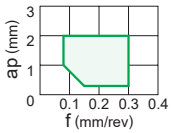
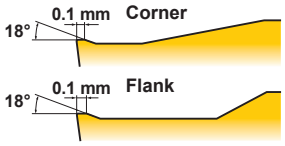
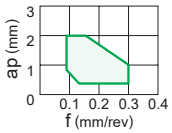
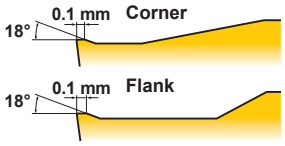
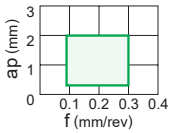
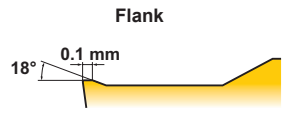
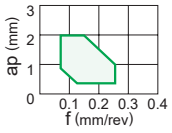
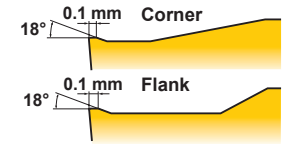
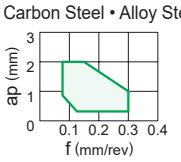
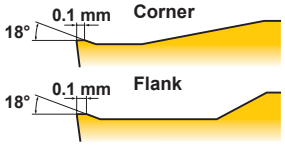
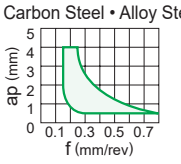
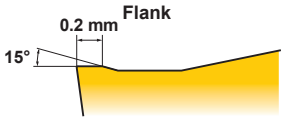
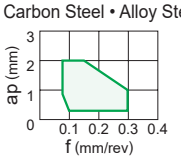
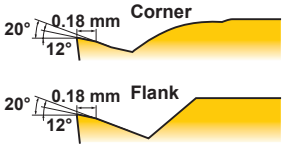
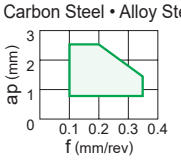
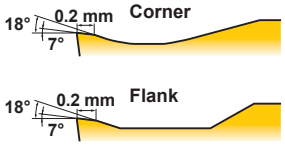
7° POSITIVE INSERTS WITH HOLE

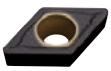
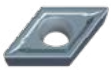
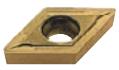
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	R/L 	**Chip breaker for finishing** Lead chip breaker. Excellent chip control at low feed rates.	Carbon Steel • Alloy Steel   WCGT020104R
	G	NEW R-SRF 	**Chip breaker for finishing** Lead chip breaker controls chip flow. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel, Stainless Steel, Difficult-to-Cut Materials   DCGT11T301MR-SRF
Light Cutting	M	LP 	**First recommendation for light cutting of carbon steel, alloy steel and mild steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel • Alloy Steel   CCMT09T308-LP
		LM 	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel   CCMT09T308-LM
		LS 	**First recommendation for light cutting of difficult-to-cut materials** Prevents welding of the insert and controls cloudy surface of the surface finish.	Difficult-to-Cut Materials   CCMT09T308-LS
	G	LS 	**First recommendation for light cutting of difficult-to-cut materials** Ideal for heat resistant alloys, titanium alloys and Cobalt chromium alloys. Parallel cutting edge. Achieves stable chip control in a wide range of areas from low to medium depths of cut.	Difficult-to-Cut Materials   CCGT09T304M-LS
		LS-P 	**First recommendation for light cutting of titanium alloys** Ideal for titanium alloys and Copper alloys. Parallel cutting edge. Achieves stable chip control in a wide range of areas from low to medium depths of cut. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloys   CCGT09T304M-LS-P
	M	SV 	**Alternative chip breaker for light cutting of carbon steel, alloy steel, mild steel and stainless steel** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel   CCMH060204-SV
		SW 	**Wiper insert for light cutting of carbon steel, alloy steel, mild steel and stainless steel** In comparison to conventional chip breakers, the surface finish is maintained even if the feed per revolution is doubled. Positive land improves sharpness.	Carbon Steel • Alloy Steel   CCMT09T304-SW

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round	Breaker Name and Cross Section
						WCGT_R/L  A151			R/L 
		DCGT_R-SRF NEW  A125							NEW R-SRF 
	CCMT_LP  A115	DCMT_LP  A125	SCMT_LP  A132	TCMT_LP  A136	VCMT_LP  A145				LP 
	CCMT_LM  A116	DCMT_LM  A125	SCMT_LM  A132	TCMT_LM  A136	VCMT_LM  A146				LM 
	CCMT_LS  A116	DCMT_LS  A125		TCMT_LS  A136	VCMT_LS  A146				LS(M) 
	CCGT_LS  A116	DCGT_LS  A125			VCGT_LS  A146				LS(G) 
	CCGT_LS-P  A116	DCGT_LS-P  A125			VCGT_LS-P  A146				LS-P 
	CCMH_SV  A116	DCMT_SV  A125			VCMT_SV  A146				SV 
	CCMT_SW  A116								SW 

CLASSIFICATION

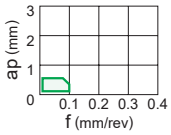
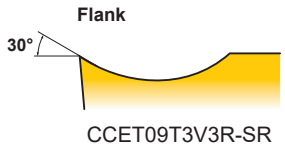
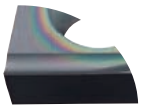
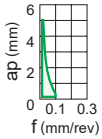
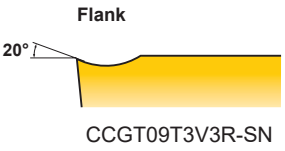
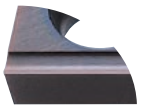
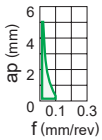
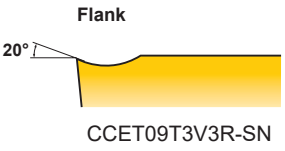
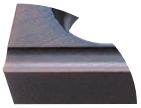
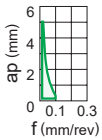
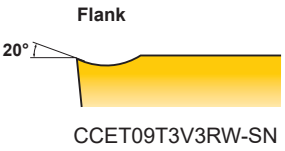
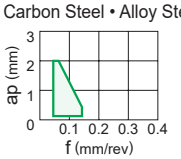
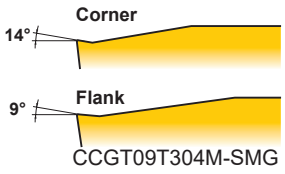
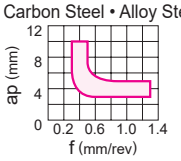
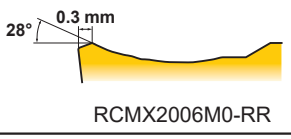
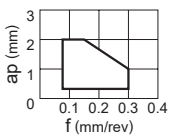
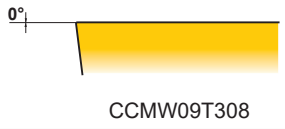
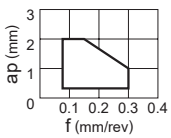
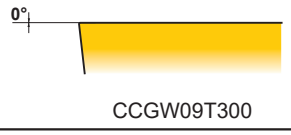
7° POSITIVE INSERTS WITH HOLE

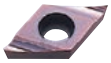
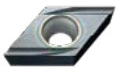
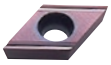
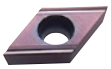
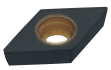
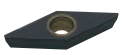
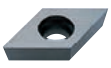
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	G	**R/L-SS** 	**Chip breaker for light cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low feed rates.	Carbon Steel • Alloy Steel   CCGT09T302R-SS
Medium Cutting	M	**MP** 	**First recommendation for medium cutting of carbon steel, alloy steel and mild steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Carbon Steel • Alloy Steel   CCMT09T308-MP
		MM 	**First recommendation for medium cutting of stainless steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Stainless Steel   CCMT09T308-MM
		MK 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron   CCMT09T308-MK
		MS 	**First recommendation for medium cutting of difficult-to-cut materials** A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Difficult-to-Cut Materials   CCMT09T308-MS
		Standard 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel • Alloy Steel   CCMT09T308 Carbon Steel • Alloy Steel   RCMX1204M0
		MV 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert and the large rake angle achieve sharp cutting edge performance. The double breakers and round shape in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel   CCMH060204-MV
		MW 	**Wiper insert for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel • Alloy Steel   CCMT09T308-MW

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round	Breaker Name and Cross Section
	CCGT_R/L-SS  A117	DCGT_R/L-SS  A126							R/L-SS 
	CCMT_MP  A117	DCMT_MP  A126	SCMT_MP  A132	TCMT_MP  A136	VCMT_MP  A146				MP 
	CCMT_MM  A117	DCMT_MM  A127	SCMT_MM  A133	TCMT_MM  A137	VCMT_MM  A147				MM 
	CCMT_MK  A117	DCMT_MK  A127	SCMT_MK  A133	TCMT_MK  A137	VCMT_MK  A147				MK 
	CCMT_MS  A118	DCMT_MS  A127	SCMT_MS  A133	TCMT_MS  A137	VCMT_MS  A147				MS 
	CCMT  A118	DCMT  A127	SCMT  A133	TCMT  A137	VCMT  A147	WCMT  A151		RCMT  A131	Standard
								RCMX  A131	
	CCMH_MV  A118	DCMT_MV  A127			VCMT_MV  A147				MV 
	CCMT_MW A118								MW

CLASSIFICATION

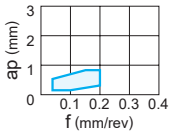
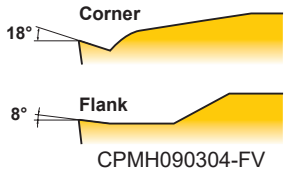
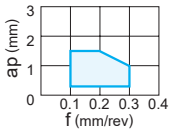
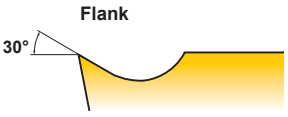
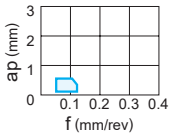
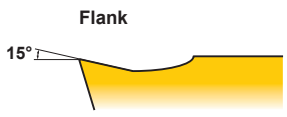
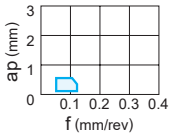
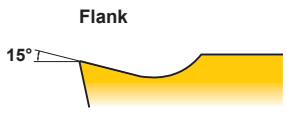
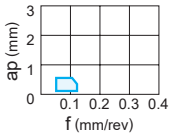
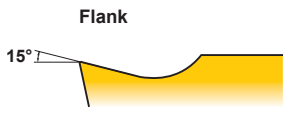
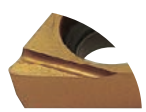
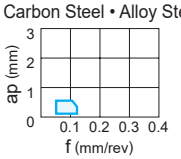
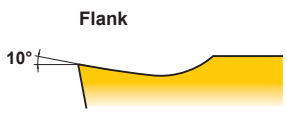
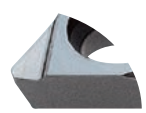
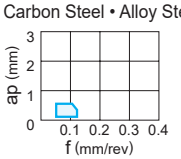
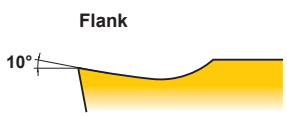
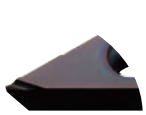
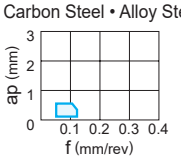
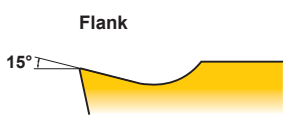
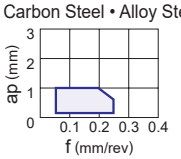
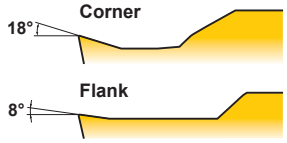
7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	E	R/L-SR 	**Chip breaker for medium cutting of automatic lathe machining** A wide lead chip breaker. Insert designed for low resistance chip control.	Carbon Steel • Alloy Steel   CCET09T3V3R-SR
	G	R/L-SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates.	Carbon Steel • Alloy Steel   CCGT09T3V3R-SN
	E	R/L-SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates. Suitable for precise machining with E class tolerance.	Carbon Steel • Alloy Steel   CCET09T3V3R-SN
		R/LW-SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates. The wiper produces a good surface finish.	Carbon Steel • Alloy Steel   CCET09T3V3RW-SN
	G	SMG 	**Chip breaker for medium cutting of automatic lathe machining** 3D moulded chip breaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel • Alloy Steel   CCGT09T304M-SMG
Heavy Cutting	M	RR 	**Chip breaker for heavy cutting of carbon steel and alloy steel** A wide groove chip breaker prevents chips from jamming at large depths of cut. Small dimples improve chip control at small depths of cut.	Carbon Steel • Alloy Steel   RCMX2006M0-RR
For Cast Iron	M	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron   CCMW09T308
	G	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   CCGW09T300

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round	Breaker Name and Cross Section
	CCET_R/L-SR  A119	DCET_R/L-SR  A127							R/L-SR 
	CCGT_R/L-SN  A119	DCGT_R/L-SN  A128							R/L-SN(G) 
	CCET_R/L-SN  A120	DCET_R/L-SN  A129							R/L-SN(E) 
	CCET_R/LW-SN  A120	DCET_R/LW-SN  A129							R/LW-SN 
	CCGT_SMG  A120	DCGT_SMG  A129							SMG 
								RCMX_RR  A131	RR 
	CCMW  A121	DCMW  A129	SCMW  A133	TCMW  A137	VCMW  A147				Flat Top(M) 
	CCGW  A121	DCGW  A129							Flat Top(G) 

CLASSIFICATION

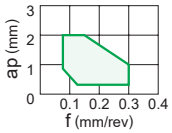
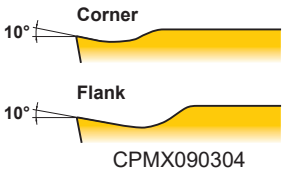
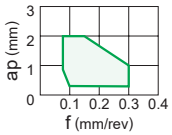
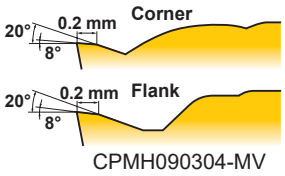
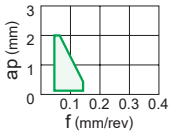
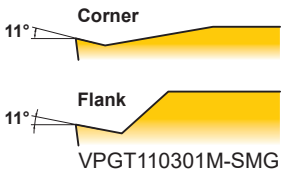
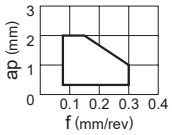
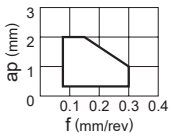
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M	**FV** 	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel   CPMH090304-FV
	G	**Standard** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	Aluminium Alloy   CPGT090304
	G	**R/L-FS** 	**Chip breaker for finishing carbon steel, alloy steel, stainless steel, cast iron and aluminium alloy** Small wide lead chip breaker. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   TPGH090204R-FS
	M	**R/L-F** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   CPMH090304R-F
	G	**R/L-F** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   CPGT090304R-F
		R/L 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel   TPGX090204R
	M	**L** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel   TPMX090204L
	E	**SRF** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   VPET080201R-SRF
Light Cutting	M	**SV** 	**First recommendation for light cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel   CPMH090304-SV

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CPMH_FV  A122			TPMH_FV  A139				FV 
	CPGT  A122							Standard 
				TPGH_R/L-FS  A139		WPGT_R/L-FS  A152		R/L-FS 
	CPMH_R/L-F  A122							R/L-F(M) 
	CPGT_R/L-F  A122							R/L-F(G) 
				TPGX_R/L  A140				R/L 
				TPMX_L  A140				L 
					VPET_R/L-SRF  A149			SRF 
	CPMH_SV  A122			TPMH_SV  A140				SV 

CLASSIFICATION

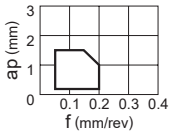
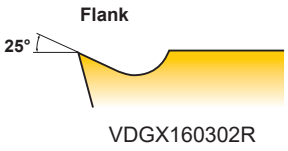
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M	**Standard** 	**Alternative chip breaker for medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chip breaker.	Carbon Steel • Alloy Steel   CPMX090304
	M	**MV** 	**First recommendation for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** A positive insert and large rake angle achieves sharp cutting edge performance. Double breakers in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel   CPMH090304-MV
	G	**SMG** 	**Chip breaker for medium cutting of automatic lathe machining** 3D moulded chip breaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel • Alloy Steel   VPGT110301M-SMG
For Cast Iron	M	**Flat Top** 	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron   SPMW120308
	G	**Flat Top** 	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   SPGX120308

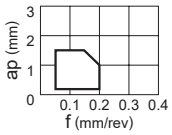
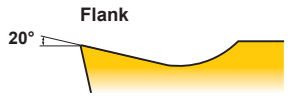
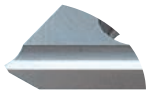
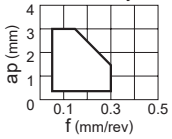
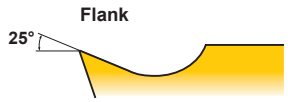
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
	CPMX  A123		SPMT  A134	TPMX  A141				Standard 
	CPMH_MV  A123			TPMH_MV  A141		WPMT_MV  A152		MV 
					VPGT_SMG  A149			SMG 
			SPMW  A134					Flat Top(M) 
			SPGX  A134	TPGX  A141				Flat Top(G) 

CLASSIFICATION

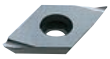
15° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminium Alloy	G	R/L 	**Chip breaker for aluminium alloy cutting** Lead chip breaker. Sharp cutting edge gives a good surface finish.	Aluminium Alloy   VDGX160302R

20° POSITIVE INSERTS WITH HOLE

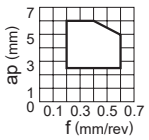
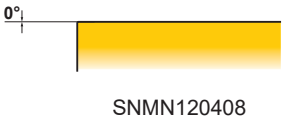
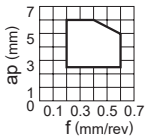
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminium Alloy	G	R/L-F 	**Chip breaker for aluminium alloy cutting** Lead chip breaker. Sharp cutting edge gives a good surface finish.	Aluminium Alloy   DEGX150402R-F
		R/L 	**Chip breaker for aluminium alloy cutting** A parallel chip breaker. Sharp cutting edge gives a good surface finish. Good chip control for medium feed rates.	Aluminium Alloy   DEGX150402R

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
					VDGX_R/L  A148			R/L 

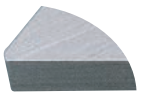
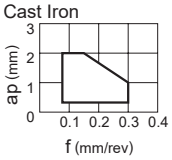
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round	Breaker Name and Cross Section
		DEGX_R/L-F  A130						R/L-F 
		DEGX_R/L  A130		TEGX_R/L  A138				R/L 

CLASSIFICATION

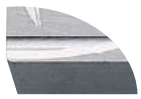
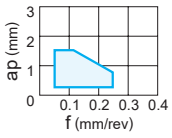
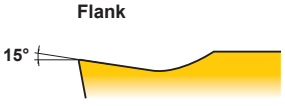
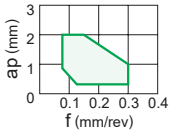
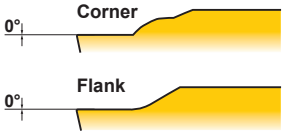
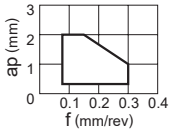
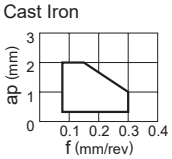
NEGATIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	M	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron   SNMN120408
	G	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   SNGN120408

7° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	G	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   TCGN090204

11° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	R/L 	**Chip breaker for finishing** A parallel chip breaker. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel   SPGR090304R
Light to Medium Cutting	M	Standard 	**Chip breaker for light to medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chip breaker.	Carbon Steel • Alloy Steel   SPMR090308
For Cast Iron	M	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron   SPMN090308
	G	Flat Top 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   SPGN090308

SPECIAL PURPOSE INSERTS

Application	Tolerance	Tool Holder Type	Inserts
Special	G	TL Type	RTG  A154

	Rhombic 80°	Square 90°	Triangular 60°	Breaker Name and Cross Section
	CNMN  A111	SNMN  A112	TNMN  A113	Flat Top(M) 
		SNGN  A112	TNGN  A113	Flat Top(G) 

	Rhombic 80°	Square 90°	Triangular 60°	Breaker Name and Cross Section
			TCGN  A156	Flat Top 

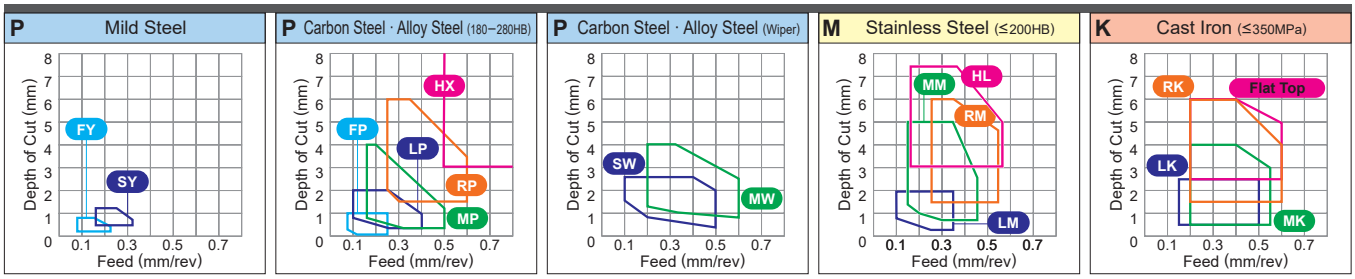
	Rhombic 80°	Square 90°	Triangular 60°	Breaker Name and Cross Section
		SPGR_R  A155	TPGR_R/L  A157	R/L 
		SPMR  A155	TPMR  A157	Standard 
		SPMN  A155	TPMN  A157	Flat Top(M) 
		SPGN  A155	TPGN  A157	Flat Top(G) 

80° CN TYPE INSERTS WITH HOLE

CNMG 12 04 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ◐ ● ✣ ○ ✣ ◐ ○ ○ ◔ ◔ ❁ ❁ ❁ ◐ ○ ○ ○ ○ ◔ ❁
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ◐ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP	**CNMG120402-FP**	0.2						▲	▲																					●			●						
	CNMG120404-FP	0.4						▲	▲																					●			●						
	CNMG120408-FP	0.8						▲	▲																					●			●						
	CNMG120412-FP	1.2						▲	▲																					●			●						
Finish Cutting																																							
FH	**CNMG120402-FH**	0.2		▲	▲																									●			●	●					
	CNMG120404-FH	0.4		▲	▲																									●	●		●						
	CNMG120408-FH	0.8		▲																										●	●		●						
	CNMG120412-FH	1.2																													●		●						
Finish Cutting																																							
FS	**CNMG120404-FS**	0.4			▲																												●						
	CNMG120408-FS	0.8																															●						
Finish Cutting																																							
FY	**CNMG120404-FY**	0.4			▲																									●		●	●						
	CNMG120408-FY	0.8			▲																									●		●	●						
Finish Cutting																																							
FJ	**CNGG1204V5-FJ**	0.05																										●										●	
	CNGG120401-FJ	0.1																										●										●	
	CNGG120402-FJ	0.2																										●										●	
	CNGG120404-FJ	0.4																										●	●									●	
	CNGG120408-FJ	0.8																										●	●									●	
Finish Cutting																																							
LP	**CNMG120404-LP**	0.4	▲	▲		●	●	▲	▲	▲																				●									
	CNMG120408-LP	0.8	▲	▲		●	●	▲	▲	▲																				●									
	CNMG120412-LP	1.2	▲	▲		●	●	▲	▲	▲																													
Light Cutting																																							

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
P	Steel		○	◔	❁	●	✣	◔	❁	✣	❁	●																❁	❁	◐	○	○	○	○	◔	❁				
M	Stainless Steel												●	◐	✣	○	✣											◔	❁	❁		○	○	○			❁				
K	Cast Iron																	●	◐	○	◔	◔						◔	❁			○	○	○			❁	○	◔		
N	Non-ferrous Metal																																				◔		
S	Heat resistant Alloy, Titanium Alloy																						●	◐	✣	○	○	◔	❁								◔	◐	◐

Shape	Order Number	RE (mm)																																					
LM	**CNMG120404-LM**	0.4											●	●	●																								
	CNMG120408-LM	0.8											●	●	●																								
	CNMG120412-LM	1.2											●	●	●																								
Light Cutting																																							
LK	**CNMG120404-LK**	0.4																▲	▲																				
	CNMG120408-LK	0.8																▲	▲			●																	
	CNMG120412-LK	1.2																▲	▲			●																	
Light Cutting																																							
LS	**CNMG090304-LS**	0.4																					●	●	●														
	CNMG090308-LS	0.8																					●	●	●														
	CNMG120402-LS	0.2																					●	●	●														●
	CNMG120404-LS	0.4																					●	●	●														●
Light Cutting	**CNMG120408-LS**	0.8																					●	●	●														●
SH	**CNMG09T304-SH**	0.4		▲												●																						
	CNMG09T308-SH	0.8		▲																																		
	CNMG120404-SH	0.4	▲	▲	▲	●	●	▲	▲							●															●			●	●				
	CNMG120408-SH	0.8	▲	▲	▲	●	●	▲	▲							●															●			●	●				
Light Cutting	**CNMG120412-SH**	1.2	▲	▲	▲	●	●	▲	▲																														
SA	**CNMG120404-SA**	0.4	▲	▲	▲	●	●	▲	▲																									●	●				
	CNMG120408-SA	0.8	▲	▲	▲	●	●	▲	▲																									●	●				
	CNMG120412-SA	1.2	▲	▲	▲	●	●	▲	▲																										●				
Light Cutting																																							
*1 **SW**	**CNMG120404-SW**	0.4	▲	▲		●	●	▲							▲			▲	▲												●			●	●				
	CNMG120408-SW	0.8	▲	▲		●	●	▲										▲	▲												●			●	●				
	CNMG120412-SW	1.2	▲	▲		●	●	▲																							●			●	●				
Light Cutting (Wiper)																																							
SY	**CNMG120404-SY**	0.4			▲																										●		●	●					
	CNMG120408-SY	0.8			▲																										●		●	●					
Light Cutting																																							
MJ	**CNMG120404-MJ**	0.4																					●	●		●	●	●											●
	CNMG120408-MJ	0.8																					●	●		●	●	●											●
	CNMG120412-MJ	1.2																					●	●		●	●	●											
	CNMG120416-MJ	1.6																					●	●		●	●	●											
Light Cutting																																							
MJ	**CNGG120404-MJ**	0.4																									●	●									●	●	
	CNGG120408-MJ	0.8																									●	●									●	●	
Light Cutting																																							

*1 Please refer to A028 before using the SW breaker (wiper insert).

● = NEW

Scan here for product NEWS ▶

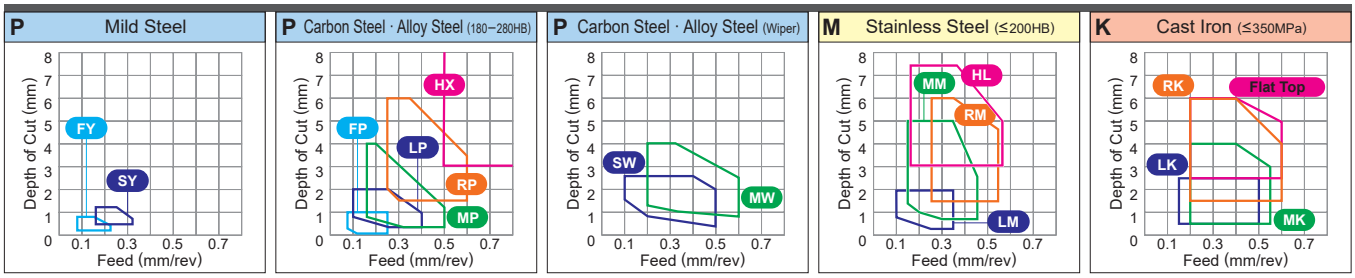
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMG 12 04 04- MP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ● ◐ ○ ○ ◔ ○ ◔ ❁ ❁ ❁ ◐ ○ ○ ◔ ❁ ○ ○ ◔
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ○ ○ ❁ ○ ◔ ● ◐ ✣ ○ ○ ◔ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MP	CNMG120404-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																				●								
	CNMG120408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																				●								
	CNMG120412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲										▲										●								
	CNMG120416-MP	1.6	▲	▲	▲	●	●	▲	▲	▲																												
	CNMG160608-MP	0.8	▲	▲	▲	●	●		▲																													
	CNMG160612-MP	1.2	▲	▲	▲	●	●		▲																													
Medium Cutting	CNMG160616-MP	1.6	▲	▲	▲	●	●		▲																													
MM	CNMG120408-MM	0.8											●	●	●																								
	CNMG120412-MM	1.2											●	●	●																								
	CNMG120416-MM	1.6											●	●	●																								
	CNMG160608-MM	0.8											●	●	●																								
	CNMG160612-MM	1.2											●	●	●																								
	CNMG160616-MM	1.6											●	●	●																								
	CNMG190608-MM	0.8											●	●	●																								
	CNMG190612-MM	1.2											●	●	●																								
Medium Cutting	CNMG190616-MM	1.6											●	●	●																								
MK	CNMG120404-MK	0.4																▲	▲																				
	CNMG120408-MK	0.8																▲	▲																				
	CNMG120412-MK	1.2																▲	▲																				
	CNMG120416-MK	1.6																▲	▲																				
	CNMG160608-MK	0.8																▲	▲																				
	CNMG160612-MK	1.2																▲	▲																				
	CNMG160616-MK	1.6																▲	▲																				
	CNMG190612-MK	1.2																▲	▲																				
Medium Cutting	CNMG190616-MK	1.6																▲	▲																				
*1 **MS**	CNMG090304-MS	0.4																					●	●	●														
	CNMG090308-MS	0.8																					●	●	●														
	CNMG120404-MS	0.4																					●	●	●														●
	CNMG120408-MS	0.8																					●	●	●														●
	CNMG120412-MS	1.2																					●	●	●														●
	CNMG160612-MS	1.2																					●	●	●														●
Medium Cutting	CNMG160616-MS	1.6																					●	●	●														●

*1 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MS	**CNMG090304-MS**	0.4														●																						
	CNMG090308-MS	0.8		▲												●																						
	CNMG09T304-MS	0.4														●																			●			
	CNMG09T308-MS	0.8		▲												●																						
	CNMG120404-MS	0.4		▲	▲										▲	●									●	●	●	●	●							●	●	
	CNMG120408-MS	0.8		▲	▲										▲	●									●	●	●	●	●						●	●	●	
	CNMG120412-MS	1.2		▲											▲	●									●	●	●	●									●	
	CNMG160608-MS	0.8														●																						
	CNMG160612-MS	1.2														●																						
Medium Cutting	**CNMG190612-MS**	1.2														●																						
	CNMG190616-MS	1.6														●																						
GK	**CNMG120404-GK**	0.4																▲	▲																			
	CNMG120408-GK	0.8																▲	▲			●																
	CNMG120412-GK	1.2																▲	▲			●																
Medium Cutting																																						
GM	**CNMG120404-GM**	0.4											●	●	●																							
	CNMG120408-GM	0.8											●	●	●																							
	CNMG120412-GM	1.2											●	●	●																							
Medium Cutting																																						
MA	**CNMG120404-MA**	0.4	▲	▲	▲	●	●	▲	▲					●	●	●	●	▲	▲	▲				●	●				●					●				
	CNMG120408-MA	0.8	▲	▲	▲	●	●	▲	▲	▲				●	●	●	●	▲	▲	▲	▲	●		●	●				●					●				
	CNMG120412-MA	1.2	▲	▲	▲	●	●	▲	▲	▲				●	●	▲	●	▲	▲	▲		●		●	●				●					●				
	CNMG120416-MA	1.6	▲	▲	▲	●	●										●							●	●													
	CNMG160608-MA	0.8	▲	▲	▲	●	●	▲	▲	▲							●																						
	CNMG160612-MA	1.2	▲	▲	▲	●	●	▲	▲	▲						▲	●																						
	CNMG160616-MA	1.6	▲	▲		●	●	▲	▲	▲							●																						
	CNMG190612-MA	1.2	▲	▲	▲	●	●	▲	▲	▲							●		▲																				
Medium Cutting	**CNMG190616-MA**	1.6		▲	▲	●	●	▲	▲	▲							●																						
MH	**CNMG120404-MH**	0.4	▲	▲	▲	●	●									▲																						
	CNMG120408-MH	0.8	▲	▲	▲	●	●	▲	▲	▲						▲																						
	CNMG120412-MH	1.2	▲	▲	▲	●	●	▲	▲	▲																												
	CNMG120416-MH	1.6	▲	▲	▲	●	●																															
	CNMG160608-MH	0.8	▲	▲		●	●																															
	CNMG160612-MH	1.2	▲	▲	▲	●	●	▲	▲	▲																												
	CNMG160616-MH	1.6	▲	▲		●	●																															
	CNMG190612-MH	1.2	▲	▲	▲	●	●	▲	▲	▲																												
Medium Cutting	**CNMG190616-MH**	1.6	▲	▲	▲	●	●																															

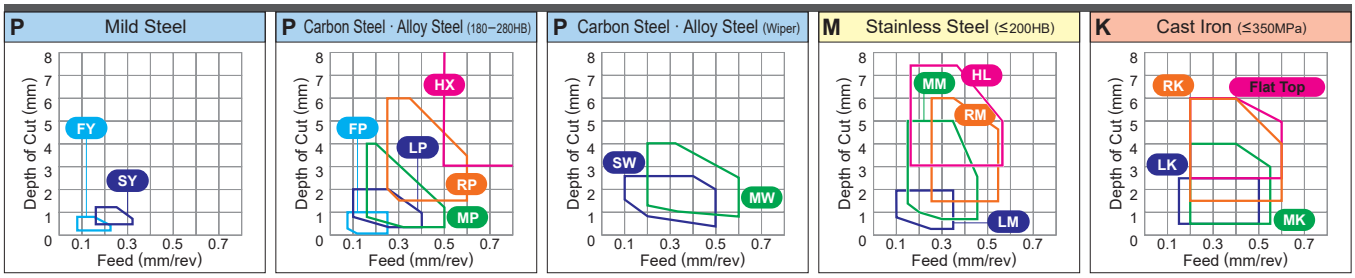
● = NEW

80° CN TYPE INSERTS WITH HOLE

CNMG 09 03 08
Size / Thickness / Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ● ● ◐ ✣ ○ ✣ ● ◐ ○ ◔ ◔ ❁ ❁ ❁ ◐ ○ ○ ○ ◔ ❁
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
Standard	**CNMG090308**	0.8	▲																																		
	CNMG09T304	0.4	▲					▲	▲																								●				
	CNMG09T308	0.8	▲					▲	▲																								●				
	CNMG120404	0.4	▲	▲	▲	●	●	▲	▲											▲	▲										●			●	●	●		●		
	CNMG120408	0.8	▲	▲	▲	●	●	▲	▲	▲										▲	▲								●		●			●		●		●		
	CNMG120412	1.2	▲	▲	▲	●	●	▲	▲	▲										▲	▲								●					●						
	CNMG120416	1.6	▲	▲		●	●	▲	▲											▲																			
	CNMG160608	0.8	▲	▲	▲	●	●	▲	▲	▲																													
	CNMG160612	1.2	▲	▲	▲	●	●	▲	▲	▲										▲	▲																			
	CNMG160616	1.6	▲	▲		●	●	▲	▲	▲										▲																			
	CNMG190608	0.8	▲	▲	▲	●	●	▲	▲	▲																													
	CNMG190612	1.2	▲	▲	▲	●	●	▲	▲	▲										▲																			
Medium Cutting	**CNMG190616**	1.6	▲	▲	▲	●	●	▲	▲	▲																													
*1 **MW**	**CNMG120408-MW**	0.8	▲	▲	▲	●	●	▲	▲							▲		▲	▲	▲																			
	CNMG120412-MW	1.2	▲	▲	▲	●	●	▲	▲									▲	▲	▲																			
Medium Cutting (Wiper)																																							
RP	**CNMG120408-RP**	0.8	▲	▲		●	●	▲	▲	▲																													
	CNMG120412-RP	1.2	▲	▲		●	●	▲	▲	▲																													
	CNMG120416-RP	1.6	▲	▲		●	●	▲	▲	▲																													
	CNMG160612-RP	1.2	▲	▲		●	●	▲	▲	▲																													
	CNMG160616-RP	1.6	▲	▲		●	●	▲	▲	▲																													
	CNMG190612-RP	1.2	▲	▲		●	●	▲	▲	▲																													
Rough Cutting	**CNMG190616-RP**	1.6	▲	▲		●	●	▲	▲	▲																													
RM	**CNMG120408-RM**	0.8											●	●	●																								
	CNMG120412-RM	1.2											●	●	●																								
	CNMG120416-RM	1.6											●	●	●																								
	CNMG160612-RM	1.2											●	●	●																								
	CNMG160616-RM	1.6											●	●	●																								
	CNMG190612-RM	1.2											●	●	●																								
Rough Cutting	**CNMG190616-RM**	1.6											●	●	●																								

*1 Please refer to A028 before using the MW breaker (wiper insert).

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
RK	CNMG120408-RK	0.8																▲ ▲			●																
	CNMG120412-RK	1.2																▲ ▲			●																
	CNMG120416-RK	1.6																▲ ▲																			
	CNMG160608-RK	0.8																▲ ▲																			
	CNMG160612-RK	1.2																▲ ▲																			
	CNMG160616-RK	1.6																▲ ▲																			
	CNMG190612-RK	1.2																▲ ▲																			
Rough Cutting	CNMG190616-RK	1.6																▲ ▲																			
RS	CNMG120408-RS	0.8																					● ●														●
	CNMG120412-RS	1.2																					● ●														●
	CNMG120416-RS	1.6																					● ●														●
	CNMG160612-RS	1.2																					● ●														●
	CNMG160616-RS	1.6																					● ●														●
	CNMG190612-RS	1.2																					● ●														●
Rough Cutting	CNMG190616-RS	1.6																					● ●														●
GH	CNMG120408-GH	0.8	▲ ▲ ▲			● ●										▲ ●				▲ ▲																	
	CNMG120412-GH	1.2	▲ ▲ ▲			● ●										●				▲ ▲																	
	CNMG120416-GH	1.6	▲ ▲			● ●														▲ ▲																	
	CNMG160612-GH	1.2	▲ ▲ ▲			● ●										●				▲ ▲																	
	CNMG160616-GH	1.6	▲ ▲			● ●														▲ ▲																	
	CNMG190612-GH	1.2	▲ ▲ ▲			● ●										●				▲ ▲																	
Rough Cutting	CNMG190616-GH	1.6	▲ ▲ ▲			● ●										●				▲ ▲																	
GJ	CNMG120408-GJ	0.8																							●		● ●										●
	CNMG120412-GJ	1.2																							●		● ●										●
	CNMG120416-GJ	1.6																							●		● ●										●
	CNMG160612-GJ	1.2																							●		●										●
	CNMG190612-GJ	1.2																							●		●										●
Rough Cutting	CNMG190616-GJ	1.6																							●		●										●
HX	CNMM120408-HX	0.8							▲ ▲																												
	CNMM120412-HX	1.2							▲ ▲																												
	CNMM160612-HX	1.2							▲ ▲																												
	CNMM160616-HX	1.6							▲ ▲																												
	CNMM190612-HX	1.2		▲ ▲					▲ ▲	●																											
	CNMM190616-HX	1.6		▲ ▲					▲ ▲	●																											
	CNMM190624-HX	2.4		▲ ▲					▲ ▲	●																											
Heavy Cutting	CNMM250924-HX	2.4		▲ ▲					▲ ▲	●																											
HL	CNMM120408-HL	0.8							▲ ▲							●																					
	CNMM120412-HL	1.2							▲ ▲							●																					
	CNMM120416-HL	1.6							▲																												
	CNMM160612-HL	1.2							▲ ▲							●																					
	CNMM160616-HL	1.6							▲ ▲							●																					
	CNMM190612-HL	1.2							▲ ▲							●																					
	CNMM190616-HL	1.6							▲ ▲							●																					
Heavy Cutting	CNMM190624-HL	2.4							▲ ▲							●																					

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

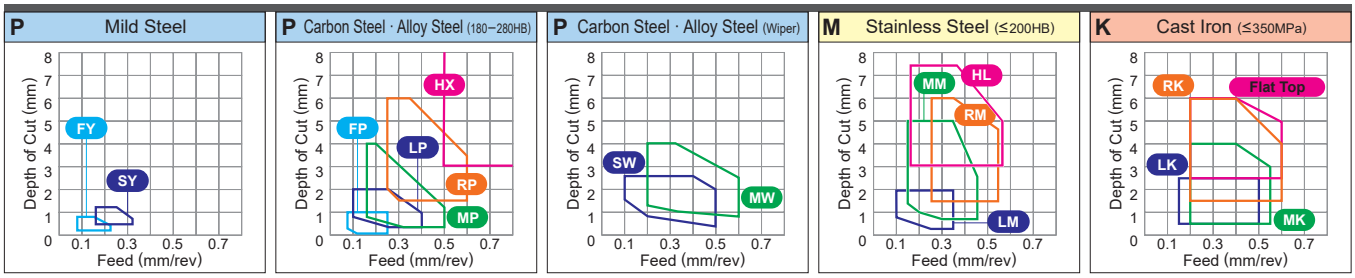
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMM 25 09 24- HR
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9015
HR	CNMM250924-HR	2.4							▲	▲																													
Heavy Cutting																																								
HV	CNMM190616-HV	1.6		▲	▲				▲	▲	●																												
	CNMM190624-HV	2.4		▲	▲				▲	▲	●																												
	CNMM250924-HV	2.4		▲	▲				▲	▲	●																												
Heavy Cutting																																							
HZ	CNMM120408-HZ	0.8		▲	▲				▲	▲																												
	CNMM120412-HZ	1.2		▲	▲				▲	▲																												
	CNMM120416-HZ	1.6								▲																												
	CNMM160612-HZ	1.2		▲	▲																																
	CNMM160616-HZ	1.6		▲	▲																																
	CNMM190612-HZ	1.2		▲	▲						●																												
Heavy Cutting	CNMM190616-HZ	1.6		▲	▲						●																												
HM	CNMM160612-HM	1.2							▲	▲							●																						
	CNMM160616-HM	1.6							▲	▲							●																						
	CNMM190612-HM	1.2							▲	▲							●																						
	CNMM190616-HM	1.6							▲	▲							●																						
	CNMM190624-HM	2.4							▲	▲							●																						
Heavy Cutting	CNMM250924-HM	2.4							▲	▲																													
Flat Top	CNMA120404	0.4																▲	▲	▲																●	●		
	CNMA120408	0.8																▲	▲	▲	▲	●														●	●		
	CNMA120412	1.2																▲	▲	▲	▲	●																	
	CNMA120416	1.6																▲	▲	▲																			
	CNMA160612	1.2																▲	▲	▲	▲																		
	CNMA160616	1.6																▲	▲	▲	▲																		
	CNMA190612	1.2																▲	▲	▲																			
	CNMA190616	1.6																▲	▲	▲	▲																		
	CNMA190624	2.4																▲	▲																				

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

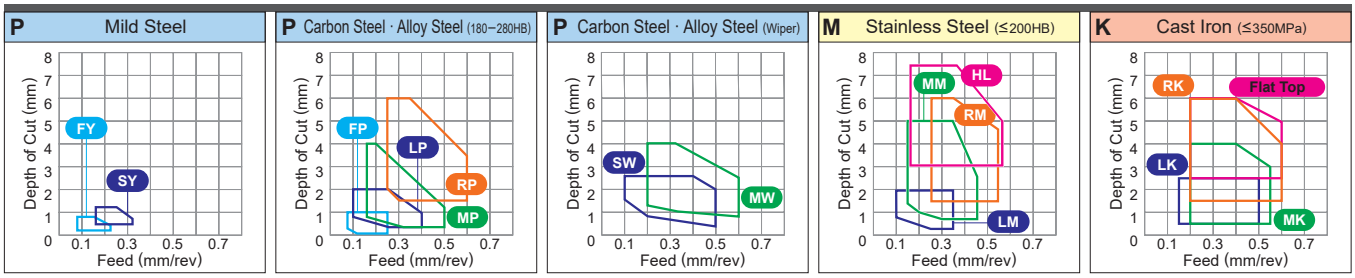
**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

55° DN TYPE INSERTS WITH HOLE

DNMG 15 04 02- FP
Size · Thickness · Corner Radius · Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy

Shape	Order Number	RE (mm)	Coated																							Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP	**DNMG150402-FP**	0.2						▲	▲																					●			●						
	DNMG150404-FP	0.4						▲	▲																					●			●						
	DNMG150408-FP	0.8						▲	▲																					●			●						
	DNMG150412-FP	1.2						▲	▲																					●			●						
	DNMG150602-FP	0.2						▲	▲																					●			●						
	DNMG150604-FP	0.4						▲	▲																					●			●						
	DNMG150608-FP	0.8						▲	▲																					●			●						
Finish Cutting	**DNMG150612-FP**	1.2						▲	▲																					●			●						
FH	**DNMG150402-FH**	0.2		▲	▲																									●			●	●					
	DNMG150404-FH	0.4		▲																										●	●		●	●					
	DNMG150408-FH	0.8		▲																										●	●		●						
	DNMG150602-FH	0.2		▲	▲																									●			●	●					
	DNMG150604-FH	0.4		▲	▲																									●									
Finish Cutting	**DNMG150608-FH**	0.8		▲	▲																									●									
FS	**DNMG150404-FS**	0.4																															●						
	DNMG150408-FS	0.8			▲																												●						
Finish Cutting																																							
FY	**DNMG150404-FY**	0.4			▲																									●		●	●	●					
	DNMG150408-FY	0.8			▲																									●		●	●						
	DNMG150604-FY	0.4																												●									
Finish Cutting	**DNMG150608-FY**	0.8			▲																									●									
FJ	**DNGG150404-FJ**	0.4																										●	●									●	
	DNGG150408-FJ	0.8																										●	●									●	
Finish Cutting																																							

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

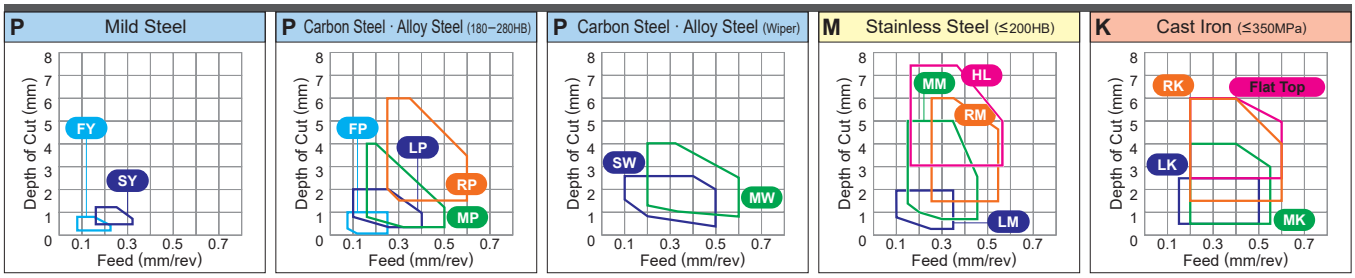
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNMG 11 04 04- LP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
LP	DNMG110404-LP	0.4	▲	▲				▲	▲	▲																				●								
	DNMG110408-LP	0.8	▲	▲				▲	▲	▲																				●								
	DNMG150404-LP	0.4	▲	▲		●	●	▲	▲	▲																				●								
	DNMG150408-LP	0.8	▲	▲		●	●	▲	▲	▲																				●								
	DNMG150412-LP	1.2	▲	▲		●	●	▲	▲	▲																				●								
	DNMG150604-LP	0.4	▲	▲		●	●	▲	▲	▲																				●								
	DNMG150608-LP	0.8	▲	▲		●	●	▲	▲	▲																				●								
Light Cutting	DNMG150612-LP	1.2	▲	▲		●	●	▲	▲	▲																													
LM	DNMG110404-LM	0.4											●	●	●																								
	DNMG110408-LM	0.8											●	●	●																								
	DNMG150404-LM	0.4											●	●	●																								
	DNMG150408-LM	0.8											●	●	●																								
	DNMG150412-LM	1.2											●	●	●																								
	DNMG150604-LM	0.4											●	●	●																								
	DNMG150608-LM	0.8											●	●	●																								
Light Cutting	DNMG150612-LM	1.2											●	●	●																								
LK	DNMG110408-LK	0.8																▲	▲																				
	DNMG150404-LK	0.4																▲	▲			●																	
	DNMG150408-LK	0.8																▲	▲																				
	DNMG150412-LK	1.2																▲	▲																				
	DNMG150604-LK	0.4																▲	▲																				
	DNMG150608-LK	0.8																▲	▲																				
Light Cutting	DNMG150612-LK	1.2																▲	▲																				
LS	DNMG150402-LS	0.2																					●	●	●														●
	DNMG150404-LS	0.4																					●	●	●														●
	DNMG150408-LS	0.8																					●	●	●														●
	DNMG150604-LS	0.4																					●	●	●														●
Light Cutting	DNMG150608-LS	0.8																					●	●	●														●

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◐ ●

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
SH	**DNMG110404-SH**	0.4	▲	▲												●																					
	DNMG110408-SH	0.8	▲	▲												●																					
	DNMG150404-SH	0.4	▲	▲	▲	●	●	▲	▲							●															●		●	●					
	DNMG150408-SH	0.8	▲	▲	▲	●	●	▲	▲							●															●		●	●					
	DNMG150412-SH	1.2	▲	▲	▲	●	●	▲	▲							●															●		●						
	DNMG150604-SH	0.4	▲	▲		●	●																																
	DNMG150608-SH	0.8	▲	▲		●	●																																
Light Cutting	**DNMG150612-SH**	1.2	▲	▲		●	●																																
SA	**DNMG150404-SA**	0.4	▲	▲	▲	●	●	▲	▲																									●	●					
	DNMG150408-SA	0.8	▲	▲	▲	●	●	▲	▲																									●	●					
	DNMG150412-SA	1.2	▲	▲	▲	●	●	▲	▲																										●					
	DNMG150604-SA	0.4	▲	▲	▲	●	●																												●					
	DNMG150608-SA	0.8	▲	▲	▲	●	●																												●					
Light Cutting	**DNMG150612-SA**	1.2	▲	▲	▲	●	●																												●					
*1 **SW**	**DNMX110404-SW**	0.4	▲					▲																															
	DNMX110408-SW	0.8	▲					▲																															
	DNMX150404-SW	0.4	▲	▲				▲																									●		●	●				
	DNMX150408-SW	0.8	▲	▲				▲																									●		●	●				
	DNMX150412-SW	1.2	▲	▲				▲																											●	●				
	DNMX150604-SW	0.4	▲	▲				▲																									●		●	●				
	DNMX150608-SW	0.8	▲	▲				▲																									●		●	●				
Light Cutting (Wiper)	**DNMX150612-SW**	1.2	▲	▲				▲																												●	●				
SY	**DNMG150404-SY**	0.4			▲																												●		●	●				
	DNMG150408-SY	0.8			▲																												●		●	●				
	DNMG150604-SY	0.4																															●							
	DNMG150608-SY	0.8			▲																												●							
Light Cutting																																								
MJ	**DNMG150404-MJ**	0.4																					●	●		●	●	●										●	
	DNMG150408-MJ	0.8																					●	●		●	●	●										●	
	DNMG150412-MJ	1.2																					●	●		●	●	●											
	DNMG150416-MJ	1.6																					●	●		●	●	●											
	DNMG150604-MJ	0.4																					●	●		●	●	●											
	DNMG150608-MJ	0.8																					●	●		●	●	●											
	DNMG150612-MJ	1.2																					●	●		●	●	●											
Light Cutting	**DNMG150616-MJ**	1.6																					●	●		●	●	●											
MJ	**DNGM150404-MJ**	0.4																									●	●									●	●	
	DNGM150408-MJ	0.8																									●	●									●	●	
Light Cutting																																							

*1 Please refer to A028 before using the SW breaker (wiper insert).

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

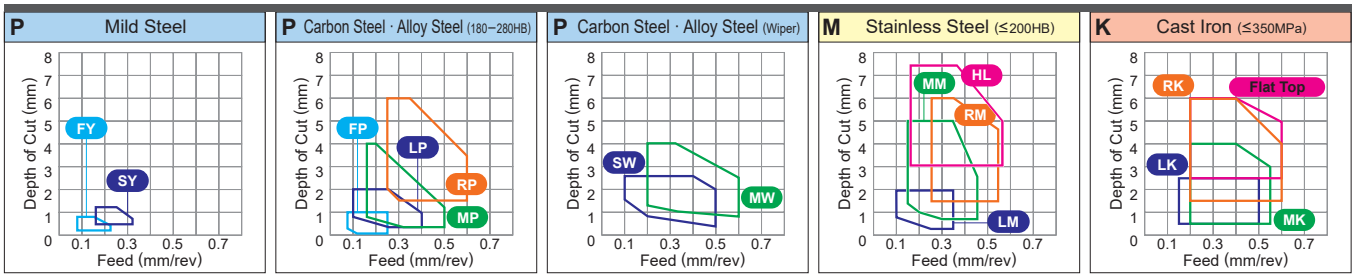
TURNING INSERTS [NEGATIVE]

55° DN TYPE INSERTS WITH HOLE

DNMG 15 04 04- MP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ● ✣ ◔ ✣ ✣ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ✣

Shape	Order Number	RE (mm)	Coated																								Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MP	DNMG150404-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																				●								
	DNMG150408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																				●								
	DNMG150412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																				●								
	DNMG150416-MP	1.6	▲	▲	▲	●	●	▲	▲	▲																												
	DNMG150604-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																				●								
	DNMG150608-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																				●								
	DNMG150612-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																				●								
Medium Cutting	DNMG150616-MP	1.6	▲	▲	▲	●	●	▲	▲	▲																												
MM	DNMG150408-MM	0.8											●	●	●																								
	DNMG150412-MM	1.2											●	●	●																								
	DNMG150608-MM	0.8											●	●	●																								
	DNMG150612-MM	1.2											●	●	●																								
Medium Cutting																																						
MK	DNMG110408-MK	0.8																▲	▲																				
	DNMG150404-MK	0.4																▲	▲																				
	DNMG150408-MK	0.8																▲	▲																				
	DNMG150412-MK	1.2																▲	▲																				
	DNMG150604-MK	0.4																▲	▲																				
	DNMG150608-MK	0.8																▲	▲																				
Medium Cutting	DNMG150612-MK	1.2																▲	▲																				
*1 **MS**	DNMG150404-MS	0.4																					●	●	●													●
	DNMG150408-MS	0.8																					●	●	●													●
	DNMG150412-MS	1.2																					●	●	●													●
	DNMG150604-MS	0.4																					●	●	●													●
	DNMG150608-MS	0.8																					●	●	●													●
Medium Cutting	DNMG150612-MS	1.2																					●	●	●													●
MS	DNMG110408-MS	0.8		▲													●									●												
	DNMG150404-MS	0.4		▲	▲												●									●	●	●										
	DNMG150408-MS	0.8		▲												▲	●									●	●	●	●								●	
	DNMG150412-MS	1.2		▲													●									●	●	●										
	DNMG150604-MS	0.4		▲													●									●	●	●		●								
	DNMG150608-MS	0.8		▲													●									●	●	●										
Medium Cutting	DNMG150612-MS	1.2		▲																						●	●	●										

*1 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	MC6115 NEW	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
	P	Steel	○	◔	❁	●	✣	◔	❁	✣	❁	●																	❁	❁	◐	○	○	○	○	◔	❁				
	M	Stainless Steel											●	◐	✣	○	✣											◔	❁	❁			○	○	○		❁				
	K	Cast Iron																●	◐	○	◔	◔						◔	❁			○	○	○		❁	○	◔			
	N	Non-ferrous Metal																																				◔			
	S	Heat resistant Alloy, Titanium Alloy																					●	◐	✣	○	○	◔	❁								◔	◐	◐	

Shape	Order Number	RE (mm)																																						
GK	**DNMG150404-GK**	0.4																▲▲			●																			
	DNMG150408-GK	0.8																▲▲																						
	DNMG150412-GK	1.2																▲▲																						
	DNMG150604-GK	0.4																▲▲																						
	DNMG150608-GK	0.8																▲▲																						
Medium Cutting	**DNMG150612-GK**	1.2																▲▲																						
GM	**DNMG150404-GM**	0.4											●	●	●																									
	DNMG150408-GM	0.8											●	●	●																									
	DNMG150412-GM	1.2											●	●	●																									
	DNMG150604-GM	0.4											●	●	●																									
	DNMG150608-GM	0.8											●	●	●																									
Medium Cutting	**DNMG150612-GM**	1.2											●	●	●																									
MA	**DNMG110404-MA**	0.4	▲▲					▲▲																															
	DNMG110408-MA	0.8	▲▲					▲▲																															
	DNMG110412-MA	1.2	▲▲					▲▲																															
	DNMG150404-MA	0.4	▲▲▲			●	●	▲▲						●	●	▲	●	▲▲▲						●	●				●						●						
	DNMG150408-MA	0.8	▲▲▲			●	●	▲▲▲						●	●	▲	●	▲▲▲						●	●				●						●						
	DNMG150412-MA	1.2	▲▲▲			●	●	▲▲▲						●	●		●	▲▲						●	●				●						●						
	DNMG150604-MA	0.4	▲▲▲			●	●	▲▲						●	●		●	▲▲						●	●				●						●						
	DNMG150608-MA	0.8	▲▲▲			●	●	▲▲▲						●	●		●	▲▲▲						●	●				●						●						
	DNMG150612-MA	1.2	▲▲▲			●	●	▲▲▲						●	●		●	▲▲▲						●	●				●						●						
Medium Cutting	**DNMG150616-MA**	1.6		▲																																				
MH	**DNMG150404-MH**	0.4	▲▲▲			●	●																																
	DNMG150408-MH	0.8	▲▲▲			●	●	▲▲▲																															
	DNMG150412-MH	1.2	▲▲▲			●	●	▲▲▲																															
	DNMG150604-MH	0.4	▲▲			●	●																																
	DNMG150608-MH	0.8	▲▲▲			●	●	▲▲▲																															
Medium Cutting	**DNMG150612-MH**	1.2	▲▲▲			●	●	▲▲▲																															
Standard	**DNMG110408**	0.8		▲																		●																		
	DNMG150404	0.4	▲▲▲			●	●	▲▲												▲▲											●			●	●		●			
	DNMG150408	0.8	▲▲▲			●	●	▲▲▲												▲▲									●		●			●	●		●			
	DNMG150412	1.2	▲▲▲			●	●	▲▲▲												▲									●					●						
	DNMG150416	1.6		▲				▲▲▲																															
	DNMG150604	0.4	▲▲▲			●	●	▲▲												▲											●			●						
	DNMG150608	0.8	▲▲▲			●	●	▲▲▲												▲▲									●		●			●						
	DNMG150612	1.2	▲▲▲			●	●	▲▲▲												▲									●											
Medium Cutting	**DNMG150616**	1.6		▲				▲▲▲																															
*1 **MW**	**DNMX150408-MW**	0.8	▲▲					▲										▲▲▲																					
	DNMX150412-MW	1.2	▲▲					▲										▲▲▲																					
	DNMX150608-MW	0.8	▲▲					▲								▲		▲▲▲																					
Medium Cutting (Wiper)	**DNMX150612-MW**	1.2	▲▲					▲										▲▲																					

*1 Please refer to A028 before using the MW breaker (wiper insert).

● = NEW

Scan here for product NEWS ▶

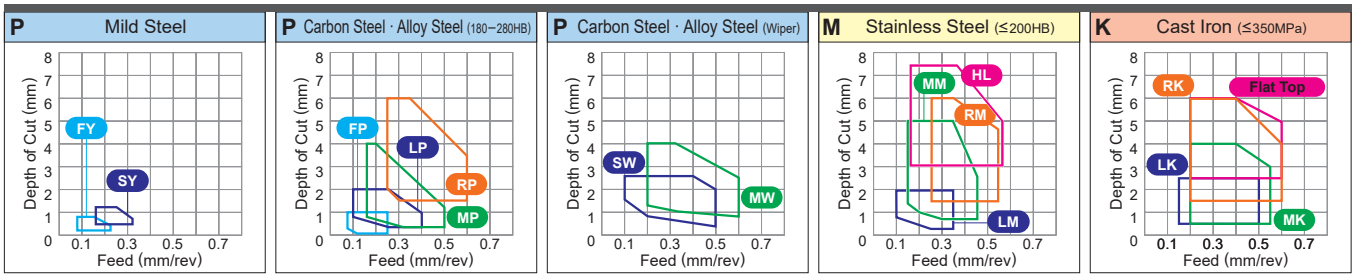
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNGG 15 04 04 R
Size / Thickness / Corner Radius / R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	VP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
R/L	DNGG150404R	0.4																														●	●	●		●		
	DNGG150404L	0.4																														●	●	●		●		
	DNGG150408R	0.8																														●	●	●				
	DNGG150408L	0.8																														●	●					
	DNGG150604R	0.4																															●	●				
	DNGG150604L	0.4																															●					
	DNGG150608R	0.8																															●					
Medium Cutting	DNGG150608L	0.8																															●					
RP	DNMG150408-RP	0.8	▲	▲		●	●	▲	▲	▲																												
	DNMG150412-RP	1.2	▲	▲		●	●	▲	▲	▲																												
	DNMG150416-RP	1.6	▲	▲		●	●	▲	▲	▲																												
	DNMG150608-RP	0.8	▲	▲		●	●	▲	▲	▲																												
	DNMG150612-RP	1.2	▲	▲		●	●	▲	▲	▲																												
Rough Cutting	DNMG150616-RP	1.6	▲	▲		●	●	▲	▲	▲																												
RM	DNMG150408-RM	0.8											●	●	●																								
	DNMG150412-RM	1.2											●	●	●																								
	DNMG150416-RM	1.6											●	●	●																								
	DNMG150608-RM	0.8											●	●	●																								
	DNMG150612-RM	1.2											●	●	●																								
Rough Cutting	DNMG150616-RM	1.6											●	●	●																								
RK	DNMG150408-RK	0.8																▲	▲																				
	DNMG150412-RK	1.2																▲	▲																				
	DNMG150608-RK	0.8																▲	▲																				
	DNMG150612-RK	1.2																▲	▲																				
Rough Cutting																																						
RS	DNMG150408-RS	0.8																						●	●														●
	DNMG150412-RS	1.2																						●	●														●
	DNMG150416-RS	1.6																						●	●														●
	DNMG150608-RS	0.8																						●	●														●
	DNMG150612-RS	1.2																						●	●														●
Rough Cutting	DNMG150616-RS	1.6																						●	●														●

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

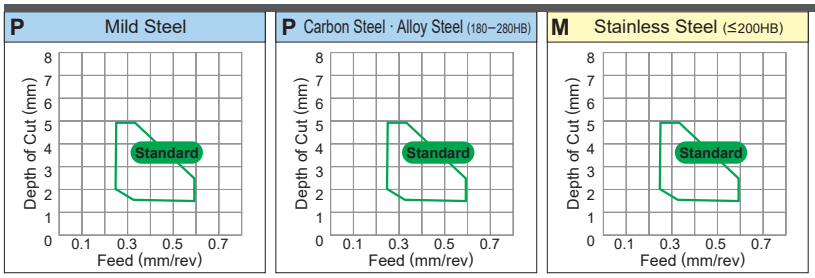
| Workpiece Material | | |

RN TYPE INSERTS WITH HOLE

RNMG 12 04 00
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····



●: Stable Cutting (1st recommendation) ◕: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																										Coated Cermet			Cermet		Carbide				
						NEW																																	
			UE6105	UE6110	UE6020	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
	P	Steel	○	◔	❁	●	✣	◔	❁	✣	❁	●																	❁	❁	◕	○	○	○	○	◔	❁				
	M	Stainless Steel											●	◕	✣	○	✣											◔	❁	❁		○	○	○	○		❁				
	K	Cast Iron																●	◕	○	◔	◔						◔	❁	❁		○	○	○	○		❁	○	◔		
	N	Non-ferrous Metal																																				◔		
	S	Heat resistant Alloy, Titanium Alloy																					●	◕	✣	○	○	◔	❁	❁								◔	◕	◕
Shape	Order Number	IC (mm)																																					
Standard	**RNMG120400**	12.7		▲	▲			▲	▲																														
Medium Cutting																																							

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

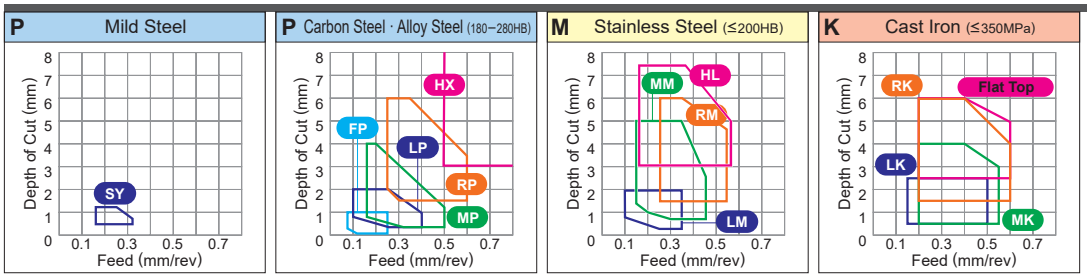
Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

90° SN TYPE INSERTS WITH HOLE

SNMG 12 04 04- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP  Finish Cutting	**SNMG120404-FP**	0.4						▲▲																						●			●						
	SNMG120408-FP	0.8						▲▲																						●			●						
	SNMG120412-FP	1.2						▲▲																						●			●						
FH  Finish Cutting	**SNMG090304-FH**	0.4																															●						
	SNMG090308-FH	0.8																															●						
	SNMG120404-FH	0.4		▲																										●			●						
	SNMG120408-FH	0.8		▲																										●									
FS  Finish Cutting	**SNMG120408-FS**	0.8																															●						
LP  Light Cutting	**SNMG120404-LP**	0.4	▲▲			●●		▲▲▲																						●									
	SNMG120408-LP	0.8	▲▲			●●		▲▲▲																						●									
	SNMG120412-LP	1.2	▲▲			●●		▲▲▲																															
LM  Light Cutting	**SNMG120404-LM**	0.4											●●●																										
	SNMG120408-LM	0.8											●●●																										
LK  Light Cutting	**SNMG120408-LK**	0.8																▲▲																					
	SNMG120412-LK	1.2																▲▲																					

● = NEW

Scan here for product NEWS ▶

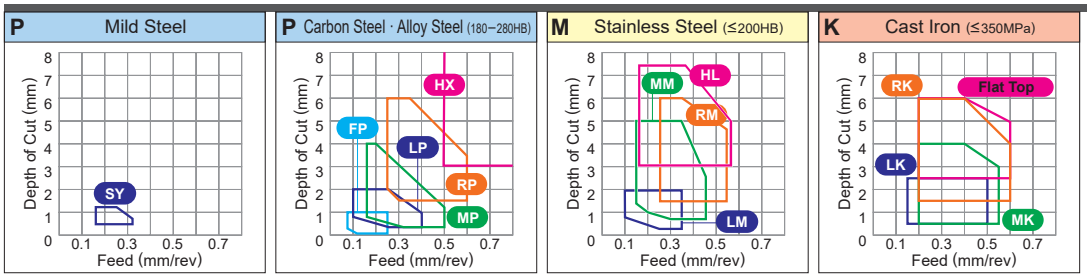
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMG 12 04 04- SH
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9015
SH	SNMG120404-SH	0.4	▲																																					
	SNMG120408-SH	0.8	▲	▲	▲	●	●																											●							
	SNMG120412-SH	1.2		▲	▲																																			
Light Cutting																																									
SA	SNMG120404-SA	0.4	▲																															●							
	SNMG120408-SA	0.8	▲	▲	▲	●	●																											●							
	SNMG120412-SA	1.2		▲	▲																													●							
Light Cutting																																									
SY	SNMG120408-SY	0.8			▲																													●							
Light Cutting																																									
MP	SNMG120404-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																								●							
	SNMG120408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																								●							
	SNMG120412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																								●							
Medium Cutting																																									
MM	SNMG120408-MM	0.8											●	●	●																										
	SNMG120412-MM	1.2											●	●	●																										
	SNMG120416-MM	1.6											●	●	●																										
	SNMG150608-MM	0.8											●	●	●																										
	SNMG150612-MM	1.2											●	●	●																										
	SNMG150616-MM	1.6											●	●	●																										
	SNMG190612-MM	1.2											●	●	●																										
Medium Cutting	SNMG190616-MM	1.6											●	●	●																										

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✤ ◔ ❁ ✤ ❁ ●
M	Stainless Steel	● ◐ ✤ ○ ✤
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✤ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MK	**SNMG120408-MK**	0.8																▲ ▲																			
	SNMG120412-MK	1.2																▲ ▲																			
	SNMG120416-MK	1.6																▲ ▲																			
	SNMG150612-MK	1.2																▲ ▲																			
	SNMG150616-MK	1.6																▲ ▲																			
	SNMG190612-MK	1.2																▲ ▲																			
Medium Cutting	**SNMG190616-MK**	1.6																▲ ▲																			
*1 **MS**	**SNMG120404-MS**	0.4																					● ●	●													●
	SNMG120408-MS	0.8																					● ●	●													●
	SNMG120412-MS	1.2																					● ●	●													●
	SNMG150612-MS	1.2																					● ●	●													●
	SNMG150616-MS	1.6																					● ●	●													●
Medium Cutting	**SNMG190612-MS**	1.2																					● ●	●													●
MS	**SNMG090304-MS**	0.4															●																				
	SNMG090308-MS	0.8															●																				
	SNMG120404-MS	0.4		▲													●																				
	SNMG120408-MS	0.8		▲ ▲												▲	●								●	● ● ● ●									●		●	
	SNMG120412-MS	1.2		▲													●								●	● ● ●											
	SNMG120416-MS	1.6															●																				
Medium Cutting	**SNMG190616-MS**	1.6															●																				
GK	**SNMG120404-GK**	0.4																▲ ▲			●																
	SNMG120408-GK	0.8																▲ ▲																			
	SNMG120412-GK	1.2																▲ ▲			●																
Medium Cutting																																					
GM	**SNMG120404-GM**	0.4											●	●	●																						
	SNMG120408-GM	0.8											●	●	●																						
	SNMG120412-GM	1.2											●	●	●																						
Medium Cutting																																					
MA	**SNMG120404-MA**	0.4	▲	▲	▲	●	●	▲	▲				●	●		●		▲	▲					●	●				●				●				
	SNMG120408-MA	0.8	▲	▲	▲	●	●	▲	▲	▲			●	●		●		▲	▲	▲				●	●				●				●				
	SNMG120412-MA	1.2	▲	▲	▲	●	●	▲	▲	▲			●	●		●		▲	▲	▲				●	●				●				●				
	SNMG120416-MA	1.6																						●	●												
	SNMG150608-MA	0.8	▲	▲	▲	●	●									●																					
	SNMG150612-MA	1.2	▲	▲	▲	●	●	▲	▲	▲						●																					
	SNMG150616-MA	1.6		▲				▲	▲	▲																											
	SNMG190612-MA	1.2	▲	▲	▲	●	●	▲	▲	▲																											
Medium Cutting	**SNMG190616-MA**	1.6	▲	▲	▲	●	●	▲	▲	▲							●																				
MH	**SNMG120408-MH**	0.8	▲	▲	▲	●	●	▲	▲	▲																											
	SNMG120412-MH	1.2	▲	▲	▲	●	●	▲	▲	▲						▲																					
	SNMG190612-MH	1.2	▲	▲	▲	●	●																														
Medium Cutting	**SNMG190616-MH**	1.6	▲	▲	▲	●	●																														

*1 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

Scan here for product NEWS ▶

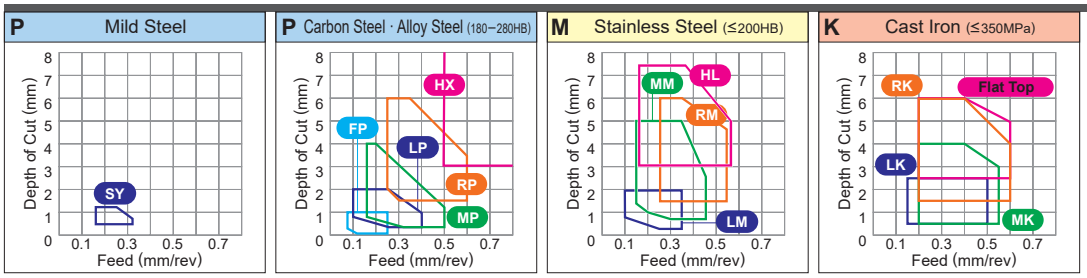
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMG 09 03 04
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◕ ✣ ○ ✣
K	Cast Iron	● ◕ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9015
Standard	**SNMG090304**	0.4	▲	▲	▲			▲	▲																					●			●	●	●					
	SNMG090308	0.8	▲	▲	▲			▲	▲																					●			●	●	●	●	●			
	SNMG120404	0.4	▲	▲	▲	●	●	▲	▲																					●			●		●		●			
	SNMG120408	0.8	▲	▲	▲	●	●	▲	▲	▲										▲	▲								●	●			●	●	●	●	●			
	SNMG120412	1.2	▲	▲	▲	●	●	▲	▲	▲										▲	▲													●		●	●			
	SNMG120416	1.6		▲	▲			▲	▲	▲										▲														●		●				
	SNMG120420	2.0			▲			▲	▲	▲																														
	SNMG150612	1.2	▲	▲	▲	●	●	▲	▲	▲										▲																				
	SNMG150616	1.6						▲	▲	▲																														
	SNMG190612	1.2	▲	▲	▲	●	●	▲	▲	▲										▲																	●				
Medium Cutting	**SNMG190616**	1.6	▲	▲	▲	●	●	▲	▲	▲																											●				
R/L	**SNGG090304R**	0.4																																	●	●	●		●		
	SNGG090304L	0.4																																	●	●	●				
	SNGG090308R	0.8																																		●	●				
	SNGG090308L	0.8																																		●	●				
	SNGG120404R	0.4																													●			●	●	●				
	SNGG120404L	0.4																													●			●	●	●				
	SNGG120408R	0.8																													●			●	●					
Medium Cutting	**SNGG120408L**	0.8																													●			●	●	●		●		
RP	**SNMG120408-RP**	0.8	▲	▲		●	●	▲	▲	▲																														
	SNMG120412-RP	1.2	▲	▲		●	●	▲	▲	▲																														
	SNMG120416-RP	1.6	▲	▲		●	●	▲	▲	▲																														
	SNMG150612-RP	1.2	▲	▲		●	●	▲	▲	▲																														
	SNMG150616-RP	1.6	▲	▲		●	●	▲	▲	▲																														
	SNMG190612-RP	1.2	▲	▲		●	●	▲	▲	▲																														
Rough Cutting	**SNMG190616-RP**	1.6	▲	▲		●	●	▲	▲	▲																														
RM	**SNMG120408-RM**	0.8											●	●	●																									
	SNMG120412-RM	1.2											●	●	●																									
	SNMG120416-RM	1.6											●	●	●																									
	SNMG150612-RM	1.2											●	●	●																									
	SNMG150616-RM	1.6											●	●	●																									
	SNMG190612-RM	1.2											●	●	●																									
Rough Cutting	**SNMG190616-RM**	1.6											●	●	●																									

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
RK	**SNMG120408-RK**	0.8																▲ ▲																			
	SNMG120412-RK	1.2																▲ ▲																			
	SNMG120416-RK	1.6																▲ ▲																			
	SNMG150612-RK	1.2																▲ ▲																			
	SNMG150616-RK	1.6																▲ ▲																			
	SNMG190612-RK	1.2																▲ ▲																			
Rough Cutting	**SNMG190616-RK**	1.6																▲ ▲																			
RS	**SNMG120408-RS**	0.8																					● ●														●
	SNMG120412-RS	1.2																					● ●														●
	SNMG120416-RS	1.6																					● ●														●
	SNMG150616-RS	1.6																					● ●														●
	SNMG190612-RS	1.2																					● ●														
Rough Cutting	**SNMG190616-RS**	1.6																					● ●														●
GH	**SNMG120408-GH**	0.8	▲	▲	▲	●	●										●			▲	▲															
	SNMG120412-GH	1.2	▲	▲	▲	●	●									▲	●			▲	▲															
	SNMG120416-GH	1.6	▲	▲		●	●										●																			
	SNMG150612-GH	1.2	▲	▲		●	●																													
	SNMG150616-GH	1.6		▲																																
	SNMG190612-GH	1.2	▲	▲		●	●										●																			
Rough Cutting	**SNMG190616-GH**	1.6	▲	▲		●	●										●																			
HX	**SNMM120408-HX**	0.8							▲	▲																										
	SNMM120412-HX	1.2							▲	▲																										
	SNMM150612-HX	1.2							▲	▲																										
	SNMM190612-HX	1.2		▲	▲				▲	▲	●																									
	SNMM190616-HX	1.6		▲	▲				▲	▲	●																									
	SNMM190624-HX	2.4		▲	▲				▲	▲	●																									
	SNMM250724-HX	2.4		▲	▲				▲	▲	●																									
Heavy Cutting	**SNMM250924-HX**	2.4		▲	▲				▲	▲	●																									
HL	**SNMM120408-HL**	0.8							▲	▲							●																			
	SNMM120412-HL	1.2							▲	▲							●																			
	SNMM150612-HL	1.2							▲	▲							●																			
	SNMM190612-HL	1.2							▲	▲							●																			
	SNMM190616-HL	1.6							▲	▲							●																			
Heavy Cutting	**SNMM190624-HL**	2.4							▲	▲							●																			
HR	**SNMM250724-HR**	2.4							▲	▲																										
	SNMM250924-HR	2.4							▲	▲																										
Heavy Cutting																																				
HV	**SNMM190616-HV**	1.6		▲	▲				▲	▲	●																									
	SNMM190624-HV	2.4		▲	▲				▲	▲	●																									
	SNMM250724-HV	2.4		▲	▲				▲	▲	●																									
	SNMM250924-HV	2.4		▲	▲				▲	▲	●																									
Heavy Cutting																																				

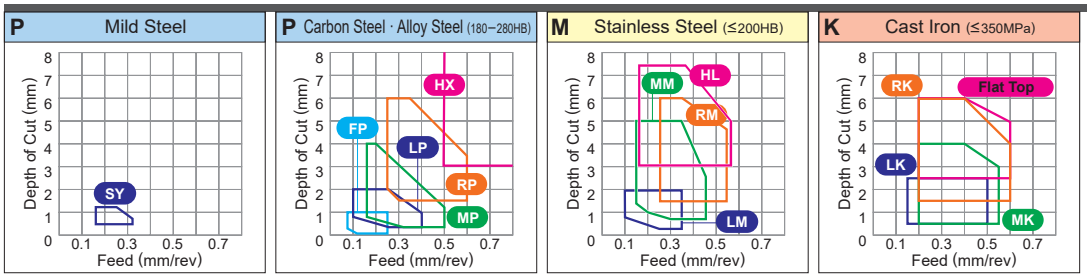
● = NEW

90° SN TYPE INSERTS WITH HOLE

SNMM 12 04 08- HZ
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
HZ	SNMM120408-HZ	0.8	▲▲						▲▲																												
	SNMM120412-HZ	1.2	▲▲						▲▲																												
	SNMM150612-HZ	1.2	▲▲																																		
	SNMM190612-HZ	1.2	▲▲								●																										
Heavy Cutting	SNMM190616-HZ	1.6	▲▲								●																										
HM	SNMM150612-HM	1.2							▲▲								●																				
	SNMM190612-HM	1.2							▲▲								●																				
	SNMM190616-HM	1.6							▲▲								●																				
	SNMM190624-HM	2.4							▲▲								●																				
	SNMM250724-HM	2.4							▲▲																												
Heavy Cutting	SNMM250924-HM	2.4							▲▲																												
Flat Top	SNMA090304	0.4																																	●		
	SNMA090308	0.8																▲▲▲																	●		
	SNMA120408	0.8																▲▲▲▲																	●	●	●
	SNMA120412	1.2																▲▲▲▲																	●		
	SNMA120416	1.6																▲▲▲																			
	SNMA150612	1.2																▲▲																			
	SNMA150616	1.6																▲▲																			
	SNMA190612	1.2																▲▲▲																			
	SNMA190616	1.6																▲▲▲																			
Flat Top	SNGA090304	0.4																																●			
	SNGA120404	0.4																																		●	
	SNGA120408	0.8																																●		●	●

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

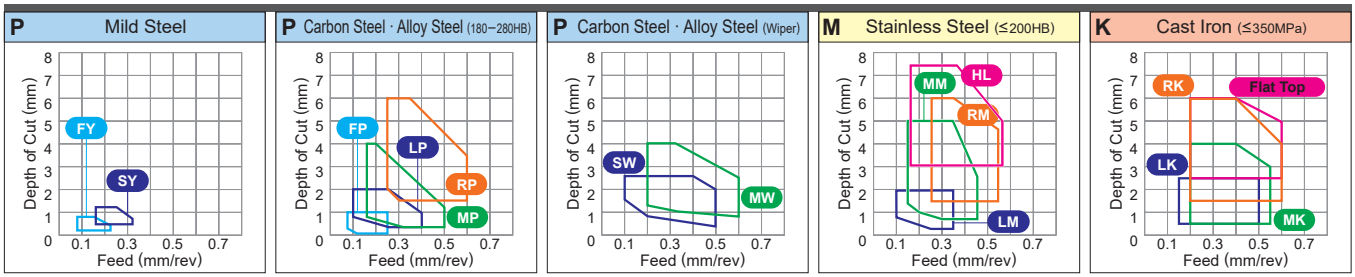
**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

60° TN TYPE INSERTS WITH HOLE

TNMG 16 04 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy

Shape	Order Number	RE (mm)	Coated																								Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP	**TNMG160402-FP**	0.2						▲▲																						●			●						
	TNMG160404-FP	0.4						▲▲																						●			●						
	TNMG160408-FP	0.8						▲▲																						●			●						
	TNMG160412-FP	1.2						▲▲																						●			●						
Finish Cutting																																							
FH	**TNMG110304-FH**	0.4																															●						
	TNMG160402-FH	0.2		▲▲																										●			● ●						
	TNMG160404-FH	0.4		▲																										● ●			● ●						
	TNMG160408-FH	0.8		▲▲																										● ●			● ●						
Finish Cutting																																							
FS	**TNMG160404-FS**	0.4			▲																												●						
	TNMG160408-FS	0.8			▲																												●						
Finish Cutting																																							
FY	**TNMG160404-FY**	0.4			▲																										●	●	● ●						
	TNMG160408-FY	0.8			▲																										●	●	●						
Finish Cutting																																							
R/L-FS	**TNGG160402R-FS**	0.2										●																					●						
	TNGG160402L-FS	0.2										●																					●						
	TNGG160404R-FS	0.4										●																					●						
	TNGG160404L-FS	0.4										●																					●						
	TNGG160408R-FS	0.8										●																											
Finish Cutting	**TNGG160408L-FS**	0.8										●																											
R/L-F	**TNGG160402R-F**	0.2																											●	●			● ●						
	TNGG160402L-F	0.2																											●	●			● ●						
	TNGG160404R-F	0.4																											●	●			● ●						
	TNGG160404L-F	0.4																											●	●			● ●						
	TNGG160408R-F	0.8																											●	●			● ●						
Finish Cutting	**TNGG160408L-F**	0.8																											●	●			● ●						

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

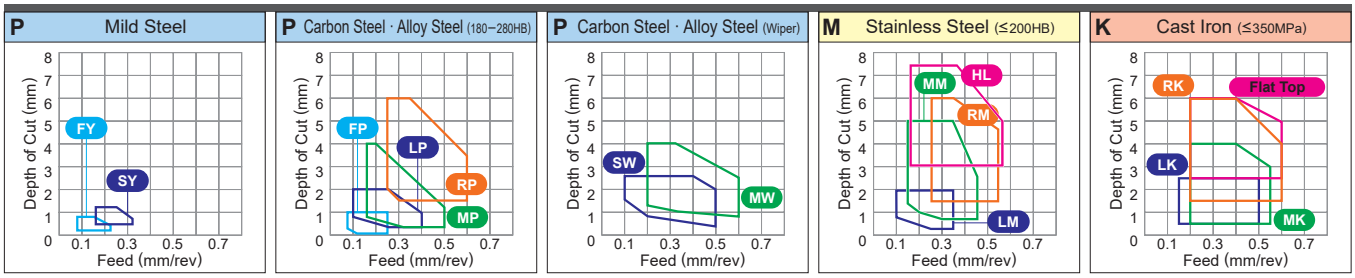
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 16 04 04- LP
Size · Thickness · Corner Radius · Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																								Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
LP	TNMG160404-LP	0.4	▲	▲		●	●	▲	▲	▲																				●								
	TNMG160408-LP	0.8	▲	▲		●	●	▲	▲	▲																				●								
	TNMG160412-LP	1.2	▲	▲		●	●	▲	▲	▲																				●								
	TNMG220408-LP	0.8	▲	▲		●	●	▲	▲	▲																				●								
Light Cutting	TNMG220412-LP	1.2	▲	▲		●	●	▲	▲	▲																													
LM	TNMG160404-LM	0.4											●	●	●																								
	TNMG160408-LM	0.8											●	●	●																								
	TNMG160412-LM	1.2											●	●	●																								
Light Cutting																																							
LK	TNMG160404-LK	0.4																▲	▲																				
	TNMG160408-LK	0.8																▲	▲																				
	TNMG160412-LK	1.2																▲	▲																				
Light Cutting																																							
LS	TNMG160402-LS	0.2																					●	●	●														●
	TNMG160404-LS	0.4																					●	●	●														●
	TNMG160408-LS	0.8																					●	●	●														●
Light Cutting																																							
SH	TNMG160404-SH	0.4	▲	▲	▲	●	●	▲	▲								●														●		●	●					
	TNMG160408-SH	0.8	▲	▲	▲	●	●	▲	▲								●														●		●	●					
	TNMG220408-SH	0.8	▲	▲		●	●										●																						
Light Cutting																																							
SA	TNMG160404-SA	0.4	▲	▲	▲	●	●	▲	▲																								●	●					
	TNMG160408-SA	0.8	▲	▲	▲	●	●	▲	▲																								●	●					
	TNMG160412-SA	1.2	▲	▲	▲	●	●																											●					
	TNMG220408-SA	0.8	▲	▲	▲	●	●																																
Light Cutting	TNMG220412-SA	1.2		▲																																			

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✤: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✤ ◔ ❁ ✤ ❁ ●
M	Stainless Steel	● ◐ ✤ ○ ✤ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✤ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
*1 SW	TNMX160404-SW	0.4	▲	▲				▲								▲														●			●	●					
	TNMX160408-SW	0.8	▲	▲				▲																						●			●	●					
Light Cutting (Wiper)																																							
SY	TNMG160404-SY	0.4			▲																									●		●	●	●					
	TNMG160408-SY	0.8			▲																									●		●	●						
Light Cutting																																							
MJ	TNMG160404-MJ	0.4																					●	●		●	●	●										●	
	TNMG160408-MJ	0.8																					●	●		●	●	●										●	
	TNMG160412-MJ	1.2																					●	●		●	●	●											
Light Cutting																																							
R/L-K	TNGG160402R-K	0.2																												●			●	●					
	TNGG160402L-K	0.2																												●			●	●					
	TNGG160404R-K	0.4																												●			●	●					
	TNGG160404L-K	0.4																												●				●					
	TNGG160408R-K	0.8																												●									
Light Cutting	TNGG160408L-K	0.8																												●									
MP	TNMG160404-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																				●									
	TNMG160408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																				●									
	TNMG160412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																				●									
	TNMG220408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																													
Medium Cutting	TNMG220412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																													
MM	TNMG160408-MM	0.8											●	●	●																								
	TNMG160412-MM	1.2											●	●	●																								
	TNMG220408-MM	0.8											●	●	●																								
	TNMG220412-MM	1.2											●	●	●																								
Medium Cutting	TNMG220416-MM	1.6											●	●	●																								
MK	TNMG160404-MK	0.4																▲	▲																				
	TNMG160408-MK	0.8																▲	▲																				
	TNMG160412-MK	1.2																▲	▲																				
	TNMG220408-MK	0.8																▲	▲																				
	TNMG220412-MK	1.2																▲	▲																				
Medium Cutting	TNMG220416-MK	1.6																▲	▲																				
*2 MS	TNMG160404-MS	0.4																					●	●	●														●
	TNMG160408-MS	0.8																					●	●	●														●
	TNMG160412-MS	1.2																					●	●	●														●
	TNMG220408-MS	0.8																					●	●	●														●
Medium Cutting	TNMG220412-MS	1.2																					●	●	●														●

*1 Please refer to A028 before using the SW breaker (wiper insert).
*2 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

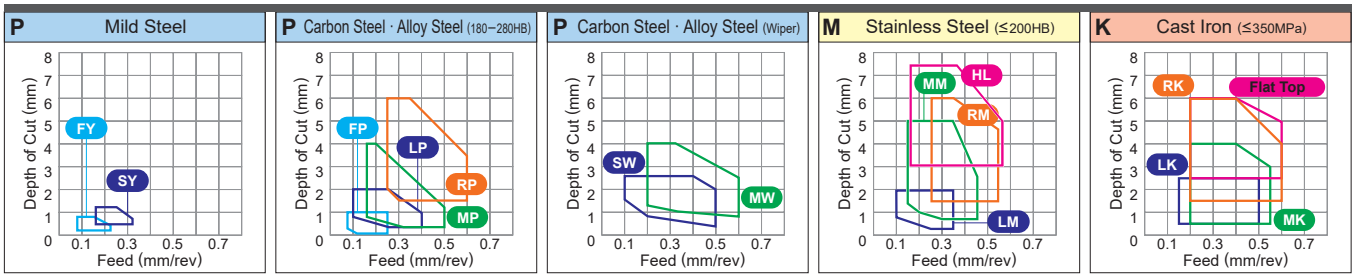
● = NEW

60° TN TYPE INSERTS WITH HOLE

TNMG 16 04 04- MS
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MS	TNMG160404-MS	0.4	▲												▲	●									●	●	●	●					●				
	TNMG160408-MS	0.8	▲	▲											▲	●									●	●	●	●	●				●				●
	TNMG160412-MS	1.2	▲													●									●	●	●										
	TNMG220408-MS	0.8	▲													●									●	●	●	●	●								
Medium Cutting	TNMG220412-MS	1.2														●																					
GK	TNMG160404-GK	0.4																▲	▲																		
	TNMG160408-GK	0.8																▲	▲																		
	TNMG160412-GK	1.2																▲	▲			●															
	TNMG220408-GK	0.8																▲	▲																		
Medium Cutting	TNMG220412-GK	1.2																▲	▲																		
GM	TNMG160404-GM	0.4											●	●	●																						
	TNMG160408-GM	0.8											●	●	●																						
	TNMG160412-GM	1.2											●	●	●																						
	TNMG220408-GM	0.8											●	●	●																						
Medium Cutting	TNMG220412-GM	1.2											●	●	●																						
MA	TNMG160404-MA	0.4	▲	▲	▲	●	●	▲	▲				●	●	▲	●		▲	▲	▲				●	●				●					●				
	TNMG160408-MA	0.8	▲	▲	▲	●	●	▲	▲	▲			●	●	▲	●		▲	▲	▲	▲			●	●				●					●				
	TNMG160412-MA	1.2	▲	▲	▲	●	●	▲	▲	▲			●	●		●		▲	▲					●	●				●					●				
	TNMG220408-MA	0.8	▲	▲	▲	●	●	▲	▲	▲			●	●		●		▲	▲	▲				●	●				●									
	TNMG220412-MA	1.2	▲	▲	▲	●	●	▲	▲	▲			●	●		●		▲	▲					●	●				●									
	TNMG220416-MA	1.6																						●	●													
	TNMG270608-MA	0.8	▲	▲	▲	●	●																															
	TNMG270612-MA	1.2	▲	▲	▲	●	●										●																					
	TNMG270616-MA	1.6																						●	●													
Medium Cutting	TNMG330924-MA	2.4																						●	●													
MH	TNMG160404-MH	0.4	▲	▲	▲	●	●								▲																						
	TNMG160408-MH	0.8	▲	▲	▲	●	●	▲	▲	▲																											
	TNMG160412-MH	1.2	▲	▲	▲	●	●	▲	▲	▲																											
	TNMG220408-MH	0.8	▲	▲	▲	●	●	▲	▲	▲																											
Medium Cutting	TNMG220412-MH	1.2	▲	▲	▲	●	●	▲	▲	▲																											

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																									Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
Standard	**TNMG110304**	0.4		▲	▲			▲	▲																									●		●		
	TNMG110308	0.8		▲	▲			▲	▲																													
	TNMG160304	0.4		▲				▲	▲																									●				
	TNMG160308	0.8		▲	▲			▲	▲																									●				
	TNMG160404	0.4		▲	▲	▲	●	●	▲	▲										▲	▲								●		●			●	●	●	●		
	TNMG160408	0.8		▲	▲	▲	●	●	▲	▲	▲									▲	▲								●		●			●	●	●	●		
	TNMG160412	1.2		▲	▲	▲	●	●	▲	▲	▲									▲	▲													●					
	TNMG160416	1.6			▲				▲	▲	▲																							●					
	TNMG220404	0.4		▲	▲	▲	●	●	▲	▲	▲																								●	●				
	TNMG220408	0.8		▲	▲	▲	●	●	▲	▲	▲																								●	●				
	TNMG220412	1.2		▲	▲	▲	●	●	▲	▲	▲																													
	TNMG220416	1.6			▲	▲			▲	▲	▲																													
	TNMG270608	0.8			▲				▲	▲	▲																													
	TNMG270612	1.2			▲	▲			▲	▲	▲																										●			
	TNMG270616	1.6			▲	▲																																	
Medium Cutting	**TNMG330924**	2.4																																		●			
✱1 **MW**	**TNMX160408-MW**	0.8		▲	▲				▲										▲	▲																			
	TNMX160412-MW	1.2		▲	▲				▲										▲	▲	▲																		
Medium Cutting (Wiper)																																							
R/L-ES	**TNMG160404R-ES**	0.4													▲	●																							
	TNMG160404L-ES	0.4													▲	●																							
	TNMG160408R-ES	0.8													▲	●																							
	TNMG160408L-ES	0.8													▲	●																							
	TNMG220408R-ES	0.8														●																							
Medium Cutting	**TNMG220408L-ES**	0.8														●																							
R/L-2G	**TNMG160404R-2G**	0.4																																●					
	TNMG160404L-2G	0.4																																●					
	TNMG160408R-2G	0.8																																●					
	TNMG160408L-2G	0.8																																●					
Medium Cutting																																							
R/L	**TNGG110302R**	0.2																																	●				
	TNGG110302L	0.2																																●	●				
	TNGG110304R	0.4																																●	●				
	TNGG110304L	0.4																																●	●				
	TNGG110308R	0.8																																	●				
	TNGG110308L	0.8																																●	●				
	TNGG160304R	0.4																																●	●	●			
	TNGG160304L	0.4																																●	●				
	TNGG160402R	0.2																													●			●	●	●		●	
	TNGG160402L	0.2																													●			●	●				
	TNGG160404R	0.4																													●			●	●	●	●	●	
Medium Cutting	**TNGG160404L**	0.4																													●			●	●	●		●	

✱1 Please refer to A028 before using the MW breaker (wiper insert).

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

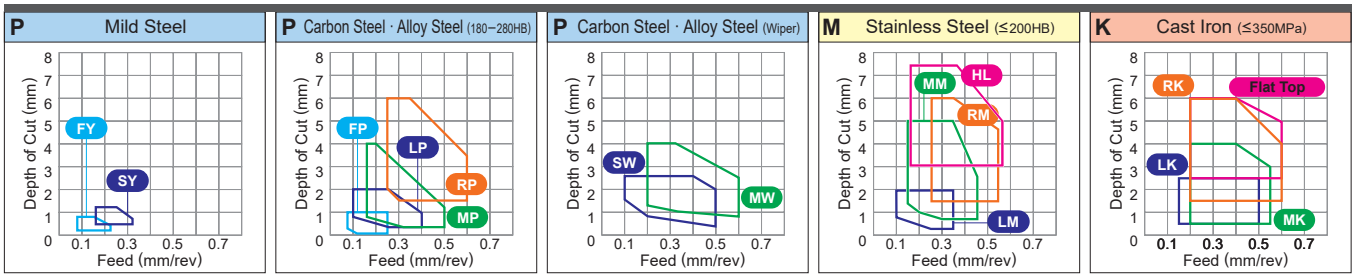
60° TN TYPE INSERTS WITH HOLE

TNGG 16 04 08 R
Size / Thickness / Corner Radius / R/L

* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ● ◐ ✣ ○ ✣ ● ◐ ✣ ○ ◔ ◔ ❁ ❁ ❁ ◐ ○ ○ ○ ◔ ❁
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ❁ ○ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	VP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
R/L	TNGG160408R	0.8																											●			●	●	●	●	●		
	TNGG160408L	0.8																											●			●	●	●	●	●		
	TNGG220404R	0.4																														●	●	●				
	TNGG220404L	0.4																														●	●	●				
	TNGG220408R	0.8																														●	●	●				
Medium Cutting	TNGG220408L	0.8																														●	●	●				
RP	TNMG160408-RP	0.8	▲	▲		●	●	▲	▲	▲																												
	TNMG160412-RP	1.2	▲	▲		●	●	▲	▲	▲																												
	TNMG220408-RP	0.8	▲	▲		●	●	▲	▲	▲																												
	TNMG220412-RP	1.2	▲	▲		●	●	▲	▲	▲																												
	TNMG220416-RP	1.6	▲	▲		●	●	▲	▲	▲																												
	TNMG270612-RP	1.2	▲	▲		●	●	▲	▲	▲																												
Rough Cutting	TNMG270616-RP	1.6	▲	▲		●	●	▲	▲	▲																												
RM	TNMG160408-RM	0.8											●	●	●																								
	TNMG160412-RM	1.2											●	●	●																								
	TNMG220408-RM	0.8											●	●	●																								
	TNMG220412-RM	1.2											●	●	●																								
Rough Cutting	TNMG220416-RM	1.6											●	●	●																								
RK	TNMG160408-RK	0.8																▲	▲																				
	TNMG160412-RK	1.2																▲	▲																				
	TNMG160416-RK	1.6																▲	▲																				
	TNMG220408-RK	0.8																▲	▲																				
	TNMG220412-RK	1.2																▲	▲																				
Rough Cutting	TNMG220416-RK	1.6																▲	▲																				
RS	TNMG160408-RS	0.8																						●	●														●
	TNMG160412-RS	1.2																						●	●														●
	TNMG220408-RS	0.8																						●	●														●
	TNMG220412-RS	1.2																						●	●														●
Rough Cutting																																						

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																												Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
GH	**TNMG160408-GH**	0.8	▲	▲	▲	●	●										●			▲	▲																		
	TNMG160412-GH	1.2	▲	▲		●	●														▲																		
	TNMG220408-GH	0.8	▲	▲	▲	●	●										●				▲																		
	TNMG220412-GH	1.2	▲	▲	▲	●	●										●			▲	▲																		
	TNMG220416-GH	1.6	▲	▲		●	●																																
	TNMG270612-GH	1.2	▲	▲	▲	●	●										●																						
Rough Cutting	**TNMG270616-GH**	1.6	▲	▲		●	●																																
HL	**TNMM160408-HL**	0.8							▲	▲							●																						
	TNMM160412-HL	1.2							▲	▲							●																						
	TNMM220408-HL	0.8							▲	▲							●																						
	TNMM220412-HL	1.2							▲	▲							●																						
Heavy Cutting	**TNMM220416-HL**	1.6							▲	▲							●																						
HZ	**TNMM160408-HZ**	0.8		▲	▲				▲	▲																													
	TNMM160412-HZ	1.2							▲	▲																													
	TNMM220408-HZ	0.8		▲	▲																																		
	TNMM220412-HZ	1.2		▲	▲																																		
Heavy Cutting	**TNMM220416-HZ**	1.6		▲	▲																																		
Flat Top	**TNMA160404**	0.4																▲	▲	▲	▲															●	●		
	TNMA160408	0.8																▲	▲	▲	▲															●	●	●	
	TNMA160412	1.2																▲	▲	▲	▲																		
	TNMA160416	1.6																▲	▲																				
	TNMA160420	2.0																▲	▲																				
	TNMA220404	0.4																																			●		
	TNMA220408	0.8																▲	▲	▲														●		●		●	
	TNMA220412	1.2																▲	▲	▲																			
	TNMA220416	1.6																▲	▲	▲																●			
Flat Top	**TNGA110304**	0.4																																			●		
	TNGA110308	0.8																																			●		
	TNGA160402	0.2																																			●		
	TNGA160404	0.4																																		●	●	●	
	TNGA160408	0.8																																			●	●	
	TNGA220404	0.4																																		●			
	TNGA220408	0.8																																			●		

● = NEW

Scan here for product NEWS ▶

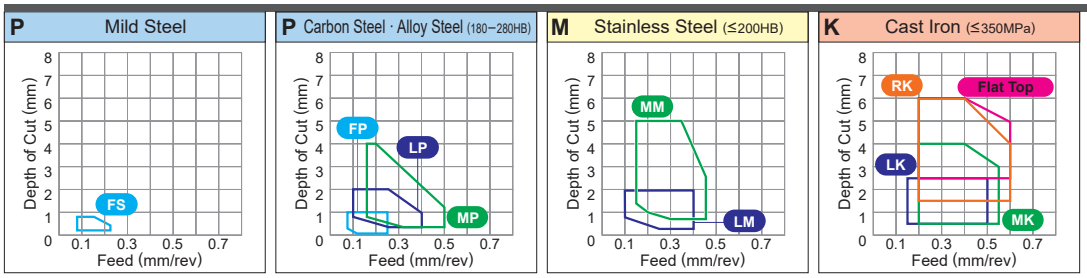
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

VNMG 16 04 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ◐ ● ◐ ✣ ○ ✣ ○ ◐ ◐ ○ ◔ ◔ ○ ◔ ❁ ❁ ◐ ○ ○ ○ ○ ◔ ❁
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP	**VNMG160402-FP**	0.2						▲▲																						●			●					
	VNMG160404-FP	0.4						▲▲																						●			●					
	VNMG160408-FP	0.8						▲▲																						●			●					
	VNMG160412-FP	1.2						▲▲																						●			●					
Finish Cutting																																							
FH	**VNMG160402-FH**	0.2		▲▲																										●			● ●					
	VNMG160404-FH	0.4		▲▲																										● ●			●					
	VNMG160408-FH	0.8		▲▲																										● ●			● ●					
Finish Cutting																																							
FS	**VNMG160404-FS**	0.4			▲																												●					
	VNMG160408-FS	0.8			▲																												●					
Finish Cutting																																							
FJ	**VNGG1604V5-FJ**	0.05																										●									●	
	VNGG160401-FJ	0.1																										●									●	
	VNGG160402-FJ	0.2																										●									●	
Finish Cutting																																							
R/L-F	**VNGG160402R-F**	0.2																											●	●			● ●					
	VNGG160402L-F	0.2																											●	●			● ●					
	VNGG160404R-F	0.4																											●	●			● ●					
	VNGG160404L-F	0.4																											●	●			● ●					
Finish Cutting																																							
LP	**VNMG160404-LP**	0.4	▲▲			● ●		▲▲▲																						●								
	VNMG160408-LP	0.8	▲▲			● ●		▲▲▲																						●								
Light Cutting																																							

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
LM	**VNMG160404-LM**	0.4											●	●	●																						
	VNMG160408-LM	0.8											●	●	●																						
Light Cutting																																					
LK	**VNMG160404-LK**	0.4																▲	▲																		
	VNMG160408-LK	0.8																▲	▲																		
Light Cutting																																					
LS	**VNMG160402-LS**	0.2																					●	●	●												●
	VNMG160404-LS	0.4																					●	●	●												●
	VNMG160408-LS	0.8																					●	●	●												●
Light Cutting																																					
SH	**VNMG160404-SH**	0.4	▲	▲	▲	●	●	▲	▲																					●			●	●				
	VNMG160408-SH	0.8	▲	▲	▲	●	●	▲	▲																					●			●	●				
Light Cutting																																					
SA	**VNMG160404-SA**	0.4						▲	▲																								●				
	VNMG160408-SA	0.8						▲	▲																								●				
Light Cutting																																					
MJ	**VNMG160404-MJ**	0.4																					●	●		●	●	●									●
	VNMG160408-MJ	0.8																					●	●		●	●	●									●
	VNMG160412-MJ	1.2																					●	●		●	●	●									
Light Cutting																																					
MJ	**VNGM160404-MJ**	0.4																									●										●
	VNGM160408-MJ	0.8																									●										●
Light Cutting																																					
MP	**VNMG160404-MP**	0.4	▲	▲	▲	●	●	▲	▲	▲																				●								
	VNMG160408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																				●								
	VNMG160412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																												
Medium Cutting																																					
MM	**VNMG160408-MM**	0.8											●	●	●																						
Medium Cutting																																					

● = NEW

Scan here for product NEWS ▶

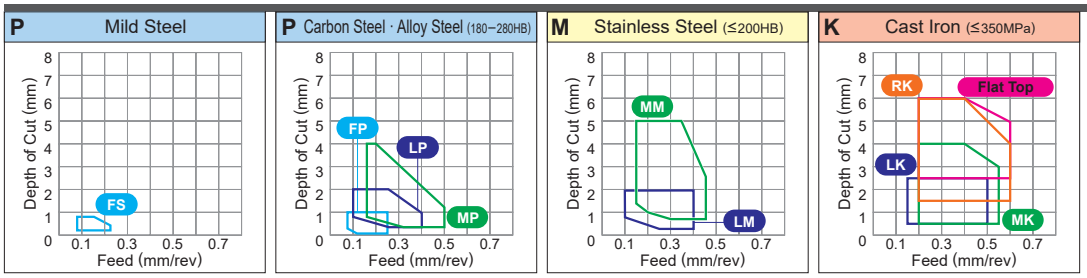
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

VNMG 16 04 04- MK
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Rough Cutting····· Heavy Cutting·····



●: Stable Cutting (1st recommendation) ◕: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ● ◕ ● ✣ ○ ✣ ◕ ○ ○ ◔ ◔ ● ✣ ○ ○ ◔ ❁ ❁ ❁ ◕ ○ ○ ○ ◔ ❁
M	Stainless Steel	● ◕ ✣ ○ ✣ ◔ ❁ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◕ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✣ ○ ○ ◔ ❁ ◔ ◕ ◕

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MK	**VNMG160404-MK**	0.4																▲	▲																		
	VNMG160408-MK	0.8																▲	▲			●															
	VNMG160412-MK	1.2																▲	▲																		
Medium Cutting																																					
*1 **MS**	**VNMG160404-MS**	0.4																					●	●	●												●
	VNMG160408-MS	0.8																					●	●	●												●
Medium Cutting																																					
MS	**VNMG160404-MS**	0.4		▲											▲	●										●	●	●	●								
	VNMG160408-MS	0.8		▲												●										●	●	●					●				●
Medium Cutting																																					
GK	**VNMG160404-GK**	0.4																▲	▲																		
	VNMG160408-GK	0.8																▲	▲																		
	VNMG160412-GK	1.2																▲	▲																		
Medium Cutting																																					
GM	**VNMG160404-GM**	0.4											●	●	●																						
	VNMG160408-GM	0.8											●	●	●																						
Medium Cutting																																					
MA	**VNMG160404-MA**	0.4	▲	▲	▲	●	●	▲	▲				●	●	▲	●		▲	▲	▲								●									
	VNMG160408-MA	0.8	▲	▲	▲	●	●	▲	▲	▲			●	●	▲	●		▲	▲	▲	▲							●									
Medium Cutting																																					

*1 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																												Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
MH	**VNMG160404-MH**	0.4	▲	▲	▲	●	●																																
	VNMG160408-MH	0.8	▲	▲	▲	●	●	▲	▲	▲					▲					▲																				
 Medium Cutting																																							
Standard	**VNMG160404**	0.4	▲	▲	▲	●	●	▲	▲											▲	▲								●		●			●	●	●		●		
	VNMG160408	0.8	▲	▲	▲	●	●	▲	▲	▲										▲	▲								●		●			●	●	●		●		
 Medium Cutting	**VNMG160412**	1.2	▲	▲		●	●	▲	▲	▲										▲	▲													●						
R/L	**VNGG160404R**	0.4																																	●	●	●		●		
	VNGG160404L	0.4																																	●	●	●				
 Medium Cutting																																							
Flat Top	**VNMA160404**	0.4																▲	▲																					
	VNMA160408	0.8																▲	▲																					
	**VNMA160412**	1.2																▲	▲																					
Flat Top	**VNGA160404**	0.4																																			●	●		
	VNGA160408	0.8																																			●	●		
																																							

● = NEW

Scan here for product NEWS ▶

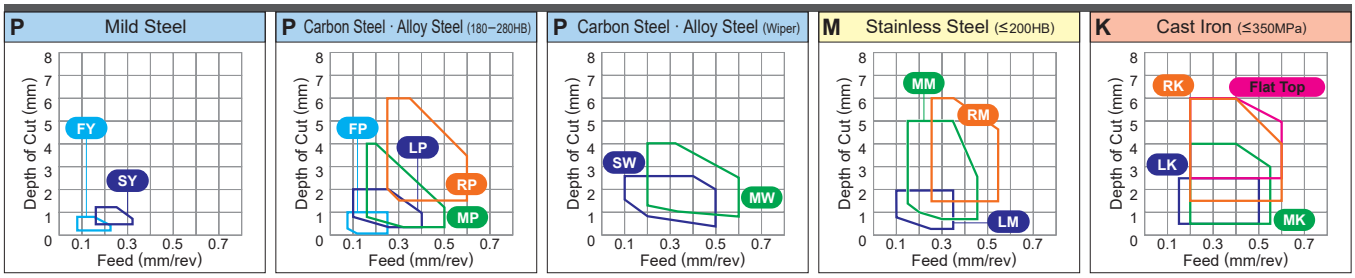
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 08 04 02- FP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated			NEW																						Coated Cermet		Cermet		Carbide				
			UE6105	UE6110	UE6020	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
FP	**WNMG080402-FP**	0.2						▲	▲																					●			●						
	WNMG080404-FP	0.4						▲	▲																					●			●						
	WNMG080408-FP	0.8						▲	▲																					●			●						
	WNMG080412-FP	1.2						▲	▲																					●			●						
Finish Cutting																																							
FH	**WNMG080404-FH**	0.4		▲																										●			●						
	WNMG080408-FH	0.8		▲																										●	●		●						
Finish Cutting																																							
FS	**WNMG080404-FS**	0.4			▲																												●						
	WNMG080408-FS	0.8			▲																												●						
Finish Cutting																																							
FY	**WNMG080404-FY**	0.4																												●			●						
	WNMG080408-FY	0.8			▲																									●		●	●						
Finish Cutting																																							
LP	**WNMG06T304-LP**	0.4	▲	▲				▲	▲	▲																				●									
	WNMG06T308-LP	0.8	▲	▲				▲	▲	▲																				●									
	WNMG060404-LP	0.4	▲	▲				▲	▲	▲																				●									
	WNMG060408-LP	0.8	▲	▲				▲	▲	▲																				●									
	WNMG080404-LP	0.4	▲	▲		●	●	▲	▲	▲																				●									
	WNMG080408-LP	0.8	▲	▲		●	●	▲	▲	▲																				●									
Light Cutting	**WNMG080412-LP**	1.2	▲	▲		●	●	▲	▲	▲																														
LM	**WNMG060404-LM**	0.4											●	●	●																									
	WNMG060408-LM	0.8											●	●	●																									
	WNMG080404-LM	0.4											●	●	●																									
	WNMG080408-LM	0.8											●	●	●																									
Light Cutting																																							

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ○ : Stable Cutting (2nd recommendation)
● : General Cutting (1st recommendation) ◔ : General Cutting (2nd recommendation)
✱ : Unstable Cutting (1st recommendation) ✱ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
	P	Steel	○	◔	✱	●	✱	◔	✱	✱	✱	●																✱	✱	◕	○	○	○	◔	✱				
	M	Stainless Steel											●	◕	✱	○	✱										◔	✱	✱		○	○	○		✱				
	K	Cast Iron																●	◕	○	◔	◔					◔	✱			○	○	○		✱	○	◔		
	N	Non-ferrous Metal																																			◔		
	S	Heat resistant Alloy, Titanium Alloy																					●	◕	✱	○	○	◔	✱								◔	◕	◕

Shape	Order Number	RE (mm)																																					
LK	**WNMG080404-LK**	0.4																▲	▲																				
	WNMG080408-LK	0.8																▲	▲			●																	
	WNMG080412-LK	1.2																▲	▲			●																	
Light Cutting																																							
LS	**WNMG080402-LS**	0.2																					●	●	●														●
	WNMG080404-LS	0.4																					●	●	●														●
	WNMG080408-LS	0.8																					●	●	●														●
Light Cutting																																							
SH	**WNMG06T304-SH**	0.4	▲	▲													●																						
	WNMG06T308-SH	0.8	▲	▲													●																						
	WNMG060404-SH	0.4	▲	▲													●																						
	WNMG060408-SH	0.8	▲	▲													●																						
	WNMG080404-SH	0.4	▲	▲		●	●	▲	▲								●																●						
	WNMG080408-SH	0.8	▲	▲	▲	●	●	▲	▲								●																●						
Light Cutting	**WNMG080412-SH**	1.2	▲	▲	▲	●	●	▲	▲								●																						
SA	**WNMG080404-SA**	0.4	▲	▲	▲	●	●	▲	▲																								●	●					
	WNMG080408-SA	0.8	▲	▲	▲	●	●	▲	▲																								●	●					
	WNMG080412-SA	1.2	▲	▲	▲	●	●	▲	▲																									●					
Light Cutting																																							
✱1 **SW**	**WNMG060404-SW**	0.4	▲	▲				▲																								●		●					
	WNMG060408-SW	0.8	▲	▲				▲																								●		●					
	WNMG080404-SW	0.4	▲	▲		●	●	▲										▲	▲													●		●					
Light Cutting (Wiper)	**WNMG080408-SW**	0.8	▲	▲		●	●	▲										▲	▲													●		●					
	WNMG080412-SW	1.2	▲	▲		●	●	▲																								●		●					
SY	**WNMG080404-SY**	0.4																														●		●					
	WNMG080408-SY	0.8			▲																											●	●	●					
Light Cutting																																							
MJ	**WNMG080408-MJ**	0.8																					●	●		●	●	●											
	WNMG080412-MJ	1.2																					●	●		●	●	●											
	WNMG080416-MJ	1.6																					●	●		●	●	●											
Light Cutting																																							

✱1 Please refer to A028 before using the SW breaker (wiper insert).

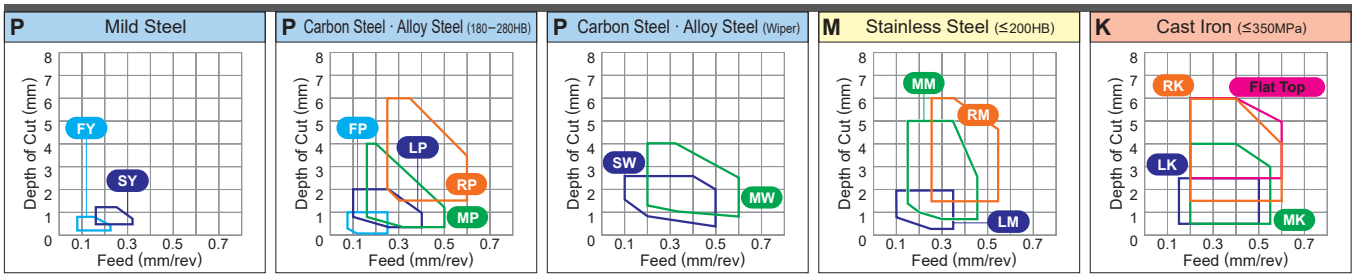
● = NEW

80° WN TYPE INSERTS WITH HOLE

WNMG 06 T3 04- MP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9015
MP	WNMG06T304-MP	0.4	▲	▲	▲			▲	▲	▲																														
	WNMG06T308-MP	0.8	▲	▲	▲			▲	▲	▲																														
	WNMG06T312-MP	1.2	▲	▲	▲			▲	▲	▲																														
	WNMG060404-MP	0.4	▲	▲	▲			▲	▲	▲																														
	WNMG060408-MP	0.8	▲	▲	▲			▲	▲	▲										▲																				
	WNMG060412-MP	1.2	▲	▲	▲			▲	▲	▲										▲																				
	WNMG080404-MP	0.4	▲	▲	▲	●	●	▲	▲	▲																					●									
	WNMG080408-MP	0.8	▲	▲	▲	●	●	▲	▲	▲																					●									
	WNMG080412-MP	1.2	▲	▲	▲	●	●	▲	▲	▲																					●									
Medium Cutting	WNMG080416-MP	1.6	▲	▲	▲	●	●	▲	▲	▲																														
MM	WNMG060408-MM	0.8											●	●	●																									
	WNMG060412-MM	1.2											●	●	●																									
	WNMG080408-MM	0.8											●	●	●																									
	WNMG080412-MM	1.2											●	●	●																									
Medium Cutting																																							
MK	WNMG080404-MK	0.4																▲	▲																					
	WNMG080408-MK	0.8																▲	▲																					
	WNMG080412-MK	1.2																▲	▲																					
	WNMG080416-MK	1.6																▲	▲																					
Medium Cutting																																							
*1 **MS**	WNMG080404-MS	0.4																					●	●	●														●
	WNMG080408-MS	0.8																					●	●	●														●
	WNMG080412-MS	1.2																					●	●	●														●
Medium Cutting																																							
MS	WNMG06T304-MS	0.4		▲													●																						
	WNMG06T308-MS	0.8		▲													●																						
	WNMG060404-MS	0.4		▲													●																						
	WNMG060408-MS	0.8		▲													●																						
	WNMG080404-MS	0.4		▲	▲												●																						
	WNMG080408-MS	0.8		▲	▲											▲	●									●	●	●										●	
Medium Cutting	WNMG080412-MS	1.2		▲													●									●	●												

*1 Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ● ✣ ◔ ❁ ✣ ❁ ●
M	Stainless Steel	● ◐ ✣ ○ ✣ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ○ ◔ ❁ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
GK	**WNMG060404-GK**	0.4																▲ ▲																			
	WNMG060408-GK	0.8																▲ ▲																			
	WNMG080404-GK	0.4																▲ ▲																			
	WNMG080408-GK	0.8																▲ ▲			●																
Medium Cutting	**WNMG080412-GK**	1.2																▲ ▲			●																
GM	**WNMG060404-GM**	0.4											●	●	●																						
	WNMG060408-GM	0.8											●	●	●																						
	WNMG080404-GM	0.4											●	●	●																						
	WNMG080408-GM	0.8											●	●	●																						
Medium Cutting	**WNMG080412-GM**	1.2											●	●	●																						
MA	**WNMG06T304-MA**	0.4	▲ ▲														●																				
	WNMG06T308-MA	0.8	▲ ▲														●																				
	WNMG06T312-MA	1.2	▲ ▲														●																				
	WNMG060404-MA	0.4	▲ ▲					▲ ▲									●																				
	WNMG060408-MA	0.8	▲ ▲					▲ ▲					●	●			●	▲ ▲											●								
	WNMG060412-MA	1.2	▲ ▲					▲ ▲					●	●			●	▲ ▲											●								
	WNMG080404-MA	0.4	▲ ▲ ▲			●	●	▲ ▲					●	●	▲		●	▲ ▲					●	●				●					●				
	WNMG080408-MA	0.8	▲ ▲ ▲			●	●	▲ ▲	▲				●	●	▲		●	▲ ▲	▲	▲			●	●				●					●				
	WNMG080412-MA	1.2	▲ ▲ ▲			●	●	▲ ▲	▲				●	●	▲		●	▲ ▲	▲	▲			●	●				●					●				
	WNMG080416-MA	1.6	▲ ▲			●	●																●	●													
Medium Cutting	**WNMG100612-MA**	1.2			▲																																
MH	**WNMG080404-MH**	0.4	▲ ▲ ▲			●	●																														
	WNMG080408-MH	0.8	▲ ▲ ▲			●	●	▲ ▲	▲																												
	WNMG080412-MH	1.2	▲ ▲ ▲			●	●	▲ ▲	▲												▲																
Medium Cutting																																					
Standard	**WNMG080404**	0.4	▲ ▲ ▲			●	●	▲ ▲												▲ ▲											●			●				
	WNMG080408	0.8	▲ ▲ ▲			●	●	▲ ▲	▲											▲ ▲									●		●			●	●			
	WNMG080412	1.2	▲ ▲ ▲			●	●	▲ ▲	▲											▲ ▲									●						●			
	WNMG080416	1.6																		▲																	
Medium Cutting																																					
*1 **MW**	**WNMG060408-MW**	0.8	▲ ▲ ▲					▲ ▲										▲ ▲ ▲	▲																		
	WNMG060412-MW	1.2	▲ ▲					▲ ▲										▲ ▲ ▲																			
	WNMG080408-MW	0.8	▲ ▲ ▲			●	●	▲ ▲										▲ ▲ ▲	▲																		
	WNMG080412-MW	1.2	▲ ▲			●	●	▲ ▲										▲ ▲ ▲	▲																		
Medium Cutting (Wiper)																																					
RP	**WNMG080408-RP**	0.8	▲ ▲			●	●	▲ ▲	▲																												
	WNMG080412-RP	1.2	▲ ▲			●	●	▲ ▲	▲																												
Rough Cutting																																					

*1 Please refer to A028 before using the MW breaker (wiper insert).

● = NEW

Scan here for product NEWS ▶

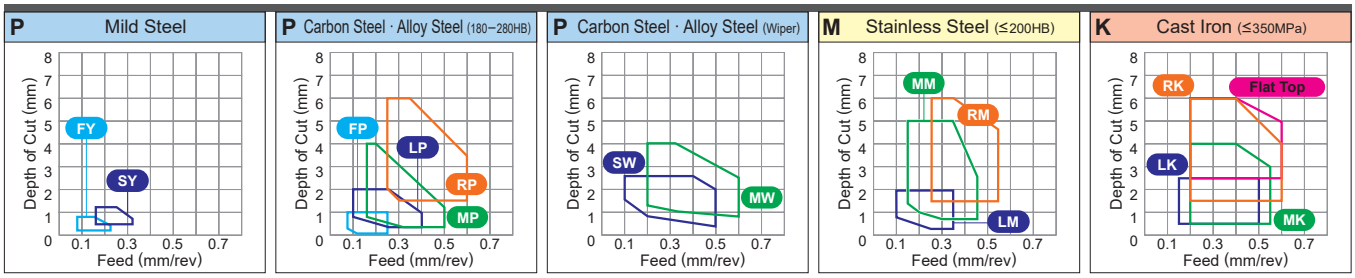
EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
CHIP BREAKERS ➤ A042
GRADES ➤ A030
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 06 04 08- RM
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Rough Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
RM	**WNMG060408-RM**	0.8											●	●	●																						
	WNMG060412-RM	1.2											●	●	●																						
	WNMG080408-RM	0.8											●	●	●																						
	WNMG080412-RM	1.2											●	●	●																						
Rough Cutting																																					
RK	**WNMG080408-RK**	0.8																▲	▲																		
	WNMG080412-RK	1.2																▲	▲			●															
	WNMG080416-RK	1.6																▲	▲			●															
Rough Cutting																																					
RS	**WNMG080408-RS**	0.8																						●	●												●
	WNMG080412-RS	1.2																						●	●												●
	WNMG080416-RS	1.6																						●	●												●
	WNMG100612-RS	1.2																						●	●												●
Rough Cutting																																					
GH	**WNMG080408-GH**	0.8	▲	▲	▲	●	●									●				▲	▲																
	WNMG080412-GH	1.2	▲	▲	▲	●	●									●				▲	▲																
Rough Cutting																																					
GJ	**WNMG080408-GJ**	0.8																								●	●	●									●
	WNMG080412-GJ	1.2																								●	●	●									●
	WNMG080416-GJ	1.6																								●	●	●									●
	WNMG100612-GJ	1.2																									●	●									●
Rough Cutting																																					
Flat Top	**WNMA060408**	0.8																▲	▲																		
	WNMA060412	1.2																▲	▲																		
	WNMA080404	0.4																▲	▲	▲																●	
	WNMA080408	0.8																▲	▲	▲	▲															●	
	WNMA080412	1.2																▲	▲	▲	▲																
	WNMA080416	1.6																▲	▲		▲																

● = NEW

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.

(10 inserts in one case)

CHIP BREAKERS ➤ A042

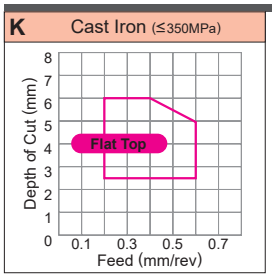
80° CN TYPE INSERTS WITHOUT HOLE

CNMN 12 04 08
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Heavy Cutting·····

K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◶ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																									Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
P	Steel		○	◶	❁	●	✣	◶	❁	✣	❁	●																❁	❁	◕	○	○	○	◶	❁				
M	Stainless Steel												●	◕	✣	○	✣											◶	❁	❁		○	○	○		❁				
K	Cast Iron																	●	◕	○	◶	◶						◶	❁	❁		○	○	○		❁	○	◶		
N	Non-ferrous Metal																																				◶		
S	Heat resistant Alloy, Titanium Alloy																						●	◕	✣	○	○	◶	❁							◶	◕	◕
Shape	Order Number	RE (mm)																																					
Flat Top	**CNMN120408**	0.8																▲	▲																				
	CNMN120412	1.2																▲	▲																				
	CNMN120416	1.6																▲	▲																				

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

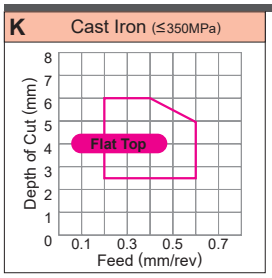
CHIP BREAKERS ➤ A072
GRADES ➤ A030
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITHOUT HOLE

SNMN 12 04 08
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Heavy Cutting·····



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																										Coated Cermet			Cermet		Carbide				
			UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
P	Steel		○	◔	❁	●	✣	◔	❁	✣	❁	●																❁	❁	◐	○	○	○	○	◔	❁				
M	Stainless Steel												●	◐	✣	○	✣											◔	❁	❁		○	○	○			❁				
K	Cast Iron																	●	◐	○	◔	◔						◔	❁			○	○	○			❁	○	◔		
N	Non-ferrous Metal																																				◔		
S	Heat resistant Alloy, Titanium Alloy																						●	◐	✣	○	○	◔	❁								◔	◐	◐
Shape	Order Number	RE (mm)																																					
Flat Top 	SNMN120408	0.8																▲	▲	▲														●		●		●		
	SNMN120412	1.2																▲	▲	▲														●		●				
	SNMN120416	1.6																▲	▲	▲																				
	SNMN190412	1.2																																		●				
Flat Top 	SNGN090308	0.8																																				●		
	SNGN120404	0.4																																		●		●		
	SNGN120408	0.8																																		●				

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

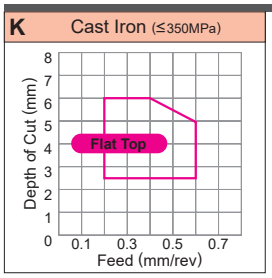
60° TN TYPE INSERTS WITHOUT HOLE

TNMN 16 03 08
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Heavy Cutting·····

K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

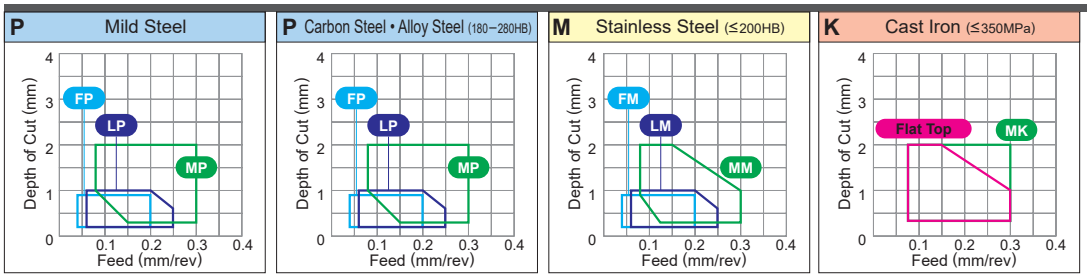
Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide				
						NEW																														
			UE6105	UE6110	UE6020	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US7020	US735	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9015
P	Steel		○	◔	❁	●	✣	◔	❁	✣	❁	●						●	◕	○	◔	◔						❁	❁	◕	○	○	○	○	◔	❁				
M	Stainless Steel												●	◕	✣	○	✣											◔	❁	❁		○	○	○		❁				
K	Cast Iron																	●	◕	○	◔	◔						◔	❁		○	○	○		❁	○	◔		
N	Non-ferrous Metal																																			◔			
S	Heat resistant Alloy, Titanium Alloy																						●	◕	✣	○	○	◔	❁						◔	◕	◕	
Shape	Order Number	RE (mm)																																				
Flat Top	**TNMN160308**	0.8																															●					
	TNMN160408	0.8																▲	▲	▲													●					
	TNMN160412	1.2																▲	▲	▲																		
	TNMN160416	1.6																▲	▲	▲																		
	TNMN220408	0.8																															●					
	TNMN220412	1.2																																	●			
Flat Top	**TNGN110304**	0.4																																		●		
	TNGN110308	0.8																																		●		
	TNGN160404	0.4																																		●		
	TNGN160408	0.8																																		●		

80° CC TYPE INSERTS WITH HOLE

CCMT 06 02 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting Light Cutting Medium Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ◔ ✣ ✣ ● ◔ ✣ ○ ✣ ● ● ◔ ○ ○ ◔ ○ ◔ ✣ ✣ ◔ ○ ○ ○ ◔ ○ ◔ ✣ ○
M	Stainless Steel	◔ ✣ ○ ✣ ● ● ◔ ◔ ✣ ✣ ○ ○ ○ ◔ ✣ ✣ ○ ○ ✣ ○
K	Cast Iron	● ◔ ○ ○ ◔ ◔ ◔ ✣ ✣ ○ ○ ○ ○ ◔ ✣ ✣ ○ ○ ✣ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ○ ◔ ✣ ◔ ● ● ◔ ○

Shape	Order Number	RE (mm)	Coated																							Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP	CCMT060202-FP	0.2	▲		▲	▲	▲																					●				●								
	CCMT060204-FP	0.4	▲		▲	▲	▲																					●				●								
	CCMT09T302-FP	0.2	▲		▲	▲	▲																					●				●								
	CCMT09T304-FP	0.4	▲		▲	▲	▲																					●				●								
Finish Cutting	CCMT09T308-FP	0.8	▲		▲	▲	▲																					●				●								
FM	CCMT060202-FM	0.2																									●												
	CCMT060204-FM	0.4																									●												
	CCMT09T302-FM	0.2																									●												
	CCMT09T304-FM	0.4																									●												
Finish Cutting	CCMT09T308-FM	0.8																									●												
FS	CCGT060201M-FS	0.1*1																		●	●	●																		
	CCGT060202M-FS	0.2*1																		●	●	●																		
	CCGT09T301M-FS	0.1*1																		●	●	●																		
	CCGT09T302M-FS	0.2*1																		●	●	●																		
Finish Cutting	CCGT09T304M-FS	0.4*1																		●	●	●																		
FS-P	CCGT060201M-FS-P	0.1*1												●									●																	
	CCGT060202M-FS-P	0.2*1												●									●																	
	CCGT09T301M-FS-P	0.1*1												●									●																	
	CCGT09T302M-FS-P	0.2*1												●									●																	
Finish Cutting	CCGT09T304M-FS-P	0.4*1												●									●																	
FV	CCMT060202-FV	0.2			▲																						●		●	●	●	●								
	CCMT060204-FV	0.4			▲																						●		●	●	●	●								
	CCMT09T302-FV	0.2			▲																									●	●	●								
	CCMT09T304-FV	0.4			▲																								●		●	●								
Finish Cutting	CCMT09T308-FV	0.8			▲																								●		●	●								
FJ	CCGT0602V5-FJ	0.05																								●													
	CCGT060201-FJ	0.1																								●													
	CCGT060202-FJ	0.2																								●													
	CCGT09T3V5-FJ	0.05																								●													
	CCGT09T301-FJ	0.1																								●											●			
	CCGT09T302-FJ	0.2																								●											●			
Finish Cutting	CCGT09T304-FJ	0.4																								●											●			

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																							Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
P	Steel		○	◔	❁	◔	❁	❁	●															◐			❁	❁	◐	○	○	◔	○	◔	❁					○
M	Stainless Steel									◐	✣	○	✣	●									◐		◔	❁	❁			○	○		○		❁					
K	Cast Iron														●	◐	○	◔	◔						◔	❁				○	○		○		❁	○	◔			○
N	Non-ferrous Metal																																			◔				○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	◐	●	◐	

Shape	Order Number	RE (mm)																																						
AZ	**CCGT060202-AZ**	0.2																																		●				
	CCGT060204-AZ	0.4																																		●				
	CCGT09T302-AZ	0.2																																		●				
	CCGT09T304-AZ	0.4																																		●				
	CCGT09T308-AZ	0.8																																		●				
	CCGT120402-AZ	0.2																																		●				
	CCGT120404-AZ	0.4																																		●				
Medium Cutting – Finish Cutting	**CCGT120408-AZ**	0.8																																		●				
R/L-F	∗1 **CCGT03S1V3L-F**	0.03																								●					●								
	∗1 **CCGT03S101L-F**	0.1																								●					●								
	∗1 **CCGT03S102L-F**	0.2																								●			●		●								
	∗1 **CCGT03S104L-F**	0.4																								●			●		●								
	∗1 **CCGT04T0V3L-F**	0.03																								●					●								
	∗1 **CCGT04T001L-F**	0.1																								●					●								
	∗1 **CCGT04T002L-F**	0.2																								●			●		●								
	∗1 **CCGT04T004L-F**	0.4																								●			●		●								
	∗1 **CCGT03S101MR-F**	0.1∗2							●																																
	∗1 **CCGT03S101ML-F**	0.1∗2							●																																
	∗1 **CCGT03S102MR-F**	0.2∗2							●																																
	∗1 **CCGT03S102ML-F**	0.2∗2							●																																
	∗1 **CCGT03S104MR-F**	0.4∗2							●																																
	∗1 **CCGT03S104ML-F**	0.4∗2							●																																
	∗1 **CCGT04T001MR-F**	0.1∗2							●																																
	∗1 **CCGT04T001ML-F**	0.1∗2							●																																
	∗1 **CCGT04T002MR-F**	0.2∗2							●																																
	∗1 **CCGT04T002ML-F**	0.2∗2							●																																
	∗1 **CCGT04T004MR-F**	0.4∗2							●																																
Finish Cutting	∗1 **CCGT04T004ML-F**	0.4∗2							●																																
R/L-F	**CCGH060202R-F**	0.2																								●			●		●					●				
	CCGH060202L-F	0.2																								●			●		●					●				
	CCGH060204R-F	0.4																								●			●		●					●				
	CCGH060204L-F	0.4																								●			●		●					●				
	CCGH060202MR-F	0.2∗2							●																																
	CCGH060202ML-F	0.2∗2							●																																
	CCGH060204MR-F	0.4∗2							●																																
	CCGH060204ML-F	0.4∗2							●																																
Finish Cutting																																								
LP	**CCMT060204-LP**	0.4		▲		▲▲																							●		●									
	CCMT060208-LP	0.8		▲		▲▲																							●		●									
	CCMT09T304-LP	0.4		▲		▲▲																							●		●									
	CCMT09T308-LP	0.8		▲		▲▲																							●		●									
Light Cutting																																								

∗1 Diameter of inscribed circle is special. (For SCLC type)
∗2 Indicates the maximum value of the corner R. For more details, see page D003.

Scan here for product NEWS ▶

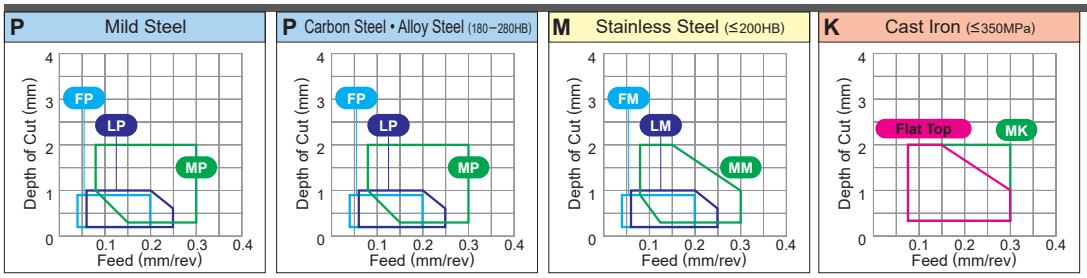
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D010	IDENTIFICATION	➤ A002

80° CC TYPE INSERTS WITH HOLE

CCMT 06 02 04- LM
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ◔ ✣ ✣ ● ◕ ✣ ○ ✣ ● ● ○ ◔ ◔ ◕ ✣ ✣ ◕ ○ ○ ○ ◔ ○ ◔ ✣ ○
M	Stainless Steel	◕ ✣ ○ ✣ ● ● ○ ◔ ◔ ◕ ✣ ✣ ○ ○ ○ ✣ ○
K	Cast Iron	● ◕ ○ ○ ◔ ◔ ◔ ✣ ✣ ○ ○ ○ ✣ ○ ✣ ○ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✣ ○ ◕ ○ ◔ ✣ ◔ ◕ ● ◕

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
LM	**CCMT060204-LM**	0.4								●	●																●												
	CCMT060208-LM	0.8								●	●																●												
	CCMT09T304-LM	0.4								●	●																●												
	CCMT09T308-LM	0.8								●	●																●												
Light Cutting																																							
LS	**CCMT060202-LS**	0.2																		●	●	●																●		
	CCMT060204-LS	0.4																		●	●	●																●		
	CCMT09T302-LS	0.2																		●	●	●																●		
	CCMT09T304-LS	0.4																		●	●	●																●		
Light Cutting	**CCMT09T308-LS**	0.8																		●	●	●																●		
LS	**CCGT060201M-LS**	0.1*2																		●	●	●																		
	CCGT060202M-LS	0.2*2																		●	●	●																		
	CCGT09T301M-LS	0.1*2																		●	●	●																		
	CCGT09T302M-LS	0.2*2																		●	●	●																		
Light Cutting	**CCGT09T304M-LS**	0.4*2																		●	●	●																		
LS-P	**CCGT060201M-LS-P**	0.1*2							●					●										●														●		
	CCGT060202M-LS-P	0.2*2							●					●										●														●		
	CCGT09T301M-LS-P	0.1*2							●					●										●														●		
	CCGT09T302M-LS-P	0.2*2							●					●										●														●		
Light Cutting	**CCGT09T304M-LS-P**	0.4*2							●					●										●														●		
SV	**CCMH060202-SV**	0.2			▲		▲					●														●				●	●	●							
	CCMH060204-SV	0.4			▲		▲					●														●				●	●	●							
Light Cutting																																							
*1 **SW**	**CCMT060202-SW**	0.2			▲	▲	▲	▲																								●	●	●						
	CCMT060204-SW	0.4			▲	▲	▲	▲																								●	●	●						
	CCMT09T302-SW	0.2			▲	▲	▲	▲																								●	●	●						
	CCMT09T304-SW	0.4			▲	▲	▲	▲				▲																				●	●	●						
Light Cutting (Wiper)																																							

*1 Please refer to A028 before using the SW breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◐ ✣ ○ ✣ ●
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																								Coated Cermet				Cermet		Carbide							
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SS	CCGT0602V3R-SS	0.03																								●														
	CCGT0602V3L-SS	0.03																								●														
	CCGT060201R-SS	0.1																								●														
	CCGT060201L-SS	0.1																								●														
	CCGT060202R-SS	0.2																																						
	CCGT060202L-SS	0.2																								●														
	CCGT09T3V3R-SS	0.03																								●														
	CCGT09T3V3L-SS	0.03																								●														
	CCGT09T301R-SS	0.1																								●														
	CCGT09T301L-SS	0.1																								●														
	CCGT09T302R-SS	0.2																								●														
	CCGT09T302L-SS	0.2																								●														
	CCGT060201MR-SS	0.1*1							●																															
	CCGT060201ML-SS	0.1*1							●																															
	CCGT060202MR-SS	0.2*1							●																															
	CCGT060202ML-SS	0.2*1							●																															
	CCGT09T301MR-SS	0.1*1							●																															
	CCGT09T301ML-SS	0.1*1							●																															
	CCGT09T302MR-SS	0.2*1							●																															
	CCGT09T302ML-SS	0.2*1							●																															
	CCGT09T304MR-SS	0.4*1							●																															
Light Cutting	CCGT09T304ML-SS	0.4*1							●																															
MP	CCMT060204-MP	0.4		▲		▲▲																							●				●							
	CCMT060208-MP	0.8		▲		▲▲																							●				●							
	CCMT09T304-MP	0.4		▲		▲▲																							●				●							
	CCMT09T308-MP	0.8		▲		▲▲																							●				●							
	CCMT120404-MP	0.4		▲		▲▲																							●				●							
	CCMT120408-MP	0.8		▲		▲▲																							●				●							
Medium Cutting	CCMT120412-MP	1.2		▲		▲▲																							●				●							
MM	CCMT060204-MM	0.4								●	●															●														
	CCMT060208-MM	0.8								●	●															●														
	CCMT09T304-MM	0.4								●	●															●														
	CCMT09T308-MM	0.8								●	●															●														
	CCMT120404-MM	0.4								●	●															●														
	CCMT120408-MM	0.8								●	●															●														
Medium Cutting	CCMT120412-MM	1.2								●	●															●														
MK	CCMT060204-MK	0.4													▲	▲																									
	CCMT060208-MK	0.8													▲	▲																									
	CCMT09T304-MK	0.4													▲	▲																									
	CCMT09T308-MK	0.8													▲	▲																									
	CCMT120404-MK	0.4													▲	▲																									
	CCMT120408-MK	0.8													▲	▲																									
Medium Cutting	CCMT120412-MK	1.2													▲	▲																									

*1 Indicates the maximum value of the corner R. For more details, see page D003.

Scan here for product NEWS ▶

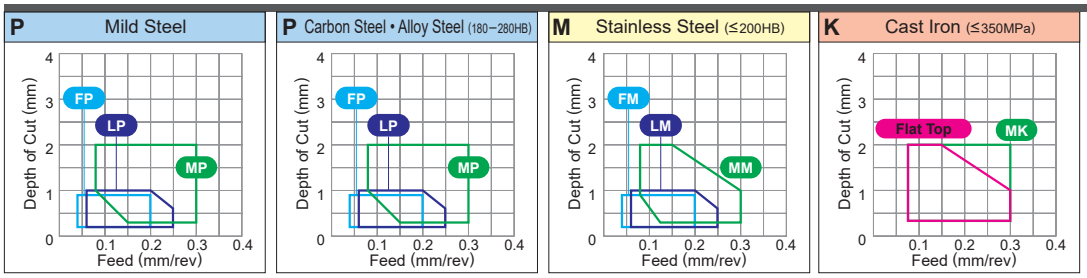
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D010	IDENTIFICATION	➤ A002

80° CC TYPE INSERTS WITH HOLE

CCMT 06 02 02- MS
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◕ ✣ ○ ✣ ●
K	Cast Iron	● ◕ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✣ ○ ◕ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																					Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
MS	**CCMT060202-MS**	0.2																		●	●	●																●		
	CCMT060204-MS	0.4																		●	●	●																●		
	CCMT060208-MS	0.8																		●	●	●																●		
	CCMT09T302-MS	0.2																		●	●	●																		
	CCMT09T304-MS	0.4																		●	●	●																●		
	CCMT09T308-MS	0.8																		●	●	●																●		
	CCMT120404-MS	0.4																		●	●	●																●		
	CCMT120408-MS	0.8																		●	●	●																●		
Medium Cutting	**CCMT120412-MS**	1.2																		●	●	●																●		
Standard	**CCMT060202**	0.2		▲	▲								●																●	●			●	●	●					
	CCMT060204	0.4	▲	▲	▲								●				▲										●		●	●			●	●	●					
	CCMT060208	0.8		▲	▲								●				▲										●						●		●					
	CCMT080302	0.2		▲																																				
	CCMT080304	0.4		▲									●																●	●			●	●	●					
	CCMT080308	0.8		▲									●																						●					
	CCMT09T302	0.2		▲	▲								●																●	●			●	●						
	CCMT09T304	0.4	▲	▲	▲								●				▲										●		●	●			●	●	●					
	CCMT09T308	0.8	▲	▲	▲								●				▲										●		●	●			●	●	●					
	CCMT120404	0.4	▲	▲	▲								●				▲										●		●	●			●	●	●					
	CCMT120408	0.8	▲	▲	▲								●				▲										●		●				●	●	●					
Medium Cutting	**CCMT120412**	1.2		▲	▲								●																				●							
MV	**CCMH060202-MV**	0.2			▲		▲						●														●		●	●		●	●	●						
	CCMH060204-MV	0.4			▲		▲					▲	●			▲											●		●	●		●	●	●						
Medium Cutting																																								
*1 **MW**	**CCMT060204-MW**	0.4			▲	▲	▲																						●	●		●								
	CCMT060208-MW	0.8		▲	▲	▲	▲																						●	●		●								
	CCMT09T304-MW	0.4		▲	▲	▲	▲					▲																	●	●		●								
	CCMT09T308-MW	0.8		▲	▲	▲	▲					▲																	●	●		●								
	CCMT120404-MW	0.4		▲	▲	▲	▲																							●		●								
Medium Cutting (Wiper)	**CCMT120408-MW**	0.8		▲	▲	▲	▲																							●		●								

*1 Please refer to A028 before using the MW breaker (wiper insert).

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◐ ✣ ○ ✣ ●
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁

Shape	Order Number	RE (mm)	Coated																										Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SR	CCET0602V3R-SR	0.03*1																									●					●				●					
	CCET0602V3L-SR	0.03*1																									●					●				●					
	CCET060201R-SR	0.1 *1																									●					●				●					
	CCET060201L-SR	0.1 *1																									●					●				●					
	CCET060202R-SR	0.2 *1																									●					●				●					
	CCET060202L-SR	0.2 *1																									●					●				●					
	CCET060204R-SR	0.4 *1																									●					●				●					
	CCET060204L-SR	0.4 *1																									●					●				●					
	CCET09T3V3R-SR	0.03*1																									●					●				●					
	CCET09T3V3L-SR	0.03*1																									●					●				●					
	CCET09T301R-SR	0.1 *1																									●					●				●					
	CCET09T301L-SR	0.1 *1																									●					●				●					
	CCET09T302R-SR	0.2 *1																									●					●				●					
	CCET09T302L-SR	0.2 *1																									●					●				●					
	CCET09T304R-SR	0.4 *1																									●					●				●					
Medium Cutting	CCET09T304L-SR	0.4 *1																									●					●				●					
R/L-SN	CCGT0602V3R-SN	0.03																									●														
	CCGT060201R-SN	0.1																									●														
	CCGT060201L-SN	0.1																									●														
	CCGT060202R-SN	0.2																									●														
	CCGT060202L-SN	0.2																									●														
	CCGT09T3V3R-SN	0.03																									●														
	CCGT09T3V3L-SN	0.03																									●														
	CCGT09T301R-SN	0.1																									●														
	CCGT09T301L-SN	0.1																									●														
	CCGT09T302R-SN	0.2																									●														
	CCGT09T302L-SN	0.2																									●														
	CCGT09T304R-SN	0.4																									●														
	CCGT09T304L-SN	0.4																									●														
	CCGT060201MR-SN	0.1*1							●					●										●																		
	CCGT060201ML-SN	0.1*1							●																																
	CCGT060202MR-SN	0.2*1							●					●										●																		
	CCGT060202ML-SN	0.2*1							●																																
	CCGT09T301MR-SN	0.1*1							●					●										●																		
	CCGT09T301ML-SN	0.1*1							●																																
	CCGT09T302MR-SN	0.2*1							●					●										●																		
	CCGT09T302ML-SN	0.2*1							●																																
	CCGT09T304MR-SN	0.4*1							●					●										●																		
Medium Cutting	CCGT09T304ML-SN	0.4*1							●																																

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

Scan here for product NEWS ▶

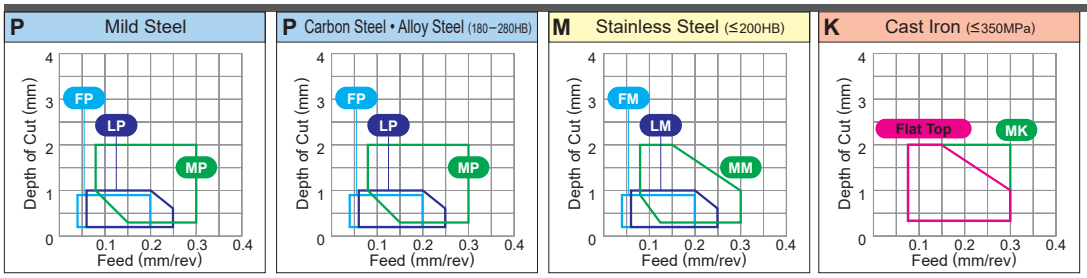
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D010	IDENTIFICATION	➤ A002

80° CC TYPE INSERTS WITH HOLE

CCET 06 02 00 R-SN
Size Thickness Corner Radius R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



●: Stable Cutting (1st recommendation) ◔: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◷: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ❁ ◷ ❁ ❁ ● ◔ ✣ ○ ✣ ● ● ○ ○ ◷ ○ ◷ ○ ○ ◔ ○ ○ ◷ ○ ◷ ❁ ❁ ◔ ○ ○ ○ ◷ ○ ◷ ❁ ❁ ○
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ◷ ❁ ❁ ○ ○ ○ ◷ ❁ ❁ ○ ❁
K	Cast Iron	● ◔ ○ ○ ◷ ◷ ◷ ❁ ○ ○ ○ ○ ❁ ○ ◷ ◔ ● ● ◔ ○
N	Non-ferrous Metal	◷ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ◷ ◷ ❁ ◷ ◔ ● ◔

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SN	CCET060200R-SN	0.0 *2																								●			●		●						
	CCET060200L-SN	0.0 *2																								●			●		●						
	CCET0602V3R-SN	0.03*2																								●			●		●						
	CCET0602V3L-SN	0.03*2																								●			●		●						
	CCET060201R-SN	0.1 *2																								●			●		●						
	CCET060201L-SN	0.1 *2																								●			●		●						
	CCET060202R-SN	0.2 *2																								●			●		●						
	CCET060202L-SN	0.2 *2																								●			●		●						
	CCET060204R-SN	0.4 *2																								●			●		●						
	CCET060204L-SN	0.4 *2																								●			●		●						
	CCET09T300R-SN	0.0 *2																								●			●		●						
	CCET09T300L-SN	0.0 *2																								●			●		●						
	CCET09T3V3R-SN	0.03*2																								●			●		●						
	CCET09T3V3L-SN	0.03*2																								●			●		●						
	CCET09T301R-SN	0.1 *2																								●			●		●						
	CCET09T301L-SN	0.1 *2																								●			●		●						
	CCET09T302R-SN	0.2 *2																								●			●		●						
	CCET09T302L-SN	0.2 *2																								●			●		●						
	CCET09T304R-SN	0.4 *2																								●			●		●						
Medium Cutting	CCET09T304L-SN	0.4 *2																								●			●		●						
R/LW-SN *1	CCET0602V3RW-SN	0.03*2																								●											
	CCET0602V3LW-SN	0.03*2																								●											
	CCET09T3V3RW-SN	0.03*2																								●											
Medium Cutting (Wiper)	CCET09T3V3LW-SN	0.03*2																								●											
SMG	CCGT060201M-SMG	0.1 *2							●																													
	CCGT060202M-SMG	0.2 *2							●																		●											
	CCGT060204M-SMG	0.4 *2							●																		●											
	CCGT09T301M-SMG	0.1 *2							●																													
	CCGT09T302M-SMG	0.2 *2							●																													
Medium Cutting	CCGT09T304M-SMG	0.4 *2							●																													

*1 Please refer to A028 before using the R/LW-SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
P	Steel		○	◔	❁	◔	❁	❁	●															◐			❁	❁	◐	○	○	◔	○	◔	❁						○
M	Stainless Steel									◐	✣	○	✣	●										◐		◔	❁	❁		○	○		○		❁						
K	Cast Iron														●	◐	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
N	Non-ferrous Metal																																			◔					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	◐	●	◐		

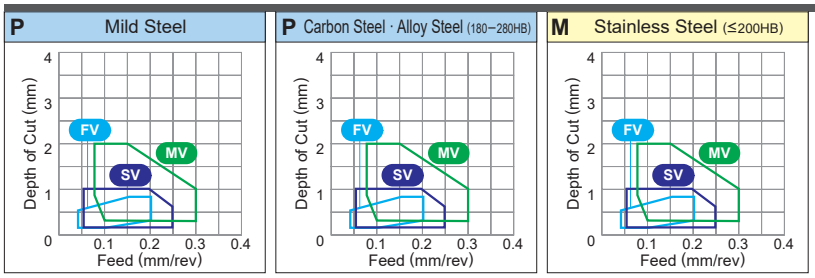
Shape	Order Number	RE (mm)																																						
Flat Top	CCMW060202	0.2																																		●					
	CCMW060204	0.4													▲	▲	▲																			●		●				
	CCMW060208	0.8													▲	▲																										
	CCMW09T304	0.4													▲	▲	▲	▲																				●				
	CCMW09T308	0.8													▲	▲	▲																			●		●				
	CCMW09T312	1.2													▲	▲																										
	CCMW120404	0.4													▲	▲	▲																					●				
	CCMW120408	0.8													▲	▲	▲																					●				
	CCMW120412	1.2													▲	▲																										
Flat Top	CCGW060200	0.0																																●							
	CCGW0602V5	0.05																																●							
	CCGW09T300	0.0																																●							
	CCGW09T3V5	0.05																																●							

80° CP TYPE INSERTS WITH HOLE

CPMH 08 02 02- FV
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
		Coated																										Coated Cermet				Cermet		Carbide						
	P Steel	○	◔	❁	◔	❁	❁	●																			❁	❁	◕	○	○	◔	○	◔	❁						○
	M Stainless Steel								◕	✣	○	✣	●										◕			◔	❁	❁		○	○		○		❁						
	K Cast Iron													●	◕	○	◔	◔								◔	❁		○	○		○		❁	○	◔	◔				○
	N Non-ferrous Metal																																			◔					○
	S Heat resistant Alloy, Titanium Alloy																		●	◕	✣	○	◕	○	◔	❁									◔	◕	●	◕			

Shape	Order Number	RE (mm)	UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FV	**CPMH080202-FV**	0.2			▲																					●		●			●	●							
	CPMH080204-FV	0.4			▲																					●		●			●	●							
	CPMH090302-FV	0.2			▲																					●		●			●	●							
	CPMH090304-FV	0.4			▲																					●		●			●	●							
Finish Cutting	**CPMH090308-FV**	0.8			▲																					●		●			●	●							
Standard	**CPGT080202**	0.2																																	●					
	CPGT080204	0.4																																	●					
	CPGT090302	0.2																																	●					
	CPGT090304	0.4																																	●					
Finish Cutting																																								
R/L-F	**CPMH080204R-F**	0.4																									●					●			●					
	CPMH080204L-F	0.4																									●					●			●					
	CPMH090304R-F	0.4																									●					●			●					
	CPMH090304L-F	0.4																									●		●			●			●					
Finish Cutting																																								
R/L-F	**CPGT080204R-F**	0.4																														●								
	CPGT080204L-F	0.4																														●								
	CPGT090302R-F	0.2																														●								
	CPGT090302L-F	0.2																														●								
	CPGT090304R-F	0.4																														●								
Finish Cutting	**CPGT090304L-F**	0.4																														●								
SV	**CPMH080202-SV**	0.2			▲		▲						●														●		●		●	●							
	CPMH080204-SV	0.4			▲		▲						●														●		●		●	●							
	CPMH090302-SV	0.2			▲		▲						●														●		●		●	●							
	CPMH090304-SV	0.4			▲		▲						●														●		●		●	●							
Light Cutting	**CPMH090308-SV**	0.8			▲		▲						●														●		●		●	●							

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ✠: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
P	Steel		○	◔	✠	◔	✠	✠	●															◐			✠	✠	◐	○	○	◔	○	◔	✠						○
M	Stainless Steel									◐	✠	○	✠	●										◐		◔	✠	✠		○	○		○		✠						
K	Cast Iron														●	◐	○	◔	◔							◔	✠			○	○		○		✠	○	◔				○
N	Non-ferrous Metal																																			◔					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✠	○	◐	○	◔	✠									◔	◐	●	◐		

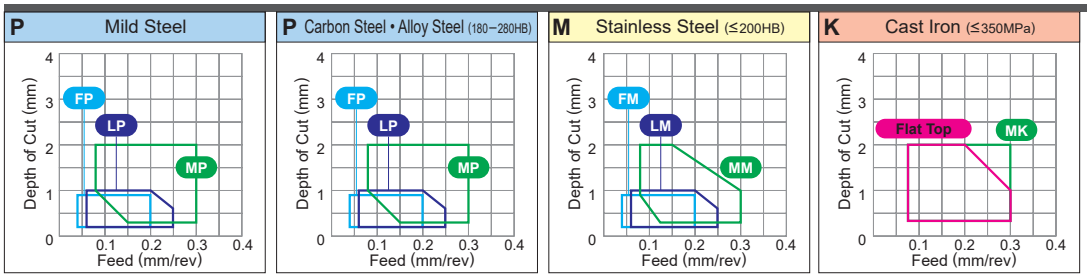
Shape	Order Number	RE (mm)																																						
Standard	**CPMX080204**	0.4		▲																							●													
	**CPMX080208**	0.8		▲																							●													
	CPMX090304	0.4		▲																							●					●		●						
	CPMX090308	0.8		▲	▲																						●							●						
Medium Cutting																																								
MV	**CPMH080204-MV**	0.4			▲		▲					▲	●			▲											●		●	●		●	●							
	**CPMH080208-MV**	0.8			▲		▲					▲	●			▲											●		●	●		●	●							
	CPMH090304-MV	0.4			▲		▲					▲	●			▲											●		●	●		●	●							
	CPMH090308-MV	0.8			▲		▲					▲	●			▲											●		●	●		●	●							
Medium Cutting																																								

55° DC TYPE INSERTS WITH HOLE

DCMT 07 02 02- FP
Size · Thickness · Corner Radius · Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◐ ✣ ○ ✣ ● ◐ ○ ◔ ◔ ○ ◔ ◔ ◐ ○ ◔ ◔ ❁ ❁ ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	◐ ✣ ○ ✣ ● ◐ ◔ ❁ ❁ ○ ○ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔ ◔ ◐ ● ◐
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ○ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔ ◔
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ◔ ○ ◔ ❁ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP	**DCMT070202-FP**	0.2	▲		▲▲																							●				●										
	DCMT070204-FP	0.4	▲		▲▲																							●				●										
	DCMT11T302-FP	0.2	▲		▲▲																							●				●										
	DCMT11T304-FP	0.4	▲		▲▲																							●				●										
Finish Cutting	**DCMT11T308-FP**	0.8	▲		▲▲																							●				●										
FM	**DCMT070202-FM**	0.2																								●																
	DCMT070204-FM	0.4																								●																
	DCMT11T302-FM	0.2																								●																
	DCMT11T304-FM	0.4																								●																
Finish Cutting	**DCMT11T308-FM**	0.8																								●																
FS	**DCGT070201M-FS**	0.1*1																		●	●	●																				
	DCGT070202M-FS	0.2*1																		●	●	●																				
	NEW **DCGT070204M-FS**	0.4*1																		●	●	●																				
	DCGT11T301M-FS	0.1*1																		●	●	●																				
	DCGT11T302M-FS	0.2*1																		●	●	●																				
Finish Cutting	NEW **DCGT11T304M-FS**	0.4*1																		●	●	●																				
FS-P	**DCGT070201M-FS-P**	0.1*1												●										●																		
	DCGT070202M-FS-P	0.2*1												●										●																		
	NEW **DCGT070204M-FS-P**	0.4*1												●										●																		
	DCGT11T301M-FS-P	0.1*1												●										●																		
	DCGT11T302M-FS-P	0.2*1												●										●																		
Finish Cutting	NEW **DCGT11T304M-FS-P**	0.4*1												●										●																		
FV	**DCMT070202-FV**	0.2		▲▲																							●		●				● ●									
	DCMT070204-FV	0.4		▲▲																							●		●				● ●									
	DCMT070208-FV	0.8		▲																							●						● ●									
	DCMT11T302-FV	0.2		▲																							●						● ●									
	DCMT11T304-FV	0.4		▲▲																							●		●				● ●									
Finish Cutting	**DCMT11T308-FV**	0.8		▲▲																							●		●				● ●									
AZ	**DCGT070202-AZ**	0.2																																								
	DCGT070204-AZ	0.4																																								
	DCGT11T302-AZ	0.2																																								
	DCGT11T304-AZ	0.4																																								
Medium Cutting – Finish Cutting	**DCGT11T308-AZ**	0.8																																								

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ○: Stable Cutting (2nd recommendation)
◐: General Cutting (1st recommendation) ◔: General Cutting (2nd recommendation)
✣: Unstable Cutting (1st recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◐ ✣ ○ ✣ ● ◐ ◐ ○ ◔ ◔ ◐ ✣ ❁ ◐ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	◐ ✣ ○ ✣ ● ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated																							Coated Cermet				Cermet		Carbide							
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-F	DCGT070202R-F	0.2																									●				●				●					
	DCGT070202L-F	0.2																									●				●				●					
	DCGT070204R-F	0.4																									●				●				●					
	DCGT070204L-F	0.4																									●				●				●					
	DCGT11T302R-F	0.2																									●				●				●					
	DCGT11T302L-F	0.2																									●				●				●					
	DCGT11T304R-F	0.4																									●				●				●					
Finish Cutting	DCGT11T304L-F	0.4																									●				●				●					
R-SRF NEW	DCGT11T301MR-SRF	0.1*1												●										●																
	DCGT11T302MR-SRF	0.2*1												●										●																
	DCGT11T304MR-SRF	0.4*1												●										●																
Finish Cutting																																								
LP	DCMT070204-LP	0.4		▲		▲▲																					●				●									
	DCMT070208-LP	0.8		▲		▲▲																					●				●									
	DCMT11T304-LP	0.4		▲		▲▲																					●				●									
	DCMT11T308-LP	0.8		▲		▲▲																					●				●									
Light Cutting																																								
LM	DCMT070204-LM	0.4								●	●																●													
	DCMT070208-LM	0.8								●	●																●													
	DCMT11T304-LM	0.4								●	●																●													
	DCMT11T308-LM	0.8								●	●																●													
Light Cutting																																								
LS	DCMT070202-LS	0.2																		●	●	●																●		
	DCMT070204-LS	0.4																		●	●	●																●		
	DCMT11T302-LS	0.2																		●	●	●																●		
	DCMT11T304-LS	0.4																		●	●	●																●		
Light Cutting	DCMT11T308-LS	0.8																		●	●	●																●		
LS	DCGT070201M-LS	0.1*1																		●	●	●																		
	DCGT070202M-LS	0.2*1																		●	●	●																		
	DCGT070204M-LS	0.4*1																		●	●	●																		
	DCGT11T301M-LS	0.1*1																		●	●	●																		
	DCGT11T302M-LS	0.2*1																		●	●	●																		
Light Cutting	DCGT11T304M-LS	0.4*1																		●	●	●																		
LS-P	DCGT070201M-LS-P	0.1*1							●					●										●															●	
	DCGT070202M-LS-P	0.2*1							●					●										●															●	
	DCGT070204M-LS-P	0.4*1							●					●										●															●	
	DCGT11T301M-LS-P	0.1*1							●					●										●															●	
	DCGT11T302M-LS-P	0.2*1							●					●										●															●	
Light Cutting	DCGT11T304M-LS-P	0.4*1							●					●										●															●	
SV	DCMT070202-SV	0.2			▲							●														●				●	● ●								
	DCMT070204-SV	0.4		▲▲								●														●				●	● ●								
	DCMT070208-SV	0.8		▲▲								●														●				●	● ●								
	DCMT11T302-SV	0.2		▲▲								●														●				●	● ●								
	DCMT11T304-SV	0.4		▲▲								●														●				●	● ●								
Light Cutting	DCMT11T308-SV	0.8		▲▲								●														●				●	● ●								

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

Scan here for product NEWS ▶

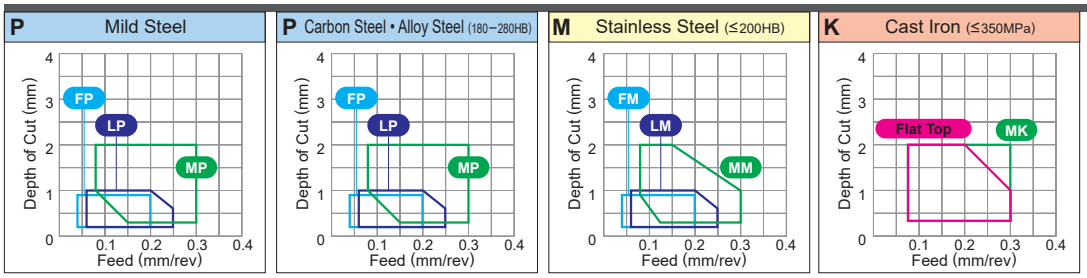
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D011, D026	IDENTIFICATION	➤ A002

55° DC TYPE INSERTS WITH HOLE

DCGT 07 02 V3 R-SS
Size / Thickness / Corner Radius / R/L / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ◔ ✣ ✣ ●
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ◔ ○ ◔ ◔ ◔ ✣ ✣ ✣ ○ ○ ○ ○ ✣
K	Cast Iron	● ◔ ○ ◔ ◔ ◔ ✣ ✣ ○ ○ ○ ✣ ○ ◔ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ○ ◔ ✣ ◔ ● ◔

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 (NEW)	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SS	DCGT0702V3R-SS	0.03																								●																
	DCGT0702V3L-SS	0.03																								●																
	DCGT070201R-SS	0.1																								●																
	DCGT070201L-SS	0.1																								●																
	DCGT070202R-SS	0.2																								●																
	DCGT070202L-SS	0.2																								●																
	DCGT11T3V3R-SS	0.03																								●																
	DCGT11T301R-SS	0.1																								●																
	DCGT11T302R-SS	0.2																								●																
	DCGT070201MR-SS	0.1*1							●																																		
	DCGT070201ML-SS	0.1*1							●																																		
	DCGT070202MR-SS	0.2*1							●																																		
	DCGT070202ML-SS	0.2*1							●																																		
	DCGT11T301MR-SS	0.1*1							●																																		
	DCGT11T301ML-SS	0.1*1							●																																		
	DCGT11T302MR-SS	0.2*1							●																																		
	DCGT11T302ML-SS	0.2*1							●																																		
	DCGT11T304MR-SS	0.4*1							●																																		
Light Cutting	DCGT11T304ML-SS	0.4*1							●																																		
MP	DCMT070204-MP	0.4		▲		▲▲																							●				●									
	DCMT070208-MP	0.8		▲		▲▲																							●				●									
	DCMT11T304-MP	0.4		▲		▲▲																							●				●									
	DCMT11T308-MP	0.8		▲		▲▲																							●				●									
	DCMT150404-MP	0.4		▲		▲▲																							●				●									
Medium Cutting	DCMT150408-MP	0.8		▲		▲▲																							●				●									

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◐ ✠ ○ ✠ ●
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																									Coated Cermet				Cermet		Carbide							
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
MM	**DCMT070204-MM**	0.4								●	●																●														
	DCMT070208-MM	0.8								●	●																●														
	DCMT11T304-MM	0.4								●	●																●														
	DCMT11T308-MM	0.8								●	●																●														
	DCMT150404-MM	0.4								●	●																●														
Medium Cutting	**DCMT150408-MM**	0.8								●	●																●														
MK	**DCMT070204-MK**	0.4													▲	▲																									
	DCMT070208-MK	0.8													▲	▲																									
	DCMT11T304-MK	0.4													▲	▲																									
	DCMT11T308-MK	0.8													▲	▲																									
	DCMT150404-MK	0.4													▲	▲																									
Medium Cutting	**DCMT150408-MK**	0.8													▲	▲																									
MS	**DCMT070204-MS**	0.4																		●	●	●																	●		
	DCMT070208-MS	0.8																		●	●	●																	●		
	DCMT11T304-MS	0.4																		●	●	●																	●		
	DCMT11T308-MS	0.8																		●	●	●																	●		
Medium Cutting	**DCMT11T312-MS**	1.2																		●	●	●																	●		
Standard	**DCMT070202**	0.2		▲	▲							●																	●	●			●	●	●						
	DCMT070204	0.4	▲	▲	▲							●															●		●	●			●	●	●						
	DCMT070208	0.8		▲								●																	●	●			●	●							
	DCMT11T302	0.2		▲	▲							●																	●	●			●	●	●						
	DCMT11T304	0.4	▲	▲	▲							●					▲										●		●	●			●	●	●						
	DCMT11T308	0.8	▲	▲	▲							●					▲										●		●	●			●	●	●						
	DCMT11T312	1.2		▲																																					
	DCMT150404	0.4		▲	▲							●																	●	●			●	●	●						
	DCMT150408	0.8		▲	▲							●						▲											●					●	●						
Medium Cutting	**DCMT150412**	1.2		▲																																					
MV	**DCMT070202-MV**	0.2		▲	▲		▲				▲	●															●		●	●		●	●								
	DCMT070204-MV	0.4		▲	▲		▲				▲	●				▲											●		●	●		●	●								
	DCMT070208-MV	0.8		▲	▲		▲					●				▲											●		●	●		●	●								
	DCMT11T302-MV	0.2		▲	▲		▲				▲	●															●		●	●		●	●								
	DCMT11T304-MV	0.4		▲	▲		▲				▲	●				▲											●		●	●		●	●								
Medium Cutting	**DCMT11T308-MV**	0.8		▲	▲		▲				▲	●				▲											●		●	●		●	●								
R/L-SR	**DCET0702V3R-SR**	0.03*1																									●					●			●					
	DCET0702V3L-SR	0.03*1																									●					●			●					
	DCET070201R-SR	0.1 *1																									●					●			●					
	DCET070201L-SR	0.1 *1																									●					●			●					
	DCET070202R-SR	0.2 *1																									●					●			●					
	DCET070202L-SR	0.2 *1																									●					●			●					
	DCET070204R-SR	0.4 *1																									●					●			●					
	DCET070204L-SR	0.4 *1																									●					●			●					
	DCET11T3V3R-SR	0.03*1																									●					●			●					
Medium Cutting	**DCET11T3V3L-SR**	0.03*1																									●					●			●					

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

Scan here for product NEWS ▶

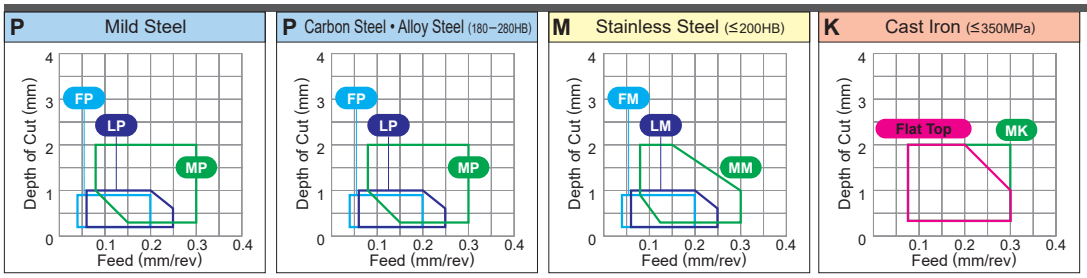
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D011, D026	IDENTIFICATION	➤ A002

55° DC TYPE INSERTS WITH HOLE

DCET 11 T3 01 R-SR
Size Thickness Corner Radius R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ❁ ◷ ❁ ❁ ● ◔ ✣ ○ ✣ ● ● ◔ ○ ○ ◷ ○ ◷ ❁ ◔ ○ ○ ○ ◷ ○ ◷ ❁ ○
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ○ ○ ◷ ◷ ◔ ◷ ❁ ❁ ○ ○ ○ ❁ ○
K	Cast Iron	● ◔ ○ ○ ◷ ◷ ◷ ❁ ○ ○ ○ ❁ ❁ ◷ ○
N	Non-ferrous Metal	◷ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ○ ◷ ❁ ◷ ◔ ● ◔ ○

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SR	DCET11T301R-SR	0.1*1																								●							●			●					
	DCET11T301L-SR	0.1*1																								●							●			●					
	DCET11T302R-SR	0.2*1																								●							●			●					
	DCET11T302L-SR	0.2*1																								●							●			●					
	DCET11T304R-SR	0.4*1																								●							●			●					
Medium Cutting	DCET11T304L-SR	0.4*1																								●							●			●					
R/L-SN	DCGT0702V3R-SN	0.03																								●																
	DCGT070201R-SN	0.1																								●																
	DCGT070202R-SN	0.2																								●																
	DCGT070202L-SN	0.2																								●																
	DCGT11T3V3R-SN	0.03																								●																
	DCGT11T3V3L-SN	0.03																								●																
	DCGT11T301R-SN	0.1																								●																
	DCGT11T301L-SN	0.1																								●																
	DCGT11T302R-SN	0.2																								●																
	DCGT11T302L-SN	0.2																								●																
	DCGT11T304R-SN	0.4																								●																
	DCGT11T304L-SN	0.4																								●																
	DCGT070201MR-SN	0.1*1							●					●										●																		
	DCGT070201ML-SN	0.1*1							●																																
	DCGT070202MR-SN	0.2*1							●					●										●																		
	DCGT070202ML-SN	0.2*1							●																																
NEW	DCGT070204MR-SN	0.4*1												●										●																		
	DCGT11T301MR-SN	0.1*1							●					●										●																		
	DCGT11T301ML-SN	0.1*1							●																																
	DCGT11T302MR-SN	0.2*1							●					●										●																		
	DCGT11T302ML-SN	0.2*1							●																																
	DCGT11T304MR-SN	0.4*1							●					●										●																		
Medium Cutting	DCGT11T304ML-SN	0.4*1							●																																

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy

Shape	Order Number	RE (mm)	Coated																								Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SN	**DCET070200R-SN**	0.0 *2																								●						●			●					
	DCET070200L-SN	0.0 *2																								●						●			●					
	DCET0702V3R-SN	0.03*2																								●						●			●					
	DCET0702V3L-SN	0.03*2																								●						●			●					
	DCET070201R-SN	0.1 *2																								●						●			●					
	DCET070201L-SN	0.1 *2																								●						●			●					
	DCET070202R-SN	0.2 *2																								●						●			●					
	DCET070202L-SN	0.2 *2																								●						●			●					
	DCET070204R-SN	0.4 *2																								●						●			●					
	DCET070204L-SN	0.4 *2																								●						●			●					
	DCET11T300R-SN	0.0 *2																								●						●			●					
	DCET11T300L-SN	0.0 *2																								●						●			●					
	DCET11T3V3R-SN	0.03*2																								●						●			●					
	DCET11T3V3L-SN	0.03*2																								●						●			●					
	DCET11T301R-SN	0.1 *2																								●						●			●					
	DCET11T301L-SN	0.1 *2																								●						●			●					
	DCET11T302R-SN	0.2 *2																								●						●			●					
	DCET11T302L-SN	0.2 *2																								●						●			●					
	DCET11T304R-SN	0.4 *2																								●						●			●					
Medium Cutting	**DCET11T304L-SN**	0.4 *2																								●						●			●					
R/LW-SN *1	**DCET0702V3RW-SN**	0.03*2																								●														
	DCET0702V3LW-SN	0.03*2																								●														
	DCET11T3V3RW-SN	0.03*2																								●														
Medium Cutting (Wiper)	**DCET11T3V3LW-SN**	0.03*2																								●														
SMG	**DCGT070201M-SMG**	0.1*2							●																																
	DCGT070202M-SMG	0.2*2							●																		●														
	DCGT070204M-SMG	0.4*2							●																		●														
	DCGT11T301M-SMG	0.1*2							●																																
	DCGT11T302M-SMG	0.2*2							●																		●														
Medium Cutting	**DCGT11T304M-SMG**	0.4*2							●																		●														
Flat Top	**DCMW070204**	0.4													▲	▲	▲																				●				
	DCMW11T304	0.4													▲	▲	▲																		●		●				
	DCMW11T308	0.8													▲	▲	▲																				●				
	DCMW150404	0.4																																			●				
	DCMW150408	0.8																																			●				
Flat Top	**DCGW070200**	0.0																														●								
	DCGW0702V5	0.05																														●								
	DCGW11T300	0.0																														●								
	DCGW11T3V5	0.05																														●								

*1 Please refer to A028 before using the R/LW-SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

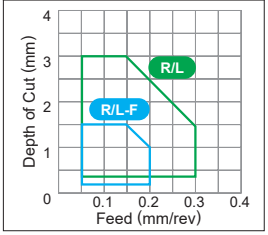
55° DE TYPE INSERTS WITH HOLE

DEGX 15 04 02 R-F
Size / Thickness / Corner Radius / R/L / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Medium Cutting ·····

N Aluminium Alloy



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◐ ✣ ○ ✣ ● ◐ ◔ ❁ ❁ ○ ○ ○ ◔ ○ ◔ ❁ ○
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated																									Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-F	DEGX150402R-F	0.2																																	●					
	DEGX150402L-F	0.2																																	●					
	DEGX150404R-F	0.4																																	●					
	DEGX150404L-F	0.4																																	●					
Finish Cutting (For Aluminium Alloy)																																								
R/L	DEGX150402R	0.2																																	●					
	DEGX150402L	0.2																																	●					
	DEGX150404R	0.4																																	●					
	DEGX150404L	0.4																																	●					
Medium Cutting (For Aluminium Alloy)																																								

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

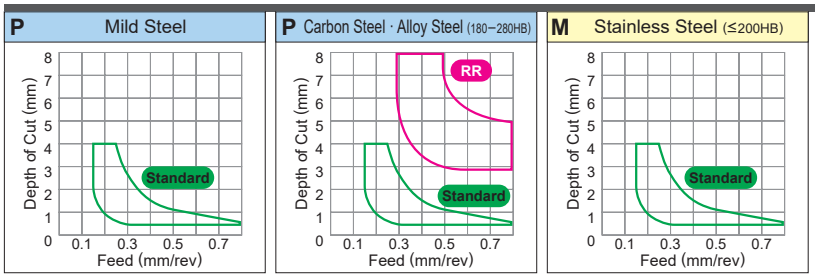
CHIP BREAKERS ➢ A070

RC TYPE INSERTS WITH HOLE

RCGT 08 03 M0- AZ
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	IC (mm)	Coated																						Coated Cermet				Cermet		Carbide					
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
AZ  Medium Cutting – Finish Cutting	RCGT0803M0-AZ	8.0																																	●					
	RCGT10T3M0-AZ	10.0																																	●					
Standard  Medium Cutting	RCMT0602M0	6.0		▲																●	●	●							●			●	●				●	●		
	RCMT0803M0	8.0		▲									●							●	●	●							●			●	●				●	●		
	NEW RCMT10T3M0	10.0																		●	●	●																●	●		
	NEW RCMT1204M0	12.0																		●	●	●																●	●		
	NEW RCMT1606M0	16.0																		●	●	●																●	●		
Standard  Medium Cutting	RCMX1003M0	10.0		▲	▲		▲						●												●				●			●	●							
	RCMX1204M0	12.0	▲	▲	▲		▲						●			▲							●		●	●			●				●	●							
	RCMX1606M0	16.0	▲	▲	▲		▲	●					●										●		●	●															
	RCMX2006M0	20.0	▲	▲	▲		▲	●					●																												
	RCMX2507M0	25.0	▲	▲	▲		▲																																		
	RCMX3209M0	32.0	▲	▲	▲																																				
RR  Heavy Cutting	RCMX1606M0-RR	16.0		▲	▲		▲	●					●																											
	RCMX2006M0-RR	20.0		▲	▲		▲	●					●																											
	RCMX2507M0-RR	25.0		▲	▲		▲	●					●																											
	RCMX3209M0-RR	32.0		▲	▲																																			

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING	➤ C002—C005	
BORING	➤ —	

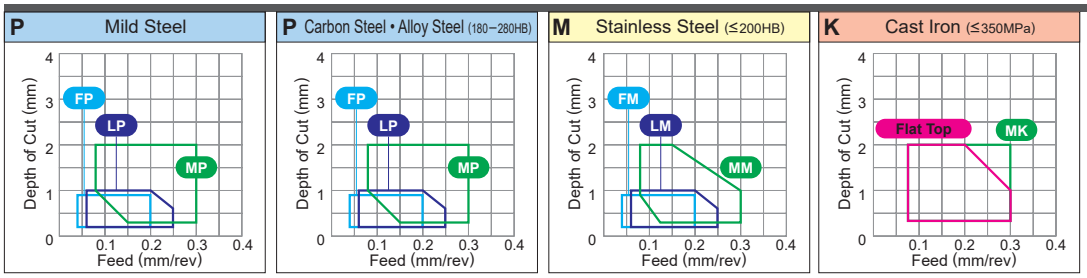
CHIP BREAKERS	➤ A058
GRADES	➤ A030
IDENTIFICATION	➤ A002

90° SC TYPE INSERTS WITH HOLE

SCMT 09 T3 04- FP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◕ ✣ ○ ✣ ● ◕ ○ ○ ○ ◔ ○ ◔ ❁ ❁ ◕ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	◕ ✣ ○ ✣ ● ◕ ◔ ❁ ❁ ○ ○ ○ ❁ ○
K	Cast Iron	● ◕ ○ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ❁ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	◔ ◕ ● ◕

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP  Finish Cutting	**SCMT09T304-FP**	0.4	▲			▲▲																							●			●								
	SCMT09T308-FP	0.8	▲			▲▲																							●			●								
FM  Finish Cutting	**SCMT09T304-FM**	0.4																									●												
	SCMT09T308-FM	0.8																									●												
FV  Finish Cutting	**SCMT09T304-FV**	0.4			▲																								●		●	● ●							
LP  Light Cutting	**SCMT09T304-LP**	0.4	▲			▲▲																							●			●								
	SCMT09T308-LP	0.8	▲			▲▲																							●			●								
LM  Light Cutting	**SCMT09T304-LM**	0.4								●	●																●												
	SCMT09T308-LM	0.8								●	●																●												
MP  Medium Cutting	**SCMT09T304-MP**	0.4	▲			▲▲																							●			●								
	SCMT09T308-MP	0.8	▲			▲▲																							●			●								
	SCMT120404-MP	0.4	▲			▲▲																							●			●								
	SCMT120408-MP	0.8	▲			▲▲																							●			●								

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide						
	P	Steel	○	◔	❁	◔	❁	❁	●				✣		◐									◐			❁	❁	◐	○	○	○	◔	○	◔	❁						○
	M	Stainless Steel								◐	✣	○	✣	●										◐		◔	❁	❁		○	○		○		❁						
	K	Cast Iron													●	◐	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																		◔					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁									◔	◐	●	◐		

Shape	Order Number	RE (mm)																																								
MM	**SCMT09T304-MM**	0.4								●	●															●														
	SCMT09T308-MM	0.8								●	●															●														
	SCMT120404-MM	0.4								●	●															●														
	SCMT120408-MM	0.8								●	●															●														
Medium Cutting																																									
MK	**SCMT09T304-MK**	0.4													▲	▲																									
	SCMT09T308-MK	0.8													▲	▲																									
	SCMT120404-MK	0.4													▲	▲																									
	SCMT120408-MK	0.8													▲	▲																									
Medium Cutting																																									
MS	**SCMT09T304-MS**	0.4																		●	●	●																		●		
	SCMT09T308-MS	0.8																		●	●	●																		●		
	SCMT120404-MS	0.4																		●	●	●																		●		
	SCMT120408-MS	0.8																		●	●	●																		●		
Medium Cutting	**SCMT120412-MS**	1.2																		●	●	●																		●		
Standard	**SCMT09T304**	0.4	▲	▲	▲								●																●	●			●	●	●						
	SCMT09T308	0.8	▲	▲	▲								●					▲											●	●			●	●	●						
	SCMT120404	0.4	▲	▲	▲								●																●				●	●							
	SCMT120408	0.8	▲	▲	▲								●					▲											●	●			●	●	●						
Medium Cutting	**SCMT120412**	1.2		▲																																					
Flat Top	**SCMW09T304**	0.4													▲	▲																			●		●				
	SCMW09T308	0.8													▲	▲	▲																								
	SCMW120408	0.8													▲	▲	▲																								

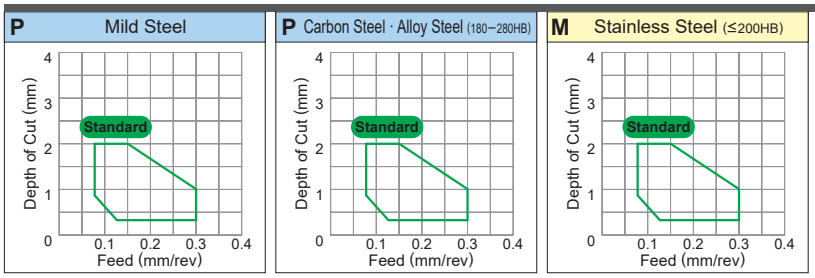
● = NEW

90° SP TYPE INSERTS WITH HOLE

SPMT 09 03 04
Size Thickness Corner Radius
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ●
M	Stainless Steel	◐ ✣ ○ ✣ ● ◐
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
Standard	**SPMT090304**	0.4																															●									
	SPMT090308	0.8																															●									
	**SPMT120308**	0.8																															●		●							
Medium Cutting																																										
Flat Top	**SPMW090304**	0.4																								●	●						●		●		●					
	SPMW090308	0.8																								●	●						●		●		●					
	**SPMW120304**	0.4																								●	●						●		●		●					
	SPMW120308	0.8																								●	●						●		●		●					
Flat Top	**SPGX090304**	0.4																															●				●					
	SPGX090308	0.8																																			●					
	**SPGX120304**	0.4																																			●					
	SPGX120308	0.8																																			●					

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Inventory maintained in Japan.
▲: Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

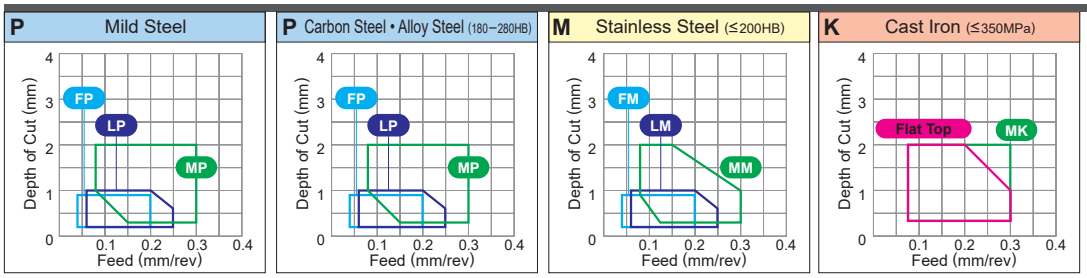
CHIP BREAKERS ➤ A068

60° TC TYPE INSERTS WITH HOLE

TCMT 09 02 02- FP
Size · Thickness · Corner Radius · Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ✣ ◔ ✣ ✣ ● ◔ ✣ ○ ✣ ● ○ ◷ ✣ ◔ ○ ◷ ✣ ✣ ○ ○ ◷ ○ ◷ ✣ ○
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ○ ◷ ✣ ○ ○ ○
K	Cast Iron	● ◔ ○ ◷ ◷ ◷ ✣ ○ ○ ○ ✣ ○ ◷ ○
N	Non-ferrous Metal	◷ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ◷ ✣ ◷ ◔ ● ◔

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP	TCMT090202-FP	0.2	▲		▲	▲	▲																					●				●							
	TCMT090204-FP	0.4	▲		▲	▲	▲																					●				●							
	TCMT110202-FP	0.2	▲		▲	▲	▲																					●				●							
	TCMT110204-FP	0.4	▲		▲	▲	▲																					●				●							
Finish Cutting	TCMT16T304-FP	0.4	▲		▲	▲	▲																					●				●							
FM	TCMT090202-FM	0.2																									●												
	TCMT090204-FM	0.4																									●												
	TCMT110202-FM	0.2																									●												
	TCMT110204-FM	0.4																									●												
Finish Cutting	TCMT16T304-FM	0.4																									●												
FV	TCMT110204-FV	0.4			▲																							●		●	● ●								
	TCMT16T304-FV	0.4			▲																							●			● ●								
Finish Cutting																																							
AZ	TCGT110202-AZ	0.2																																	●				
	TCGT110204-AZ	0.4																																	●				
	TCGT110208-AZ	0.8																																	●				
	TCGT16T302-AZ	0.2																																	●				
	TCGT16T304-AZ	0.4																																	●				
Medium Cutting – Finish Cutting	TCGT16T308-AZ	0.8																																	●				
R/L-F	TCGT0601V3L-F	0.03																															●						
	TCGT060101L-F	0.1																								●							●						
	TCGT060102R-F	0.2																								●							●		●				
	TCGT060102L-F	0.2																								●							●		●				
	TCGT060104R-F	0.4																															●		●				
	TCGT060104L-F	0.4																								●							●		●				
	TCGT060101MR-F	0.1*1							●																														
	TCGT060101ML-F	0.1*1							●																														
	TCGT060102MR-F	0.2*1							●																														
	TCGT060102ML-F	0.2*1							●																														
	TCGT060104MR-F	0.4*1							●																														
Finish Cutting	TCGT060104ML-F	0.4*1							●																														

*1 Indicates the maximum value of the corner R. For more details, see page D003.

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

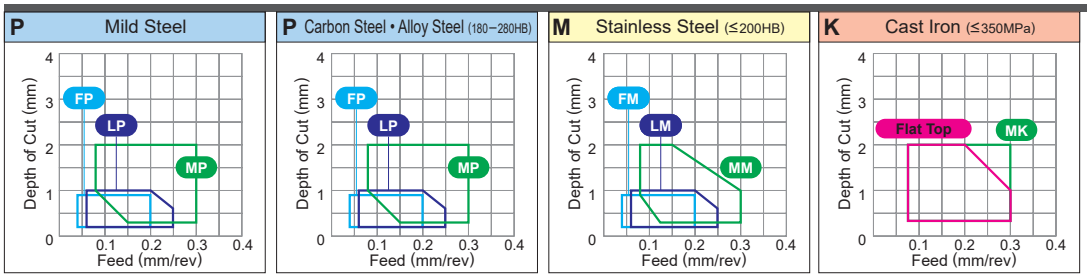
CHIP BREAKERS ➤ A058
GRADES ➤ A030
IDENTIFICATION ➤ A002

60° TC TYPE INSERTS WITH HOLE

TCMT 09 02 04- LP
Size / Thickness / Corner Radius / Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ✣ ❁ ● ◕ ✣ ○ ✣ ● ○ ○ ○ ◔ ◔ ◕ ✣ ○ ○ ○ ◔ ○ ◔ ✣ ○
M	Stainless Steel	◕ ✣ ○ ✣ ● ◕ ✣ ○ ◔ ✣ ○ ○ ○ ◔ ✣
K	Cast Iron	● ◕ ○ ◔ ◔ ◔ ✣ ○ ○ ○ ○ ◔ ✣ ○ ○ ○ ○ ◔ ✣ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✣ ○ ◕ ○ ◔ ✣ ◔ ◕ ● ◕

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
LP	**TCMT090204-LP**	0.4	▲		▲▲																							●				●							
	TCMT090208-LP	0.8	▲		▲▲																							●				●							
	TCMT110204-LP	0.4	▲		▲▲																							●				●							
	TCMT110208-LP	0.8	▲		▲▲																							●				●							
	TCMT16T304-LP	0.4	▲		▲▲																							●				●							
Light Cutting	**TCMT16T308-LP**	0.8	▲		▲▲																							●				●							
LM	**TCMT090204-LM**	0.4								●	●																●												
	TCMT090208-LM	0.8								●	●																●												
	TCMT110204-LM	0.4								●	●																●												
	TCMT110208-LM	0.8								●	●																●												
	TCMT16T304-LM	0.4								●	●																●												
Light Cutting	**TCMT16T308-LM**	0.8								●	●																●												
LS	**TCMT090202-LS**	0.2																		●	●	●																●		
	TCMT110202-LS	0.2																		●	●	●																●		
Light Cutting																																								
MP	**TCMT090204-MP**	0.4	▲		▲▲																							●				●							
	TCMT090208-MP	0.8	▲		▲▲																							●				●							
	TCMT110204-MP	0.4	▲		▲▲																							●				●							
	TCMT110208-MP	0.8	▲		▲▲																							●				●							
	TCMT130304-MP	0.4	▲		▲▲																							●				●							
	TCMT16T304-MP	0.4	▲		▲▲																							●				●							
	TCMT16T308-MP	0.8	▲		▲▲																							●				●							
Medium Cutting	**TCMT16T312-MP**	1.2	▲		▲▲																							●				●							

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✠ ◔ ✠ ✠ ●
M	Stainless Steel	◐ ✠ ○ ✠ ●
K	Cast Iron	● ◐ ○ ◔ ◔
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																								Coated Cermet				Cermet		Carbide							
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
MM	TCMT090204-MM	0.4								●	●																●													
	TCMT090208-MM	0.8								●	●																●													
	TCMT110204-MM	0.4								●	●																●													
	TCMT110208-MM	0.8								●	●																●													
	TCMT130304-MM	0.4								●	●																●													
	TCMT16T304-MM	0.4								●	●																●													
	TCMT16T308-MM	0.8								●	●																●													
Medium Cutting	TCMT16T312-MM	1.2								●	●																●													
MK	TCMT110204-MK	0.4													▲	▲																								
	TCMT110208-MK	0.8													▲	▲																								
	TCMT16T304-MK	0.4													▲	▲																								
	TCMT16T308-MK	0.8													▲	▲																								
Medium Cutting	TCMT16T312-MK	1.2													▲	▲																								
MS	TCMT090204-MS	0.4																		●	●	●																	●		
	TCMT090208-MS	0.8																		●	●	●																	●		
	TCMT110204-MS	0.4																		●	●	●																			
	TCMT110208-MS	0.8																		●	●	●																			
	TCMT16T304-MS	0.4																		●	●	●																	●		
	TCMT16T308-MS	0.8																		●	●	●																	●		
Medium Cutting	TCMT16T312-MS	1.2																		●	●	●																	●		
Standard	TCMT080204	0.4																										●				●		●						
	TCMT090204	0.4		▲	▲							●																●	●			●	●	●						
	TCMT110202	0.2		▲	▲							●															●	●	●			●	●							
	TCMT110204	0.4	▲	▲	▲							●					▲										●	●	●			●	●	●						
	TCMT110208	0.8	▲	▲																							●	●												
	TCMT130302	0.2																										●	●											
	TCMT130304	0.4		▲								●																●					●							
	TCMT16T304	0.4	▲	▲	▲							●					▲										●	●	●			●	●	●						
	TCMT16T308	0.8	▲	▲	▲							●					▲										●	●	●			●	●	●						
Medium Cutting	TCMT16T312	1.2		▲																																				
Flat Top	TCMW110204	0.4													▲	▲	▲																			●				
	TCMW130304	0.4																																		●				
	TCMW16T304	0.4													▲	▲	▲																			●				
	TCMW16T308	0.8													▲	▲	▲																			●				
	TCMW16T312	1.2													▲	▲																								

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005

CHIP BREAKERS ➤ A058
GRADES ➤ A030
IDENTIFICATION ➤ A002

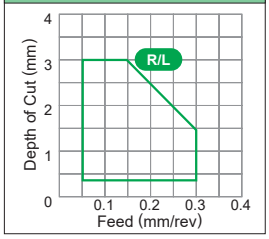
60° TE TYPE INSERTS WITH HOLE

TEGX 16 03 02 R
Size Thickness Corner Radius R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····

N Aluminium Alloy



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
	P	Steel	○	◔	❁	◔	❁	❁	●															◕				❁	❁	◕	○	○	◔	○	◔	❁					○
	M	Stainless Steel								◕	✣	○	✣	●									◕			◔	❁	❁		○	○		○		❁						
	K	Cast Iron													●	◕	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																			◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◕	✣	○	◕	○	◔	❁									◔	◕	●	◕		
Shape	Order Number	RE (mm)																																							
R/L	TEGX160302R	0.2																																		●					
	TEGX160302L	0.2																																		●					
	TEGX160304R	0.4																																		●					
	TEGX160304L	0.4																																		●					



Medium Cutting
(For Aluminium Alloy)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

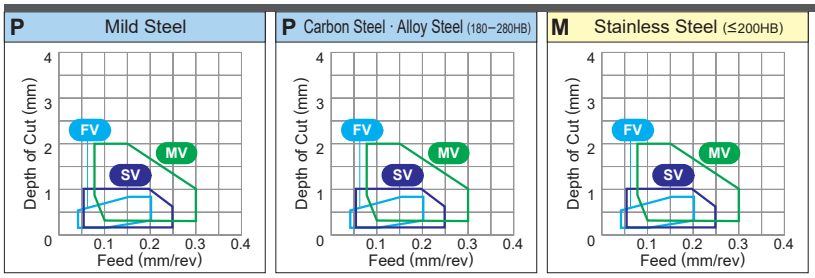
CHIP BREAKERS ➢ A070

60° TP TYPE INSERTS WITH HOLE

TPMH 08 02 02- FV
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ❁ ◷ ❁ ❁ ●
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔
K	Cast Iron	● ◔ ○ ◷ ◷ ◔ ◷ ❁ ○ ○ ○ ❁ ○ ○ ❁ ○ ◷ ○
N	Non-ferrous Metal	◷ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ○ ◷ ❁ ◷ ◔ ● ◔

Shape	Order Number	RE (mm)	Coated																							Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FV	**TPMH080202-FV**	0.2			▲																					●				●	●							
	TPMH080204-FV	0.4			▲																					●				●	●							
	TPMH090202-FV	0.2			▲																					●				●	●							
	TPMH090204-FV	0.4			▲																					●				●	●							
	TPMH110302-FV	0.2			▲																					●				●	●							
	TPMH110304-FV	0.4			▲																					●				●	●							
	TPMH110308-FV	0.8			▲																					●				●	●							
	TPMH160302-FV	0.2			▲																					●				●	●							
	TPMH160304-FV	0.4			▲																					●				●	●							
Finish Cutting	**TPMH160308-FV**	0.8			▲																					●				●	●							
R/L-FS	**TPGH080202R-FS**	0.2																								●						●			●			
	TPGH080202L-FS	0.2																								●				● ●		●			●			
	TPGH080204R-FS	0.4																								●						●			●			
	TPGH080204L-FS	0.4																								●				● ●		●			●			
	TPGH090202R-FS	0.2																								●						●			●			
	TPGH090202L-FS	0.2																								●				● ●		●			●			
	TPGH090204R-FS	0.4																								●						●			●			
	TPGH090204L-FS	0.4																								●				● ●		●			●			
	TPGH110302R-FS	0.2																								●						●			●			
	TPGH110302L-FS	0.2																								●				● ●		●			●			
	TPGH110304R-FS	0.4																								●						●			●			
	TPGH110304L-FS	0.4																								●				● ●		●			●			
	TPGH160304R-FS	0.4																								●						●			●			
	TPGH160304L-FS	0.4																								●				●		●			●			
	TPGH160308R-FS	0.8																								●						●			●			
Finish Cutting	**TPGH160308L-FS**	0.8																								●				●		●			●			

Scan here for product NEWS ▶

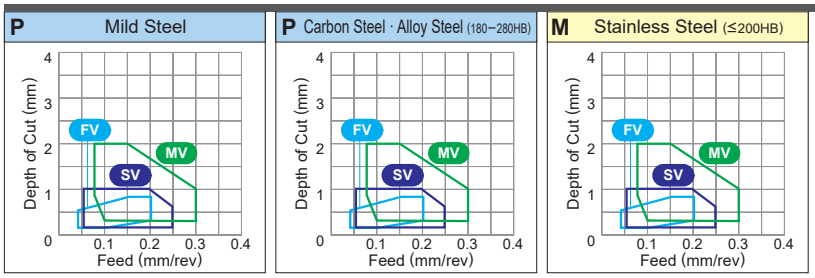
EXTERNAL TURNING	➤ C002—C005
BORING	➤ E002—E005
CHIP BREAKERS	➤ A066
GRADES	➤ A030
IDENTIFICATION	➤ A002

60° TP TYPE INSERTS WITH HOLE

TPGX 08 02 02 R
Size / Thickness / Corner Radius / R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◐ ✠ ○ ✠ ● ◐ ● ◐ ○ ◔ ◔ ◐ ● ● ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	◐ ✠ ○ ✠ ● ◐ ○ ◔ ◔ ◐ ○ ○ ○ ◔ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✠ ○ ◐ ○ ◔ ❁ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L	TPGX080202R	0.2																														●							
	TPGX080202L	0.2																														●		●	●				
	TPGX080204R	0.4																														●			●				
	TPGX080204L	0.4																									●					●		●	●				
	TPGX090202R	0.2																														●							
	TPGX090202L	0.2																														●		●	●				
	TPGX090204R	0.4																														●			●				
	TPGX090204L	0.4																									●					●		●	●				
	TPGX090208R	0.8																																	●				
	TPGX090208L	0.8																														●			●				
	TPGX110302L	0.2																														●		●	●				
	TPGX110304R	0.4																									●					●			●				
	TPGX110304L	0.4																									●					●		●	●				
	TPGX110308R	0.8																														●			●				
Finish Cutting	TPGX110308L	0.8																									●					●		●	●	●			
L	TPMX090204L	0.4																														●							
	TPMX110304L	0.4																														●							
Finish Cutting																																							
SV	TPMH080202-SV	0.2			▲	▲						●														●		●			●	●							
	TPMH080204-SV	0.4			▲	▲						●														●		●		●	●	●							
	TPMH090202-SV	0.2			▲	▲						●														●		●			●	●							
	TPMH090204-SV	0.4			▲	▲						●														●		●		●	●	●							
	TPMH110302-SV	0.2			▲	▲						●														●		●		●	●	●							
	TPMH110304-SV	0.4			▲	▲						●														●		●		●	●	●							
	TPMH110308-SV	0.8			▲	▲						●														●		●		●	●	●							
	TPMH160302-SV	0.2			▲	▲						●														●		●		●	●	●							
	TPMH160304-SV	0.4			▲	▲						●														●		●		●	●	●							
Light Cutting	TPMH160308-SV	0.8			▲	▲						●														●		●		●	●	●							

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

**Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).**

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
P	Steel		○	◔	❁	◔	❁	❁	●															◐			❁	❁	◐	○	○	◔	○	◔	❁						○
M	Stainless Steel									◐	✣	○	✣	●									◐			◔	❁	❁		○	○		○		❁						
K	Cast Iron														●	◐	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
N	Non-ferrous Metal																																			◔					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	◐	●	◐		

Shape	Order Number	RE (mm)																																						
Standard	**TPMX110304**	0.4																										●				●	●							
	TPMX110308	0.8																										●				●	●							
Medium Cutting																																								
MV	**TPMH080202-MV**	0.2			▲	▲							●														●				●	●							
	TPMH080204-MV	0.4			▲	▲						▲	●		▲												●	●	●		●	●							
	TPMH090202-MV	0.2			▲	▲							●														●				●	●							
	TPMH090204-MV	0.4			▲	▲						▲	●		▲												●	●	●		●	●							
	TPMH090208-MV	0.8			▲	▲									▲												●					●							
	TPMH110302-MV	0.2			▲	▲							●														●	●	●		●	●							
	TPMH110304-MV	0.4			▲	▲						▲	●		▲												●	●	●		●	●							
	TPMH110308-MV	0.8			▲	▲						▲	●		▲												●	●	●		●	●							
	TPMH160304-MV	0.4			▲	▲							●		▲												●	●	●		●	●							
Medium Cutting	**TPMH160308-MV**	0.8			▲	▲							●		▲												●	●	●		●	●							
Flat Top	**TPGX080202**	0.2																																		●					
	TPGX080204	0.4																								●	●					●	●	●	●					
	TPGX080208	0.8																														●	●	●	●					
	TPGX090202	0.2																																		●					
	TPGX090204	0.4																									●					●	●	●						
	TPGX090208	0.8																									●					●	●	●						
	TPGX110302	0.2																																		●					
	TPGX110304	0.4																									●					●	●	●	●					
	TPGX110308	0.8																									●					●	●	●	●					
	TPGX160304	0.4																														●	●	●						
	TPGX160308	0.8																														●	●	●						

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ —
BORING ➤ E002—E005

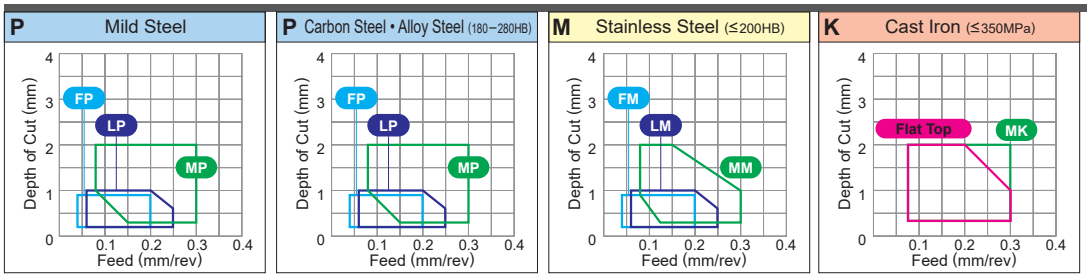
CHIP BREAKERS ➤ A066
GRADES ➤ A030
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBMT 11 03 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Light Cutting ····· Medium Cutting ····· Heavy Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ◔ ✣ ✣ ● ◐ ✣ ○ ✣ ● ● ◐ ○ ○ ◔ ○ ◔ ✣ ✣ ◐ ○ ○ ◔ ○ ◔ ✣ ○
M	Stainless Steel	◐ ✣ ○ ✣ ● ● ◐ ◔ ✣ ✣ ○ ○ ○ ✣ ○ ◐ ◔ ✣ ✣
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ✣ ✣ ○ ○ ○ ✣ ○ ◔ ✣ ✣ ○ ○ ○ ○ ✣ ○ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ✣ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP	VBMT110302-FP	0.2	▲		▲▲																							●				●							
	VBMT110304-FP	0.4	▲		▲▲																							●				●							
	VBMT110308-FP	0.8	▲		▲▲																							●				●							
	VBMT160404-FP	0.4	▲		▲▲																							●				●							
Finish Cutting	VBMT160408-FP	0.8	▲		▲▲																							●				●							
FM	VBMT110302-FM	0.2																									●											
	VBMT110304-FM	0.4																									●											
	VBMT110308-FM	0.8																									●											
	VBMT160404-FM	0.4																									●											
Finish Cutting	VBMT160408-FM	0.8																									●											
FV	VBMT110304-FV	0.4			▲																						●					● ●						
	VBMT110308-FV	0.8			▲																						●					● ●						
	VBMT160404-FV	0.4			▲																						●					● ●						
Finish Cutting	VBMT160408-FV	0.8			▲																						●					● ●						
R/L-F	VBGT110302R-F	0.2																									●					● ●						
	VBGT110302L-F	0.2																									●					● ●						
	VBGT110304R-F	0.4																									●					●						
	VBGT110304L-F	0.4																									●					●						
	VBGT160402R-F	0.2																									●					●						
	VBGT160402L-F	0.2																									●					●						
	VBGT160404R-F	0.4																									●					●						
Finish Cutting	VBGT160404L-F	0.4																									●					●						
LP	VBMT110304-LP	0.4	▲		▲▲																							●				●							
	VBMT110308-LP	0.8	▲		▲▲																							●				●							
	VBMT160404-LP	0.4	▲		▲▲																							●				●							
Light Cutting	VBMT160408-LP	0.8	▲		▲▲																							●				●							
LM	VBMT110304-LM	0.4								● ●																	●											
	VBMT110308-LM	0.8								● ●																	●											
	VBMT160404-LM	0.4								● ●																	●											
Light Cutting	VBMT160408-LM	0.8								● ●																	●											

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ⊛ : Unstable Cutting (2nd recommendation)

Workpiece Material			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide						
	P	Steel	○	◔	⊛	◔	⊛	⊛	●				✠		◐									✠			⊛	⊛	◐	○	○	◔	○	◔	⊛						○
	M	Stainless Steel								◐	✠	○	✠	●									◐		◔	⊛	⊛		○	○		○		⊛						
	K	Cast Iron													●	◐	○	◔	◔						◔	⊛			○	○		○		⊛	○	◔				○
	N	Non-ferrous Metal																																		◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	⊛									◔	◐	●	◐		

Shape	Order Number	RE (mm)	UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
LS	**VBMT110302-LS**	0.2																		●	●	●																●		
	VBMT110304-LS	0.4																		●	●	●																●		
	VBMT110308-LS	0.8																		●	●	●																●		
	VBMT160404-LS	0.4																		●	●	●																●		
Light Cutting	**VBMT160408-LS**	0.8																		●	●	●																●		
SV	**VBMT110304-SV**	0.4			▲																						●						●							
	VBMT110308-SV	0.8			▲																						●						●							
	VBMT160404-SV	0.4			▲																						●						●							
Light Cutting	**VBMT160408-SV**	0.8			▲																						●						●							
MP	**VBMT160404-MP**	0.4		▲		▲▲																							●				●							
	VBMT160408-MP	0.8		▲		▲▲																							●				●							
Medium Cutting																																									
MM	**VBMT160404-MM**	0.4								●	●																●														
	VBMT160408-MM	0.8								●	●																●														
Medium Cutting																																									
MK	**VBMT160404-MK**	0.4													▲▲																										
	VBMT160408-MK	0.8													▲▲																										
Medium Cutting																																									
MS	**VBMT160402-MS**	0.2																		●	●	●																●		
	VBMT160404-MS	0.4																		●	●	●																●		
	VBMT160408-MS	0.8																		●	●	●																●		
	VBMT160412-MS	1.2																		●	●	●																●		
Medium Cutting																																									
Standard	**VBMT160404**	0.4		▲																																				
	VBMT160408	0.8		▲																																				
Medium Cutting																																									
MV	**VBMT110304-MV**	0.4			▲		▲					▲	●			▲											●			●		●		●	●						
	VBMT110308-MV	0.8			▲		▲						●			▲											●			●		●		●	●						
	VBMT160404-MV	0.4			▲		▲					▲	●			▲											●			●		●		●	●						
Medium Cutting	**VBMT160408-MV**	0.8			▲		▲						●			▲											●			●		●		●	●						
Medium Cutting																																									

● = NEW

Scan here for product NEWS ▶

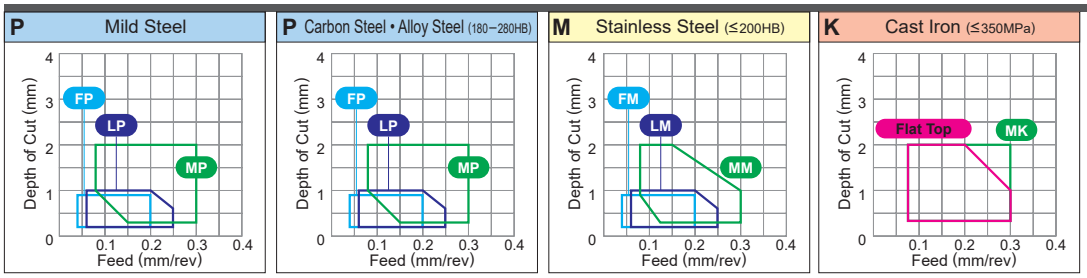
EXTERNAL TURNING	➤ —	CHIP BREAKERS	➤ A052
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D012	IDENTIFICATION	➤ A002

35° VB TYPE INSERTS WITH HOLE

VBET 11 03 V3 R-SR
Size Thickness Corner Radius R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◐ ✣ ○ ✣ ● ◐ ○ ○ ○ ○ ◔ ○ ○ ◔ ❁ ❁ ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	◐ ✣ ○ ✣ ● ◐ ◐ ○ ○ ◔ ◔ ◐ ◔ ❁ ❁ ○ ○ ○ ❁ ○
K	Cast Iron	● ◐ ○ ○ ◔ ◔ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SR	VBET1103V3R-SR	0.03*2																								●							●			●					
	VBET1103V3L-SR	0.03*2																								●							●			●					
	VBET110301R-SR	0.1 *2																								●							●			●					
	VBET110301L-SR	0.1 *2																								●							●			●					
	VBET110302R-SR	0.2 *2																								●							●			●					
	VBET110302L-SR	0.2 *2																								●							●			●					
	VBET110304R-SR	0.4 *2																								●							●			●					
Medium Cutting	VBET110304L-SR	0.4 *2																								●							●			●					
R/L-SN	VBET110300R-SN	0.0 *2																								●							●			●					
	VBET110300L-SN	0.0 *2																								●							●			●					
	VBET1103V3R-SN	0.03*2																								●							●			●					
	VBET1103V3L-SN	0.03*2																								●							●			●					
	VBET110301R-SN	0.1 *2																								●							●			●					
	VBET110301L-SN	0.1 *2																								●							●			●					
	VBET110302R-SN	0.2 *2																								●							●			●					
	VBET110302L-SN	0.2 *2																								●							●			●					
	VBET110304R-SN	0.4 *2																								●							●			●					
Medium Cutting	VBET110304L-SN	0.4 *2																								●							●			●					
R/LW-SN *1	VBET1103V3RW-SN	0.03*2																								●																
	VBET1103V3LW-SN	0.03*2																								●																
Medium Cutting (Wiper)																																										
Flat Top	VBMW160408	0.8													▲▲																											

*1 Please refer to A028 before using the R/LW-SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

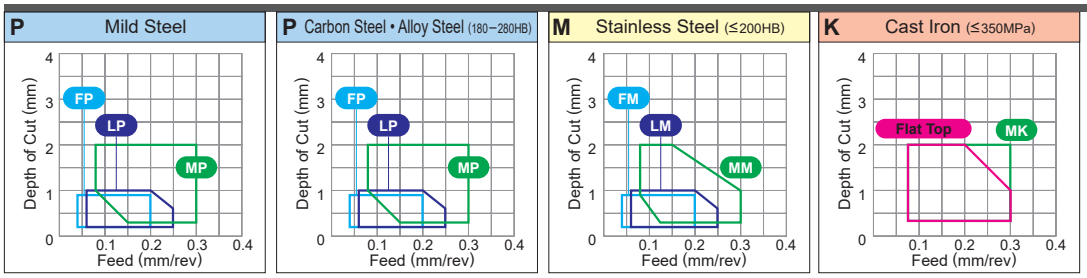
CHIP BREAKERS ➤ A056

35° VC TYPE INSERTS WITH HOLE

VCMT 11 03 02- FP
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✣ ◔ ✣ ✣ ● ◐ ✣ ○ ✣ ● ● ◐ ○ ○ ◔ ○ ◔ ✣ ✣ ◐ ○ ○ ◔ ○ ◔ ✣ ○
M	Stainless Steel	◐ ✣ ○ ✣ ● ◐ ○ ○ ◔ ◔ ✣ ✣ ○ ○ ○ ✣ ○
K	Cast Iron	● ◐ ○ ○ ◔ ◔ ◔ ✣ ✣ ○ ○ ○ ✣ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ✣ ◔ ◐ ◐

Shape	Order Number	RE (mm)	Coated																							Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
FP	VCMT110302-FP	0.2	▲		▲	▲	▲																					●				●							
	VCMT110304-FP	0.4	▲		▲	▲	▲																					●				●							
	VCMT160404-FP	0.4	▲		▲	▲	▲																					●				●							
	VCMT160408-FP	0.8	▲		▲	▲	▲																					●				●							
Finish Cutting																																								
FM	VCMT110302-FM	0.2																									●												
	VCMT110304-FM	0.4																									●												
	VCMT160404-FM	0.4																									●												
	VCMT160408-FM	0.8																									●												
Finish Cutting																																								
FV	VCMT080202-FV	0.2				▲	▲																				●	●				●	●						
	VCMT080204-FV	0.4				▲	▲																				●	●				●	●						
	VCMT160404-FV	0.4		▲	▲																							●				●	●						
	VCMT160408-FV	0.8		▲	▲																							●				●	●						
Finish Cutting																																								
AZ	VCGT160404-AZ	0.4																																		●				
	VCGT160408-AZ	0.8																																		●				
	VCGT160412-AZ	1.2																																		●				
Medium Cutting – Finish Cutting																																								
R/L-F	VCGT080202R-F	0.2																																		●				
	VCGT080202L-F	0.2																																		●				
	VCGT080204R-F	0.4																																		●				
	VCGT080204L-F	0.4																																		●				
Finish Cutting																																								
LP	VCMT110304-LP	0.4	▲		▲	▲	▲																					●				●							
	VCMT110308-LP	0.8	▲		▲	▲	▲																					●				●							
	VCMT160404-LP	0.4	▲		▲	▲	▲																					●				●							
	VCMT160408-LP	0.8	▲		▲	▲	▲																					●				●							
Light Cutting																																								

Scan here for product NEWS ▶

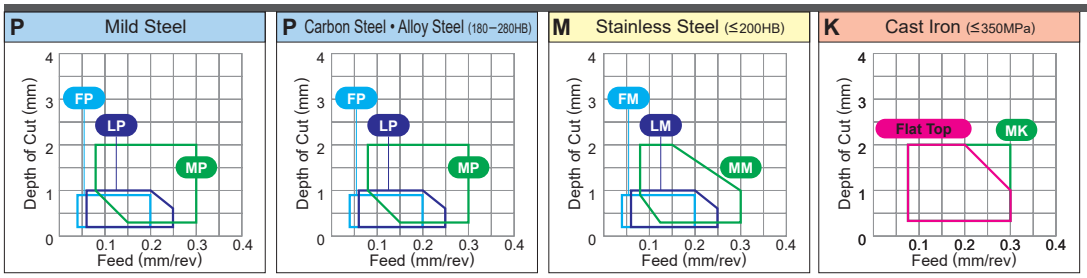
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D012, D013	IDENTIFICATION	➤ A002

35° VC TYPE INSERTS WITH HOLE

VCMT 11 03 04- LM
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Light Cutting····· Medium Cutting····· Heavy Cutting·····



● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ❁ ◷ ❁ ❁ ●
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ◔ ○ ◷ ◷ ◔ ◷ ❁ ❁ ❁ ◔ ○ ○ ○ ◷ ○ ◷ ❁ ○
K	Cast Iron	● ◔ ○ ◷ ◷ ◷ ❁ ○ ○ ○ ◷ ❁ ○ ○ ○ ❁ ○ ◷ ○
N	Non-ferrous Metal	◷ ○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ○ ◷ ❁ ◷ ◔ ● ◔

Shape	Order Number	RE (mm)	Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
LM	**VCMT110304-LM**	0.4								●	●																●												
	VCMT110308-LM	0.8								●	●																●												
	VCMT160404-LM	0.4								●	●																●												
	VCMT160408-LM	0.8								●	●																●												
Light Cutting																																							
LS	**VCMT110302-LS**	0.2																		●	●	●																●		
	VCMT110304-LS	0.4																		●	●	●																●		
	VCMT160404-LS	0.4																		●	●	●																●		
	VCMT160408-LS	0.8																		●	●	●																●		
Light Cutting																																							
LS	**VCGT110301M-LS**	0.1*1																		●	●	●																		
	VCGT110302M-LS	0.2*1																		●	●	●																		
	VCGT110304M-LS	0.4*1																		●	●	●																		
	VCGT130301M-LS	0.1*1																		●	●	●																		
	VCGT130302M-LS	0.2*1																		●	●	●																		
Light Cutting	**VCGT130304M-LS**	0.4*1																		●	●	●																		
LS-P	**VCGT110301M-LS-P**	0.1*1												●																								●		
	VCGT110302M-LS-P	0.2*1												●																								●		
	VCGT110304M-LS-P	0.4*1												●																								●		
	VCGT130301M-LS-P	0.1*1																																				●		
	VCGT130302M-LS-P	0.2*1																																				●		
Light Cutting	**VCGT130304M-LS-P**	0.4*1																																				●		
SV	**VCMT080202-SV**	0.2			▲		▲																			●		●				●							
	VCMT080204-SV	0.4			▲		▲																			●		●				●							
Light Cutting																																							
MP	**VCMT160404-MP**	0.4			▲		▲▲																					●			●							
	VCMT160408-MP	0.8			▲		▲▲																					●			●							
	VCMT160412-MP	1.2			▲		▲▲																					●			●							
Medium Cutting																																							

*1 Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◔ ✠ ◔ ✠ ✠ ● ◐ ✠ ○ ✠ ● ◐ ○ ◔ ◔ ✠ ✠ ◐ ○ ○ ◔ ○ ◔ ✠ ○
M	Stainless Steel	◐ ✠ ○ ✠ ● ◐ ○ ◔ ◔ ✠ ✠ ○ ○ ○ ✠ ◔ ✠
K	Cast Iron	● ◐ ○ ◔ ◔ ◔ ✠ ✠ ○ ○ ○ ✠ ✠ ◔ ✠ ○
N	Non-ferrous Metal	◔ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✠ ○ ◐ ○ ◔ ✠ ◔ ◐ ● ◐

Shape	Order Number	RE (mm)	Coated																						Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
MM	**VCMT160404-MM**	0.4								●	●																●												
	VCMT160408-MM	0.8								●	●																●												
	VCMT160412-MM	1.2								●	●																●												
Medium Cutting																																							
MK	**VCMT160404-MK**	0.4													▲	▲			●																					
	VCMT160408-MK	0.8													▲	▲																								
Medium Cutting																																							
MS	**VCMT110302-MS**	0.2																		●	●	●																	
	VCMT110304-MS	0.4																		●	●	●																●	
	VCMT110308-MS	0.8																		●	●	●																●	
	VCMT160404-MS	0.4																		●	●	●																●	
Medium Cutting	**VCMT160408-MS**	0.8																		●	●	●																●	
Standard	**VCMT110304**	0.4			▲	▲							●														●		●	●		●	●		●				
	VCMT160404	0.4	▲	▲	▲								●														●		●	●		●	●		●				
	VCMT160408	0.8	▲	▲	▲								●					▲									●		●	●		●	●		●				
	VCMT160412	1.2			▲	▲							●																			●	●						
Medium Cutting																																							
MV	**VCMT080202-MV**	0.2				▲		▲					●														●		●	●		●	●						
	VCMT080204-MV	0.4				▲		▲					●			▲											●		●	●		●	●						
Medium Cutting																																							
Flat Top	**VCMW110304**	0.4																																		●			
	VCMW160404	0.4													▲	▲	▲																				●			
	VCMW160408	0.8													▲	▲	▲		●																		●			

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A058
BORING	➤ E002—E005	GRADES	➤ A030
SMALL TOOLS	➤ D013	IDENTIFICATION	➤ A002

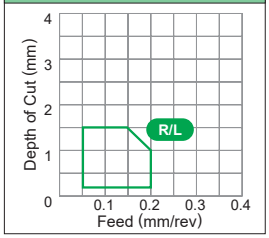
35° VD TYPE INSERTS WITH HOLE

VDGX 16 03 02 R
Size Thickness Corner Radius R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····

N Aluminium Alloy



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide						
Shape	Order Number	RE (mm)	UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L	VDGX160302R	0.2																																		●				
	VDGX160302L	0.2																																		●				
	VDGX160304R	0.4																																		●				
	VDGX160304L	0.4																																		●				
Medium Cutting (For Aluminium)																																								

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

● : Inventory maintained in Japan.
(10 inserts in one case)

CHIP BREAKERS ➤ A070

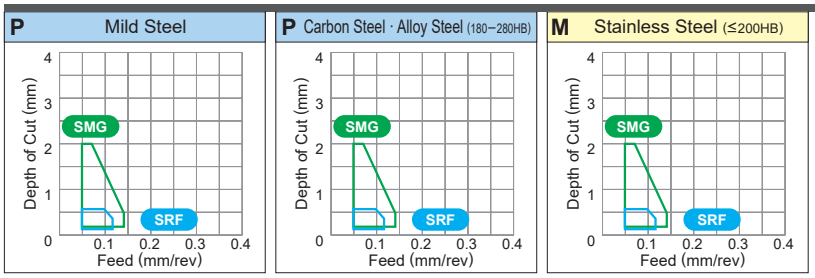
A
TURNING INSERTS
POSI 11°
WITH HOLE
C
D
R
S
T
V
W
X

35° VP TYPE INSERTS WITH HOLE

VPET 08 02 01 R-SRF
Size Thickness Corner Radius R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting····· Medium Cutting·····



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✤: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 (NEW)	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
	P	Steel	○	◔	❁	◔	❁	❁	●																		❁	❁	◐	○	○	◔	○	◔	❁						○
	M	Stainless Steel								◐	✤	○	✤	●										◐		◔	❁	❁		○	○		○		❁						
	K	Cast Iron													●	◐	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																			◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✤	○	◐	○	◔	❁										◔	◐	●	◐	

Shape	Order Number	RE (mm)	Coated																										Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 (NEW)	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L-SRF	VPET080201R-SRF	0.1 *1																									●														
	VPET080201L-SRF	0.1 *1																									●														
	VPET080202R-SRF	0.2 *1																									●														
	VPET080202L-SRF	0.2 *1																									●														
	VPET1103V3R-SRF	0.03*1																									●														
	VPET1103V3L-SRF	0.03*1																									●														
	VPET110301R-SRF	0.1 *1																									●														
	VPET110301L-SRF	0.1 *1																									●														
	VPET110302R-SRF	0.2 *1																									●														
Finish Cutting	VPET110302L-SRF	0.2 *1																									●														
SMG	VPGT080201M-SMG	0.1 *1																									●														
	VPGT080202M-SMG	0.2 *1																									●														
	VPGT110301M-SMG	0.1 *1																									●														
	VPGT110302M-SMG	0.2 *1																									●														
Medium Cutting																																									

*1 Indicates the maximum value of the corner R. For more details, see page D003.

Scan here for product NEWS ▶

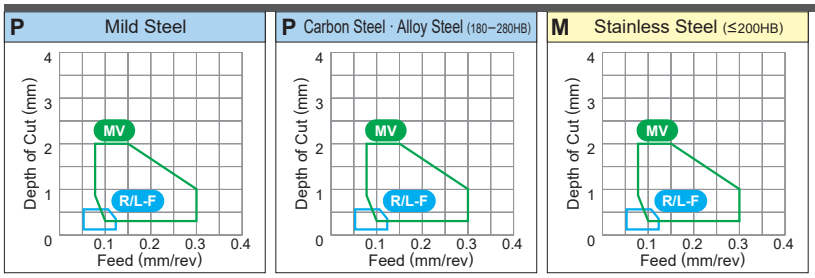
EXTERNAL TURNING	➤ C002—C005	CHIP BREAKERS	➤ A066
BORING	➤ —	GRADES	➤ A030
SMALL TOOLS	➤ D012, D013	IDENTIFICATION	➤ A002

80° WB TYPE INSERTS WITH HOLE

WBGT 02 01 V3 L-F
Size / Thickness / Corner Radius / R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Medium Cutting ·····



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
	P	Steel	○	◔	❁	◔	❁	❁	●																	❁	❁	◐	○	○	○	◔	○	◔	❁						○
	M	Stainless Steel								◐	✣	○	✣	●										◐		◔	❁	❁		○	○		○		❁						○
	K	Cast Iron													●	◐	○	◔	◔							◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																			◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁										◔	◐	●	◐		
Shape	Order Number	RE (mm)																																							
R/L-F	WBGT0201V3L-F	0.03																								●						●								
	WBGT020101L-F	0.1																								●						●								
	WBGT020102L-F	0.2																								●		●				●								
	WBGT020104L-F	0.4																								●		●				●								
	WBGTL302V3L-F	0.03																								●						●								
	WBGTL30201L-F	0.1																								●						●								
	WBGTL30202R-F	0.2																								●						●								
	WBGTL30202L-F	0.2																								●		●				●								
	WBGTL30204R-F	0.4																								●						●								
Finish Cutting	WBGTL30204L-F	0.4																								●		●				●								
R/L-MV	WBMTL30202R-MV	0.2			▲		▲																			●		●			●	●	●						
	WBMTL30202L-MV	0.2			▲		▲																			●		●			●	●	●						
	WBMTL30204R-MV	0.4			▲		▲																			●		●			●	●	●						
	WBMTL30204L-MV	0.4			▲		▲																			●		●			●	●	●						
Medium Cutting																																								

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

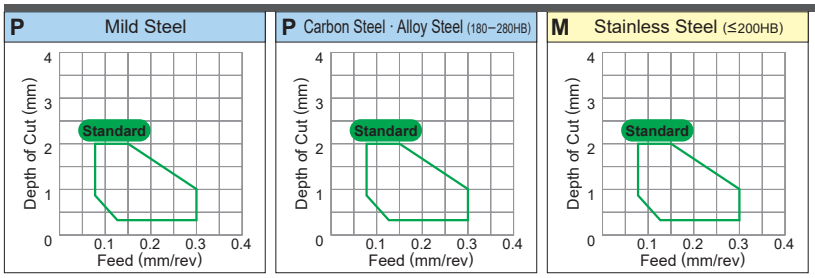
● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

CHIP BREAKERS ➤ A052

WCGT 02 01 02 R
Size Thickness Corner Radius R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide						
	P	Steel	○	◔	❁	◔	❁	❁	●																				◕	○	○	◔	○	◔	❁						
	M	Stainless Steel								◕	✠	○	✠	●										◕						○	○		○								
	K	Cast Iron													●	◕	○	◔	◔							◔	❁			○	○		○	❁		○	◔				○
	N	Non-ferrous Metal																																		◔					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◕	✠	○	◕	○	◔	❁								◔	◕	●	◕			

Shape	Order Number	RE (mm)	UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L	WCGT020102R	0.2																															●								
	WCGT020102L	0.2																															●				●				
	WCGT020104R	0.4																															●								
	WCGT020104L	0.4																															●				●				
	WCGTL30202L	0.2																															●								
Finish Cutting	WCGTL30204L	0.4																															●								
Standard	WCMT020102	0.2		▲	▲								●																●	●			●	●	●						
	WCMT020104	0.4		▲	▲								●																●	●			●	●	●						
	WCMTL30202	0.2		▲									●																●	●			●	●	●						
	WCMTL30204	0.4		▲									●																●	●			●	●	●						
	WCMT040202	0.2		▲	▲								●																●	●			●	●	●						
	WCMT040204	0.4		▲	▲								●																●	●			●	●	●						
	WCMT040208	0.8			▲																																				
	WCMT06T304	0.4		▲	▲								●																●	●			●	●	●						
Medium Cutting	WCMT06T308	0.8		▲	▲								●																●	●			●	●	●						

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ —
BORING ➤ E002—E005

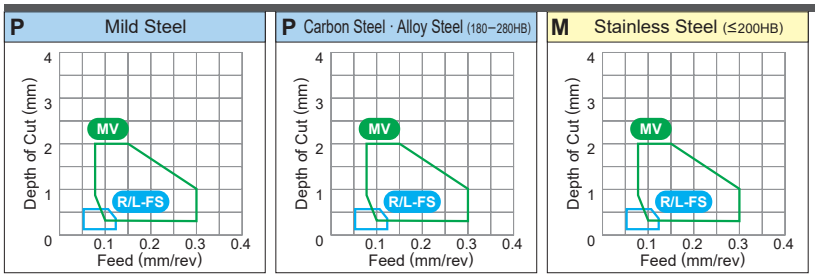
CHIP BREAKERS ➤ A058
GRADES ➤ A030
IDENTIFICATION ➤ A002

80° WP TYPE INSERTS WITH HOLE

WPGT 04 02 04 R-FS
Size Thickness Corner Radius R/L Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Medium Cutting ·····



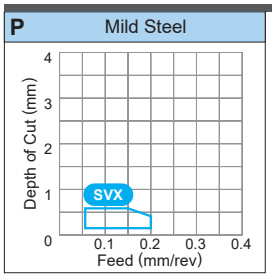
● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

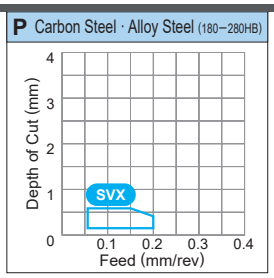
Workpiece Material		
P	Steel	○ ◔ ❁ ◔ ❁ ❁ ● ◐ ✣ ○ ✣ ● ● ◐ ○ ◔ ◔ ◐ ◔ ◐ ◐ ◐

XCMT 15 03 02- SVX
Size Thickness Corner Radius Chip Breaker
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting·····





●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																							Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
	P	Steel	○	◔	❁	◔	❁	❁	●															◐			❁	❁	◐	○	○	◔	○	◔	❁						○
	M	Stainless Steel								◐	✣	○	✣	●									◐		◔	❁	❁		○	○		○		❁						
	K	Cast Iron													●	◐	○	◔	◔						◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																		◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁								◔	◐	●	◐			
Shape	Order Number	RE (mm)																																						
SVX	XCMT150302-SVX	0.2																								●														
	XCMT150304-SVX	0.4			▲																					●														
	XCMT150308-SVX	0.8			▲																					●														
Finish Cutting																																								

RTG TYPE INSERTS WITHOUT HOLE

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	MS7025 NEW	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide						
	P	Steel	○	◔	❁	◔	❁	❁	●																		❁	❁	◐	○	○	◔	○	◔	❁						○
	M	Stainless Steel								◐	✣	○	✣	●									◐		◔	❁	❁		○	○		○			❁						
	K	Cast Iron													●	◐	○	◔	◔						◔	❁			○	○		○			❁	○	◔				○
	N	Non-ferrous Metal																																			◔				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁										◔	◐	●	◐		
Shape	Order Number	IC (mm)																																							
 For Special Use (For TL Holder)	RTG05A	5.0																																	●		●				
	RTG06A	6.0																																	●		●				
	RTG07A	7.0																																	●						
	RTG08A	8.0																																	●		●				
	RTG10A	10.0																																	●		●				

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

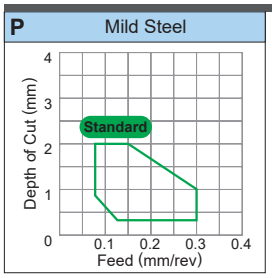
Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

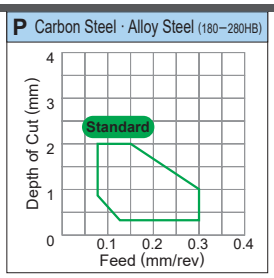
90° SP TYPE INSERTS WITHOUT HOLE

SPGR 09 03 04 R
Size Thickness Corner Radius R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Medium Cutting·····





●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	RE (mm)	Coated																						Coated Cermet				Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R	**SPGR090304R**	0.4																																●						
Finish Cutting																																								
Standard	**SPMR090304**	0.4		▲▲																								●				●●							
	SPMR090308	0.8		▲▲																								●				●●							
	SPMR120304	0.4		▲▲																								●				●●							
	SPMR120308	0.8		▲▲																								●				●●							
Medium Cutting																																								
Flat Top	**SPMN090304**	0.4																														●		●	●				
	SPMN090308	0.8		▲																												●		●	●				
	SPMN120304	0.4		▲																						●								●	●				
	SPMN120304T	0.4																														●							
	SPMN120308	0.8		▲																						●●								●	●				
	SPMN120312	1.2		▲▲																						●								●	●				
	SPMN120408	0.8																																●	●				
	SPMN120412	1.2																																●						
	SPMN150408	0.8																																●						
	SPMN150412	1.2																																●						
	SPMN190404	0.4																																●						
	SPMN190408	0.8																																●						
	SPMN190412	1.2																																●						
Flat Top	**SPGN090304**	0.4																														●		●	●				
	SPGN090308	0.8																																	●					
	SPGN120304	0.4																														●		●	●				
	SPGN120308	0.8																														●		●	●				
	SPGN120312	1.2																																	●					
	SPGN120404	0.4																																	●					
	SPGN120408	0.8																																●	●				
	SPGN150404	0.4																																●						
	SPGN150408	0.8																																	●					

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ —
BORING ➤ —

CHIP BREAKERS ➤ A072
GRADES ➤ A030
IDENTIFICATION ➤ A002

60° TC TYPE INSERTS WITHOUT HOLE

TCGN 06 01 04
Size Thickness Corner Radius
* Please refer to page A002.

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide						
			UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
P	Steel		○	◔	❁	◔	❁	❁	●																	❁	❁	◐	○	○	○	◔	○	◔	❁						○
M	Stainless Steel									◐	✣	○	✣	●									◐		◔	❁	❁		○	○		○		❁						
K	Cast Iron														●	◐	○	◔	◔						◔	❁			○	○		○		❁	○	◔				○
N	Non-ferrous Metal																																			◔				○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	◐	●	◐	

Shape	Order Number	RE (mm)																																					
Flat Top	TCGN060104	0.4																																		●				
	TCGN090204	0.4																																		●				

Orders for the MC60 series, UE60 series, MC50 series, and UC51 series will be discontinued after new grades are released.
The successor grades are the MC61 series and the MC51 series (scheduled to be released).

●: Inventory maintained in Japan.
▲: Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

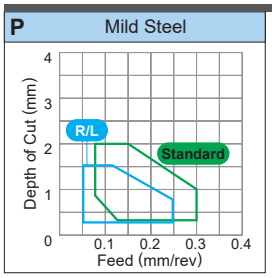
CHIP BREAKERS ➤ A072

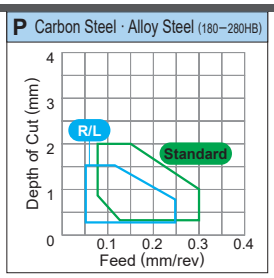
60° TP TYPE INSERTS WITHOUT HOLE

TPGR 11 03 04 R
Size · Thickness · Corner Radius · R/L
* Please refer to page A002.

CHIP CONTROL RANGE FOR WORKPIECE MATERIALS

Finish Cutting ····· Medium Cutting ·····





● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◷ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	○ ◷ ❁ ◷ ❁ ❁ ●
M	Stainless Steel	◔ ✣ ○ ✣ ● ◔ ◷ ❁ ❁ ○ ○ ○ ❁
K	Cast Iron	● ◔ ○ ◷ ◷ ◷ ❁ ○ ○ ○ ❁ ○ ◷
N	Non-ferrous Metal	○
S	Heat resistant Alloy, Titanium Alloy	● ◔ ✣ ○ ◔ ◷ ◷ ❁ ◷ ◔ ● ◔ ○

Shape	Order Number	RE (mm)	Coated: UE6105	UE6110	UE6020	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US7020	US735	NEW MS7025	MC5005	MC5015	UC5105	UC5115	MH515	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9010	MT9005	MT9015	TF15
R/L	TPGR110304R	0.4																															●				●					
	TPGR110304L	0.4																															●		●		●					
	TPGR160304R	0.4																															●		●		●					
	TPGR160304L	0.4																															●		●		●					
	TPGR160308R	0.8																															●									
Finish Cutting	TPGR160308L	0.8																															●		●		●					
Standard	TPMR090202	0.2																											●					●								
	TPMR090204	0.4																											●				●	●								
	TPMR090208	0.8																											●													
	TPMR110302	0.2																											●				●	●								
	TPMR110304	0.4		▲▲																									●				●	●								
	TPMR110308	0.8		▲▲																									●				●	●								
	TPMR160304	0.4		▲▲																									●				●	●								
	TPMR160308	0.8		▲▲																									●				●	●								
Medium Cutting	TPMR160312	1.2		▲																									●					●								
Flat Top	TPMN110304	0.4		▲											▲▲▲												●					●		●		●					
	TPMN110308	0.8		▲											▲▲▲												●					●		●		●					
	TPMN160304	0.4		▲											▲▲▲											●	●					●		●		●					
	TPMN160308	0.8		▲											▲▲▲											●	●					●		●	●	●					
	TPMN160312	1.2		▲											▲▲▲												●									●					
	TPMN160320	2.0																																		●							
	TPMN220404	0.4		▲																																●							
	TPMN220408	0.8		▲▲																							●	●								●		●					
	TPMN220412	1.2		▲																							●									●		●					
Flat Top	TPGN110302	0.2																																				●					
	TPGN110304	0.4																															●			●		●				
	TPGN110308	0.8																										●									●					
	TPGN160302	0.2																																				●					
	TPGN160304	0.4																										●					●			●		●				
	TPGN160308	0.8																										●					●			●		●				
	TPGN160312	1.2																																				●					
	TPGN160316	1.6																																				●					
	TPGN160408	0.8																																		●							
	TPGN220404	0.4																										●									●					
	TPGN220408	0.8																										●									●					

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ —
BORING ➤ —
SMALL TOOLS ➤ —
CHIP BREAKERS ➤ A072
GRADES ➤ A030
IDENTIFICATION ➤ A002

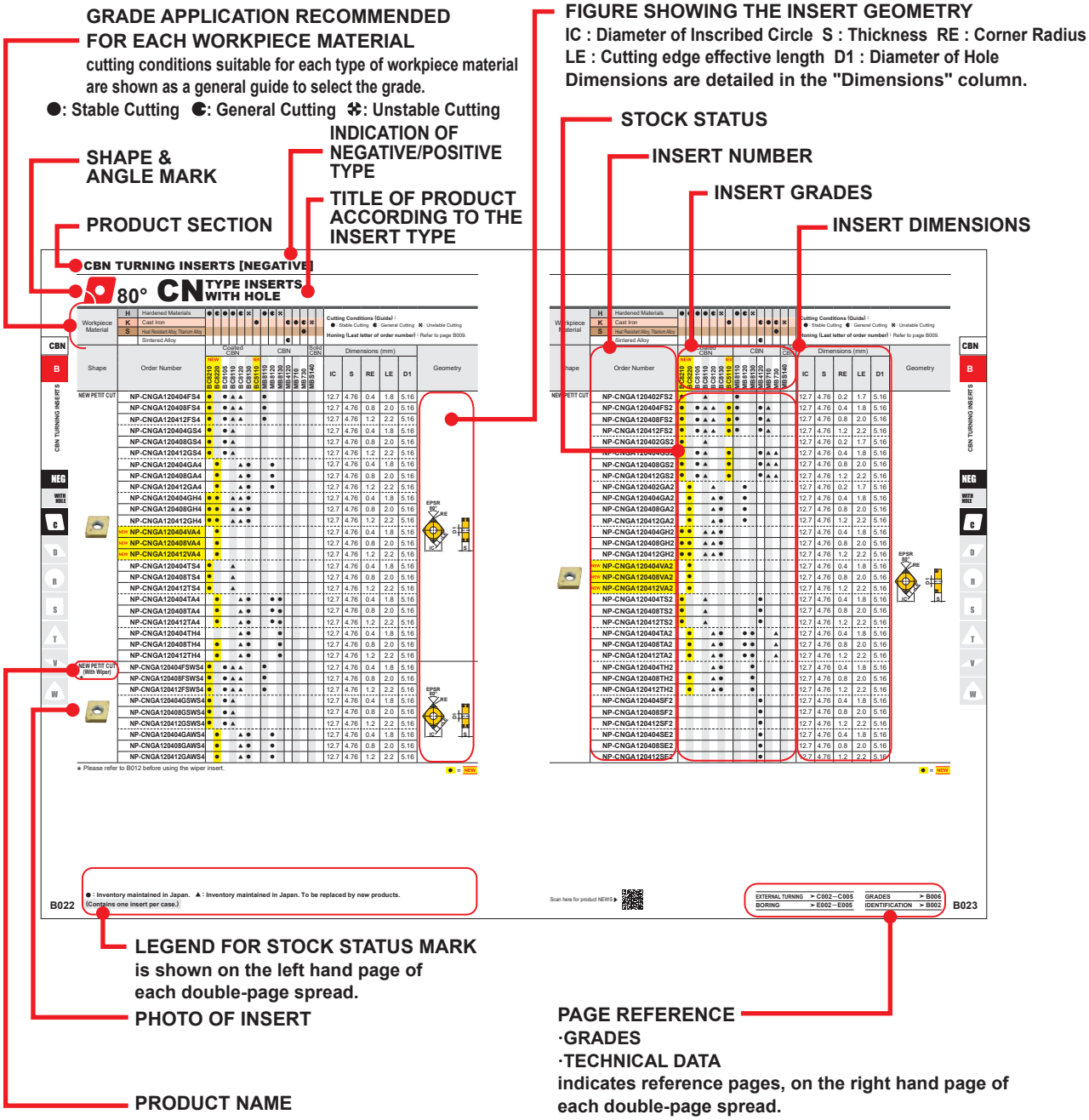
HOW TO READ THE STANDARD OF CBN & PCD TURNING INSERTS

●How this section page is organised

①Organised according to turning insert shape.
(Refer to the index on the next page.)

②Inserts are arranged in order of :

- Negative inserts (with hole→without hole)
- Positive inserts (with hole→without hole)



●To Order : Please specify
①insert number and ②grade.

TURNING TOOLS

CBN & PCD INSERT STANDARDS
CBN & PCD INSERT GRADES

IDENTIFICATION B002
CLASSIFICATION OF CBN & PCD GRADES B004
INTRODUCTION OF CBN GRADES B006
CBN B008
HONING B009
CBN BREAKER INSERT B010
WIPER INSERT B012
CBN GROOVING SERIES (GY) B014
INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES ... B015
CLASSIFICATION OF CBN & PCD INSERTS B016

STANDARD OF CBN TURNING INSERTS

NEGATIVE INSERTS WITH HOLE

CN○○TYPE···RHOMBIC 80° B022
DN○○TYPE···RHOMBIC 55° B026
SN○○TYPE···SQUARE 90° B031
TN○○TYPE···TRIANGULAR 60° B032
VN○○TYPE···RHOMBIC 35° B035
WN○○TYPE···TRIGON 80° B037

NEGATIVE INSERTS WITHOUT HOLE

CN○○TYPE···RHOMBIC 80° B038
DN○○TYPE···RHOMBIC 55° B038
RN○○TYPE···ROUND B038
SN○○TYPE···SQUARE 90° B039
TN○○TYPE···TRIANGULAR 60° B039

POSITIVE INSERTS WITH HOLE

CC○○TYPE···RHOMBIC 80° B040
CP○○TYPE···RHOMBIC 80° B043
DC○○TYPE···RHOMBIC 55° B044
TC○○TYPE···TRIANGULAR 60° B046
TP○○TYPE···TRIANGULAR 60° B047
VB○○TYPE···RHOMBIC 35° B049
VC○○TYPE···RHOMBIC 35° B050
WC○○TYPE···TRIGON 80° B051

POSITIVE INSERTS WITHOUT HOLE

SP○○TYPE···SQUARE 90° B052
TB○○TYPE···TRIANGULAR 60° B053
TP○○TYPE···TRIANGULAR 60° B053
GY TYPE B054

STANDARD OF PCD TURNING INSERTS

NEGATIVE INSERTS WITH HOLE

CN○○TYPE···RHOMBIC 80° B055
DN○○TYPE···RHOMBIC 55° B055
SN○○TYPE···SQUARE 90° B056
TN○○TYPE···TRIANGULAR 60° B056
VN○○TYPE···RHOMBIC 35° B057

NEGATIVE INSERTS WITHOUT HOLE

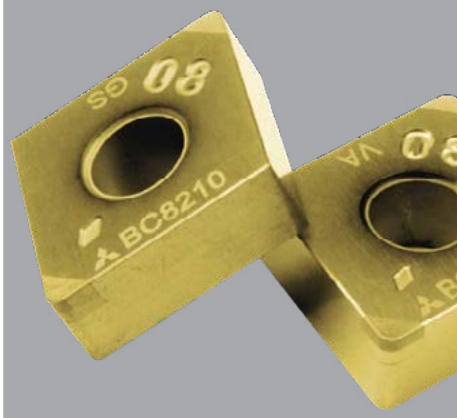
SN○○TYPE···SQUARE 90° B058

POSITIVE INSERTS WITH HOLE

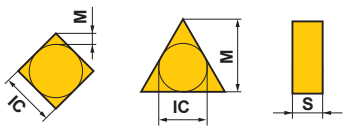
CC○○TYPE···RHOMBIC 80° B059
CP○○TYPE···RHOMBIC 80° B059
DC○○TYPE···RHOMBIC 55° B060
SP○○TYPE···SQUARE 90° B060
TC○○TYPE···TRIANGULAR 60° B061
TP○○TYPE···TRIANGULAR 60° B062
VB○○TYPE···RHOMBIC 35° B064
VC○○TYPE···RHOMBIC 35° B064
WC○○TYPE···TRIGON 80° B065
WP○○TYPE···TRIGON 80° B065
DE○○TYPE···RHOMBIC 55° B066
TE○○TYPE···TRIANGULAR 60° B066
VD○○TYPE···RHOMBIC 35° B067

POSITIVE INSERTS WITHOUT HOLE

SP○○TYPE···SQUARE 90° B068
TP○○TYPE···TRIANGULAR 60° B068



IDENTIFICATION



Symbol	Tolerance of Nose Height **M** (mm)	Tolerance of Inscribed Circle **IC** (mm)	Tolerance of Thickness **S** (mm)
G	±0.025	±0.025	±0.13
M*	±0.08–±0.18	±0.05–±0.15	±0.13

The surface of insert with * mark is sintered.

Detail of M Class Insert Tolerance

● Tolerance of Nose Height **M** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	–
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	–
12.70	±0.13	±0.13	±0.13	±0.15	–	–

● Tolerance of Inscribed Circle **IC** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	–
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	–	±0.08

④ Tolerance Class

BR	For High Depth of Cut
BM	For Medium Depth of Cut
BF	For Finishing
NP	New Petit Cut*
No mark	Standard Type

① Insert Geometry

*Pleaes refer to pages B009 and B015 for further information.

①	②	③	④	⑤
NP	**D**	**N**	**G**	**A**

② Insert Shape

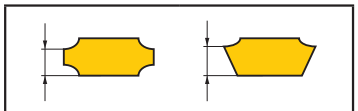
Symbol	Insert Shape
C	Rhombic 80°
D	Rhombic 55°
R	Round
S	Square
T	Triangular
V	Rhombic 35°
W	Trigon

③ Normal Clearance

Symbol	Normal Clearance
B	5°
C	7°
D	15°
E	20°
N	0°
P	11°

⑤ Fixing and/or for Chip Breaker

Metric				
Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40–60°)	No	
T/V	With Hole		One Sided	
B	With Hole	Cylindrical Hole + One Countersink (70–90°)	No	
H	With Hole		One Sided	
A	With Hole	Cylindrical Hole	No	
M	With Hole	Cylindrical Hole	One Sided	
N	Without Hole	–	No	
X	–	–	–	Special Design



*Thickness is from the bottom of the insert to the top of the cutting edge.

Symbol	Thickness (mm)
S1	1.39
01	1.59
T0	1.79
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76

⑦ Insert Thickness

Diameter of Inscribed Circle (mm)	Symbol R	W	V	D	C	S	T
3.97		02		04	03	03	06
4.76		L3	08	05	04	04	08
5.56		03	09	06	05	05	09
6.35		04	11	07	06	06	11
7.94		05	13	09	08	07	13
9.525	09	06	16	11	09	09	16
12.70	12	08	22	15	12	12	22

⑥ Insert Size

Symbol	Corner Radius (mm)
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6

⑧ Insert Corner Configuration

⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
15	04	04	GA	WS	2	J	R

⑨ Application (Honing)

Symbol	Honing
FS FA FB F	Continuous Cutting
GS GA GB GH	General Cutting
VA	High-Speed, High Feed Cutting
TS TA TH T	Interrupted Cutting
SF SE	Cutting Sintered Alloys

Refer to Honing on page B009 for details.

⑩ Wiper

WS	For High Rigidity Workpiece Material
WL	For Deflection and Vibration Prevention
No mark	Without Wiper

⑪ Number of Teeth

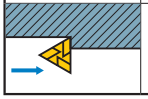
2	2
3	3
4	4
6	6
No mark	1

⑫ Cutting Edge Angle

F	91°
J	93°
No mark	Non Restriction

Please pay special attention when using an indexable insert.

⑬ Cutting Direction

Figure	Hand	Symbol
	Right	R
	Left	L

CLASSIFICATION OF CBN & PCD GRADES

UNCOATED CBN MATERIALS

CBN sintered material based cutting tools are produced by binding CBN (cubic Boron Nitride) and ceramic. Its hardness is next to diamond and it is sintered under ultra-high pressure and high temperature.
CBN has a lower affinity to iron than diamond. The low affinity and high hardness properties mean that sintered CBN delivers a superior cutting performance especially during high-speed machining of materials such hardened steel, cast iron and sintered alloys, etc.

COATED CBN MATERIALS

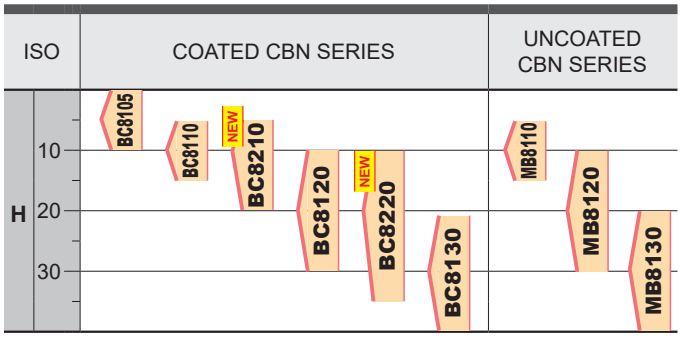
Mitsubishi Materials achieves longer tool life by using a unique "particle-activated sintering method" and combines it with an increased cutting edge strength. This specially developed PVD ceramic coating for CBN grades has a high crater wear resistance, longer tool life, and improved machine efficiency that exceed the conventional CBN grades.

PCD MATERIALS (Sintered Diamond)

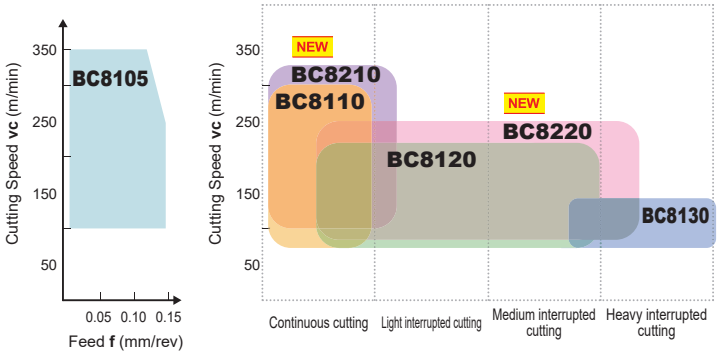
Suitable for cutting materials such as nonferrous metals and fibre reinforced plastics (FRP) including aluminium alloys.
It supports ultra-high-speed finish cutting.

Workpiece materials for turning grades/application area

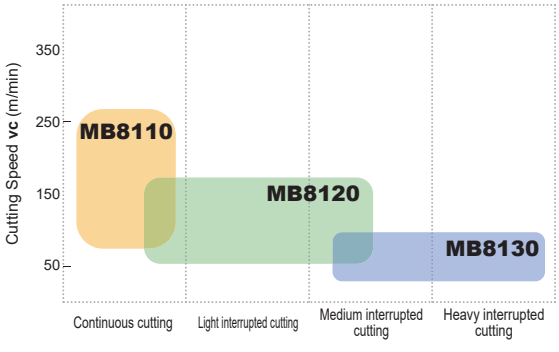
Hardened Steel



COATED CBN MATERIALS



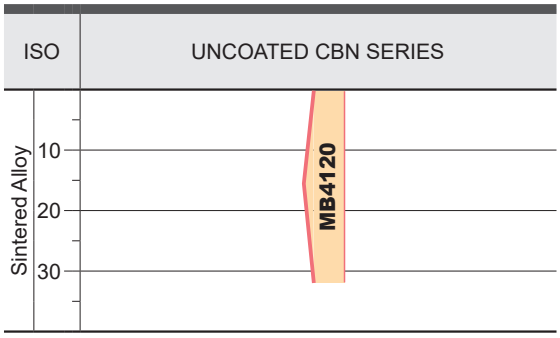
UNCOATED CBN MATERIALS

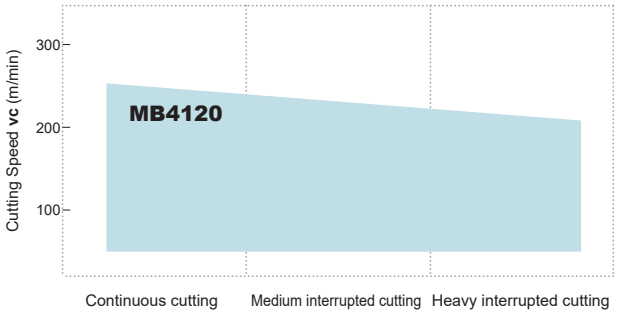


Suitable for finishing with surface roughness Ra 0.6 µm or Rz 2.4 µm or less.

Coated CBN Grades BC8200, BC8100 and Uncoated CBN Grade MB8100 for high hardness steel machining are available in a wide range of areas from finishing to continuous cutting of hardened steels and strongly interrupted machining.

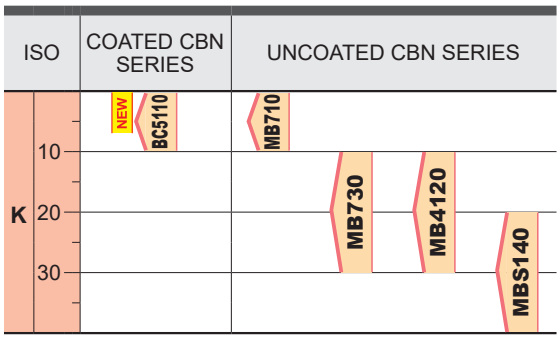
Sintered Alloys

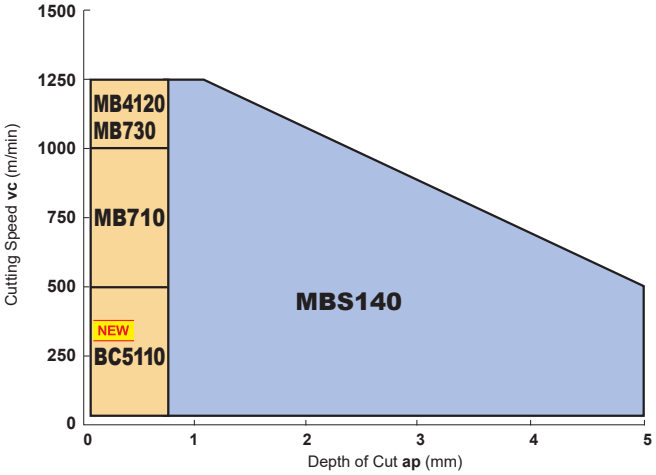




The CBN grade “MB4120” for sintered alloys and cast iron cutting can be used widely from continuous cutting to interrupted cutting in the machining of cast iron such as sintered alloys for valve mechanism parts and oil pump parts.

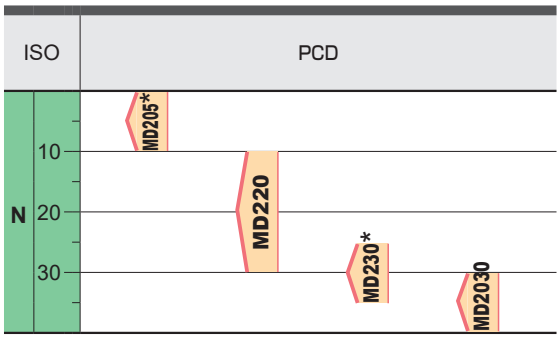
Cast Iron

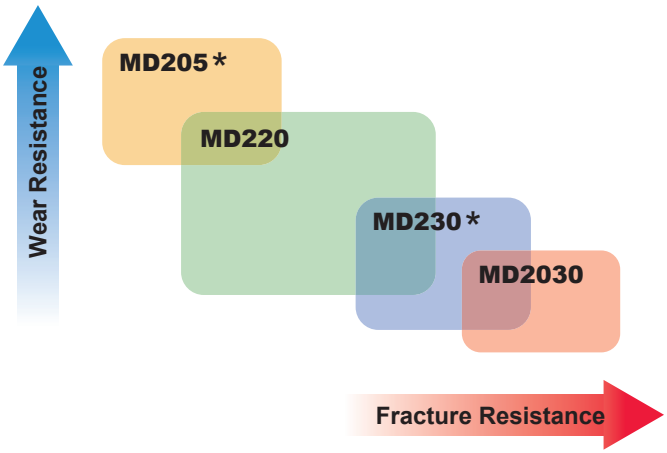




Lineup of grades available from general cutting to cutting of deep depths for high efficiency machining.

Aluminium Alloys





Suitable for cutting materials such as nonferrous metals and fibre reinforced plastics (FRP) including aluminium alloys.
It supports ultra-high-speed finish cutting.

*MD205 and MD230 are produced-to-order products.

Detailed information regarding each grade is available on the website. ▶

INTRODUCTION OF CBN GRADES

Coated CBN Grade for Machining of Hardened Steel

NEW BC8200 series

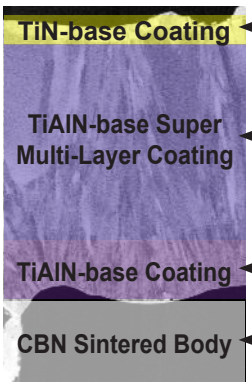
The new CBN substrate contains a new ultra micro-particle and heat resistant binder that suppress both chipping and crater wear which promotes longer tool life.

BC8210 NEW



- TiN-base Coating: Gold colour assists easy identification of edge use.
- AlCrSiN-base Coating: Excellent chipping resistance. Absorbs impact forces.
- TiAlSiN-base Coating: Excellent wear resistance. Abrasion resistant layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8210.
- CBN Sintered Body: Excellent crater wear and chipping resistance. Exclusive BC8210 sintered body.

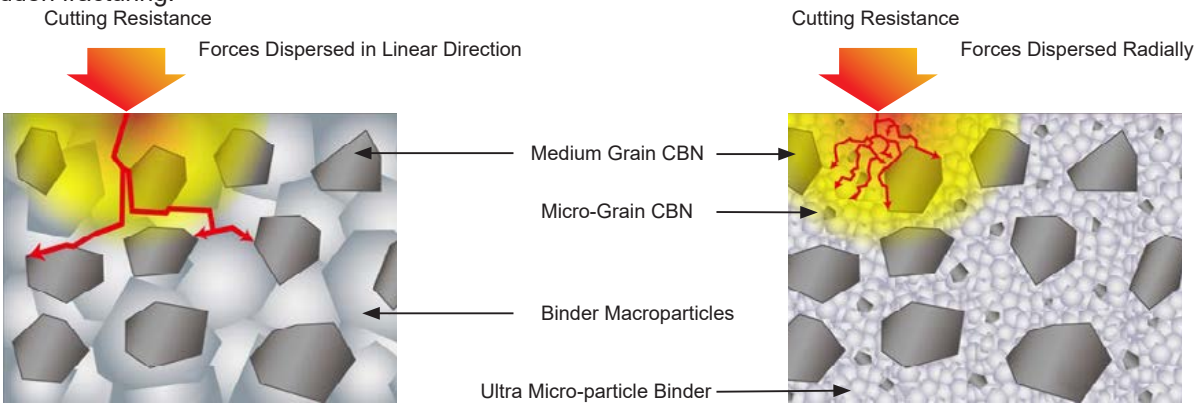
BC8220 NEW



- TiN-base Coating: Gold colour assists easy identification of edge use.
- TiAlN-base Super Multi-Layer Coating: High wear and chipping resistance. Super Multi-Layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8220.
- CBN Sintered Body: Excellent crater wear and fracture resistance. Exclusive BC8220 sintered body.

Ultra Micro-Particle Binder Prevents Sudden Defects

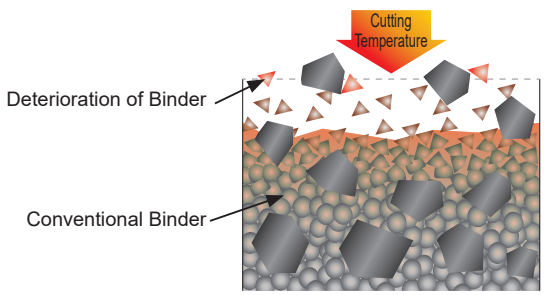
The ultra micro-particle binder cBN added to the CBN base material prevents linear crack development and avoids sudden fracturing.



Conventional | **BC8200, BC8100 Series**

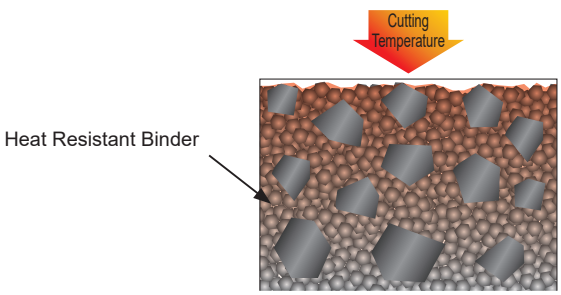
Heat Resistant Binder Suppresses Crater Wear

By increasing the heat reistance of the binder, wear resistance due to the deterioration of the binder component increases, thereby suppressing crater wear, chipping, and fracturing.



As binder wear progresses due to the heat produced during cutting, the CBN particples are exposed and lost.

Conventional



Suppresses the binder wear caused by cutting heat.

BC8200 Series

Coated CBN Grade for Machining Cast Iron

NEW BC5110

BC5110 uses a tough substrate with a remarkably hard coating to provide excellent chipping and wear resistance.

Excellent Chipping Resistance

Compared to conventional grades, the fine grain and high cBN content greatly improve chipping resistance and provide stability and long tool life.

Excellent Wear Resistance Coating

The hard ceramic coating layer provides excellent surface finishes as well as wear and notch resistance during continuous cutting.
Additionally, chipping and peeling of the coating layer is suppressed due to the improved bonding strength to the cBN substrate.



FOR CYLINDER LINER

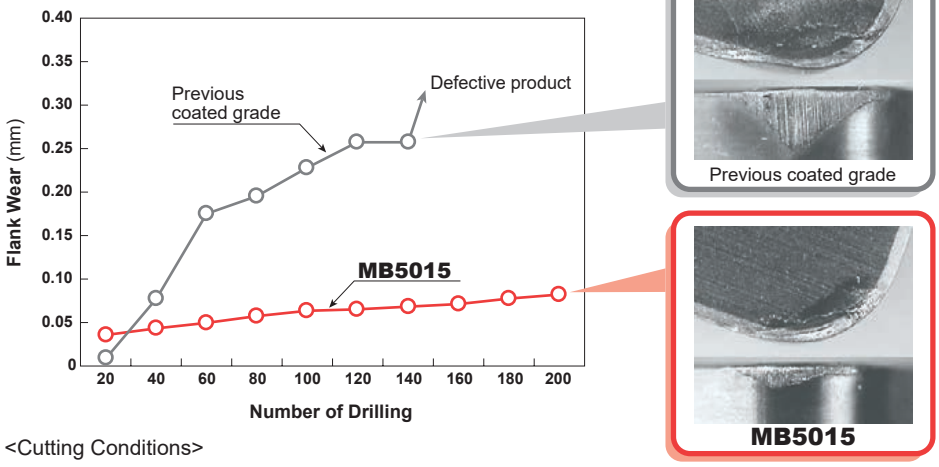
MB5015 *Produced to order only.

MB5015 is an exclusive grade for boring of centrifugal casting cylinder liners in semi finishing or finishing applications with high wear resistance.

■ Recommended Cutting Conditions

Workpiece Material		Cutting Mode	Cutting Speed vc (m/min) 100 500 1000 1500	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Centrifugal casting	Cast Iron	Continuous cutting		–0.3(Finishing) –0.8(Semi-finishing)	–0.05(Finishing) –0.2(Semi-finishing)	Wet Cutting

■ Cutting Performance



<Cutting Conditions>
Workpiece Material : FC200 (Centrifugal casting) ϕ63.0
Cutting Speed : vc=800m/min Feed : f=0.35mm/rev Depth of Cut : ap=0.03mm
Work : Centrifugal casting Cylinder liner Hole Depth : 100mm

CBN

●Heat Treated Steel (Hardened Steel, etc.)

Workpiece Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions			
					Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Structural Steel Esp. Carburized Steel (SC, SCM, SCr) High Alloy Steel (SKD, SKH)	35—65 HRC	Coated	High-speed finishing cutting	**BC8105**	250 (100—350)	≤0.15	≤0.2	Dry,Wet
			Continuous cutting for general purpose	NEW **BC8210** **BC8110**	200 (100—300)	≤0.2	≤0.35	Dry,Wet
				NEW **BC8220** **BC8120**	200 (100—230)	≤0.3	≤0.8	Dry,Wet
			Medium interrupted cutting	NEW **BC8220** **BC8120**	150 (60—200)	≤0.2	≤0.3	Dry,Wet
			Interrupted cutting	**BC8130**	120 (60—150)	≤0.2	≤0.3	Dry,Wet
		Uncoated	Continuous cutting for general purpose	**MB8110**	200 (100—250)	≤0.2	≤0.3	Dry,Wet
				MB8120	150 (80—220)	≤0.2	≤0.5	Dry,Wet
			Medium interrupted cutting	**MB8120**	130 (85—180)	≤0.2	≤0.3	Dry,Wet
			Interrupted cutting	**MB8130**	100 (60—150)	≤0.2	≤0.3	Dry,Wet

●Cast Iron

Workpiece Material		Workpiece Structure	Cutting Speed vc (m/min) 250 500 750 1000 1250	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Gray Cast Iron	JIS FC250	Ferritic + Pearlitic	MBS140; NEW BC5110; MB710; MB730	—0.5	—1.0 MBS140 —5.0	Dry,Wet
	JIS FC300	Pearlitic				
Alloy Cast Iron		Pearlitic		—0.4	—0.5	Dry,Wet
Ductile Cast Iron	JIS FCD400	Ferritic	MB710; MB730	—0.4	—0.5	Dry,Wet
	JIS FCD700	Ferritic + Pearlitic Pearlitic				

Cutting speed of MB4120.

●Sintered Alloy

Workpiece Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
General Sintered Alloy	**MB4120**	180 (80—300)	—0.2	—0.3
High Density Sintered Alloy	**MB4120**	150 (80—230)	—0.2	—0.3
Sintered Alloy	**MB4120**	130 (80—180)	—0.2	—0.3

●Valve Seat

Amount of Hard Particles	None or Small ← → Large			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	MB4120			
Traverse Cut	MB4120			

●Roll

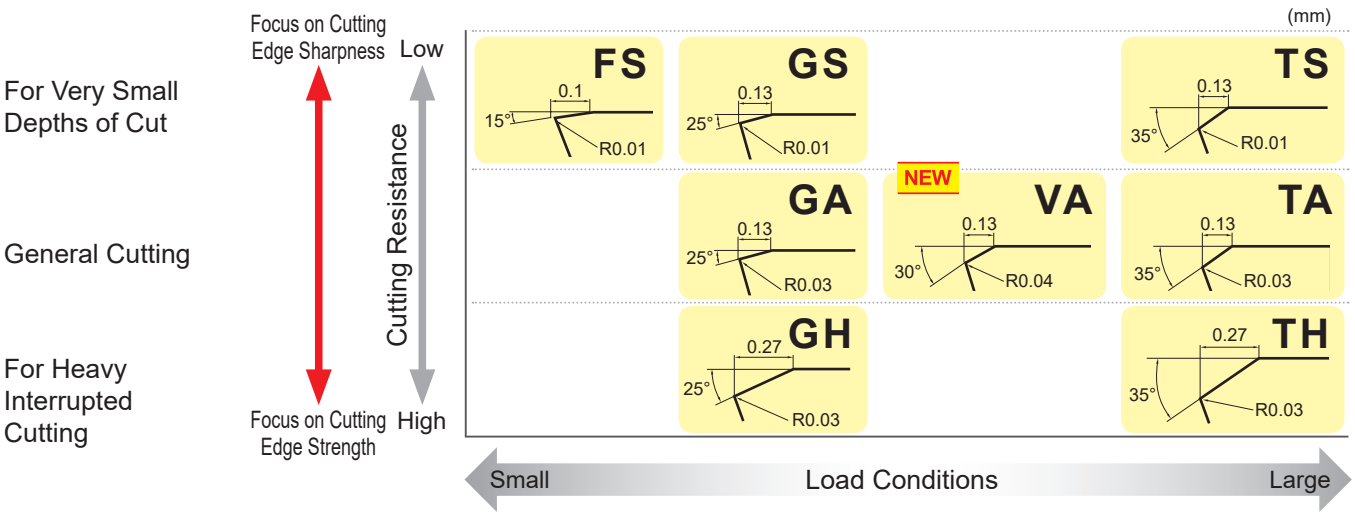
Workpiece Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ductile Cast Iron Granular Cast Iron Chilled Cast Iron	**MB710**	80 (30—130)	0.3 (0.1—0.5)	0.2—3.0
High-Speed Steel	**MB730**	50 (20—70)	0.25 (0.1—0.4)	0.1—3.0
Cemented Carbide	**MB730, MBS140**	20 (10—30)	—0.2	—0.2

●Heat Resistant Alloys

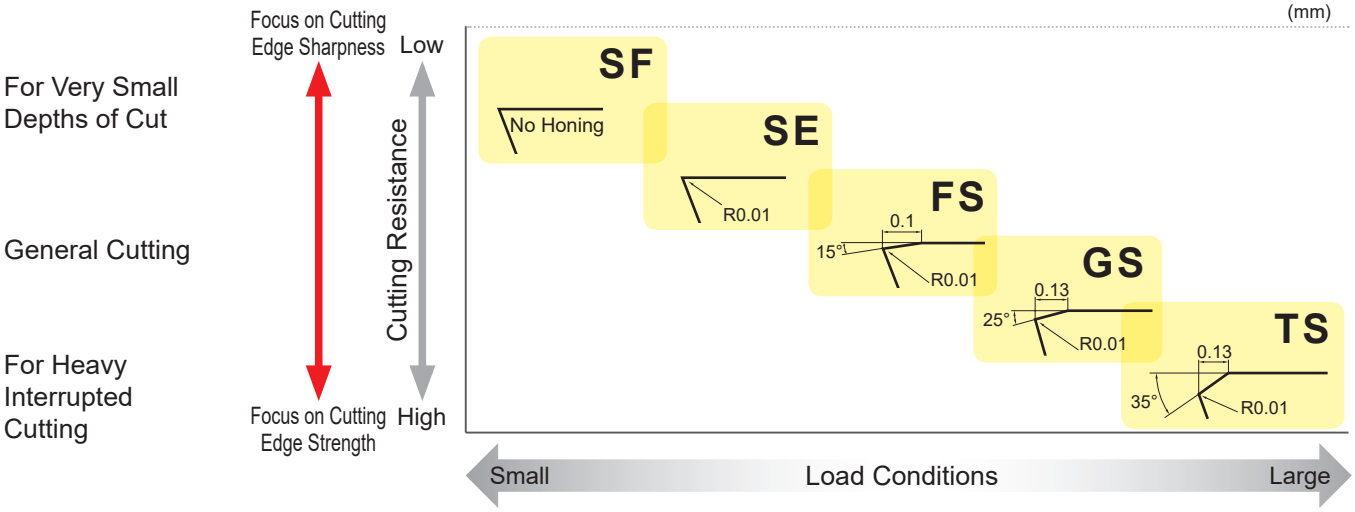
Workpiece Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ni Base Heat Resistant Alloy (e.g. Inconel)	**MB730**	120 (100—150)	—0.2	—0.5
Co Base Heat Resistant Alloy (e.g. Stellite)	**MB730**	70 (50—100)	—0.2	—0.5

HONING

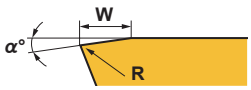
Honing for Machining Hardened Steel



Honing for Machining Sintered Alloys



NP-CNGA120408-GA2



Main Application — Edge Honing Type

(mm)

	A General			S Vibration and burr control			H High efficiency			F Focus on dimensional precision			E Chipping control		
	α	W	R	α	W	R	α	W	R	α	W	R	α	W	R
F Continuous cutting	15°	0.1	0	15°	0.1	0.01	—	—	—	—	—	—	—	—	—
G General cutting	25°	0.13	0.03	25°	0.13	0.01	25°	0.27	0.03	—	—	—	—	—	—
V For high-speed, High feed cutting	30°	0.13	0.04	—	—	—	—	—	—	—	—	—	—	—	—
T Interrupted cutting	35°	0.13	0.03	35°	0.13	0.01	35°	0.27	0.03	—	—	—	—	—	—
S High precision cutting	—	—	—	—	—	—	—	—	—	0°	0	0	0°	0	0.01

Conventional honing shapes
F honing : 0.1mm×15°+R0 **G** honing : 0.13mm×25°+R0.03 **T** honing : 0.13mm×35°+R0.03

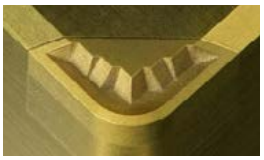
New Petit Cut Series

The surface area of the CBN sintered body has been optimised to allow for a lower price. In adition, tool management is easier because repolishing is not required.

CBN BREAKER INSERT

■Application Area

A BR breaker has been added to achieve better chip control at higher depths of cut.
A versatile range of chip breakers is available for a wide range of applications.



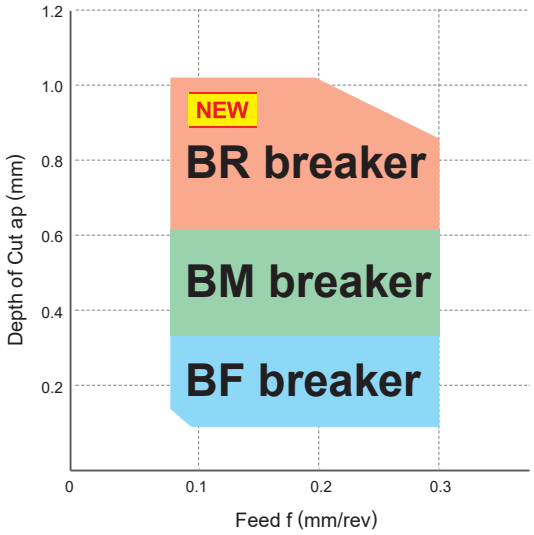
BR breaker



BM breaker



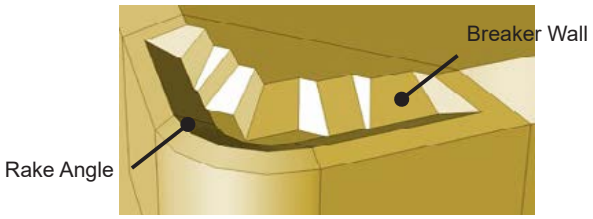
BF breaker

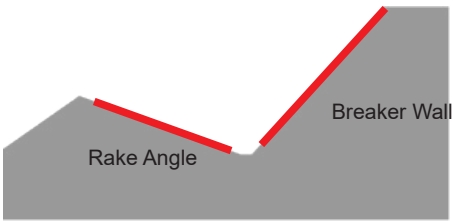


NEW BR Breaker (BC8220)

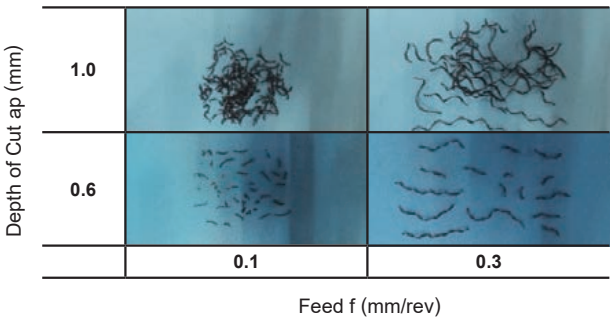
The number of passes needed is reduced and chip control during high depths of cut is also improved.
Chips are formed with the effect from the rake angle, and the multi stage breaker wall supports a wide range of cuts.

Recommended Cutting Conditions : vc=80－200 m/min, f ≤0.3 mm/rev, ap=0.6－1.0 mm





Achieves ideal chip control even at high depths of cut.

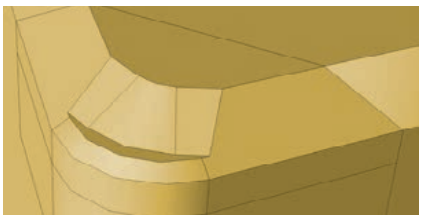


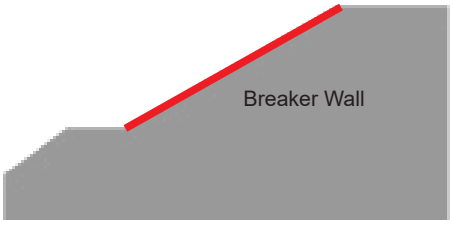
<Cutting Conditions>
Workpiece Material : SCr420 (60 HRC)
Insert : BR-CNGM120408TA2
Cutting Speed : vc=200 m/min
Feed : f=0.1 mm/rev
0.3 mm/rev
Depth of Cut : ap=0.6 mm
1.0 mm
Cutting Mode : Wet Cutting

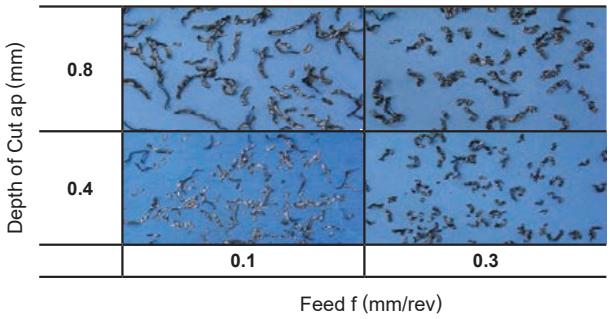
BM Breaker (BC8220)

Great chip control when machining at medium depths of cut. (0.3－0.8 mm)

Recommended Cutting Conditions : vc=80－200 m/min, f ≤0.3 mm/rev, ap=0.3－0.8 mm





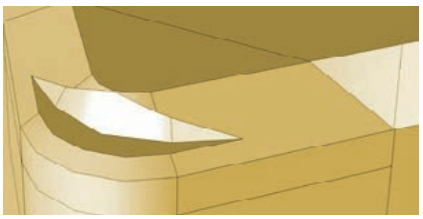


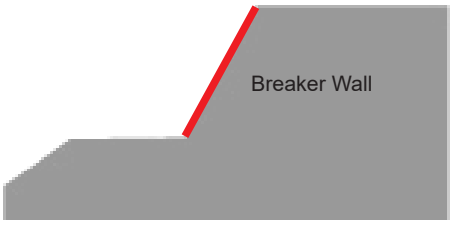
<Cutting Conditions>
Workpiece Material : SCM415 (60 HRC)
Insert : BM-CNGM120408TA2
Cutting Speed : vc=160 m/min
Feed : f=0.1 mm/rev
0.3 mm/rev
Depth of Cut : ap=0.4 mm
0.8 mm
Cutting Mode : Wet Cutting

BF Breaker (BC8210, BC8220)

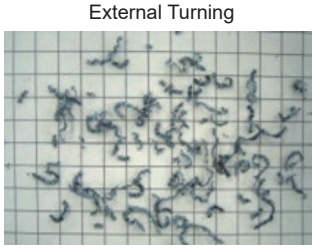
Achieves excellent chip control while finish cutting at depths of 0.3 mm or less.

Recommended Cutting Conditions : vc=80－200 m/min, f ≤0.3 mm/rev, ap=0.1－0.3 mm



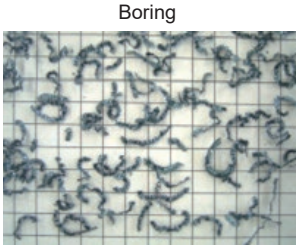


External Turning



Cutting Speed : vc=100 m/min
Feed : f=0.2 mm/rev
Depth of Cut : ap=0.3 mm

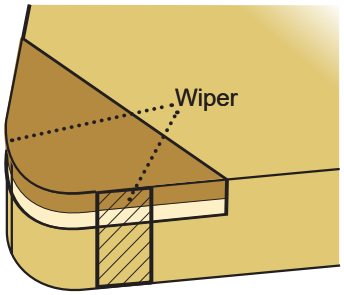
Boring



Cutting Speed : vc=120 m/min
Feed : f=0.2 mm/rev
Depth of Cut : ap=0.3 mm

<Cutting Conditions>
Workpiece Material : SCM415 (60 HRC)
Insert : BF-CNGM120408TS2
Cutting Mode : Wet Cutting

WIPER INSERT



Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

Improving Efficiency

High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

Increased Tool Life

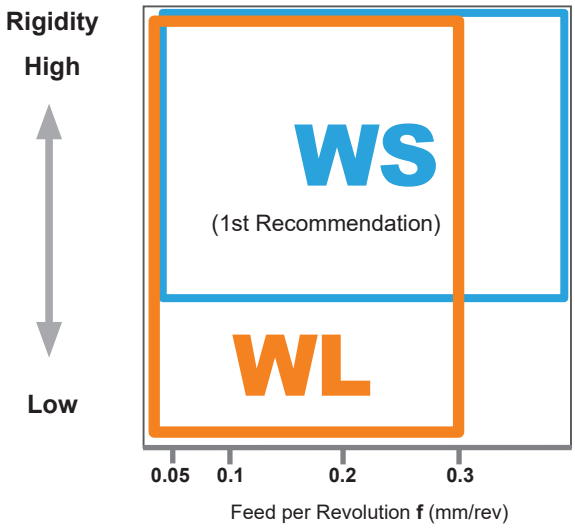
When changed to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

Improving Chip Control

Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

■ Application of Wiper Inserts

The most recommended wiper shape is the WS Wiper. If deflection or chatter occur, use the WL Wiper.

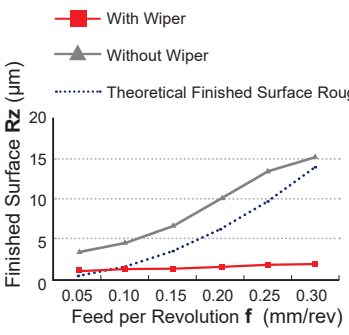


Examples of Low Rigidity:

- When overhang length is long due to boring
- When the workpiece material has a small diameter

■ Cutting Performance

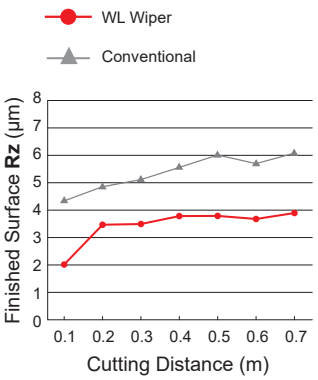
WL Wiper (External Turning)



<Cutting Conditions>

Workpiece Material	: Hardened Steel (60HRC)
Insert	: NP-CNGA120408
Machining Methods	: Continuous
Cutting Speed	: vc=120m/min
Depth of Cut	: ap=0.1mm
Cutting Mode	: Dry Cutting

WL Wiper (Boring)



<Cutting Conditions>

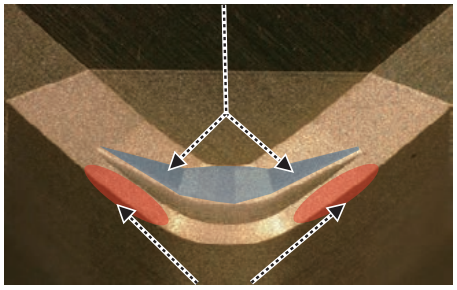
Workpiece Material	: SCr415 (60HRC)
Insert	: NP-CNGA120408FBWL2
Machining Methods	: Continuous
Cutting Speed	: vc=160m/min
Feed	: f=0.3mm/rev
Depth of Cut	: ap=0.1mm
Cutting Mode	: Dry Cutting

Stable surface finish is maintained even in unstable cutting.

Combination of BF Breaker and WS Wiper Insert

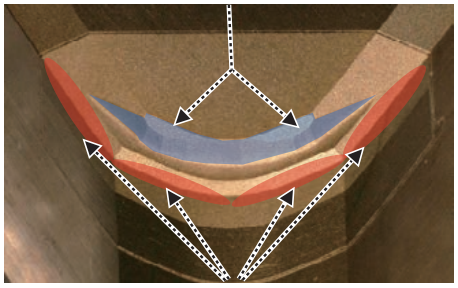
CNGM and DNGM types are now available with new inserts that combine a BF chip breaker with a WS wiper Insert.
(BC8210 : BF-○NGM○○○○○○TSWS2, BC8220 : BF-○NGM○○○○○○TAWS2)
It is effective for chip control and an improvement of finished surface roughness without worrying about the hand of the tool even when continuous external or internal turning and facing.

BF breaker



WL Wiper (No hand)
BF-CNGM120408TSWS2

BF breaker



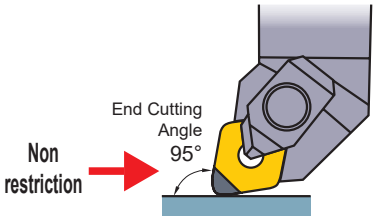
WL Wiper (No hand)
BF-DNGM150412TAWS2

■ Precautions when Using Wiper Inserts

When Using CNGM Type

No Restriction for Holders

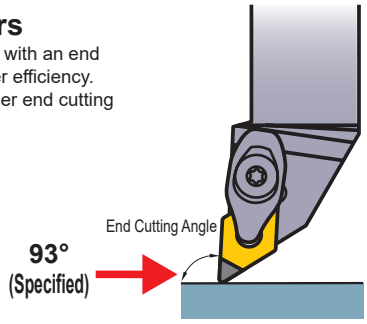
A standard holder can be used.
(*A double clamp, high rigidity tool is recommended.)



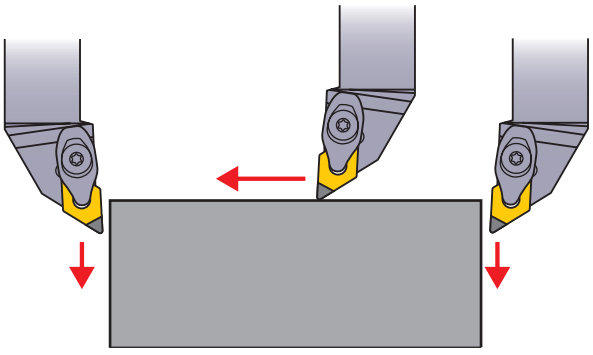
When Using DNGM Type

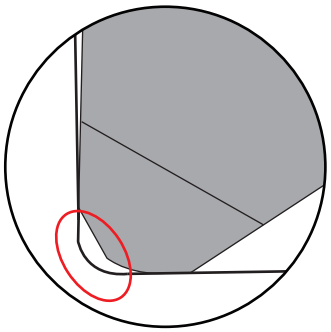
Restriction for Holders

Use a PDJN holder or DDJN holder with an end cutting angle of 93° to improve wiper efficiency.
There is no wiper efficiency with other end cutting angles (60°, 90°,107°, etc.).



Displays great wiper efficiency when machining the end face and outer diameter in both right-hand and left-hand machining.





*The DNGM type is not suitable for machining the R that connects the end face and the outer diameter because it will leave uncut parts.

CBN GROOVING SERIES
(GY)

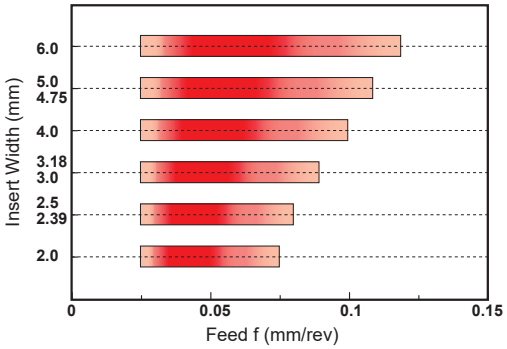
BC8110 coating for continuous machining of hardened steel has been added to GY inserts.

GY is a grooving tool series that achieves high rigidity with the "Tri-Lock System". (See page F004 for more details.)

BC8110 coating with excellent wear resistance has been added. Compared to conventional coating, it displays excellent wear resistance that achieves a longer tool life. A blade width of 6.0 has also been added to the BC8110 lineup.



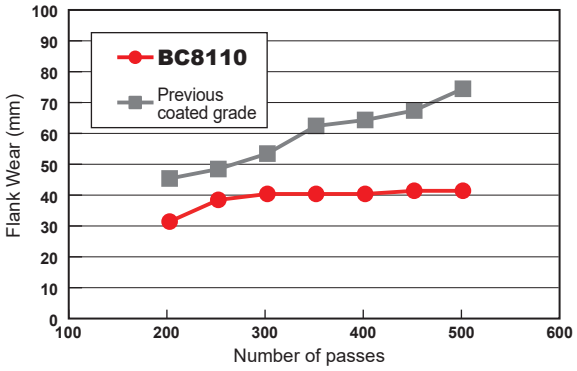
■ Recommended Cutting Conditions



Workpiece Material		Hardness	Grade	Cutting Speed vc (m/min)	Cutting Mode
H	Hardened Steel	35—65HRC	**BC8110**	100 (60—120)	Dry,Wet

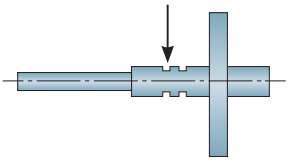
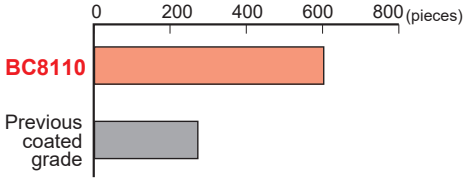
■ Cutting Performance

Tool life evaluation for the GY holder



<Cutting Conditions>
Insert : GY1G0200D020N-GFGS
Workpiece Material : SCr420 (60HRC)
Cutting Speed : vc=120 m/min
Feed : f=0.1 mm/rev
Depth of Cut : ap=0.3 mm
Cutting Mode : Dry Cutting

■ Application Example

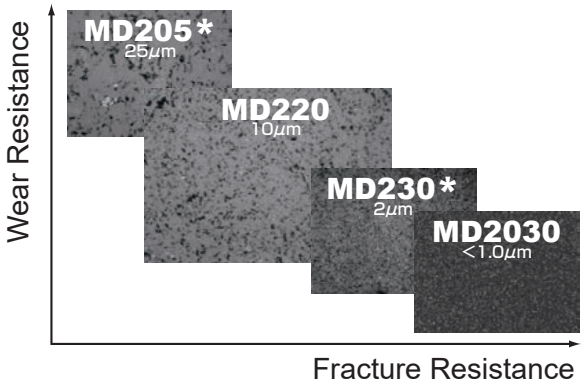
Insert	**GY1G0300F020N-GFGS** (Grade : **BC8110**)
Workpiece Material	 SNCM230H (58—62HRC)
Component	Input shaft
Cutting Conditions: Cutting Speed vc (m/min)	130
Cutting Conditions: Feed f (mm/rev)	0.1
Result	 Tool life over twice as long as conventional products

INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES

Suitable for materials such as aluminium alloys, non-ferrous metals, and fibre reinforced plastic.

Suitable for extreme high-speed finishing.





Grade	Features
MD205*	**For Continuous Cutting** Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insufficient.
MD220	**For General Machining** Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable for general finishing of non-ferrous metals, non-metal cutting, and similar machining.
MD230*	**For Interrupted Cutting** Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high-quality finished surface are demanded with MD220.
MD2030	**For Heavy Interrupted Cutting** Strong sintering of ultra micro-grain PCD particles provides exceptional fracture resistance. Chipping during high-speed finish turning can be controlled.

*MD205 and MD230 are produced-to-order products.

■ SELECTION STANDARD

TURNING

Workpiece Material	Recommended Grade		Recommended Cutting Conditions		
	MD205	MD220	Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Aluminium Alloy (Si ≤ 12%)		◎	800 (200—1200)	—0.2	—1.0
Aluminium Alloy (Si ≥13%)	◎	○	600 (200—1000)	—0.2	—1.0
Copper Alloy		◎	700 (200—1200)	—0.2	—1.0
Strengthened Plastic		◎	600 (100—1000)	—0.4	—1.0
Glass Fibre Reinforced Plastic		◎	500 (100—800)	—0.25	—1.0
Carbon	○	◎	400 (100—600)	—0.3	—1.0
Ceramics		○	50 (30—80)	—0.1	—1.0
Hard Rubber		◎	600 (300—800)	—0.15	—1.0
Wood Inorganic Board		◎	1300 (300—4000)	—0.4	—
Cemented Carbide	◎	○	15 (5—20)	—0.2	—0.5

Note1) ◎ : 1st recommendation. ○ : 2nd recommendation
Note2) Not suitable for steel.

■ NEW PETIT CUT INSERT SERIES

●**Economical** Low cost is achieved by reducing the area of the diamond sintered body. In addition, tool management is economical because regrinding is unnecessary.

●**With Breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.

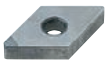
●Machining of small corner R is possible with the corner R0.05 lineup.

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type Double-Sided	G	Flat Top	NP-CNGA_○4 B022	NP-DNGA_○4 B026		NP-TNGA_○6 B032	NP-VNGA_○4 B035	NP-WNGA_○6 B037
	Multi-Corner Type Double-Sided With Wiper		Flat Top	NP-CNGA_○W○4 B022					
	Multi-Corner Type Single Sided		Flat Top	NP-CNGA_○2 B023	NP-DNGA_○2 B027	NP-SNGA_○2 B031	NP-TNGA_○3 B032	NP-VNGA_○2 B035	NP-WNGA_○3 B037
	Multi-Corner Type Single Sided With Wiper		Flat Top	NP-CNGA_○W○2 B024	NP-DNGA_○W○2J_R/L B029				NP-WNGA_○W○3 B037
	Multi-Corner Type Single Sided With Breaker		BF	BF-CNGM_○2 B024	BF-DNGM_○2 B029				
	Multi-Corner Type Single Sided With Breaker With Wiper		BF	BF-CNGM_○WS2 NEW B024	BF-DNGM_○WS2 NEW B029				
	Multi-Corner Type Single Sided With Breaker		BM	BM-CNGM_○2 B024	BM-DNGM_○2 B029		BM-TNGM_○3 B033		
	Multi-Corner Type Single Sided With Breaker		BR	BR-CNGM_○2 NEW B024	BR-DNGM_○2 NEW B029				
	One-Corner Type Single Sided	M	Flat Top	NP-CNMA_○ B025	NP-DNMA_○ B030	NP-SNMA_○ B031	NP-TNMA_○ B033	NP-VNMA_○ B036	
	One-Corner Type Single Sided With Breaker		R/L-F	NP-CNMM_R/L-F B055	NP-DNMM_R/L-F B055	NP-SNMM_R/L-F B056	NP-TNMM_R/L-F B056	NP-VNMM_R/L-F B057	

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGA  B025		SNGA  B031	TNGA  B034		
	One-Corner Type Single Sided	M	Flat Top	CNMA  B025, B055					
	One-Corner Type Single Sided	G	Flat Top		DNGA  B030, B055	SNGA  B031, B056	TNGA  B033, B056	VNGA  B036, B057	

5° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top					NP-VBGW_○2  B049	
	One-Corner Type With Breaker		R-F					NP-VBGT_R-F  B064	

CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CCGW_○2 B040	NP-DCGW_○2 B044		NP-TCGW_○3 B046	NP-VCGW_○2 B050	
	Multi-Corner Type With Wiper	G	Flat Top	NP-CCGW_○W○2 B041					
	Multi-Corner Type With Breaker	G	BF	BF-CCGT_○2 B041	BF-DCGT_○2 B045				
	Multi-Corner Type With Breaker	G	BM	BM-CCGT_○2 B041	BM-DCGT_○2 B045				
	One-Corner Type With Breaker	M	Breaker	NP-CCMH B059					
	One-Corner Type	G	Flat Top	NP-CCGW_○ B041	NP-DCGW_○ B045				
	One-Corner Type	M	Flat Top						NP-WCMW_○ B051
	One-Corner Type	M	Flat Top	NP-CCMW B059					
	One-Corner Type With Breaker	M	R/L-F		NP-DCMT_R/L-F B060				
	One-Corner Type With Breaker	G	R-F					NP-VCGT_R-F B064	
STANDARD	One-Corner Type	M / G	Flat Top	CCMW B042, B059	DCMW B045, B060		TCMW TCGW B046, B061	NEW VCGW B064	WCMW B065

11° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CPGB_○2  B043			NP-TPGB_○3  B047		
	One-Corner Type With Breaker	M	Breaker	NP-CPMH  B059					
	One-Corner Type	G	Flat Top				NP-TPGX_○  B048		
	One-Corner Type With Breaker	M	R/L-F				NP-TPMX_R/L-F  B062		
	One-Corner Type With Breaker		R/L-F				NP-TPMH_R/L-F  B062		
STANDARD	One-Corner Type With Breaker	G	Breaker	CPGT  B059					WPGT  B065
	One-Corner Type		Flat Top			SPGX  B060	TPGX  B048, B063		
	One-Corner Type With Breaker		R/L-F				TPGT/V_R/L-F  B062, B063		

CLASSIFICATION

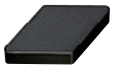
15° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 35° 	
One-Corner Type (For Aluminium With Breaker)	G	R/L 	VDGX_R/L-F  ➲ B067	

20° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55° 	Triangular 60° 
One-Corner Type (For Aluminium With Breaker)	G	R/L 		TEGX_R/L  ➲ B066
One-Corner Type (For Aluminium With Breaker)		R/L-F 	DEGX_R/L-F  ➲ B066	
One-Corner Type (For Aluminium)		Flat Top 		TEGX  ➲ B066

NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
One-Corner Type Single Sided	G	Flat Top			SNGN  B039, B058	TNGN  B039	
Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGN  B038	DNGN  B038	SNGN  B039	TNGN  B039	RNGN  B038

5° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Triangular 60°	
Multi-Corner Type	G	Flat Top	TBGN  B053	

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
GY Type	G	GY_GFGS  B054

11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
Multi-Corner Type	G	Flat Top	NP-SPGN_○2 NEW  B052	
One-Corner Type	G	Flat Top	SPGN  B052, B068	TPGN  B053, B068

80° CN TYPE INSERTS WITH HOLE

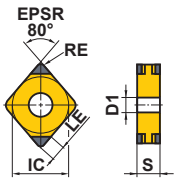
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

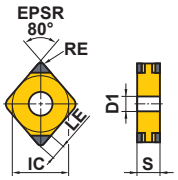
Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CNGA120404FS4	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FS4	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GS4	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GS4	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GA4		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GA4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GA4		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GH4	●	●			▲	▲	●								12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GH4	●	●			▲	▲	●								12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GH4	●	●			▲	▲	●								12.7	4.76	1.2	2.2	5.16	
	NEW NP-CNGA120404VA4		●													12.7	4.76	0.4	1.8	5.16	
	NEW NP-CNGA120408VA4		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-CNGA120412VA4		●													12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TS4	●			▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TS4	●			▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TS4	●			▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TA4		●			▲	●			●	●					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TA4		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TA4		●			▲	●			●	●					12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TH4					▲	●				●					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TH4		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TH4		●			▲	●				●					12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT (With Wiper) *	NP-CNGA120404FSWS4	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FSWS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FSWS4	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GSWS4	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GSWS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GSWS4	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GAWS4		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GAWS4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GAWS4		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	









* Please refer to B012 before using the wiper insert.

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-CNGA120402FS2	●			▲				●							12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120402GS2	●			▲											12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404GS2	●		●	▲			●				●	▲	▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GS2	●		●	▲			●				●	▲	▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GS2	●		●	▲			●				●	▲	▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120402GA2		●			▲				●						12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404GA2		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GA2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GA2		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404GH2	●	●		▲	▲	●									12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GH2	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GH2	●	●		▲	▲	●									12.7	4.76	1.2	2.2	5.16	EPSR 80° RE D1 IC S
	NEW	NP-CNGA120404VA2		●													12.7	4.76	0.4	1.8	5.16	
	NEW	NP-CNGA120408VA2		●													12.7	4.76	0.8	2.0	5.16	
	NEW	NP-CNGA120412VA2		●													12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TS2	●			▲							●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TS2	●			▲							●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TS2	●			▲							●				12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TA2		●			▲	●			●	●			▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TA2		●			▲	●			●	●			▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TA2		●			▲	●			●	●			▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TH2					▲	●				●					12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TH2		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TH2		●			▲	●				●					12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404SF2											●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408SF2											●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412SF2											●				12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404SE2											●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408SE2											●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412SE2											●				12.7	4.76	1.2	2.2	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

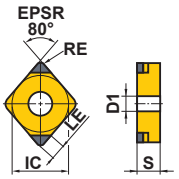
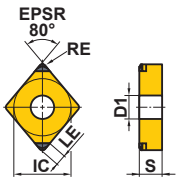
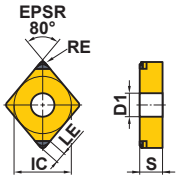
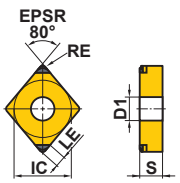
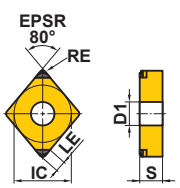
● = NEW

80° CN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT (With Wiper) *	NP-CNGA120404FSWS2	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FSWS2	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FSWS2	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404FBWL2			●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FBWL2			●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FBWL2			●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GSWS2	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GSWS2	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GSWS2	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GAWS2		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GAWS2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GAWS2		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GBWL2			●	▲	▲				●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GBWL2			●	▲	▲				●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GBWL2			●	▲	▲				●						12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT  (With Breaker)	BF-CNGM120404TS2	●			▲											12.7	4.76	0.4	1.8	5.16	
	BF-CNGM120408TS2	●			▲											12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TS2	●			▲											12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT (With Wiper) * NEW  (With Breaker)	BF-CNGM120408TSWS2	●														12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TSWS2	●														12.7	4.76	1.2	2.2	5.16	
	BF-CNGM120408TAWS2		●													12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TAWS2		●													12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT  (With Breaker)	BM-CNGM120404TA2		●			▲										12.7	4.76	0.4	1.8	5.16	
	BM-CNGM120408TA2		●			▲										12.7	4.76	0.8	2.0	5.16	
	BM-CNGM120412TA2		●			▲										12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT NEW  (With Breaker)	BR-CNGM120404TA2		●													12.7	4.76	0.4	1.8	5.16	
	BR-CNGM120408TA2		●													12.7	4.76	0.8	2.0	5.16	
	BR-CNGM120412TA2		●													12.7	4.76	1.2	2.2	5.16	

* Please refer to B012 before using the wiper insert.

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠										
	K	Cast Iron							●				◐	●	◐	✠						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-CNMA120404GS												▲	▲		12.7	4.76	0.4	1.8	5.16	EPSR 80° LE RE D1 IC S
		NP-CNMA120408GS												▲	▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412GS												▲	▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNMA120404F												▲			12.7	4.76	0.4	1.8	5.16	
		NP-CNMA120408F												▲			12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412F												▲			12.7	4.76	1.2	2.2	5.16	
		NP-CNMA120404T													▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNMA120408T													▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412T													▲		12.7	4.76	1.2	2.2	5.16	
		CNMA120404												▲	▲		12.7	4.76	0.4	3.6	5.16	EPSR 80° LE RE D1 IC S
		CNMA120408												▲	▲		12.7	4.76	0.8	3.6	5.16	
		CNMA120412												▲	▲		12.7	4.76	1.2	3.6	5.16	
		CNGA120408														●	12.7	4.76	0.8	—	5.16	EPSR 80° RE D1 IC S
		CNGA120412														●	12.7	4.76	1.2	—	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

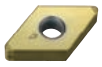
55° DN TYPE INSERTS WITH HOLE

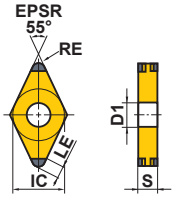
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DNGA150404FS4	●		●	▲	▲			●							12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408FS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412FS4	●		●	▲	▲			●							12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604FS4	●		●	▲				●							12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608FS4	●		●	▲				●							12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612FS4	●		●	▲				●							12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GS4	●		●	▲											12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GS4	●		●	▲											12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GS4	●		●	▲											12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GS4	●		●	▲											12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GS4	●		●	▲											12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GA4		●			▲	●			●						12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GA4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GA4		●			▲	●			●						12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GA4		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GA4		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GA4		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GH4	●	●		▲	▲	●									12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GH4	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GH4	●	●		▲	▲	●									12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GH4	●	●		▲	▲	●									12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GH4	●	●		▲	▲	●									12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GH4	●	●		▲	▲	●									12.7	6.35	1.2	1.8	5.16	
	NEW NP-DNGA150404VA4		●													12.7	4.76	0.4	2.1	5.16	
	NEW NP-DNGA150408VA4		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-DNGA150412VA4		●													12.7	4.76	1.2	1.8	5.16	
	NEW NP-DNGA150604VA4		●													12.7	6.35	0.4	2.1	5.16	
	NEW NP-DNGA150608VA4		●													12.7	6.35	0.8	2.0	5.16	
	NEW NP-DNGA150612VA4		●													12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TS4	●			▲											12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TS4	●			▲											12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TS4	●			▲											12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TS4	●			▲											12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TS4	●			▲											12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TS4	●			▲											12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TA4		●			▲	●			●	●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TA4		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TA4		●			▲	●			●	●					12.7	4.76	1.2	1.8	5.16	





● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-DNGA150604TA4		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608TA4		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612TA4		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150404TH4					▲	●				●					12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408TH4		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412TH4		●			▲	●				●					12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604TH4					▲	●									12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608TH4		●			▲	●									12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612TH4		●			▲	●									12.7	6.35	1.2	1.8	5.16	
NEW PETIT CUT		NP-DNGA150402FS2	●			▲				●							12.7	4.76	0.2	2.2	5.16	
		NP-DNGA150404FS2	●		●	▲	▲		●	●			●				12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408FS2	●		●	▲	▲		●	●			●				12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412FS2	●		●	▲	▲			●			●				12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604FS2	●		●	▲	▲		●	●			●				12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608FS2	●		●	▲	▲		●	●			●				12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612FS2	●		●	▲	▲			●			●				12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150402GS2	●			▲											12.7	4.76	0.2	2.2	5.16	
	*	NP-DNGA150404GS2	●		●	▲			●				●				12.7	4.76	0.4	2.1	5.16	
	*	NP-DNGA150404GS2												▲	▲		12.7	4.76	0.4	1.5	5.16	
	*	NP-DNGA150408GS2	●		●	▲			●				●				12.7	4.76	0.8	2.0	5.16	
	*	NP-DNGA150408GS2												▲	▲		12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150412GS2	●		●	▲							●	▲	▲		12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604GS2	●		●	▲							●				12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GS2	●		●	▲			●				●				12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GS2	●		●	▲							●				12.7	6.35	1.2	1.8	5.16	
		NP-DNGA110408GA2		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
		NP-DNGA150402GA2		●			▲										12.7	4.76	0.2	2.2	5.16	
		NP-DNGA150404GA2		●			▲	●			●						12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408GA2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412GA2		●			▲	●			●						12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150602GA2					▲										12.7	6.35	0.2	2.2	5.16	
		NP-DNGA150604GA2		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GA2		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GA2		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150404GH2	●	●		▲	▲	●									12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408GH2	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412GH2	●	●		▲	▲	●									12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604GH2	●	●		▲	▲	●									12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GH2	●	●		▲	▲	●									12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GH2	●	●		▲	▲	●									12.7	6.35	1.2	1.8	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

EPSR 55° RE LE IC D1 S

✱ Please note that LE dimensions vary by grade.

● = NEW

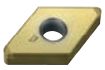
55° DN TYPE INSERTS WITH HOLE

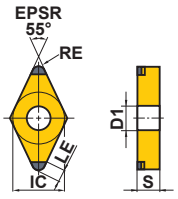
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NEW NP-DNGA150404VA2		●													12.7	4.76	0.4	2.1	5.16	
	NEW NP-DNGA150408VA2		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-DNGA150412VA2		●													12.7	4.76	1.2	1.8	5.16	
	NEW NP-DNGA150604VA2		●													12.7	6.35	0.4	2.1	5.16	
	NEW NP-DNGA150608VA2		●													12.7	6.35	0.8	2.0	5.16	
	NEW NP-DNGA150612VA2		●													12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TS2	●			▲							●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TS2	●			▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TS2	●			▲							●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TS2	●			▲							●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TS2	●			▲							●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TS2	●			▲							●				12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TA2		●			▲	●			●	●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TA2		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TA2		●			▲	●			●	●					12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TA2		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TA2		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TA2		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TH2					▲	●				●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TH2		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TH2		●			▲	●				●					12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TH2					▲	●									12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TH2		●			▲	●									12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TH2		●			▲	●									12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404SF2											●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408SF2											●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412SF2											●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604SF2											●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608SF2											●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612SF2											●				12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404SE2											●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408SE2											●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412SE2											●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604SE2											●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608SE2											●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612SE2											●				12.7	6.35	1.2	1.8	5.16	





● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✻		●	◐	✻										
	K	Cast Iron							●				◐	●	◐	✻						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT (With Wiper) *		NP-DNGA150404GSWS2JR	●														12.7	4.76	0.4	1.8	5.16	EPSR 55° RE LE IC D1 S
		NP-DNGA150404GSWS2JL	●														12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150408GSWS2JR	●														12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150408GSWS2JL	●														12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150604GSWS2JR	●														12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150604GSWS2JL	●														12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150608GSWS2JR	●														12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150608GSWS2JL	●														12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150404GAWS2JR		●		▲				●							12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150404GAWS2JL		●		▲				●							12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150408GAWS2JR		●		▲				●							12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150408GAWS2JL		●		▲				●							12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150604GAWS2JR		●		▲				●							12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150604GAWS2JL		●		▲				●							12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150608GAWS2JR		●		▲				●							12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150608GAWS2JL		●		▲				●							12.7	6.35	0.8	1.7	5.16	Right hand insert shown.
NEW PETIT CUT (With Breaker)		BF-DNGM150404TS2	●			▲											12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
		BF-DNGM150408TS2	●			▲											12.7	4.76	0.8	2.0	5.16	
		BF-DNGM150412TS2	●			▲											12.7	4.76	1.2	1.8	5.16	
NEW PETIT CUT (With Wiper) * NEW (With Breaker)		BF-DNGM150408TSWS2	●														12.7	4.76	0.8	2.4	5.16	EPSR 55° RE LE IC D1 S
		BF-DNGM150412TSWS2	●														12.7	4.76	1.2	2.6	5.16	
		BF-DNGM150408TAWS2		●													12.7	4.76	0.8	2.4	5.16	
		BF-DNGM150412TAWS2		●													12.7	4.76	1.2	2.6	5.16	
NEW PETIT CUT (With Breaker)		BM-DNGM150404TA2		●			▲										12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
		BM-DNGM150408TA2		●			▲										12.7	4.76	0.8	2.0	5.16	
		BM-DNGM150412TA2		●			▲										12.7	4.76	1.2	1.8	5.16	
		BM-DNGM150604TA2					▲										12.7	6.35	0.4	2.1	5.16	
		BM-DNGM150608TA2					▲										12.7	6.35	0.8	2.0	5.16	
		BM-DNGM150612TA2					▲										12.7	6.35	1.2	1.8	5.16	
NEW PETIT CUT NEW (With Breaker)		BR-DNGM150404TA2		●													12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
		BR-DNGM150408TA2		●													12.7	4.76	0.8	2.0	5.16	
		BR-DNGM150412TA2		●													12.7	4.76	1.2	1.8	5.16	
		BR-DNGM150604TA2		●													12.7	6.35	0.4	2.1	5.16	
		BR-DNGM150608TA2		●													12.7	6.35	0.8	2.0	5.16	
		BR-DNGM150612TA2		●													12.7	6.35	1.2	1.8	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✻ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

* Please refer to B012 before using the wiper insert.

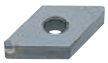
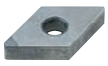
● = NEW

55° DN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN							Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DNMA150404GS												▲	▲		12.7	4.76	0.4	1.5	5.16	EPSR 55° RE LE D1 IC S
	NP-DNMA150408GS												▲	▲		12.7	4.76	0.8	1.7	5.16	
	NP-DNMA150404F												▲			12.7	4.76	0.4	1.5	5.16	
	NP-DNMA150408F												▲			12.7	4.76	0.8	1.7	5.16	
	NP-DNMA150404T													▲		12.7	4.76	0.4	1.5	5.16	
	NP-DNMA150408T													▲		12.7	4.76	0.8	1.7	5.16	
	DNGA150404												□	□		12.7	4.76	0.4	3.5	5.16	EPSR 55° RE LE D1 IC S
	DNGA150408												□	□		12.7	4.76	0.8	3.1	5.16	
	DNGA150412												□	□		12.7	4.76	1.2	2.7	5.16	

● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

90° SN TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
Shape	Order Number																					
NEW PETIT CUT	NP-SNGA120404FS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408FS2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412FS2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404GS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408GS2								●				●	▲	▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412GS2												●	▲	▲		12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120408GA2		●				▲	●			●						12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412GA2		●				▲	●			●						12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404TS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408TS2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412TS2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404SF2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408SF2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412SF2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404SE2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408SE2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412SE2												●				12.7	4.76	1.2	2.5	5.16	
NEW PETIT CUT	NP-SNMA120404GS													▲	▲		12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408GS													▲	▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120404F													▲			12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408F													▲			12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120412F													▲			12.7	4.76	1.2	2.5	5.16	
	NP-SNMA120404T														▲		12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408T														▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120412T														▲		12.7	4.76	1.2	2.5	5.16	
	SNGA120404													□	□		12.7	4.76	0.4	4.0	5.16	
	SNGA120408													▲	▲		12.7	4.76	0.8	4.1	5.16	
	SNGA120412													▲	▲		12.7	4.76	1.2	4.0	5.16	
	SNGA120408															●	12.7	4.76	0.8	—	5.16	
	SNGA120412															●	12.7	4.76	1.2	—	5.16	

Workpiece Material

H	Hardened Materials	● ◐ ● ● ◐ ✱ ● ● ◐ ✱ ◐ ● ◐ ✱
K	Cast Iron	◐ ● ◐ ✱
S	Heat Resistant Alloy, Titanium Alloy	●
	Sintered Alloy	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

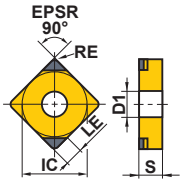
Honing (Last letter of order number) : Refer to page B009.

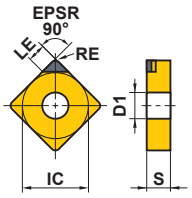


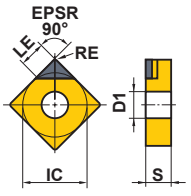


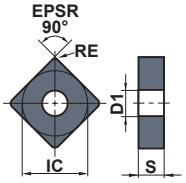












● = NEW

60° TN TYPE INSERTS WITH HOLE

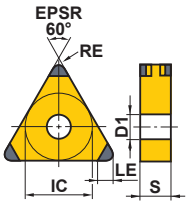
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

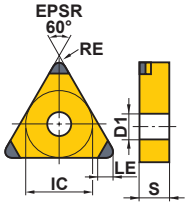
Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TNGA160404FS6	●		●	▲	▲			●							9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408FS6	●		●	▲	▲			●							9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412FS6	●		●	▲	▲			●							9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GS6	●		●	▲											9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GS6	●		●	▲											9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GS6	●		●	▲											9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GA6		●			▲	●			●						9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GA6		●			▲	●			●						9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GA6		●			▲	●			●						9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GH6		●		▲	▲	●									9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GH6		●		▲	▲	●									9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GH6		●		▲	▲	●									9.525	4.76	1.2	1.9	3.81	
	NEW NP-TNGA160404VA6		●													9.525	4.76	0.4	1.6	3.81	
	NEW NP-TNGA160408VA6		●													9.525	4.76	0.8	1.7	3.81	
	NEW NP-TNGA160412VA6		●													9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TS6	●			▲											9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TS6	●			▲											9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TS6	●			▲											9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TA6		●			▲	●			●	●					9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TA6		●			▲	●			●	●					9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TA6		●			▲	●			●	●					9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TH6					▲	●				●					9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TH6		●			▲	●				●					9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TH6		●			▲	●				●					9.525	4.76	1.2	1.9	3.81	
NEW PETIT CUT	NP-TNGA160402FS3	●			▲				●							9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404FS3	●		●	▲	▲		●	●			●				9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408FS3	●		●	▲	▲		●	●			●				9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412FS3	●		●	▲	▲		●	●			●				9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402GS3	●			▲											9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GS3	●		●	▲			●				●				9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GS3	●		●	▲			●				●	▲	▲		9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GS3	●		●	▲			●				●	▲	▲		9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402GA3		●			▲				●						9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GA3		●			▲	●			●						9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GA3		●			▲	●			●						9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GA3		●			▲	●			●						9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GH3		●		▲	▲	●									9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GH3		●		▲	▲	●									9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GH3		●		▲	▲	●									9.525	4.76	1.2	1.9	3.81	









● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
	K	Cast Iron							●				◐	●	◐	✲						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									

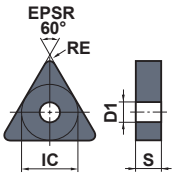
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

NEW PETIT CUT	NEW	NP-TNGA160404VA3		●													9.525	4.76	0.4	1.6	3.81	EPSR 60° RE D1 LE IC S
	NEW	NP-TNGA160408VA3		●													9.525	4.76	0.8	1.7	3.81	
	NEW	NP-TNGA160412VA3		●													9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TS3	●			▲							●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TS3	●			▲							●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TS3	●			▲							●				9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TA3		●			▲	●			●	●					9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TA3		●			▲	●			●	●					9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TA3		●			▲	●			●	●					9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TH3					▲	●				●					9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TH3		●			▲	●				●					9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TH3		●			▲	●				●					9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404SF3											●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408SF3											●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412SF3											●				9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404SE3											●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408SE3											●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412SE3											●				9.525	4.76	1.2	1.9	3.81	
NEW PETIT CUT		BM-TNGM160408TA3					▲										9.525	4.76	0.8	1.7	3.81	EPSR 60° RE D1 LE IC S
		BM-TNGM160412TA3					▲										9.525	4.76	1.2	1.9	3.81	
(With Breaker)																						
NEW PETIT CUT		NP-TNMA160404GS												▲	▲		9.525	4.76	0.4	1.6	3.81	EPSR 60° LE RE D1 IC S
		NP-TNMA160408GS												▲	▲		9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412GS												▲	▲		9.525	4.76	1.2	1.9	3.81	
		NP-TNMA160404F												▲			9.525	4.76	0.4	1.6	3.81	
		NP-TNMA160408F												▲			9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412F												□			9.525	4.76	1.2	1.9	3.81	
		NP-TNMA160404T													▲		9.525	4.76	0.4	1.6	3.81	
		NP-TNMA160408T													▲		9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412T													□		9.525	4.76	1.2	1.9	3.81	
		TNGA160404												▲	▲		9.525	4.76	0.4	3.6	3.81	EPSR 60° LE RE D1 IC S
		TNGA160408												▲	▲		9.525	4.76	0.8	3.3	3.81	
		TNGA220404												▲	□		12.7	4.76	0.4	3.6	5.16	
		TNGA220408												▲	□		12.7	4.76	0.8	3.3	5.16	
		TNGA220412												▲	□		12.7	4.76	1.2	3.0	5.16	

● = NEW

60° TN TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
	K	Cast Iron							●				◐	●	◐	✲						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
Shape	Order Number																					
	TNGA160408															●	9.525	4.76	0.8	—	3.81	
	TNGA160412															●	9.525	4.76	1.2	—	3.81	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

35° VN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱				
	K	Cast Iron							●				◐	●	◐	✱
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

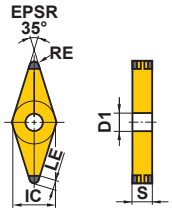
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

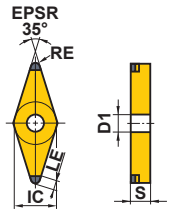
Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VNGA160404FS4	●		●	▲	▲			●							9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408FS4	●		●	▲	▲			●							9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412FS4					▲										9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GS4	●		●	▲											9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GS4	●		●	▲											9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GS4	●			▲											9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GA4		●			▲	●			●						9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GA4		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GA4		●			▲	●			●						9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GH4		●		▲	▲	●									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GH4		●		▲	▲	●									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GH4				▲	▲	●									9.525	4.76	1.2	1.5	3.81	
	NEW NP-VNGA160404VA4		●													9.525	4.76	0.4	2.5	3.81	
	NEW NP-VNGA160408VA4		●													9.525	4.76	0.8	2.0	3.81	
	NEW NP-VNGA160412VA4		●													9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TS4	●			▲											9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TS4	●			▲											9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404TA4		●			▲	●			●						9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TA4		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TA4					▲	●			●						9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TH4		●			▲	●									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TH4		●			▲	●									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TH4					▲	●									9.525	4.76	1.2	1.5	3.81	
NEW PETIT CUT	NP-VNGA160402FS2	●			▲				●							9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404FS2	●		●	▲	▲		●	●			●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408FS2	●		●	▲	▲		●	●			●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412FS2					▲										9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160402GS2	●			▲											9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404GS2	●		●	▲			●				●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GS2	●		●	▲			●				●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GS2	●			▲											9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160402GA2		●			▲				●						9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404GA2		●			▲	●			●						9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GA2		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GA2		●			▲	●			●						9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GH2		●		▲	▲	●									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GH2		●		▲	▲	●									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GH2				▲	▲	●									9.525	4.76	1.2	1.5	3.81	
	NEW NP-VNGA160404VA2		●													9.525	4.76	0.4	2.5	3.81	
	NEW NP-VNGA160408VA2		●													9.525	4.76	0.8	2.0	3.81	
	NEW NP-VNGA160412VA2		●													9.525	4.76	1.2	1.5	3.81	









● = NEW

35° VN TYPE INSERTS WITH HOLE

Workpiece Material		
H	Hardened Materials	● ◐ ● ● ◐ ✱ ● ● ◐ ✱ ◐ ● ◐ ✱
K	Cast Iron	● ◐ ✱ ◐ ● ◐ ✱
S	Heat Resistant Alloy, Titanium Alloy	●
	Sintered Alloy	◐

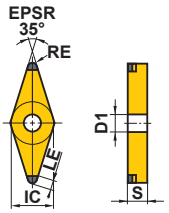
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

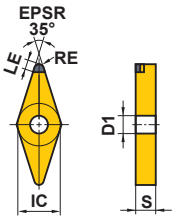
Honing (Last letter of order number) : Refer to page B009.

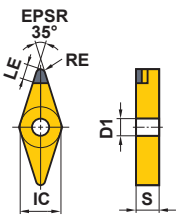
Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VNGA160404TS2	●			▲							●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TS2	●			▲							●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404TA2		●			▲	●			●						9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TA2		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TA2					▲	●			●						9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TH2		●			▲	●									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TH2		●			▲	●									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TH2					▲	●									9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404SF2											●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408SF2											●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404SE2											●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408SE2											●				9.525	4.76	0.8	2.0	3.81	
NEW PETIT CUT	NP-VNMA160404GS												▲	▲		9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408GS												▲	▲		9.525	4.76	0.8	1.4	3.81	
	NP-VNMA160404F												▲			9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408F												▲			9.525	4.76	0.8	1.4	3.81	
	NP-VNMA160404T													▲		9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408T													▲		9.525	4.76	0.8	1.4	3.81	
	VNGA160404												□	□		9.525	4.76	0.4	2.8	3.81	
	VNGA160408												□	□		9.525	4.76	0.8	1.9	3.81	











● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° WN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱				
	K	Cast Iron							●				◐	●	◐	✱
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-WNGA080408FS6	●		●	▲											12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S
	NP-WNGA080408GS6	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TS6	●			▲											12.7	4.76	0.8	2.0	5.16	
NEW PETIT CUT	NP-WNGA080408FS3	●		●	▲	▲						●				12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S
	NP-WNGA080408GS3	●		●	▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408GA3		●			▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408GH3				▲	▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TS3	●			▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TA3		●			▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TH3					▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408SF3											●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408SE3											●				12.7	4.76	0.8	2.0	5.16	
NEW PETIT CUT (With Wiper) *	NP-WNGA080408GSWS3	●			▲											12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S

* Please refer to B012 before using the wiper insert.

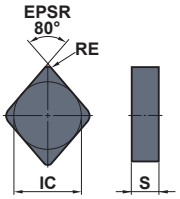
● = NEW

CBN TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220 NEW	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

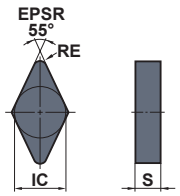
Shape	Order Number	IC	S	RE	LE	Geometry
	CNGN120404	12.7	4.76	0.4	—	
	CNGN120408	12.7	4.76	0.8	—	
	CNGN120412	12.7	4.76	1.2	—	

● = NEW

55° DN TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220 NEW	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

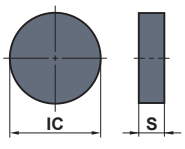
Shape	Order Number	IC	S	RE	LE	Geometry
	DNGN110308	9.525	3.18	0.8	—	
	DNGN110312	9.525	3.18	1.2	—	

● = NEW

RN TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220 NEW	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Shape	Order Number	IC	S	LE	RE	Geometry
	RNGN090300	9.525	3.18	—	—	
	RNGN120300	12.7	3.18	—	—	
	RNGN120400	12.7	4.76	—	—	

● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

90° SN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲									
	K	Cast Iron							●				◐	●	◐	✲					
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
		SNGN090304												□	□		9.525	3.18	0.4	4.0	
		SNGN090308												□	□		9.525	3.18	0.8	4.1	
		SNGN120404												□	□		12.7	4.76	0.4	4.0	
		SNGN120408												▲	□		12.7	4.76	0.8	4.1	
		SNGN120412												▲	□		12.7	4.76	1.2	4.0	
		SNGN090308														●	9.525	3.18	0.8	—	
		SNGN090312														●	9.525	3.18	1.2	—	
		SNGN090316														●	9.525	3.18	1.6	—	
		SNGN090408														●	9.525	4.76	0.8	—	
		SNGN090412														●	9.525	4.76	1.2	—	
		SNGN120408														●	12.7	4.76	0.8	—	
		SNGN120412														●	12.7	4.76	1.2	—	
		SNGN120416														●	12.7	4.76	1.6	—	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

● = NEW

60° TN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲									
	K	Cast Iron							●				◐	●	◐	✲					
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
		TNGN160404												▲	□		9.525	4.76	0.4	3.6	
		TNGN160408												▲	□		9.525	4.76	0.8	3.3	
		TNGN160408														●	9.525	4.76	0.8	—	
		TNGN160412														●	9.525	4.76	1.2	—	
		TNGN160416														●	9.525	4.76	1.6	—	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

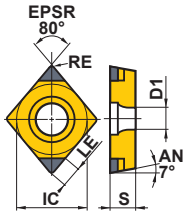
● = NEW

80° CC TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✲: Unstable Cutting Honing (Last letter of order number) : Refer to page B009.
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CCGW060202FS2	●			▲			●	●			●			6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204FS2	●			▲			●	●			●			6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208FS2	●			▲				●			●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302FS2	●		●	▲				●			●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202FA2												▲	▲	6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204FA2												▲	▲	6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208FA2												▲	▲	6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T304FA2												▲	▲	9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308FA2												▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202GS2	●		●	▲			●				●	▲	▲	6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204GS2	●		●	▲							●	▲	▲	6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208GS2	●		●	▲							●	▲	▲	6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302GS2	●		●	▲							●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202GA2		●			▲			●						6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204GA2		●			▲	●		●						6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208GA2		●			▲	●		●						6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302GA2		●			▲			●						9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304GA2		●			▲	●		●						9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GA2		●			▲	●		●						9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304GH2				▲	▲	●								9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GH2				▲	▲	●								9.525	3.97	0.8	2.0	4.4	
NEW	NP-CCGW09T304VA2		●												9.525	3.97	0.4	1.8	4.4	
NEW	NP-CCGW09T308VA2		●												9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060208TS2											●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T308TS2											●			9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060204TA2						●			●					6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208TA2						●			●					6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T304TA2		●			▲	●			●	●				9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308TA2		●			▲	●			●	●				9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304TH2					▲	●				●				9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308TH2					▲	●				●				9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202SF2											●			6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204SF2											●			6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208SF2											●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302SF2											●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304SF2											●			9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308SF2											●			9.525	3.97	0.8	2.0	4.4	





● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲									
	K	Cast Iron							●				◐	●	◐						
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
Shape		Order Number	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT		NP-CCGW060202SE2											●			6.35	2.38	0.2	1.7	2.8	EPSR 80° RE D1 LE AN 7° IC S
		NP-CCGW060204SE2											●			6.35	2.38	0.4	1.8	2.8	
		NP-CCGW060208SE2											●			6.35	2.38	0.8	2.0	2.8	
		NP-CCGW09T302SE2											●			9.525	3.97	0.2	1.7	4.4	
		NP-CCGW09T304SE2											●			9.525	3.97	0.4	1.8	4.4	
		NP-CCGW09T308SE2											●			9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Wiper) *1		NP-CCGW09T304FSWS2	●		●	▲	▲			●						9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
		NP-CCGW09T308FSWS2	●		●	▲	▲			●						9.525	3.97	0.8	2.0	4.4	
		NP-CCGW09T304FBWL2			●	▲	▲			●						9.525	3.97	0.4	1.8	4.4	
		NP-CCGW09T308FBWL2			●	▲	▲			●						9.525	3.97	0.8	2.0	4.4	
		NP-CCGW09T304GSWS2	●		●	▲										9.525	3.97	0.4	1.8	4.4	
		NP-CCGW09T308GSWS2	●		●	▲										9.525	3.97	0.8	2.0	4.4	
		NP-CCGW09T304GAWS2		●			▲	●			●					9.525	3.97	0.4	1.8	4.4	
		NP-CCGW09T308GAWS2		●			▲	●			●					9.525	3.97	0.8	2.0	4.4	
		NP-CCGW09T304GBWL2			●	▲	▲				●					9.525	3.97	0.4	1.8	4.4	
		NP-CCGW09T308GBWL2			●	▲	▲				●					9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Breaker)		BF-CCGT09T304TS2	●			▲										9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
		BF-CCGT09T308TS2	●			▲										9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Breaker)		BM-CCGT09T304TA2		●			▲									9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
		BM-CCGT09T308TA2		●			▲									9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT	*2	NP-CCGW03S102FS	●			▲				●						3.57	1.39	0.2	1.1	2.0	EPSR 80° LE RE D1 AN 7° IC S
	*2	NP-CCGW03S104FS	●			▲				●						3.57	1.39	0.4	1.0	2.0	
	*2	NP-CCGW04T002FS	●			▲				●						4.37	1.79	0.2	1.5	2.4	
	*2	NP-CCGW04T004FS	●			▲				●						4.37	1.79	0.4	1.4	2.4	
	*2	NP-CCGW03S102GS			●											3.57	1.39	0.2	1.1	2.0	
	*2	NP-CCGW03S104GS			●											3.57	1.39	0.4	1.0	2.0	
	*2	NP-CCGW04T002GS			●											4.37	1.79	0.2	1.5	2.4	
	*2	NP-CCGW04T004GS			●											4.37	1.79	0.4	1.4	2.4	
		NP-CCGW09T302GS												▲	▲	9.525	3.97	0.2	1.7	4.4	
		NP-CCGW09T304GS												▲	▲	9.525	3.97	0.4	1.8	4.4	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

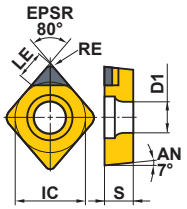
Honing (Last letter of order number) : Refer to page B009.

*1 Please refer to B012 before using the wiper insert.
*2 Diameter of inscribed circle is special. (For SCLC type)

● = NEW

80° CC TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting Honing (Last letter of order number) : Refer to page B009.
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠				
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	IC	S	RE	LE	D1	Geometry
	CCMW060202	6.35	2.38	0.2	2.8	2.8	
	CCMW060204	6.35	2.38	0.4	2.7	2.8	
	CCMW09T302	9.525	3.97	0.2	3.7	4.4	
	CCMW09T304	9.525	3.97	0.4	3.6	4.4	
	CCMW09T308	9.525	3.97	0.8	3.6	4.4	
	CCMW120404	12.7	4.76	0.4	3.6	5.5	
	CCMW120408	12.7	4.76	0.8	3.6	5.5	
	CCMW120412	12.7	4.76	1.2	3.6	5.5	

● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° CP TYPE INSERTS WITH HOLE

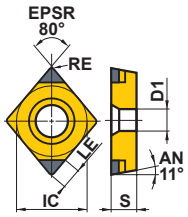
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-CPGB080202FS2	7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204FS2	7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208FS2	7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302FS2	9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304FS2	9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308FS2	9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312FS2	9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080204GS2	7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GS2	7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302GS2	9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GS2	9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GS2	9.525	3.18	0.8	2.0	4.5	
	NP-CPGB080204GA2	7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GA2	7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212GA2	7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090302GA2	9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GA2	9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GA2	9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312GA2	9.525	3.18	1.2	2.2	4.5	
	NEW NP-CPGB090304VA2	9.525	3.18	0.4	1.8	4.5	
	NEW NP-CPGB090308VA2	9.525	3.18	0.8	2.0	4.5	
	NEW NP-CPGB090312VA2	9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080204TA2	7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208TA2	7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212TA2	7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090304TA2	9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308TA2	9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312TA2	9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080202SE2	7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204SE2	7.94	2.38	0.4	1.8	3.5	
	NP-CPGB090302SE2	9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304SE2	9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308SE2	9.525	3.18	0.8	2.0	4.5	





● = NEW

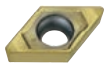
55° DC TYPE INSERTS WITH HOLE

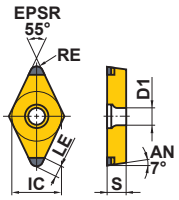
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DCGW070202FS2	●			▲				●						6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204FS2	●			▲	▲		●	●			●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208FS2	●			▲				●			●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302FS2	●		●	▲				●			●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304FS2	●		●	▲	▲			●			●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304FA2												▲	▲	9.525	3.97	0.4	1.5	4.4	
	NP-DCGW11T308FA2												▲	▲	9.525	3.97	0.8	1.7	4.4	
	NP-DCGW070202GS2	●		●	▲										6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204GS2	●		●	▲			●				●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208GS2	●		●	▲							●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302GS2	●		●	▲							●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070202GA2		●			▲				●					6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204GA2		●			▲	●			●					6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208GA2		●				●								6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302GA2		●			▲				●					9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304GA2		●			▲	●			●					9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GA2		●			▲	●			●					9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304GH2				▲	▲	●								9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GH2				▲	▲	●								9.525	3.97	0.8	2.0	4.4	
NEW	NP-DCGW11T304VA2		●												9.525	3.97	0.4	2.1	4.4	
NEW	NP-DCGW11T308VA2		●												9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204TA2					▲	●			●	●				6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208TA2						●				●				6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T304TA2		●			▲	●			●	●				9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308TA2		●			▲	●			●	●				9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304TH2					▲	●				●				9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308TH2					▲	●				●				9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204SF2											●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208SF2											●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302SF2											●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304SF2											●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308SF2											●			9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204SE2											●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208SE2											●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302SE2											●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304SE2											●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308SE2											●			9.525	3.97	0.8	2.0	4.4	





● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠									
	K	Cast Iron							●				◐	●	◐						
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
NEW PETIT CUT		BF-DCGT11T304TS2	●			▲										9.525	3.97	0.4	2.1	4.4	EPSR 55° RE LE IC D1 AN 7° S
		BF-DCGT11T308TS2	●			▲										9.525	3.97	0.8	2.0	4.4	
(With Breaker)																					
NEW PETIT CUT		BM-DCGT11T304TA2		●			▲									9.525	3.97	0.4	2.1	4.4	EPSR 55° RE LE IC D1 AN 7° S
		BM-DCGT11T308TA2		●			▲									9.525	3.97	0.8	2.0	4.4	
(With Breaker)																					
NEW PETIT CUT		NP-DCGW11T302GS												▲	▲	9.525	3.97	0.2	1.4	4.4	EPSR 55° LE RE IC D1 AN 7° S
		NP-DCGW11T304GS												▲	▲	9.525	3.97	0.4	1.5	4.4	
		DCMW070202												□	□	6.35	2.38	0.2	2.7	2.8	EPSR 55° LE RE IC D1 AN 7° S
		DCMW070204												□	□	6.35	2.38	0.4	2.5	2.8	
		DCMW11T302												□	□	9.525	3.97	0.2	3.7	4.4	
		DCMW11T304												□	□	9.525	3.97	0.4	3.4	4.4	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
SMALL TOOLS ➤ D011, D026
GRADES ➤ B006
IDENTIFICATION ➤ B002

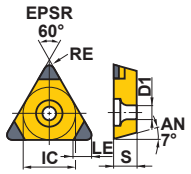
60° TC TYPE INSERTS WITH HOLE

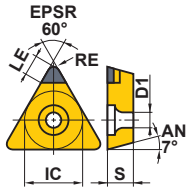
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TCGW110204FS3							●				●			6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208FS3							●				●			6.35	2.38	0.8	1.7	2.8	
	NP-TCGW110204FA3												▲	▲	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208FA3												▲	▲	6.35	2.38	0.8	1.7	2.8	
	NP-TCGW090204GS3				▲			●							5.56	2.38	0.4	1.6	2.5	
	NP-TCGW090208GS3				▲										5.56	2.38	0.8	1.7	2.5	
	NP-TCGW110202GS3				▲										6.35	2.38	0.2	1.5	2.8	
	NP-TCGW110204GS3				▲							●			6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208GS3				▲			●				●			6.35	2.38	0.8	1.7	2.8	
	NP-TCGW130304GS3				▲										7.94	3.18	0.4	1.6	3.4	
	NP-TCGW130308GS3				▲										7.94	3.18	0.8	1.7	3.4	
	NP-TCGW16T304GS3				▲										9.525	3.97	0.4	1.6	4.4	
	NP-TCGW16T308GS3				▲										9.525	3.97	0.8	1.7	4.4	
	NP-TCGW110204SF3											●			6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208SF3											●			6.35	2.38	0.8	1.7	2.8	
	NP-TCGW110204SE3											●			6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208SE3											●			6.35	2.38	0.8	1.7	2.8	
	TCMW110202												□	□	6.35	2.38	0.2	2.7	2.8	
	TCMW110204												□	□	6.35	2.38	0.4	2.6	2.8	





● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

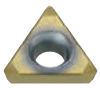
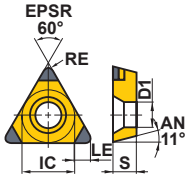
□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

60° TP TYPE INSERTS WITH HOLE

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TPGB090202FS3											●			5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204FS3							●				●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302FS3	●		●	▲				●			●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304FS3	●		●	▲	▲		●	●			●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308FS3	●		●	▲	▲		●	●			●			6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304FS3					▲									9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308FS3					▲									9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204GS3	●		●	▲			●							4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208GS3	●		●	▲										4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090202GS3											●			5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204GS3	●		●	▲							●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GS3	●		●	▲										5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GS3	●		●	▲							●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GS3	●		●	▲			●				●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GS3	●		●	▲			●				●			6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GS3	●		●	▲										9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GS3	●		●	▲										9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204GA3						●								4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208GA3						●								4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204GA3		●			▲	●			●					5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GA3		●			▲	●			●					5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GA3		●			▲				●					6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GA3		●			▲	●			●					6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GA3		●			▲	●			●					6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GA3		●			▲	●			●					9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GA3		●			▲	●			●					9.525	3.18	0.8	1.7	4.4	
	NP-TPGB160304GH3				▲	▲	●								9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GH3				▲	▲	●								9.525	3.18	0.8	1.7	4.4	
	NEW NP-TPGB110304VA3		●												6.35	3.18	0.4	1.6	3.4	
	NEW NP-TPGB110308VA3		●												6.35	3.18	0.8	1.7	3.4	
	NP-TPGB080204TA3						●				●				4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208TA3						●				●				4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204TA3						●				●				5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208TA3						●				●				5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110304TA3		●			▲	●			●	●				6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308TA3		●			▲	●			●	●				6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304TA3					▲	●			●	●				9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308TA3					▲	●			●	●				9.525	3.18	0.8	1.7	4.4	
	NP-TPGB160304TH3					▲	●				●				9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308TH3					▲	●				●				9.525	3.18	0.8	1.7	4.4	

● = NEW

60° TP TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✠: Unstable Cutting Honing (Last letter of order number) : Refer to page B009.
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠				
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TPGB090202SF3											●			5.56	2.38	0.2	1.5	2.9	EPSR 60° RE D1 AN 11° LE IC S
	NP-TPGB090204SF3											●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302SF3											●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304SF3											●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308SF3											●			6.35	3.18	0.8	1.7	3.4	
	NP-TPGB090202SE3											●			5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204SE3											●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302SE3											●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304SE3											●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308SE3											●			6.35	3.18	0.8	1.7	3.4	
NEW PETIT CUT	NP-TPGX110304F												▲		6.35	3.18	0.4	1.6	3.5	EPSR 60° LE RE D1 AN 11° IC S
	NP-TPGX110308F												▲		6.35	3.18	0.8	1.7	3.5	
	NP-TPGX110304T													▲	6.35	3.18	0.4	1.6	3.5	
	NP-TPGX110308T													▲	6.35	3.18	0.8	1.7	3.5	
	TPGX080202												▲	▲	4.76	2.38	0.2	1.8	2.5	EPSR 60° LE RE D1 AN 11° IC S
	TPGX080204												▲	▲	4.76	2.38	0.4	1.7	2.5	
	TPGX080208												□	□	4.76	2.38	0.8	1.4	2.5	
	TPGX090202												▲	▲	5.56	2.38	0.2	2.7	3.0	
	TPGX090204												▲	▲	5.56	2.38	0.4	2.6	3.0	
	TPGX090208												□	□	5.56	2.38	0.8	2.3	3.0	
	TPGX110302												□	□	6.35	3.18	0.2	2.7	3.5	TPGX16○○○○ EPSR 60° LE RE D1 AN 11° IC S
	TPGX110304												▲	▲	6.35	3.18	0.4	2.6	3.5	
	TPGX110308												▲	▲	6.35	3.18	0.8	2.3	3.5	
	TPGX160304												▲	□	9.525	3.18	0.4	3.6	4.8	
	TPGX160308												▲	□	9.525	3.18	0.8	3.3	4.8	
	TPGX160404												□	□	9.525	4.76	0.4	3.6	4.8	
	TPGX160408												□	□	9.525	4.76	0.8	3.3	4.8	

● = NEW

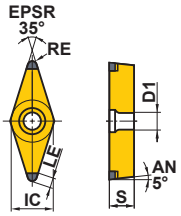
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

35° VB TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
Shape	Order Number																				
NEW PETIT CUT	NP-VBGW110302FS2		●			▲				●						6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304FS2		●			▲				●			●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308FS2		●			▲				●			●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402FS2		●			▲				●						9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404FS2						▲						●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408FS2						▲						●			9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110302GS2		●		●	▲										6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304GS2		●		●	▲							●		▲	6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308GS2		●		●	▲							●		▲	6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402GS2		●		●	▲										9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404GS2		●		●	▲			●				●	▲	▲	9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GS2		●		●	▲			●				●	▲	▲	9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110302GA2			●			▲				●					6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304GA2			●			▲	●			●					6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308GA2			●			▲	●			●					6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402GA2			●			▲				●					9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404GA2			●			▲	●			●					9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GA2			●			▲	●			●					9.525	4.76	0.8	2.0	4.43	
	NP-VBGW160404GH2					▲	▲	●								9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GH2					▲	▲	●								9.525	4.76	0.8	2.0	4.43	
	NEW NP-VBGW160404VA2			●												9.525	4.76	0.4	2.5	4.43	
	NEW NP-VBGW160408VA2			●												9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304TA2							●								6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308TA2							●								6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404TA2			●			▲	●			●					9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408TA2			●			▲	●			●					9.525	4.76	0.8	2.0	4.43	
	NP-VBGW160404TH2						▲	●								9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408TH2						▲	●								9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304SF2												●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308SF2												●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404SF2												●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408SF2												●			9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304SE2												●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308SE2												●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404SE2												●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408SE2												●			9.525	4.76	0.8	2.0	4.43	





Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

35° VC TYPE INSERTS WITH HOLE

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VCGW160404FS2				▲	▲			●						9.525	4.76	0.4	2.5	4.4	EPSR 35° RE LE IC D1 AN 7° S
	NP-VCGW160408FS2				▲	▲			●						9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GS2	●		●	▲										9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GS2	●		●	▲										9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GA2		●			▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GA2		●			▲	●								9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GH2				▲	▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GH2				▲	▲	●								9.525	4.76	0.8	2.0	4.4	
	NEW NP-VCGW160404VA2		●												9.525	4.76	0.4	2.5	4.4	
	NEW NP-VCGW160408VA2		●												9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TS2				▲										9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TS2				▲										9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TA2		●			▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TA2		●			▲	●								9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TH2					▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TH2					▲	●								9.525	4.76	0.8	2.0	4.4	

● = NEW

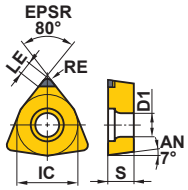
● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

80° WC TYPE INSERTS WITH HOLE

Workpiece Material			BC6210 NEW	BC6220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
	**NP-WCMWL30204FA**	4.76	2.38	0.4	1.8	2.3	
	NP-WCMWL30208FA	4.76	2.38	0.8	1.9	2.3	

● = NEW

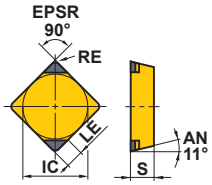
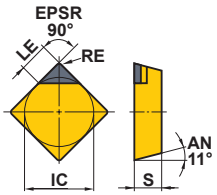
Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
SMALL TOOLS ➤ D013
GRADES ➤ B006
IDENTIFICATION ➤ B002

90° SP TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Dimensions (mm)				Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲								
	K	Cast Iron							●				◐	●	◐					
	S	Heat Resistant Alloy, Titanium Alloy													●					
		Sintered Alloy											◐							

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Shape	Order Number																			Geometry
NEW PETIT CUT NEW 	NP-SPGN120412GS2							●							12.7	4.76	1.2	2.5	
	SPGN090302												□	□	9.525	3.18	0.2	4.0	
	SPGN090304												▲	□	9.525	3.18	0.4	4.0	
	SPGN090308												▲	□	9.525	3.18	0.8	4.1	
	SPGN090312												□	□	9.525	3.18	1.2	4.0	
	SPGN120304												▲	▲	12.7	3.18	0.4	4.0	
	SPGN120308												▲	▲	12.7	3.18	0.8	4.1	
	SPGN120312												□	□	12.7	3.18	1.2	4.0	
	SPGN120408												□	□	12.7	4.76	0.8	4.1	
	SPGN120412												□	□	12.7	4.76	1.2	4.0	

● = NEW

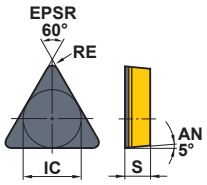
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

60° TB TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

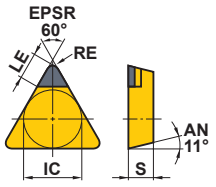
Shape	Order Number	IC	S	RE	LE	Geometry
	**TBGN060104**	3.97	1.59	0.4	—	
	TBGN060108	3.97	1.59	0.8	—	

▲ = NEW

60° TP TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Shape	Order Number	IC	S	RE	LE	Geometry
	**TPGN090204**	5.56	2.38	0.4	2.6	
	TPGN110302	6.35	3.18	0.2	2.7	
	TPGN110304	6.35	3.18	0.4	2.6	
	TPGN110308	6.35	3.18	0.8	2.3	
	TPGN160304	9.525	3.18	0.4	3.6	
	TPGN160308	9.525	3.18	0.8	3.3	
	TPGN160312	9.525	3.18	1.2	3.0	
	TPGN160408	9.525	4.76	0.8	3.3	
	TPGN220408	12.7	4.76	0.8	3.3	

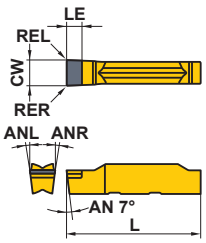
▲ = NEW

GY TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	CW	RER REL	L	LE	ANR ANL	
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣									
	K	Cast Iron							●				◐	●	◐						
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
	GY1G0200D020N-GFGS					▲										2.00	0.2	20.7	2.7	3°	
	GY1G0239E020N-GFGS					▲										2.39	0.2	20.7	2.7	7°	
	GY1G0250E020N-GFGS					▲										2.50	0.2	20.7	2.7	7°	
	GY1G0300F020N-GFGS					▲										3.00	0.2	20.7	2.7	7°	
	GY1G0318F020N-GFGS					▲										3.18	0.2	20.7	2.7	7°	
	GY1G0400G020N-GFGS					▲										4.00	0.2	25.65	2.7	7°	
	GY1G0475H020N-GFGS					▲										4.75	0.2	25.65	2.7	7°	
	GY1G0500H020N-GFGS					▲										5.00	0.2	25.65	2.7	7°	
	GY1G0600J020N-GFGS					▲										6.00	0.2	25.65	2.7	7°	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting





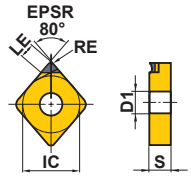
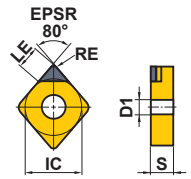
● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

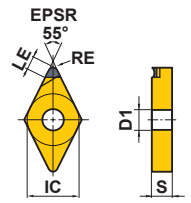
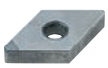
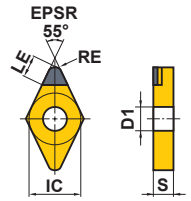
80° CN TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-CNMM120402R-F	●	12.7	4.76	0.2	1.7	5.16	
	NP-CNMM120402L-F	□	12.7	4.76	0.2	1.7	5.16	
	NP-CNMM120404R-F	●	12.7	4.76	0.4	1.8	5.16	
	NP-CNMM120404L-F	□	12.7	4.76	0.4	1.8	5.16	
	NP-CNMM120408R-F	●	12.7	4.76	0.8	2.0	5.16	
	NP-CNMM120408L-F	□	12.7	4.76	0.8	2.0	5.16	
(With Breaker)								Right hand insert shown.
	CNMA120404	●	12.7	4.76	0.4	3.6	5.16	
	CNMA120408	●	12.7	4.76	0.8	3.6	5.16	

55° DN TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

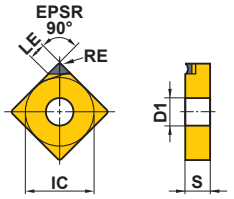
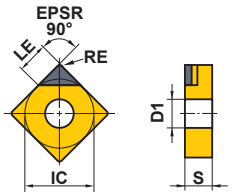
Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-DNMM150402R-F	●	12.7	4.76	0.2	2.2	5.16	
	NP-DNMM150402L-F	□	12.7	4.76	0.2	2.2	5.16	
	NP-DNMM150404R-F	●	12.7	4.76	0.4	2.1	5.16	
	NP-DNMM150404L-F	□	12.7	4.76	0.4	2.1	5.16	
	NP-DNMM150408R-F	●	12.7	4.76	0.8	2.0	5.16	
	NP-DNMM150408L-F	□	12.7	4.76	0.8	2.0	5.16	
(With Breaker)								Right hand insert shown.
	DNGA150404	●	12.7	4.76	0.4	2.9	5.16	
	DNGA150408	●	12.7	4.76	0.8	2.4	5.16	

PCD TURNING INSERTS [NEGATIVE]

90° SN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

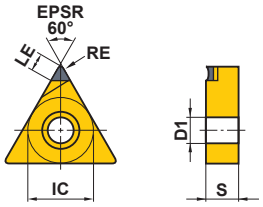
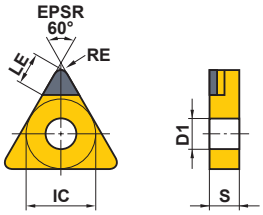
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-SNMM120404R-F	●	12.7	4.76	0.4	2.0	5.16	
	NP-SNMM120404L-F	□	12.7	4.76	0.4	2.0	5.16	
	NP-SNMM120408R-F	●	12.7	4.76	0.8	2.2	5.16	
	NP-SNMM120408L-F	□	12.7	4.76	0.8	2.2	5.16	
 (With Breaker)								 Right hand insert shown.
	SNGA120404	□	12.7	4.76	0.4	3.7	5.16	
	SNGA120408	●	12.7	4.76	0.8	3.8	5.16	
								

60° TN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TNMM160402R-F	●	9.525	4.76	0.2	1.5	3.81	
	NP-TNMM160402L-F	□	9.525	4.76	0.2	1.5	3.81	
	NP-TNMM160404R-F	●	9.525	4.76	0.4	1.6	3.81	
	NP-TNMM160404L-F	□	9.525	4.76	0.4	1.6	3.81	
	NP-TNMM160408R-F	●	9.525	4.76	0.8	1.7	3.81	
	NP-TNMM160408L-F	□	9.525	4.76	0.8	1.7	3.81	
 (With Breaker)								 Right hand insert shown.
	TNGA160402	●	9.525	4.76	0.2	3.1	3.81	
	TNGA160404	●	9.525	4.76	0.4	2.9	3.81	
	TNGA160408	●	9.525	4.76	0.8	2.8	3.81	
								

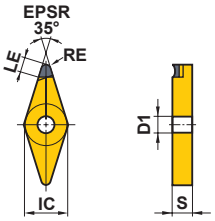
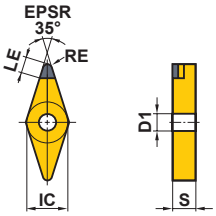
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

35° VN TYPE INSERTS WITH HOLE

Workpiece Material				
	N	Non-ferrous Metal	●	

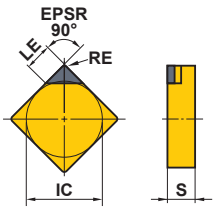
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
NEW PETIT CUT	**NP-VNMM160402R-F**	●	9.525	4.76	0.2	2.5	3.81	
	NP-VNMM160402L-F	□	9.525	4.76	0.2	2.5	3.81	
	**NP-VNMM160404R-F**	●	9.525	4.76	0.4	2.5	3.81	
	NP-VNMM160404L-F	□	9.525	4.76	0.4	2.5	3.81	
	NP-VNMM160408R-F	●	9.525	4.76	0.8	2.0	3.81	
	NP-VNMM160408L-F	□	9.525	4.76	0.8	2.0	3.81	
(With Breaker)								Right hand insert shown.
	VNGA160404	●	9.525	4.76	0.4	2.6	3.81	
	VNGA160408	●	9.525	4.76	0.8	1.8	3.81	
								

90° SN TYPE INSERTS WITHOUT HOLE

Workpiece Material				
	N	Non-ferrous Metal	●	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

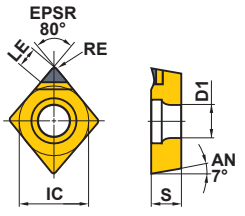
Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	**SNGN120404**	□	12.7	4.76	0.4	3.7	
	SNGN120408	●	12.7	4.76	0.8	3.8	

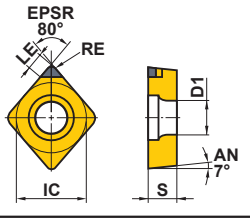
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

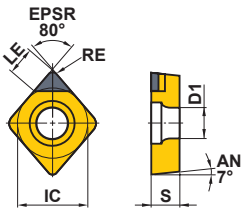
□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° CC TYPE INSERTS WITH HOLE

Workpiece Material			PCD	Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✥: Unstable Cutting					
	N	Non-ferrous Metal	●						
Shape	Order Number		MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT		NP-CCMH060202	●	6.35	2.38	0.2	1.7	2.8	
		NP-CCMH060204	●	6.35	2.38	0.4	1.8	2.8	
(With Breaker)									
NEW PETIT CUT	*	NP-CCMW03S102	●	3.57	1.39	0.2	1.1	2.0	
	*	NP-CCMW03S104	●	3.57	1.39	0.4	1.0	2.0	
	*	NP-CCMW04T002	●	4.37	1.79	0.2	1.5	2.4	
	*	NP-CCMW04T004	●	4.37	1.79	0.4	1.4	2.4	
		CCMW060202	●	6.35	2.38	0.2	2.9	2.8	
		CCMW060204	●	6.35	2.38	0.4	2.9	2.8	
		CCMW09T302	●	9.525	3.97	0.2	3.3	4.4	
		CCMW09T304	●	9.525	3.97	0.4	3.3	4.4	



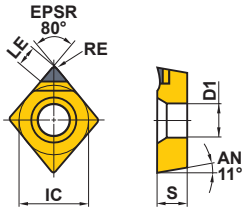


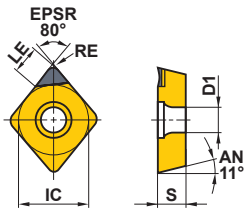


* Diameter of inscribed circle is special. (For SCLC type)

80° CP TYPE INSERTS WITH HOLE

Workpiece Material			PCD	Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✥: Unstable Cutting					
	N	Non-ferrous Metal	●						
Shape	Order Number		MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT		NP-CPMH080202	●	7.94	2.38	0.2	1.7	3.5	
		NP-CPMH080204	●	7.94	2.38	0.4	1.8	3.5	
		NP-CPMH090302	●	9.525	3.18	0.2	1.7	4.5	
		NP-CPMH090304	●	9.525	3.18	0.4	1.8	4.5	
(With Breaker)									
		CPGT080202	●	7.94	2.38	0.2	3.7	3.4	
		CPGT080204	●	7.94	2.38	0.4	3.6	3.4	
		CPGT090302	●	9.525	3.18	0.2	3.3	4.4	
		CPGT090304	●	9.525	3.18	0.4	3.3	4.4	
(With Breaker)									

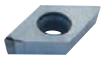




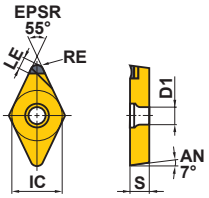
55° DC TYPE INSERTS WITH HOLE

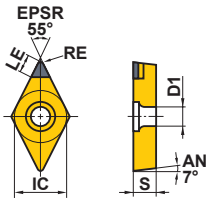
Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-DCMT070202R-F	●	6.35	2.38	0.2	1.4	2.8	
	NP-DCMT070202L-F	●	6.35	2.38	0.2	1.4	2.8	
	NP-DCMT070204R-F	●	6.35	2.38	0.4	1.5	2.8	
	NP-DCMT070204L-F	●	6.35	2.38	0.4	1.5	2.8	
	NP-DCMT11T302R-F	●	9.525	3.97	0.2	1.4	4.4	
	NP-DCMT11T302L-F	●	9.525	3.97	0.2	1.4	4.4	
	NP-DCMT11T304R-F	●	9.525	3.97	0.4	1.5	4.4	
(With Breaker)	NP-DCMT11T304L-F	●	9.525	3.97	0.4	1.5	4.4	Left hand insert shown.
	DCMW070202	●	6.35	2.38	0.2	2.7	2.8	
	DCMW070204	●	6.35	2.38	0.4	2.5	2.8	
	DCMW11T302	●	9.525	3.97	0.2	3.0	4.4	
	DCMW11T304	●	9.525	3.97	0.4	2.9	4.4	







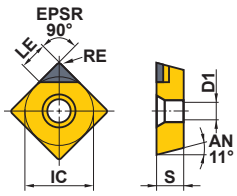


90° SP TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
	SPGX090304	●	9.525	3.18	0.4	3.7	4.8	
	SPGX090308	●	9.525	3.18	0.8	3.8	4.8	



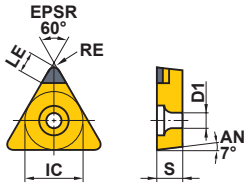
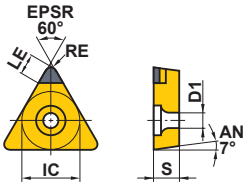


● : Inventory maintained in Japan.
(Contains one insert per case.)

60° TC TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
	**TCMW110202**	●	6.35	2.38	0.2	2.7	2.8	
	TCMW110204	●	6.35	2.38	0.4	2.6	2.8	
	**TCGW060102**	●	3.97	1.59	0.2	1.5	2.3	
	TCGW060104	●	3.97	1.59	0.4	1.6	2.3	
	TCGW060108	●	3.97	1.59	0.8	1.4	2.3	

60° TP TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TPMX090202R-F	●	5.56	2.38	0.2	1.5	3.0	
	NP-TPMX090202L-F	●	5.56	2.38	0.2	1.5	3.0	
	NP-TPMX090204R-F	□	5.56	2.38	0.4	1.6	3.0	
	NP-TPMX090204L-F	●	5.56	2.38	0.4	1.6	3.0	
	NP-TPMX090208R-F	□	5.56	2.38	0.8	1.7	3.0	
	NP-TPMX090208L-F	●	5.56	2.38	0.8	1.7	3.0	
	NP-TPMX110302R-F	□	6.35	3.18	0.2	1.5	3.5	
	NP-TPMX110302L-F	●	6.35	3.18	0.2	1.5	3.5	
	NP-TPMX110304R-F	□	6.35	3.18	0.4	1.6	3.5	
	NP-TPMX110304L-F	●	6.35	3.18	0.4	1.6	3.5	
	NP-TPMX110308R-F	□	6.35	3.18	0.8	1.7	3.5	NP-TPMX16□□□□R/L-F
	NP-TPMX110308L-F	●	6.35	3.18	0.8	1.7	3.5	
	NP-TPMX160302R-F	□	9.525	3.18	0.2	1.5	4.8	
	NP-TPMX160302L-F	●	9.525	3.18	0.2	1.5	4.8	
	NP-TPMX160304R-F	□	9.525	3.18	0.4	1.6	4.8	
	NP-TPMX160304L-F	●	9.525	3.18	0.4	1.6	4.8	
	NP-TPMX160308R-F	□	9.525	3.18	0.8	1.7	4.8	
(With Breaker)	NP-TPMX160308L-F	●	9.525	3.18	0.8	1.7	4.8	Right hand insert shown.
NEW PETIT CUT	NP-TPMH080202R-F	●	4.76	2.38	0.2	1.5	2.4	
	NP-TPMH080202L-F	●	4.76	2.38	0.2	1.5	2.4	
	NP-TPMH080204R-F	●	4.76	2.38	0.4	1.6	2.4	
	NP-TPMH080204L-F	●	4.76	2.38	0.4	1.6	2.4	
	NP-TPMH090202R-F	●	5.56	2.38	0.2	1.5	2.9	
	NP-TPMH090202L-F	●	5.56	2.38	0.2	1.5	2.9	
	NP-TPMH090204R-F	●	5.56	2.38	0.4	1.6	2.9	
	NP-TPMH090204L-F	●	5.56	2.38	0.4	1.6	2.9	
	NP-TPMH110302R-F	●	6.35	3.18	0.2	1.5	3.4	
	NP-TPMH110302L-F	●	6.35	3.18	0.2	1.5	3.4	
	NP-TPMH110304R-F	●	6.35	3.18	0.4	1.6	3.4	
	NP-TPMH110304L-F	●	6.35	3.18	0.4	1.6	3.4	
	NP-TPMH160302R-F	●	9.525	3.18	0.2	1.5	4.4	
	NP-TPMH160302L-F	●	9.525	3.18	0.2	1.5	4.4	
	NP-TPMH160304R-F	●	9.525	3.18	0.4	1.6	4.4	
(With Breaker)	NP-TPMH160304L-F	●	9.525	3.18	0.4	1.6	4.4	Left hand insert shown.
	TPGT160302R-F	●	9.525	3.18	0.2	3.1	4.4	
	TPGT160302L-F	●	9.525	3.18	0.2	3.1	4.4	
	TPGT160304R-F	●	9.525	3.18	0.4	2.9	4.4	
	TPGT160304L-F	●	9.525	3.18	0.4	2.9	4.4	
(With Breaker)								Right hand insert shown.

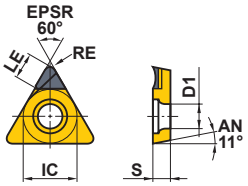
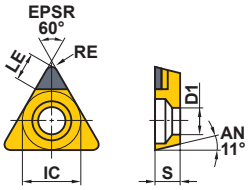
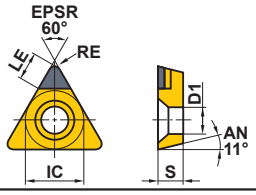
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

60° TP TYPE INSERTS WITH HOLE

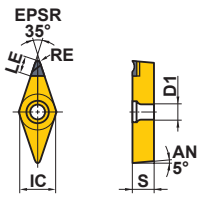
Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	TPGV090202R-F	●	5.56	2.38	0.2	2.7	2.8	 Right hand insert shown.
	TPGV090202L-F	●	5.56	2.38	0.2	2.7	2.8	
	TPGV090204R-F	●	5.56	2.38	0.4	2.6	2.8	
	TPGV090204L-F	●	5.56	2.38	0.4	2.6	2.8	
	TPGV110302R-F	●	6.35	3.18	0.2	2.7	3.4	
	TPGV110302L-F	●	6.35	3.18	0.2	2.7	3.4	
	TPGV110304R-F	●	6.35	3.18	0.4	2.6	3.4	
	TPGV110304L-F	●	6.35	3.18	0.4	2.6	3.4	
	TPGX080202	●	4.76	2.38	0.2	1.8	2.5	 TPGX16○○○○ 
	TPGX080204	●	4.76	2.38	0.4	1.7	2.5	
	TPGX080208	●	4.76	2.38	0.8	1.4	2.5	
	TPGX090202	●	5.56	2.38	0.2	2.7	3.0	
	TPGX090204	●	5.56	2.38	0.4	2.6	3.0	
	TPGX090208	●	5.56	2.38	0.8	2.3	3.0	
	TPGX110302	●	6.35	3.18	0.2	2.7	3.5	
	TPGX110304	●	6.35	3.18	0.4	2.6	3.5	
	TPGX110308	●	6.35	3.18	0.8	2.3	3.5	
	TPGX160304	●	9.525	3.18	0.4	2.9	4.8	
	TPGX160308	●	9.525	3.18	0.8	2.6	4.8	

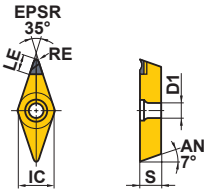
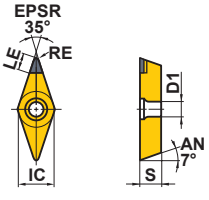
35° VB TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	NP-VBGT1103V5R-F	●	6.35	3.18	0.05	2.5	2.85	
	NP-VBGT110301R-F	●	6.35	3.18	0.1	2.5	2.85	
	NP-VBGT110302R-F	●	6.35	3.18	0.2	2.5	2.85	
	NP-VBGT110304R-F	●	6.35	3.18	0.4	2.5	2.85	

35° VC TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	NP-VCGT0802V5R-F	●	4.76	2.38	0.05	2.5	2.4	
	NP-VCGT080201R-F	●	4.76	2.38	0.1	2.5	2.4	
	NP-VCGT080202R-F	●	4.76	2.38	0.2	2.5	2.4	
	NP-VCGT080204R-F	●	4.76	2.38	0.4	2.5	2.4	
	NP-VCGT1103V5R-F	●	6.35	3.18	0.05	2.5	2.8	
	NP-VCGT110301R-F	●	6.35	3.18	0.1	2.5	2.8	
	NP-VCGT110302R-F	●	6.35	3.18	0.2	2.5	2.8	
	NP-VCGT110304R-F	●	6.35	3.18	0.4	2.5	2.8	
NEW 	VCGW110301	●	6.35	3.18	0.1	3.1	2.8	
	VCGW110302	●	6.35	3.18	0.2	3.0	2.8	
	VCGW110304	●	6.35	3.18	0.4	2.6	2.8	

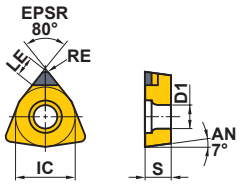
● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

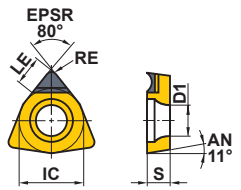
80° WC TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
	**WCMWL30202**	●	4.76	2.38	0.2	1.6	2.3	
	WCMWL30204	□	4.76	2.38	0.4	1.7	2.3	
	WCMW040202	●	6.35	2.38	0.2	2.9	2.8	
	WCMW040204	□	6.35	2.38	0.4	3.0	2.8	
	WCMW06T304	●	9.525	3.97	0.4	3.0	4.4	
	WCMW06T308	□	9.525	3.97	0.8	3.2	4.4	

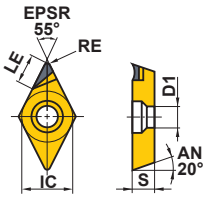
80° WP TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
 (With Breaker)	**WPGT040202**	●	6.35	2.38	0.2	2.9	2.8	
	WPGT040204	●	6.35	2.38	0.4	2.9	2.8	
	WPGT060302	●	9.525	3.18	0.2	3.3	4.4	
	WPGT060304	●	9.525	3.18	0.4	3.3	4.4	

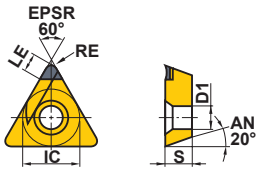
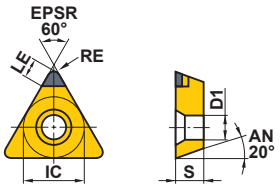
55° DE TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	DEGX150402R-F	●	12.7	4.76	0.2	3.0	5.1	 Right hand insert shown.
	DEGX150402L-F	●	12.7	4.76	0.2	3.0	5.1	
	DEGX150404R-F	●	12.7	4.76	0.4	2.9	5.1	
	DEGX150404L-F	●	12.7	4.76	0.4	2.9	5.1	

60° TE TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	TEGX160302R	●	9.525	3.18	0.2	3.8	4.4	 Right hand insert shown.
	TEGX160302L	●	9.525	3.18	0.2	3.8	4.4	
	TEGX160304R	●	9.525	3.18	0.4	3.6	4.4	
	TEGX160304L	●	9.525	3.18	0.4	3.6	4.4	
	TEGX160302	●	9.525	3.18	0.2	3.1	4.4	
	TEGX160304	●	9.525	3.18	0.4	2.9	4.4	

● : Inventory maintained in Japan.
(Contains one insert per case.)

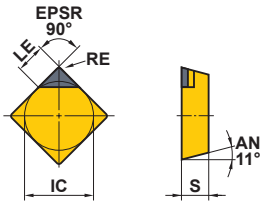
35° VD TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
	VDGX160302R-F	●	9.525	3.18	0.2	3.1	4.5	EPSR 35° RE LE IC S D1 AN 15°
	VDGX160302L-F	●	9.525	3.18	0.2	3.1	4.5	
	VDGX160304R-F	●	9.525	3.18	0.4	2.7	4.5	
	VDGX160304L-F	●	9.525	3.18	0.4	2.7	4.5	
(With Breaker)								Right hand insert shown.

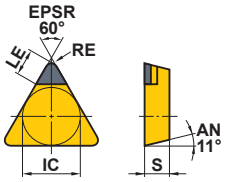
90° SP TYPE INSERTS WITHOUT HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	SPGN090302	●	9.525	3.18	0.2	3.7	
	SPGN090304	●	9.525	3.18	0.4	3.7	
	SPGN090308	●	9.525	3.18	0.8	3.8	
	SPGN090312	□	9.525	3.18	1.2	3.7	
	SPGN120304	●	12.7	3.18	0.4	3.7	
	SPGN120308	●	12.7	3.18	0.8	3.8	
	SPGN120312	●	12.7	3.18	1.2	3.7	

60° TP TYPE INSERTS WITHOUT HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	TPGN110302	●	6.35	3.18	0.2	2.7	
	TPGN110304	●	6.35	3.18	0.4	2.6	
	TPGN110308	●	6.35	3.18	0.8	2.3	
	TPGN160302	●	9.525	3.18	0.2	3.1	
	TPGN160304	●	9.525	3.18	0.4	2.9	
	TPGN160308	●	9.525	3.18	0.8	2.6	
	TPGN160312	□	9.525	3.18	1.2	2.4	

Scan here for product NEWS ▶

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

EXTERNAL TURNING ➤ —
BORING ➤ E002—E005
GRADES ➤ B015
IDENTIFICATION ➤ B002

Memo

HOW TO READ THE STANDARD OF EXTERNAL TURNING TOOLS

●How this section page is organised

①Organised according to turning insert shape.
(Refer to the index on the next page.)

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

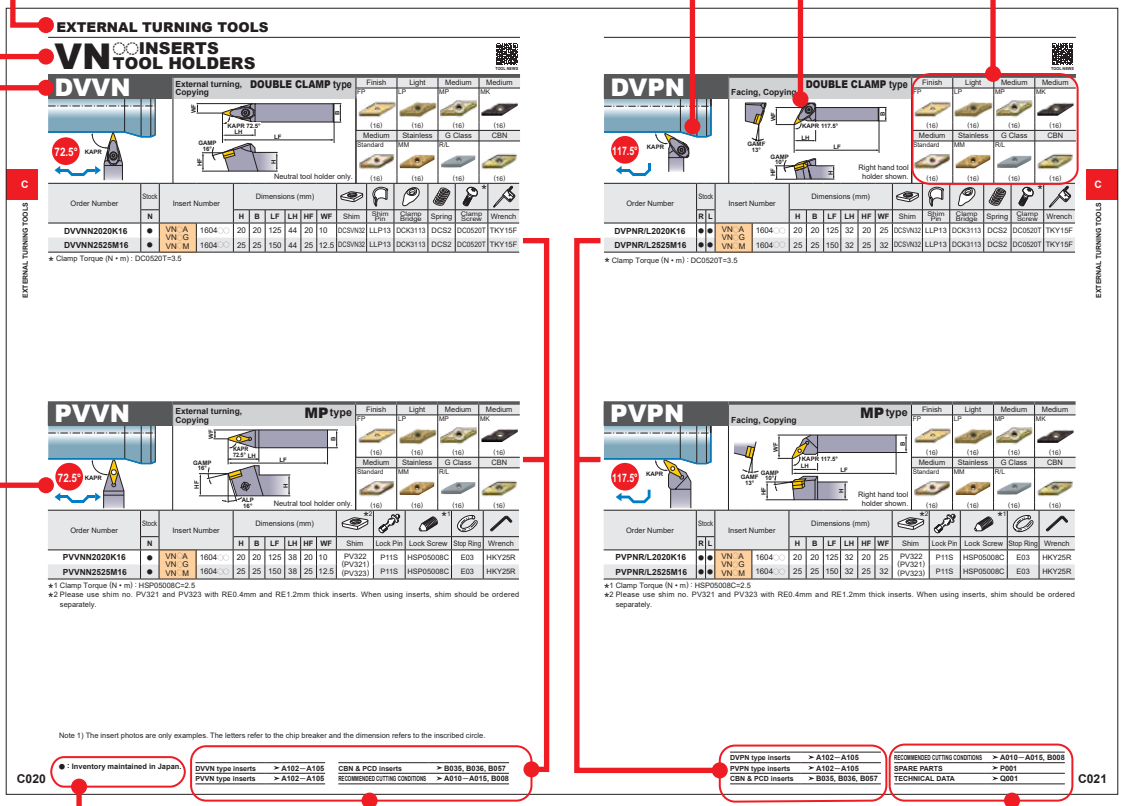
TITLE OF PRODUCT BY INSERT TYPE

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, and chamfering together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify

①order number and hand of tool (right/left).

TURNING TOOLS

EXTERNAL TURNING TOOLS

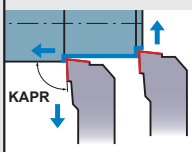
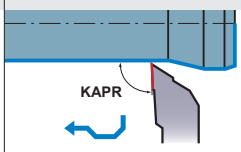
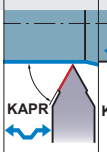
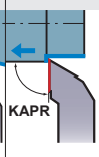
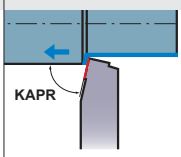
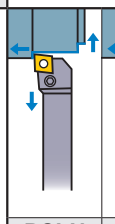
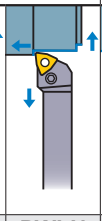
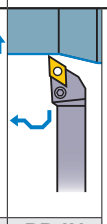
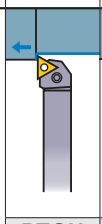
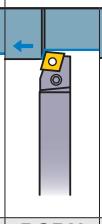
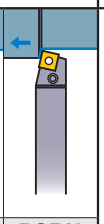
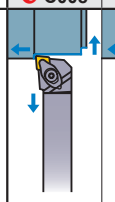
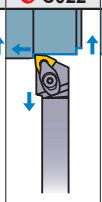
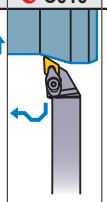
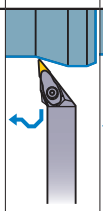
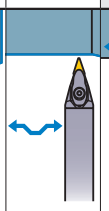
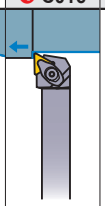
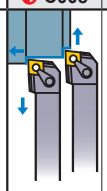
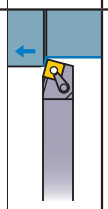
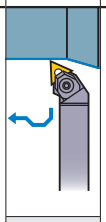
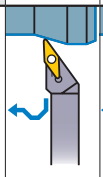
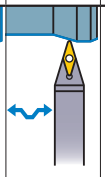
CLASSIFICATION ····· C002
IDENTIFICATION ····· C006
METHOD OF HOLDING ····· C007
STANDARD HOLDERS
CN◯◯ INSERTS TOOL HOLDERS ····· C008
DN◯◯ INSERTS TOOL HOLDERS ····· C010
SN◯◯ INSERTS TOOL HOLDERS ····· C012
TN◯◯ INSERTS TOOL HOLDERS ····· C016
VN◯◯ INSERTS TOOL HOLDERS ····· C019
WN◯◯ INSERTS TOOL HOLDERS ····· C022
CC◯◯ INSERTS TOOL HOLDERS ····· C023
DC◯◯ INSERTS TOOL HOLDERS ····· C024
RC◯◯ INSERTS TOOL HOLDERS ····· C025
SC◯◯ INSERTS TOOL HOLDERS ····· C027
TC◯◯ INSERTS TOOL HOLDERS ····· C028
VC◯◯ INSERTS TOOL HOLDERS ····· C029
XC◯◯ INSERTS TOOL HOLDERS ····· C031
TL HOLDER ····· C035
●AL HOLDER (FOR ALUMINIUM TURNING)
DE◯◯ INSERTS TOOL HOLDERS ····· C032
TE◯◯ INSERTS TOOL HOLDERS ····· C033
VD◯◯ INSERTS TOOL HOLDERS ····· C034

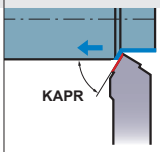
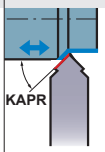
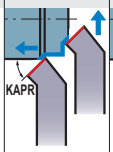
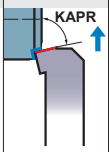
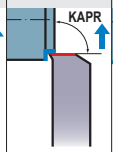
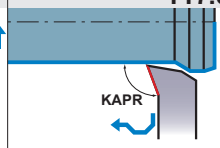
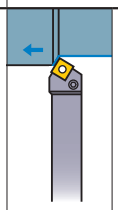
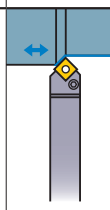
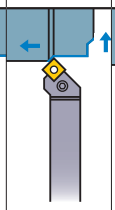
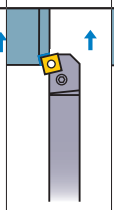
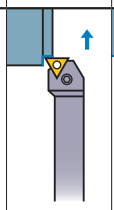
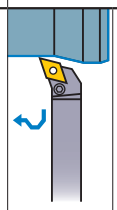
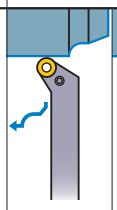
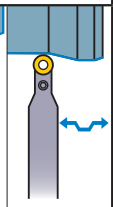
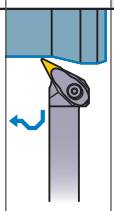
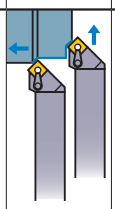
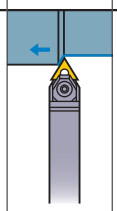
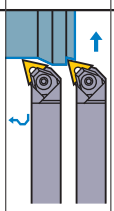
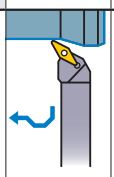


*Arranged by Alphabetical order

C008 **DCLN**	C012 **PSBN**	C033 **STFE**
C010 **DDJN**	C014 **PSDN**	C028 **STGC**
C016 **DTGN**	C015 **PSKN**	C033 **STGE**
C019 **DVJN**	C013 **PSSN**	C029 **SVJC**
C021 **DVPN**	C013 **PSTN**	C034 **SVJD**
C020 **DVVN**	C017 **PTFN**	C030 **SVPC**
C022 **DWLN**	C016 **PTGN**	C029 **SVVC**
C009 **MCLN**	C019 **PVJN**	C031 **SXZC**
C012 **MSBN**	C021 **PVPN**	C035 **TLHR**
C014 **MSSN**	C020 **PVVN**	
C018 **MTEN**	C022 **PWLN**	
C017 **MTJN**	C023 **SCLC**	
C018 **MTQN**	C024 **SDJC**	
C009 **PCBN**	C032 **SDJE**	
C008 **PCLN**	C024 **SDNC**	
C011 **PDHN**	C032 **SDNE**	
C010 **PDJN**	C026 **SRDC**	
C025 **PRDC**	C026 **SRGC**	
C025 **PRGC**	C027 **SSSC**	

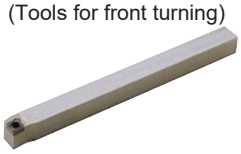
CLASSIFICATION(Negative insert)

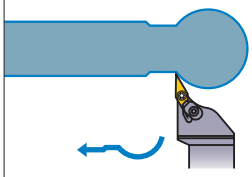
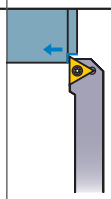
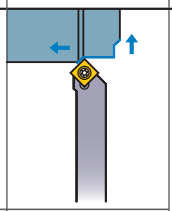
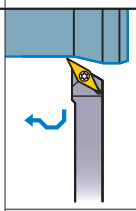
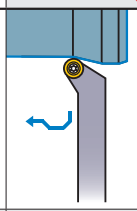
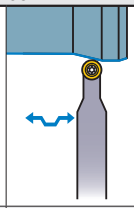
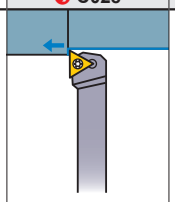
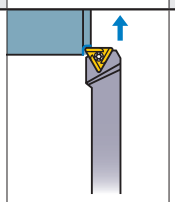
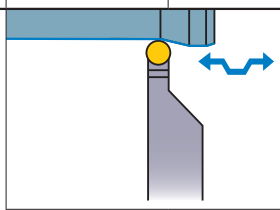
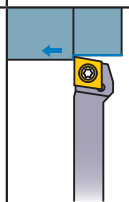
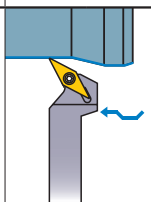
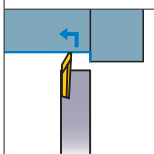
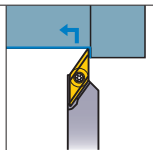
Tool Holder	Features Shank Size (H x W x L)	CN□□	WN□□	DN□□	TN□□	VN□□	VN□□	TN□□	CN□□	SN□□
		External Turning Facing		External Turning Copying				External Turning		
		KAPR=95°		KAPR=93°			KAPR=72.5°	KAPR=91°	KAPR=75°	
										
LL Type Holder 	● Lever lock type. ● ISO standard. ● Various holder shapes. ● Suitable for light to heavy cutting. ● Economical negative insert. 10 x 10 x 70 25 x 25 x 150 12 x 12 x 80 32 x 25 x 170 16 x 16 x 100 32 x 32 x 170 20 x 20 x 125									
		PCLN ➲ C008	**PWLN** ➲ C022	**PDJN** ➲ C010				**PTGN** ➲ C016	**PCBN** ➲ C009	**PSBN** ➲ C012
DOUBLE CLAMP Type Holder 	● New double clamp type. ● Holds inserts securely. ● Excellent cutting edge tolerance. ● Economical negative insert. ● Small insert series. 16 x 16 x 100 25 x 25 x 150 20 x 20 x 125 32 x 25 x 170									
		DCLN ➲ C008	**DWLN** ➲ C022	**DDJN** ➲ C010		**DVJN** ➲ C019	**DVVN** ➲ C020	**DTGN** ➲ C016		
DOUBLE CLAMP Type Holder (For heavy cutting) 	● Double clamp holder type. ● Holds inserts securely. ● Suitable for heavy cutting. ● Negative insert. 32 x 32 x 170 40 x 40 x 200									
		MCLN ➲ C009								**MSBN** ➲ C012
WP Type Holder 	● Double clamp holder type. ● Simple insert exchange. ● Economical negative insert. 20 x 20 x 125 25 x 25 x 150 35 x 25 x 170									
					MTJN ➲ C017					
MP Type Holder 	● Pin lock type. ● 35°rhombic shape insert. ● Suitable for recessing. 20 x 20 x 125 25 x 25 x 150									
						PVJN ➲ C019	**PVVN** ➲ C020			

	SN□□	TN□□	SN□□	SN□□	SN□□	TN□□	DN□□	TN□□	VN□□	Special Design (Positive inserts)					
	External Turning, Chamfering			External Turning, Facing, Chamfering	Facing		Facing, Copying			External Turning, Copying	Selection Standard				
	KAPR=60°		KAPR=45°	KAPR=45°	KAPR=75°	KAPR=91°	KAPR=105° 107.5° 117.5°			Special Design (Positive inserts)	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialised
															
	 **PSTN** C013		 **PSDN** C014	 **PSSN** C013	 **PSKN** C015	 **PTFN** C017	 **PDHN** C011			 **PRGC** C025	 **PRDC** C025	◎		○	◎	
									 **DVPN** C021			◎		◎	◎	
				 **MSSN** C014									○		
		 **MTEN** C018						 **MTQN** C018				◎		◎	◎
									 **PVPN** C021			◎			◎	

Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation.

CLASSIFICATION(Positive insert)

Applicable Insert Type		CC○○	VP○○	DC/DE○○	VB/VC/ VD○○	VC○○	DC/DE○○	VB/VC○○
Tool Holder	Features Shank Size (H x W x L)	External Turning, Facing	External Turning, Copying					
		KAPR=95°	KAPR=93° 95°				KAPR=62.5° 72.5°	
Profile Type Holder 	● Double clamp holder type. ● 25° rhombic shape insert. ● Possible to machine a face relief with up to 60° inclination. 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150							
SP Type Holder 	● Screw-on type. ● Miniature holder with 7°positive insert. 8 x 8 x 60 10 x 10 x 70 12 x 12 x 80 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150	**SCLC** ➲ C023		**SDJC** ➲ C024	**SVJC** ➲ C029		**SDNC** ➲ C024	**SVVC** ➲ C029
AL Type Holder (For Aluminium turning) 	● Screw-on type. ● 20°positive insert. (35°rhombic shape insert is 15°) ● High rake and good sharpness. 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150			**SDJE** ➲ C032	**SVJD** ➲ C034		**SDNE** ➲ C032	
TL Type Holder 	● Taper lock type ● Excellent finished surface with round shape insert. 20 x 20 x 125 25 x 25 x 150 32 x 25 x 170							
SMALL TOOLS (Tools for front turning) 	● Screw-on type. ● Tools to be equipped on gang type tool posts. ● Miniature holder with 7°positive insert. 8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	**SCLC-SM** ➲ D010	**SVLP-SM** ➲ D012	**SDJC-SM** ➲ D011	**SVJB-SM** ➲ D012	**SVJC-SM** ➲ D013 NEW	**SDNC-SM** ➲ D011	**SVVB-SM** ➲ D013
SMALL TOOLS (Tools for back turning) 	● Screw-on type. ● Tools to be equipped on gang type tool posts. ● High rigidity due to designing of vertical insert. (BTA/CTB type) ● Back machining. (BTA/CTB type) 8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120							

	CC◌◌	TC/TE◌◌	SC◌◌	TE◌◌	VC/VP◌◌	Special Design					
	External Turning		External Turning, Facing, Chamfering	Facing	Facing, Copying	External Turning, Copying	Selection Standard				
	KAPR=90° 91°		KAPR=45°	KAPR=91°	KAPR=117.5°	Special Design	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialised
						 SXZC ➲ C031		◎	◎		
		 STGC ➲ C028	 SSSC ➲ C027		 SVPC ➲ C030	 SRGC ➲ C026  SRDC ➲ C026		○			
		 STGE ➲ C033		 STFE ➲ C033				◎			◎
						 TLHR ➲ C035		○			◎
	 SCAC-SM ➲ D010				 SVPP-SM ➲ D013			○			
						Special Design  BTAH/CTBH ➲ D014  BTVH ➲ D016		○			

Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation.

IDENTIFICATION

■ LL Type Holder / Double Clamp Type Holder / SP Type Holder / Profile Type Holder / AL Type Holder

P	C	L	N	R	25	25	M	12
①	②	③	④	⑤	⑥	⑥	⑦	⑧

①Clamp Structure	
D	Double Clamp Type
M	Wedge Lock Type Multiple Clamp Type
P	Lever Lock Type
S	Screw-on Type

②Insert Shape	
C	Rhombic 80°
D	Rhombic 55°
R	Round
S	Square
T	Triangular
V	Rhombic 35°
W	Trigon
X	Special Design

③Cutting Angle KAPR	
A	90°Without Offset
B	75°
D	45°Neutral
E	60°
F	90°
G	90°With Offset
H	107.5°
J	93°
K	75°
L	95°
N	62.5°
P	117.5°
Q	105°
S	45°
T	60°
V	72.5°
Z	Special

④Insert Clearance	
C	7°Positive
N	Negative
E	20°Positive

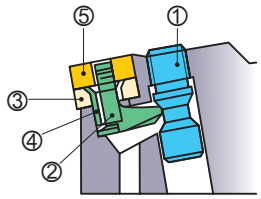
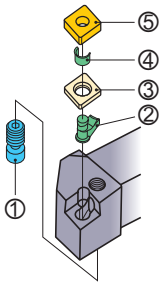
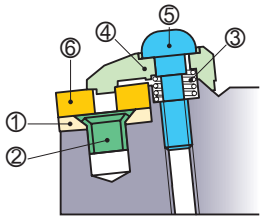
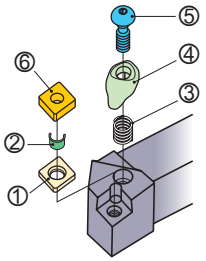
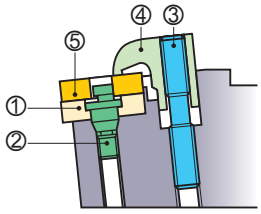
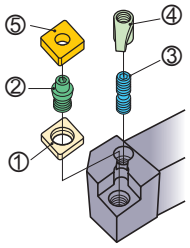
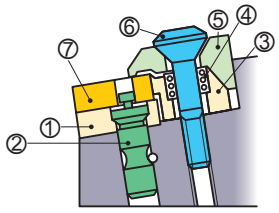
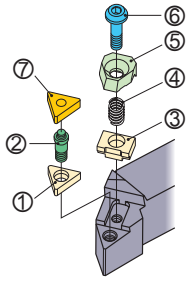
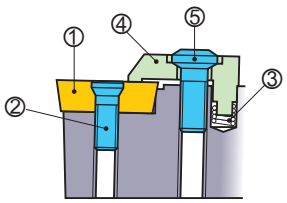
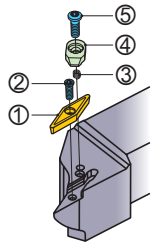
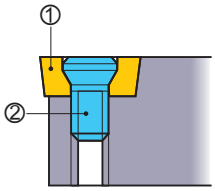
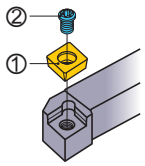
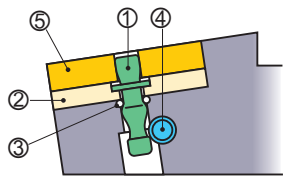
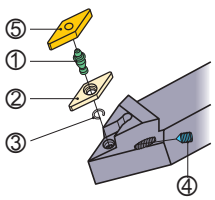
⑤Hand of Tool	
R	Right Hand
L	Left Hand
N	Neutral

⑥Tool Size H/B (mm) (Height and Width)	
8	08
10	10
12	12
16	16
20	20
25	25
32	32

⑦Tool Length LF (mm)	
D	60
E	70
F	80
H	100
K	125
M	150
P	170
Q	180
R	200

⑧Cutting Edge Length (mm)						
Inscribed Circle	Insert Shape					
	Square	Triangular	Round	Rhombic 80°	Rhombic 55°	Rhombic 35°
6.00	–	–	06	–	–	–
6.35	–	11	–	06	07	11
7.94	–	13	–	–	–	–
8.00	–	–	08	–	–	–
9.525	09	16	–	09	11	16
10.00	–	–	10	–	–	–
12.00	–	–	12	–	–	–
12.70	12	22	–	12	15	–
15.875	15	27	–	16	–	–
16.00	–	–	16	–	–	–
19.05	19	–	–	19	–	–
20.00	–	–	20	–	–	–
25.00	–	–	25	–	–	–
25.40	25	–	–	–	–	–
32.00	–	–	32	–	–	–

METHOD OF HOLDING

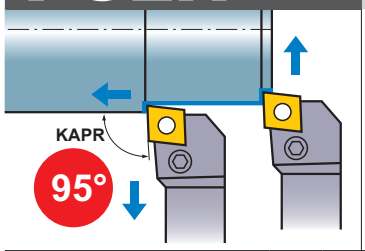
Type (Holder)	Structure	
Lever Lock (LL Type Holder)		①Clamp Screw ②Lever ③Shim ④Shim Pin ⑤Insert 
Double Clamp (DOUBLE CLAMP Type Holder)		①Shim ②Shim Pin ③Spring ④Clamp Bridge ⑤Clamp Screw ⑥Insert 
Multiple Clamp (DOUBLE CLAMP Type Holder) (For heavy cutting)		①Shim ②Shim Pin ③Clamp Screw ④Clamp Bridge ⑤Insert 
Wedge Lock (WP Type Holder)		①Shim ②Shim Pin ③Plate ④Spring ⑤Clamp Bridge ⑥Clamp Screw ⑦Insert 
Two Action Double Clamp (PROFILE Type Holder)		①Insert ②Clamp Screw (1) ③Spring ④Clamp Bridge ⑤Clamp Screw (2) 
Screw-on (SP Type Holder AL Type Holder)		①Insert ②Clamp Screw 
Pin Lock (MP Type Holder)		①Lock Pin ②Shim ③Stop Ring ④Lock Screw ⑤Insert 

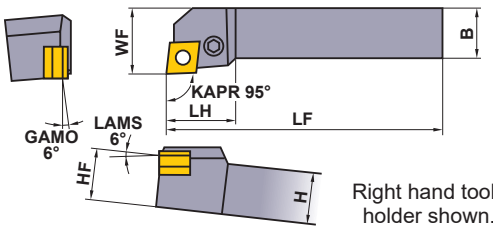
CN INSERTS TOOL HOLDERS

TOOL NEWS

PCLN

External turning, Facing — **LL type**





Right hand tool holder shown.

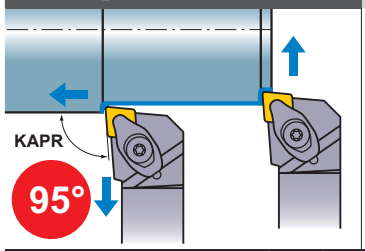
Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(12)	(12)	(12,16)	(12,16,19)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
			
(09,12,16,19)	(12,16,19)	(12,16,19)	(12)

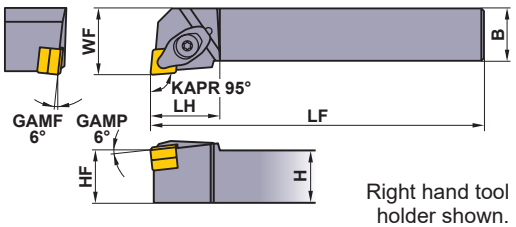
Order Number	Stock		Insert Number		Dimensions (mm)									 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PCLNR/L1616H09	●	●	CNMG	09T3○○	16	16	100	22	16	20	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2020K09	●	●		09T3○○	20	20	125	22	20	25	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2525M09	●	●		09T3○○	25	25	150	22	25	32	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2020K12	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	1204○○	20	20	125	28	20	25	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L2525M12	●	●		1204○○	25	25	150	28	25	32	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L3225P12	●	●		1204○○	32	25	170	28	32	32	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L3232P16	●	●		1606○○	32	32	170	32	32	40	LLSCN53	LLP15	LLCL25	LLCS508	HKY30R
PCLNR/L3232P19	●	●		1906○○	32	32	170	40	32	40	LLSCN63	LLP16	LLCL16	LLCS310	HKY40R

* Clamp Torque (N • m) : LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

DCLN

External turning, Facing — **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(12)	(12)	(12)	(12)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
			
(09,12)	(12)	(12)	(12)

Order Number	Stock		Insert Number		Dimensions (mm)						 *2				 *1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DCLNR/L1616H09	●	●	CNMG	09T3○○	16	16	100	25	16	20	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2020K09	●	●		09T3○○	20	20	125	25	20	25	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2525M09	●	●		09T3○○	25	25	150	25	25	32	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2020K12	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	1204○○	20	20	125	29	20	25	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L2525M12	●	●		1204○○	25	25	150	29	25	32	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L3225P12	●	●		1204○○	32	25	170	29	32	32	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (N • m) : DC0520T=3.5, DC0621T=5.0

*2 Please use shim no. LLSCN33 with 3.18mm thick inserts. When using 3.18mm thick inserts, shim should be ordered separately.

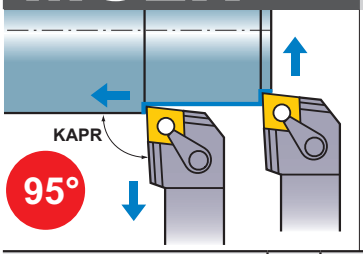
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

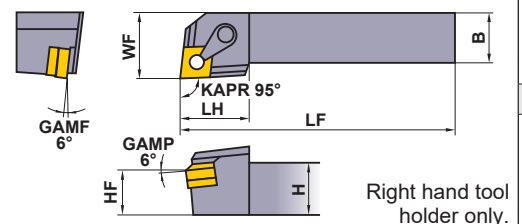
● : Inventory maintained in Japan.

PCLN type inserts	➤ A074—A080	CBN & PCD inserts	➤ B022—B025, B055
DCLN type inserts	➤ A074—A080	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008

MCLN

External turning, Facing — **DOUBLE CLAMP type** For heavy cutting





Right hand tool holder only.

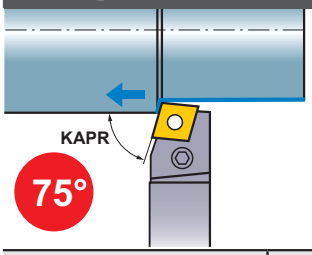
Medium	Medium	Medium	Medium to Rough
MH	Standard	MS	RP
(19)	(19)	(19)	(19)
Heavy	**Heavy**	**Heavy**	**M Class**
HZ	HX	HL	Flat Top
(19)	(19)	(19)	(19)

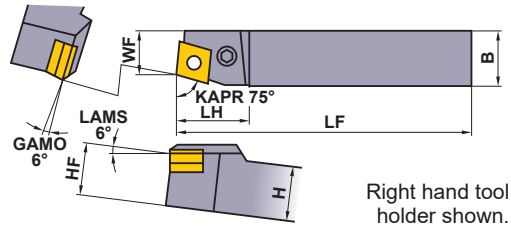
Order Number	Stock	Insert Number		Dimensions (mm)										
	R			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *	Wrench
MCLNR3232P19	●	CNMG CNMM CNMA	1906○○	32	32	170	36	32	40	MSCN63	MP6	CKW6	LS25	HKY40R
MCLNR4040R19	●		1906○○	40	40	200	36	40	50	MSCN63	MP6	CKW6	LS25	HKY40R

∗ Clamp Torque (N • m) : LS25=8.2

PCBN

External turning — **LL type**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(12)	(12)	(12)	(12)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(12)	(12)	(12)	

Order Number	Stock		Insert Number		Dimensions (mm)										
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
PCBNR/L2020K12	●	●	CN○A CN○G CN○M	1204○○	20	20	125	28	20	17	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCBNR/L2525M12	●	●		1204○○	25	25	150	25	25	22	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

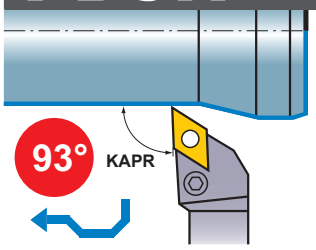
∗ Clamp Torque (N • m) : LLCS108=3.3

MCLN type inserts	➤ A076—A080	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008
PCBN type inserts	➤ A074—A080	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B022—B025, B055	TECHNICAL DATA	➤ Q001

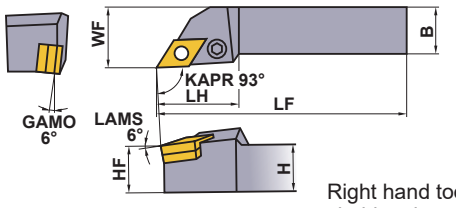
DN INSERTS TOOL HOLDERS

TOOL NEWS

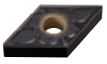
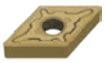
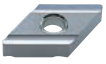
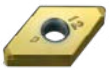
PDJN



External turning, Copying **LL type**



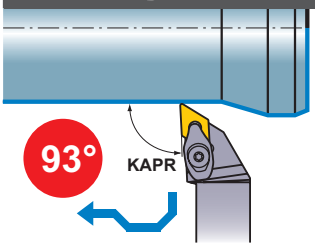
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(15)	(15)	(15)	(15)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(15)	(15)	(15)	(15)

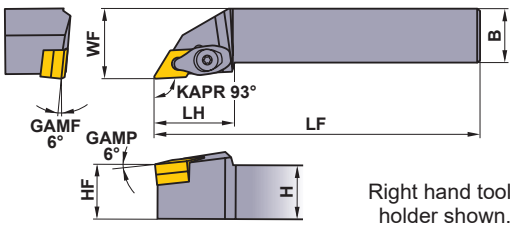
Order Number	Stock		Insert Number		Dimensions (mm)						*2			*1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PDJNR/L2020K15	●	●	DNMA DNMG DNMM DNMX DNGA DNGG DNGM	1504◯◯	20	20	125	35	20	25	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDJNR/L2525M15	●	●		1504◯◯	25	25	150	35	25	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDJNR/L3225P15	●	●		1504◯◯	32	25	170	35	32	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

∗1 Clamp Torque (N • m) : LLCS108=3.3
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, shim should be ordered separately.

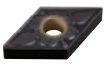
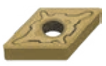
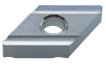
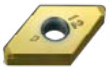
DDJN



External turning, Copying **DOUBLE CLAMP type**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(15)	(11,15)	(15)	(11,15)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(15)	(15)	(15)	(15)

Order Number	Stock		Insert Number		Dimensions (mm)						*2				*1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DDJNR/L1616H11	●	●	DNMG DNGA	1104◯◯	16	16	100	28	16	20	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2020K11	●	●		1104◯◯	20	20	125	28	20	25	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2525M11	●	●		1104◯◯	25	25	150	28	25	32	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L3225P11	●	●		1104◯◯	32	25	170	28	32	32	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2020K15	●	●	DNMA DNMG DNMM DNMX DNGA DNGG DNGM	1504◯◯	20	20	125	37	20	25	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L2525M15	●	●		1504◯◯	25	25	150	37	25	32	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L3225P15	●	●		1504◯◯	32	25	170	37	32	32	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

∗1 Clamp Torque (N • m) : DC0520T=3.5, DC0621T=5.0
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, shim should be ordered separately.

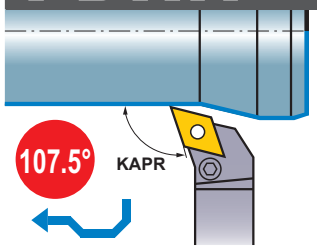
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

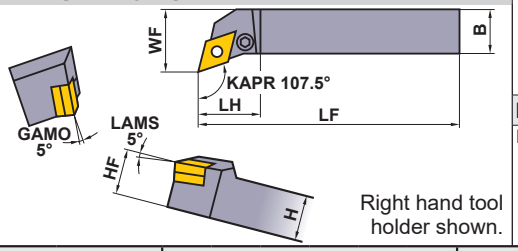
● : Inventory maintained in Japan.

PDJN type inserts	➤ A081—A087	CBN & PCD inserts	➤ B026—B030, B055
DDJN type inserts	➤ A081—A087	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008

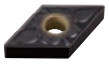
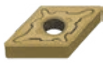
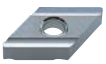
PDHN

Facing, Copying — LL type





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(15)	(15)	(15)	(15)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(15)	(15)	(15)	(15)

Order Number	Stock		Insert Number		Dimensions (mm)						✶2			✶1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PDHNR/L2020K15	●	●	DNMA DNMG	1504○○	20	20	125	34	20	25	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDHNR/L2525M15	●	●	DNMM DNGA	1504○○	25	25	150	34	25	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDHNR/L3225P15	●	●	DNGG DNGM	1504○○	32	25	170	34	32	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

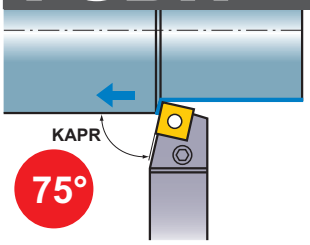
✶1 Clamp Torque (N • m) : LLCS108=3.3

✶2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, shim should be ordered separately.

PDHN type inserts	➤ A081—A087	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B026—B030, B055	TECHNICAL DATA	➤ Q001
RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008		

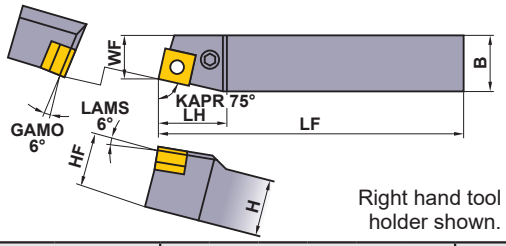
SN INSERTS TOOL HOLDERS

PSBN



External turning

LL type



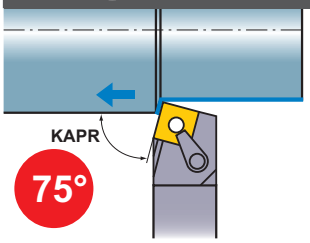
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (12)	 (12)	 (12)	 (12,15,19)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (12,15,19)	 (12,15,19)	 (09,12)	 (12)

Order Number	Stock		Insert Number		Dimensions (mm)						Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF						
PSBNR/L1212F09	●	●	SNMA SNMG SNMM SNGA SNGG	0903○○	12	12	80	20	12	13	—	—	HLS2	LLCL13S	LLCS105	HKY20R
PSBNR/L1616H09	●	●		0903○○	16	16	100	22	16	13	LLSSN33	LLP23	—	LLCL13	LLCS106	HKY25R
PSBNR/L2020K12	●	●		1204○○	20	20	125	28	20	17	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSBNR/L2525M12	●	●		1204○○	25	25	150	25	25	22	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSBNR/L2525M15	●	●		1506○○	25	25	150	33	25	22	LLSSN53	LLP15	—	LLCL25	LLCS508	HKY30R
PSBNR/L3232P19	●	●		1906○○	32	32	170	40	32	27	LLSSN63	LLP16	—	LLCL16	LLCS310	HKY40R

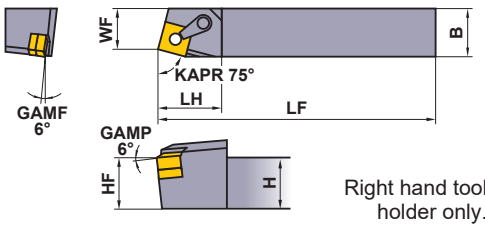
* Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

MSBN



External turning

DOUBLE CLAMP type
For heavy cutting



Right hand tool holder only.

Medium	Medium	Medium	Medium to Rough
MH	Standard	MS	RP
 (19)	 (19)	 (19)	 (19)
Heavy	**Heavy**	**Heavy**	**M Class**
HZ	HX	HL	Flat Top
 (19)	 (19)	 (19)	 (19)

Order Number	Stock	Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *	Wrench
	R			H	B	LF	LH	HF	WF					
MSBNR3232P19	●	SNMG SNMM SNMA	1906○○	32	32	170	41	32	27	MSSN63	MP6	CKW6	LS25	HKY40R
MSBNR4040R19	●		1906○○	40	40	200	41	40	35	MSSN63	MP6	CKW6	LS25	HKY40R

* Clamp Torque (N • m) : LS25=8.2

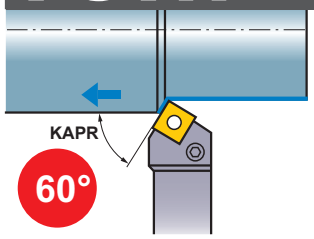
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

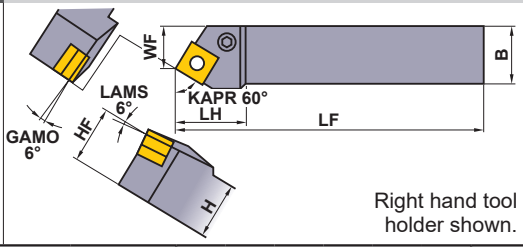
● : Inventory maintained in Japan.

PSBN type inserts	➤ A089—A094	CBN & PCD inserts	➤ B031, B056
MSBN type inserts	➤ A090—A094	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008

PSTN

External turning, Chamfering — **LL type**





Right hand tool holder shown.

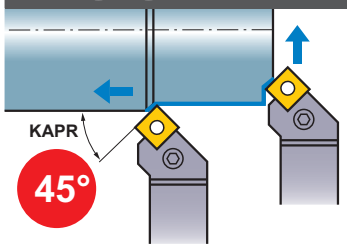
Finish	Light	Medium	Medium
FP	LP	MP	MK
(12)	(12)	(12)	(12)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(12)	(12)	(09,12)	(12)

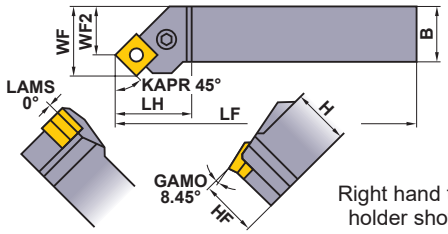
Order Number	Stock		Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF					
PSTNR/L1616H09	●	●	SNMA SNMG SNMM SNGA SNGG	0903○○	16	16	100	20	16	13	LLSSN33	LLP23	LLCL13	LLCS106	HKY25R
PSTNR/L2020K12	●	●		1204○○	20	20	125	25	20	17	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
PSTNR/L2525M12	●	●		1204○○	25	25	150	25	25	22	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R

∗ Clamp Torque (N • m) : LLCS106=2.2, LLCS108=3.3

PSSN

External turning, Facing, Chamfering — **LL type**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(12)	(12)	(12)	(12,15,19)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(12,15,19)	(12,15,19)	(09,12)	(12)

Order Number	Stock		Insert Number		Dimensions (mm)							Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF	WF2					
PSSNR/L1616H09	●	●	SNMA SNMG SNMM SNGA SNGG	0903○○	16	16	100	22	16	20	14	LLSSN33	LLP23	LLCL13	LLCS106	HKY25R
PSSNR/L2020K12	●	●		1204○○	20	20	125	31	20	25	17	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
PSSNR/L2525M12	●	●		1204○○	25	25	150	31	25	32	24	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
PSSNR/L3232P15	●	●		1506○○	32	32	170	34	32	40	29	LLSSN53	LLP15	LLCL25	LLCS508	HKY30R
PSSNR/L3232P19	●	●		1906○○	32	32	170	40	32	40	27	LLSSN63	LLP16	LLCL16	LLCS310	HKY40R

Note 1) When facing or chamfering only and using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

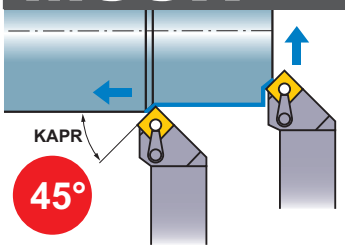
∗ Clamp Torque (N • m) : LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

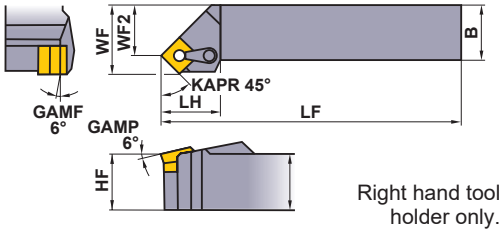
PSTN type inserts	**➤ A089—A094**	RECOMMENDED CUTTING CONDITIONS	**➤ A010—A015, B008**
PSSN type inserts	**➤ A089—A094**	**SPARE PARTS**	**➤ P001**
CBN & PCD inserts	**➤ B031, B056**	**TECHNICAL DATA**	**➤ Q001**

SN INSERTS TOOL HOLDERS

MSSN

External turning, Facing, Chamfering — **DOUBLE CLAMP type** For heavy cutting





Right hand tool holder only.

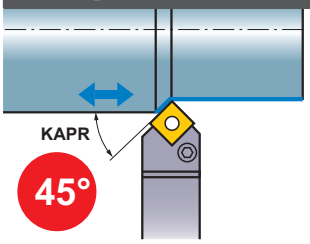
Medium	Medium	Medium	Rough
MH	Standard	MS	RP
 (19)	 (19)	 (19)	 (19)
Heavy	**Heavy**	**Heavy**	**M Class**
HZ	HX	HL	Flat Top
 (19)	 (19)	 (19)	 (19)

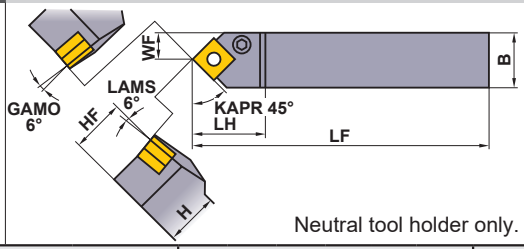
Order Number	Stock	Insert Number		Dimensions (mm)										 *	
	R			H	B	LF	LH	HF	WF	WF2	Shim	Shim Pin	Clamp Bridge	Clamp Screw	Wrench
MSSNR3232P19	●	SNMG SNMM SNMA	1906○○	32	32	170	44	32	40	27	MSSN63	MP6	CKW6	LS25	HKY40R
MSSNR4040R19	●		1906○○	40	40	200	44	40	50	37	MSSN63	MP6	CKW6	LS25	HKY40R

∗ Clamp Torque (N • m) : LS25=8.2

PSDN

External turning, Chamfering — **LL type**





Neutral tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (12)	 (12)	 (12)	 (12)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (12)	 (12)	 (09,12)	 (12)

Order Number	Stock	Insert Number		Dimensions (mm)										 *	
	N			H	B	LF	LH	HF	WF	Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw	Wrench
PSDNN1212F09	●	SNMA SNMG SNMM SNGA SNGG	0903○○	12	12	80	20	12	6.0	—	—	HLS2	LLCL13S	LLCS105	HKY20R
PSDNN1616H09	●		0903○○	16	16	100	22	16	8.0	LLSSN33	LLP23	—	LLCL13	LLCS106	HKY25R
PSDNN2020K12	●		1204○○	20	20	125	28	20	10.0	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSDNN2525M12	●		1204○○	25	25	150	28	25	12.5	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSDNN3225P12	●		1204○○	32	25	170	28	32	12.5	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R

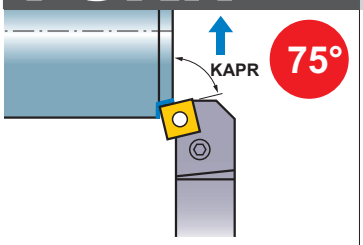
∗ Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS108=3.3

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

● : Inventory maintained in Japan.

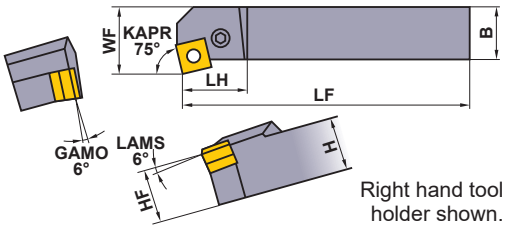
MSSN type inserts	➤ A090—A094	CBN & PCD inserts	➤ B031, B056
PSDN type inserts	➤ A089—A094	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008

PSKN



Facing

LL type



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(12)	(12)	(12)	(12)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(12)	(12)	(09,12)	(12)

Order Number	Stock		Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF					
PSKNR/L1616H09	●	●	SNMA SNMG SNMM SNGA SNGG	0903○○	16	16	100	20	16	20	LLSSN33	LLP23	LLCL13	LLCS106	HKY25R
PSKNR/L2020K12	●	●		1204○○	20	20	125	25	20	25	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
PSKNR/L2525M12	●	●		1204○○	25	25	150	25	25	32	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R

Note 1) When using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

∗ Clamp Torque (N • m) : LLCS106=2.2, LLCS108=3.3

PSKN type inserts	➤ A089—A094	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B031, B056	TECHNICAL DATA	➤ Q001
RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008		

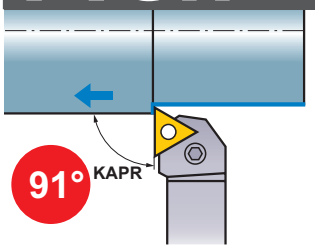
TN INSERTS TOOL HOLDERS

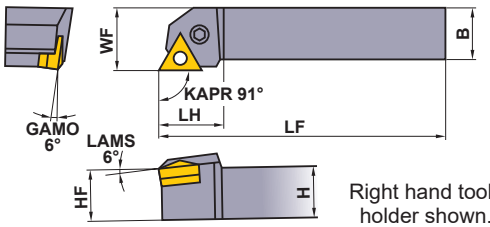
TOOL NEWS

PTGN

External turning

LL type





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (16)	 (16,22)	 (16,22)	 (16,22)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (16,22,27)	 (16,22)	 (11,16,22)	 (16)

Order Number	Stock		Insert Number		Dimensions (mm)						✶2	✶2			✶1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw	Wrench
PTGNR/L1010E11	●	●	TNMA TNMG TNMM TNGA TNGG TNGM	1103○○	10	10	70	17	10	12	—	—	HLS1	LLCL12S	LLCS105	HKY20F
PTGNR/L1212F11	●	●		1103○○	12	12	80	17	12	16	—	—	HLS1	LLCL12S	LLCS105	HKY20F
PTGNR/L1616H16	●	●		1604○○	16	16	100	22	16	20	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS106	HKY25R
PTGNR/L2020K16	●	●		1604○○	20	20	125	22	20	25	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS106	HKY25R
PTGNR/L2525M16	●	●		1604○○	25	25	150	22	25	32	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS206	HKY25R
PTGNR/L2525M22	●	●		2204○○	25	25	150	28	25	32	LLSTN42	LLP14	—	LLCL14	LLCS108	HKY30R
PTGNR/L3225P22	●	●		2204○○	32	25	170	28	32	32	LLSTN42	LLP14	—	LLCL14	LLCS108	HKY30R
PTGNR/L3232P27	●	●		2706○○	32	32	170	35	32	40	LLSTN53	LLP15	—	LLCL25	LLCS508	HKY30R

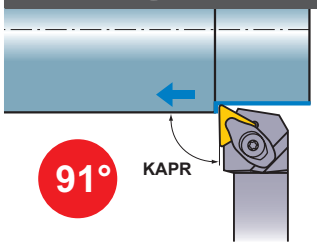
✶1 Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS206=2.2, LLCS108=3.3, LLCS508=3.3
PTGNR/L1010E11 • PTGNR/L1212F11 Clamp Torque (N • m) : LLCS105=1.0

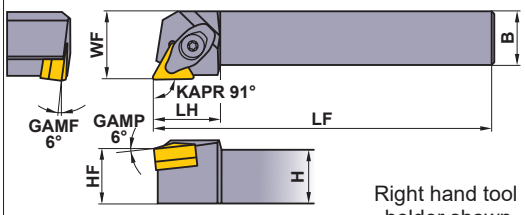
✶2 Please use shim no. LLSTN33 and shim pin no. LLP23 with 3.18mm thick inserts. When using 3.18mm thick inserts, shim and shim pin should be ordered separately.

DTGN

External turning

DOUBLE CLAMP type





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (16)	 (16)	 (16)	 (16)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (16)	 (16)	 (16)	 (16)

Order Number	Stock		Insert Number		Dimensions (mm)						✶2	✶2			✶1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DTGNR/L1616H16	●	●	TNMA TNMG TNMM TNGA TNGG TNGM	1604○○	16	16	100	25	16	20	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2020K16	●	●		1604○○	20	20	125	25	20	25	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2525M16	●	●		1604○○	25	25	150	25	25	32	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F

✶1 Clamp Torque (N • m) : DC0520T=3.5

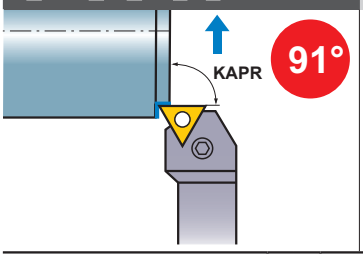
✶2 Please use shim no. LLSTN33 with 3.18mm thick inserts. When using 3.18mm thick inserts, shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

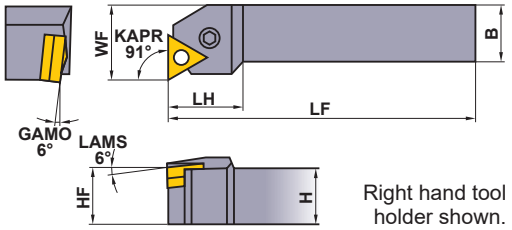
● : Inventory maintained in Japan.

PTGN type inserts	➤ A095—A101	CBN & PCD inserts	➤ B032—B034, B056
DTGN type inserts	➤ A095—A101	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008

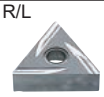
PTFN



Facing — LL type



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (16)	 (16,22)	 (16,22)	 (16,22)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (16,22)	 (16,22)	 (16,22)	 (16)

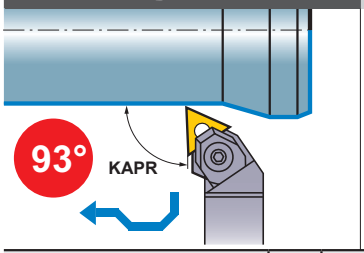
Order Number	Stock		Insert Number		Dimensions (mm)						✶2	✶2		✶1	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PTFNR/L1616H16	●	●	TNMA TNMG TNMM TNGA TNGG TNGM	1604◌◌	16	16	100	22	16	20	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS106	HKY25R
PTFNR/L2020K16	●	●		1604◌◌	20	20	125	22	20	25	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS106	HKY25R
PTFNR/L2525M16	●	●		1604◌◌	25	25	150	22	25	32	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS206	HKY25R
PTFNR/L2525M22	●	●		2204◌◌	25	25	150	28	25	32	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R

Note 1) When using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

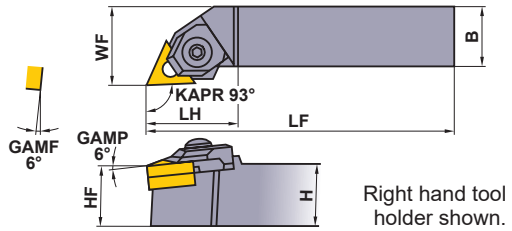
✶1 Clamp Torque (N • m) : LLCS106=2.2, LLCS206=2.2, LLCS108=3.3

✶2 Please use shim no. LLSTN33 and shim pin no. LLP23 with 3.18mm thick inserts. When using 3.18mm thick inserts, shim should be ordered separately.

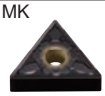
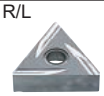
MTJN



External turning, Copying — WP type



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (16)	 (16,22)	 (16,22)	 (16,22)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
 (16,22)	 (16,22)	 (16,22)	 (16)

Order Number	Stock		Insert Number		Dimensions (mm)										✶1	✶2
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw	Wrench
MTJNR/L2020K16N	●	●	TN◌A TN◌G TN◌M TNMX	1604◌◌	20	20	125	31	20	25	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
MTJNR/L2525M16N	●	●		1604◌◌	25	25	150	31	25	32	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
MTJNR/L2525M22N	●	●		2204◌◌	25	25	150	38	25	32	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R

✶1 Clamp Torque (N • m) : SLCS105=7.0, SLCS106=7.0

✶2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

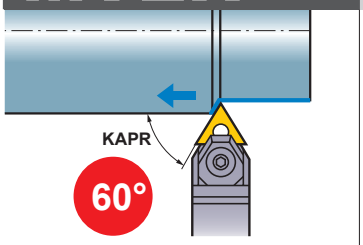
PTFN type inserts	**➤ A095—A101**
MTJN type inserts	**➤ A095—A101**
CBN & PCD inserts	**➤ B032—B034, B056**
RECOMMENDED CUTTING CONDITIONS	**➤ A010—A015, B008**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

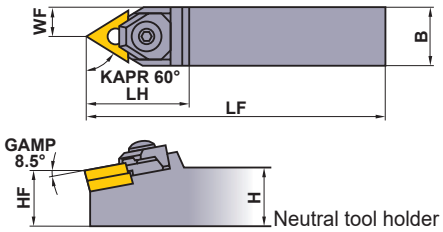
TN□□ INSERTS TOOL HOLDERS

MTEN

External turning, Chamfering

WPtype





Neutral tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16,22)	(16,22)	(16,22)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(16,22)	(16,22)	(16,22)	(16)

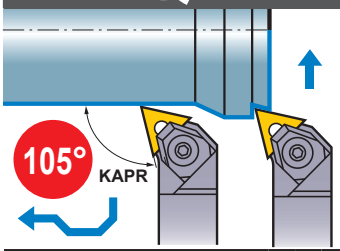
Order Number	Stock	Insert Number	Dimensions (mm)						Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw ∗1	Wrench ∗2
			H	B	LF	LH	HF	WF							
MTENN2020K16N	●	TN□A TN□G TN□M TNMX 1604□□	20	20	125	34	20	10	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
MTENN2525M22N	●	TN□A TN□G TN□M TNMX 2204□□	25	25	150	44	25	12.5	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R

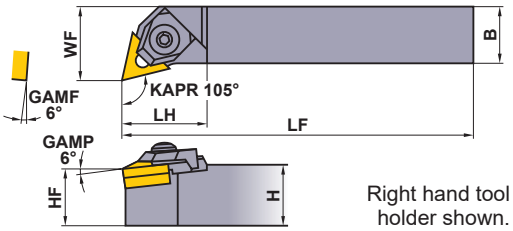
∗1 Clamp Torque (N • m) : SLCS105=7.0, SLCS106=7.0
∗2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

MTQN

Facing, Copying

WPtype





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16,22)	(16,22)	(16,22)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(16,22)	(16,22)	(16,22)	(16)

Order Number	Stock		Insert Number	Dimensions (mm)						Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw ∗1	Wrench ∗2
	R	L		H	B	LF	LH	HF	WF							
MTQNR/L2020K16N	●	●	TN□A TN□G TN□M TNMX 1604□□	20	20	125	31	20	25	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
MTQNR/L2525M22N	●	●	TN□A TN□G TN□M TNMX 2204□□	25	25	150	36	25	32	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R

Note 1) When using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

∗1 Clamp Torque (N • m) : SLCS105=7.0, SLCS106=7.0
∗2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

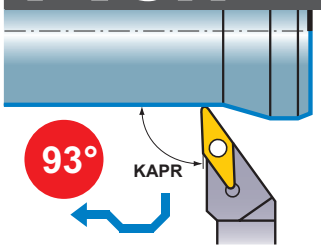
● : Inventory maintained in Japan.

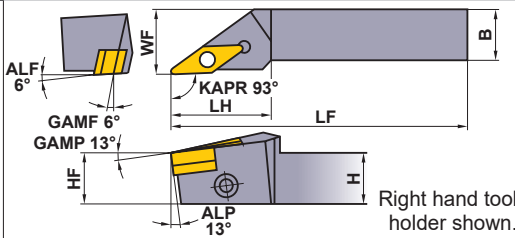
MTEN type inserts ➤ A095—A101
MTQN type inserts ➤ A095—A101
CBN & PCD inserts ➤ B032—B034, B056
RECOMMENDED CUTTING CONDITIONS ➤ A010—A015, B008

TOOL NEWS

PVJN

External turning, Copying **MP type**





Right hand tool holder shown.

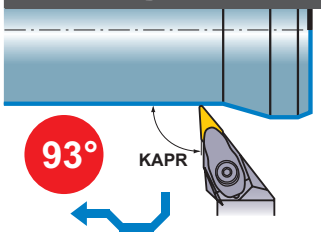
Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(16)	(16)	(16)	(16)

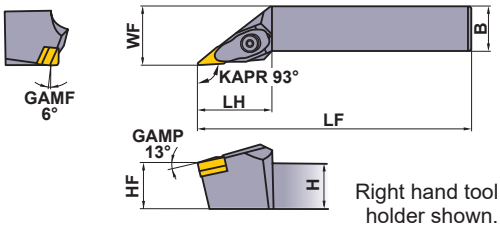
Order Number	Stock		Insert Number		Dimensions (mm)						∗2		∗1		
	R	L			H	B	LF	LH	HF	WF	Shim	Lock Pin	Lock Screw	Stop Ring	Wrench
PVJNR/L2020K16	●	●	VN□A VN□G VN□M	1604□□	20	20	125	32	20	25	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVJNR/L2525M16	●	●		1604□□	25	25	150	38	25	32		P11S	HSP05008C	E03	HKY25R

∗1 Clamp Torque (N • m) : HSP05008C=2.5
∗2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

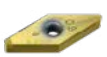
DVJN

External turning, Copying **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(16)	(16)	(16)	(16)

Order Number	Stock		Insert Number		Dimensions (mm)										∗	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DVJNR/L2020K16	●	●	VN□A VN□G VN□M	1604□□	20	20	125	41	20	25	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVJNR/L2525M16	●	●		1604□□	25	25	150	41	25	32	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

∗ Clamp Torque (N • m) : DC0520T=3.5

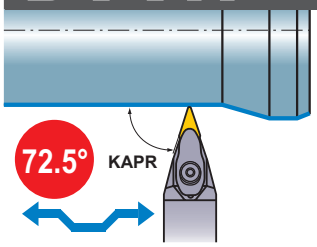
PVJN type inserts	➤ A102—A105	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008
DVJN type inserts	➤ A102—A105	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B035, B036, B057	TECHNICAL DATA	➤ Q001

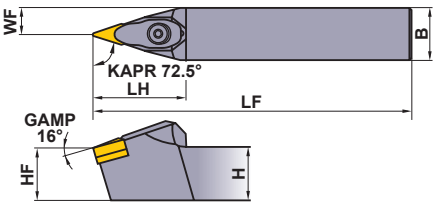
VN INSERTS TOOL HOLDERS

TOOL NEWS

DVVN

External turning, Copying **DOUBLE CLAMP type**





Neutral tool holder only.

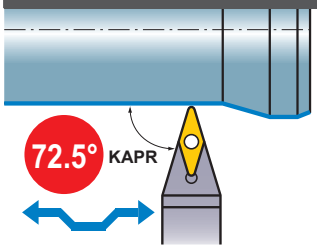
Finish	Light	Medium	Medium
FP	LP	MP	MK
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
(16)	(16)	(16)	(16)

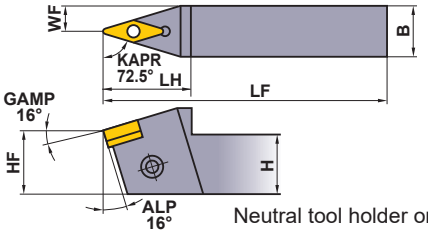
Order Number	Stock	Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	N			H	B	LF	LH	HF	WF						
DVVNN2020K16	●	VN○A VN○G VN○M	1604○○	20	20	125	44	20	10	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVVNN2525M16	●			25	25	150	44	25	12.5	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

∗ Clamp Torque (N • m) : DC0520T=3.5

PVVN

External turning, Copying **MP type**





Neutral tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
(16)	(16)	(16)	(16)

Order Number	Stock	Insert Number		Dimensions (mm)						Shim *2	Lock Pin	Lock Screw *1	Stop Ring	Wrench
	N			H	B	LF	LH	HF	WF					
PVVNN2020K16	●	VN○A VN○G VN○M	1604○○	20	20	125	38	20	10	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVVNN2525M16	●			25	25	150	38	25	12.5		P11S	HSP05008C	E03	HKY25R

∗1 Clamp Torque (N • m) : HSP05008C=2.5

∗2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

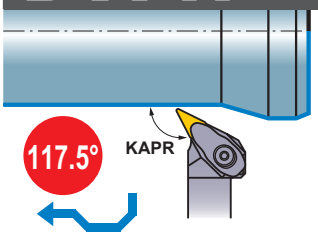
● : Inventory maintained in Japan.

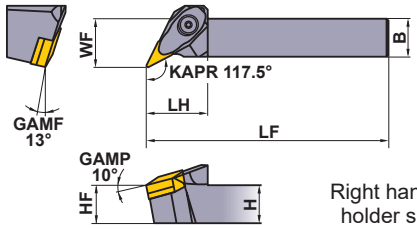
DVVN type inserts ➤ A102—A105
PVVN type inserts ➤ A102—A105
CBN & PCD inserts ➤ B035, B036, B057
RECOMMENDED CUTTING CONDITIONS ➤ A010—A015, B008

DVPN

DOUBLE CLAMP type

Facing, Copying





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(16)	(16)	(16)	(16)

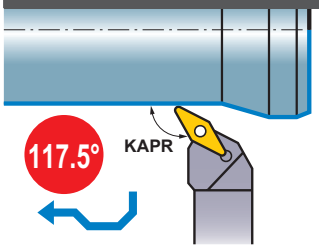
Order Number	Stock		Insert Number		Dimensions (mm)										 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DVPNR/L2020K16	●	●	VN□A VN□G VN□M	1604□□	20	20	125	32	20	25	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVPNR/L2525M16	●	●			25	25	150	32	25	32	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

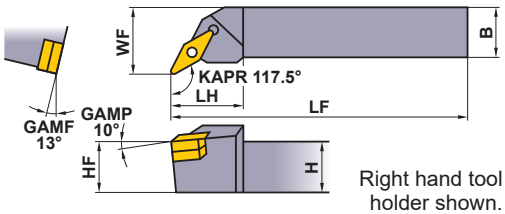
∗ Clamp Torque (N • m) : DC0520T=3.5

PVPN

MP type

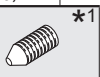
Facing, Copying





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(16)	(16)	(16)	(16)

Order Number	Stock		Insert Number		Dimensions (mm)						 *2		 *1		
	R	L			H	B	LF	LH	HF	WF	Shim	Lock Pin	Lock Screw	Stop Ring	Wrench
PVPNR/L2020K16	●	●	VN□A VN□G VN□M	1604□□	20	20	125	32	20	25	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVPNR/L2525M16	●	●			25	25	150	32	25	32		P11S	HSP05008C	E03	HKY25R

∗1 Clamp Torque (N • m) : HSP05008C=2.5

∗2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

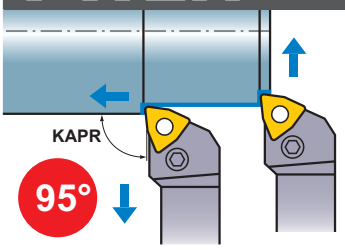
DVPN type inserts	➤ A102—A105	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015, B008
PVPN type inserts	➤ A102—A105	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B035, B036, B057	TECHNICAL DATA	➤ Q001

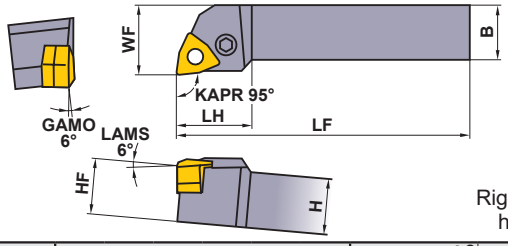
WN□□ INSERTS TOOL HOLDERS

TOOL NEWS

PWLN

External turning, Facing **LL type**





Right hand tool holder shown.

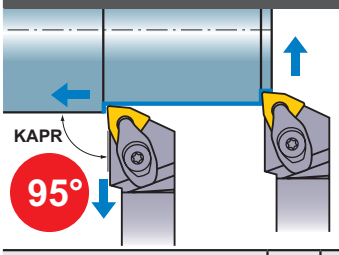
Light	Medium
LP (06)	MP (06)
Stainless	
MM (06)	

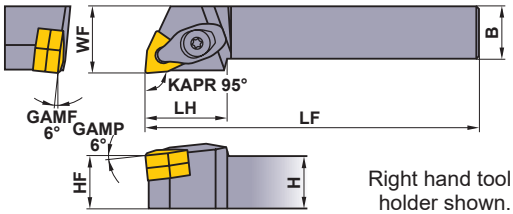
Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim *2	Shim Pin	Clamp Lever	Clamp Screw *1	Wrench
PWLNR/L1616H06	●	●	WNMG	06T3□□	16	16	100	22	16	20	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R
PWLNR/L2020K06	●	●		06T3□□	20	20	125	22	20	25	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R
PWLNR/L2525M06	●	●		06T3□□	25	25	150	25	25	32	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R

*1 Clamp Torque (N • m) : LLCS106=2.2
*2 Please use shim no. LLSWN32 with 4.76mm thick inserts. When using inserts, shim should be ordered separately.

DWLN

External turning, Facing **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP (08)	LP (06,08)	MP (06,08)	MK (08)
Medium	Medium to Rough	Stainless	CBN
Standard (08)	RP (08)	MM (06,08)	(08)

Order Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim *2	Shim Pin	Clamp Bridge	Spring	Clamp Screw *1	Wrench
DWLNR/L1616H06	●	●	WNMA WNMG WNGA	06T3□□	16	16	100	25	16	20	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2020K06	●	●		06T3□□	20	20	125	25	20	25	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2525M06	●	●		06T3□□	25	25	150	25	25	32	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2020K08	●	●		0804□□	20	20	125	31	20	25	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L2525M08	●	●		0804□□	25	25	150	31	25	32	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L3225P08	●	●		0804□□	32	25	170	31	32	32	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (N • m) : DC0520T=3.5, DC0621T=5.0
*2 Please use shim no. LLSWN32 with 4.76mm thick inserts. When using inserts, shim should be ordered separately.

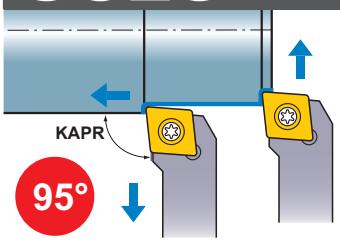
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

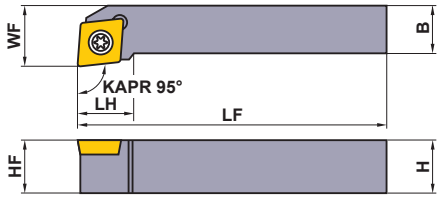
● : Inventory maintained in Japan.

PWLN type inserts ➤ A106—A110
DWLN type inserts ➤ A106—A110
CBN inserts ➤ B037
RECOMMENDED CUTTING CONDITIONS ➤ A010—A015, B008

SCLC

External turning, Facing **SP type**





Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP  (06,09)	LP  (06,09)	MP  (06,09,12)	FM  (06,09)
Stainless	**Stainless**	**Flat top**	**PCD/CBN**
LM  (06,09)	MM  (06,09,12)	 (06,09,12)	 (06,09,12)

Order Number	Stock		Insert Number		Dimensions (mm)						∗1	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SCLCR/L0808D06	●	●	CC□B CC□H ∗2 CC□T CC□W	0602□□	8	8	60	8.9	8	10	TS25	TKY08F
SCLCR/L1010E06	●	●		0602□□	10	10	70	8.9	10	12	TS25	TKY08F
SCLCR/L1212F09	●	●		09T3□□	12	12	80	13.6	12	16	TS43	TKY15F
SCLCR/L1616H12	●	●		1204□□	16	16	100	16.7	16	20	TS5	TKY25F

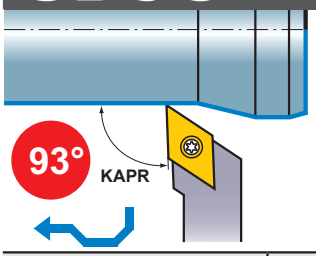
∗1 Clamp Torque (N • m) : TS25=1.0, TS43=3.5, TS5=7.5
∗2 When using CCGH and CCMH, it is recommended to use TS253 clamp screw.

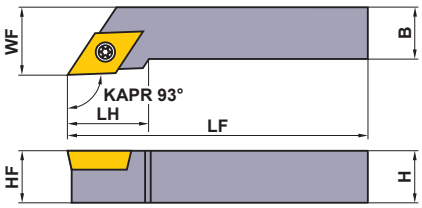
SCLC type inserts ➤ A114—A121
CBN & PCD inserts ➤ B040—B042, B059
RECOMMENDED CUTTING CONDITIONS ➤ A016—A022, B008
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

DC INSERTS TOOL HOLDERS

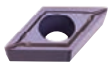
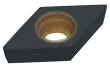
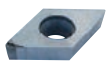
SDJC

External turning, Copying — **SP type**





Right hand tool holder shown.

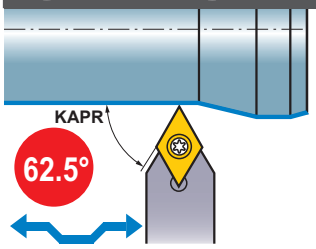
Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(07,11)	(07,11)	(07,11)	(07,11)
Stainless	**Stainless**	**Flat top**	**PCD/CBN**
LM	MM		
			
(07,11)	(07,11)	(07,11)	(07,11)

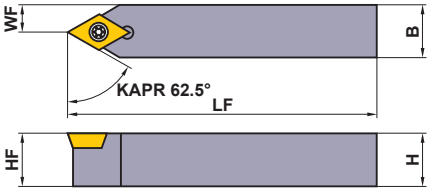
Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SDJCR/L1010E07	●	●	DCET DCGT DCMW DCMT DCGW	0702◌◌	10	10	70	12	10	12	TS25	TKY08F
SDJCR/L1212F11	●	●		11T3◌◌	12	12	80	18	12	16	TS43	TKY15F
SDJCR/L1616H11	●	●		11T3◌◌	16	16	100	18	16	20	TS43	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

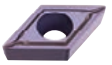
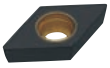
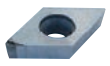
SDNC

External turning, Copying — **SP type**





Neutral tool holder only.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(07,11)	(07,11)	(07,11)	(07,11)
Stainless	**Stainless**	**Flat top**	**PCD/CBN**
LM	MM		
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock	Insert Number		Dimensions (mm)					*	
	N			H	B	LF	HF	WF	Clamp Screw	Wrench
SDNCN0808D07	●	DCET DCGT DCMW DCMT DCGW	0702◌◌	8	8	60	8	4	TS25	TKY08F
SDNCN1010E07	●		0702◌◌	10	10	70	10	5	TS25	TKY08F
SDNCN1212F11	●		11T3◌◌	12	12	80	12	6	TS43	TKY15F
SDNCN1616H11	●		11T3◌◌	16	16	100	16	8	TS43	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

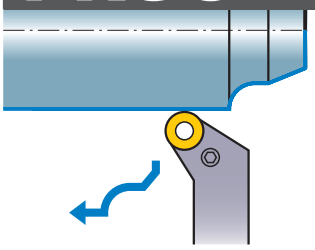
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

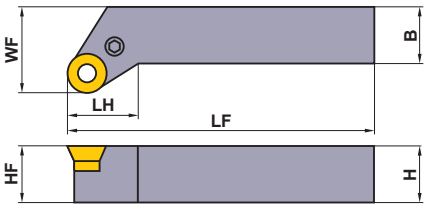
● : Inventory maintained in Japan.

SDJC type inserts ➤ A124—A129
SDNC type inserts ➤ A124—A129
CBN & PCD inserts ➤ B044, B045, B060
RECOMMENDED CUTTING CONDITIONS ➤ A016—A022, B008

PRGC

External turning, Facing, Copying — **LL type**





Right hand tool holder shown.

Medium



(10,12,16,20)

Heavy Cutting

RR



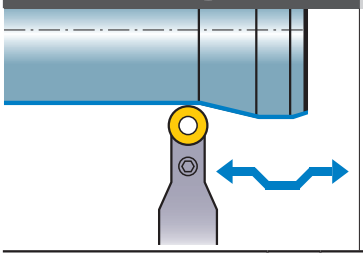
(16,20)

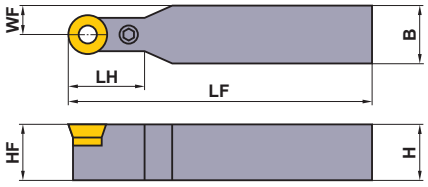
Order Number	Stock		Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R	L			H	B	LF	LH	HF	WF					
PRGCR/L2525M10	●	●	RCMX	1003M0	25	25	150	16.7	25	32	LLSRN103	LLP13	LLCL110	LLCS205	HKY20R
PRGCR/L2525M12	●	●		1204M0	25	25	150	17.5	25	32	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRGCR/L2525M16	●	●		1606M0	25	25	150	19.9	25	32	LLSRN164	LLP24	LLCL116	LLCS306	HKY25R
PRGCR/L3232P20	●	●		2006M0	32	32	170	23.8	32	40	LLSRN204	LLP15	LLCL120	LLCS508	HKY30R

* Clamp Torque (N • m) : LLCS205=1.5, LLCS106=2.2, LLCS306=2.2, LLCS508=3.3

PRDC

External turning, Copying — **LL type**





Neutral tool holder only.

Medium



(10,12,16,20)

Heavy Cutting

RR



(16,20)

Order Number	Stock	Insert Number		Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	N			H	B	LF	LH	HF	WF					
PRDCN2020K10	●	RCMX	1003M0	20	20	125	23	20	10.0	LLSRN103	LLP13	LLCL110	LLCS205	HKY20R
PRDCN2525M12	●		1204M0	25	25	150	24	25	12.5	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRDCN3225P12	●		1204M0	32	25	170	24	32	12.5	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRDCN3225P16	●		1606M0	32	25	170	28	32	12.5	LLSRN164	LLP24	LLCL116	LLCS306	HKY25R
PRDCN3232P20	●		2006M0	32	32	170	33	32	16.0	LLSRN204	LLP15	LLCL120	LLCS508	HKY30R

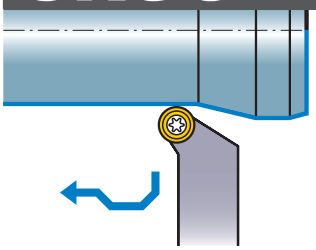
* Clamp Torque (N • m) : LLCS205=1.5, LLCS106=2.2, LLCS306=2.2, LLCS508=3.3

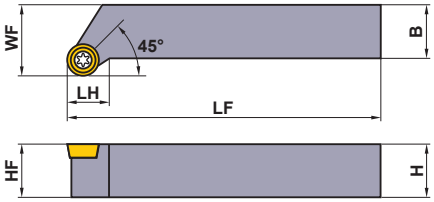
PRGC type inserts	➤ A131
PRDC type inserts	➤ A131
RECOMMENDED CUTTING CONDITIONS	➤ A016—A022
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

RC INSERTS TOOL HOLDERS

SRGC

External turning, Facing, Copying — **SP type**





Right hand tool holder shown.

Medium – Finish Cutting
AZ

(08)
Medium
Standard

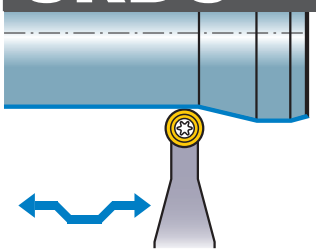
(06,08)

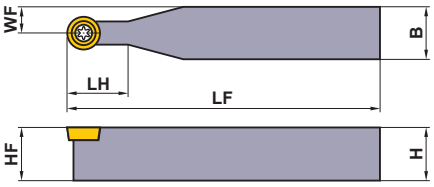
Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SRGCR/L1616H06	●	●	RCMT RCGT	0602◌◌ 0803◌◌	16	16	100	10	16	20	TS25	TKY08F
SRGCR/L1616H08	●	●			16	16	100	14.5	16	22	TS3	TKY08F

∗ Clamp Torque (N • m) : TS25=1.0, TS3=1.0

SRDC

External turning, Copying — **SP type**





Neutral tool holder only.

Medium – Finish Cutting
AZ

(08)
Medium
Standard

(06,08)

Order Number	Stock	Insert Number		Dimensions (mm)						*	
	N			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SRDCN1616H06	●	RCMT RCGT	0602◌◌ 0803◌◌	16	16	100	12	16	8	TS25	TKY08F
SRDCN1616H08	●			16	16	100	16	16	8	TS3	TKY08F

∗ Clamp Torque (N • m) : TS25=1.0, TS3=1.0

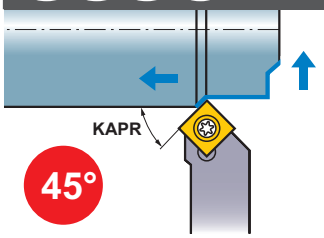
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

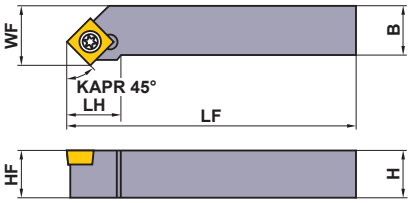
● : **Inventory maintained in Japan.**

SRGC type inserts	**➤ A131**
SRDC type inserts	**➤ A131**
RECOMMENDED CUTTING CONDITIONS	**➤ A016—A022**

SSSC

External turning, Facing, Chamfering **SP type**





Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(09)	(09)	(09)	(09)
Stainless	**Stainless**	**Medium**	**Flat top**
LM	MM	Standard	
			
(09)	(09)	(09)	(09)

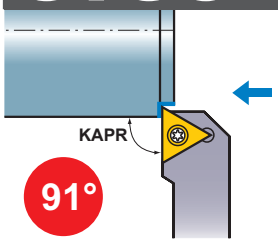
Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SSSCR/L1212F09	●	●	SCMW SCMT	09T3○○	12	12	80	15.2	12	13	TS43	TKY15F
SSSCR/L1616H09	●	●		09T3○○	16	16	100	15.2	16	17	TS43	TKY15F

* Clamp Torque (N • m) : TS43=3.5

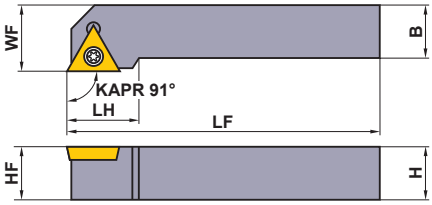
SSSC type inserts ➤ A132, A133
RECOMMENDED CUTTING CONDITIONS ➤ A016—A022
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

TC INSERTS TOOL HOLDERS

STGC



External turning **SP type**



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(11,16)	(11,16)	(11,13,16)	(11,16)
Stainless	**Stainless**	**Flat top**	**PCD/CBN**
LM	MM		
			
(11,16)	(11,13,16)	(11,13,16)	(11,13,16)

Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
STGCR/L1010E11	●	●	TCGT TCMT TCGW TCMW	1102○○ 1303○○ 16T3○○	10	10	70	13.5	10	12	TS25	TKY08F
STGCR/L1212F13	●	●			12	12	80	17.6	12	16	TS3	TKY08F
STGCR/L1616H16	●	●			16	16	100	20.7	16	20	TS43	TKY15F

* Clamp Torque (N • m) : TS25=1.0, TS3=1.0, TS43=3.5

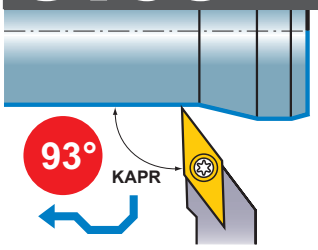
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

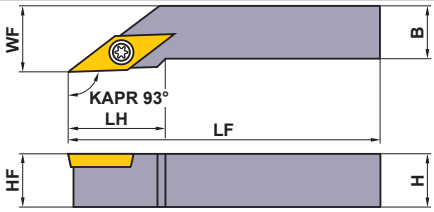
● : **Inventory maintained in Japan.**

STGC type inserts	**➤ A135—A137**
CBN & PCD inserts	**➤ B046, B061**
RECOMMENDED CUTTING CONDITIONS	**➤ A016—A022, B008**

SVJC

External turning, Copying — **SP type**





Right hand tool holder shown.

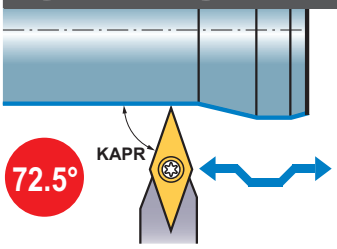
Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(11,16)	(11,16)	(16)	(11,16)
Stainless	**Stainless**	**Medium**	**Flat top**
LM	MM	Standard	
			
(11,16)	(16)	(11,16)	(11,16)

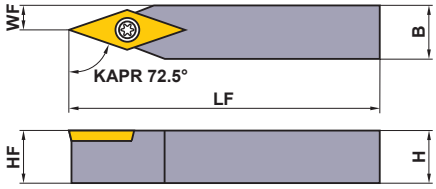
Order Number	Stock		Insert Number		Dimensions (mm)						 Shim	 Shim Pin	 * Clamp Screw	 Wrench
	R	L			H	B	LF	LH	HF	WF				
SVJCR/L1010E11	●	●	VCGT VCGW VCMT VCMW	1103○○	10	10	70	17	10	12	—	—	TS25	①TKY08F
SVJCR/L1616H16	●	●		1604○○	16	16	100	25	16	20	—	—	TS43	①TKY15F
SVJCR/L2020K16	●	●		1604○○	20	20	125	40	20	25	SPSVN32	BCP141	TS44	②TKY15R
SVJCR/L2525M16	●	●		1604○○	25	25	150	40	25	32	SPSVN32	BCP141	TS44	②TKY15R

* Clamp Torque (N • m) : TS25=1.0, TS43=3.5, TS44=3.5

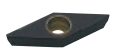
SVVC

External turning, Copying — **SP type**





Neutral tool holder only.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(16)	(16)	(16)	(16)
Stainless	**Stainless**	**Medium**	**Flat top**
LM	MM	Standard	
			
(16)	(16)	(16)	(16)

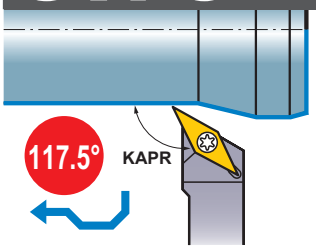
Order Number	Stock	Insert Number		Dimensions (mm)					 Shim	 Shim Pin	 * Clamp Screw	 Wrench
	N			H	B	LF	HF	WF				
SVVCN1616H16	●	VCGT VCGW VCMT VCMW	1604○○	16	16	100	16	8	—	—	TS43	①TKY15F
SVVCN2020K16	●		1604○○	20	20	125	20	10	SPSVN32	BCP141	TS44	②TKY15R
SVVCN2525M16	●		1604○○	25	25	150	25	12.5	SPSVN32	BCP141	TS44	②TKY15R

* Clamp Torque (N • m) : TS43=3.5, TS44=3.5

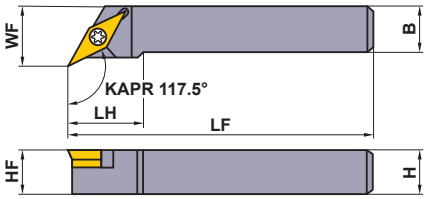
SVJC type inserts	➤ A145—A147	RECOMMENDED CUTTING CONDITIONS	➤ A016—A022, B008
SVVC type inserts	➤ A145—A147	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B050, B064	TECHNICAL DATA	➤ Q001

VC INSERTS TOOL HOLDERS

SVPC



Facing, Copying **SP type**



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(16)	(16)	(16)	(16)
Stainless	**Stainless**	**Medium**	**Flat top**
LM	MM	Standard	
			
(16)	(16)	(16)	(16)

Order Number	Stock		Insert Number		Dimensions (mm)								 *	
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Screw	Wrench
SVPCR/L2020K16	●	●	VCGT VCGW	1604○○	20	20	125	30	20	25	SPSVN32	BCP141	TS44	TKY15R
SVPCR/L2525M16	●	●	VCMT VCMW	1604○○	25	25	150	30	25	32	SPSVN32	BCP141	TS44	TKY15R

* Clamp Torque (N • m) : TS44=3.5

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

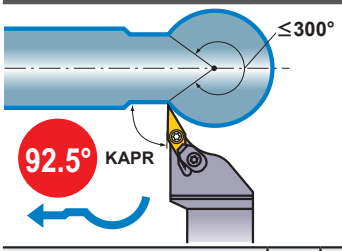
● : Inventory maintained in Japan.

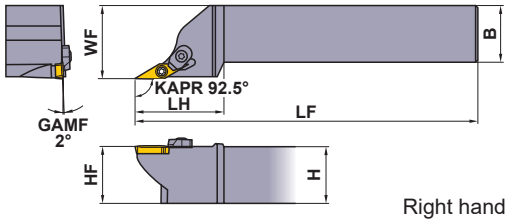
SVPC type inserts	➤ A145—A147
CBN inserts	➤ B050, B064
RECOMMENDED CUTTING CONDITIONS	➤ A016—A022, B008

SXZC

External turning, Copying — **Profile type**

Finish: SVX





Right hand tool holder shown.



(15)

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	LH	HF	WF	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Insert Wrench	Wrench for clamp bridge
SXZCR/L1616H15	●	●	XCMT	1503○○-SVX	16	16	100	35	16	20	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L2020K15	●	●	XCMT	1503○○-SVX	20	20	125	35	20	25	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L2525M15	●	●	XCMT	1503○○-SVX	25	25	150	40	25	32	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F

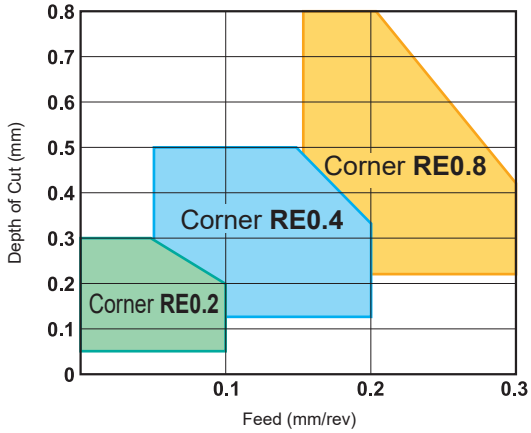
* Clamp Torque (N • m) : TS255=1.0, AJS3010T10=2.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UE6020**	250 (150—350)
P	Carbon Steel, Alloy Steel	150HB—250HB	**UE6020**	175 (100—250)
M	Stainless Steel	≤200HB	**VP15TF**	100 (70—120)

The above cutting conditions are general guidelines.
Adjustments maybe necessary depending on machine rigidity, workpiece geometry and clamping.

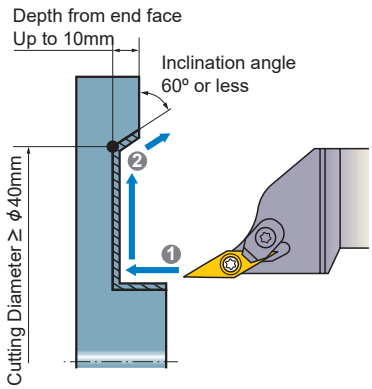
■ Applicable range



NOTE

Notes when end face copying

Pay special attention to the following when face copying.



Machining of an outer diameter (Step ①)

- To prevent burr formation, the depth of cut should be below half the nose radius.

Machining of an inclination (Step ②)

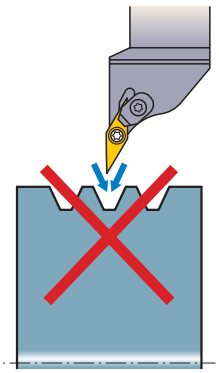
- To reduce the contact length of chips, the depth of cut should be below half the nose radius.
- To prevent interference between the tool and the workpiece, the cutting diameter should be 40mm or larger, inclination angle 60° or less and depth from the end face up to 10mm.

When changing inserts

- When indexing the inserts, it is recommended to preset the cutting edge position to maintain machining accuracy.

Not possible

●Machining of V-pulleys



When machining V-pulleys, use a VNMG insert.

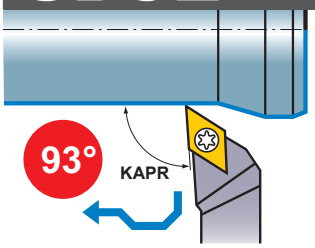
SXZC type inserts ➢ A153

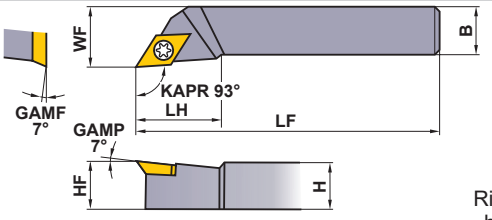
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

DE○○ INSERTS TOOL HOLDERS

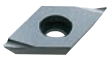
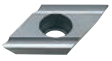
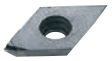
SDJE

External turning, Copying — **AL type**





Right hand tool holder shown.

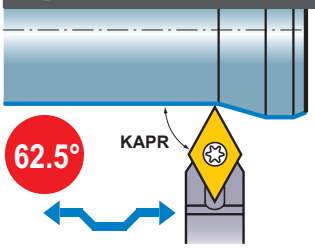
Finish	Medium
R/L-F	R/L
 (15)	 (15)
PCD	
R/L-F	
 (15)	

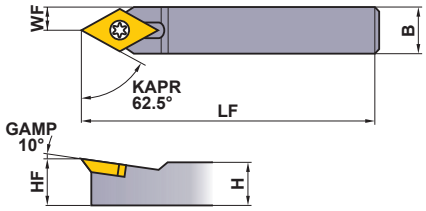
Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	LH	HF	WF	* Clamp Screw	Wrench
SDJER/L1616H15	●	●	DEGX	1504○○	16	16	100	27	16	20	CS451190T	TKY20F
SDJER/L2020K15	●	●	DEGX	1504○○	20	20	125	35	20	25	CS451190T	TKY20F
SDJER/L2525M15	●	●	DEGX	1504○○	25	25	150	35	25	32	CS451190T	TKY20F

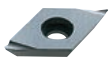
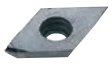
∗ Clamp Torque (N • m) : CS451190T=5.0

SDNE

External turning, Copying — **AL type**





Finish	Medium
R/L-F	R/L
 (15)	 (15)
PCD	
R/L-F	
 (15)	

Order Number	Stock	Insert Number		Dimensions (mm) H	B	LF	HF	WF	* Clamp Screw	Wrench
SDNEN1616H15	●	DEGX	1504○○	16	16	100	16	8	CS451190T	TKY20F
SDNEN2020K15	●	DEGX	1504○○	20	20	125	20	10	CS451190T	TKY20F
SDNEN2525M15	●	DEGX	1504○○	25	25	150	25	12.5	CS451190T	TKY20F

∗ Clamp Torque (N • m) : CS451190T=5.0

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N	Aluminium Alloy	**HTi10**	400	0.05−0.3	0.2−3.0
		MD220	800	0.05−0.3	0.2−0.5

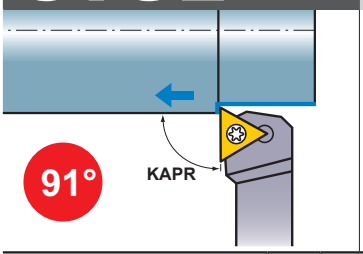
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

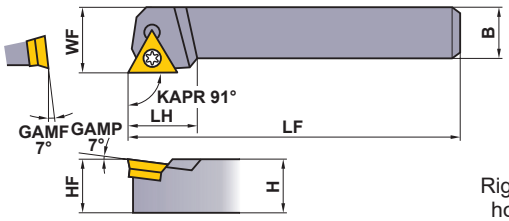
● : **Inventory maintained in Japan.**

SDJE type inserts ➤ **A130**
SDNE type inserts ➤ **A130**
PCD inserts ➤ **B066**

STGE

External turning — **AL type**





Right hand tool holder shown.

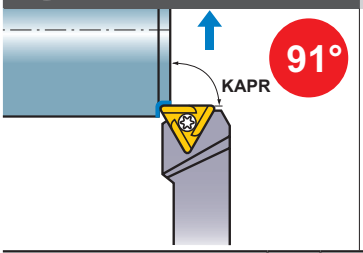
Medium	PCD
R/L	R/L
 (16)	 (16)
PCD	
 (16)	

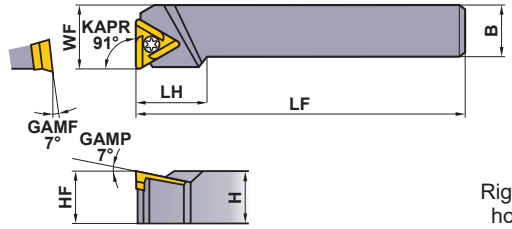
Order Number	Stock		Insert Number		Dimensions (mm)						* Clamp Screw	Wrench
	R	L			H	B	LF	LH	HF	WF		
STGER/L1616H16	●	●	TEGX	1603○○	16	16	100	22	16	20	FC400890T	TKY10F
STGER/L2020K16	●	●		1603○○	20	20	125	22	20	25	FC400890T	TKY10F
STGER/L2525M16	●	●		1603○○	25	25	150	22	25	32	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

STFE

Facing — **AL type**





Right hand tool holder shown.

Medium	PCD
R/L	R/L
 (16)	 (16)
PCD	
 (16)	

Order Number	Stock		Insert Number		Dimensions (mm)						* Clamp Screw	Wrench
	R	L			H	B	LF	LH	HF	WF		
STFER/L1616H16	●	●	TEGX	1603○○	16	16	100	22	16	20	FC400890T	TKY10F
STFER/L2020K16	●	●		1603○○	20	20	125	22	20	25	FC400890T	TKY10F
STFER/L2525M16	●	●		1603○○	25	25	150	22	25	32	FC400890T	TKY10F

Note 1) When using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

∗ Clamp Torque (N • m) : FC400890T=2.5

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N	Aluminium Alloy	**HTi10**	400	0.05−0.3	0.2−3.0
		MD220	800	0.05−0.3	0.2−0.5

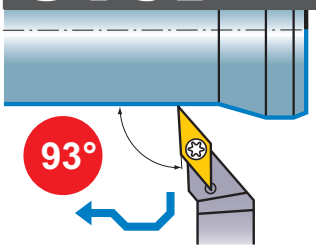
STGE type inserts	**➤ A138**
STFE type inserts	**➤ A138**
PCD inserts	**➤ B066**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

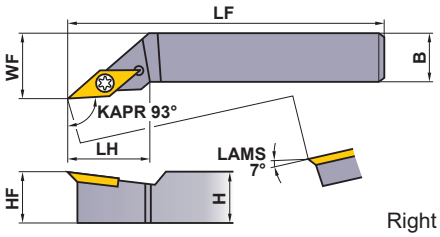
VD○○ INSERTS TOOL HOLDERS

SVJD

External turning, Copying

AL type





Right hand tool holder shown.

Finish

R/L



(16)

PCD

R/L-F



(16)

Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
SVJDR/L1616H16	●	●	VDGX	1603○○	16	16	100	30	16	20	FC400890T	TKY10F
SVJDR/L2020K16	●	●		1603○○	20	20	125	30	20	25	FC400890T	TKY10F
SVJDR/L2525M16	●	●		1603○○	25	25	150	30	25	32	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N	Aluminium Alloy	**HTi10**	400	0.05—0.3	0.2—3.0
		MD220	800	0.05—0.3	0.2—0.5

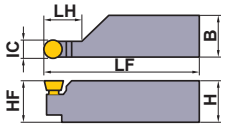
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

● : **Inventory maintained in Japan.**

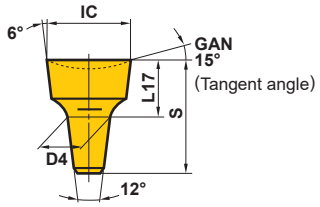
SVJD type inserts ➢ **A148**
PCD inserts ➢ **B067**

TL TYPE HOLDER

HOLDER

Geometry	Revised order number	Conventional order number	Stock	Insert Number	Dimensions (mm)					
					IC	H	B	HF	LF	LH
TLHR (External turning, Copying) 	**TLHR2020K5**	TLHR2020K5	●	RTG05A	5	20	20	20	125	16
	TLHR2020K6	TLHR2020K6	●	RTG06A	6	20	20	20	125	16
	TLHR2525M7	TLHR2525M7	●	RTG07A	7	25	25	25	150	20
	TLHR3225P10	TLHR54P10	●	RTG10A	10	32	25	32	170	25

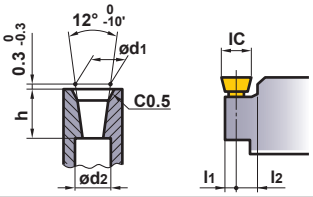
INSERTS



Order Number	Stock Carbide		Dimensions (mm)			
	UTi20T	HTi10	IC	S	D4	L17
RTG05A	●	●	5	7.5	2.5	3.5
RTG06A	●	●	6	7.5	3.5	3.5
RTG07A	●		7	11	3.5	5
RTG08A	●	●	8	11	4.5	5
RTG10A	●	●	10	14	5.5	6.5

INSERT SEAT LOCATION

When manufacturing a special tool holder, please machine insert seat in accordance to the drawing.

Insert Seat Dimensions	Insert Diameter **IC**	Dimensions (mm)					Taper Diameter
		h	d_1	d_2	l_1	l_2	
	5	4	2.5	1.9	1.85	3.2	1.5
	6	4	3.5	2.9	2.35	3.7	2.5
	7	6	3.5	2.5	2.75	4.3	2.1
	8	6	4.5	3.5	3.25	4.8	3.1
	10	7.5	5.5	4.2	4.15	5.9	3.8
	12	7.5	7.5	6.2	5.15	6.9	5.8

SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

HOW TO READ THE STANDARD OF SMALL TOOLS

●How this section page is organised

①Organised according to the cutting mode of small tools.
(Refer to the inside title on the next page.)
②Shown as Turning → External Grooving → External Cutting Off → Threading → Boring.

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

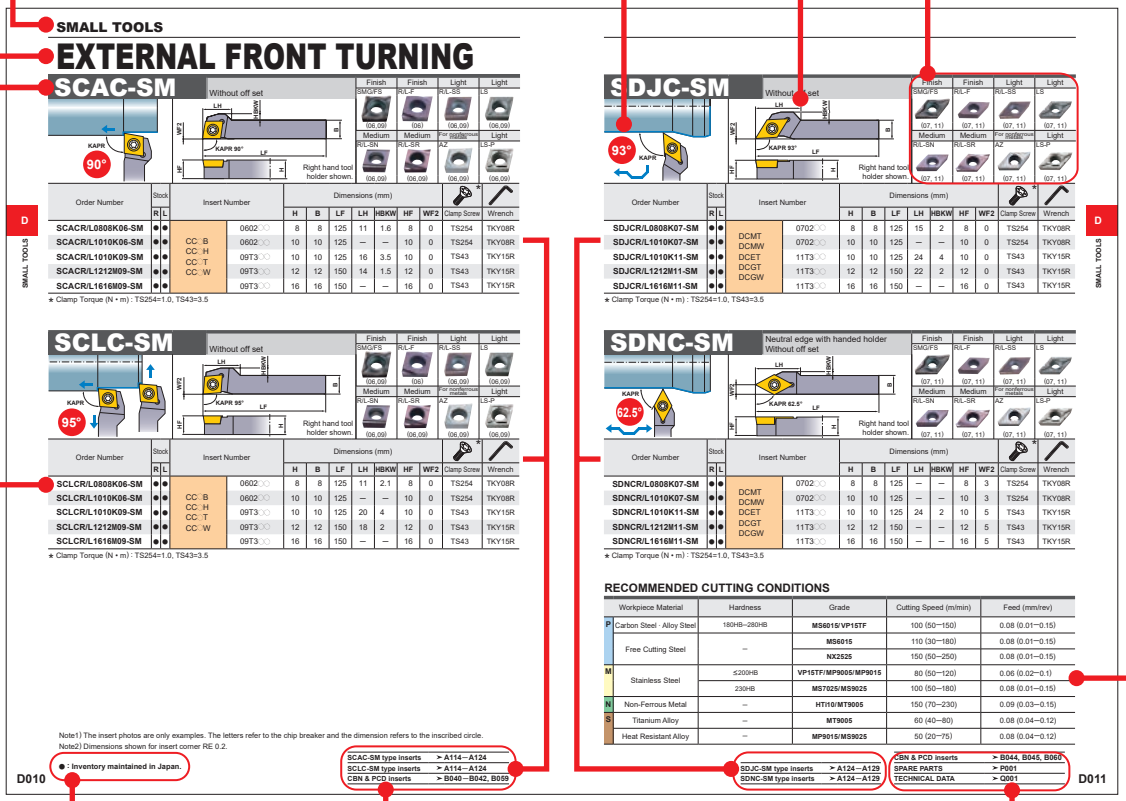
APPLICATION

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, chamfering, threading, and grooving together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each workpiece material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M and N.

●To Order : Please specify
①order number and hand of tool (right/left).

TURNING TOOLS

SMALL TOOLS

OUTLINE OF SMALL TOOLS ····· D002
CLASSIFICATION ····· D006

STANDARD OF SMALL TOOLS

EXTERNAL FRONT TURNING
SCAC-SM ····· D010
SCLC-SM ····· D010
SDJC-SM ····· D011
SDNC-SM ····· D011
SVLP-SM ····· D012
SVJB-SM ····· D012
SVJC-SM ····· D013
SVPP-SM ····· D013
SVVB-SM ····· D013

EXTERNAL BACK TURNING
BTAH ····· D014
CTBH ····· D015
BTVH ····· D016

EXTERNAL GROOVING
GTAH ····· D018
GTBH ····· D018
GTCH ····· D018

EXTERNAL CUTTING OFF
CTAH ····· D020
CTAH-S ····· D020
CTBH ····· D022

EXTERNAL THREADING
TTAH ····· D024

EXTERNAL FRONT TURNING, COPYING, FACING
SH ····· D026

CAM TYPE TOOL POSTS
CSVH ····· D027

BORING
SBAH ····· D030

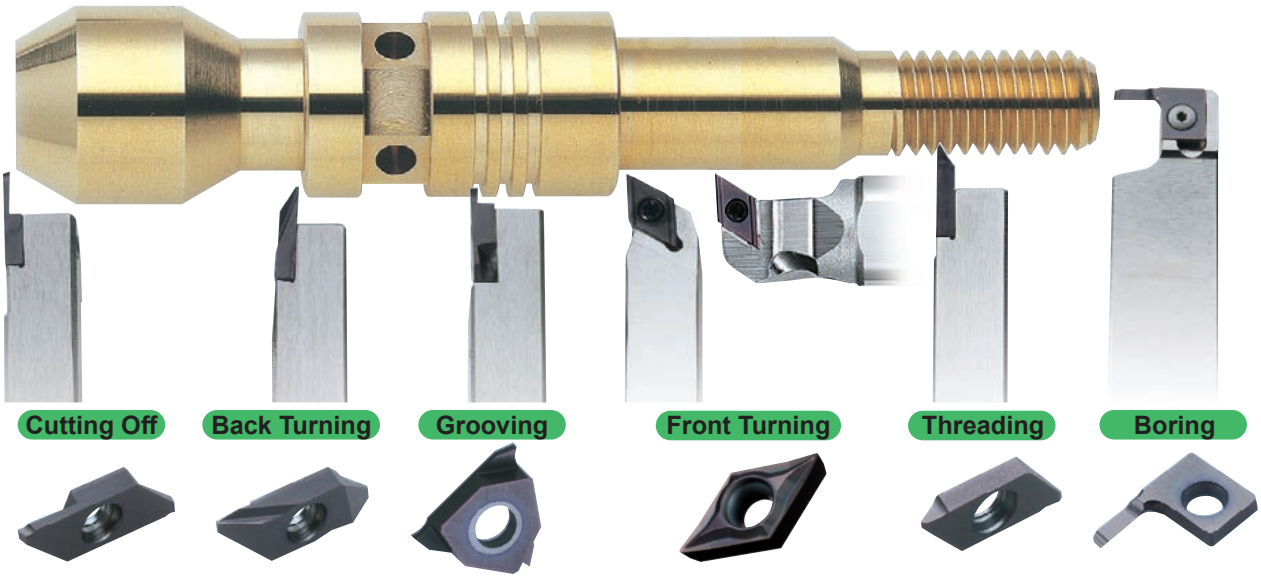


*Arranged by Alphabetical order

D014 **BTAH**
D014 **BTAT INSERTS**
D015 **BTBT INSERTS**
D016 **BTVH**
D016 **BTVT INSERTS**
D027 **CSVH**
D028 **CSVTBXL INSERTS**
D028 **CSVTB INSERTS**
D028 **CSVTC INSERTS**
D027 **CSVTF INSERTS**
D027 **CSVTFXL INSERTS**
D029 **CSVTG INSERTS**
D029 **CSVTT INSERTS**
D020 **CTAH**
D020 **CTAH-S**
D021 **CTAT INSERTS**
D015 **CTBH**
D022 **CTBH**
D022 **CTBT INSERTS**
D018 **GTAH**
D018 **GTAT INSERTS**
D018 **GTBH**
D018 **GTBT INSERTS**
D018 **GTCH**
D018 **GTCT INSERTS**
D030 **SBAH**
D030 **SBAT INSERTS**
D010 **SCAC-SM**
D010 **SCLC-SM**
D011 **SDJC-SM**
D011 **SDNC-SM**
D026 **SH**
D012 **SVJB-SM**
D013 **SVJC-SM**
D012 **SVLP-SM**
D013 **SVPP-SM**
D013 **SVVB-SM**
D024 **TTAH**
D024 **TTAT INSERTS**

OUTLINE OF SMALL TOOLS

TOOLS FOR GANG TYPE AUTOMATIC LATHES (FOR EXTERNAL TURNING AND BORING)



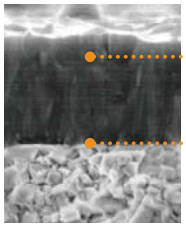
MS Series - PVD Coated Grades for High Precision and Small Parts Machining

MS6015

Skilled at pure iron, carbon steel and free cutting steel turning and achieving implemented stable finished surfaces and excellent dimensional accuracy.

	MS6015	Conventional
Coating	TiCN multilayer	TiAlN
Hardness (HV)	3,000	2,800
Wear Coefficient (Carbon Steel)	Low	High
Base Material Hardness (HRA)	92.0	92.0
T.R.S (GPa)	2.0	2.0

Ti-C-N Multilayer Coating



Superior wear and welding resistance and demonstrating the best possible results for carbon steel.

Minute multilayers remarkably improve welding.

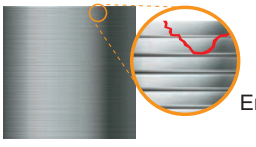
MS7025 NEW

Dramatically improved welding and wear resistance in low feed machining with a more precise nano-multilayer coating

By combining the high lubrication layer with excellent welding resistance, and the high hardness layer with a greater wear resistance that suppresses the progress of wear at the nano-level, the film damage is significantly reduced and the welding and wear resistance are dramatically improved.



Conventional Multilayer Coating



Enlarged Image

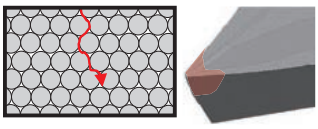
Nano-multilayer Coating

MS9025 NEW

Effective reduction of notch wear of stainless steel with a balance of wear and fracture resistance

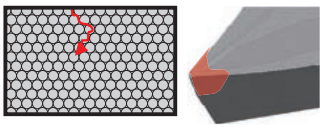
Thermal conductivity has been improved by optimizing the grain size and therefore reducing the boundary contact between the WC particles. This optimization reduces the temperature of the cutting edge during machining.

MS9025



Reducing the cutting edge temperature by improved thermal conductivity.

Conventional



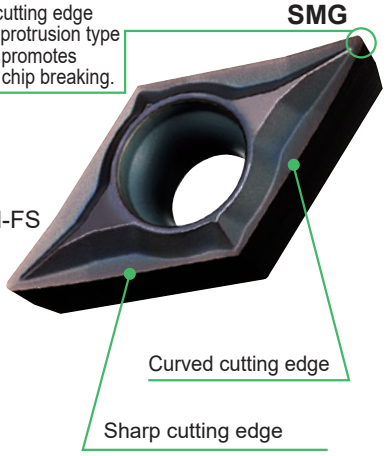
Higher cutting edge temperatures due to more particle boundary contact.

●Moulded breaker insert

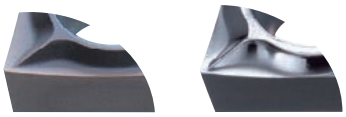
Nose radii designed with minus tolerance

- Suitable for small parts applications that often require minus tolerance dimensions.
- The order number is shown with the letter "M" that indicates minus tolerance. ex) DCGT11T301M-FS
- The radius value is printed on the side of the insert label for easy recognition.

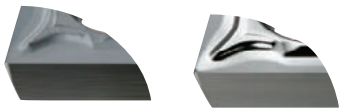
A combination of a curved cutting edge and the protrusion type breaker promotes efficient chip breaking.



FS FS-P



LS LS-P



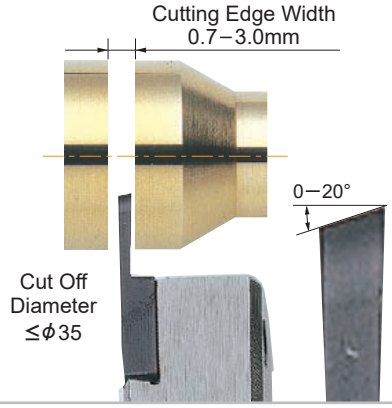
●Tolerance Corner R



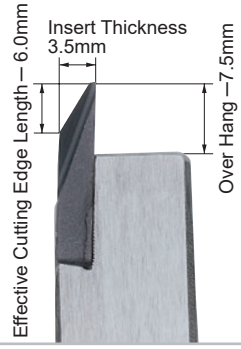
E class
RE $^{0}_{-0.02}$ mm

The letter "M" insert
RE $^{0}_{-0.05}$ mm
(Conventional G-class insert
RE ±0.10 mm)

●Cutting Off



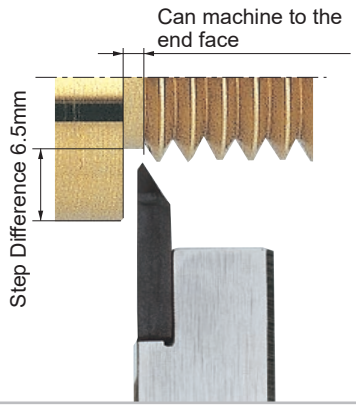
●Back Turning



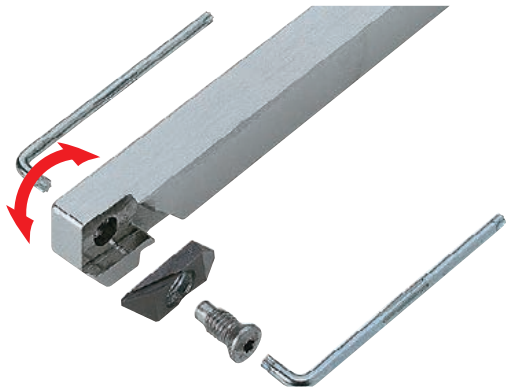
Inserts for Moulded Back Turning
SMB Breaker



●Threading



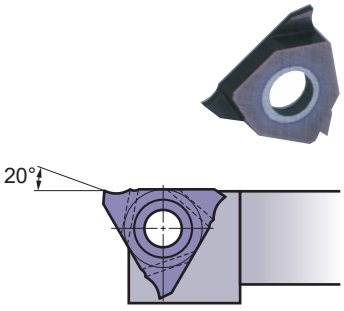
●Back Clamping Mechanism



Screw designed for front and back clamping.

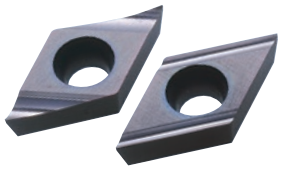
●Grooving

- 3-cornered
- Groove width 0.3–3.0mm
- Traversing possible



●Front Turning

- ISO E class accuracy inserts
- A wide variety of small corner R inserts
- Rake angle 30°



OUTLINE OF SMALL TOOLS

Grooving System

GY series

Monoblock Holder for Swiss-type Automatic Lathe

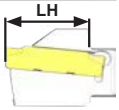
Max. Cut Off Diameter : 34mm

The new geometry with greatly improved rigidity suppresses vibrations and dimensional changes thereby solving problems during cut off.



Overhang Length Compatible with Swiss-type Automatic Lathes

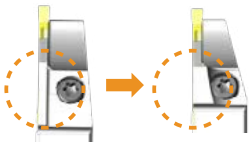
Head length corresponding to the maximum machining diameter of CNC Swiss Type automatic lathes and turret machines.



Features of High Rigidity Holder

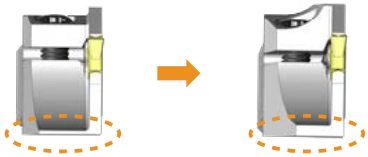
Strong Clamp Bridge

The strong design of the clamp bridge suppresses chatter and vibration.



Thicker Tool Base

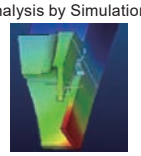
Tool deflection caused by cutting resistance is greatly reduced.



Analysis by Simulation
Deflection Measurement : 0.044

Analysis by Simulation
Deflection Measurement : 0.013

Analysis by Simulation



Cutting Off & Grooving System

GW series

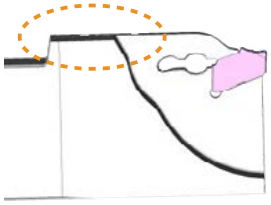
Monoblock Holder for Swiss-type Automatic Lathe

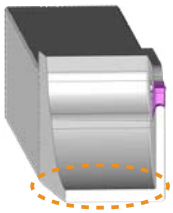
Max. Cut Off Diameter : 76mm



High Rigidity Holder

Tool deflection caused by cutting resistance and the remaining material pip in the centre are greatly reduced.





New Low Resistance and High Lead Angle Insert

New inserts with a lead angle of 8° have been added to the range to reduce burrs and the remaining material pip in the centre.



Lead Angle 5°



Lead Angle 8°

Tools for a very wide range of small parts machining

External Turning	Tools for front turning, back turning, grooving, threading, and cutting off
Internal Turning	Tools for boring, internal grooving and internal threading
Drilling	Drills
End Milling	End Mills

Tools for CNC automatic and small lathes

Types of Tool Posts	Gang type, turret type, cam type (radial pattern type)
Tool Sizes	Square shank: 8–16 mm Round shank : less than ϕ25.4

Indexable inserts developed under the concept of "high-quality, high efficiency and long tool life."

High-Quality	E class tolerance, sharp cutting edge, high accuracy small corner R, smooth surface finish
Long Tool Life	PVD coating MS6015/MS7025/MS9025/VP15TF
High Efficiency	Regrinding not necessary due to the employment of indexable inserts. A wide variety of top cutting edge geometries

TOOLS FOR CAM TYPE AUTOMATIC LATHES

- The most suitable for the use with cam type automatic lathes (radial pattern tool posts)
- The most suitable for machining of small parts with work diameter 5mm or smaller
- Single holder for front turning, back turning, grooving, threading and cutting off operations





Front Turning | Back Turning | Grooving | Threading | Cutting Off

INTERNAL TURNING TOOLS

Solid type

MICRO-MINI TWIN Boring Bars

Minimum cutting diameter ϕ2.2–

Boring
Grooving
Threading

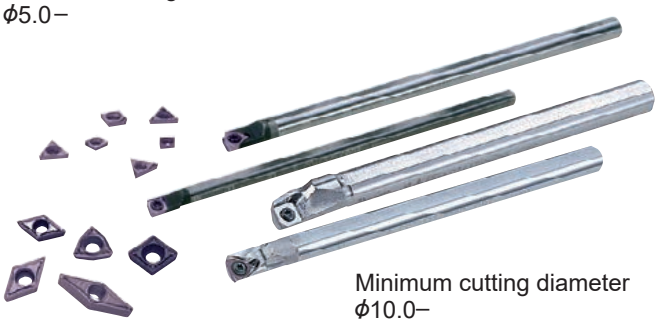


Round Shank

Square Shank

MICRO-DEX Boring Bars

Minimum cutting diameter
ϕ5.0–



Minimum cutting diameter
ϕ10.0–

DIMPLE BAR

DRILLING TOOLS

Leading Drill Series

DLE



Leading Drill Series

GKCD NEW



Solid Carbide Drills for Swiss-type Automatic & Small CNC Lathes

WSTAR Drill Series

DWAE NEW



TRISTAR Drill Series

DVAS Mini Size



END MILLING TOOLS

For Swiss Type Automatic Lathes

MS Plus End Mill Series

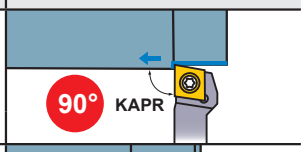
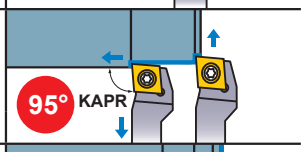
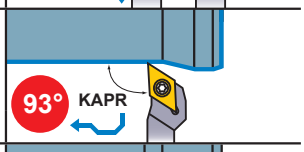
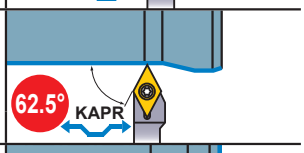
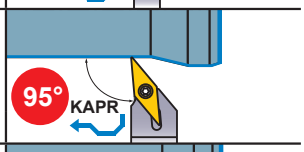
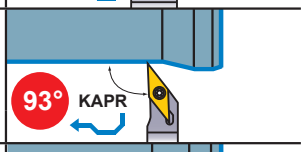
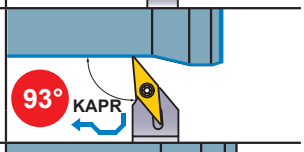
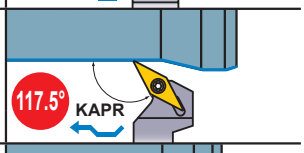
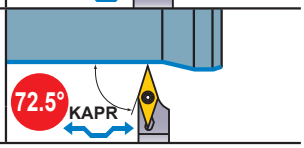
MP2ES/MP3ES/MP4EC NEW



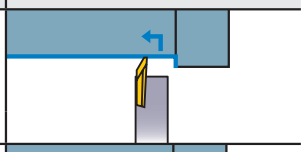
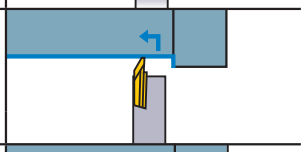
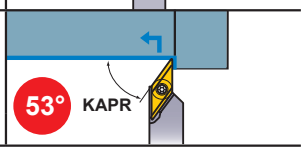
CLASSIFICATION OF EXTERNAL TURNING TOOLS

GANG TYPE TOOL POSTS

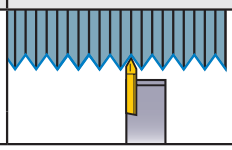
● FRONT TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
SCAC-SM ➲ D010	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SCLC-SM ➲ D010	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDJC-SM ➲ D011	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDNC-SM ➲ D011	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVLP-SM ➲ D012	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVJB-SM ➲ D012	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVJC-SM ➲ D013	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
SVPP-SM ➲ D013	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVVB-SM ➲ D013	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	

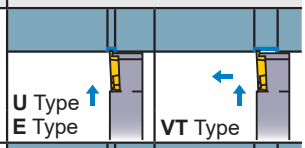
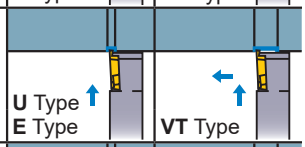
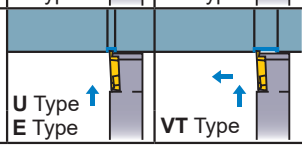
● BACK TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
BTAH (Insert Size 2.8, 3.5, 5.0mm) ➲ D014	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTBH (Insert Size 4.5, 6.0mm) ➲ D015	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
BTVH (Insert Size 7.5mm) ➲ D016	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

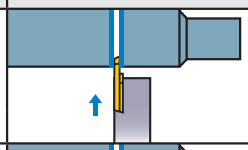
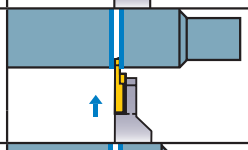
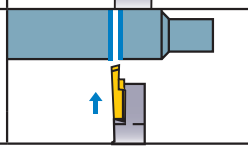
● THREADING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
TTAH ➲ D024	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

● GROOVING

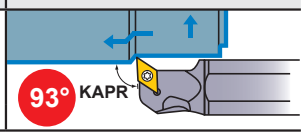
Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
GTAH (Groove Width 0.3—3.0mm) ➲ D018	8 x 8 x 80 8 x 8 x 120 10 x 10 x 80 10 x 10 x 120 12 x 12 x 80 12 x 12 x 120 16 x 16 x 120	
GTBH (Groove Width 1.45—3.0mm) ➲ D018	10 x 10 x 80 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
GTCH (Groove Width 2.5—3.0mm) ➲ D018	10 x 10 x 80 10 x 10 x 120	

● CUTTING OFF

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
CTAH (Max. Cut Off Diameter 12mm) ➲ D020	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTAH-S (Max. Cut Off Diameter 12mm) ➲ D020	10 x 10 x 80	
CTBH (Max. Cut Off Diameter 16mm) ➲ D022	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

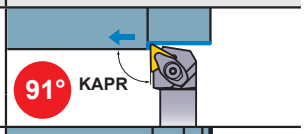
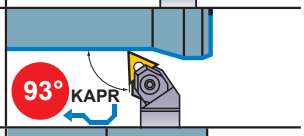
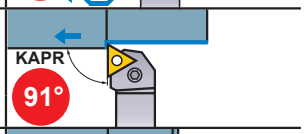
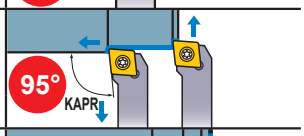
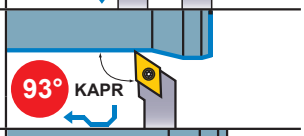
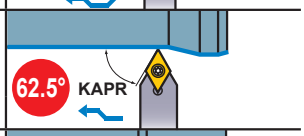
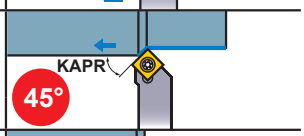
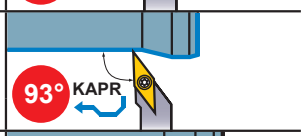
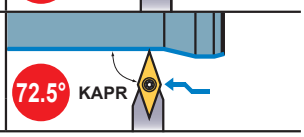
OPPOSITE TOOL POSTS

● DIMPLE SLEEVE HOLDER

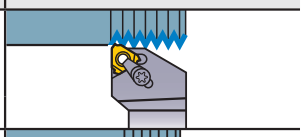
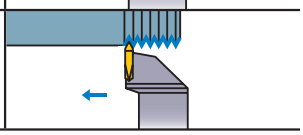
Name of Tool Holder	Shank Size (mm) (Shank Dia. x L)	Geometry
SH (Front Turning, Copying, Facing) ➲ D026	ϕ15.875 x 100 ϕ19.05 x 125 ϕ20 x 125 ϕ22 x 125 ϕ25.4 x 150	

TURRET TYPE TOOL POSTS

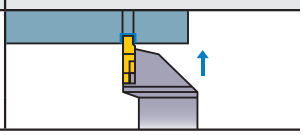
● FRONT TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
DTGN ➲ C016	16 x 16 x 100 20 x 20 x 125 25 x 25 x 150	
MTJN ➲ C017	20 x 20 x 125 25 x 25 x 150	
PTGN ➲ C016	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150	
SCLC ➲ C023	8 x 8 x 60 10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	
SDJC ➲ C024	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	
SDNC ➲ C024	8 x 8 x 60 10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	
SSSC ➲ C027	12 x 12 x 80 16 x 16 x 100	
STGC ➲ C028	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	
SVJC ➲ C029	10 x 10 x 70 16 x 16 x 100	
SVVC ➲ C029	16 x 16 x 100	

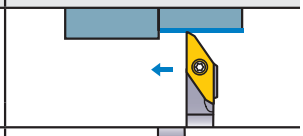
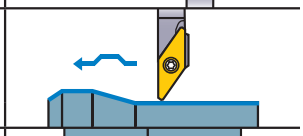
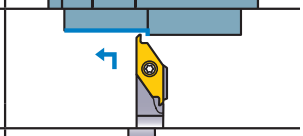
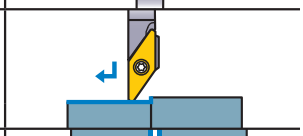
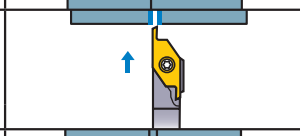
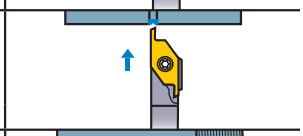
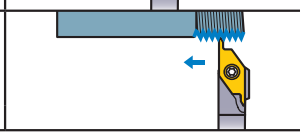
● THREADING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
MMT ➲ G023	12 x 12 x 100 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170	
SMGH ➲ G030	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	

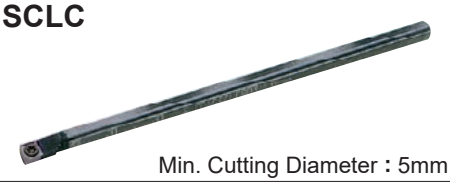
● GROOVING

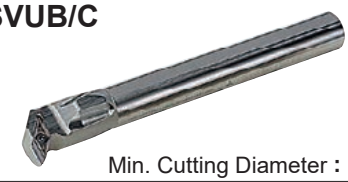
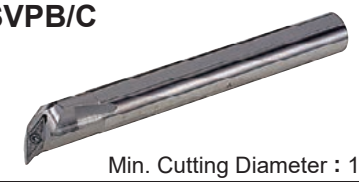
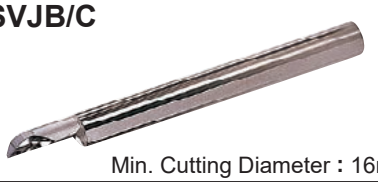
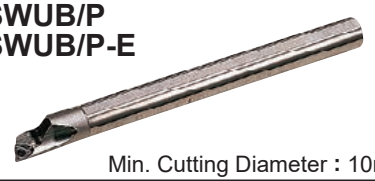
Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
SMGH ➲ F138	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100	

CAM TYPE TOOL POSTS

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
CSVH (Front Turning) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Front Turning Copying) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning Copying) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Cutting Off) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Grooving) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	
CSVH (Threading) ➲ D027	7 x 7 x 140 8 x 8 x 140 9.5x 9.5x 140 10 x10 x 140 12 x12 x 140	

CLASSIFICATION OF INTERNAL TURNING TOOLS (FOR GENERAL USE)

Product Name	Holder
For Gang Type Tool Posts ➲ D030	**SBAH**  Min. Cutting Diameter : 3mm
MICRO-MINI TWIN Boring Bars (Solid Carbide) ➲ E027	**CB CR**  Min. Cutting Diameter : 2.2mm
MICRO-MINI Boring Bars (Solid Carbide) ➲ E030	**C○○FR-BLS**  Min. Cutting Diameter : 3.2mm
MICRO-DEX Boring Bars (Carbide Shank) ➲ E024	**SCLC**  Min. Cutting Diameter : 5mm
MICRO-DEX Boring Bars (Carbide Shank) ➲ E025	**STUC**  Min. Cutting Diameter : 8mm
MICRO-DEX Boring Bars (Carbide Shank) ➲ E024	**SWUB**  Min. Cutting Diameter : 6mm
F type Bars (Steel Shank) ➲ E035	**FSWL1**  Min. Cutting Diameter : 5.8mm
F type Bars (Carbide Shank) ➲ E035	**FSWL2**  Min. Cutting Diameter : 5.8mm
DIMPLE BAR (Steel Shank Carbide Shank) ➲ E008	**FSCLC/P FSCLC/P-E**  Min. Cutting Diameter : 10mm

Product Name	Holder
DIMPLE BAR (Steel Shank Carbide Shank) ➲ E012	**FSDUC FSDUC-E**  Min. Cutting Diameter : 14mm
DIMPLE BAR (Steel Shank Carbide Shank) ➲ E014	**FSDQC FSDQC-E**  Min. Cutting Diameter : 13mm
DIMPLE BAR (Steel Shank Carbide Shank) ➲ E010	**FSTUP FSTUP-E**  Min. Cutting Diameter : 10mm
DIMPLE BAR (Steel Shank) ➲ E018	**FSVUB/C**  Min. Cutting Diameter : 16mm
DIMPLE BAR (Steel Shank) ➲ E019	**FSVPB/C**  Min. Cutting Diameter : 16mm
DIMPLE BAR (Steel Shank) ➲ E020	**FSVJB/C**  Min. Cutting Diameter : 16mm
DIMPLE BAR (Steel Shank Carbide Shank) ➲ E016	**FSWUB/P FSWUB/P-E**  Min. Cutting Diameter : 10mm

TOOLS FOR GROOVING AND THREADING/END MILLS/DRILLS

FOR GROOVING AND THREADING

Product Name	Shape
GY series F016	**External for Swiss-type lathes**  Max. Cut Off Diameter : 34mm
GW series F126	**External for Swiss-type lathes**  Max. Cut Off Diameter : 76mm
MICRO-MINI TWIN Boring Bars (Solid Type) F140	**CG TYPE(Grooving)**  Min. Cutting Diameter : 3mm
MICRO-MINI TWIN Boring Bars (Solid Type) G037	**CT TYPE(Threading)**  Min. Cutting Diameter : 3mm

END MILLS

Series Title	Shape
NEW **For Swiss-Type Automatic Lathes MS Plus End Mill Series** J074, J098, J138	**MP2ES/MP3ES/MP4EC** 

Solid Carbide End Mill series J056

HSS End Mill series J350

DRILLS

Series Title	Shape
Leading Drill Series N020	**DLE** 
NEW **Leading Drill Series** N182	**GKCD** 
NEW **WSTAR Drill Series** N030	**DWAE** 
NEW **TRISTAR Drill Series** N038	**DVAS** 

MFE series N025

MVX/TAF Drill (Indexable type) N160

Solid Carbide Drill series N006

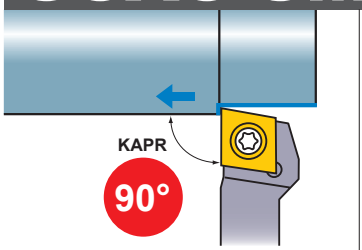
Solid Gun Drill series N136

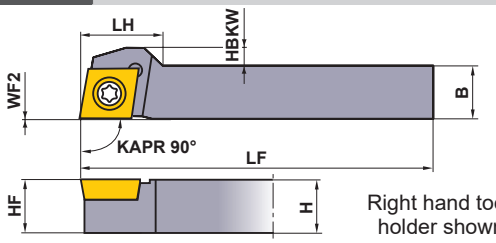
HSS Drill series N012

EXTERNAL FRONT TURNING

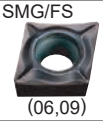
SCAC-SM

Without off set





Right hand tool holder shown.

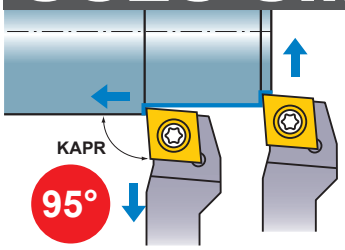
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
 (06,09)	 (06)	 (06,09)	 (06,09)
Medium	**Medium**	**For nonferrous metals**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
 (06,09)	 (06,09)	 (06,09)	 (06,09)

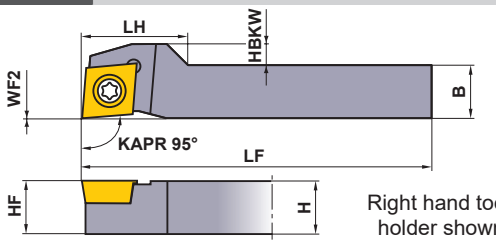
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCACR/L0808K06-SM	●	●	CC□B CC□H CC□T CC□W	0602□□	8	8	125	11	1.6	8	0	TS254	TKY08R
SCACR/L1010K06-SM	●	●		0602□□	10	10	125	—	—	10	0	TS254	TKY08R
SCACR/L1010K09-SM	●	●		09T3□□	10	10	125	16	3.5	10	0	TS43	TKY15R
SCACR/L1212M09-SM	●	●		09T3□□	12	12	150	14	1.5	12	0	TS43	TKY15R
SCACR/L1616M09-SM	●	●		09T3□□	16	16	150	—	—	16	0	TS43	TKY15R

∗ Clamp Torque (N • m) : TS254=1.0, TS43=3.5

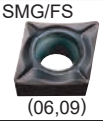
SCLC-SM

Without off set





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
 (06,09)	 (06)	 (06,09)	 (06,09)
Medium	**Medium**	**For nonferrous metals**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
 (06,09)	 (06,09)	 (06,09)	 (06,09)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCLCR/L0808K06-SM	●	●	CC□B CC□H CC□T CC□W	0602□□	8	8	125	11	2.1	8	0	TS254	TKY08R
SCLCR/L1010K06-SM	●	●		0602□□	10	10	125	—	—	10	0	TS254	TKY08R
SCLCR/L1010K09-SM	●	●		09T3□□	10	10	125	20	4	10	0	TS43	TKY15R
SCLCR/L1212M09-SM	●	●		09T3□□	12	12	150	18	2	12	0	TS43	TKY15R
SCLCR/L1616M09-SM	●	●		09T3□□	16	16	150	—	—	16	0	TS43	TKY15R

∗ Clamp Torque (N • m) : TS254=1.0, TS43=3.5

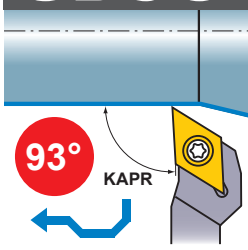
Note1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note2) Dimensions shown for insert corner RE 0.2.

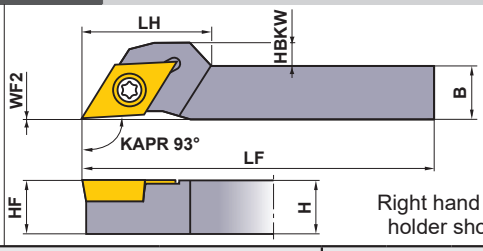
● : **Inventory maintained in Japan.**

SCAC-SM type inserts	**➤ A114—A124**
SCLC-SM type inserts	**➤ A114—A124**
CBN & PCD inserts	**➤ B040—B042, B059**

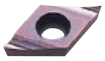
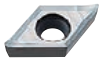
SDJC-SM

Without off set





Right hand tool holder shown.

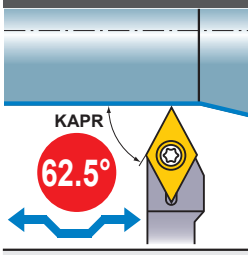
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)
Medium	Medium	For nonferrous metals	Light
R/L-SN	R/L-SR	AZ	LS-P
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)

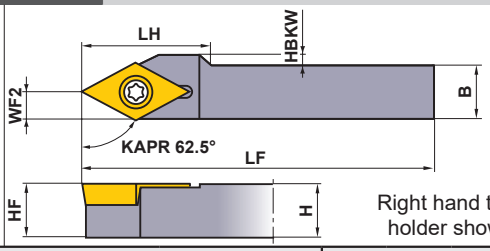
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDJCR/L0808K07-SM	●	●	DCMT DCMW DCET DCGT DCGW	0702□□	8	8	125	15	2	8	0	TS254	TKY08R
SDJCR/L1010K07-SM	●	●		0702□□	10	10	125	—	—	10	0	TS254	TKY08R
SDJCR/L1010K11-SM	●	●		11T3□□	10	10	125	24	4	10	0	TS43	TKY15R
SDJCR/L1212M11-SM	●	●		11T3□□	12	12	150	22	2	12	0	TS43	TKY15R
SDJCR/L1616M11-SM	●	●		11T3□□	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (N • m) : TS254=1.0, TS43=3.5

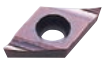
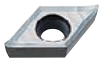
SDNC-SM

Neutral edge with handed holder
Without off set





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)
Medium	Medium	For nonferrous metals	Light
R/L-SN	R/L-SR	AZ	LS-P
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDNCR/L0808K07-SM	●	●	DCMT DCMW DCET DCGT DCGW	0702□□	8	8	125	—	—	8	3	TS254	TKY08R
SDNCR/L1010K07-SM	●	●		0702□□	10	10	125	—	—	10	3	TS254	TKY08R
SDNCR/L1010K11-SM	●	●		11T3□□	10	10	125	24	2	10	5	TS43	TKY15R
SDNCR/L1212M11-SM	●	●		11T3□□	12	12	150	—	—	12	5	TS43	TKY15R
SDNCR/L1616M11-SM	●	●		11T3□□	16	16	150	—	—	16	5	TS43	TKY15R

* Clamp Torque (N • m) : TS254=1.0, TS43=3.5

RECOMMENDED CUTTING CONDITIONS

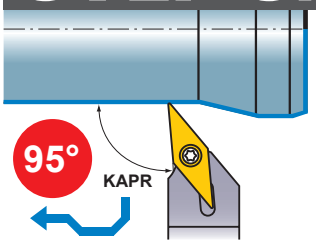
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.08 (0.01–0.15)
P	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.08 (0.01–0.15)
P			**NX2525**	150 (50–250)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	80 (50–120)	0.06 (0.02–0.1)
M		230HB	**MS7025/MS9025**	100 (50–180)	0.08 (0.01–0.15)
N	Non-Ferrous Metal	–	**HTi10/MT9005**	150 (70–230)	0.09 (0.03–0.15)
S	Titanium Alloy	–	**MT9005**	60 (40–80)	0.08 (0.04–0.12)
S	Heat Resistant Alloy	–	**MP9015/MS9025**	50 (20–75)	0.08 (0.04–0.12)

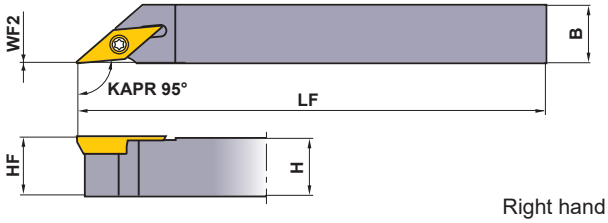
SDJC-SM type inserts	**➤ A124–A129**
SDNC-SM type inserts	**➤ A124–A129**
CBN & PCD inserts	**➤ B044, B045, B060**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

EXTERNAL FRONT TURNING

SVLP-SM

Without off set





Right hand tool holder shown.

Finish
R/L-SRF

(08,11)

Finish
SMG

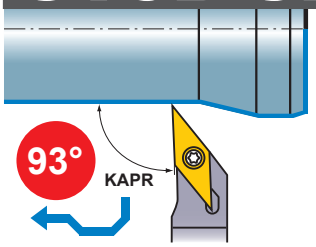
(08,11)

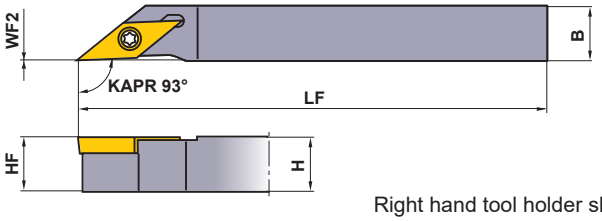
Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H	B	LF	HF	WF2	Clamp Screw	Wrench
SVLPR/L1010K08-SM	●	●	VPET VPGT	0802□□	10	10	125	10	0	TS202	TKY06R
SVLPR/L1212M08-SM	●	●		0802□□	12	12	150	12	0	TS202	TKY06R
SVLPR/L1010K11-SM	●	●		1103□□	10	10	125	10	0	TS255	TKY08R
SVLPR/L1212M11-SM	●	●		1103□□	12	12	150	12	0	TS255	TKY08R
SVLPR/L1616M11-SM	●	●		1103□□	16	16	150	16	0	TS255	TKY08R

∗ Clamp Torque (N • m) : TS202=0.6, TS255=1.0

SVJB-SM

Without off set





Right hand tool holder shown.

Finish
R/L-F

(11)

Medium
R/L-SN

(11)

Medium
R/L-SR

(11)

Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H	B	LF	HF	WF2	Clamp Screw	Wrench
SVJBR/L1010K11-SM	●	●	VBMT VBET VBGT VBGW	1103□□	10	10	125	10	0	TS255	TKY08R
SVJBR/L1212M11-SM	●	●		1103□□	12	12	150	12	0	TS255	TKY08R
SVJBR/L1616M11-SM	●	●		1103□□	16	16	150	16	0	TS255	TKY08R

∗ Clamp Torque (N • m) : TS255=1.0

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.08 (0.01–0.15)
P	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.08 (0.01–0.15)
P			**NX2525**	150 (50–250)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	80 (50–120)	0.06 (0.02–0.1)
M		230HB	**MS7025/MS9025**	100 (50–180)	0.08 (0.01–0.15)
N	Non-Ferrous Metal	–	**HTi10/MT9005**	150 (70–230)	0.09 (0.03–0.15)
S	Titanium Alloy	–	**MT9005**	60 (40–80)	0.08 (0.04–0.12)
S	Heat Resistant Alloy	–	**MP9015/MS9025**	50 (20–75)	0.08 (0.04–0.12)

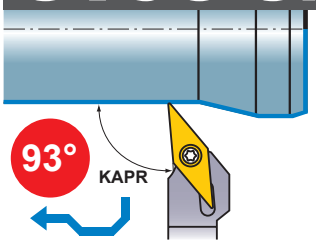
Note1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note2) Dimensions shown for insert corner RE 0.2.

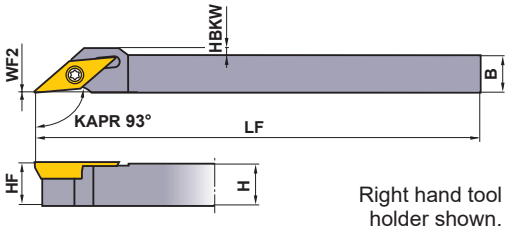
● : **Inventory maintained in Japan.**

SVLP-SM type inserts	**➤ A149**
SVJB-SM type inserts	**➤ A142–A144**
CBN & PCD inserts	**➤ B049, B064**

SVJC-SM

Without off set





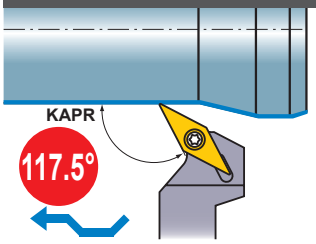
Right hand tool holder shown.

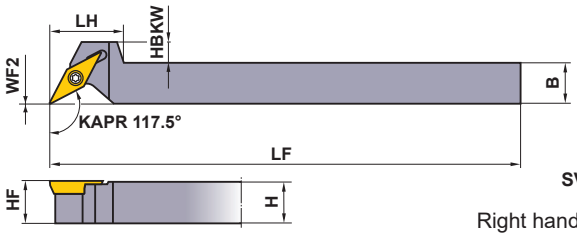
Finish	Finish	Light	Light
FP	FM	LS	LS-P
			
(11)	(11)	(11,13)	(11,13)
Light	**Light**	**Light**	
LP	LM	LS	
			
(11)	(11)	(11)	

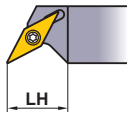
Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	HBKW	HF	WF2	Clamp Screw	Wrench
SVJCR/L1010JX11-SM	●	●	VCMW VCMT VCGT	1103○○	10	10	120	—	10	0	TS255	TKY08R
SVJCR/L1212JX11-SM	●	●		1103○○	12	12	120	—	12	0	TS255	TKY08R
SVJCR/L1616JX11-SM	●	●		1103○○	16	16	120	—	16	0	TS255	TKY08R
SVJCR/L1010JX13-SM	●	●		1303○○	10	10	120	2	10	0	TS32	TKY08R
SVJCR/L1212JX13-SM	●	●		1303○○	12	12	120	—	12	0	TS32	TKY08R
SVJCR/L1616JX13-SM	●	●		1303○○	16	16	120	—	16	0	TS32	TKY08R

* Clamp Torque (N • m) : TS255=1.0, TS32=1.0

SVPP-SM







SVPPR/L1616M11-SM

Right hand tool holder shown.

Finish
R/L-SRF

(11)
Finish
SMG

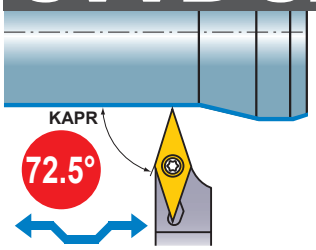
(11)

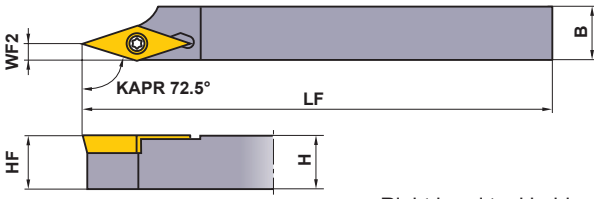
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SVPPR/L1010K11-SM	●	●	VPET VPGT	1103○○	10	10	125	20	8	10	0	TS255	TKY08R
SVPPR/L1212M11-SM	●	●		1103○○	12	12	150	20	6	12	0	TS255	TKY08R
SVPPR/L1616M11-SM	●	●		1103○○	16	16	150	17	—	16	0	TS255	TKY08R

* Clamp Torque (N • m) : TS255=1.0

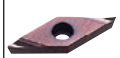
SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

Finish	Medium
R/L-F	R/L-SN
	
(11)	(11)
Medium	
R/L-SR	
	
(11)	

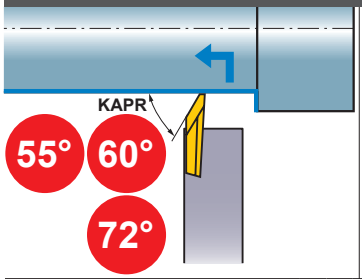
Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H	B	LF	HF	WF2	Clamp Screw	Wrench
SVVBR/L1010K11-SM	●	●	VBET VBGT VBMT VBGW	1103○○	10	10	125	10	3	TS255	TKY08R
SVVBR/L1212M11-SM	●	●		1103○○	12	12	150	12	3	TS255	TKY08R
SVVBR/L1616M11-SM	●	●		1103○○	16	16	150	16	3	TS255	TKY08R

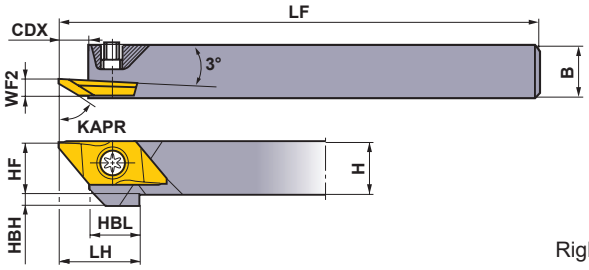
* Clamp Torque (N • m) : TS255=1.0

SVJC-SM type inserts	**➤ A145—A147**	**CBN & PCD inserts**	**➤ B050, B064**
SVPP-SM type inserts	**➤ A149**	**SPARE PARTS**	**➤ P001**
SVVB-SM type inserts	**➤ A142—A144**	**TECHNICAL DATA**	**➤ Q001**

EXTERNAL BACK TURNING

BTAH





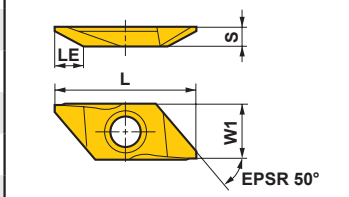
Right hand tool holder shown.

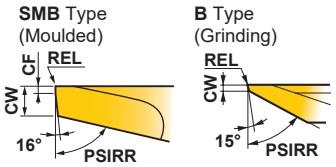
Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
BTAHR/L0810-50	●	●	BTAT	5528○○R/L-B	8	10	120	15	8	3.5	4	9.5	5.5	NS402W	NKY15S
BTAHR/L1010-50	●	●		6035○○R/L-B	10	10	120	15	10	3.5	2	9.5	5.5	NS402W	NKY15S
BTAHR/L1212-50	●	●		605000RX	12	12	120	15	12	3.5	—	9.5	5.5	NS403W	NKY15S
BTAHR/L1616-50	●			7235○○R-SMB	16	16	120	15	16	3.5	—	9.5	5.5	NS403W	NKY15S

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
∗ Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

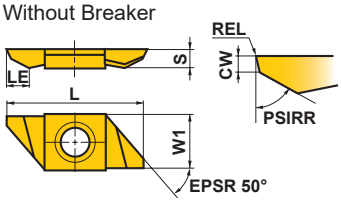
INSERTS

Order Number	Hand	Coated		Dimensions (mm)							LE* (mm)	Geometry
		VP15TF	MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S		
BTAT7235V5R-SMB	R	●		72°	0.05	0.3	20	8	1.4	2.5	3.5	With Breaker
BTAT723501MR-SMB	R	●		72°	0.08	0.3	20	8	1.4	2.5	3.5	
BTAT723502MR-SMB	R	●		72°	0.18	0.3	20	8	1.4	2.5	3.5	
BTAT552800R-B	R	●	●	55°	0	0	20	8	0.5	2.5	2.8	
BTAT552800L-B	L	●		55°	0	0	20	8	0.5	2.5	2.8	
BTAT552801R-B	R	●	●	55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT552801L-B	L	●		55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT603500R-B	R	●	●	60°	0	0	20	8	0.5	2.5	3.5	
BTAT603500L-B	L	●		60°	0	0	20	8	0.5	2.5	3.5	
BTAT603501MR-B	R		●	60°	0.08	0	20	8	0.5	2.5	3.5	
BTAT603501R-B	R	●	●	60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT603501L-B	L	●		60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT605000RX	R	●		60°	0	0	20	8	1.25	2.5	5.0	Without Breaker





Right hand insert shown.



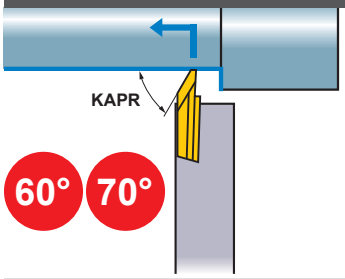
Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.
∗ Numeric value set insert on holder.

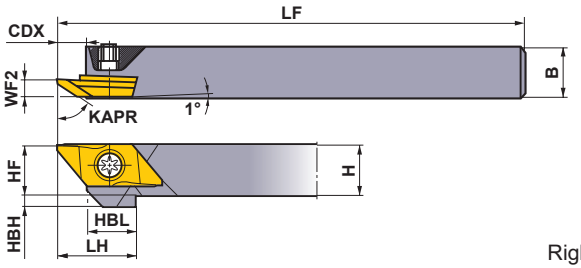
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.08 (0.01–0.15)
	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.06 (0.02–0.1)
N	Non-Ferrous Metal	–	**MS6015**	150 (70–230)	0.09 (0.03–0.15)

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

CTBH





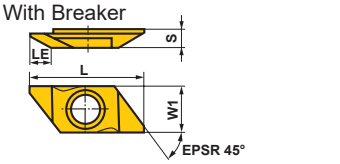
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
CTBHR/L1010-160	●	●	BTBT	60450○R/L-B	10	10	120	19.5	10	3.4	2	12	7.5	NS402W	NKY15S
CTBHR/L1212-160	●	●		606000R/L	12	12	120	19.5	12	3.4	—	12	7.5	NS403W	NKY15S
CTBHR/L1616-160	●	●		7055○○R-SMB	16	16	120	19.5	16	3.4	—	12	7.5	NS403W	NKY15S

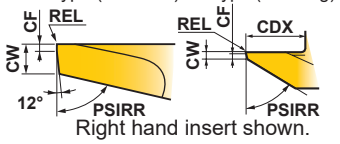
Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
∗ Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

INSERTS

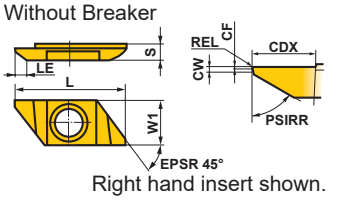
Order Number	Hand	Coated		Dimensions (mm)								LE* (mm)	Geometry
		VP15TF	MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S	CDX		
BTBT7055V5R-SMB	R	●		70°	0.05	0.3	25	9.4	1.35	3.5	6.5	5.5	With Breaker
BTBT705501MR-SMB	R	●		70°	0.08	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT705502MR-SMB	R	●		70°	0.18	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT604500R-B	R	●	●	60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604500L-B	L	●		60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501MR-B	R		●	60°	0.08	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501R-B	R	●	●	60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501L-B	L	●		60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT606000R	R	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	Without Breaker
BTBT606000L	L	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	



SMB Type (Moulded) **B** Type (Grinding)



Right hand insert shown.

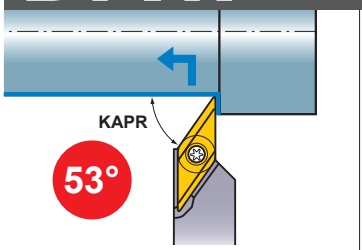


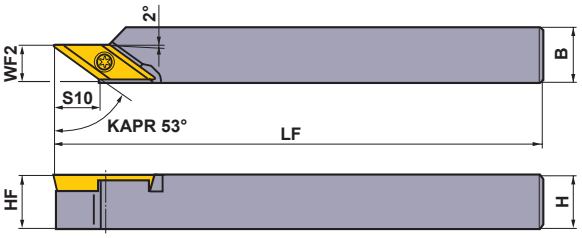
Right hand insert shown.

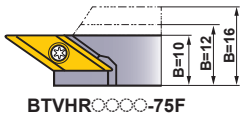
Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.
∗ Numeric value set insert on holder.

EXTERNAL BACK TURNING

BTVH







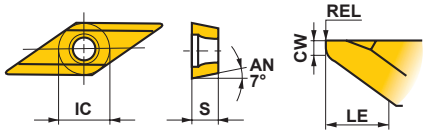
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*	
	R			H	B	LF	HF	WF2	S10	Clamp Screw	Wrench
BTVHR1010-75	●	BTVT	5375□□R-B	10	10	120	10	7.5	8.5	NS251	NKY15S
BTVHR1212-75	●			12	12	120	12	7.5	8.5	NS251	NKY15S
BTVHR1616-75	●			16	16	120	16	7.5	8.5	NS251	NKY15S
BTVHR1010-75F	●			10	10	120	10	10.0	8.5	NS251	NKY15S
BTVHR1212-75F	●			12	12	120	12	10.0	8.5	NS251	NKY15S
BTVHR1616-75F	●			16	16	120	16	10.0	8.5	NS251	NKY15S

Note 1) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).
Note 2) For high load machining, F type is recommended.
* Clamp Torque (N • m) : NS251=1.0

INSERTS

Order Number	Hand	Coated	Dimensions (mm)				LE (mm) *	Geometry
		VP15TF	IC	S	REL	CW		
BTVT5375V5R-B	R	●	6.35	3.18	0.05	0.5	7.5	With Breaker
BTVT537501R-B	R	●	6.35	3.18	0.1	0.5	7.5	



* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**VP15TF**	100 (50–150)	0.08 (0.01–0.15)
	Free Cutting Steel	–	**VP15TF**	110 (30–180)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.06 (0.02–0.1)
N	Non-Ferrous Metal	–	**VP15TF**	150 (70–230)	0.09 (0.03–0.15)

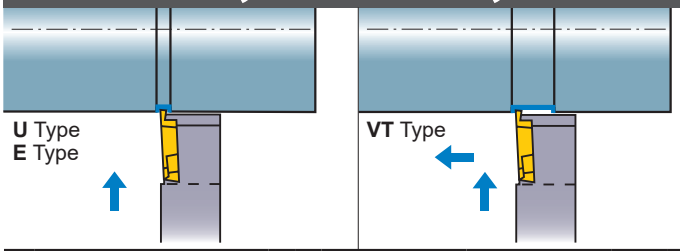
● : **Inventory maintained in Japan.**
(Contains 5 inserts per case.)

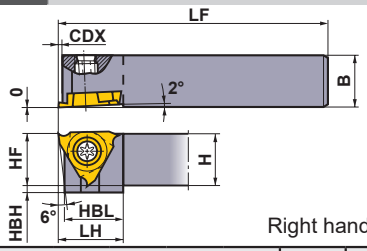
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Memo

EXTERNAL GROOVING

GTAH, GTBH, GTCH





Right hand tool holder shown.

Order Number		Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	CDX *1	LH	HBH	HBL	Cutting Width (mm)	*2 Clamp Screw	Wrench
Standard Shank	GTAHR/L0808-20S	●	●	GTAT GTBT *1 GTCT *1	○○○○	8	8	8	80	2	15	5	12.9	0.3 — 3.0	NS404W	NKY15S
	GTAHR/L1010-20S	●	●		○○○○	10	10	10	80	2	15	3	12.9	0.3 — 3.0	NS404W	NKY15S
	GTAHR/L1212-20S	●	●		○○○○	12	12	12	80	2	15	1	12.9	0.3 — 3.0	NS404W	NKY15S
	GTBHR/L1010-30S	●	●	GTBT. GTCT	○○○○	10	10	10	80	3	15	3	13.4	1.45 — 3.0	NS404W	NKY15S
	GTCHR/L1010-30S	●	●	GTCT	○○○○	10	10	10	80	3	15	3	13.4	2.5 — 3.0	NS404W	NKY15S
Long Shank	GTAHR/L0808-20	●	●	GTAT GTBT *1 GTCT *1	○○○○	8	8	8	120	2	15	5	12.9	0.3 — 3.0	NS404W	NKY15S
	GTAHR/L1010-20	●	●		○○○○	10	10	10	120	2	15	3	12.9	0.3 — 3.0	NS404W	NKY15S
	GTAHR/L1212-20	●	●		○○○○	12	12	12	120	2	15	1	12.9	0.3 — 3.0	NS404W	NKY15S
	GTAHR/L1616-20	●	●		○○○○	16	16	16	120	2	15	—	12.9	0.3 — 3.0	NS404W	NKY15S
	GTBHR/L1010-30	●	●	GTBT. GTCT	○○○○	10	10	10	120	3	15	3	13.4	1.45 — 3.0	NS404W	NKY15S
	GTBHR/L1212-30	●	●		○○○○	12	12	12	120	3	15	1	13.4	1.45 — 3.0	NS404W	NKY15S
	GTBHR/L1616-30	●	●		○○○○	16	16	16	120	3	15	—	13.4	1.45 — 3.0	NS404W	NKY15S
	GTCHR/L1010-30	●	●	GTCT	○○○○	10	10	10	120	3	15	3	13.4	2.5 — 3.0	NS404W	NKY15S

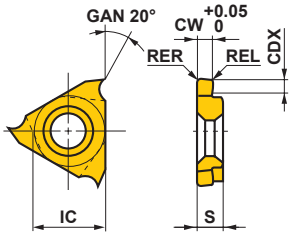
Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

*1 It is not possible to machine depths over **CDX** dimensions(Max. Groove Depth).
For the actual maximum depth that can be machined, check the **CDX** of only the insert.

*2 Clamp Torque (N • m) : NS404W=1.0

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	CDX *1	RER/L	IC	S	Geometry
GTAT03006V3R-U	R	●	0.3	0.27	0.03	9.525	3.18	**U** Type Breaker (General purpose Grooving)
GTAT03006V3L-U	L	●	0.3	0.27	0.03	9.525	3.18	
GTAT05012V5R-U	R	●	0.5	0.9	0.05	9.525	3.18	
GTAT05012V5L-U	L	●	0.5	0.9	0.05	9.525	3.18	
GTAT07520V5R-U	R	●	0.75	1.8	0.05	9.525	3.18	
GTAT07520V5L-U	L	●	0.75	1.8	0.05	9.525	3.18	
GTAT09520V5R-U	R	●	0.95	1.8	0.05	9.525	3.18	
GTAT09520V5L-U	L	●	0.95	1.8	0.05	9.525	3.18	
GTAT10020V5R-U	R	●	1.0	1.8	0.05	9.525	3.18	
GTAT10020V5L-U	L	●	1.0	1.8	0.05	9.525	3.18	
GTAT10320V5R-U	R	●	1.03	1.8	0.05	9.525	3.18	
GTAT12520V5R-U	R	●	1.25	1.8	0.05	9.525	3.18	
GTAT12520V5L-U	L	●	1.25	1.8	0.05	9.525	3.18	
GTBT14530V5R-U	R	●	1.45	2.8	0.05	9.525	3.18	
GTBT14530V5L-U	L	●	1.45	2.8	0.05	9.525	3.18	
GTBT15030V5R-U	R	●	1.5	2.8	0.05	9.525	3.18	
GTBT15030V5L-U	L	●	1.5	2.8	0.05	9.525	3.18	
GTBT17530V5R-U	R	●	1.75	2.8	0.05	9.525	3.18	
GTBT17530V5L-U	L	●	1.75	2.8	0.05	9.525	3.18	
GTBT20030V5R-U	R	●	2.0	2.8	0.05	9.525	3.18	
GTBT20030V5L-U	L	●	2.0	2.8	0.05	9.525	3.18	
GTCT25030V5R-U	R	●	2.5	2.8	0.05	9.525	3.18	
GTCT25030V5L-U	L	●	2.5	2.8	0.05	9.525	3.18	



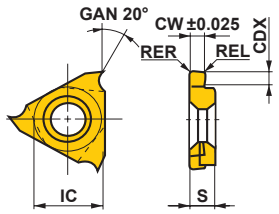
Right hand insert shown.

*1 **CDX** is a value that assumes the machining diameter of ϕ42 or less.
Please note that the maximum machining depth is limited by the holder used.

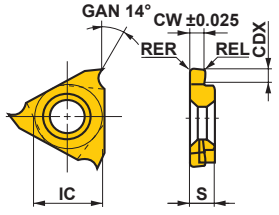
● : **Inventory maintained in Japan.**
(Contains 5 inserts per case.)

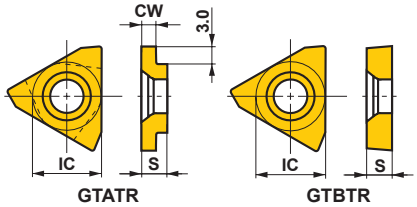
INSERTS

Order Number	Hand	Coated		Carbide	Dimensions (mm)					Geometry
		VP15TF	VP15KZ	TF15	CW	CDX	RER/L	IC	S	
GTAT03306V3R-E	R	●			0.33	0.27	0.03	9.525	3.18	**E** Type Breaker (Ring processing Grooving)
GTAT03306V3L-E	L	●			0.33	0.27	0.03	9.525	3.18	
GTAT04312V3R-E	R	●			0.43	0.9	0.03	9.525	3.18	
GTAT04312V3L-E	L	●			0.43	0.9	0.03	9.525	3.18	
GTAT05312V5R-E	R	●			0.53	0.9	0.05	9.525	3.18	
GTAT05312V5L-E	L	●			0.53	0.9	0.05	9.525	3.18	
GTAT07520V5R-E	R	●			0.75	1.8	0.05	9.525	3.18	
GTAT07520V5L-E	L	●			0.75	1.8	0.05	9.525	3.18	
GTAT09520V5R-E	R	●			0.95	1.8	0.05	9.525	3.18	
GTAT09520V5L-E	L	●			0.95	1.8	0.05	9.525	3.18	
GTAT10020V5R-E	R	●			1.0	1.8	0.05	9.525	3.18	
GTAT10020V5L-E	L	●			1.0	1.8	0.05	9.525	3.18	
GTAT1002001R-E	R	●			1.0	1.8	0.1	9.525	3.18	
GTAT1002001L-E	L	●			1.0	1.8	0.1	9.525	3.18	
GTAT12020V5R-E	R	●			1.2	1.8	0.05	9.525	3.18	
GTAT12020V5L-E	L	●			1.2	1.8	0.05	9.525	3.18	
GTAT1202001R-E	R	●			1.2	1.8	0.1	9.525	3.18	
GTAT1202001L-E	L	●			1.2	1.8	0.1	9.525	3.18	
GTAT14020V5R-E	R	●			1.4	1.8	0.05	9.525	3.18	
GTAT14020V5L-E	L	●			1.4	1.8	0.05	9.525	3.18	
GTBT15030V5R-E	R	●			1.5	2.8	0.05	9.525	3.18	
GTBT15030V5L-E	L	●			1.5	2.8	0.05	9.525	3.18	
GTBT1503001R-E	R	●			1.5	2.8	0.1	9.525	3.18	
GTBT1503001L-E	L	●			1.5	2.8	0.1	9.525	3.18	
GTBT18030V5R-E	R	●			1.8	2.8	0.05	9.525	3.18	
GTBT18030V5L-E	L	●			1.8	2.8	0.05	9.525	3.18	
GTBT20030V5R-E	R	●			2.0	2.8	0.05	9.525	3.18	
GTBT20030V5L-E	L	●			2.0	2.8	0.05	9.525	3.18	
GTBT2003001R-E	R	●			2.0	2.8	0.1	9.525	3.18	
GTBT2003001L-E	L	●			2.0	2.8	0.1	9.525	3.18	
GTBT22530V5R-E	R	●			2.25	2.8	0.05	9.525	3.18	
GTBT22530V5L-E	L	●			2.25	2.8	0.05	9.525	3.18	
GTCT25030V5R-E	R	●			2.5	2.8	0.05	9.525	3.18	
GTCT25030V5L-E	L	●			2.5	2.8	0.05	9.525	3.18	
GTCT27530V5R-E	R	●			2.75	2.8	0.05	9.525	3.18	
GTCT27530V5L-E	L	●			2.75	2.8	0.05	9.525	3.18	
GTCT30030V5R-E	R	●			3.0	2.8	0.05	9.525	3.18	
GTCT30030V5L-E	L	●			3.0	2.8	0.05	9.525	3.18	
GTAT0330600R-VT	R		●		0.33	0.25	0	9.525	3.18	**VT** Type Breaker (Grooving, Side Turning)
GTAT0431200R-VT	R		●		0.43	0.9	0	9.525	3.18	
GTAT0532000R-VT	R		●		0.53	1.6	0	9.525	3.18	
GTAT0652000R-VT	R		●		0.65	1.6	0	9.525	3.18	
GTAT0752000R-VT	R		●		0.75	1.6	0	9.525	3.18	
GTAT0802000R-VT	R		●		0.8	1.6	0	9.525	3.18	
GTAT0852000R-VT	R		●		0.85	1.6	0	9.525	3.18	
GTAT0952000R-VT	R		●		0.95	1.6	0	9.525	3.18	
GTAT1002000R-VT	R		●		1.0	1.6	0	9.525	3.18	
GTAT1102000R-VT	R		●		1.1	1.6	0	9.525	3.18	
GTAT1202000R-VT	R		●		1.2	1.6	0	9.525	3.18	
GTAT1302000R-VT	R		●		1.3	1.6	0	9.525	3.18	
GTAT1402000R-VT	R		●		1.4	1.6	0	9.525	3.18	
GTBT1503000R-VT	R		●		1.5	2.7	0	9.525	3.18	
GTBT2003000R-VT	R		●		2.0	2.7	0	9.525	3.18	
GTATR	R			*●	1.76	—	—	9.525	3.18	Blank
GTATL	L			*●	1.76	—	—	9.525	3.18	
GTBTR	R			*●	—	—	—	9.525	3.18	
GTBTL	L			*●	—	—	—	9.525	3.18	



Right hand insert shown.





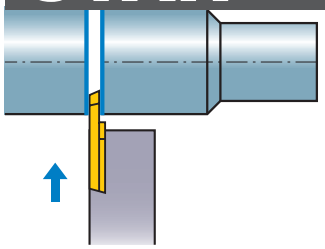
Right hand insert shown.

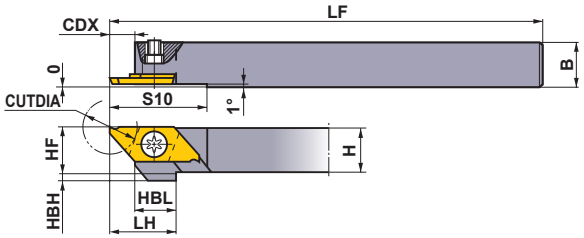
* Contains 10 inserts per case.

CUTTING CONDITIONS ➤ D020
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

EXTERNAL CUTTING OFF

CTAH



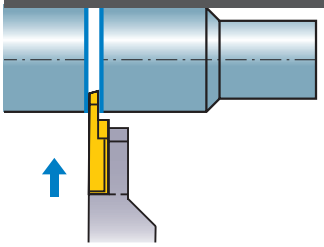


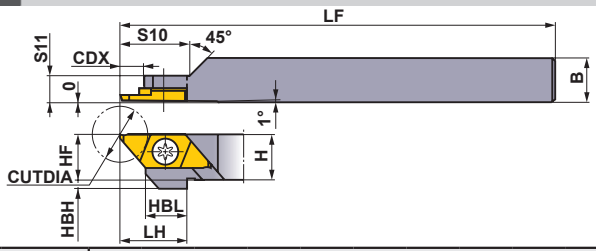
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									CUTDIA (mm)	*2	
	R	L			H	B	HF	LF	LH	CDX	HBH	HBL	S10		Clamp Screw	Wrench
CTAHR/L0810-120	●	●	CTAT	○○○○	8	10	8	120	15	5.5	4	9.5	22	12 (8)*1	NS402W	NKY15S
CTAHR/L1010-120	●	●		○○○○	10	10	10	120	15	5.5	2	9.5	22		NS402W	NKY15S
CTAHR/L1212-120	●	●		○○○○	12	12	12	120	15	5.5	—	9.5	22		NS403W	NKY15S
CTAHR/L1616-120	●	●		○○○○	16	16	16	120	15	5.5	—	9.5	22		NS403W	NKY15S

*1 When the width of cutting off (CW) is 0.7mm.
*2 Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

CTAH-S





Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)										CUTDIA (mm)	*2	
	R			H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11		Clamp Screw	Wrench
CTAHR1010-120S	●	CTAT	○○○○	10	10	10	80	15	16	2	9.5	16	5.5	12 (8)*1	NS401	NKY25R

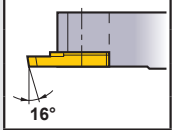
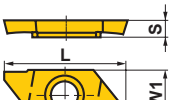
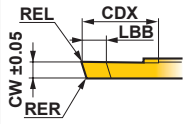
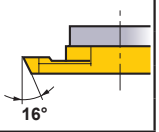
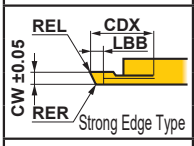
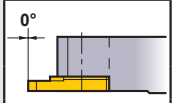
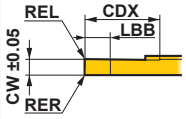
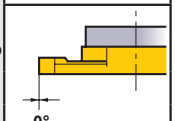
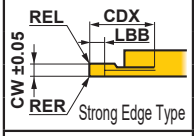
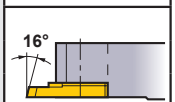
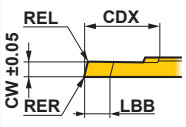
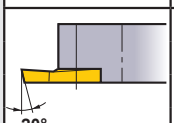
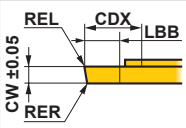
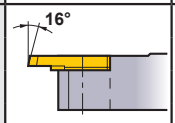
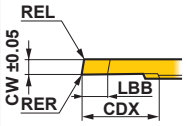
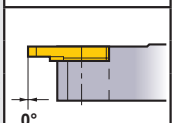
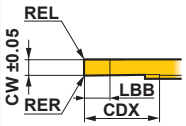
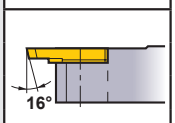
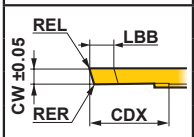
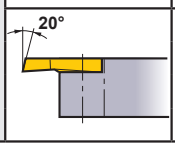
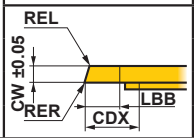
*1 When the width of cutting off (CW) is 0.7mm.
*2 Clamp Torque (N • m) : NS401=3.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.05 (0.02–0.09)
	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.05 (0.01–0.09)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.03 (0.02–0.05)
N	Non-Ferrous Metal	–	**MS6015**	150 (70–230)	0.07 (0.03–0.11)

● : **Inventory maintained in Japan.**
(Contains 5 inserts per case.)

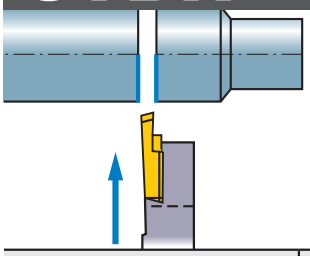
INSERTS

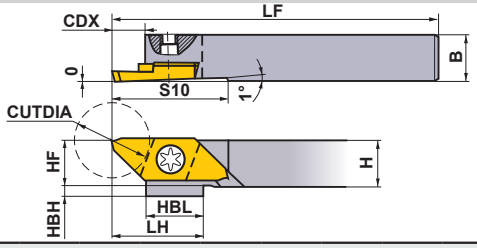
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (mm)							CUTDIA (mm)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB	
Right Hand (R)		With Breaker			**CTAT07080V5RR-B**	R	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5RR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT15120V5RR-BX**	R	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-BX	R	●		2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10120V5RN-B**	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT15120V5RN-BX**	N	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-BX	N	●		2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10110V5RL-B**	L	●		1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5RL-B	L	●		1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5RL-B	L	●		2.0	6.7	0.05	20	8	2.5	1.5	11
		Without Breaker			**CTAT1012000RR**	R	●	●	1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000RR	R	●	●	1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000RR	R	●	●	2.0	6.7	0	20	8	2.5	3.5	12
Left Hand (L)		With Breaker			**CTAT07080V5LL-B**	L	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5LL-B	L	●		1.0	6.7	0	20	8	2.5	1.5	12
					CTAT15120V5LL-B	L	●		1.5	6.7	0	20	8	2.5	1.5	12
					CTAT20120V5LL-B	L	●		2.0	6.7	0	20	8	2.5	1.5	12
					**CTAT10120V5LN-B**	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5LN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5LN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10110V5LR-B**	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5LR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5LR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	11
		Without Breaker	Right hand insert shown.		**CTAT1012000LL**	L	●		1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000LL	L	●		1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000LL	L	●		2.0	6.7	0	20	8	2.5	3.5	12

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

EXTERNAL CUTTING OFF

CTBH



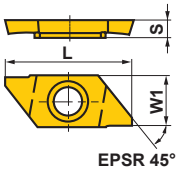
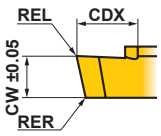
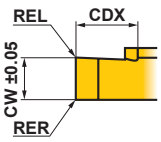
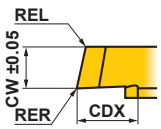
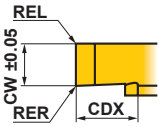
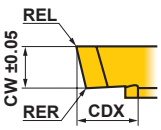


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	CDX	HBH	HBL	S10	CUTDIA (mm)	* Clamp Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	○○○○	10	10	10	120	19.5	7.5	2	9.5	25	16	NS402W	NKY15S
CTBHR/L1212-160	●	●		○○○○	12	12	12	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S
CTBHR/L1616-160	●	●		○○○○	16	16	16	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S

* Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Coated MS6015	CW	CDX	RER/L	L	W1	S	CUTDIA (mm)
Right Hand (R)	16°	With Breaker			**CTBT15160V5RR-B**	R	●	●	1.5	9.2	0.05	25	9.4	3.5	16
					CTBT20160V5RR-B	R	●	●	2.0	9.2	0.05	25	9.4	3.5	16
	0°				**CTBT20160V5RN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
Left Hand (L)	16°				**CTBT20160V5LL-B**	L	●		2.0	9.2	0.05	25	9.4	3.5	16
	0°				**CTBT20160V5LN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
	16°		Right hand insert shown.		**CTBT20145V5LR-B**	R	●	●	2.0	9.2	0.05	25	9.4	3.5	14.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.05 (0.02–0.09)
	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.05 (0.01–0.09)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.03 (0.02–0.05)
N	Non-Ferrous Metal	–	**MS6015**	150 (70–230)	0.07 (0.03–0.11)

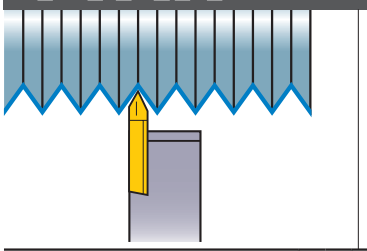
● : **Inventory maintained in Japan.**
(Contains 5 inserts per case.)

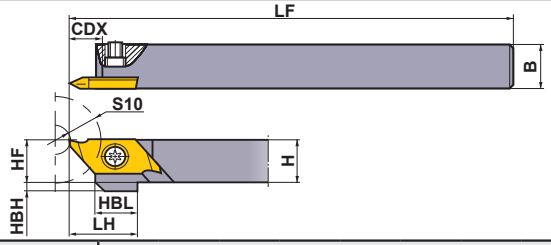
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Memo

EXTERNAL THREADING

TTAH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	HF	LF	LH	HBH	HBL	CDX	S10	Clamp Screw	Wrench
TTAHR/L0810	●	●	TTAT	○○○○	8	10	8	120	15	4	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1010	●	●		○○○○	10	10	10	120	15	2	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1212	●	●		○○○○	12	12	12	120	15	—	9.5	7	6.5	NS403W	NKY15S
TTAHR/L1616	●	●		○○○○	16	16	16	120	15	—	9.5	7	6.5	NS403W	NKY15S

* Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated	Dimensions (mm)					Pitch of Screw mm (thread/inch)
							VP15TF	PDX	RE	L	W1	S	
Right Hand (R)		With Breaker	General Purpose Partial Profile (60°)		**TTAT60075F5RR-B**	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2—0.75 (80—36)
					TTAT60125V5RR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5—1.25 (40—16)
					TTAT60075F5RL-B	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2—0.75 (80—36)
					TTAT60125V5RL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5—1.25 (40—16)
					TTAT6015001RN-B	N	●	1.25	0.1	20.0	8.0	2.5	1.0—1.5 (24—18)
Left Hand (L)					**TTAT60075F5LR-B**	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2—0.75 (80—36)
					TTAT60125V5LR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5—1.25 (40—16)
					TTAT60075F5LL-B	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2—0.75 (80—36)
					TTAT60125V5LL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5—1.25 (40—16)
					TTAT6015001LN-B	N	●	1.25	0.1	20.0	8.0	2.5	1.0—1.5 (24—18)
Right Hand (R)			General Purpose Partial Profile (55°)		**TTAT55158V5RR-B**	R	●	0.8	0.05	20.0	8.0	2.5	(40—16)
					TTAT55158V5RL-B	L	●	0.8	0.05	20.0	8.0	2.5	(40—16)
Left Hand (L)					**TTAT55158V5LR-B**	R	●	0.8	0.05	20.0	8.0	2.5	(40—16)
					TTAT55158V5LL-B	L	●	0.8	0.05	20.0	8.0	2.5	(40—16)

Right hand insert shown.

Right hand insert shown.

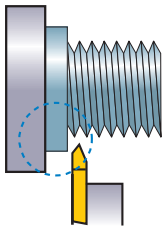
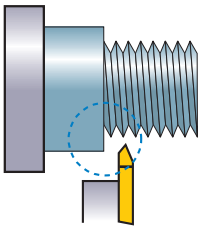
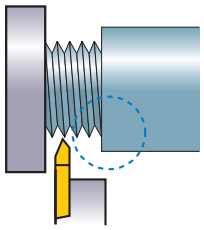
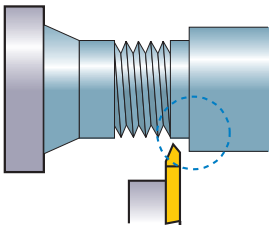
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Speed (m/min)
P	Carbon Steel · Alloy Steel	180HB—280HB	100 (50—150)
	Free Cutting Steel	—	110 (30—180)

	Workpiece Material	Hardness	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	80 (50—120)
N	Non-Ferrous Metal	—	150 (70—230)

● : **Inventory maintained in Japan.**
(Contains 5 inserts per case.)

HOLDER APPLICATION

	Right Hand Holder	Left Hand Holder
Right Hand Insert		
Left Hand Insert		

*The above combinations enable to machine the side of ◌.

THREAD RANGE

Application range

Pitch (mm)	Pitch Diameter of Thread (mm)										Number of Passes
	≥ϕ1.0	≥ϕ1.2	≥ϕ1.6	≥ϕ2.0	≥ϕ2.5	≥ϕ3.0	≥ϕ4.0	≥ϕ5.0	≥ϕ6.0	≥ϕ7.0	
0.2											2－4
0.25											
0.3											3－5
0.35											
0.4											4－6
0.45											
0.5											5－7
0.6											
0.7											
0.75											
0.8		Threading impossible									
1											
1.25											6－8
1.5											

*Metric Thread (60°)

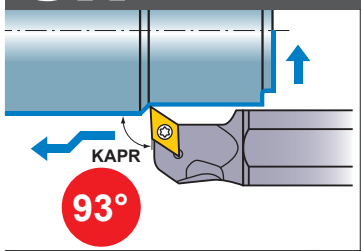
Pitch(thread/inch)	Pitch Diameter of Thread									Number of Passes
Inch	≥ϕ0.060	≥ϕ0.073	≥ϕ0.086	≥ϕ0.099	≥ϕ0.112	≥ϕ0.164	≥ϕ0.190	≥ϕ0.250	≥ϕ0.313	
mm	≥ϕ1.524	≥ϕ1.854	≥ϕ2.184	≥ϕ2.515	≥ϕ2.845	≥ϕ4.166	≥ϕ4.826	≥ϕ6.350	≥ϕ7.938	
80										3－5
72										
64										4－6
56										
48										5－7
44										
40										
32										
28										
26										
24		Threading impossible								
20										6－8
18										
16										

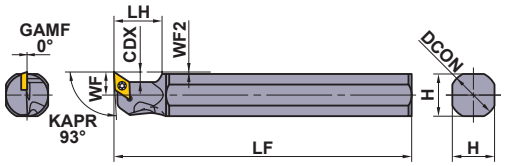
*American UN, Whitworth

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

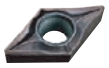
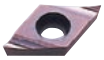
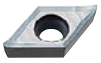
EXTERNAL FRONT TURNING, COPYING, FACING (FOR OPPOSITE TOOL POSTS)

SH





Left hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R-F	R-SS	LS
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)
Medium	**Medium**	**For nonferrous metals**	**Light**
R-SN	R-SR	AZ	LS-P
			
(07, 11)	(07, 11)	(07, 11)	(07, 11)

Order Number	Stock	Insert Number		Dimensions (mm)							*	
	L			DCON	LF	LH	H	WF	WF2	CDX	Clamp Screw	Wrench
SH16H-FSDUCL07	●	DCMT DCMW DCET DCGT DCGW	0702○○	15.875	100	20	14	7.75	0.75	4.2	TS254	TKY08R
SH19K-FSDUCL07	●			19.05	125	20	17	9.25	0.75	4.2	TS254	TKY08R
SH20K-FSDUCL07	●			20	125	20	18	9.75	0.75	4.2	TS254	TKY08R
SH22K-FSDUCL07	●			22	125	20	20	10.75	0.75	4.2	TS254	TKY08R
SH25M-FSDUCL07	●			25.4	150	20	23	12.25	0.75	4.2	TS254	TKY08R
SH16H-FSDUCL11	●	DCMT DCMW DCET DCGT DCGW	11T3○○	15.875	100	20	15	7.75	0.75	6.4	TS43	TKY15R
SH19K-FSDUCL11	●			19.05	125	20	17	9.25	0.75	6.4	TS43	TKY15R
SH20K-FSDUCL11	●			20	125	20	18	9.75	0.75	6.4	TS43	TKY15R
SH22K-FSDUCL11	●			22	125	20	20	10.75	0.75	6.4	TS43	TKY15R
SH25M-FSDUCL11	●			25.4	150	20	23	12.25	0.75	6.4	TS43	TKY15R

Note 1) When using insert with right and left hand chip breaker, please use right hand insert.
Note 2) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
* Clamp Torque (N • m) : TS254=1.0, TS43=3.5

RECOMMENDED CUTTING CONDITIONS

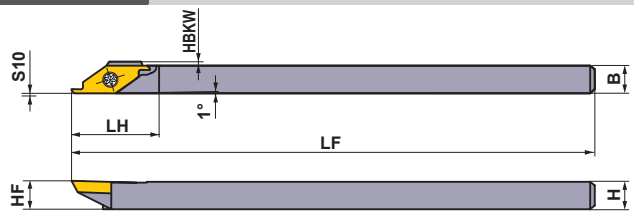
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.08 (0.01–0.15)
P	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.08 (0.01–0.15)
P			**NX2525**	150 (50–250)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	80 (50–120)	0.06 (0.02–0.1)
M		230HB	**MS7025/MS9025**	100 (50–180)	0.08 (0.01–0.15)
N	Non-Ferrous Metal	–	**HTi10/MT9005**	150 (70–230)	0.09 (0.03–0.15)
S	Titanium Alloy	–	**MT9005**	60 (40–80)	0.08 (0.04–0.12)
S	Heat Resistant Alloy	–	**MP9015/MS9025**	50 (20–75)	0.08 (0.04–0.12)

● : **Inventory maintained in Japan.**

SH○○○ type inserts ➤ A124–A129
CBN & PCD inserts ➤ B044, B045, B060

CAM TYPE TOOL POSTS

CSVH



Right hand tool holder shown.

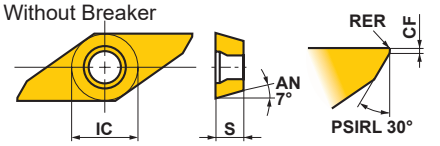
Order Number	Stock		Insert Number		Dimensions (mm)							∗1 APMX (mm)	∗2 Clamp Screw	Wrench
	R	L			H	B	HF	LF	HBKW	LH	S10			
CSVHR/L0707	●	●	CSVT	○○○○	7	7	7	140	0.5	20	0.1	3.0	NS251	NKY15S
CSVHR/L0808	●	●		○○○○	8	8	8	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L0909	●			○○○○	9.5	9.5	9.5	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L1010	●	●		○○○○	10	10	10	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L1212	●			○○○○	12	12	12	140	0	20	0.1	3.0	NS251	NKY15S

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Max. Cutting Depth (APMX) varies depending on the type of insert used.
∗1 APMX : Max. Cutting Depth
∗2 Clamp Torque (N • m) : NS251=1.0

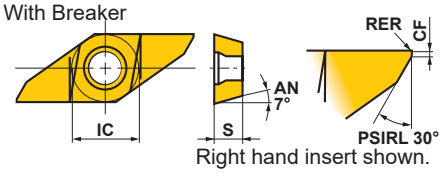
INSERTS

CSVTF — Front turning

Order Number	Hand	Coated	Dimensions (mm)				∗ APMX (mm)	Geometry
		VP15KZ	IC	S	RER/L	CF		
CSVTF30AR	R	●	6.35	2.38	0	0.3	3.0	Without Breaker
CSVTF30AL	L	●	6.35	2.38	0	0.3	3.0	
CSVTF30BR	R	●	6.35	2.38	0	0.3	3.0	
CSVTF30CR	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30DR	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30AR-B	R	●	6.35	2.38	0	0.3	3.0	With Breaker
CSVTF30AL-B	L	●	6.35	2.38	0	0.3	3.0	
CSVTF30BR-B	R	●	6.35	2.38	0	0.3	3.0	
CSVTF30CR-B	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30DR-B	R	●	6.35	2.38	0	0.15	3.0	



Right hand insert shown.

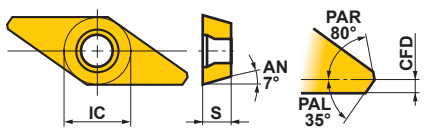


Right hand insert shown.

∗ APMX : Max. Cutting Depth

CSVTFXL — Front turning, Copying

Order Number	Hand	Coated	Dimensions (mm)			∗ APMX (mm)	Geometry
		VP15KZ	IC	S	CFD		
CSVTFXL	L	●	6.35	2.38	0.7	3.0	Without Breaker



∗ APMX : Max. Cutting Depth

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

CAM TYPE TOOL POSTS

INSERTS

CSVTC — Cutting off

Order Number	Hand	Coated VP15KZ	Dimensions (mm) IC	S	RER/L	CDX	CW	APMX* (mm)	Geometry
CSVTC0640R	R	●	6.35	2.38	0	2.0	0.6	1.5	Without Breaker
CSVTC0750R	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0750L	L	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0850R	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0850L	L	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0950R	R	●	6.35	2.38	0	2.5	0.9	2.0	
CSVTC1060R	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1060L	L	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1360R	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1360L	L	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1560R	R	●	6.35	2.38	0	3.0	1.5	2.5	
CSVTC1560L	L	●	6.35	2.38	0	3.0	1.5	2.5	Right hand insert shown.
CSVTC0640R-B	R	●	6.35	2.38	0	2.0	0.6	1.5	With Breaker
CSVTC0750R-B	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0850R-B	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0950R-B	R	●	6.35	2.38	0	2.5	0.9	2.0	
CSVTC1060R-B	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1360R-B	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1560R-B	R	●	6.35	2.38	0	3.0	1.5	2.5	Right hand insert shown.

* APMX : Max. Cutting Depth

CSVTB — Back turning

Order Number	Hand	Coated VP15KZ	Dimensions (mm) IC	S	RER/L	CDX	CW	CF	PSIRR/L	APMX* (mm)	Geometry
CSVTB10AR	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	Without Breaker
CSVTB10AL	L	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	
CSVTB10BR	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB10CR	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB10DR	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB12AR	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB14AR	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	Right hand insert shown.
CSVTB10AR-B	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	With Breaker
CSVTB10BR-B	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB10CR-B	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB10DR-B	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB12AR-B	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB14AR-B	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	Right hand insert shown.

* APMX : Max. Cutting Depth

CSVTBXL — Back turning, Copying

Order Number	Hand	Coated VP15KZ	Dimensions (mm) IC	S	RER/L	CW	CF	APMX* (mm)	Geometry
CSVTBXL	L	●	6.35	2.38	0	0.7	0.035	3.0	Without Breaker

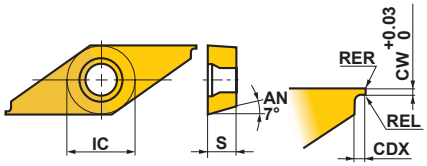
* APMX : Max. Cutting Depth

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

INSERTS

CSVTG — Grooving

Order Number	Hand	Coated	Dimensions (mm)					APMX* (mm)	Geometry
		VP15KZ	IC	S	RER/L	CDX	CW		
CSVTG02505R	R	●	6.35	2.38	0	0.5	0.25	0.15	Without Breaker
CSVTG03005R	R	●	6.35	2.38	0	0.5	0.3	0.15	
CSVTG03505R	R	●	6.35	2.38	0	0.5	0.35	0.15	
CSVTG04005R	R	●	6.35	2.38	0	0.5	0.4	0.15	
CSVTG04510R	R	●	6.35	2.38	0	1.0	0.45	0.45	
CSVTG05010R	R	●	6.35	2.38	0	1.0	0.5	0.45	
CSVTG05510R	R	●	6.35	2.38	0	1.0	0.55	0.45	
CSVTG06010R	R	●	6.35	2.38	0	1.0	0.6	0.45	
CSVTG06510R	R	●	6.35	2.38	0	1.0	0.65	0.45	
CSVTG07010R	R	●	6.35	2.38	0	1.0	0.7	0.45	
CSVTG07520R	R	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG07520L	L	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG08020R	R	●	6.35	2.38	0	2.0	0.8	1.4	
CSVTG08520R	R	●	6.35	2.38	0	2.0	0.85	1.4	
CSVTG09020R	R	●	6.35	2.38	0	2.0	0.9	1.4	
CSVTG09520R	R	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG09520L	L	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG10020R	R	●	6.35	2.38	0	2.0	1.0	1.4	
CSVTG11030R	R	●	6.35	2.38	0	3.0	1.1	2.6	
CSVTG12030R	R	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG12030L	L	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG13030R	R	●	6.35	2.38	0	3.0	1.3	2.6	
CSVTG14030R	R	●	6.35	2.38	0	3.0	1.4	2.6	
CSVTG15030R	R	●	6.35	2.38	0	3.0	1.5	2.6	

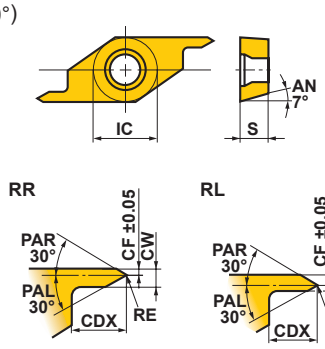


Right hand insert shown.

* APMX : Max. Cutting Depth

CSVTT — Threading

Order Number	Hand	Coated	Pitch (mm)	Dimensions (mm)						Geometry
		VP15KZ		IC	S	RE	CDX	CW	CF	
CSVTT60050RR	R	●	0.2—0.5	6.35	2.38	0.03	3.0	1.0	0.35	Without Breaker General Purpose Partial Profile (60°)
CSVTT60050RL	L	●	0.2—0.5	6.35	2.38	0.03	3.0	1.0	0.35	

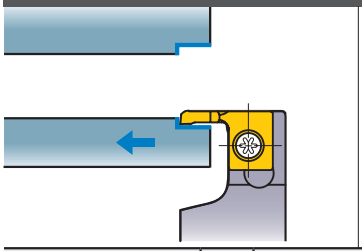


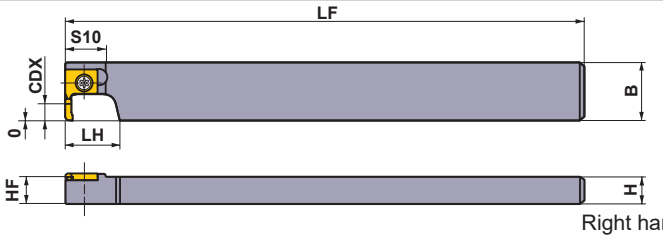
Right hand insert shown.

BORING

SBAH

Without off set





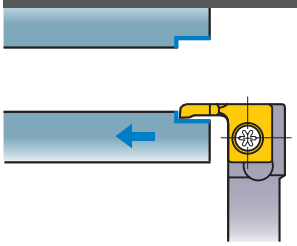
Right hand tool holder only.

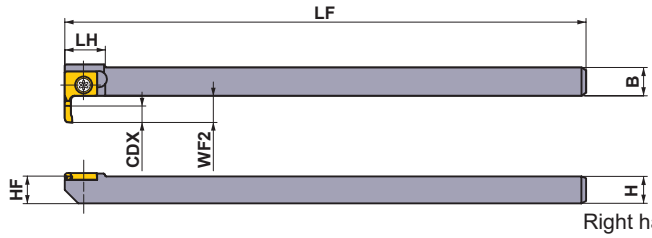
Order Number	Stock	Insert Number		Dimensions (mm)						CDX (mm)	DMIN (mm) *1	*2	
	R			H	B	LF	HF	LH	S10			Clamp Screw	Wrench
SBAHR1022	●	SBAT	3080○○L/L-B	10	21.5	120	10	17.5	15	8	3	NS402W	NKY15S
SBAHR1222	●	SBAT	3080○○L/L-B	12	21.5	120	12	17.5	15	8	3	NS403W	NKY15S

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

SBAH

With off set





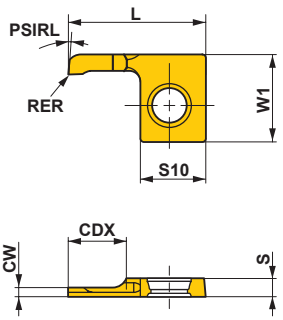
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						CDX (mm)	DMIN (mm) *1	*2	
	R			H	B	LF	HF	WF2	LH			Clamp Screw	Wrench
SBAHR1010	●	SBAT	3080○○L/L-B	10	10	120	10	10	15	8	3	NS402W	NKY15S

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (N • m) : NS402W=1.0

INSERTS

Breaker	Order Number	Coated	Dimensions (mm)								DMIN * (mm)	Geometry
		VP15KZ	PSIRL	RER	CDX	L	W1	S	CW	S10		
Without Breaker	**SBAT308000L**	●	5°	0	8.0	18.5	12.0	2.50	1.25	9.0	3	
	SBAT3080V5L	●	5°	0.05	8.0	18.5	12.0	2.50	1.25	9.0	3	
With Breaker	**SBAT308000L-B**	●	5°	0	8.0	18.5	12.0	2.50	1.25	9.0	3	
	SBAT3080V5L-B	●	5°	0.05	8.0	18.5	12.0	2.50	1.25	9.0	3	



* DMIN : Min. Cutting Diameter

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Memo

HOW TO READ THE STANDARD OF BORING BARS

●How this section page is organised

①Organised by product series.
(Refer to the index on the next page.)

TYPE OF BORING BAR
indicates the initial letters for the order number, as well as applicable insert types.

TITLE OF PRODUCT SERIES

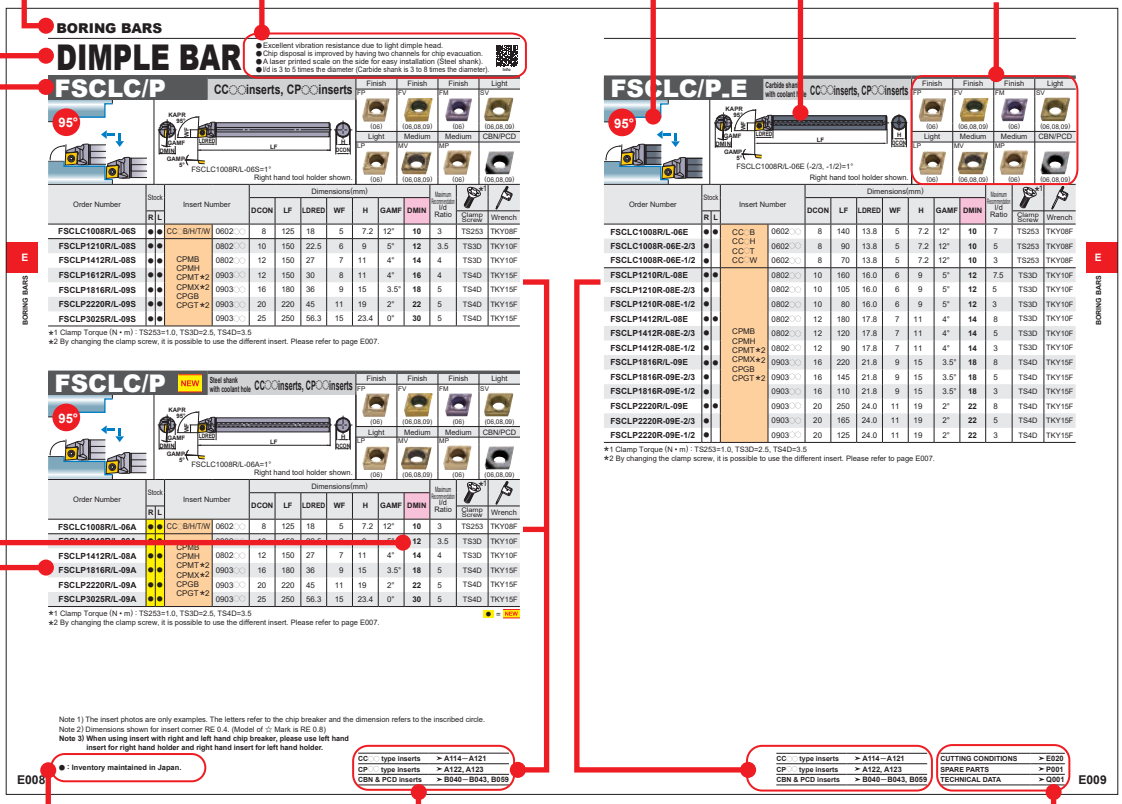
PRODUCT SECTION

PRODUCT FEATURES

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the title product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, minimum cutting diameters, standard corner radius, recommended l/d ratios, and spare parts.

MIN. CUTTING DIAMETER
is colour-coded to let you find, at a glance, the maximum / minimum cutting diameters for internal machining.

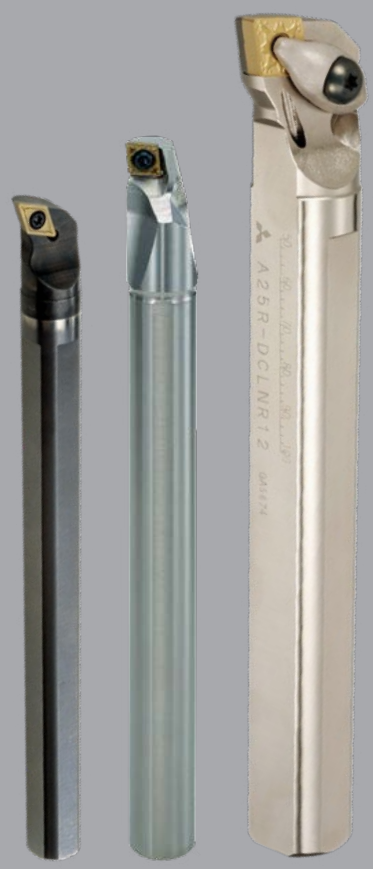
●To Order : Please specify
①order number and hand of tool (right/left).

TURNING TOOLS

BORING BARS

CLASSIFICATION OF BORING TOOLS ····· E002
IDENTIFICATION ····· E004

STANDARD OF BORING BARS
- FEATURES OF DIMPLE BAR ····· E005
- DIMPLE BAR ····· E006
- DOUBLE CLAMP DIMPLE BAR ····· E013
- MICRO-DEX BORING BARS ····· E016
- MICRO-MINI TWIN BORING BARS ····· E019
- MICRO-MINI BORING BARS ····· E022
- F TYPE BORING BARS ····· E025
- S TYPE BORING BARS ····· E028
- P TYPE BORING BARS ····· E035
- M TYPE BORING BARS ····· E039
- D TYPE BORING HEAD ····· E040
- AL TYPE BORING BARS ····· E043



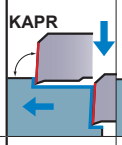
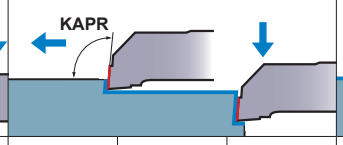
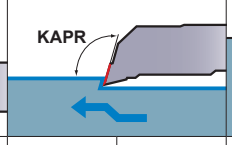
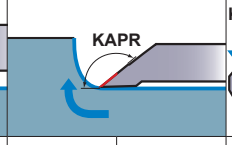
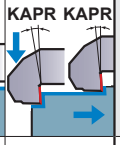
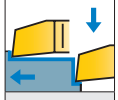
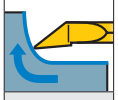
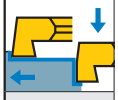
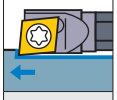
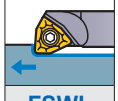
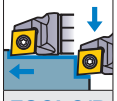
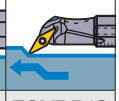
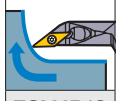
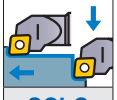
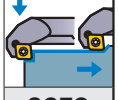
*Arranged by Alphabetical order

E021 **A□□□-DCLN**
E021 **A□□□-DDUN**
E022 **A□□□-DSKN**
E022 **A□□□-DTFN**
E023 **A□□□-DVUN**
E023 **A□□□-DWLN**
E047 **A□□□MWLN**
E044 **A□□□PCLN**
E045 **A□□□PDQN**
E044 **A□□□PDUN**
E046 **A□□□PDZN**
E043 **A□□□PSKN**
E043 **A□□□PTFN**
E045 **A□□□PWLN**
E050 **B1□□□□**
E030 **C□□□□-BLS**
E024 **C□□□SCLC**
E038 **C□□□SCLC**
E039 **C□□□SDQC**
E037 **C□□□SDUC**
E036 **C□□□STFC**
E025 **C□□□STUC**
E040 **C□□□SVQC**
E024 **C□□□SWUB**
E027 **CB**
E028 **CR**
E049 **DPCL**
E049 **DPDH**
E048 **DPDU**
E048 **DPTF**
E050 **DPVP**
E034 **FCTU1**
E034 **FCTU2**
E008 **FSCLC/P**
E014 **FSDQC**
E012 **FSDUC**
E033 **FSTU1**
E033 **FSTU2**
E010 **FSTUP**
E020 **FSVJB/C**
E019 **FSVPB/C**
E018 **FSVUB/C**
E035 **FSWL1**
E035 **FSWL2**
E016 **FSWUB/P**
E026 **RBH**
E031 **RBH**
E038 **S□□□SCLC**
E042 **S□□□SCZC**
E039 **S□□□SDQC**
E037 **S□□□SDUC**
E041 **S□□□SSKC**
E036 **S□□□STFC**
E051 **STFE**
E040 **S□□□SVQC**
E041 **S□□□SVUC**
E032 **SBH**

CLASSIFICATION

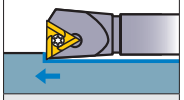
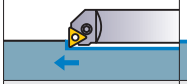
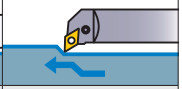
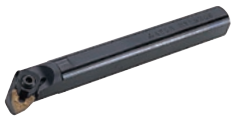
Name of Tool Holder	DMIN Minimum Cutting Diameter	Features	Applicable Insert Type: SC○○ / TC○○ / DC○○ / TC/TP○○ / TP○○ / VB/VC○○ / WB/WP○○
			KAPR=75° / KAPR=91° / KAPR=93°
MICRO-MINI TWIN Boring Bars 	ϕ2.2 – ϕ8.2	● Solid carbide type with two cutting edges. ● Continuous cutting from boring to facing. ● With or without a chip breaker.	
MICRO-MINI Boring Bars 	ϕ3.2 – ϕ5.2	● Solid carbide type (Single cutting edges). ● l/d is 5 times the diameter. ● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range (threading,grooving,copying, etc.).	
MICRO-DEX Boring Bars (Carbide Shank) 	ϕ5 – ϕ8	● 7°positive insert. ● Carbide shank type. ● Easy-to-use tool geometries. ● Suitable for small workpieces. ● l/d is 5 times the diameter.	STUC ➔ E025 SWUB ➔ E024
F Type Boring Bars 	ϕ5.8 – ϕ40	● 11°positive insert. ● Screw-on type and Clamp-on type. ● l/d is 3 to 5 times the diameter. ● FSWL type is 7°positive insert.	FSTU ➔ E033 FCTU ➔ E034
DIMPLE BAR 	ϕ10 – ϕ40	● 5°, 7°, 11° positive insert. ● Excellent vibration resistance due to a light dimple head. ● l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).	FSDUC ➔ E012 FSTUP ➔ E010 FSVUB/C ➔ E018 FSWUB/P ➔ E016
S Type Boring Bars 	ϕ11 – ϕ50	● ISO standard. ● 7°positive insert. ● Screw-on type. ● l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).	SSKC ➔ E041 STFC ➔ E036 SDUC ➔ E037 SVUC ➔ E041

Note 1) Holders with blue colour symbol have an anti-vibration carbide shank. (For Micro-dex boring bars, carbide shank only.)
Note 2) l/d represents the ratio of the projection length L to the cutting edge and the shank diameter d.

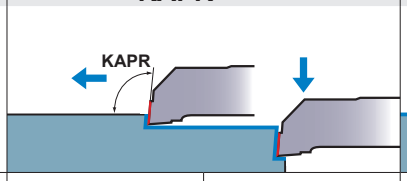
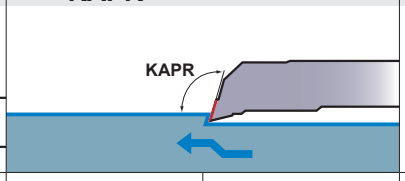
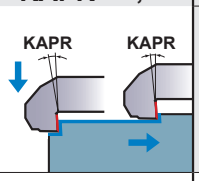
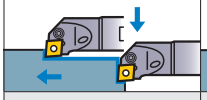
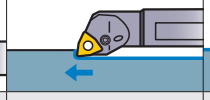
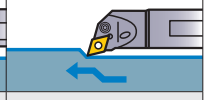
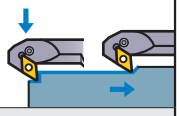
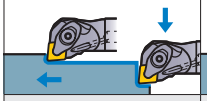
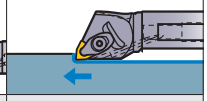
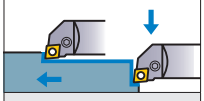
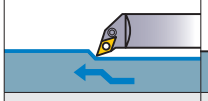
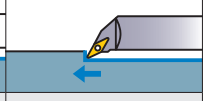
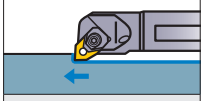
MICRO-MINI Boring Bars	MICRO-MINI TWIN Boring Bars	CC/CP○○	WC○○	DC○○	VB/VC○○	MICRO-MINI TWIN Boring Bars	VB/VC○○	CC○○	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Vibration Resisiance	Operation Efficiency	Coolant Hole	Specialized	Small Diameter Cutting
KAPR=94°	KAPR=95°			KAPR=107.5°–117.5°		KAPR=142°		KAPR=3°,5°	Selection Standard							
																
	 CB○○RS(-B) E027					 CR E028				◎		* ◎				◎
 C○○FR-BLS E030										◎						◎
		 SCLC E024										* ◎				◎
			 FSWL E035							○		* ○				○
		 FSCLC/P E008		 FSDQC E014	 FSVPB/C E019		 FSVJB/C E020			◎		* ◎	◎	* ◎		
		 SCLC E038		 SDQC E039	 SVQC E040			 SCZC E042		○		* ○				

Note 3) ◎ : 1st recommendation. ○: 2nd recommendation.
Note 4) ＊Indicates that the shank material is carbide.

CLASSIFICATION

Name of Tool Holder	DMIN Minimum Cutting Diameter	Features	SN□□	TE/TN□□	DN□□	VN□□
			KAPR=75°	KAPR=91°	KAPR=93°	
AL Type Boring Bars (For Aluminium Alloy) 	ϕ20 – ϕ32	● Suitable for non-ferrous metal. ● 20°positive insert. ● Screw-on type. ● l/d is 6 times the diameter. ● Excellent vibration resistance.		 STFE E051		
P Type Boring Bars 	ϕ20 – ϕ70	● ISO standard. ● Economical negative insert. ● Lever lock type, and pin lock type. ● l/d is 3 times the diameter.	 PSKN E043	 PTFN E043	 PDUN E044	
DOUBLE CLAMP DIMPLE BAR 	ϕ32 – ϕ50	● Economical negative insert. ● Single action type. ● Excellent vibration resistance due to a light dimple head. (With coolant hole.) ● l/d is 3 to 4 times the diameter.	 DSKN E022	 DTFN E022	 DDUN E021	 DVUN E023
D Type Boring Head 	ϕ40 – ϕ60	● Economical negative insert. ● Lever lock type. ● Exchangeable head type.		 DPTF E048	 DPDU E048	
M Type Boring Bars 	ϕ63	● Negative trigon shape insert. ● Double clamp type. ● l/d is 3 times the diameter.				

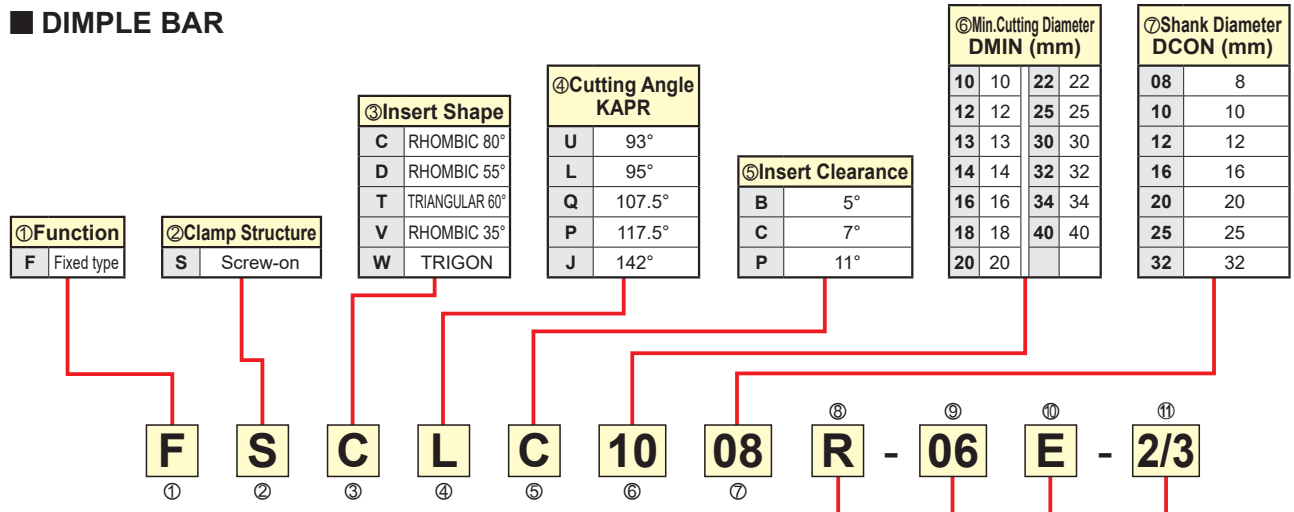
Note 1) Holders with blue colour symbol have an anti-vibration carbide shank. (For Micro-dex boring bars, carbide shank only.)
Note 2) l/d represents the ratio of the projection length L to the cutting edge and the shank diameter d.

	CN□□	WN□□	DN□□	VN□□	DN□□								
	KAPR=95°		KAPR=107.5°—117.5°		KAPR=3°,5°	Selection Standard							
						Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Vibration Resisiance	Operation Efficiency	Coolant Hole	Specialized	Small Diameter Cutting
							◎		○			◎	
	 **PCLN** ➲ E044	 **PWLN** ➲ E045	 **PDQN** ➲ E045		 **PDZN** ➲ E046	◎		○		◎	◎		
	 **DCLN** ➲ E021	 **DWLN** ➲ E023				◎		◎		◎	◎		
	 **DPCL** ➲ E049		 **DPDH** ➲ E049	 **DPVP** ➲ E050		◎		○		◎			
		 **MWLN** ➲ E047				◎		◎		○	◎		

Note 3) ◎ : 1st recommendation. ○: 2nd recommendation.

IDENTIFICATION

■ DIMPLE BAR



⑧Hand of Tool

R	Right Hand
L	Left Hand

⑨Cutting Edge Length (mm)

Inscribed circle of insert	4.76	5.56	6.35	7.94	9.525
RHOMBIC 80°	–	–	**06**	**0.8**	**09**
RHOMBIC 55°	–	–	**07**	–	**11**
TRIANGULAR 60°	**08**	**09**	**11**	–	**16**
RHOMBIC 35°	**08**	–	**11**	–	**16**
TRIGON	**L3**	–	**04**	–	**06**

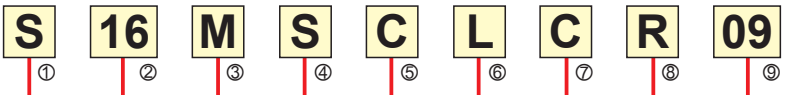
⑩Shank Material

E	Carbide Shank
A	Steel Shank Internal
S	Steel Shank External

⑪Tool Length (Carbide shank only) (mm)

Shank Dia.	8	10	12	16	20
No symbol	140	160	180	220	250
2/3	90	105	120	145	165
1/2	70	80	90	110	125

■ ISO TYPE BORING TOOLS
[For Aluminium Alloy, P-type and S-type]



①Shank Material

A	Steel Shank with Coolant Hole
C	Carbide Shank
E	Carbide Shank with Coolant Hole
S	Steel Shank

②Shank Diameter DCON (mm)

08	8
10	10
12	12
16	16
20	20
25	25
32	32
40	40

③Tool Length LF (mm)

F	80
H	100
K	125
M	150
Q	180
R	200
S	250
T	300
U	350
V	400

④Clamp Structure

P	Lever Lock
S	Screw-on

⑤Insert Shape

C	RHOMBIC 80°
D	RHOMBIC 55°
S	SQUARE 90°
T	TRIANGULAR 60°
V	RHOMBIC 35°
W	TRIGON

⑥Cutting Angle KAPR

F	91°
K	75°
L	95°
Q	107.5°
U	93°

⑦Insert Clearance

C	7°Positive
E	20°Positive
N	0°
P	11°Positive

⑧Hand of Tool

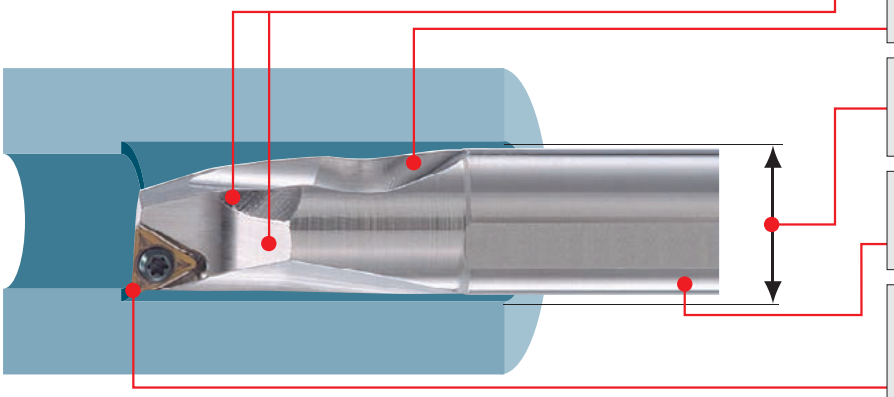
R	Right Hand
L	Left Hand

⑨Cutting Edge Length (mm)

Inscribed circle of insert	6.35	7.94	9.525	12.70	19.05
RHOMBIC 80°	**06**	**08**	**09**	**12**	**19**
RHOMBIC 55°	**07**	–	**11**	**15**	–
SQUARE 90°	–	–	**09**	**12**	**19**
TRIANGULAR 60°	**11**	–	**16**	**22**	–
RHOMBIC 35°	**11**	–	**16**	–	–

FEATURES OF DIMPLE BAR

Highly rigid steel shank and a lightweight head configuration designed by computer simulation analysis reduces chatter and improves the vibration damping properties.



- Chip disposal is improved by having two channels for chip evacuation.
- The lightweight head with its large dimple reduces chatter.
- Available in sizes smaller than the ISO standard. Therefore the boring of small diameter holes is possible.
- The boring bar has a laser printed scale on the shank to facilitate easy installation.
- "F and FS" breakers improves the quality of the surface finish, "MV" breaker offers excellent chip disposal. High wear resistant CBN inserts are also available for the machining of hardened materials.

■ VIBRATION RESISTANCE

●DIMPLE BAR

Weight of the Head	Damping Time
49.7g	15.8ms



By reducing the weight of the head, the damping properties are increased.

●Conventional Product

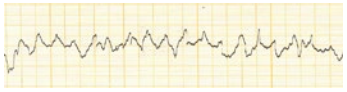
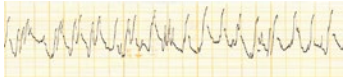
Weight of the Head	Damping Time
70.1g	20ms

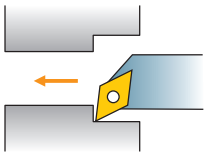


■ CUTTING PERFORMANCE

SCM440 Steel Shank Comparison of Surface Roughness

Internal coolant improves chip evacuation, suppresses chips scraping the machined surface, and improves surface roughness.

	Measured Value	Ra
NEW **Steel shank with coolant hole**		1.4μm
Steel shank without coolant hole		2.4μm



<Cutting Conditions>

Workpiece Material	: JIS SCM400
Tool	: KAPR 93°
Inserts	: DCMT070204-MV
Cutting Speed	: vc=80m/min
Feed per Rev.	: f=0.1mm/rev
Depth of Cut	: ap=0.5mm
Cutting Mode	: Wet Cutting Internal vs External (Water-Soluble Cutting Fluid)

* The simulation data stated above was conducted with a FSCLP1816R-09S holder, under the following conditions; l/d=5, depth of cut=0.5mm, and feed=0.05mm/rev.

■ Direction for the use of CCG/MT • CPG/MT • CPMX • TPG/MX type inserts

By changing the clamp screw, it is possible to use the inserts listed in the table below.

Holder : FSCLC/P • FSCLC/P...E

Insert Number	Clamp Screw
CCG/MT0602○○ (ϕ6.35)	Can be used as it is.
CPG/MT0802○○ (ϕ7.94)	Change to **TS3**
CPG/MT0903○○ (ϕ9.525)	Change to **TS4**
CPMX0802○○ (ϕ7.94)	Can be used as it is.
CPMX0903○○ (ϕ9.525)	Can be used as it is.

Holder : FSTUP • FSTUP...E

Insert Number	Clamp Screw
TPG/MX0802○○ (ϕ4.76)	Change to **CS200T**
TPG/MX0902○○ (ϕ5.56)	Change to **CS250T**
TPG/MX1103○○ (ϕ6.35)	Change to **CS300890T**

* If the screw is too long the please shorten as necessary.

Note 1) TPMT/W09, W11 types cannot be used due to a different clamp screw size.

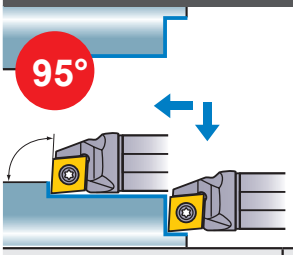
DIMPLE BAR

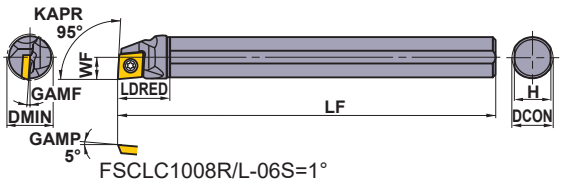
- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

Info

FSCLC/P

CC○○inserts, CP○○inserts





FSCLC1008R/L-06S=1°
Right hand tool holder shown.

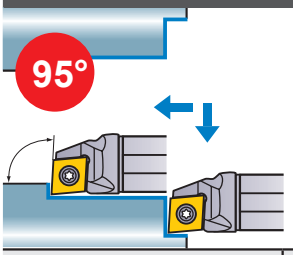
Finish	Finish	Finish	Light
FP	FV	FM	SV
			
(06)	(06,08,09)	(06)	(06,08,09)
Light	**Medium**	**Medium**	**CBN/PCD**
LP	MV	MP	
			
(06)	(06,08,09)	(06)	(06,08,09)

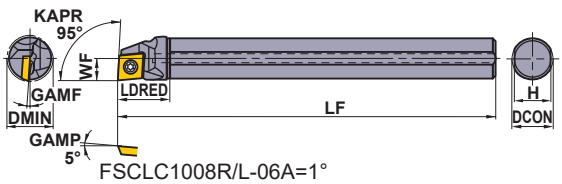
Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	∗1 Clamp Screw	Wrench
FSCLC1008R/L-06S	●	●	CC○B/H/T/W	0602○○	8	125	18	5	7.2	12°	**10**	3	TS253	TKY08F
FSCLP1210R/L-08S	●	●	CPMB CPMH CPMT∗2 CPMX∗2 CPGB CPGT∗2	0802○○	10	150	22.5	6	9	5°	**12**	3.5	TS3D	TKY10F
FSCLP1412R/L-08S	●	●		0802○○	12	150	27	7	11	4°	**14**	4	TS3D	TKY10F
FSCLP1612R/L-09S	●	●		0903○○	12	150	30	8	11	4°	**16**	4	TS4D	TKY15F
FSCLP1816R/L-09S	●	●		0903○○	16	180	36	9	15	3.5°	**18**	5	TS4D	TKY15F
FSCLP2220R/L-09S	●	●		0903○○	20	220	45	11	19	2°	**22**	5	TS4D	TKY15F
FSCLP3025R/L-09S	●	●		0903○○	25	250	56.3	15	23.4	0°	**30**	5	TS4D	TKY15F

∗1 Clamp Torque (N • m) : TS253=1.0, TS3D=2.5, TS4D=3.5
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

FSCLC/P NEW

Steel shank with coolant hole CC○○inserts, CP○○inserts





FSCLC1008R/L-06A=1°
Right hand tool holder shown.

Finish	Finish	Finish	Light
FP	FV	FM	SV
			
(06)	(06,08,09)	(06)	(06,08,09)
Light	**Medium**	**Medium**	**CBN/PCD**
LP	MV	MP	
			
(06)	(06,08,09)	(06)	(06,08,09)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	∗1 Clamp Screw	Wrench
FSCLC1008R/L-06A	●	●	CC○B/H/T/W	0602○○	8	125	18	5	7.2	12°	**10**	3	TS253	TKY08F
FSCLP1210R/L-08A	●	●	CPMB CPMH CPMT∗2 CPMX∗2 CPGB CPGT∗2	0802○○	10	150	22.5	6	9	5°	**12**	3.5	TS3D	TKY10F
FSCLP1412R/L-08A	●	●		0802○○	12	150	27	7	11	4°	**14**	4	TS3D	TKY10F
FSCLP1816R/L-09A	●	●		0903○○	16	180	36	9	15	3.5°	**18**	5	TS4D	TKY15F
FSCLP2220R/L-09A	●	●		0903○○	20	220	45	11	19	2°	**22**	5	TS4D	TKY15F
FSCLP3025R/L-09A	●	●		0903○○	25	250	56.3	15	23.4	0°	**30**	5	TS4D	TKY15F

∗1 Clamp Torque (N • m) : TS253=1.0, TS3D=2.5, TS4D=3.5
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

● = NEW

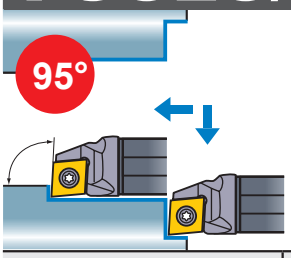
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

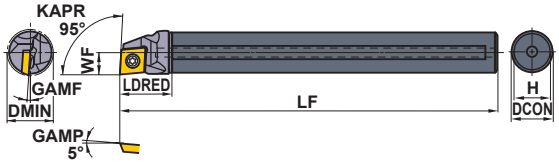
● : Inventory maintained in Japan.

CC○○ type inserts	➤ A114—A121
CP○○ type inserts	➤ A122, A123
CBN & PCD inserts	➤ B040—B043, B059

FSCLC/P_E

Carbide shank with coolant hole CC○○inserts, CP○○inserts





FSCLC1008R/L-06E (-2/3, -1/2)=1°

Right hand tool holder shown.

Finish	Finish	Finish	Light
FP	FV	FM	SV
			
(06)	(06,08,09)	(06)	(06,08,09)
Light	**Medium**	**Medium**	**CBN/PCD**
LP	MV	MP	
			
(06)	(06,08,09)	(06)	(06,08,09)

Order Number	Stock		Insert Number		Dimensions(mm)							Maximum Recommendation l/d Ratio	✶1 Clamp Screw	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN			
FSCLC1008R/L-06E	●	●	CC○B CC○H CC○T CC○W	0602○○	8	140	13.8	5	7.2	12°	**10**	7	TS253	TKY08F
FSCLC1008R-06E-2/3	●			0602○○	8	90	13.8	5	7.2	12°	**10**	5	TS253	TKY08F
FSCLC1008R-06E-1/2	●			0602○○	8	70	13.8	5	7.2	12°	**10**	3	TS253	TKY08F
FSCLP1210R/L-08E	●	●	CPMB CPMH CPMT✶2 CPMX✶2 CPGB CPGT✶2	0802○○	10	160	16.0	6	9	5°	**12**	7.5	TS3D	TKY10F
FSCLP1210R-08E-2/3	●			0802○○	10	105	16.0	6	9	5°	**12**	5	TS3D	TKY10F
FSCLP1210R-08E-1/2	●			0802○○	10	80	16.0	6	9	5°	**12**	3	TS3D	TKY10F
FSCLP1412R/L-08E	●	●		0802○○	12	180	17.8	7	11	4°	**14**	8	TS3D	TKY10F
FSCLP1412R-08E-2/3	●			0802○○	12	120	17.8	7	11	4°	**14**	5	TS3D	TKY10F
FSCLP1412R-08E-1/2	●			0802○○	12	90	17.8	7	11	4°	**14**	3	TS3D	TKY10F
FSCLP1816R/L-09E	●	●		0903○○	16	220	21.8	9	15	3.5°	**18**	8	TS4D	TKY15F
FSCLP1816R-09E-2/3	●			0903○○	16	145	21.8	9	15	3.5°	**18**	5	TS4D	TKY15F
FSCLP1816R-09E-1/2	●			0903○○	16	110	21.8	9	15	3.5°	**18**	3	TS4D	TKY15F
FSCLP2220R/L-09E	●	●		0903○○	20	250	24.0	11	19	2°	**22**	8	TS4D	TKY15F
FSCLP2220R-09E-2/3	●			0903○○	20	165	24.0	11	19	2°	**22**	5	TS4D	TKY15F
FSCLP2220R-09E-1/2	●			0903○○	20	125	24.0	11	19	2°	**22**	3	TS4D	TKY15F

✶1 Clamp Torque (N • m) : TS253=1.0, TS3D=2.5, TS4D=3.5

✶2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

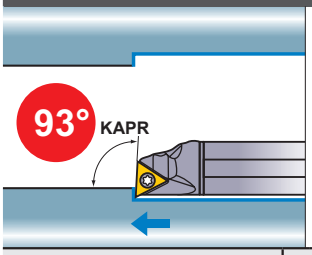
CC○○ type inserts	➤ A114—A121	CUTTING CONDITIONS	➤ E020
CP○○ type inserts	➤ A122, A123	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B040—B043, B059	TECHNICAL DATA	➤ Q001

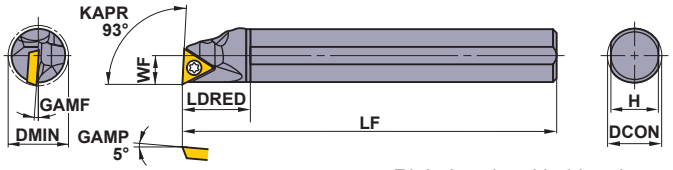
DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

Info

FSTUP — TP○○inserts





Right hand tool holder shown.

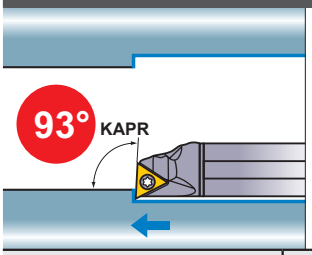
Finish	Light	Medium
FV	SV	MV
		
(08,09,11,16)	(08,09,11,16)	(08,09,11,16)
PCD	**CBN**	
R/L-F		
		
(08,09,11,16)	(08,09,11,16)	

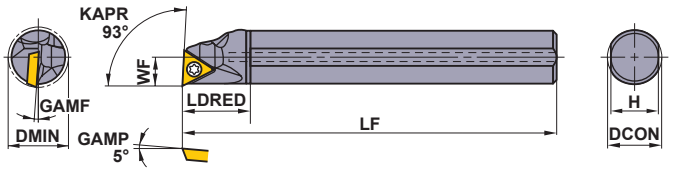
Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	✶1 Clamp Screw	Wrench
FSTUP1008R/L-08S	●	●	TPMB TPMH TPMX✶2 TPGB TPGH TPGX✶2	0802○○	8	125	18	5	7.2	10°	**10**	3	TS2D	TKY06F
FSTUP1210R/L-09S	●	●		0902○○	10	150	22.5	6	9	8°	**12**	3.5	TS25D	TKY08F
FSTUP1412R/L-09S	●	●		0902○○	12	150	27	7	11	7°	**14**	4	TS25D	TKY08F
FSTUP1210R/L-11S	●	●		1103○○	10	150	22.5	6	9	8°	**12**	3.5	TS31D	TKY10F
FSTUP1412R/L-11S	●	●		1103○○	12	150	27	7	11	7°	**14**	4	TS31D	TKY10F
FSTUP1816R/L-11S	●	●		1103○○	16	180	36	9	15	4°	**18**	5	TS31D	TKY10F
FSTUP2220R/L-11S	●	●		1103○○	20	220	45	11	19	0°	**22**	5	TS31D	TKY10F
FSTUP3225R/L-16S ☆	●	●		1603○○	25	270	56.3	16	23.4	0°	**32**	5	TS4D	TKY15F

✶ Clamp Torque (N • m) : TS2D=0.6, TS25D=1.0, TS31D=2.5, TS4D=3.5

✶2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

FSTUP — NEW — Steel shank with coolant hole — TP○○inserts





Right hand tool holder shown.

Finish	Light	Medium
FV	SV	MV
		
(08,09,11,16)	(08,09,11,16)	(08,09,11,16)
PCD	**CBN**	
R/L-F		
		
(08,09,11,16)	(08,09,11,16)	

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	✶1 Clamp Screw	Wrench
FSTUP1008R/L-08A	●	●	TPMB TPMH TPMX✶2 TPGB TPGH TPGX✶2	0802○○	8	125	18	5	7.2	10°	**10**	3	TS2D	TKY06F
FSTUP1210R/L-09A	●	●		0902○○	10	150	22.5	6	9	8°	**12**	3.5	TS25D	TKY08F
FSTUP1412R/L-09A	●	●		0902○○	12	150	27	7	11	7°	**14**	4	TS25D	TKY08F
FSTUP1816R/L-11A	●	●		1103○○	16	180	36	9	15	4°	**18**	5	TS31D	TKY10F
FSTUP2220R/L-11A	●	●		1103○○	20	220	45	11	19	0°	**22**	5	TS31D	TKY10F
FSTUP3225R/L-16A ☆	●	●		1603○○	25	270	56.3	16	23.4	0°	**32**	5	TS4D	TKY15F

✶ Clamp Torque (N • m) : TS2D=0.6, TS25D=1.0, TS31D=2.5, TS4D=3.5

● = NEW

✶2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

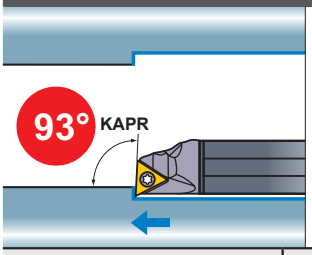
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

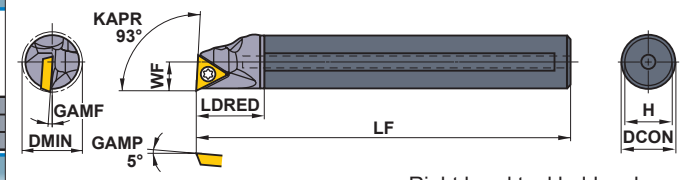
● : **Inventory maintained in Japan.**

TP○○ type inserts ➤ A139—A141
CBN & PCD inserts ➤ B047, B048, B062, B063

FSTUP_E

Carbide shank with coolant hole — **TP○○inserts**





Right hand tool holder shown.

Finish	Light	Medium
FV	SV	MV
		
(08,09,11)	(08,09,11)	(08,09,11)
PCD	**CBN**	
R/L-F		
		
(08,09,11)	(08,09,11)	

Order Number	Stock		Insert Number		Dimensions(mm)							Maximum Recommendation l/d Ratio	✱1 Clamp Screw	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN			
FSTUP1008R/L-08E	●	●	TPMB TPMH TPMX✱2 TPGB TPGH TPGX✱2	0802○○	8	140	13.8	5	7.2	10°	**10**	7	TS2D	TKY06F
FSTUP1008R-08E-2/3	●			0802○○	8	90	13.8	5	7.2	10°	**10**	5	TS2D	TKY06F
FSTUP1008R-08E-1/2	●			0802○○	8	70	13.8	5	7.2	10°	**10**	3	TS2D	TKY06F
FSTUP1210R/L-09E	●	●		0902○○	10	160	16.0	6	9	8°	**12**	7.5	TS25D	TKY08F
FSTUP1210R-09E-2/3	●			0902○○	10	105	16.0	6	9	8°	**12**	5	TS25D	TKY08F
FSTUP1210R-09E-1/2	●			0902○○	10	80	16.0	6	9	8°	**12**	3	TS25D	TKY08F
FSTUP1412R/L-09E	●	●		0902○○	12	180	17.8	7	11	7°	**14**	8	TS25D	TKY08F
FSTUP1412R-09E-2/3	●			0902○○	12	120	17.8	7	11	7°	**14**	5	TS25D	TKY08F
FSTUP1412R-09E-1/2	●			0902○○	12	90	17.8	7	11	7°	**14**	3	TS25D	TKY08F
FSTUP1816R/L-11E	●	●		1103○○	16	220	21.8	9	15	4°	**18**	8	TS31D	TKY10F
FSTUP1816R-11E-2/3	●			1103○○	16	145	21.8	9	15	4°	**18**	5	TS31D	TKY10F
FSTUP1816R-11E-1/2	●			1103○○	16	110	21.8	9	15	4°	**18**	3	TS31D	TKY10F
FSTUP2220R/L-11E	●	●		1103○○	20	250	24.0	11	19	0°	**22**	8	TS31D	TKY10F
FSTUP2220R-11E-2/3	●			1103○○	20	165	24.0	11	19	0°	**22**	5	TS31D	TKY10F
FSTUP2220R-11E-1/2	●			1103○○	20	125	24.0	11	19	0°	**22**	3	TS31D	TKY10F

✱1 Clamp Torque (N • m) : TS2D=0.6, TS25D=1.0, TS31D=2.5

✱2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E007.

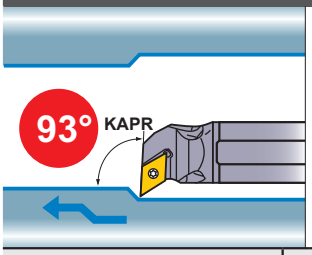
TP○○ type inserts ➤ A139—A141
CBN & PCD inserts ➤ B047, B048, B062, B063
CUTTING CONDITIONS ➤ E020
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

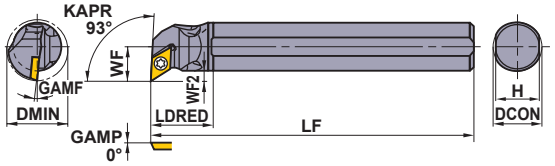
DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

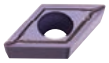
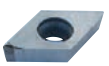
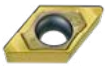
Info

FSDUC — DC○○inserts





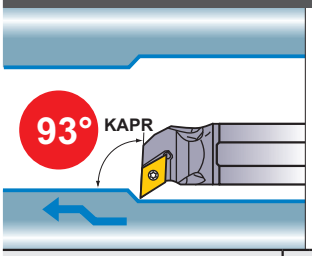
Right hand tool holder shown.

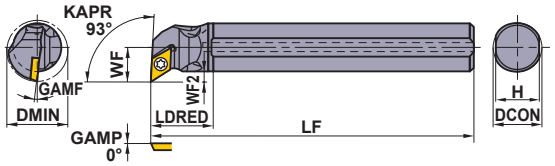
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
FSDUC1410R/L-07S	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	150	18	8.3	3.3	9	7.5°	**14**	3.5	TS25	TKY08F
FSDUC1612R/L-07S	●	●		0702○○	12	150	20	9.3	3.3	11	6°	**16**	4	TS25	TKY08F
FSDUC2016R/L-07S	●	●		0702○○	16	180	20	11.3	3.3	15	5°	**20**	5	TS25	TKY08F
FSDUC3220R/L-11S☆	●	●		11T3○○	20	180	22.5	16.1	6.1	19	5°	**32**	5	TS43	TKY15F

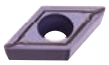
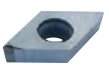
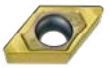
∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

FSDUC — NEW — Steel shank with coolant hole — DC○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
FSDUC1410R/L-07A	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	150	18	8.3	3.3	9	7.5°	**14**	3.5	TS25	TKY08F
FSDUC1612R/L-07A	●	●		0702○○	12	150	20	9.3	3.3	11	6°	**16**	4	TS25	TKY08F
FSDUC2016R/L-07A	●	●		0702○○	16	180	20	11.3	3.3	15	5°	**20**	5	TS25	TKY08F
FSDUC3220R/L-11A☆	●	●		11T3○○	20	180	22.5	16.1	6.1	19	5°	**32**	5	TS43	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

● = NEW

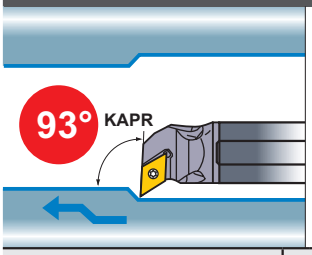
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

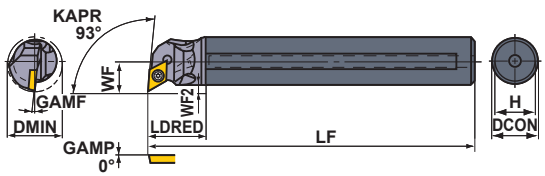
● : Inventory maintained in Japan.

DC○○ type inserts	**➤ A124—A129**
CBN & PCD inserts	**➤ B044, B045, B060**

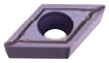
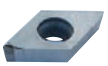
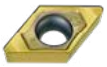
FSDUC_E

Carbide shank with coolant hole **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock		Insert Number		Dimensions(mm)								Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN			
FSDUC1410R/L-07E	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	160	16.0	8.3	3.3	9	7.5°	**14**	7.5	TS25	TKY08F
FSDUC1612R/L-07E	●	●		0702○○	12	180	17.8	9.3	3.3	11	6.0°	**16**	8	TS25	TKY08F
FSDUC2016R/L-07E	●	●		0702○○	16	220	21.8	11.3	3.3	15	5.0°	**20**	8	TS25	TKY08F
FSDUC3220R/L-11E ☆	●	●		11T3○○	20	250	24.0	16.1	6.1	19	5.0°	**32**	8	TS43	TKY15F

* Clamp Torque (N • m) : TS25=1.0, TS43=3.5

DC○○ type inserts	➤ A124—A129
CBN & PCD inserts	➤ B044, B045, B060

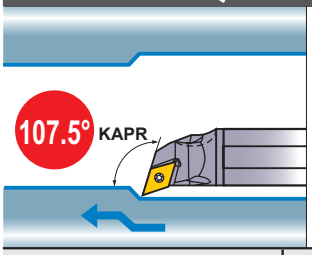
CUTTING CONDITIONS	➤ E020
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

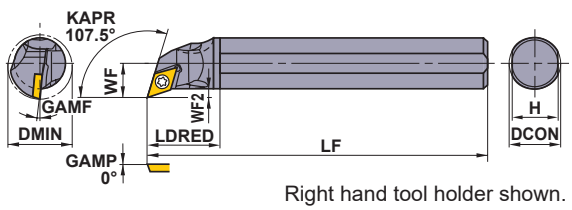
DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

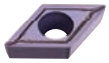
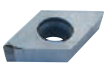
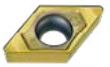
Info

FSDQC — DC○○inserts





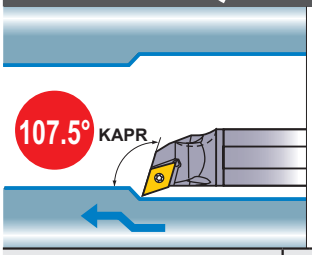
Right hand tool holder shown.

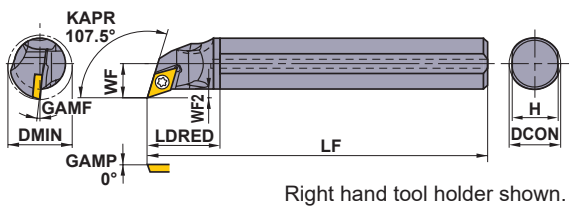
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
FSDQC1310R/L-07S	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	150	20.5	7.6	2.6	9	8°	**13**	3.5	TS25	TKY08F
FSDQC1612R/L-07S	●	●		0702○○	12	150	22.5	8.6	2.6	11	6°	**16**	4	TS25	TKY08F
FSDQC2016R/L-07S	●	●		0702○○	16	180	22.5	10.6	2.6	15	5°	**20**	5	TS25	TKY08F
FSDQC2520R/L-11S☆	●	●		11T3○○	20	180	26	13.7	3.7	19	7°	**25**	5	TS43	TKY15F

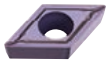
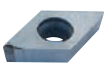
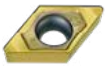
∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

FSDQC — NEW — Steel shank with coolant hole — DC○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
FSDQC1310R/L-07A	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	150	20.5	7.6	2.6	9	8°	**13**	3.5	TS25	TKY08F
FSDQC1612R/L-07A	●	●		0702○○	12	150	22.5	8.6	2.6	11	6°	**16**	4	TS25	TKY08F
FSDQC2016R/L-07A	●	●		0702○○	16	180	22.5	10.6	2.6	15	5°	**20**	5	TS25	TKY08F
FSDQC2520R/L-11A☆	●	●		11T3○○	20	180	26	13.7	3.7	19	7°	**25**	5	TS43	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

● = NEW

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

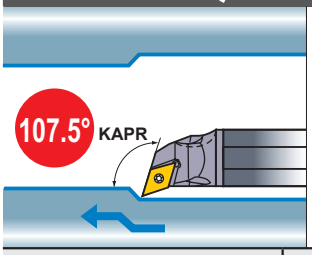
● : Inventory maintained in Japan.

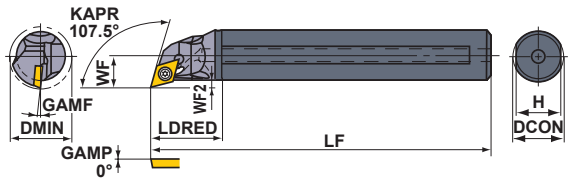
DC○○ type inserts	**➤ A124—A129**
CBN & PCD inserts	**➤ B044, B045, B060**

FSDQC_E

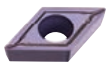
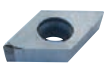
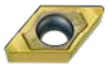
Carbide shank with coolant hole

DC○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L-F	
			
(07,11)	(07,11)	(07,11)	(07,11)

Order Number	Stock		Insert Number		Dimensions(mm)								Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN			
FSDQC1310R/L-07E	●	●	DCET DCMT DCMW DCGT DCGW	0702○○	10	162	18.4	7.6	2.6	9	8°	**13**	7.5	TS25	TKY08F
FSDQC1612R/L-07E	●	●		0702○○	12	182	20.2	8.6	2.6	11	6°	**16**	8	TS25	TKY08F
FSDQC2016R/L-07E	●	●		0702○○	16	222	24.2	10.6	2.6	15	5°	**20**	8	TS25	TKY08F
FSDQC2520R/L-11E ☆	●	●		11T3○○	20	254	28.0	13.7	3.7	19	7°	**25**	8	TS43	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS43=3.5

DC○○ type inserts ➤ A124—A129
CBN & PCD inserts ➤ B044, B045, B060
CUTTING CONDITIONS ➤ E020
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

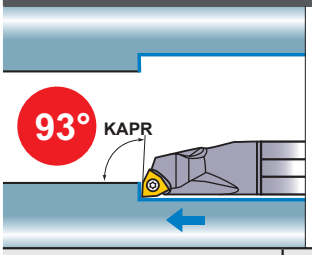
DIMPLE BAR

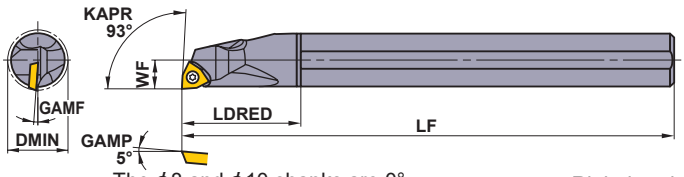
- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

Info

FSWUB/P

WB○○inserts, WP○○inserts





The ϕ8 and ϕ10 shanks are 0°

Right hand tool holder shown.

Finish
R/L-F·FS



(L3,04,06)

Medium
MV



(L3,04,06)

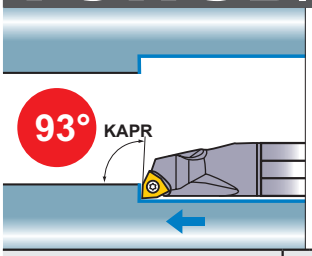
Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	Clamp Screw *	Wrench
FSWUB1008R/L-L3S ☆1	●	●	WBMT WBGT	L302○○	8	125	18	5	7.2	14°	**10**	3	TS2	TKY06F
FSWUB1210R/L-L3S ☆1	●	●		L302○○	10	150	22.5	6	9	11°	**12**	3.5	TS2	TKY06F
FSWUP1412R/L-04S	●	●	WPMT WPGT	0402○○	12	150	27	7	11	4°	**14**	4	TS253	TKY08F
FSWUP1816R/L-04S	●	●		0402○○	16	180	36	9	15	1°	**18**	5	TS253	TKY08F
FSWUP2220R/L-06S ☆2	●	●		0603○○	20	220	45	11	19	2°	**22**	5	TS4	TKY15F
FSWUP3025R/L-06S ☆2	●	●		0603○○	25	250	56.3	15	23.4	0°	**30**	5	TS4	TKY15F

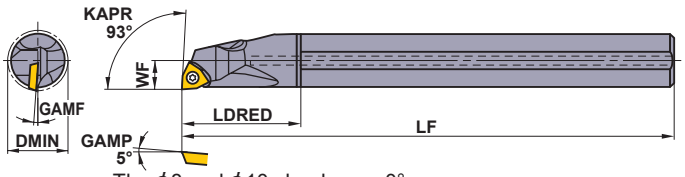
* Clamp Torque (N • m) : TS2=0.6, TS253=1.0, TS4=3.5

FSWUB/P NEW

Steel shank with coolant hole

WB○○inserts, WP○○inserts





The ϕ8 and ϕ10 shanks are 0°

Right hand tool holder shown.

Finish
R/L-F·FS



(L3,04,06)

Medium
MV



(L3,04,06)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	Clamp Screw *	Wrench
FSWUB1008R/L-L3A ☆1	●	●	WBMT WBGT	L302○○	8	125	18	5	7.2	14°	**10**	3	TS2	TKY06F
FSWUB1210R/L-L3A ☆1	●	●		L302○○	10	150	22.5	6	9	11°	**12**	3.5	TS2	TKY06F
FSWUP1412R/L-04A	●	●	WPMT WPGT	0402○○	12	150	27	7	11	4°	**14**	4	TS253	TKY08F
FSWUP1816R/L-04A	●	●		0402○○	16	180	36	9	15	1°	**18**	5	TS253	TKY08F
FSWUP2220R/L-06A ☆2	●	●		0603○○	20	220	45	11	19	2°	**22**	5	TS4	TKY15F
FSWUP3025R/L-06A ☆2	●	●		0603○○	25	250	56.3	15	23.4	0°	**30**	5	TS4	TKY15F

* Clamp Torque (N • m) : TS2=0.6, TS253=1.0, TS4=3.5

● = NEW

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆1 Mark is RE 0.2 , Model of ☆2 Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

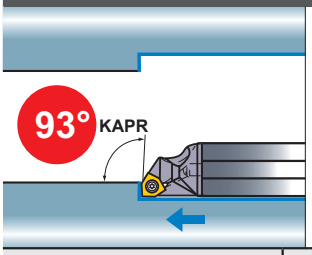
● : Inventory maintained in Japan.

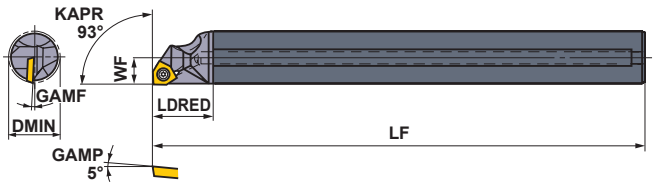
WB○○ type inserts ➤ A150
WP○○ type inserts ➤ A152
PCD inserts ➤ B065

FSWUB/P_E

Carbide shank with coolant hole

WB○○inserts, WP○○inserts





The ϕ8 and ϕ10 shanks are 0°

Right hand tool holder shown.

Finish

R/L-F·FS



(L3,04,06)

Medium

MV



(L3,04,06)

Order Number	Stock		Insert Number		Dimensions(mm)							Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN			
FSWUB1008R/L-L3E ☆1	●	●	WBMT WBGT	L302○○	8	140	13.8	5	7.2	14°	**10**	7	TS2	TKY06F
FSWUB1008R-L3E-2/3 ☆1	●			L302○○	8	90	13.8	5	7.2	14°	**10**	5	TS2	TKY06F
FSWUB1008R-L3E-1/2 ☆1	●			L302○○	8	70	13.8	5	7.2	14°	**10**	3	TS2	TKY06F
FSWUB1210R/L-L3E ☆1	●	●		L302○○	10	160	16.0	6	9	11°	**12**	7.5	TS2	TKY06F
FSWUB1210R-L3E-2/3 ☆1	●			L302○○	10	105	16.0	6	9	11°	**12**	5	TS2	TKY06F
FSWUB1210R-L3E-1/2 ☆1	●			L302○○	10	80	16.0	6	9	11°	**12**	3	TS2	TKY06F
FSWUP1412R/L-04E	●	●	WPMT WPGT	0402○○	12	180	17.8	7	11	4°	**14**	8	TS253	TKY08F
FSWUP1412R-04E-2/3	●			0402○○	12	120	17.8	7	11	4°	**14**	5	TS253	TKY08F
FSWUP1412R-04E-1/2	●			0402○○	12	90	17.8	7	11	4°	**14**	3	TS253	TKY08F
FSWUP1816R/L-04E	●	●		0402○○	16	220	21.8	9	15	1°	**18**	8	TS253	TKY08F
FSWUP1816R-04E-2/3	●			0402○○	16	145	21.8	9	15	1°	**18**	5	TS253	TKY08F
FSWUP1816R-04E-1/2	●			0402○○	16	110	21.8	9	15	1°	**18**	3	TS253	TKY08F
FSWUP2220R/L-06E ☆2	●	●		0603○○	20	250	24.0	11	19	2°	**22**	8	TS4	TKY15F
FSWUP 2220R-06E-2/3 ☆2	●			0603○○	20	165	24.0	11	19	2°	**22**	5	TS4	TKY15F
FSWUP 2220R-06E-1/2 ☆2	●			0603○○	20	125	24.0	11	19	2°	**22**	3	TS4	TKY15F

* Clamp Torque (N • m) : TS2=0.6, TS253=1.0, TS4=3.5

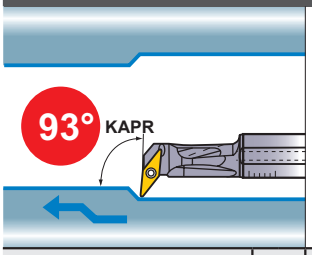
WB○○ type inserts	➤ A150	CUTTING CONDITIONS	➤ E020
WP○○ type inserts	➤ A152	SPARE PARTS	➤ P001
PCD inserts	➤ B065	TECHNICAL DATA	➤ Q001

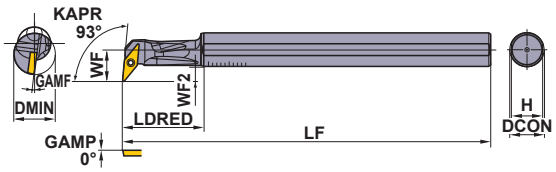
DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

Info

FSVUB/C — VC○○inserts, VB○○inserts





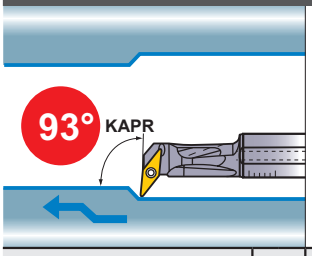
Right hand tool holder shown.

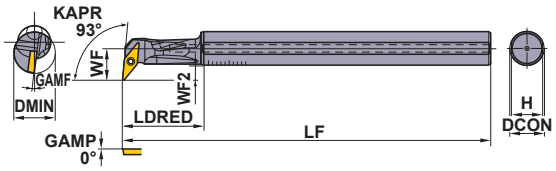
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
			
(16)	(16)	(16)	(11,16)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	Shim	Shim Pin	Clamp Screw *	Wrench
FSVUC1612R/L-08S	●	●	VCGT VCMT	0802○○	12	150	25	11	5.5	11	8°	**16**	4	—	—	TS202	TKY06F
FSVUB2016R/L-11S	●	●	VBMT VBMW VBET VBGW	1103○○	16	180	32.5	15.5	8	15	8°	**20**	5	—	—	TS255	TKY08F
FSVUB2520R/L-11S	●	●		1103○○	20	200	40.5	17.5	8	19	7°	**25**	5	—	—	TS255	TKY08F
FSVUB3425R/L-16S☆2	●	●		1604○○	25	220	50	20.5	8.5	23.4	13°	**34**	5	SPSVN32	BCP141	TS35D	TKY15F
FSVUB4032R/L-16S☆2	●	●		1604○○	32	250	84.0	27.5	12	30.4	9°	**40**	5	SPSVN32	BCP141	TS35D	TKY15F

* Clamp Torque (N • m) : TS202=0.6, TS255=1.0, TS35D=3.5

FSVUB/C NEW — Steel shank with coolant hole — VC○○inserts, VB○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
			
(16)	(16)	(16)	(11,16)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	Shim	Shim Pin	Clamp Screw *	Wrench
FSVUC1612R/L-08A	●	●	VCGT VCMT	0802○○	12	150	25	11	5.5	11	8°	**16**	4	—	—	TS202	TKY06F
FSVUB2016R/L-11A	●	●	VBMT VBMW VBET VBGW	1103○○	16	180	32.5	15.5	8	15	8°	**20**	5	—	—	TS255	TKY08F
FSVUB2520R/L-11A	●	●		1103○○	20	200	40.5	17.5	8	19	7°	**25**	5	—	—	TS255	TKY08F
FSVUB3425R/L-16A☆2	●	●		1604○○	25	220	50	20.5	8.5	23.4	13°	**34**	5	SPSVN32	BCP141	TS35D	TKY15F
FSVUB4032R/L-16A☆2	●	●		1604○○	32	250	84.0	27.5	12	30.4	9°	**40**	5	SPSVN32	BCP141	TS35D	TKY15F

* Clamp Torque (N • m) : TS202=0.6, TS255=1.0, TS35D=3.5

● = NEW

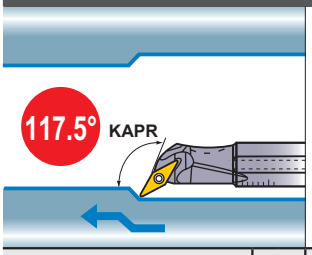
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆1 Mark is RE 0.2 , Model of ☆2 Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

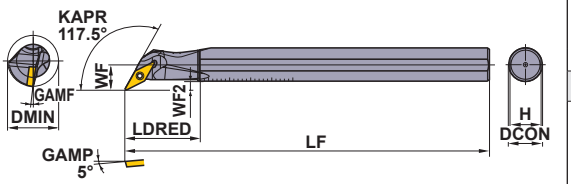
● : Inventory maintained in Japan.

VB○○ type inserts	**➤ A142—A144**
VC○○ type inserts	**➤ A145—A147**
CBN & PCD inserts	**➤ B049, B064**

FSVPB/C

VC○○inserts, VB○○inserts





Right hand tool holder shown.

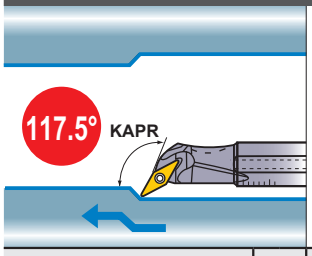
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	Medium	Medium	CBN
MP	MM	Standard	
			
(16)	(16)	(16)	(11,16)

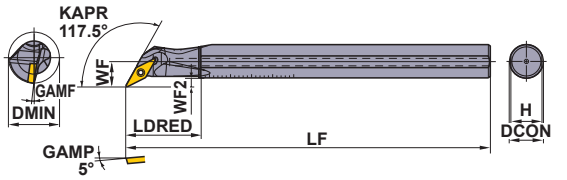
Order Number	Stock		Insert Number		Dimensions(mm)								Maximum Recommendation l/d Ratio			* 	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN		Shim	Shim Pin	Clamp Screw	Wrench
FSVPC1610R/L-08S	●	●	VCGT VCMT	0802○○	10	150	25	8	3	9	8°	**16**	3.5	—	—	TS202	TKY06F
FSVPB2012R/L-11S	●	●		1103○○	12	150	28	10	4.5	11	8°	**20**	4	—	—	TS255	TKY08F
FSVPB2516R/L-11S	●	●	VBMT	1103○○	16	180	35	12.5	5	15	5°	**25**	5	—	—	TS255	TKY08F
FSVPB3020R/L-11S	●	●	VBMW VBET	1103○○	20	200	40	15	5	19	5°	**30**	5	—	—	TS255	TKY08F
FSVPB3425R/L-16S ☆2	●	●	VBGW	1604○○	25	220	50	17	5	23.4	13°	**34**	5	SPSVN32	BCP141	TS35D	TKY15F
FSVPB4032R/L-16S ☆2	●	●		1604○○	32	250	55	22	6.5	30.4	9°	**40**	5	SPSVN32	BCP141	TS35D	TKY15F

* Clamp Torque (N • m) : TS202=0.6, TS255=1.0, TS35D=3.5

FSVPB/C NEW

Steel shank with coolant hole VC○○inserts, VB○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	Medium	Medium	CBN
MP	MM	Standard	
			
(16)	(16)	(16)	(11,16)

Order Number	Stock		Insert Number		Dimensions(mm)								Maximum Recommendation l/d Ratio			* 	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN		Shim	Shim Pin	Clamp Screw	Wrench
FSVPC1610R/L-08A	●	●	VCGT VCMT	0802○○	10	150	25	8	3	9	8°	**16**	3.5	—	—	TS202	TKY06F
FSVPB2012R/L-11A	●	●		1103○○	12	150	28	10	4.5	11	8°	**20**	4	—	—	TS255	TKY08F
FSVPB2516R/L-11A	●	●	VBMT VBMW	1103○○	16	180	35	12.5	5	15	5°	**25**	5	—	—	TS255	TKY08F
FSVPB3425R/L-16A ☆2	●	●	VBET VBGW	1604○○	25	220	50	17	5	23.4	13°	**34**	5	SPSVN32	BCP141	TS35D	TKY15F
FSVPB4032R/L-16A ☆2	●	●		1604○○	32	250	55	22	6.5	30.4	9°	**40**	5	SPSVN32	BCP141	TS35D	TKY15F

* Clamp Torque (N • m) : TS202=0.6, TS255=1.0, TS35D=3.5

● = NEW

VB○○ type inserts	➤ A142—A144	CUTTING CONDITIONS	➤ E020
VC○○ type inserts	➤ A145—A147	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B049, B064	TECHNICAL DATA	➤ Q001

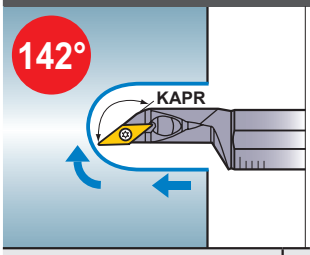
DIMPLE BAR

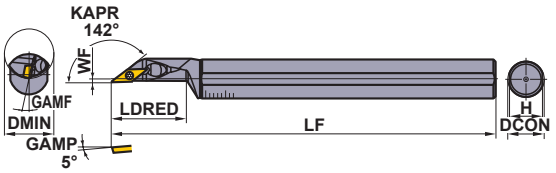
- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter.

Info

FSVJB/C

VC○○inserts, VB○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11)	(11)	(11)	(11)
Medium			
MV			
			
(08,11)			

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Maximum Recommendation l/d Ratio	* Clamp Screw	Wrench
FSVJC1612R/L-08S ☆	●	●	VCGT VCMT	0802○○	12	150	26	2	11	5°	**16**	4	TS202	TKY06F
FSVJC2016R/L-08S ☆	●	●	VCGT VCMT	0802○○	16	180	36	2	15	5°	**20**	5	TS202	TKY06F
FSVJB2520R/L-11S ☆	●	●	VBMT VBMW	1103○○	20	200	37.5	2	19	5°	**25**	5	TS255	TKY08F
FSVJB3025R/L-11S ☆	●	●	VBET VBGW	1103○○	25	250	45	3.5	23.4	5°	**30**	5	TS255	TKY08F

* Clamp Torque (N • m) : TS202=0.6, TS255=1.0

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Cutting Mode	Breaker	Recom-mendation	Grade	Cutting Speed (m/min)	l/d ≤ 3 (Steel shank) l/d ≤ 6 (Carbide shank) Feed (mm/rev)	Depth of Cut (mm)	l/d = 4–5 (Steel shank) l/d = 7–8 (Carbide shank) Feed (mm/rev)	Depth of Cut (mm)
P	Mild Steel ≤180HB	Finish	FP	①	NX2525	170 (120–220)	0.10 (0.05–0.15)	–0.5	0.10 (0.05–0.15)	–0.5
		Light	LP	①	MP3025	150 (100–200)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
				②	NX2525	160 (110–210)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
		Medium	MP	①	MP3025	140 (90–190)	0.25 (0.15–0.35)	–2.0	0.20 (0.15–0.25)	–1.5
				②	NX2525	150 (100–200)	0.25 (0.15–0.35)	–2.0	0.20 (0.15–0.25)	–1.5
	Carbon Steel Alloy Steel 180–350HB	Finish	FP	①	MC6015	140 (90–190)	0.10 (0.05–0.15)	–0.5	0.10 (0.05–0.15)	–0.5
				②	NX2525	130 (80–180)	0.10 (0.05–0.15)	–0.5	0.10 (0.05–0.15)	–0.5
		Light	LP	①	MC6025	140 (90–190)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
				②	MP3025	110 (60–160)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
		Medium	MP	①	MC6025	130 (80–180)	0.25 (0.15–0.35)	–2.0	0.20 (0.15–0.25)	–1.5
				②	MP3025	100 (60–150)	0.25 (0.15–0.35)	–2.0	0.20 (0.15–0.25)	–1.5
M	Stainless Steel ≤200HB	Finish	FM	①	VP15TF	150 (110–190)	0.10 (0.05–0.15)	–0.5	0.10 (0.05–0.15)	–0.5
		Light	LM	①	MC7025	125 (85–165)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
				②	VP15TF	130 (90–170)	0.20 (0.10–0.25)	–1.0	0.15 (0.05–0.20)	–1.0
		Medium	MM	①	MC7025	105 (70–135)	0.20 (0.15–0.25)	–2.0	0.20 (0.15–0.25)	–1.0
				②	VP15TF	120 (80–160)	0.20 (0.15–0.25)	–2.0	0.20 (0.15–0.25)	–1.0
K	Gray Cast Iron Tensile Strength ≤350MPa	Finish	F, FS	①	HTi10	130 (90–160)	0.15 (0.10–0.20)	–0.5	0.15 (0.10–0.20)	–0.5
		Medium	MK	①	MC5015	90 (60–120)	0.20 (0.15–0.25)	–2.0	0.20 (0.15–0.25)	–1.5
N	Aluminium Alloy	Finish	F, FS	①	HTi10	300 (200–400)	0.10 (0.05–0.15)	–0.5	0.10 (0.05–0.15)	–0.5
			Flat Top	①	MD220	200 (150–250)	0.10 (0.05–0.15)	–2.0	0.10 (0.05–0.15)	–1.0
H	Hardened Steel 35–65HRC	Finish	Flat Top	①	MB8120	100 (80–200)	0.10 (0.05–0.15)	–0.15	0.10 (0.05–0.15)	–0.1

When vibrations occur, reduce cutting speed by 30%.
The depth of cut needs to be less than the corner diameter when using the FSVJ type.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.(Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

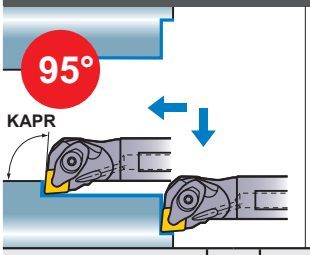
● : Inventory maintained in Japan.

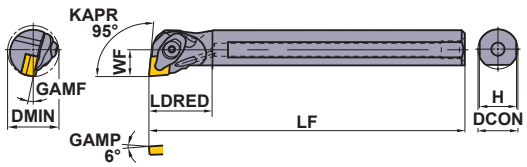
VB○○ type inserts	**➤ A142–A144**
VC○○ type inserts	**➤ A145–A147**
CBN & PCD inserts	**➤ B049, B064**

DOUBLE CLAMP DIMPLE BAR

- Economical negative insert.
- Single action type.
- Excellent vibration resistance due to a light dimple head. (With coolant hole.)
- l/d is 3 to 4 times the diameter.

A○○○-DCLN With coolant hole CN○○inserts





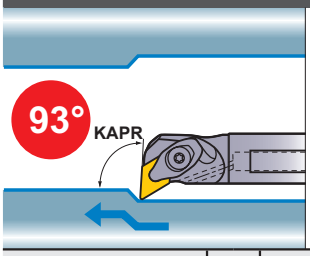
Right hand tool holder shown.

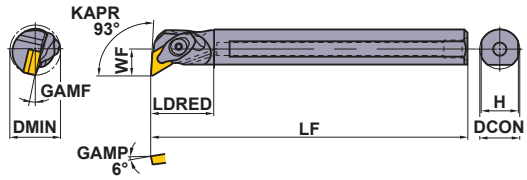
Finish	Light	Light	Light
FP	SA	LP	LM
(12)	(12)	(12)	(12)
Medium	Medium	Stainless	CBN/PCD
MP	Standard	MM	
(12)	(12)	(12)	(12)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
A25R-DCLNR/L12	●	●	CN○A	1204○○	25	200	40	17	23	13°	32	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DCLNR/L12	●	●	CN○G	1204○○	32	250	50	22	30	13°	40	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DCLNR/L12	●	●	CN○M	1204○○	40	300	63	27	37	10°	50	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

∗ Clamp Torque (N • m) : DC0621T=5.0

A○○○-DDUN With coolant hole DN○○inserts





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
(15)	(15)	(15)	(15)
Medium	Stainless	G class	CBN/PCD
Standard	MM	R/L	
(15)	(15)	(15)	(15)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
A25R-DDUNR/L15	●	●	DN○A	1504○○	25	200	40	17	23	13°	35	LLSDP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DDUNR/L15	●	●	DN○G	1504○○	32	250	50	22	30	13°	40	LLSDN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DDUNR/L15	●	●	DN○M	1504○○	40	300	63	27	37	10°	50	LLSDN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

∗ Clamp Torque (N • m) : DC0621T=5.0

RECOMMENDED CUTTING CONDITIONS

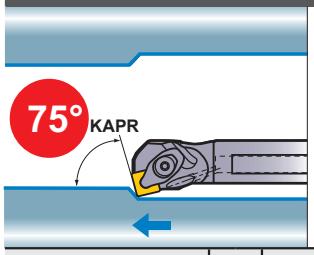
Workpiece Material		Hardness	Cutting Mode	l/d≤3 Cutting Speed (m/min)	l/d≤3 Feed (mm/rev)	l/d≤3 Depth of Cut (mm)	l/d=3—4 Cutting Speed (m/min)	l/d=3—4 Feed (mm/rev)	l/d=3—4 Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
M	Stainless Steel	≤200HB	Medium	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

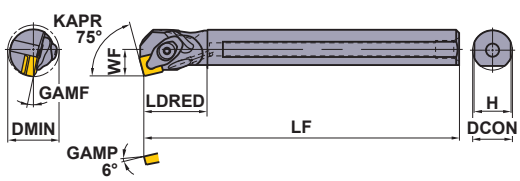
CN○○ type inserts ➤ A074—A080
DN○○ type inserts ➤ A081—A087
CBN & PCD inserts ➤ B022—B030, B055
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

DOUBLE CLAMP DIMPLE BAR

- Economical negative insert.
- Single action type.
- Excellent vibration resistance due to a light dimple head. (With coolant hole.)
- l/d is 3 to 4 times the diameter.

A○○○-DSKN With coolant hole SN○○inserts





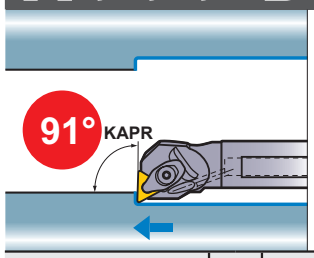
Right hand tool holder shown.

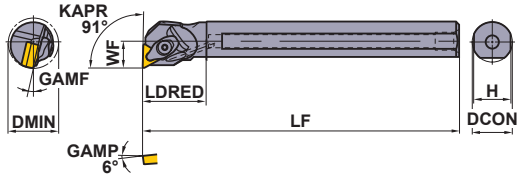
Finish	Light	Medium	Medium
FP	LP	MP	MH
 (12)	 (12)	 (12)	 (12)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
 (12)	 (12)	 (12)	 (12)

Order Number	Stock R	Stock L	Insert Number	DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
				Dimensions(mm)												
A25R-DSKNR/L12	●	●	SNMA SNMG SNMM SNGA SNGG 1204○○	25	200	40	17	23	13°	32	LLSSP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DSKNR/L12	●	●		32	250	50	22	30	13°	40	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

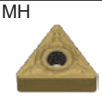
* Clamp Torque (N • m) : DC0621T=5.0

A○○○-DTFN With coolant hole TN○○inserts





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
 (16)	 (16)	 (16)	 (16)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
 (16)	 (16)	 (16)	 (16)

Order Number	Stock R	Stock L	Insert Number	DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
				Dimensions(mm)												
A25R-DTFNR/L16	●	●	TN○A TN○G TN○M 1604○○	25	200	40	17	23	13°	32	LLSTP32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
A32S-DTFNR/L16	●	●		32	250	50	22	30	13°	40	LLSTN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F

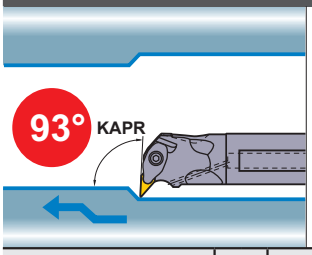
* Clamp Torque (N • m) : DC0520T=3.5

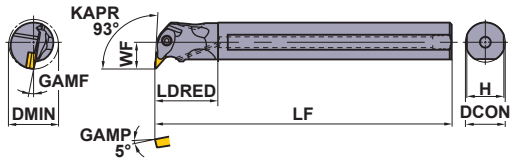
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.8.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : **Inventory maintained in Japan.**

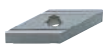
SN○○ type inserts	**➤ A089—A094**
TN○○ type inserts	**➤ A095—A101**
CBN & PCD inserts	**➤ B031—B034, B056**

A○○○-DVUN With coolant hole VN○○inserts





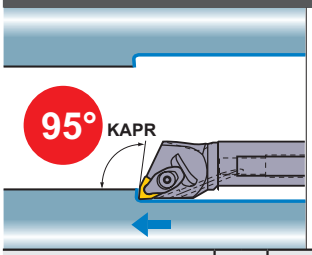
Right hand tool holder shown.

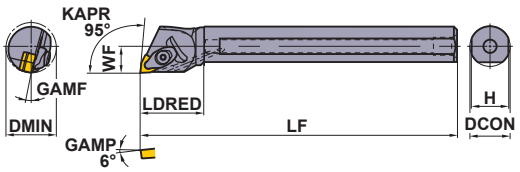
Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(16)	(16)	(16)	(16)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(16)	(16)	(16)	(16)

Order Number	Stock		Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN						
A40T-DVUNR/L16	●	●	VN○A VN○G VN○M	1604○○	40	300	63	27	37	9°	50	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

∗ Clamp Torque (N • m) : DC0520T=3.5

A○○○-DWLN With coolant hole WN○○inserts





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(08)	(06, 08)	(06,08)	(08)
Medium	**Medium — Rough**	**Stainless**	
Standard	RP	MM	
			
(08)	(08)	(06,08)	

Order Number	Stock		Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN						
A25R-DWLNR/L06	●	●	WNMA WNMG	0604○○	25	200	40	17	23	13°	35	LLSWP32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
A25R-DWLNR/L08	●	●	WNMA	0804○○	25	200	40	17	23	13°	35	LLSWP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DWLNR/L08	●	●	WNMG	0804○○	32	250	50	22	30	13°	40	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DWLNR/L08	●	●	WNGA	0804○○	40	300	63	27	37	10°	50	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

∗ Clamp Torque (N • m) : DC0520T=3.5, DC0621T=5.0

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Cutting Mode	l/d≤3			l/d=3—4		
				Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
M	Stainless Steel	≤200HB	Medium	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

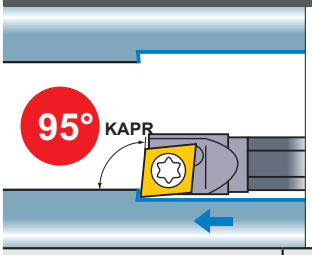
VN○○ type inserts ➤ A102—A105
WN○○ type inserts ➤ A106—A110
CBN & PCD inserts ➤ B035—B037, B057
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

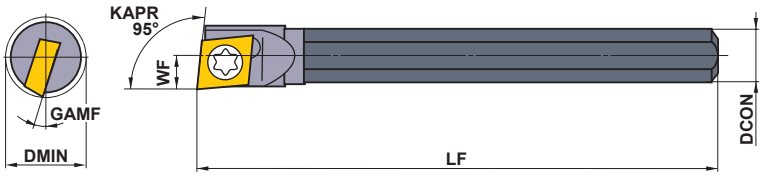
MICRO-DEX BORING BARS

- The minimum cutting diameter is from ϕ5.
- 7° positive insert, carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpieces.
- l/d is 5 times the diameter.

Info

C○○○SCLC — Carbide shank — CC○○inserts





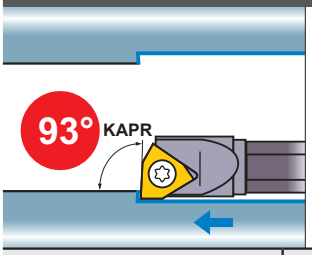
Right hand tool holder shown.

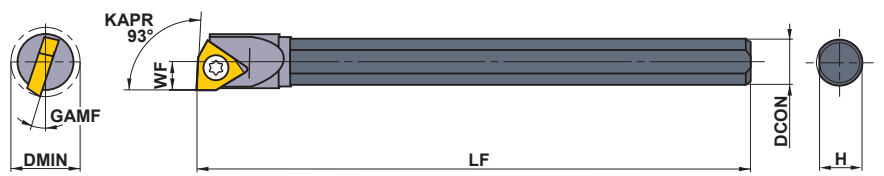
Finish: L-F (03,04) / CBN/PCD (03,04)

Order Number	Stock R	Insert Number		Dimensions(mm) DCON	LF	WF	H	GAMF	DMIN	*2 Clamp Screw	Wrench
C04GSCLCR03	●	*1 CCGT CCGW CCMW	03S1○○	4	90	2.5	3.7	15°	**5**	TS16	TKY06F
C05HSCLCR03	●		03S1○○	5	100	3.0	4.7	13°	**6**	TS16	TKY06F
C06JSCLCR04	●		04T0○○	6	110	3.5	5.7	13°	**7**	TS21	TKY06F
C07KSCLCR04	●		04T0○○	7	125	4.0	6.7	11°	**8**	TS21	TKY06F

*1 Diameter of inscribed circle is special. (For SCLC type)
*2 Clamp Torque (N • m) : TS16=0.6, TS21=0.6

C○○○SWUB — Carbide shank — WB○○ inserts





Right hand tool holder shown.

Finish: L-F (02,L3)

Order Number	Stock R	Insert Number		Dimensions(mm) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C05HSWUBR02	●	WBGT WBMT	0201○○L-F	5	100	3.0	4.7	15°	**6**	TS21	TKY06F
C06JSWUBR02	●		0201○○L-F	6	110	3.5	5.7	13°	**7**	TS2C	TKY06F
C07KSWUBRL3	●		L302○○L-F	7	125	4.0	6.7	15°	**8**	TS2	TKY06F

* Clamp Torque (N • m) : TS21=0.6, TS2C=0.6, TS2=0.6

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.2.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained in Japan.

CCGT type inserts	**➢ A115**
WBGT type inserts	**➢ A150**
CBN & PCD inserts	**➢ B041, B059**

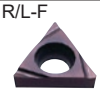
C○○○STUC

Carbide shank

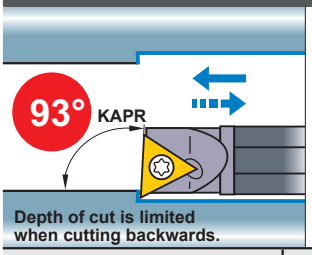
TCGT inserts

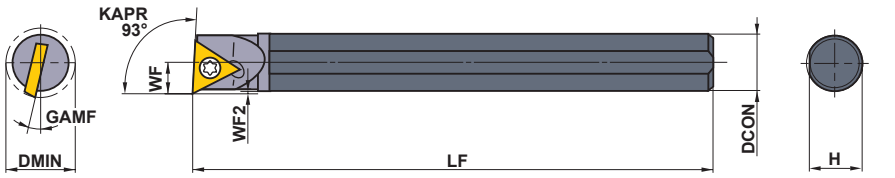
Finish

R/L-F



(06)





Right hand tool holder only.

Order Number	Stock R	Insert Number		Dimensions(mm) DCON	LF	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
C07KSTUCR06	●	TCGT	0601○○	7	125	4.0	0.35	6.7	12°	**8**	TS2C	TKY06F

∗ Clamp Torque (N • m) : TS2C=0.6

E

BORING BARS

RECOMMENDED CUTTING CONDITIONS

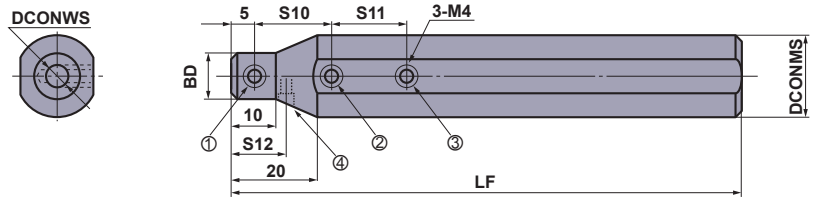
	Workpiece Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d
P	Carbon Steel, Alloy Steel 180–350HB	**NX2525**	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
M	Stainless Steel ≤200HB	**VP15TF**	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
K	Gray Cast Iron ≤350MPa	**VP15TF**	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
N	Non-Ferrous Meterial	**VP15TF**	120 (80–160)	0.05 (0.01–0.08)	0.4 (0.1–0.6)	3–5
		MD220	120 (80–160)	0.05 (0.01–0.08)	0.4 (0.1–0.6)	3–5
H	Hardened Steel 35–65HRC	**MB8110**	80 (40–120)	0.03 (0.01–0.05)	0.1 (0.03–0.2)	3–5

TCGT type inserts ➤ **A135**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

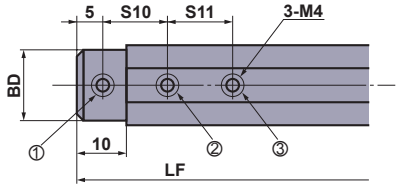
MICRO-DEX BORING BARS

Info

STANDARD HOLDER



RBH22○○N has a temporary set screw for different machine specifications.
(Represented by number 4)



RBH158○○N, RBH16○○N,
RBH190○○N

Order Number	Stock	Dimensions(mm)							MICRO-DEX	✱Clamp Screw				Wrench	Torque (N • m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		①	②	③	④		
RBH15840N	●	15.875	4	15	100	15	15	—	C04GS○○○R○○	A	A	A	—	HKY20F	2.0
RBH15850N	●	15.875	5	15	100	15	15	—	C05HS○○○R○○	A	A	A	—	HKY20F	2.0
RBH15860N	●	15.875	6	15	100	15	15	—	C06JS○○○R○○	A	A	A	—	HKY20F	2.0
RBH15870N	●	15.875	7	15	100	20	20	—	C07KS○○○R○○	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	C04GS○○○R○○	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	C05HS○○○R○○	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	C06JS○○○R○○	A	A	A	—	HKY20F	2.0
RBH1670N	●	16	7	15	100	20	20	—	C07KS○○○R○○	A	A	A	—	HKY20F	2.0
✱2 **RBH19040N**	●	19.05	4	18	125	15	15	—	C04GS○○○R○○	B	B	B	—	HKY20F	2.0
✱2 **RBH19050N**	●	19.05	5	18	125	15	15	—	C05HS○○○R○○	B	B	B	—	HKY20F	2.0
✱2 **RBH19060N**	●	19.05	6	18	125	15	15	—	C06JS○○○R○○	B	B	B	—	HKY20F	2.0
✱2 **RBH19070N**	●	19.05	7	18	125	20	20	—	C07KS○○○R○○	B	B	B	—	HKY20F	2.0
RBH2040N	●	20	4	13	125	15	15	—	C04GS○○○R○○	A	B	B	—	HKY20F	2.0
RBH2050N	●	20	5	14	125	15	15	—	C05HS○○○R○○	A	B	B	—	HKY20F	2.0
RBH2060N	●	20	6	15	125	15	15	—	C06JS○○○R○○	A	B	B	—	HKY20F	2.0
RBH2070N	●	20	7	16	125	20	20	—	C07KS○○○R○○	A	B	B	—	HKY20F	2.0
RBH2240N	●	22	4	13	125	15	15	12.5	C04GS○○○R○○	A	B	B	A	HKY20F	2.0
RBH2250N	●	22	5	14	125	15	15	12.5	C05HS○○○R○○	A	B	B	A	HKY20F	2.0
RBH2260N	●	22	6	15	125	15	15	15	C06JS○○○R○○	A	B	B	A	HKY20F	2.0
RBH2270N	●	22	7	16	125	20	20	15	C07KS○○○R○○	A	B	B	A	HKY20F	2.0
RBH2540N	●	25	4	13	150	15	15	—	C04GS○○○R○○	A	C	C	—	HKY20F	2.0
RBH2550N	●	25	5	14	150	15	15	—	C05HS○○○R○○	A	C	C	—	HKY20F	2.0
RBH2560N	●	25	6	15	150	15	15	—	C06JS○○○R○○	A	C	C	—	HKY20F	2.0
RBH2570N	●	25	7	16	150	20	20	—	C07KS○○○R○○	A	C	C	—	HKY20F	2.0
RBH25440N	●	25.4	4	13	150	15	15	—	C04GS○○○R○○	A	C	C	—	HKY20F	2.0
RBH25450N	●	25.4	5	14	150	15	15	—	C05HS○○○R○○	A	C	C	—	HKY20F	2.0
RBH25460N	●	25.4	6	15	150	15	15	—	C06JS○○○R○○	A	C	C	—	HKY20F	2.0
RBH25470N	●	25.4	7	16	150	20	20	—	C07KS○○○R○○	A	C	C	—	HKY20F	2.0

✱1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008
✱2 Revised order number.

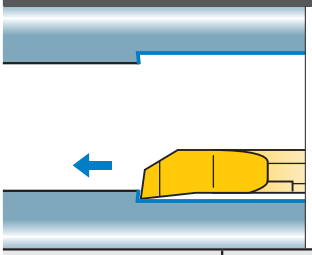
Conventional Order Number	Revised Order Number
RBH1940N	**RBH19040N**
RBH1950N	**RBH19050N**
RBH1960N	**RBH19060N**
RBH1970N	**RBH19070N**

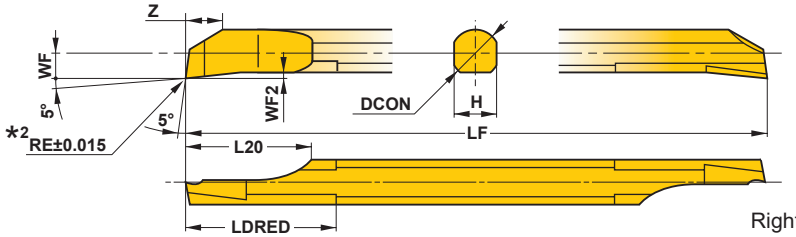
● : Inventory maintained in Japan.
(MICRO-MINI TWIN is available in 1 piece in one pack.)

MICRO-MINI TWIN

CB

For internal machining





Right hand tool only.

Order Number	Stock		Breaker	Dimensions(mm)									
	Micro-Grain	Coated		DMIN*1		RE	DCON	LF	L20	LDRED	WF	WF2	H	Z
	TF15	VP15TF		l/d ≤ 3	l/d>3									
CB02RS	●	●	without	**2.2**	**3.6**	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-B	●	●	with	**2.2**	**3.9**	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01	●	●	without	**2.2**	**3.6**	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01B	●	●	with	**2.2**	**4.2**	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02	●	●	without	**2.2**	**3.6**	0.2	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02B	●	●	with	**2.2**	**4.9**	0.2	2	50	5	6	1	0.25	1.8	1.4
CB03RS	●	●	without	**3.2**	**4.2**	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-B	●	●	with	**3.2**	**4.4**	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01	●	●	without	**3.2**	**4.2**	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01B	●	●	with	**3.2**	**4.5**	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02	●	●	without	**3.2**	**4.2**	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02B	●	●	with	**3.2**	**4.8**	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB04RS	●	●	without	**4.2**	**5.1**	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-B	●	●	with	**4.2**	**5.2**	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01	●	●	without	**4.2**	**5.1**	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01B	●	●	with	**4.2**	**5.3**	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02	●	●	without	**4.2**	**5.1**	0.2	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02B	●	●	with	**4.2**	**5.5**	0.2	4	60	10	12	2	0.45	3.6	3.1
CB05RS	●	●	without	**5.2**	**6.0**	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-B	●	●	with	**5.2**	**6.1**	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02	●	●	without	**5.2**	**6.0**	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02B	●	●	with	**5.2**	**6.4**	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB06RS	●	●	without	**6.2**	**7.2**	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-B	●	●	with	**6.2**	**7.3**	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02	●	●	without	**6.2**	**7.2**	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02B	●	●	with	**6.2**	**7.8**	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB07RS	●	●	without	**7.2**	**8.6**	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-B	●	●	with	**7.2**	**8.8**	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02	●	●	without	**7.2**	**8.6**	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02B	●	●	with	**7.2**	**9.2**	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB08RS	●	●	without	**8.2**	**9.5**	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-B	●	●	with	**8.2**	**9.6**	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02	●	●	without	**8.2**	**9.5**	0.2	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02B	●	●	with	**8.2**	**9.8**	0.2	8	95	15	24	4	0.85	7.2	6.3

*1 DMIN : Min. Cutting Diameter
*2 The RE dimension represents the size before grinding a chip breaker.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Micro-Mini Twin **CB**				Micro-Mini Twin **CR**		
		Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Cutting Speed (m/min)	Feed(mm/rev)	
							03RS/04RS	05RS
P	Carbon Steel Alloy Steel 180–350HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
M	Stainless Steel ≤200HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
K	Gray Cast Iron ≤350MPa	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.03 (0.01–0.05)	0.03 (0.01–0.05)
N	Non-Ferrous Meterial	120 (80–160)	0.05 (0.01–0.08)	0.3 (0.1–0.5)	3–5	120 (80–160)	0.03 (0.01–0.05)	0.05 (0.01–0.08)

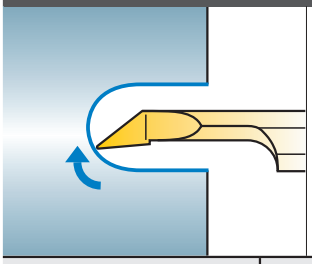
Note 1) Recommend wet machining.

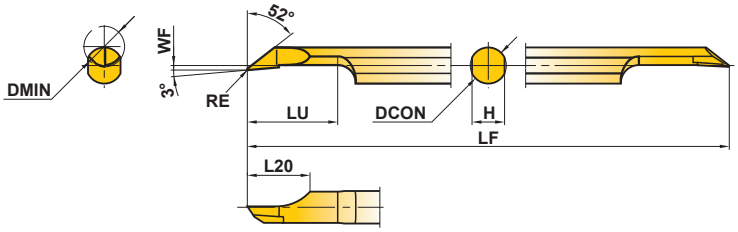
MICRO-MINI TWIN

Info

CR

For internal copying





Right hand tool only.

Order Number	Stock		Breaker	Dimensions(mm)							
	Micro-Grain	Coated		DMIN	RE	DCON	LF	LU	L20	WF	H
	TF15	VP15TF									
CR03RS-01	●	●	without	**3.5**	0.1	3	50	8	6	0.15	2.7
CR03RS-01B	●	●	with	**3.5**	0.1	3	50	8	6	0.15	2.7
CR04RS-01	●	●	without	**4.5**	0.1	4	60	10	7	0.15	3.6
CR04RS-01B	●	●	with	**4.5**	0.1	4	60	10	7	0.15	3.6
CR05RS-01	●	●	without	**5.5**	0.1	5	70	12	8	0.15	4.5
CR05RS-01B	●	●	with	**5.5**	0.1	5	70	12	8	0.15	4.5

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Micro-Mini Twin **CB**				Micro-Mini Twin **CR**		
		Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Cutting Speed (m/min)	Feed(mm/rev) 03RS/04RS	Feed(mm/rev) 05RS
P	Carbon Steel Alloy Steel 180–350HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
M	Stainless Steel ≤200HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
K	Gray Cast Iron ≤350MPa	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.03 (0.01–0.05)	0.03 (0.01–0.05)
N	Non-Ferrous Meterial	120 (80–160)	0.05 (0.01–0.08)	0.3 (0.1–0.5)	3–5	120 (80–160)	0.03 (0.01–0.05)	0.05 (0.01–0.08)

Note 1) Recommend wet machining.
Note 2) The recommended tool overhang of CR type is LU+2mm.

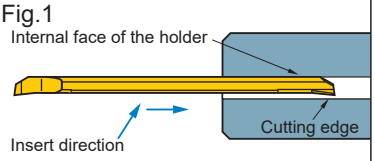
● : **Inventory maintained in Japan.**
(MICRO-MINI TWIN is available in 1 piece in one pack.)

■PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

●When using a holder for general purpose / small automatic lathe:

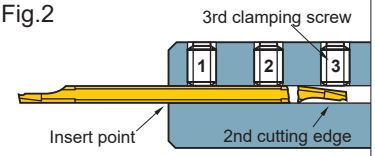
1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

Fig.1



2 When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

Fig.2



◎When using Mitsubishi holders
When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. (RBH1620N, RBH19020N, RBH2020N and RBH2520N do not have the 3rd screw.) The set torque value for clamping screw is 2.0 N•m.

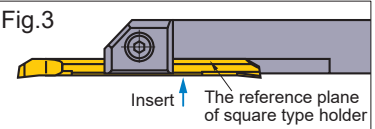
●When using a square type holder:

1 When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.

2 Make sure that the clamping screws are tightened to the recommended values.

3 Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

Fig.3



Tighten the clamping screw ensuring making the micro-mini twin boring bars is in contact with the reference plane of square type holder.

MACHINING METHODS OF THE CR TYPE

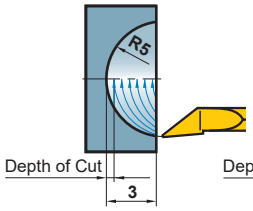
●Profile turning

By drilling a pre-prepared hole, the machining time will be shortened and chip control will be improved.

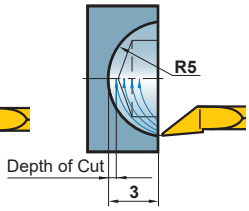
<Cutting Conditions>

Workpiece	: JIS S20C
Tool	: CR05RS-01B
Cutting Speed	: 80m/min
Feed	: 0.05mm/rev
Depth of Cut	: 0.05mm
Wet Cutting	

Machining a work piece without a pre-prepared hole



Machining a work piece with a pre-prepared hole



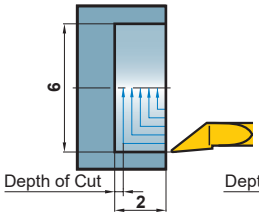
●Inner end facing

By drilling a pre-prepared hole, the machining time will be shortened and chip control will be improved.

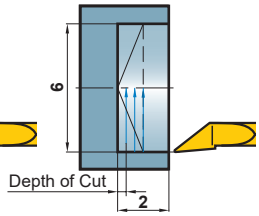
<Cutting Conditions>

Workpiece	: JIS S20C
Tool	: CR05RS-01B
Cutting Speed	: 80m/min
Feed	: 0.05mm/rev
Depth of Cut	: 0.05mm
Wet Cutting	

Machining a work piece without a pre-prepared hole

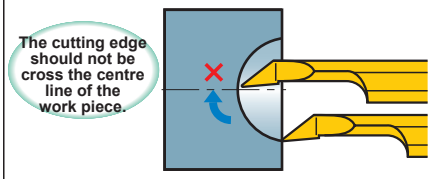


Machining a work piece with a pre-prepared hole



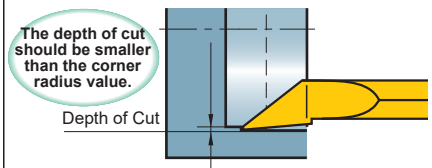
■NOTES FOR USE

Profile turning, Inner end facing



If the cutting edge crosses the centre line of a work piece, the cutting edge can fracture.

Copying



With depths of cut larger than the corner radius value, burrs will be formed.

MICRO-MINI BORING BARS

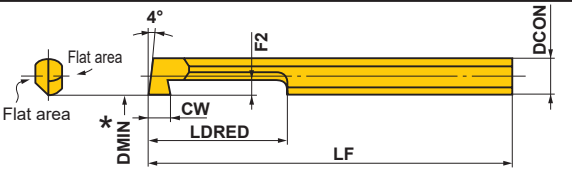
- Solid carbide type with minimum cutting diameter ϕ3.2mm.
- l/d is 5 times the diameter.
- Cutting edge can be shaped according to the application thus, it covers a wide application range (threading, grooving, copying, etc).

94°

Info

STANDARD MICRO-MINI BORING BARS (Solid carbide boring bar)

Order Number	Stock	Dimensions(mm)						Geometry
	TF15	CW	DCON	LF	LDRED	DMIN*	F2	
C03FR-BLS	●	2.0	3	80	15	3.2	1.0	
C04FR-BLS	●	2.5	4	80	20	4.2	1.5	
C05HR-BLS	●	3.0	5	100	25	5.2	2.0	



Right hand tool only.

*DMIN : Min. Cutting Diameter

E

BORING BARS

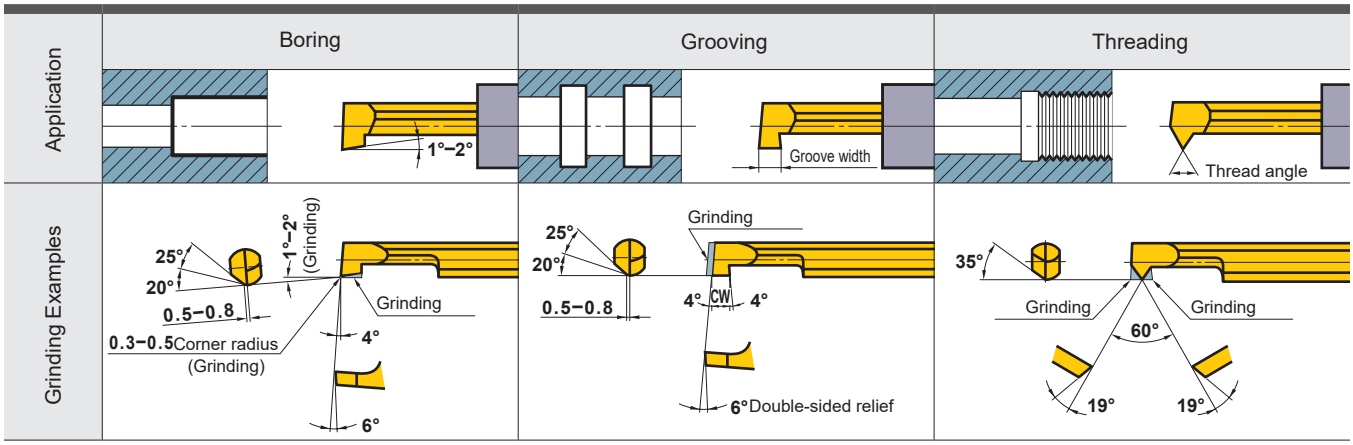
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Edge Condition (mm)	
						*Corner Radius or BCH	*Honing
P	Carbon Steel, Alloy Steel 180—350HB	40 (30—50)	0.05 (—0.1)	0.2 (0.1—0.3)	5	0.1—0.5	0.01—0.05
M	Stainless Steel ≤200HB	40 (30—50)	0.05 (—0.1)	0.2 (0.1—0.3)	5	≤0.4	≤0.03 (Honing not required)
K	Gray Cast Iron ≤350MPa	40 (30—50)	0.05 (—0.05)	0.2 (0.1—0.3)	5	0.1—0.5	0.01—0.05
N	Non-Ferrous Meterial	80 (60—100)	0.05 (—0.1)	0.3 (0.1—0.5)	5	0.1—0.5	≤0.03 (Honing not required)

*Cutting edge is not honed. Please hone according to the workpiece before machining.

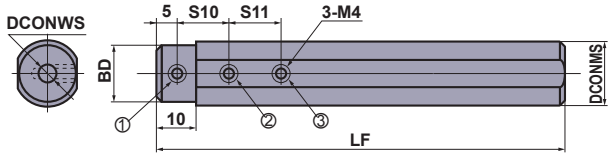
■GRINDING THE CUTTING EDGE OF MICRO-MINI BORING BAR

- MICRO-MINI boring bar can be applied to boring and grooving without any modifications. It can also be reground as shown below.
- For shaping and regrinding, use a diamond whetstone approximately #250—#400. Please grind according to the application using the figure below as a reference.

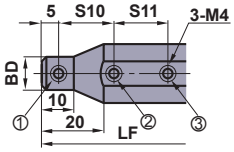


● : Inventory maintained in Japan.
(MICRO MINI is available in 1 piece in one pack.)

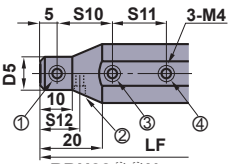
■ROUND TYPE HOLDER



RBH158○○N, RBH16○○N, RBH190○○N



RBH20○○N, RBH25○○N, RBH254○○N



RBH22○○N

Order Number	Stock	Dimensions(mm)							Micro-Mini C	Micro-Mini Twin		✶1 Clamp Screw				Wrench	Torque (N • m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		CB	CR	①	②	③	④		
RBH15820N	●	15.875	2	15	100	10	—	—	—	02RS(-B) 02RS-0○(B)	—	B	B	—	—	HKY20F	2.0
RBH15830N	●	15.875	3	15	100	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	A	A	—	HKY20F	2.0
RBH15840N	●	15.875	4	15	100	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	A	A	—	HKY20F	2.0
RBH15850N	●	15.875	5	15	100	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	A	A	—	HKY20F	2.0
RBH15860N	●	15.875	6	15	100	15	15	—	—	06RS(-B) 06RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH15870N	●	15.875	7	15	100	20	20	—	—	07RS(-B) 07RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH15880N	●	15.875	8	15	100	20	20	—	—	08RS(-B) 08RS-0○(B)	—	D	D	D	—	HKY20F	2.0
RBH1620N	●	16	2	15	100	10	—	—	—	02RS(-B) 02RS-0○(B)	—	B	B	—	—	HKY20F	2.0
RBH1630N	●	16	3	15	100	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	—	06RS(-B) 06RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH1670N	●	16	7	15	100	20	20	—	—	07RS(-B) 07RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH1680N	●	16	8	15	100	20	20	—	—	08RS(-B) 08RS-0○(B)	—	D	D	D	—	HKY20F	2.0
✶2 RBH19020N	●	19.05	2	18	125	10	—	—	—	02RS(-B) 02RS-0○(B)	—	C	C	—	—	HKY20F	2.0
✶2 RBH19030N	●	19.05	3	18	125	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	B	B	B	—	HKY20F	2.0
✶2 RBH19040N	●	19.05	4	18	125	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	B	B	B	—	HKY20F	2.0
✶2 RBH19050N	●	19.05	5	18	125	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	B	B	B	—	HKY20F	2.0
✶2 RBH19060N	●	19.05	6	18	125	15	15	—	—	06RS(-B) 06RS-0○(B)	—	B	B	B	—	HKY20F	2.0
✶2 RBH19070N	●	19.05	7	18	125	20	20	—	—	07RS(-B) 07RS-0○(B)	—	B	B	B	—	HKY20F	2.0
RBH19080N	●	19.05	8	18	125	20	20	—	—	08RS(-B) 08RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH2020N	●	20	2	11	125	10	—	—	—	02RS(-B) 02RS-0○(B)	—	A	A	—	—	HKY20F	2.0
RBH2030N	●	20	3	12	125	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	A	B	—	HKY20F	2.0
RBH2040N	●	20	4	13	125	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	B	B	—	HKY20F	2.0
RBH2050N	●	20	5	14	125	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	B	B	—	HKY20F	2.0
RBH2060N	●	20	6	15	125	15	15	—	—	06RS(-B) 06RS-0○(B)	—	A	B	B	—	HKY20F	2.0
RBH2070N	●	20	7	16	125	20	20	—	—	07RS(-B) 07RS-0○(B)	—	A	B	B	—	HKY20F	2.0
RBH2080N	●	20	8	17	125	20	20	—	—	08RS(-B) 08RS-0○(B)	—	A	A	A	—	HKY20F	2.0
RBH2220N	●	22	2	11	125	10	—	10	—	02RS(-B) 02RS-0○(B)	—	A	B	—	A	HKY20F	2.0
RBH2230N	●	22	3	12	125	10	10	10	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	B	C	A	HKY20F	2.0
RBH2240N	●	22	4	13	125	15	15	12.5	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	B	B	A	HKY20F	2.0
RBH2250N	●	22	5	14	125	15	15	12.5	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	B	B	A	HKY20F	2.0
RBH2260N	●	22	6	15	125	15	15	15	—	06RS(-B) 06RS-0○(B)	—	A	B	B	A	HKY20F	2.0
RBH2270N	●	22	7	16	125	20	20	15	—	07RS(-B) 07RS-0○(B)	—	A	B	B	A	HKY20F	2.0
RBH2280N	●	22	8	17	125	20	20	15	—	08RS(-B) 08RS-0○(B)	—	A	B	B	A	HKY20F	2.0
RBH2520N	●	25	2	11	150	10	—	—	—	02RS(-B) 02RS-0○(B)	—	A	B	—	—	HKY20F	2.0
RBH2530N	●	25	3	12	150	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	B	C	—	HKY20F	2.0
RBH2540N	●	25	4	13	150	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	C	C	—	HKY20F	2.0
RBH2550N	●	25	5	14	150	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	C	C	—	HKY20F	2.0
RBH2560N	●	25	6	15	150	15	15	—	—	06RS(-B) 06RS-0○(B)	—	A	C	C	—	HKY20F	2.0
RBH2570N	●	25	7	16	150	20	20	—	—	07RS(-B) 07RS-0○(B)	—	A	C	C	—	HKY20F	2.0
RBH2580N	●	25	8	17	150	20	20	—	—	08RS(-B) 08RS-0○(B)	—	A	B	B	—	HKY20F	2.0
RBH25420N	●	25.4	2	11	150	10	—	—	—	02RS(-B) 02RS-0○(B)	—	A	B	—	—	HKY20F	2.0
RBH25430N	●	25.4	3	12	150	10	10	—	03FR-BLS	03RS(-B) 03RS-0○(B)	03RS-01(B)	A	B	C	—	HKY20F	2.0
RBH25440N	●	25.4	4	13	150	15	15	—	04FR-BLS	04RS(-B) 04RS-0○(B)	04RS-01(B)	A	C	C	—	HKY20F	2.0
RBH25450N	●	25.4	5	14	150	15	15	—	05HR-BLS	05RS(-B) 05RS-0○(B)	05RS-01(B)	A	C	C	—	HKY20F	2.0
RBH25460N	●	25.4	6	15	150	15	15	—	—	06RS(-B) 06RS-0○(B)	—	A	C	C	—	HKY20F	2.0
RBH25470N	●	25.4	7	16	150	20	20	—	—	07RS(-B) 07RS-0○(B)	—	A	C	C	—	HKY20F	2.0
RBH25480N	●	25.4	8	17	150	20	20	—	—	08RS(-B) 08RS-0○(B)	—	A	B	B	—	HKY20F	2.0

✶1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008, D=HSS04003 ✶2 Revised order number.

Conventional Order Number	Revised Order Number
RBH1920N	RBH19020N
RBH1930N	RBH19030N
RBH1940N	RBH19040N

Conventional Order Number	Revised Order Number
RBH1950N	RBH19050N
RBH1960N	RBH19060N
RBH1970N	RBH19070N

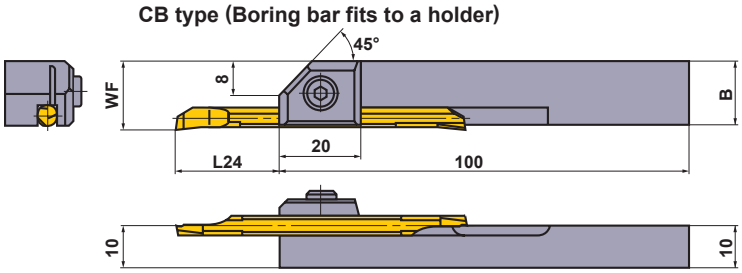
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

MICRO-MINI TWIN

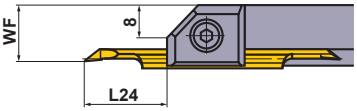
Info

■ SQUARE TYPE HOLDER

CB type (Boring bar fits to a holder)



CR type (Boring bar fits to a holder)



Order Number	Stock	Dimensions(mm)						Micro-Mini Twin		Clamp Screw	Wrench	Torque (N • m)
		WF		L24 *		B						
		CB	CR	CB	CR	CB	CR	CB	CR			
SBH1020R	●	13	—	6—24 (6—10)	—	12.9		02RS(-B) 02RS-0□(B)	—	HSC04010	HKY30R	4.8
SBH1030R	●	14	12.65	8.5—22 (9—15)	11—19.5 (12)	13.8		03RS(-B) 03RS-0□(B)	03RS-01(B)	HSC05012	HKY40R	9.5
SBH1040R	●	15	13.15	11—29.5 (12—20)	13—27.5 (14)	14.7		04RS(-B) 04RS-0□(B)	04RS-01(B)	HSC05012	HKY40R	9.5
SBH1050R	●	16	13.65	13.5—37 (15—25)	15—35.5 (16)	15.6		05RS(-B) 05RS-0□(B)	05RS-01(B)	HSC05012	HKY40R	9.5
SBH1060R	●	17	—	13.5—42 (18—30)	—	16.5		06RS(-B) 06RS-0□(B)	—	HSC05012	HKY40R	9.5
SBH1070R	●	18	—	13.5—52 (21—35)	—	17.4		07RS(-B) 07RS-0□(B)	—	HSC05012	HKY40R	9.5

Note 1) The MICRO-DEX and the MICRO-MINI cannot be fit to square holders.
*L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.

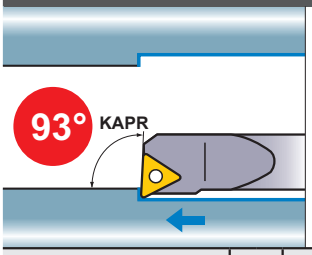
● : Inventory maintained in Japan.

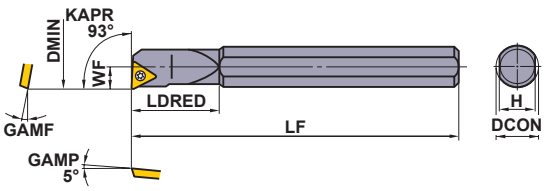
F TYPE BORING BARS

- The minimum cutting diameter is from ϕ10.
- 11°positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

FSTU1

TP○○inserts





Right hand tool holder shown.

Finish	Flat Top
R/L	
 (08,09,11)	 (08,09,11)
PCD	CBN/PCD
R/L-F	
 (09,11)	 (08,09,11)

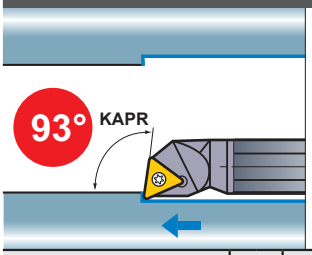
Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSTU108R/L	●	●	TPGX TPMX	0802○○	8	125	18	5	7	15°	**10**	CS200T	TKY06F
FSTU110R/L	●	●		0902○○	10	150	22	6	9	13°	**12**	CS250T	TKY08F
FSTU112R/L	●	●		0902○○	12	180	25	8	11	10°	**16**	CS250T	TKY08F
FSTU116R/L	●	●		1103○○	16	200	30	11	14	7°	**22**	CS300890T	TKY08F

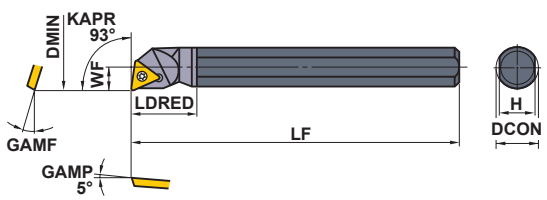
* Clamp Torque (N • m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

FSTU2

Carbide shank

TP○○inserts





Right hand tool holder shown.

Finish	Flat Top
R/L	
 (08,09,11)	 (08,09,11)
PCD	CBN/PCD
R/L-F	
 (09,11)	 (08,09,11)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSTU208R/L	●	●	TPGX TPMX	0802○○	8	125	13	5	7	15°	**10**	CS200T	TKY06F
FSTU210R/L	●	●		0902○○	10	150	16	6	9	13°	**12**	CS250T	TKY08F
FSTU212R/L	●	●		0902○○	12	180	19	8	11	10°	**16**	CS250T	TKY08F
FSTU216R/L	●	●		1103○○	16	200	26	11	14	7°	**22**	CS300890T	TKY08F

* Clamp Torque (N • m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d≤3			l/d=3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d≤5			l/d=6–7		
Workpiece Material		Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

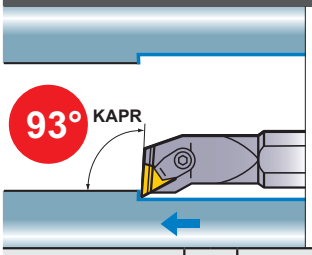
TP○○ type inserts	➢ A140, A141	SPARE PARTS	➢ P001
CBN & PCD inserts	➢ B048, B062, B063	TECHNICAL DATA	➢ Q001

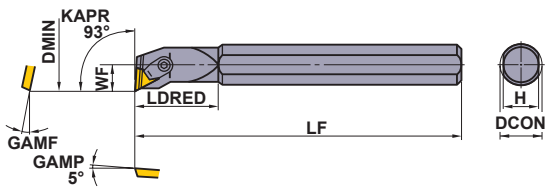
F TYPE BORING BARS

- The minimum cutting diameter is from ϕ22.
- 11°positive insert.
- Clamp-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

FCTU1

TP○○inserts





Right hand tool holder shown.

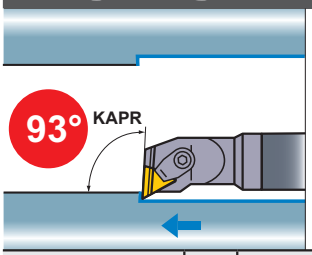
M Class	M Class	G class
Standard		R/L
		
(11,16)	(11,16)	(11,16)
G class	CBN/PCD	
		
(11,16)	(11,16)	

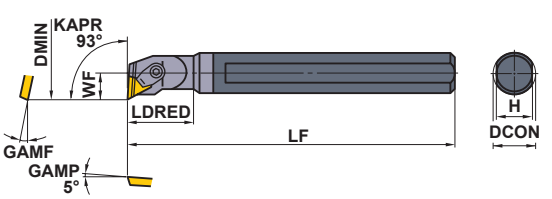
Order Number	Stock		Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Set *	Breaker Piece	Wrench
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN					
FCTU116R/L	●	●	TPMN TPMR TPGN TPGR	1103○○	16	200	30	11	14	7°	**22**	—	—	C3	CBT2N	HKY25R
FCTU120R/L☆	●	●		1603○○	20	200	37	13	18	5°	**26**	—	—	C4	CBT3F	HKY30R
FCTU125R/L☆ (4 Side Flat Shank)	●	●		1603○○	25	250	40	16	22	5°	**32**	PT32	BCP202	C4	CBT3F	HKY30R
FCTU132R/L☆ (4 Side Flat Shank)	●	●		1603○○	32	300	45	20	29	0°	**40**	PT32	BCP201	C4	CBT3F	HKY30R

∗ Clamp Torque (N • m) : C3=2.2, C4=3.3

FCTU2

Carbide shank **TP○○inserts**





Right hand tool holder only.

M Class	M Class	G class
Standard		R/L
		
(11,16)	(11,16)	(11,16)
G class	CBN/PCD	
		
(11,16)	(11,16)	

Order Number	Stock	Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Set *	Breaker Piece	Wrench
	R			DCON	LF	LDRED	WF	H	GAMF	DMIN					
FCTU216R	●	TPMN TPMR TPGN TPGR	1103○○	16	200	26	11	14	7°	**22**	—	—	C3	CBT2N	HKY25R
FCTU220R ☆	●		1603○○	20	200	33	13	18	5°	**26**	—	—	C4	CBT3F	HKY30R
FCTU225R ☆	●		1603○○	25	250	37	16	22	5°	**32**	PT32	BCP202	C4	CBT3F	HKY30R

∗ Clamp Torque (N • m) : C3=2.2, C4=3.3

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.(Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : **Inventory maintained in Japan.**

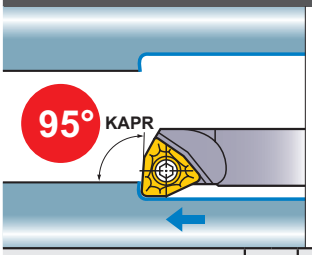
TP○○ type inserts ➤ A157
CBN & PCD inserts ➤ B053, B068

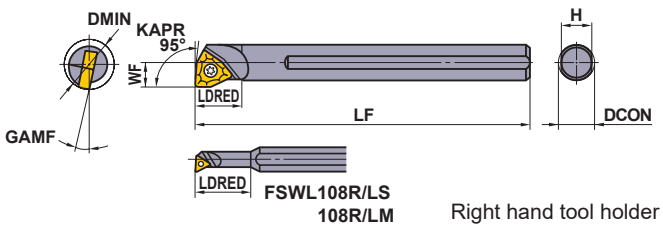
F TYPE BORING BARS

- The minimum cutting diameter is from ϕ5.8.
- 7°positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

FSWL1

WC○○inserts





Right hand tool holder shown.

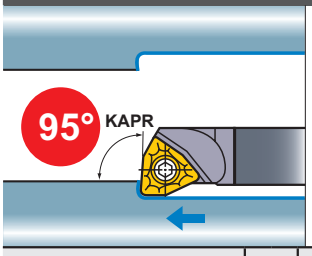
Finish	Light
R/L	Standard
 (02,L3)	 (02,L3,04,06)
CBN/PCD	
 (L3,04,06)	

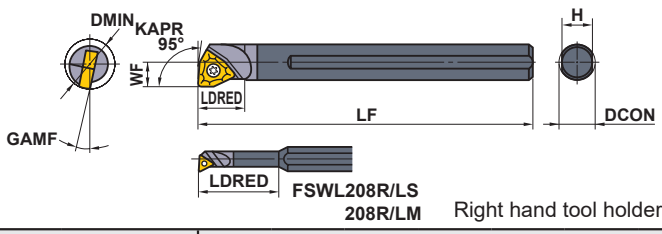
Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSWL108R/LS	●	●	WCMT WCGT	0201○○	8	100	19	2.9	7	17°	**5.8**	TS21	TKY06F
FSWL108R/LM	●	●	WCMT WCGT WCMW	L302○○	8	100	25	4	7	15°	**8**	TS2	TKY06F
FSWL108R/L	●	●	WCMT WCMW	0402○○	8	125	10	5	7	15°	**10**	TS25	TKY08F
FSWL110R/L	●	●		0402○○	10	150	12	6	9	13°	**12**	TS25	TKY08F
FSWL112R/L ☆	●	●		06T3○○	12	180	15	8	11	13°	**16**	TS4	TKY15F
FSWL116R/L ☆	●	●		06T3○○	16	200	20	11	14	7°	**22**	TS4	TKY15F

∗ Clamp Torque (N • m) : TS21=0.6, TS2=0.6, TS25=1.0, TS4=3.5

FSWL2

Carbide shank **WC○○inserts**





Right hand tool holder shown.

Finish	Light
R/L	Standard
 (02,L3)	 (02,L3,04,06)
CBN/PCD	
 (L3,04,06)	

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSWL208R/LS	●	●	WCMT WCGT	0201○○	8	122	25	2.9	7	17°	**5.8**	TS21	TKY06F
FSWL208R/LM	●	●	WCMT WCGT WCMW	L302○○	8	125	33	4	7	15°	**8**	TS2	TKY06F
FSWL208R/L	●	●	WCMT WCMW	0402○○	8	125	10	5	7	15°	**10**	TS25	TKY08F
FSWL210R/L	●	●		0402○○	10	150	12	6	9	13°	**12**	TS25	TKY08F
FSWL212R/L ☆	●	●		06T3○○	12	180	15	8	11	13°	**16**	TS4	TKY15F
FSWL216R/L ☆	●	●		06T3○○	16	200	20	11	14	7°	**22**	TS4	TKY15F

∗ Clamp Torque (N • m) : TS21=0.6, TS2=0.6, TS25=1.0, TS4=3.5

RECOMMENDED CUTTING CONDITIONS

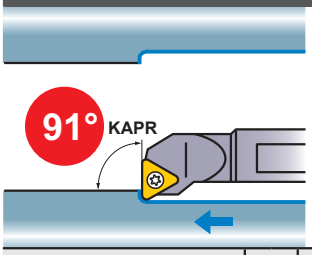
Steel Shank				l/d≤3			l/d=3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank				l/d≤5			l/d=6–7		
Workpiece Material		Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

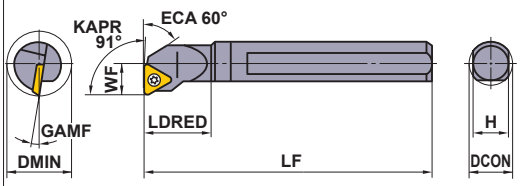
WC○○ type inserts	➤ A151
CBN & PCD inserts	➤ B051, B065
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

S TYPE BORING BARS

- The minimum cutting diameter is from ϕ11.
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S○○○STFC — TC○○inserts





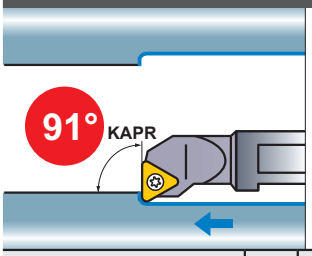
Right hand tool holder shown.

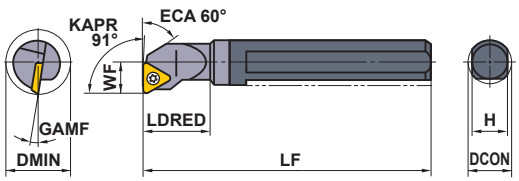
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(09,11,16)	(09,11,16)	(09,11,16)	(09,11,16)
Medium	Medium	Flat top	CBN/PCD
MP	MM		
			
(09,11,16)	(09,11,16)	(11,16)	(09,11,16)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S08FSTFCR/L09	●	●	TCMT TCGW	0902○○	8	80	12	6	7	15°	**11**	TS22	TKY06F
S10HSTFCR/L11	●	●		1102○○	10	100	16	7	9	13°	**13**	TS25	TKY08F
S12KSTFCR/L11	●	●		1102○○	12	125	20	9	11	10°	**16**	TS25	TKY08F
S16MSTFCR/L11	●	●	TCMW TCMT TCGW TCGT	1102○○	16	150	25	11	14	7°	**20**	TS25	TKY08F
S20QSTFCR/L16 ☆	●	●		16T3○○	20	180	32	13	18	7°	**25**	TS4	TKY15F
S25RSTFCR/L16 ☆	●	●		16T3○○	25	200	40	17	23	5°	**32**	TS4	TKY15F
S32SSTFCR/L16 ☆	●	●		16T3○○	32	250	50	22	30	5°	**40**	TS4	TKY15F

* Clamp Torque (N • m) : TS22=0.6, TS25=1.0, TS4=3.5

C○○○STFC — Carbide shank — TC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(09,11,16)	(09,11,16)	(09,11,16)	(09,11,16)
Medium	Medium	Flat top	CBN/PCD
MP	MM		
			
(09,11,16)	(09,11,16)	(11,16)	(11)

Order Number	Stock R	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C08HSTFCR09	●	TCMT TCGW	0902○○	8	100	12	6	7	15°	**11**	TS22	TKY06F
C10KSTFCR11	●		1102○○	10	125	16	7	9	13°	**13**	TS25	TKY08F
C12MSTFCR11	●	TCMW TCMT TCGW TCGT	1102○○	12	150	20	9	11	10°	**16**	TS25	TKY08F
C16RSTFCR11	●		1102○○	16	200	25	11	14	7°	**20**	TS25	TKY08F
C20SSTFCR16 ☆	●		16T3○○	20	250	32	13	18	7°	**25**	TS4	TKY15F
C25TSTFCR16 ☆	●		16T3○○	25	300	40	17	23	5°	**32**	TS4	TKY15F

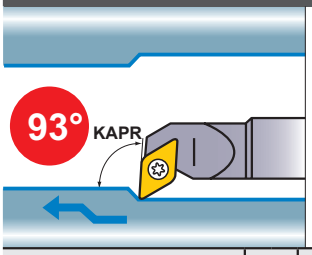
* Clamp Torque (N • m) : TS22=0.6, TS25=1.0, TS4=3.5

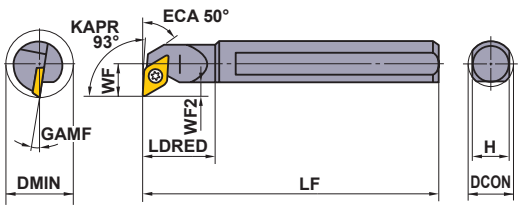
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.(Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained in Japan.

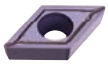
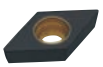
TC○○ type inserts	**➤A135—A137**
CBN & PCD inserts	**➤B046, B061**

S○○○SDUC — DC○○inserts





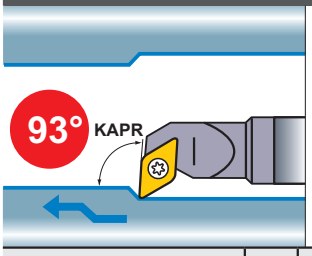
Right hand tool holder shown.

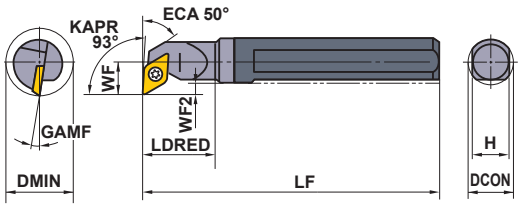
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	Medium	Medium	Flat top
MP	MM	Standard	
			
(07,11,15)	(07,11,15)	(07,11,15)	(07,11,15)

Order Number	Stock		Insert Number		Dimensions(mm)								*	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S10HSDUCR/L07	●	●	DCMT DCET DCGT DCMW DCGW	0702○○	10	100	16	7	2.4	9	13°	**13**	TS25	TKY08F
S12KSDUCR/L07	●	●		0702○○	12	125	20	9	3.4	11	10°	**16**	TS25	TKY08F
S16MSDUCR/L07	●	●		0702○○	16	150	25	11	3.9	14	7°	**20**	TS25	TKY08F
S20QSDUCR/L11☆	●	●		11T3○○	20	180	32	13	4.4	18	7°	**25**	TS4	TKY15F
S25RSDUCR/L15☆	●	●		1504○○	25	200	40	17	6.9	23	5°	**32**	TS5	TKY25F
S32SSDUCR/L15☆	●	●		1504○○	32	250	50	22	8.4	30	5°	**40**	TS5	TKY25F
S40TSDUCR/L15☆	●	●		1504○○	40	300	63	27	9.4	37	5°	**50**	TS5	TKY25F

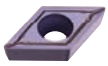
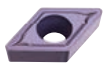
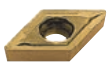
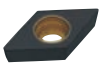
* Clamp Torque (N • m) : TS25=1.0, TS4=3.5, TS5=7.5

C○○○SDUC — Carbide shank DC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	Medium	Medium	Flat top
MP	MM	Standard	
			
(07,11,15)	(07,11,15)	(07,11,15)	(07,11,15)

Order Number	Stock	Insert Number		Dimensions(mm)								*	
	R			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
C10KSDUCR07	●	DCMT DCET DCGT DCMW DCGW	0702○○	10	125	16	7	2.1	9	13°	**13**	TS25	TKY08F
C12MSDUCR07	●		0702○○	12	150	20	9	3.1	11	10°	**16**	TS25	TKY08F
C16RSDUCR07	●		0702○○	16	200	25	11	3.1	14	7°	**20**	TS25	TKY08F
C20SSDUCR11☆	●		11T3○○	20	250	32	13	3.1	18	7°	**25**	TS4	TKY15F
C25TSDUCR15☆	●	DCMW DCMT	1504○○	25	300	40	17	4.9	23	5°	**32**	TS5	TKY25F

* Clamp Torque (N • m) : TS25=1.0, TS4=3.5, TS5=7.5

RECOMMENDED CUTTING CONDITIONS

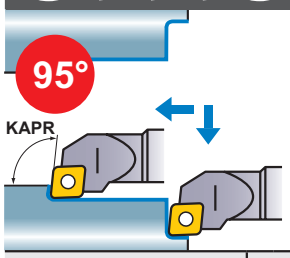
Steel Shank				l/d≤3			l/d=3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank				l/d≤5			l/d=6–7		
Workpiece Material		Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

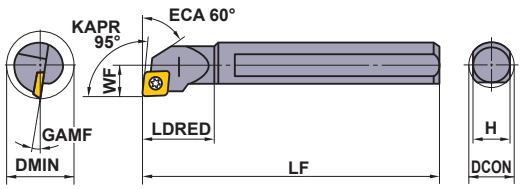
DC○○ type inserts	**➤ A124–A129**
CBN & PCD inserts	**➤ B044, B045, B060**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

S TYPE BORING BARS

- The minimum cutting diameter is from ϕ11.
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S○○○SCLC — CC○○inserts





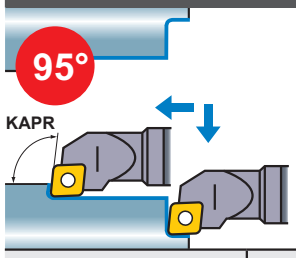
Right hand tool holder shown.

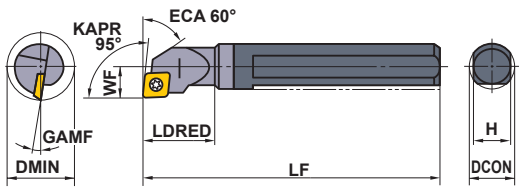
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(06,09)	(06,09)	(06,09)	(06,09)
Medium	**Medium**	**Flat top**	**CBN/PCD**
MP	MM		
			
(06,09,12)	(06,09,12)	(06,09,12)	(06,09,12)

Order Number	Stock		Insert Number		Dimensions(mm)							*	
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench
S08FSCLCR/L06	●	●	CCMB CCMH CCMT CCMW CCET CCGB CCGH CCGT CCGW	0602○○	8	80	12	6	7	15°	**11**	TS25	TKY08F
S10HSCLCR/L06	●	●		0602○○	10	100	16	7	9	13°	**13**	TS25	TKY08F
S12KSCLCR/L06	●	●		0602○○	12	125	20	9	11	10°	**16**	TS25	TKY08F
S16MSCLCR/L09 ☆	●	●		09T3○○	16	150	25	11	14	7°	**20**	TS4	TKY15F
S20QSCLCR/L09 ☆	●	●		09T3○○	20	180	32	13	18	7°	**25**	TS4	TKY15F
S25RSCLCR/L12 ☆	●	●		1204○○	25	200	40	17	23	5°	**32**	TS5	TKY25F
S32SSCLCR/L12 ☆	●	●		1204○○	32	250	50	22	30	5°	**40**	TS5	TKY25F
S40TSCLCR/L12 ☆	●	●		1204○○	40	300	63	27	37	5°	**50**	TS5	TKY25F

* Clamp Torque (N • m) : TS25=1.0, TS4=3.5, TS5=7.5

C○○○SCLC — Carbide shank CC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(06,09)	(06,09)	(06,09)	(06,09)
Medium	**Medium**	**Flat top**	**CBN/PCD**
MP	MM		
			
(06,09)	(06,09)	(06,09)	(06,09)

Order Number	Stock	Insert Number		Dimensions(mm)							*	
	R			DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench
C08HSCLCR06	●	CCMB CCMH CCMT CCMW CCET CCGB CCGH CCGT CCGW	0602○○	8	100	12	6	7	15°	**11**	TS25	TKY08F
C10KSCLCR06	●		0602○○	10	125	16	7	9	13°	**13**	TS25	TKY08F
C12MSCLCR06	●		0602○○	12	150	20	9	11	10°	**16**	TS25	TKY08F
C16RSCLCR09 ☆	●		09T3○○	16	200	25	11	14	7°	**20**	TS4	TKY15F
C20SSCLCR09 ☆	●		09T3○○	20	250	32	13	18	7°	**25**	TS4	TKY15F

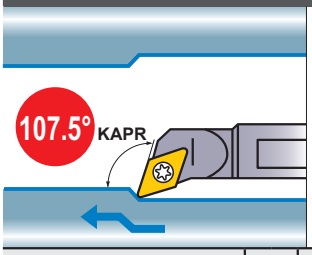
* Clamp Torque (N • m) : TS25=1.0, TS4=3.5

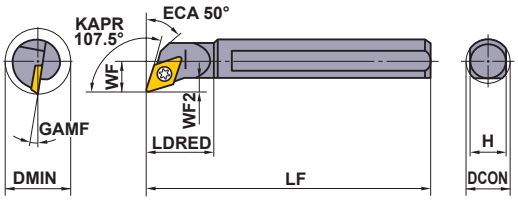
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.(Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : **Inventory maintained in Japan.**

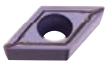
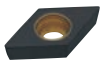
CC○○ type inserts	**➤ A114—A121**
CBN & PCD inserts	**➤ B040—B042, B059**

S○○○SDQC — DC○○inserts





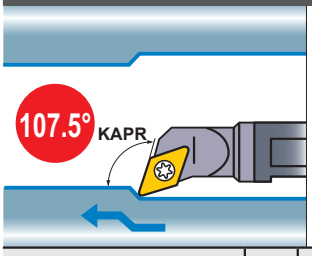
Right hand tool holder shown.

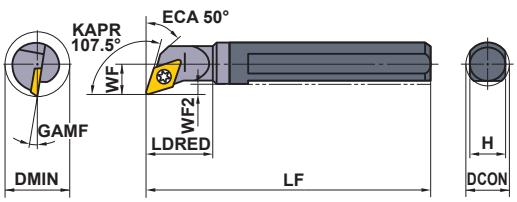
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**Flat top**	**CBN/PCD**
MP	MM		
			
(07,11,15)	(07,11,15)	(07,11,15)	(07,11)

Order Number	Stock		Insert Number		Dimensions(mm)								*	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S10HSDQCR/L07	●	●	DCMT DCET DCGT DCMW DCGW	0702○○	10	100	16	7	2.4	9	13°	**13**	TS25	TKY08F
S12KSDQCR/L07	●	●		0702○○	12	125	20	9	3.4	11	10°	**16**	TS25	TKY08F
S16MSDQCR/L07	●	●		0702○○	16	150	25	11	3.9	14	7°	**20**	TS25	TKY08F
S20QSDQCR/L11 ☆	●	●		11T3○○	20	180	32	13	4.4	18	7°	**25**	TS4	TKY15F
S25RSDQCR/L15 ☆	●	●		1504○○	25	200	40	17	6.9	23	5°	**32**	TS5	TKY25F
S32SSDQCR15 ☆	●			1504○○	32	250	50	22	8.4	30	5°	**40**	TS5	TKY25F
S40TSDQCR15 ☆	●			1504○○	40	300	63	27	9.4	37	5°	**50**	TS5	TKY25F

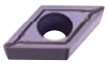
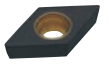
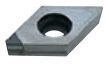
* Clamp Torque (N • m) : TS25=1.0, TS4=3.5, TS5=7.5

C○○○SDQC — Carbide shank DC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(07,11)	(07,11)	(07,11)	(07,11)
Medium	**Medium**	**Flat top**	**CBN/PCD**
MP	MM		
			
(07,11,15)	(07,11,15)	(07,11,15)	(07,11)

Order Number	Stock	Insert Number		Dimensions(mm)								*	
	R			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
C10KSDQCR07	●	DCMT DCET DCGT DCMW DCGW	0702○○	10	125	16	7	2.1	9	13°	**13**	TS25	TKY08F
C12MSDQCR07	●		0702○○	12	150	20	9	3.1	11	10°	**16**	TS25	TKY08F
C16RSDQCR07	●		0702○○	16	200	25	11	3.1	14	7°	**20**	TS25	TKY08F
C20SSDQCR11 ☆	●		11T3○○	20	250	32	13	3.1	18	7°	**25**	TS4	TKY15F
C25TSDQCR15 ☆	●	DCMW DCMT	1504○○	25	300	40	17	4.9	23	5°	**32**	TS5	TKY25F

* Clamp Torque (N • m) : TS25=1.0, TS4=3.5, TS5=7.5

RECOMMENDED CUTTING CONDITIONS

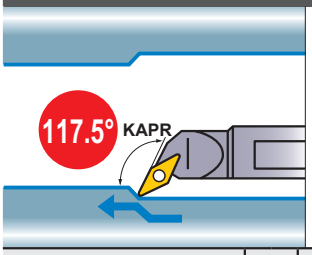
Steel Shank				l/d≤3			l/d=3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank				l/d≤5			l/d=6–7		
Workpiece Material		Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

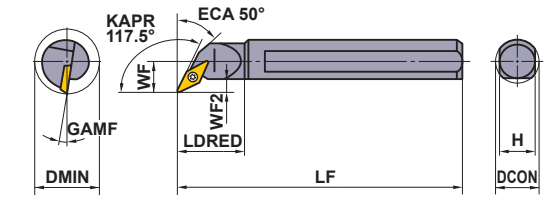
DC○○ type inserts	**➤ A124–A129**
CBN & PCD inserts	**➤ B044, B045, B060**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

S TYPE BORING BARS

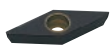
- The minimum cutting diameter is from ϕ20.
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S○○○SVQC — VC○○inserts





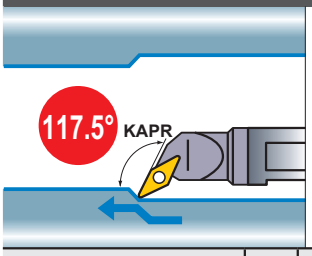
Right hand tool holder shown.

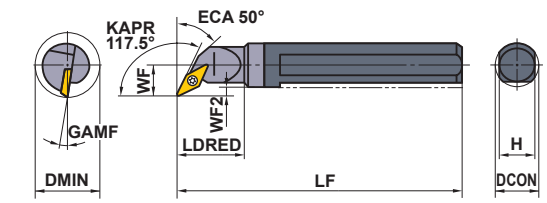
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	**Medium**	**Medium**	**Flat top**
MP	MM	Standard	
			
(16)	(16)	(11,16)	(11,16)

Order Number	Stock		Insert Number		Dimensions(mm)								*	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S16MSVQCR/L11	●	●	VCMW VCMT VCGW VCGT	1103○○	16	150	25	11	3.9	14	7°	**20**	TS25	TKY08F
S20QSVQCR/L11	●	●		1103○○	20	180	32	13	4.4	18	7°	**25**	TS25	TKY08F
S25RSVQCR/L16 ☆	●	●		1604○○	25	200	40	17	6.9	23	5°	**32**	TS4	TKY15F
S32SSVQCR/L16 ☆	●	●		1604○○	32	250	50	22	8.4	30	5°	**40**	TS4	TKY15F
S40TSVQCR16 ☆	●			1604○○	40	300	63	27	9.4	37	5°	**50**	TS4	TKY15F

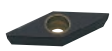
∗ Clamp Torque (N • m) : TS25=1.0, TS4=3.5

C○○○SVQC — Carbide shank — VC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	**Medium**	**Medium**	**Flat top**
MP	MM	Standard	
			
(16)	(16)	(11,16)	(11,16)

Order Number	Stock	Insert Number		Dimensions(mm)								*	
	R			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
C16RSVQCR11	●	VCMW VCMT VCGW VCGT	1103○○	16	200	25	11	3.1	14	7°	**20**	TS25	TKY08F
C20SSVQCR11	●		1103○○	20	250	32	13	3.1	18	7°	**25**	TS25	TKY08F
C25TSVQCR16 ☆	●		1604○○	25	300	40	17	4.9	23	5°	**32**	TS4	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS4=3.5

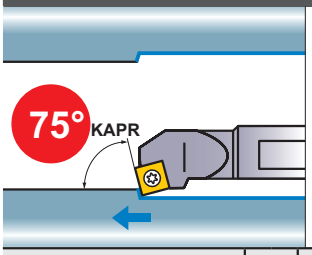
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.(Model of ☆ Mark is RE 0.8)
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

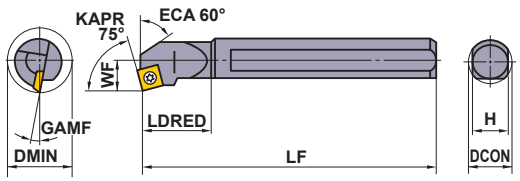
● : **Inventory maintained in Japan.**

VC○○ type inserts	**➤ A145—A147**
CBN & PCD inserts	**➤ B050, B064**

S○○○SSKC

SC○○inserts





Right hand tool holder shown.

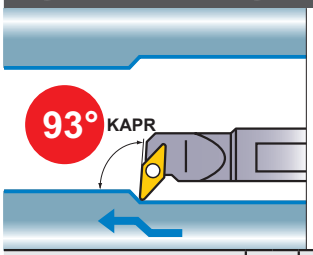
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(09)	(09)	(09)	(09)
Medium	Medium	Medium	Flat top
MP	MM	Standard	
			
(09,12)	(09,12)	(09,12)	(09,12)

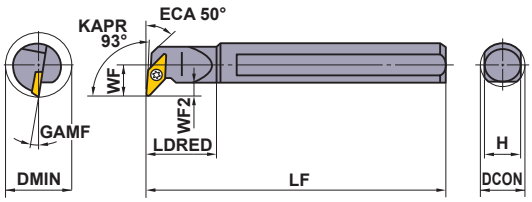
Order Number	Stock		Insert Number		Dimensions(mm)							*	
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench
S16MSSKCR/L09 ☆	●	●	SCMW SCMT	09T3○○	16	150	25	11	14	7°	**20**	TS4	TKY15F
S20QSSKCR/L09 ☆	●	●		09T3○○	20	180	32	13	18	7°	**25**	TS4	TKY15F
S25RSSKCR/L12 ☆	●	●		1204○○	25	200	40	17	23	5°	**32**	TS5	TKY25F

∗ Clamp Torque (N • m) : TS4=3.5, TS5=7.5

S○○○SVUC

VC○○inserts





Right hand tool holder only.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(11,16)	(11,16)	(11,16)	(11,16)
Medium	Medium	Medium	Flat top
MP	MM	Standard	
			
(16)	(16)	(11,16)	(11,16)

Order Number	Stock		Insert Number		Dimensions(mm)								*	
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S20QSVUCR/L11	●	●	VCMW VCMT VCGW VCGT	1103○○	20	180	32	13	4.4	18	7°	**25**	TS25	TKY08F
S25RSVUCR/L16 ☆	●	●		1604○○	25	200	40	17	6.9	23	5°	**32**	TS4	TKY15F
S32SSVUCR/L16 ☆	●	●		1604○○	32	250	50	22	8.4	30	5°	**40**	TS4	TKY15F
S40TSVUCR/L16 ☆	●	●		1604○○	40	300	63	27	9.4	37	5°	**50**	TS4	TKY15F

∗ Clamp Torque (N • m) : TS25=1.0, TS4=3.5

RECOMMENDED CUTTING CONDITIONS

Steel Shank				l/d≤3			l/d=3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank				l/d≤5			l/d=6–7		
Workpiece Material		Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

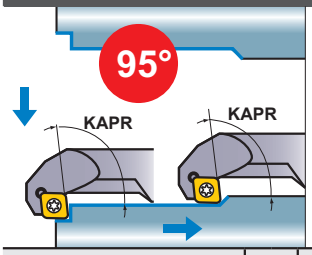
SC○○ type inserts ➤ A132, A133
VC○○ type inserts ➤ A145–A147
CBN & PCD inserts ➤ B050, B064
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

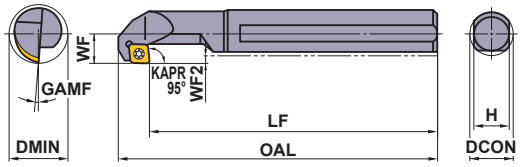
S TYPE BORING BARS

- The minimum cutting diameter is from ϕ20.
- l/d ≤ 3
- ISO standard.
- 7° positive insert.
- Screw-on type.

S○○○SCZC

CC○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
 (06,09)	 (06,09)	 (06,09)	 (06,09)
Medium	Medium	Flat top	CBN/PCD
MP	MM		
 (06,09)	 (06,09)	 (06,09)	 (06,09)

Order Number	Stock		Insert Number		Dimensions(mm)								*	
	R	L			DCON	OAL	LF	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S16MSCZCR/L06	●	●	CC○B CC○H CC○T CC○W	0602○○	16	161	150	11	3	14	10°	**20**	TS25	TKY08F
S20QSCZCR/L09	●	●		09T3○○	20	198	180	13	3	18	7°	**25**	TS4	TKY15F

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use right hand insert for right hand holder and left hand insert for left hand holder.
∗ Clamp Torque (N • m) : TS25=1.0, TS4=3.5

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Cutting Mode	l/d≤3		
				Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2
			Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0
M	Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2
			Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0
N	Aluminium Alloy	–	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2
			Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0

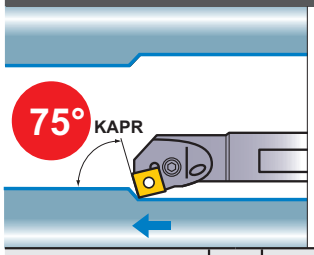
● : Inventory maintained in Japan.

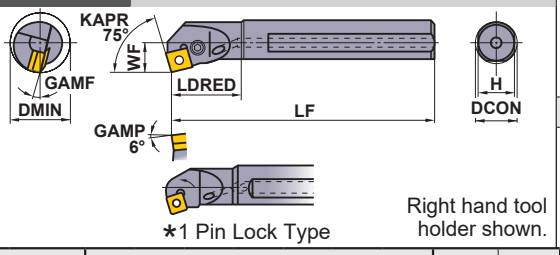
CC○○ type inserts ➤ A114–A121
CBN & PCD inserts ➤ B040–B042, B059

P TYPE BORING BARS

- The minimum cutting diameter is from ϕ25.
- ISO standard.
- Economical negative insert.
- Lever lock type.
- l/d is 3 times the diameter.

A○○○PSKN With coolant hole SN○○inserts





*1 Pin Lock Type

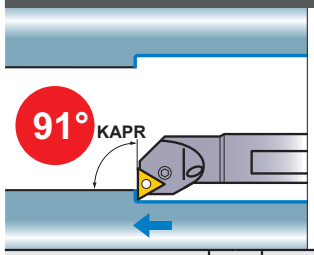
Right hand tool holder shown.

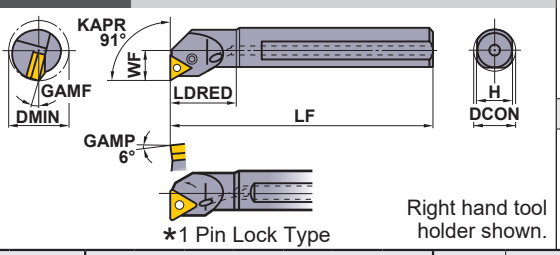
Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(12)	(12)	(12)	(12)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(09,12)	(12)	(09,12)	(12)

Order Number	Stock		Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Lever	Clamp Screw *2	Wrench	Plug	Clamp Pin *2	Pin	Screw
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN									
A20QPSKNR/L09	●	●	SNMA SNMG	0903○○	20	180	32	13	18	13°	**25**	—	—	—	—	HKY15R HKY25R	HGM-PT1/8	HP3T	P208AM	HSS03005
A25RPSKNR/L12	●	●	SNMM SNGA SNGG	1204○○	25	200	40	17	23	13°	**32**	MLSP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPSKNR/L12	●	●		1204○○	32	250	50	22	30	13°	**44**	LLSSN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

*1 Pin Lock Type : A20QPSKNR/L09, A25RPSKNR/L12
*2 Clamp Torque (N • m) : LLCS108S=3.3, HP3T=2.2, HP43=3.3

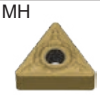
A○○○PTFN With coolant hole TN○○inserts





*1 Pin Lock Type

Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(16)	(16, 22)	(16,22)	(16,22)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(16,22)	(16,22)	(16,22)	(16,22)

Order Number	Stock		Insert Number		Dimensions(mm)							Shim	Shim Pin	Clamp Lever	Clamp Screw *2	Wrench	Plug	Clamp Pin *2	Pin	Screw
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN									
A20QPTFNR/L16	●	●	TNMA TNMG TNMM TNGA TNGG TNGH	1604○○	20	180	32	13	18	15°	**25**	—	—	—	—	HKY15R HKY25R	HGM-PT1/8	HP31	P208AM	HSS03005
A25RPTFNR/L16	●	●		1604○○	25	200	40	17	23	13°	**32**	MLTP32	—	—	—	HKY15R HKY25R	HGM-PT1/4	HP33	P208AM	HSS03005
A32SPTFNR/L16	●	●		1604○○	32	250	50	22	30	13°	**44**	LLSTN32	LLP13	LLCL13	LLCS106	HKY25R	HGM-PT3/8	—	—	—
A40TPTFNR/L22	●	●		2204○○	40	300	63	27	37	10°	**54**	LLSTN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPTFNR/L22	●	●		2204○○	50	350	80	35	47	9°	**70**	LLSTN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

*1 Pin Lock Type : A20QPTFNR/L16, A25RPTFNR/L16
*2 Clamp Torque (N • m) : LLCS106=2.2, LLCS108S=3.3, HP31=2.2, HP33=2.2

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (m/min)	l/d≤3 Feed (mm/rev)	l/d≤3 Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0
M	Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0

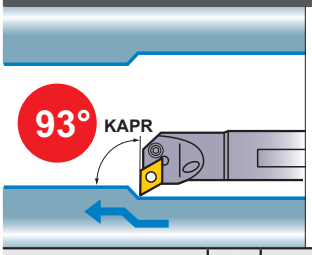
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.8.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

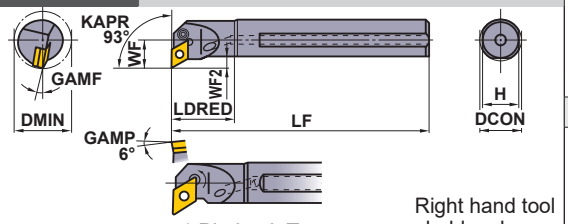
SN○○ type inserts	➤ A089—A094
TN○○ type inserts	➤ A095—A101
CBN & PCD inserts	➤ B031—B034, B056
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

P TYPE BORING BARS

- The minimum cutting diameter is from ϕ20.
- ISO standard.
- Economical negative insert.
- Lever lock type.
- l/d is 3 times the diameter.

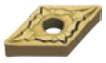
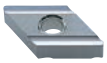
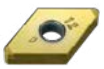
A○○○PDUN With coolant hole DN○○inserts





∗1 Pin Lock Type

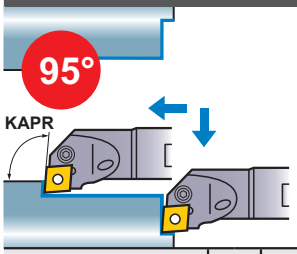
Right hand tool holder shown.

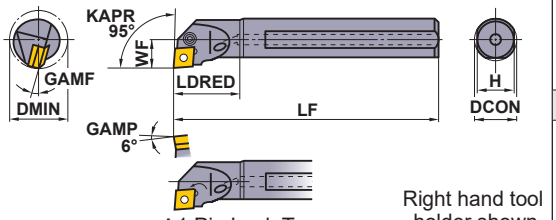
Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(15)	(11, 15)	(15)	(15)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(11,15)	(15)	(15)	(15)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	F2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw *2	Wrench	Plug	Clamp Pin *2	Pin	Screw
A20QPDUNR/L11	●	●	DNMA DNMG DNMX DNMM DNGA DNGG DNGM	1104○○	20	180	32	15	6.4	18	13°	**26**	—	—	LLCL23S	LLCS125	HKY20R	HGM-PT1/8	—	—	—
A25RPDUNR/L11	●	●		1104○○	25	200	40	17	6.9	23	15°	**32**	LLSDN32	LLP13	LLCL23	LLCS106	HKY25R	HGM-PT1/4	—	—	—
A25RPDUNR/L15	●	●		1504○○	25	200	40	17	6.9	23	13°	**32**	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPDUNR/L11	●	●		1104○○	32	250	50	22	8.4	30	13°	**44**	LLSDN32	LLP13	LLCL23	LLCS106	HKY25R	HGM-PT3/8	—	—	—
A32SPDUNR/L15	●	●		1504○○	32	250	50	22	8.4	30	13°	**44**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPDUNR/L15	●	●		1504○○	40	300	63	27	9.4	37	10°	**54**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPDUNR/L15	●	●		1504○○	50	350	80	35	12.4	47	9°	**70**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

∗1 Pin Lock Type : A25RPDUNR/L15
∗2 Clamp Torque (N • m) : LLCS125=1.5, LLCS106=2.2, LLCS108S=3.3, HP43=3.3

A○○○PCLN With coolant hole CN○○inserts





∗1 Pin Lock Type

Right hand tool holder shown.

Finish	Light	Light	Medium
FP	SA	LP	MP
			
(12)	(12)	(12)	(12)
Medium	**Medium**	**Stainless**	**CBN/PCD**
MH	Standard	MM	
			
(12)	(09,12)	(12)	(12)

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever *3	Clamp Screw *2	Wrench	Plug	Clamp Pin *2	Pin	Screw
A16MPCLNR/L09	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	09T3○○	16	150	25	11	14	15°	**20**	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/8	—	—	—
A20QPCLNR/L09	●	●		09T3○○	20	180	32	13	18	13°	**25**	—	—	—	—	HKY25R HKY15R	HGM-PT1/8	HP3T	P208AM	HSS03005
A20QPCLNR/L09N	●	●		09T3○○	20	180	32	13	18	13°	**25**	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/8	—	—	—
A25RPCLNR/L09	●	●		09T3○○	25	200	40	17	23	13°	**32**	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/4	—	—	—
A25RPCLNR/L12	●	●		1204○○	25	200	40	17	23	13°	**32**	MLCP42	—	—	—	HKY30R HKY15R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPCLNR/L12	●	●		1204○○	32	250	50	22	30	13°	**44**	LLSCN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPCLNR/L12	●	●		1204○○	40	300	63	27	37	10°	**54**	LLSCN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPCLNR12	●			1204○○	50	350	80	35	47	10°	**63**	LLSCP42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

∗1 Pin Lock Type : A20QPCLNR/L09, A25RPCLNR/L12
∗2 Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS108S=3.3, HP3T=2.2, HP43=3.3
∗3 When replacing clamp Lever LLCL13S, please consider purchasing lever spring HLS2 as necessary.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.8.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

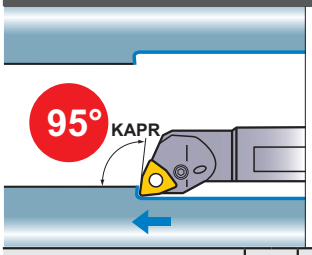
● : **Inventory maintained in Japan.**

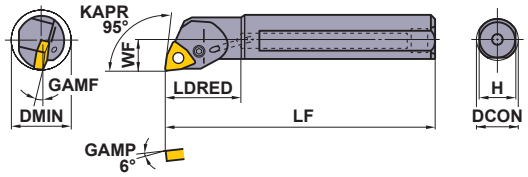
DN○○ type inserts	**➤ A081—A087**
CN○○ type inserts	**➤ A074—A080**
CBN & PCD inserts	**➤ B022—B030, B055**

A○○○PWLN

With coolant hole

WN○○inserts





Right hand tool holder shown.

Light	Medium
LP	MP
	
(06)	(06)
Stainless	
MM	
	
(06)	

Order Number	Stock		Insert Number		Dimensions(mm)							*2	*1		
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Lever	Clamp Screw	Wrench	Plug
A16MPWLNR/L06	●	●	WNMG	06T3○○	16	150	25	11	14	15°	**20**	LLCL13S	LLCS105	HKY20R	HGM-PT1/8
A20QPWLNR/L06	●	●		06T3○○	20	180	32	13	18	13°	**25**	LLCL13S	LLCS105	HKY20R	HGM-PT1/8
A25RPWLNR/L06	●	●		06T3○○	25	200	40	17	23	13°	**32**	LLCL13S	LLCS105	HKY20R	HGM-PT1/4

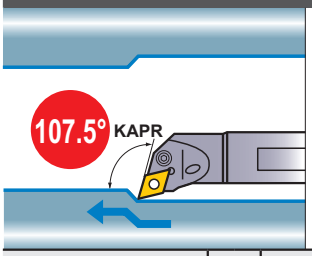
∗1 Clamp Torque (N • m) : LLCS105=1.5

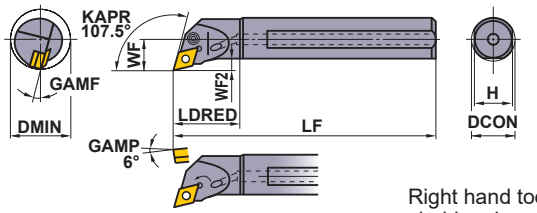
∗2 When replacing clamp Lever LLCL13S, please consider purchasing lever spring HLS2 as necessary.

A○○○PDQN

With coolant hole

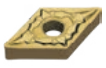
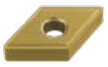
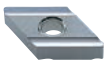
DN○○inserts





∗1 Pin Lock Type

Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(15)	(15)	(15)	(15)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(15)	(15)	(15)	(15)

Order Number	Stock		Insert Number		Dimensions(mm)								*2				*2			
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw
A25RPDQNR/L15	●	●	DNMA DNMG	1504○○	25	200	40	17	6.9	23	13°	**32**	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPDQNR/L15	●	●	DNMM	1504○○	32	250	50	22	8.4	30	13°	**44**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPDQNR/L15	●	●	DNGA DNGG	1504○○	40	300	63	27	9.4	37	10°	**54**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPDQNR15	●		DNGM	1504○○	50	350	80	35	12.4	47	9°	**70**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

∗1 Pin Lock Type : A25RPDQNR/L15

∗2 Clamp Torque (N • m) : LLCS108S=3.3, HP43=3.3

RECOMMENDED CUTTING CONDITIONS

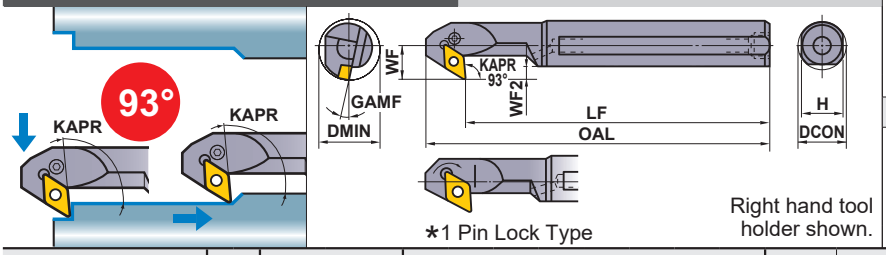
	Workpiece Material	Hardness	Cutting Mode	l/d≤3		
				Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0
M	Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0

WN○○ type inserts	**➤ A106—A109**
DN○○ type inserts	**➤ A081—A087**
CBN & PCD inserts	**➤ B026—B030, B055**
SPARE PARTS	**➤ P001**
TECHNICAL DATA	**➤ Q001**

P TYPE BORING BARS

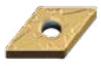
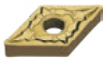
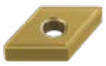
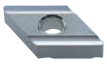
- The minimum cutting diameter is from ϕ32.
- ISO standard.
- Economical negative insert.
- Lever lock type.
- l/d is 3 times the diameter.

A○○○PDZN With coolant hole DN○○inserts



*1 Pin Lock Type

Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(15)	(15)	(15)	(15)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(15)	(15)	(15)	(15)

Order Number	Stock R	Stock L	Insert Number		DCON	OAL	LF	WF	WF2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw *2	Wrench	Plug	Clamp Pin *2	Pin	Screw
A25RPDZNR/L15	●	●	DNMA DNMG	1504○○	25	225	200	17	6.7	23	13°	**32**	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPDZNR/L15	●	●	DNMX DNMM	1504○○	32	275	250	22	8.2	30	13°	**40**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPDZNR/L15	●	●	DNGA DNGG	1504○○	40	325	300	27	9.2	37	10°	**50**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPDZNR/L15	●	●	DNGM	1504○○	50	375	350	35	12.2	47	9°	**63**	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

*1 Pin Lock Type : A25RPDZNR/L15

*2 Clamp Torque (N • m) : LLCS108S=3.3, HP43=3.3

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.8.

Note 3) When using insert with right and left hand chip breaker, please use right hand insert for right hand holder and left hand insert for left hand holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (m/min)	l/d≤3 Feed (mm/rev)	l/d≤3 Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0
M	Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0

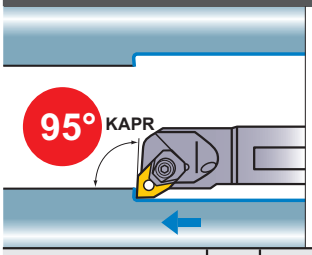
● : Inventory maintained in Japan.

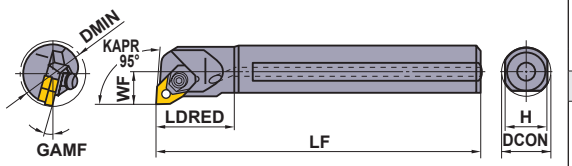
DN○○ type inserts ➤ A081—A087
CBN & PCD inserts ➤ B026—B030, B055

M TYPE BORING BARS

- The minimum cutting is from ϕ63.
- Negative trigon shape insert.
- Double clamp type.
- l/d is 3 times the diameter.

A○○○MWLN With coolant hole WN○○inserts





Right hand tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(08)	(08)	(08)	(08)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
			
(08)	(08)	(08)	

Order Number	Stock	Insert Number	Dimensions(mm)							Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw*	Wrench	Plug
	R		DCON	LF	LDRED	WF	H	GAMF	DMIN								
A50UMWLNR08	●	WNMA WNMG WNGA 0804○○	50	350	80	35	63	9°	**63**	WPS WC43	CCP44	CCK13	CPT24	MES2	SLCS105	HKY25R HKY40R	HGM-PT3/8

∗1 Clamp Torque (N • m) : SLCS105=7.0

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.8.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (m/min)	l/d≤3 Feed (mm/rev)	l/d≤3 Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0
M	Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0

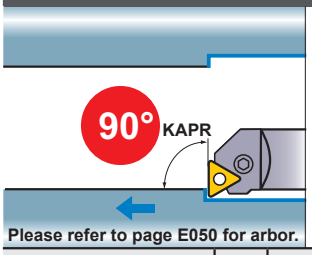
WN○○ type inserts ➤A106—A110
CBN inserts ➤B037

D TYPE BORING HEAD

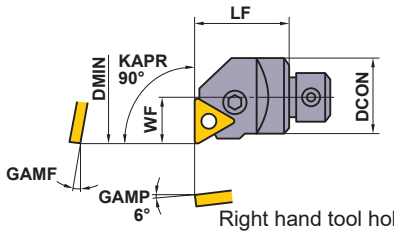
- The minimum cutting diameter is from ϕ40.
- Economical negative insert.
- Lever lock type.
- Exchangeable head type.

DPTF

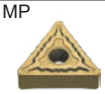
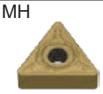
TN○○inserts



Please refer to page E050 for arbor.



Right hand tool holder only.

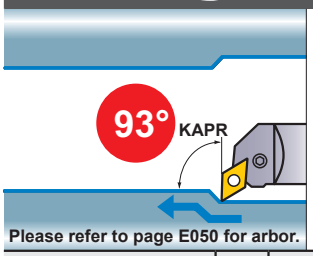
Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(16)	(16,22)	(16,22)	(16,22)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	R/L	
			
(16,22)	(16,22)	(16,22)	(16)

Order Number	Stock	Insert Number		Dimensions(mm)					Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R			DCON	LF	WF	GAMF	DMIN					
DPTF132R	●	TN○A TN○G TN○M	1604○○	32	40	20	12°	**40**	LLSTN32	LLP13	LLCL13	LLCS106	HKY25R
DPTF140R	●		2204○○	40	50	25	10°	**50**	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R

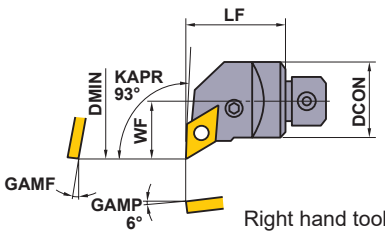
∗ Clamp Torque (N • m) : LLCS106=2.2, LLCS108=3.3

DPDU

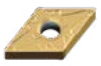
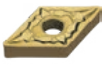
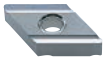
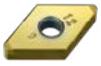
DN○○inserts



Please refer to page E050 for arbor.



Right hand tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(15)	(15)	(15)	(15)
Medium	**Stainless**	**G class**	**CBN/PCD**
Standard	MM	L	
			
(15)	(15)	(15)	(15)

Order Number	Stock	Insert Number		Dimensions(mm)					Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R			DCON	LF	WF	GAMF	DMIN					
DPDU132R	●	DN○A DN○G DN○M DN○X	1504○○	32	40	25	10°	**50**	LLSDN42	LLP14	LLCL24	LLCS108	HKY30R
DPDU140R	●		1504○○	40	50	30	9°	**60**	LLSDN42	LLP14	LLCL24	LLCS108	HKY30R

∗ Clamp Torque (N • m) : LLCS108=3.3

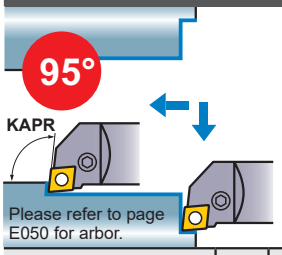
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.8.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

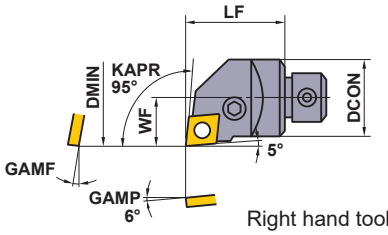
● : Inventory maintained in Japan.

TN○○ type inserts	**➤ A095—A101**
DN○○ type inserts	**➤ A081—A087**
CBN & PCD inserts	**➤ B026—B030, B032—B034, B055, B056**

DPCL

CN○○inserts





Right hand tool holder only.

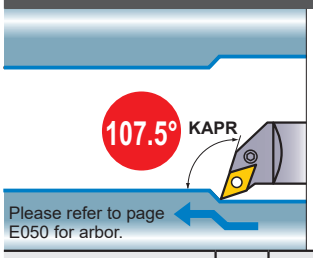
Finish	Light	Light	Light
FP	SA	LP	LM
			
(12)	(12)	(12)	(12)
Medium	Medium	Stainless	CBN/PCD
MP	Standard	MM	
			
(12)	(12)	(12)	(12)

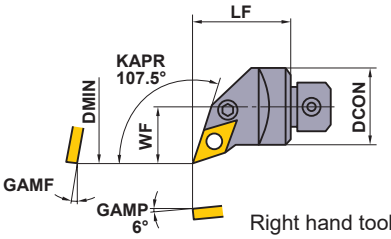
Order Number	Stock	Insert Number		Dimensions(mm)								 *	
	R			DCON	LF	WF	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
DPCL132R	●	CN○A CN○G CN○M	1204○○	32	40	20	12°	**40**	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
DPCL140R	●		1204○○	40	50	25	10°	**50**	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

∗ Clamp Torque (N • m) : LLCS108=3.3

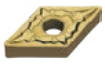
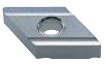
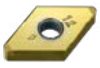
DPDH

DN○○inserts





Right hand tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(15)	(15)	(15)	(15)
Medium	Stainless	G class	CBN/PCD
Standard	MM	L	
			
(15)	(15)	(15)	(15)

Order Number	Stock	Insert Number		Dimensions(mm)								 *	
	R			DCON	LF	WF	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
DPDH132R	●	DN○A DN○G DN○M	1504○○	32	40	25	10°	**50**	LLSDN42	LLP14	LLCL24	LLCS108	HKY30R
DPDH140R	●		1504○○	40	50	30	9°	**60**	LLSDN42	LLP14	LLCL24	LLCS108	HKY30R

∗ Clamp Torque (N • m) : LLCS108=3.3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Cutting Mode	l/d≤3			l/d=3—4		
				Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P	Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
M	Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

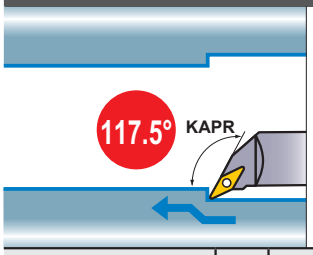
CN○○ type inserts ➤ A074—A080
DN○○ type inserts ➤ A081—A087
CBN & PCD inserts ➤ B022—B030, B055
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

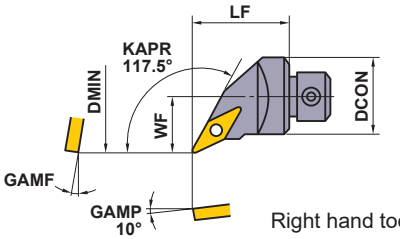
D TYPE BORING HEAD

- The minimum cutting diameter is from ϕ40.
- Economical negative insert.
- Lever lock type.
- Exchangeable head type.

DPVP

VN○○inserts





Right hand tool holder only.

Finish	Light	Medium	Medium
FP	LP	MP	MH
 (16)	 (16)	 (16)	 (16)
Stainless	**G class**	**PCD**	**CBN**
MM	L	L-F	
 (16)	 (16)	 (16)	 (16)

Order Number	Stock	Insert Number		Dimensions(mm)							 *		
	R			DCON	LF	WF	GAMF	DMIN	Shim	Lock Pin	Lock Screw	Stop Ring	Wrench
DPVP132R	●	VN○A VN○G VN○M	1604○○	32	40	25	13°	**50**	PV322	P11S	HSP05008C	E03	HKY25R
DPVP140R	●		1604○○	40	50	30	13°	**60**	PV322	P11S	HSP05008C	E03	HKY25R

∗ Clamp Torque (N • m) : HSP05008C=2.5

Note 1) Dimensions shown for insert corner RE 0.8.

STANDARD ARBOR FOR D TYPE BORING HEAD

① **B** ② **1** ③ **32** ④ **32**

①Designation

②Arbor Length (mm)

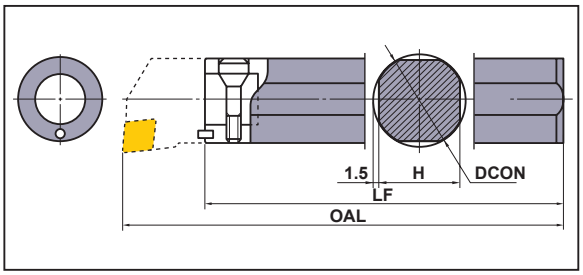
Symbol	DCON	LF	OAL
1	32	260	300
	40	310	360

③Arbor Diameter (mm)

Symbol	Diameter(DCON)
32	32
40	40

④Head Diameter (mm)

Symbol	Diameter(BD)
32	32
40	40



Order Number	Stock	Dimensions (mm)				Set Bolt	Wrench	Head Order Number
		DCON	LF	H	OAL			
B13232	●	32	260	29	300	SD32	HKY60R	DP○○132R
B14040	●	40	310	37	360	SD40	HKY60R	DP○○140R

● : Inventory maintained in Japan.

VN○○ type inserts ➤ A102—A105

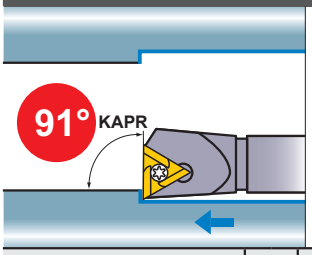
CBN & PCD inserts ➤ B035, B036, B057

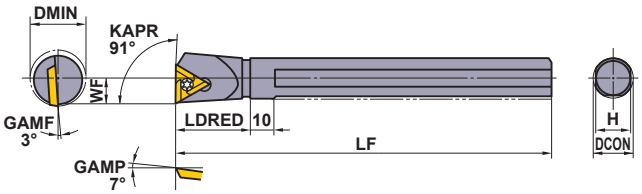
AL TYPE BORING BARS

- Suitable for non-ferrous metal.
- 20° positive insert.
- Screw-on type.
- l/d is 6 times the diameter.
- Excellent vibration resistance.
- The minimum cutting diameter is from ϕ20.

STFE

TE○○inserts





Right hand tool holder shown.

Medium	PCD
R/L	R/L
 (16)	 (16)
PCD	
 (16)	

Order Number	Stock R	Stock L	Insert Number		Dimensions(mm) DCON	LF	LDRED	WF	H	DMIN	* Clamp Screw	Wrench
S16RSTFER/L16	●	●	TEGX	1603○○	16	200	30	11	14.6	**20**	FC400890T	TKY10F
S20RSTFER/L16	●	●		1603○○	20	200	37	13	18	**25**	FC400890T	TKY10F
S25SSTFER/L16	●	●		1603○○	25	250	40	17	23	**32**	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

E

BORING BARS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Grade	Cutting Speed (m/min)	l/d=3 Feed (mm/rev)	l/d=3 Depth of Cut (mm)	l/d=4 Feed (mm/rev)	l/d=4 Depth of Cut (mm)	l/d=5 Feed (mm/rev)	l/d=5 Depth of Cut (mm)	l/d=6 Feed (mm/rev)	l/d=6 Depth of Cut (mm)
N	Aluminium Alloy	**HTi10**	400 (200—600)	0.15 (0.05—0.25)	—3.0	0.15 (0.05—0.25)	—3.0	0.1 (0.05—0.2)	—2.5	0.1 (0.05—0.2)	—1.0
		MD220	800 (200—1500)	0.15 (0.05—0.25)	—3.0	0.15 (0.05—0.25)	—3.0	0.1 (0.05—0.2)	—2.5	0.1 (0.05—0.2)	—1.0

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) Dimensions shown for insert corner RE 0.4.
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

TE○○ type inserts ➤ **A138**
PCD inserts ➤ **B066**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

HOW TO READ THE STANDARD OF GROOVING AND CUTTING OFF

●How this section page is organised

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

[For External Grooving / Cutting Off] [For Internal Grooving]

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications such as cutting off, grooving, and copying.

INDICATION OF HOLDER TYPE ACCORDING TO APPLICATION
indicates the holder types, such as the standard type or the L type, according to machining application.

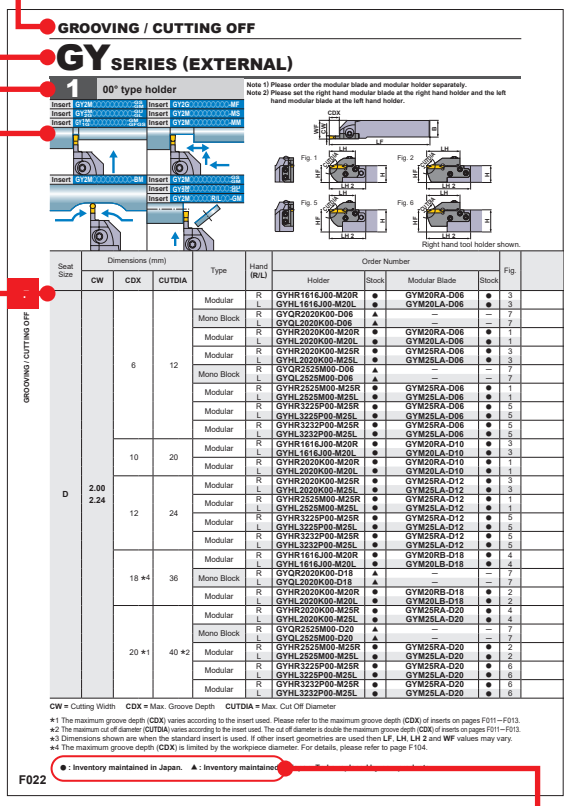
TITLE OF PRODUCT

PRODUCT SECTION

PRODUCT FEATURES

MIN. CUTTING DIAMETER
is colour-coded to let you find, at a glance, the minimum cutting diameters for internal machining.

GEOMETRY



GROOVING / CUTTING OFF

GY SERIES (EXTERNAL)

1 00° type holder

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

Right hand tool holder shown.

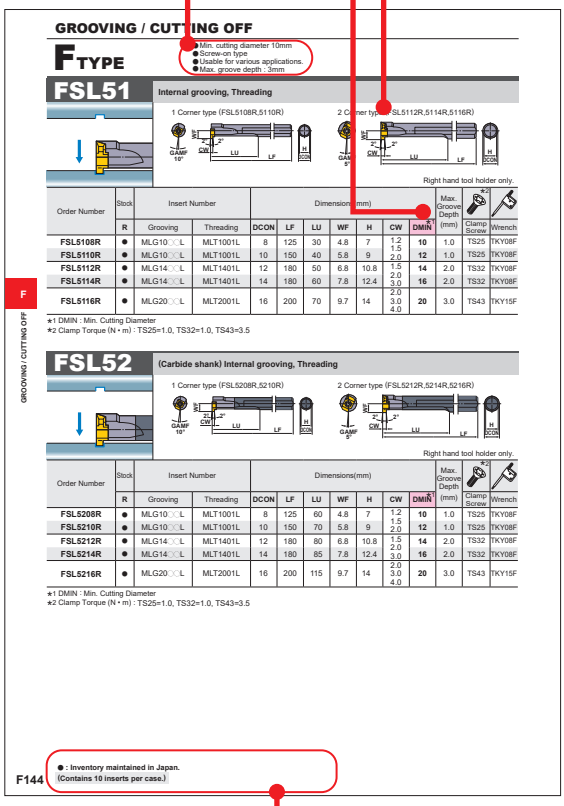
Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-D06	●	3
				Mono Block	R	GYQR2020K00-D06	▲	–	–	7
					L	GYQL2020K00-D06	▲	–	–	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-D06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-D06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-D06	●	3
				Mono Block	R	GYQR2525M00-D06	▲	–	–	7
					L	GYQL2525M00-D06	▲	–	–	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-D06	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D06	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-D06	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D06	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-D06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-D10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-D10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-D12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-D12	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D12	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-D12	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D12	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-D12	●	5
		18 ★4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-D18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-D18	●	4
				Mono Block	R	GYQR2020K00-D18	▲	–	–	7
					L	GYQL2020K00-D18	▲	–	–	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-D18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-D18	●	2
		20 ★1	40 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-D20	●	4
				Mono Block	R	GYQR2525M00-D20	▲	–	–	7
					L	GYQL2525M00-D20	▲	–	–	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-D20	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D20	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-D20	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D20	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-D20	●	6

CW = Cutting Width CDX = Max. Groove Depth CUTDIA = Max. Cut Off Diameter

★1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F011–F013.
★2 The maximum cut off diameter (CUTDIA) varies according to the insert used. The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F011–F013.
★3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH 2 and WF values may vary.
★4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F104.

● : Inventory maintained in Japan. ▲ : Inventory maintained

F022



GROOVING / CUTTING OFF

F TYPE

● Min. cutting diameter 10mm
● Screw-on type
● Usable for various applications.
● Max. groove depth : 3mm

FSL51 Internal grooving, Threading

1 Corner type (FSL5108R,5110R) 2 Corner type (FSL5112R,5114R,5116R)

Right hand tool holder only.

Order Number	Stock R	Insert Number Grooving	Insert Number Threading	Dimensions(mm) DCON	LF	LU	WF	H	CW	DMIN	Max. Groove Depth (mm)	Clamp Screw ★2	Wrench ★2
FSL5108R	●	MLG10□□L	MLT1001L	8	125	30	4.8	7	1.2 1.5 2.0	10	1.0	TS25	TKY08F
FSL5110R	●	MLG10□□L	MLT1001L	10	150	40	5.8	9	1.5 2.0	12	1.0	TS25	TKY08F
FSL5112R	●	MLG14□□L	MLT1401L	12	180	50	6.8	10.8	1.5 2.0	14	2.0	TS32	TKY08F
FSL5114R	●	MLG14□□L	MLT1401L	14	180	60	7.8	12.4	2.0 3.0	16	2.0	TS32	TKY08F
FSL5116R	●	MLG20□□L	MLT2001L	16	200	70	9.7	14	2.0 3.0 4.0	20	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 Clamp Torque (N・m) : TS25=1.0, TS32=1.0, TS43=3.5

FSL52 (Carbide shank) Internal grooving, Threading

1 Corner type (FSL5208R,5210R) 2 Corner type (FSL5212R,5214R,5216R)

Right hand tool holder only.

Order Number	Stock R	Insert Number Grooving	Insert Number Threading	Dimensions(mm) DCON	LF	LU	WF	H	CW	DMIN	Max. Groove Depth (mm)	Clamp Screw ★2	Wrench ★2
FSL5208R	●	MLG10□□L	MLT1001L	8	125	60	4.8	7	1.2 1.5 2.0	10	1.0	TS25	TKY08F
FSL5210R	●	MLG10□□L	MLT1001L	10	150	70	5.8	9	1.5 2.0	12	1.0	TS25	TKY08F
FSL5212R	●	MLG14□□L	MLT1401L	12	180	80	6.8	10.8	1.5 2.0 3.0	14	2.0	TS32	TKY08F
FSL5214R	●	MLG14□□L	MLT1401L	14	180	85	7.8	12.4	2.0 3.0	16	2.0	TS32	TKY08F
FSL5216R	●	MLG20□□L	MLT2001L	16	200	115	9.7	14	2.0 3.0 4.0	20	3.0	TS43	TKY15F

★1 DMIN : Min. Cutting Diameter
★2 Clamp Torque (N・m) : TS25=1.0, TS32=1.0, TS43=3.5

● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

F144

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), holders, Modular Blade, cutting widths, maximum groove depths, maximum cut-off diameters, dimensions, applicable inserts, and cutting edge shapes.

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

●To Order : For holder, please specify ①order number and hand of tool (right/left).
For insert, please specify ①insert number and ②grade.

TURNING TOOLS

GROOVING AND CUTTING OFF

CLASSIFICATION (EXTERNAL) ····· F002
CLASSIFICATION (INTERNAL) ····· F003

STANDARD OF GROOVING AND CUTTING OFF TOOLS

EXTERNAL

FEATURES OF THE GY SERIES ····· F004
GY SERIES ORDER NUMBER ····· F008
GY SERIES INSERTS ····· F011
GY SERIES REFERENCE MATERIAL ··· F015
GY SERIES ····· F016
GW SERIES ····· F122
MG HOLDER ····· F136
SMG HOLDER ····· F138

INTERNAL

GY SERIES ····· F086
MICRO-MINI BORING BARS ····· F139
MICRO-MINI TWIN BORING BARS ····· F140
F TYPE BORING BARS ····· F144
D TYPE BORING HEAD ····· F146

*Arranged by Alphabetical order

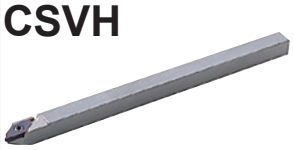
F139 **C○○○R-BLS**
F140 **CG**
F146 **DPT4**
F144 **FSL51**
F144 **FSL52**
F130 **GW1**
F128 **GWB**
F129 **GWTB**
F016 **GY**
F136 **MGH**
F137 **MGT**
F145 **MLG**
F145 **MLT**
F142 **RBH**
F143 **SBH**
F138 **SMGH**
F138 **SMGT**
F138 **SMTT**



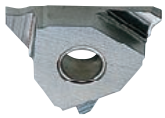


CLASSIFICATION

EXTERNAL

Name of Tool Holder	Insert Shape	Features	Cutting Width According to Cutting Mode (mm)					
			Shallow Grooving	Deep Grooving	Cutting Off	Copying	Recessing	Face Grooving
GY Series  F016		**Modular blade type** ● Clamp-on type. ● The modular blade allows for high rigidity and accuracy. (Tri-Lock System) ● Various insert types. **Mono block type** ● Clamp-on type. ● Maximum cut off diameter : 50mm. Info	1.5 2 2.24 2.39 2.5 2.74 3 3.18 3.24 4 4.24 4.75 5 5.24 6 6.31 6.35 8	1.5 2 2.24 2.39 2.5 2.74 3 3.18 3.24 4 4.24 4.75 5 5.24 6 6.31 6.35 8	1.5 2 2.24 2.39 2.5 2.74 3 3.18 3.24 4 4.24 4.75 5 5.24 6 6.31 6.35 8	2 2.5 3 3.18 4 4.75 5 6 6.35 8	2 2.5 3 3.18 4 4.75 5 6 6.35	2 2.24 2.39 2.5 2.74 3 3.18 3.24 4 4.24 4.75 5 5.24 6 6.31 6.35
GW Series  F122		● Spring clamp type. ● Simple insert clamping method. ● The blade is possible to use with both external or through coolant. ● Breaker system offering excellent chip disposal properties. ● Maximum cut off diameter : 120mm. Info	2 2.39 3 4 5	2 2.39 3 4 5	2 2.39 3 4 5			
MG Holder  F136		● Clamp-on type. ● Precision class insert. ● Positive insert suffers from negligible chattering and thus produces a good finished surface.	1.25 I 6					
SMG Holder  F138		● Screw-on type. ● Precision class insert. ● Positive insert suffers from negligible chattering and thus produces a good finished surface.	0.5 I 1.3					
SMALL TOOLS **GTAH GTBH GTCH**  D018		● For gang type tool posts. ● Small Shank : 8–16mm ● Possible to control the back clamping. ● High rigidity due to design of vertical insert. ● Economical due to the design of three-corner inserts.	0.3 I 3.0					
CTAH  D020		● For gang type tool posts. ● Small Shank : 8–16mm ● Due to the design of handed tool holders, able to minimize accumulation of workpieces. ● High rigidity due to design of vertical insert. ● Maximum cut off diameter : 12mm	0.7 1.0 1.5 2.0	0.7 1.0 1.5 2.0	0.7 1.0 1.5 2.0			
CTBH  D015		● For gang type tool posts. ● Small Shank : 10–16mm ● Single holder for inserts for back turning and cutting off. ● High rigidity due to design of vertical insert. ● Maximum cut off diameter : 16mm	1.5 2.0	1.5 2.0	1.5 2.0			
CSVH  D027		● For cam type tool posts. ● Small Shank : 7–12mm ● Single holder responds to front turning, back turning, grooving, threading and cutting off operations. ● The most suitable for machining of small parts with work diameter 5mm or smaller. ● Maximum groove depth : 0.3–2.5mm ● Maximum cut off diameter : 3–5mm	0.25 I 1.5		0.6 I 1.5			

INTERNAL

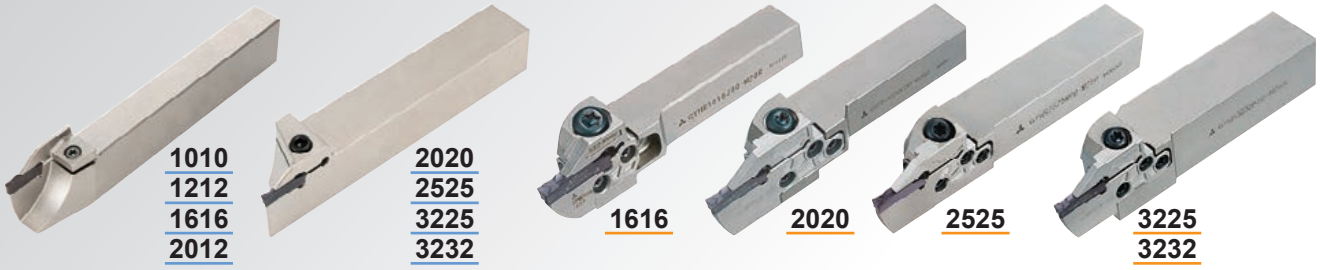
Name of Tool Holder	Insert Shape	Features	Min. Cutting Diameter (mm)	Groove Width (mm)	Max. Groove Depth (mm)
MICRO-MINI TWIN Boring Bars  F140	–	● Solid carbide type. ● Economical due to single tool with two cutting edges.	3.0	1.0 I 2.0	1.0 I 2.0
MICRO-MINI Boring Bars  F139	–	● Solid carbide type. ● Insert can be ground to suit the application.	3.2	2.0 I 3.0	1.0 I 2.0
GY Series  F086		**Modular blade type** ● Clamp-on type. ● The modular blade allows for high rigidity and accuracy. (Tri-Lock System) ● Various insert types. **Mono block type** ● Clamp-on type. Info	25	2 I 6.35	4 I 13
FSL5  F144		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth : 3mm.	10	1.2 I 4.0	1.0 I 3.0
DPT4  F146		● Pin lock type. ● Precision class insert. ● Exchangable head type.	40	1.25 I 4.5	1.2 I 4.5

GY SERIES

A wide selection of holders and inserts available for diverse grooving and cutting off applications

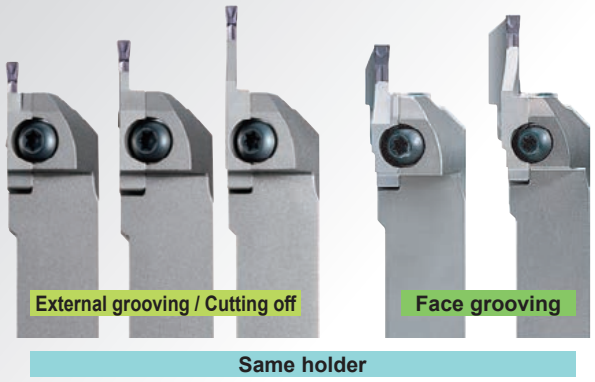
External • Face holders

Corresponding blades to a variety of modular holders with different shank sizes

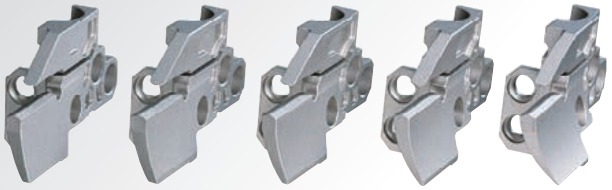


Mono block type | **Modular type**

A wide selection of holders and inserts available for diverse grooving and cutting off applications



Applicable for various diameters of face grooves by the wide array of modular blades with different grooving diameters

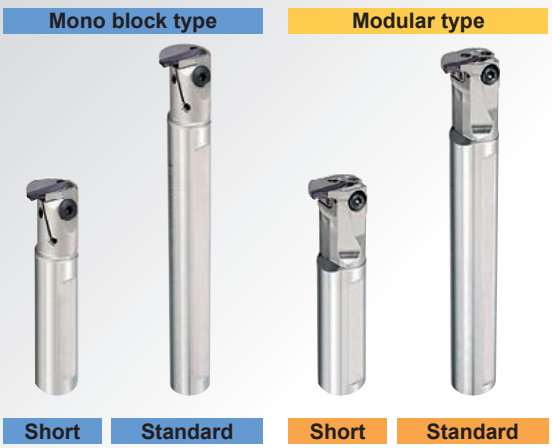


Internal holders

A wide range of holders available from minimum diameter of ø25mm



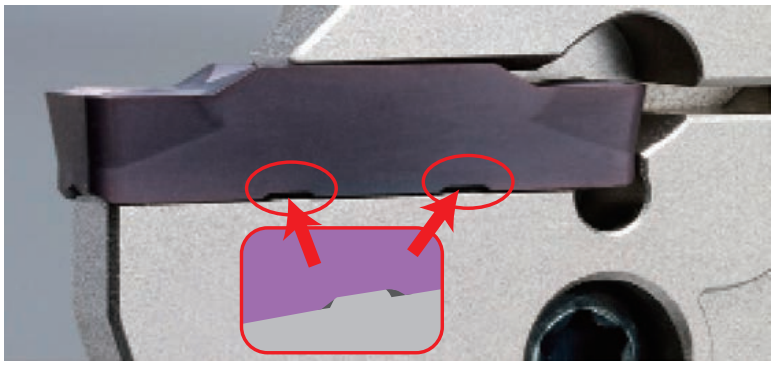
Short shank types are standard stocked



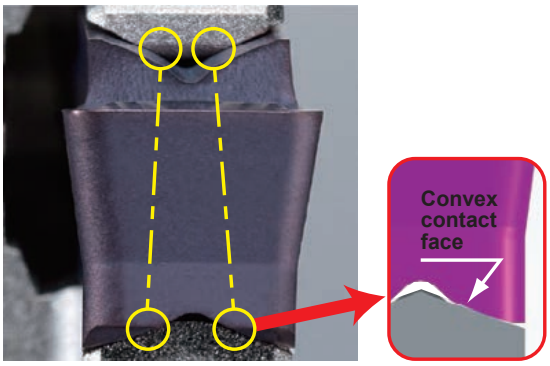
Original insert design leading the way to new grooving and cutting off applications

Highly reliable insert clamping

Safety keys prevent insert movement.



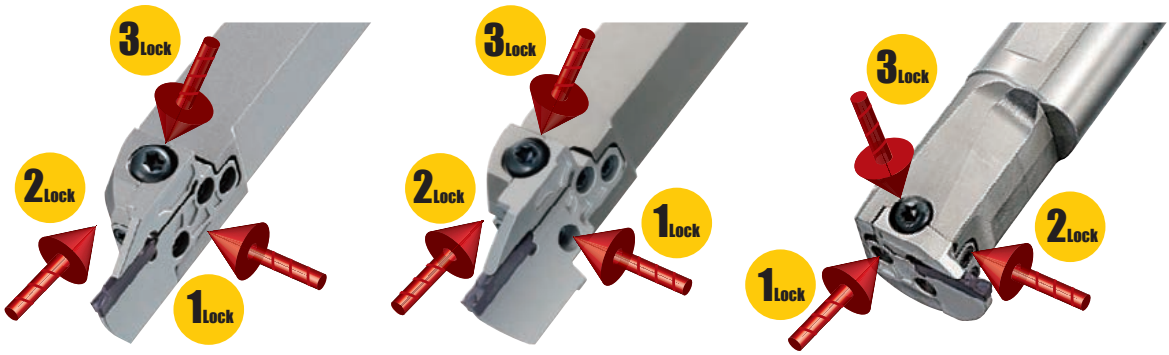
The convex geometry ensures high precision clamping.



New TRI-LOCK System for increased stability and performance!

TRI-LOCK System

The TRI-LOCK system ensures the blade is securely fixed in 3 directions (side, front and top), giving high rigidity for stable grooving and cutting off performance.



INSERT

A WIDE SELECTION OF INSERTS

Breaker system

Grooving



GU Breaker (For Gummy Steel)	GS Breaker (Low feeds)	GM Breaker (Medium feeds)	GFGS (For hardened steel)	GL Breaker (Aluminium Alloys)

For Multifunctional Grooving / Copying/For recessing



MF Breaker (G class)	MS Breaker (Low feeds)	MM Breaker (Medium feeds)	BM Breaker

Cutting Off

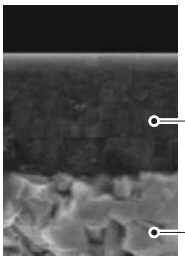


GU Breaker (For Gummy Steel)	GS Breaker (Low feeds)	GM Breaker (Medium feeds)	R/L05-GM Breaker (Medium feeds)	GL Breaker (Aluminium Alloys)

INSERT GRADE

Machining Condition \ Workpiece Material	P Steel	M Stainless Steel	K Cast Iron	N Aluminium Alloy	S Heat Resistant Alloy / Titanium Alloy	H Hardened Steel
Stable ↑ Machining Condition ↓ Unstable	NX2525 MY5015 VP10RT VP20RT	VP10RT VP20RT	MY5015 VP10RT VP20RT	RT9010	NEW MP9015 / RT9010 NEW MP9025	BC8110

MP9000 Series

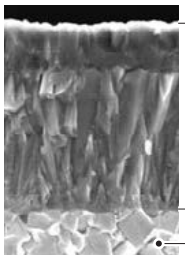


- The high Al-rich (Al, Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

High Al-rich (Al, Ti)N Single Layer Coating

Special Cemented Carbide Substrate

MY5015

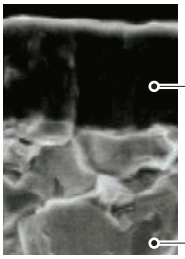


- MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast irons. Also suitable for high-speed continuous cutting of steels.

CVD Coated Carbide

Tough cemented carbide substrate

VP20RT



- PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MIRACLE Coating

Tough cemented carbide substrate (90.5HRA)

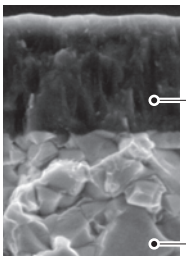
RT9010

- RT9010 is an uncoated cemented carbide grade. Suitable for processing non-ferrous metals.

NX2525

- NX2525, a cermet grade for finish machining of steels and for good surface finishes at lower cutting speeds.

VP10RT



- PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

MIRACLE Coating

Tough cemented carbide substrate (92.0HRA)

BC8110

- A CBN coated grade for continuous cutting, which provides longer life when machining hardened steel.

GL Breaker for Aluminium Alloys

G Class Breaker

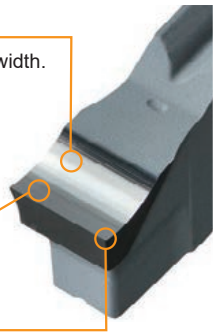
Improved chip control by narrowing the breaker width.

High Rake Angle

Achieves low cutting resistance.

Sharp Edge

Improved welding resistance for aluminium alloys.



MF Breaker (Finishing)

Efficient chip breaking when cross-feed machining.

Chips are controlled when finish machining.

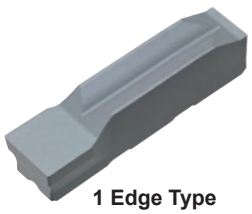


BLANK INSERTS

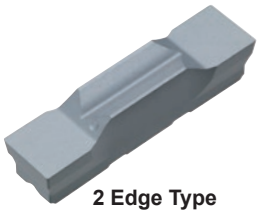
- Blank inserts for custom grinding

RT9010/RT9020 for insert blank

- First recommendation on insert blank is RT9020 due to the tougher carbide substrate and suitable for a wide range of application. RT9010 is a harder substrate than RT9020 and is ideal for long tool life on stable cutting applications. Coating is recommended for application on steel, stainless steel and cast iron materials.



1 Edge Type

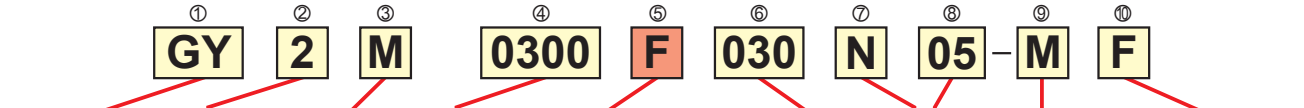


2 Edge Type

*** Insert blank is not suitable for machining without grinding.**

GY SERIES ORDER NUMBER

■INSERT



①Series Description

②Number of Teeth

1	1 Edge Type
2	2 Edge Type

③Peripheral

G	Ground
M	Sintered
B	Blank

④Cutting Width

0150	1.50mm
0200	2.00mm
⋮	⋮
0800	8.00mm

⑤Seat Size *1

C	1.50mm
D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.35mm
K	8.00mm

⑥Corner Radius

010	0.10mm
015	0.15mm
⋮	⋮
400	4.00mm

⑦Hand

N	Neutral
R	Right
L	Left

⑧Lead angle (R/L type insert)

05	5°

⑨Application 1

G	Grooving/Cutting off
M	Multifunctional
B	Copying (Ball shape)

⑩Application 2

U	For Gummy Steel
F	Finishing
S	Low feeds
M	Medium feeds

■CBN INSERT



⑪Application 3

F	Flat Top

⑫Honing Type

GS	General Purpose

*1 Select a seat size with the same symbol as that of modular blade and mono block holder.

■MODULAR BLADE

●EXTERNAL/INTERNAL/FOR RECESSING



①Series Description

②Modular Blade Size

M20
M25

③Hand

R	Right
L	Left

④Modular Blade Type

A	Standard Type
B	Reinforced Type
C	For recessing
D	Face Grooving

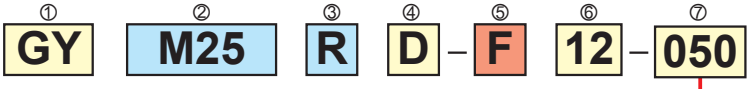
⑤Seat Size *1

D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.35mm

⑥Max. Groove Depth CDX *2

005	0.5mm
06	6mm
⋮	⋮
25	25mm

●FACE GROOVING



⑦Min. Groove Diameter

035	35mm
040	40mm
⋮	⋮
250	250mm

*1 Select a seat size with the same symbol as that of the insert.
*2 The maximum groove depth is a value when used for external grooving and changes according to the insert used. For internal grooving, refer to the maximum groove depth on pages F086—F092.
*3 GYM20R/LA-○10, GYM20R/LA-○12, GYM25R/LA-○12 and GYM25R/LA-○14 can be used for both external and internal grooving.

■ EXTERNAL/FACE GROOVING/FOR RECESSING

● MONO BLOCK HOLDER

①	②	③	④	⑤	⑥		⑦	⑧
GY	P	R	2525	M	00	–	K	25

①Series Description

②Holder Type

S	Mono-Block Holder for Swiss-Type Automatic Lathes
P	With mono block offset
Q	Without mono block offset
H	Modular holder

③Hand of Holder

R	Right
L	Left

④Shank Diameter(H x W)

1010	10x10mm
1212	12x12mm
1616	16x16mm
2012	20x12mm
2020	20x20mm
2525	25x25mm
3225	32x25mm
3232	32x32mm

⑤Holder Length LF

J	110mm
JX	120mm
K	125mm
M	150mm
P	170mm

⑥Angle

00	0°
50	50°
90	90°

⑦Seat Size *1

C	1.50mm
D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.35mm
K	8.00mm

⑧Max. Groove Depth CDX

06	6mm
08	8mm
⋮	⋮
25	25mm

● MODULAR HOLDER

①	②	③	④	⑤	⑥		⑨	⑩
GY	H	R	2525	M	00	–	M25	R

⑨Modular Blade Size

M20
M25

⑩Hand of Modular Blade

R	Right
L	Left

*1 Select a seat size with the same symbol as that of the insert.

■ INTERNAL

● MONO BLOCK HOLDER

①	②	③	④	⑤	⑥	⑦		⑧	⑨
GY	A	R	20	K	90	A	–	F	06

①Series Description

②Holder Type

A	Mono Block
D	Modular holder

③Hand of Holder

R	Right
L	Left

④Shank Diameter DCON

20	20mm
25	25mm
32	32mm
40	40mm
50	50mm

⑤Holder Length LF

K	125mm
L	140mm
M	150mm
P	170mm
Q	180mm
R	200mm
S	250mm
T	300mm

⑥Angle

90	90°

⑦Neck Length

A	30mm
B	40mm
C	50mm
D	60mm
F	80mm

⑧Seat Size *1

D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.24mm

⑨Max. Groove Depth CDX

06	6mm
07	7mm

● MODULAR HOLDER

①	②	③	④	⑤	⑥	⑦		⑩	⑪
GY	D	R	40	M	90	D	–	M25	L

⑩Modular Blade Size

M20
M25

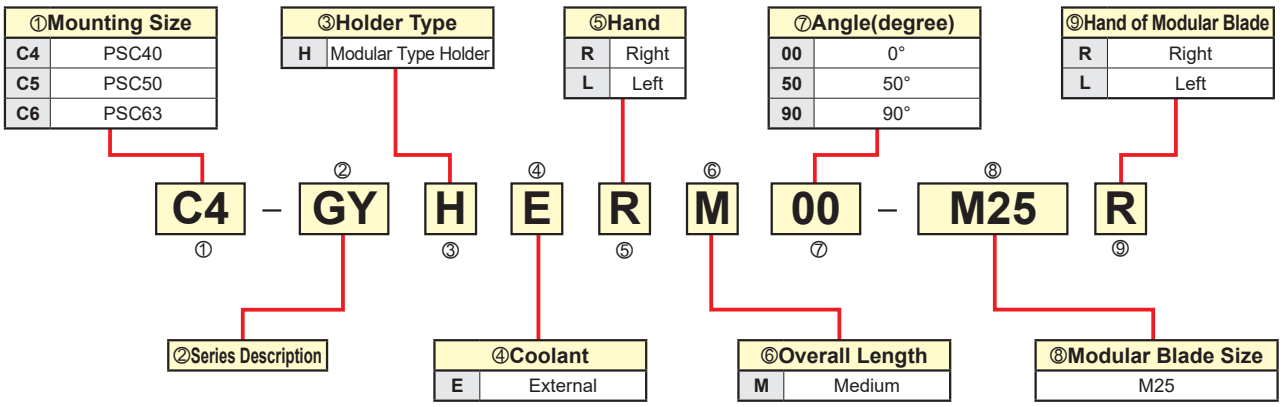
⑪Hand of Modular Blade

R	Right
L	Left

*1 Select a seat size with the same symbol as that of the insert.

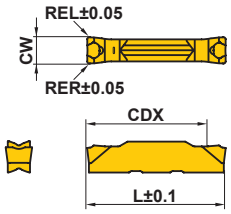
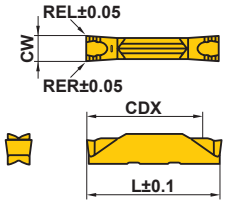
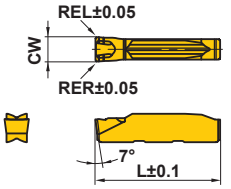
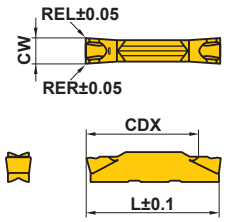
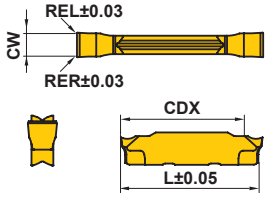
PSC Holder Order Number

■ EXTERNAL/FACE GROOVING/FOR RECESSING



GY SERIES INSERTS

INSERTS

Applications	Geometry	Order Number	Stock: Coated NEW MP9015	Coated NEW MP9025	Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide	Carbide RT9010	Carbide RT9020	Seat Size	Dimensions (mm): CW Cutting Width	CW Tolerance	RER/L	CDX	* L
For Grooving / Cutting Off	**GU Breaker** (For gummy steel) 	GY2M0200D020N-GU			●	●		●				D	2.00	±0.03	0.2	19.7	20.70
		GY2M0239E020N-GU			●	●		●				E	2.39	±0.03	0.2	19.8	20.70
		GY2M0250E020N-GU			●	●		●				E	2.50	±0.03	0.2	19.5	20.70
		GY2M0300F030N-GU			●	●		●				F	3.00	±0.03	0.3	19.3	20.70
		GY2M0318F030N-GU			●	●		●				F	3.18	±0.03	0.3	19.3	20.70
		GY2M0400G030N-GU			●	●		●				G	4.00	±0.04	0.3	24.2	25.65
		GY2M0475H040N-GU			●	●		●				H	4.75	±0.04	0.4	24.2	25.65
		GY2M0500H040N-GU			●	●		●				H	5.00	±0.04	0.4	24.2	25.65
		GY2M0600J040N-GU			●	●		●				J	6.00	±0.04	0.4	24.2	25.65
		GY2M0635J040N-GU			●	●		●				J	6.35	±0.04	0.4	24.2	25.65
	GS Breaker (Low feeds) 	GY2M0150C010N-GS			●	●		●				C	1.50	±0.03	0.1	13.4	14.70
		GY2M0200D020N-GS			●	●		●				D	2.00	±0.03	0.2	18.7	20.70
		GY2M0239E020N-GS			●	●		●				E	2.39	±0.03	0.2	18.5	20.70
		GY2M0250E020N-GS			●	●		●				E	2.50	±0.03	0.2	18.5	20.70
		GY2M0300F020N-GS			●	●		●				F	3.00	±0.03	0.2	18.5	20.70
		GY2M0318F020N-GS			●	●		●				F	3.18	±0.03	0.2	18.5	20.70
		GY2M0400G020N-GS			●	●		●				G	4.00	±0.04	0.2	23.9	25.65
		GY2M0475H030N-GS			●	●		●				H	4.75	±0.04	0.3	23.9	25.65
		GY2M0500H030N-GS			●	●		●				H	5.00	±0.04	0.3	24.0	25.65
		GY2M0600J030N-GS			●	●		●				J	6.00	±0.04	0.3	24.1	25.65
		GY2M0635J030N-GS			●	●		●				J	6.35	±0.04	0.3	24.1	25.65
		GY2M0800K030N-GS			●	●						K	8.00	±0.04	0.3	29.1	30.50
	GM Breaker (Medium feeds) 	GY1M0200D020N-GM	●	●	●	●	●					D	2.00	±0.03	0.2	—	20.70
		GY1M0250E020N-GM	●	●	●	●	●					E	2.50	±0.03	0.2	—	20.70
		GY1M0300F030N-GM	●	●	●	●	●					F	3.00	±0.03	0.3	—	20.70
		GY1M0400G030N-GM	●	●	●	●	●					G	4.00	±0.04	0.3	—	25.65
		GY1M0500H040N-GM	●	●	●	●	●					H	5.00	±0.04	0.4	—	25.65
	GM Breaker (Medium feeds) 	GY2M0150C020N-GM	●	●	●	●		●				C	1.50	±0.03	0.2	13.9	14.70
		GY2M0200D020N-GM	●	●	●	●	●	●				D	2.00	±0.03	0.2	19.4	20.70
		GY2M0239E020N-GM	●	●	●	●	●	●				E	2.39	±0.03	0.2	19.4	20.70
		GY2M0250E020N-GM	●	●	●	●	●	●				E	2.50	±0.03	0.2	19.4	20.70
		GY2M0300F030N-GM	●	●	●	●	●	●				F	3.00	±0.03	0.3	19.4	20.70
		GY2M0318F030N-GM	●	●	●	●	●	●				F	3.18	±0.03	0.3	19.4	20.70
		GY2M0400G030N-GM	●	●	●	●	●	●				G	4.00	±0.04	0.3	24.4	25.65
		GY2M0475H040N-GM	●	●	●	●	●	●				H	4.75	±0.04	0.4	24.3	25.65
		GY2M0500H040N-GM	●	●	●	●	●	●				H	5.00	±0.04	0.4	24.3	25.65
		GY2M0600J040N-GM	●	●	●	●	●	●				J	6.00	±0.04	0.4	24.3	25.65
		GY2M0635J040N-GM	●	●	●	●	●	●				J	6.35	±0.04	0.4	24.3	25.65
		GY2M0800K050N-GM	●	●	●	●	●					K	8.00	±0.04	0.5	29.3	30.50
	GL Breaker (For Aluminium Alloys) NEW 	GY2G0200D005N-GL								●		D	2.00	±0.02	0.05	19.5	21.05
		GY2G0250E005N-GL								●		E	2.50	±0.02	0.05	19.1	21.05
		GY2G0300F005N-GL								●		F	3.00	±0.02	0.05	18.9	21.05

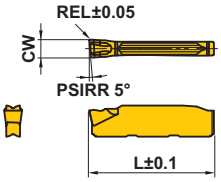
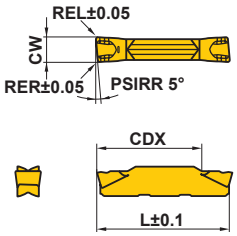
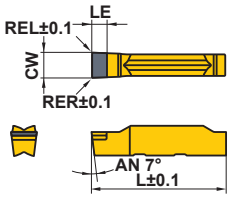
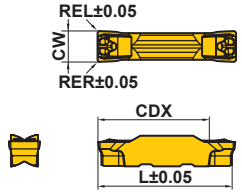
* The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

● = NEW

● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

GY SERIES INSERTS

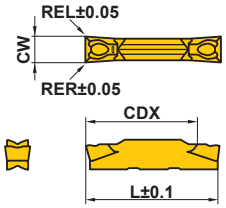
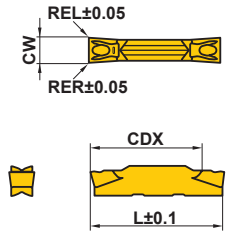
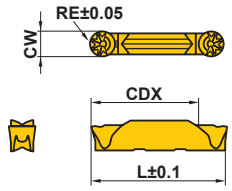
INSERTS

Applications	Geometry	Order Number	Stock: Coated NEW MP9015	Coated NEW MP9025	Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	CBN BC8110	Seat Size	Dimensions (mm): CW Cutting Width	CW Tolerance	RER/L	CDX	*2 L	LE
For Cutting Off	**R/L05-GM Breaker**  Right hand insert shown.	GY1M0200D020R05-GM			●	●						D	2.00	±0.03	0.2	—	20.80	—
		GY1M0200D020L05-GM			●	●						D	2.00	±0.03	0.2	—	20.80	—
		GY1M0300F030R05-GM			●	●						F	3.00	±0.03	0.3	—	20.85	—
		GY1M0300F030L05-GM			●	●						F	3.00	±0.03	0.3	—	20.85	—
	R/L05-GM Breaker  Right hand insert shown.	GY2M0200D020R05-GM			●	●						D	2.00	±0.03	0.2	19.5	20.80	—
		GY2M0200D020L05-GM			●	●						D	2.00	±0.03	0.2	19.5	20.80	—
		GY2M0250E020R05-GM			●	●						E	2.50	±0.03	0.2	19.5	20.825	—
		GY2M0250E020L05-GM			●	●						E	2.50	±0.03	0.2	19.5	20.825	—
		GY2M0300F030R05-GM			●	●						F	3.00	±0.03	0.3	19.5	20.85	—
		GY2M0300F030L05-GM			●	●						F	3.00	±0.03	0.3	19.5	20.85	—
		GY2M0400G030R05-GM			●	●						G	4.00	±0.04	0.3	24.5	25.85	—
		GY2M0400G030L05-GM			●	●						G	4.00	±0.04	0.3	24.5	25.85	—
		GY2M0500H040R05-GM			●	●						H	5.00	±0.04	0.4	24.5	25.95	—
		GY2M0500H040L05-GM			●	●						H	5.00	±0.04	0.4	24.5	25.95	—
For Grooving	**Flat Top** (For hardened steel) 	GY1G0200D020N-GFGS									▲	D	2.00	±0.03	0.2	—	20.70	2.7
		GY1G0239E020N-GFGS									▲	E	2.39	±0.03	0.2	—	20.70	2.7
		GY1G0250E020N-GFGS									▲	E	2.50	±0.03	0.2	—	20.70	2.7
		GY1G0300F020N-GFGS									▲	F	3.00	±0.03	0.2	—	20.70	2.7
		GY1G0318F020N-GFGS									▲	F	3.18	±0.03	0.2	—	20.70	2.7
		GY1G0400G020N-GFGS									▲	G	4.00	±0.03	0.2	—	25.65	2.7
		GY1G0475H020N-GFGS									▲	H	4.75	±0.03	0.2	—	25.65	2.7
		GY1G0500H020N-GFGS									▲	H	5.00	±0.03	0.2	—	25.65	2.7
		GY1G0600J020N-GFGS									▲	J	6.00	±0.03	0.2	—	25.65	2.7
For Multifunctional Grooving	**MF Breaker** (Finishing) 	GY2G0200D020N-MF			●	●		●	●			D	2.00	±0.02	0.2	19.5	21.05	—
		*1 GY2G0224D015N-MF			●	●		●	●			D	2.24	±0.02	0.15	19.8	21.05	—
		GY2G0239E020N-MF			●	●		●	●			E	2.39	±0.02	0.2	19.2	21.05	—
		GY2G0250E020N-MF			●	●		●	●			E	2.50	±0.02	0.2	19.4	21.05	—
		*1 GY2G0274E020N-MF			●	●		●	●			E	2.74	±0.02	0.2	19.7	21.05	—
		GY2G0300F020N-MF			●	●		●	●			F	3.00	±0.02	0.2	19.5	21.05	—
		GY2G0300F040N-MF			●	●		●	●			F	3.00	±0.02	0.4	19.3	21.05	—
		GY2G0318F020N-MF			●	●		●	●			F	3.18	±0.02	0.2	19.5	21.05	—
		GY2G0318F040N-MF			●	●		●	●			F	3.18	±0.02	0.4	19.3	21.05	—
		*1 GY2G0324F020N-MF			●	●		●	●			F	3.24	±0.02	0.2	19.5	21.05	—
		GY2G0400G020N-MF			●	●		●	●			G	4.00	±0.02	0.2	24.9	25.95	—
		GY2G0400G040N-MF			●	●		●	●			G	4.00	±0.02	0.4	24.7	25.95	—
		GY2G0400G080N-MF			●	●		●	●			G	4.00	±0.02	0.8	24.3	25.95	—
		*1 GY2G0424G020N-MF			●	●		●	●			G	4.24	±0.02	0.2	24.9	25.95	—
		GY2G0475H020N-MF			●	●		●	●			H	4.75	±0.02	0.2	24.4	25.95	—
		GY2G0475H040N-MF			●	●		●	●			H	4.75	±0.02	0.4	24.2	25.95	—
		GY2G0475H080N-MF			●	●		●	●			H	4.75	±0.02	0.8	23.8	25.95	—
		GY2G0500H020N-MF			●	●		●	●			H	5.00	±0.02	0.2	24.4	25.95	—
		GY2G0500H040N-MF			●	●		●	●			H	5.00	±0.02	0.4	24.2	25.95	—
		GY2G0500H080N-MF			●	●		●	●			H	5.00	±0.02	0.8	23.8	25.95	—
		*1 GY2G0524H020N-MF			●	●		●	●			H	5.24	±0.02	0.2	24.4	25.95	—
		GY2G0600J020N-MF			●	●		●	●			J	6.00	±0.02	0.2	24.4	25.95	—
		GY2G0600J040N-MF			●	●		●	●			J	6.00	±0.02	0.4	24.2	25.95	—
		GY2G0600J080N-MF			●	●		●	●			J	6.00	±0.02	0.8	23.8	25.95	—
		*1 GY2G0631J020N-MF			●	●		●	●			J	6.31	±0.02	0.2	24.4	25.95	—
		GY2G0635J020N-MF			●	●		●	●			J	6.35	±0.02	0.2	24.4	25.95	—
		GY2G0635J040N-MF			●	●		●	●			J	6.35	±0.02	0.4	24.2	25.95	—
		GY2G0635J080N-MF			●	●		●	●			J	6.35	±0.02	0.8	23.8	25.95	—

*1 Circlip corresponding width of cut

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 inserts per case.) (Contains one CBN insert per case.)

Applications	Geometry	Order Number	Stock									Seat Size	Dimensions (mm)				
			Coated					Cermet		Carbide			CW		RE RER/L	CDX	*2 L
			NEW MP9015	NEW MP9025	VP10RT	VP20RT	MY5015	NX2525		RT9010	RT9020		Cutting Width	Tolerance			
For Multifunctional Grooving	**MS Breaker** (Low feeds) 	**GY2M0200D020N-MS**			●	●	●	●				**D**	2.00	±0.03	0.2	19.1	20.70
		GY2M0250E020N-MS			●	●	●	●				**E**	2.50	±0.03	0.2	19.1	20.70
		GY2M0300F020N-MS			●	●	●	●				**F**	3.00	±0.03	0.2	19.2	20.70
		GY2M0300F040N-MS			●	●	●	●				**F**	3.00	±0.03	0.4	18.9	20.70
		GY2M0400G020N-MS			●	●	●	●				**G**	4.00	±0.04	0.2	24.2	25.65
		GY2M0400G040N-MS			●	●	●	●				**G**	4.00	±0.04	0.4	23.9	25.65
		GY2M0500H040N-MS			●	●	●	●				**H**	5.00	±0.04	0.4	23.9	25.65
		GY2M0500H080N-MS			●	●	●	●				**H**	5.00	±0.04	0.8	23.5	25.65
		GY2M0600J040N-MS			●	●	●	●				**J**	6.00	±0.04	0.4	23.9	25.65
		GY2M0600J080N-MS			●	●	●	●				**J**	6.00	±0.04	0.8	23.5	25.65
		GY2M0800K080N-MS			●	●	●					**K**	8.00	±0.04	0.8	28.5	30.50
	MM Breaker (Medium feeds) 	**GY2M0200D020N-MM**	●	●	●	●	●	●				**D**	2.00	±0.03	0.2	19.1	20.70
		GY2M0250E020N-MM	●	●	●	●	●	●				**E**	2.50	±0.03	0.2	19.1	20.70
		GY2M0300F020N-MM	●	●	●	●	●	●				**F**	3.00	±0.03	0.2	19.1	20.70
		GY2M0300F040N-MM	●	●	●	●	●	●				**F**	3.00	±0.03	0.4	18.9	20.70
		GY2M0300F080N-MM	●	●	●	●	●	●				**F**	3.00	±0.03	0.8	18.5	20.70
		GY2M0400G020N-MM	●	●	●	●	●	●				**G**	4.00	±0.04	0.2	24.1	25.65
		GY2M0400G040N-MM	●	●	●	●	●	●				**G**	4.00	±0.04	0.4	23.9	25.65
		GY2M0400G080N-MM	●	●	●	●	●	●				**G**	4.00	±0.04	0.8	23.5	25.65
		GY2M0500H040N-MM	●	●	●	●	●	●				**H**	5.00	±0.04	0.4	23.9	25.65
		GY2M0500H080N-MM	●	●	●	●	●	●				**H**	5.00	±0.04	0.8	23.5	25.65
		GY2M0600J040N-MM	●	●	●	●	●	●				**J**	6.00	±0.04	0.4	23.9	25.65
		GY2M0600J080N-MM	●	●	●	●	●	●				**J**	6.00	±0.04	0.8	23.5	25.65
		GY2M0800K080N-MM	●	●	●	●	●					**K**	8.00	±0.04	0.8	28.5	30.50
		GY2M0800K120N-MM	●	●	●	●	●					**K**	8.00	±0.04	1.2	28.1	30.50
For Copying / For Recessing	**BM Breaker** 	**GY2M0200D100N-BM**	●	●	●	●	●	●				**D**	2.00	±0.03	1.00	19.5	20.90
		GY2M0250E125N-BM	●	●	●	●	●	●				**E**	2.50	±0.03	1.25	19.3	20.90
		GY2M0300F150N-BM	●	●	●	●	●	●				**F**	3.00	±0.03	1.50	19.0	20.90
		GY2M0318F159N-BM	●	●	●	●	●	●				**F**	3.18	±0.03	1.59	18.9	20.90
		GY2M0400G200N-BM	●	●	●	●	●	●				**G**	4.00	±0.04	2.00	23.4	25.80
		GY2M0475H238N-BM	●	●	●	●	●	●				**H**	4.75	±0.04	2.38	22.9	25.80
		GY2M0500H250N-BM	●	●	●	●	●	●				**H**	5.00	±0.04	2.50	22.8	25.80
		GY2M0600J300N-BM	●	●	●	●	●	●				**J**	6.00	±0.04	3.00	22.5	25.90
		GY2M0635J318N-BM	●	●	●	●	●	●				**J**	6.35	±0.04	3.18	22.3	25.90
		GY2M0800K400N-BM	●	●	●	●	●					**K**	8.00	±0.04	4.00	26.5	30.80

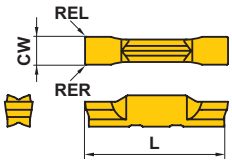
*2 The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

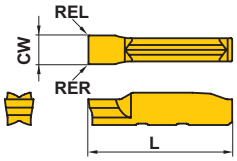
● = NEW

GY SERIES INSERTS

BLANK INSERTS

Geometry	Order Number	Stock				Seat Size	Dimensions (mm)				
		Cermet		Carbide			CW		RER	REL	L
		NX2525		RT9010	RT9020		Groove Width	Tolerance			
2 Edge Type	GY2B0220D020N	●		●	●	D	2.20	±0.10	0.2	0.2	21.05
	NEW GY2B0250D020N	●		●	●	D	2.55	±0.10	0.2	0.2	21.28
	GY2B0270E020N	●		●	●	E	2.70	±0.10	0.2	0.2	21.05
	NEW GY2B0300E020N	●		●	●	E	3.05	±0.10	0.2	0.2	21.28
	GY2B0340F020N	●		●	●	F	3.40	±0.10	0.2	0.2	21.05
	NEW GY2B0360F020N	●		●	●	F	3.65	±0.10	0.2	0.2	21.28
	GY2B0420G020N	●		●	●	G	4.20	±0.10	0.2	0.2	26.00
	NEW GY2B0460G020N	●		●	●	G	4.65	±0.10	0.2	0.2	26.18
	GY2B0520H020N	●		●	●	H	5.20	±0.10	0.2	0.2	26.00
	NEW GY2B0560H020N	●		●	●	H	5.65	±0.10	0.2	0.2	26.18
	GY2B0655J020N	●		●	●	J	6.55	±0.10	0.2	0.2	26.03
	NEW GY2B0680J020N	●		●	●	J	6.85	±0.10	0.2	0.2	26.18
	NEW GY2B0880K020N			●	●	K	8.85	±0.10	0.2	0.2	30.88
1 Edge Type	GY1B0220D020N	●		●	●	D	2.20	±0.10	0.2	0.2	21.07
	GY1B0270E020N	●		●	●	E	2.70	±0.10	0.2	0.2	21.10
	GY1B0340F020N	●		●	●	F	3.40	±0.10	0.2	0.2	21.00
	GY1B0420G020N	●		●	●	G	4.20	±0.10	0.2	0.2	25.86
	GY1B0520H020N	●		●	●	H	5.20	±0.10	0.2	0.2	25.90
	GY1B0655J020N	●		●	●	J	6.55	±0.10	0.2	0.2	25.90





Insert blank is not suitable for machining without grinding.

● = NEW

● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

C-TYPE CIRCLIP STANDARDS LIST

Category	Application		Standard	Width (Tolerance) For shaft				Width (Tolerance) For hole			
C-type stop ring 	For shaft	For hole	ANSI B27.7/27.8 (US) BS 3673 (UK) DIN 471/472 (De) NF E 22 163 (Fr) UNI 7435/7438 (It)	0.5 0.7 0.8 0.9 1.1 1.3 1.6 1.85 2.15 2.65 3.15 4.15 5.15 6.2	+0.14 0 +0.18 0 +0.22 0	0.305 0.457 0.737 0.991 1.168 1.422 1.727 2.184 2.616 3.048 3.531	+0.051 0 +0.076 0 +0.102 0 +0.127 0 +0.152 0	1.15 1.35 1.75 1.95 2.2 2.7 3.2 4.2	+0.14 0 +0.18 0	9 1.1 1.3 1.6 1.85 2.15 2.65 3.15 4.15 5.15 6.2	+0.14 0 +0.18 0 +0.22 0	0.457 0.737 0.991 1.168 1.422 1.727 2.184 2.616 3.048	+0.051 0 +0.076 0 +0.102 0 +0.127 0
C-type concentric stop ring 	For shaft	For hole	JIS B 2804 (JP)										
E-type stop ring 	For shaft		N1*** American	0.32 0.5 0.7 1.0 1.2 1.4	+0.05 0 +0.10 0 +0.14 0	0.305 0.457 0.584 0.737 0.991 1.168 1.422 1.727	+0.051 0 +0.076 0 +0.102 0	0.3 0.4 0.5 0.7 0.9 1.15 1.75 2.2	+0.05 0 +0.10 0 +0.14 0				

O-RING STANDARDS

Category	Standard	Width (Tolerance) General						Width (Tolerance) For oil pressure						Width (Tolerance) For air pressure			
For stable	DIN 3770/3771 (De)	2.54 3.18 4.32 6.1 8.0	+0.13 0	2.5 3.2 4.7 7.5 11.1	+0.14 0	1.9 2.3	+0.1 0	2.3 3.1 3.7 6.4 9.0	+0.2 0	2.3 3.1 3.7 6.4 9.0	+0.2 0	2.2 3.4 4.6 6.9 9.3	+0.25 0
	JIS B 2401 (JP) ISO 3601					2.9	+0.15 0						
For dynamic	SMS 1586/1588 (Se) BS 1806/4518 (UK)	3.2 4.0 7.5 11.0	+0.2 0			3.6 4.5	+0.2 0	2.4 3.6 4.8 7.1 9.5	+0.25 0				
	SAE AS-568 (US)	2.39 3.58 4.78 7.14 9.58	+0.25 0			5.5 7.0	+0.3 0						
						8.6	+0.4 0						
						10.7	+0.5 0						

G-class insert with MF breaker is available for single-step machining.
Conventional GY series insert is available for single-step machining.
Machined in multiple steps or by cross feed machining.

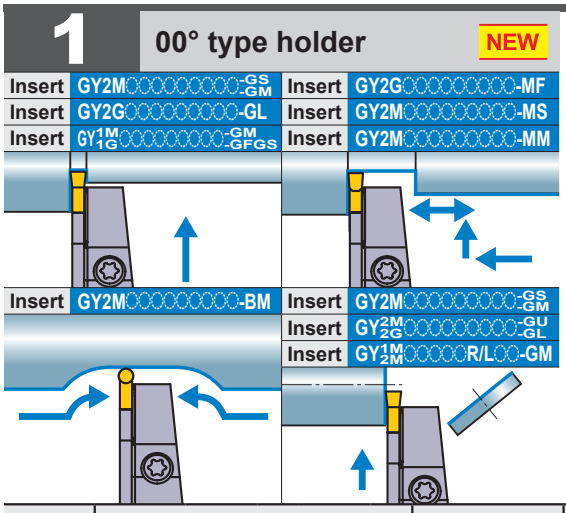
GY SERIES L DIMENSION TOLERANCE CONVERSION TABLE

Cutting Width CW (mm)	*1 Dimensions L (mm)	*2 Dimensional tolerance (mm) versus standard dimension (L) of each breaker							
		GU	GS/GM	MS/MM	R/L-GM	Flat Top	MF	BM	GL
1.50	14.70		0						
2.00	20.70	0	0	0	0.10	0	0.35	0.20	0.35
2.24	*3 (20.7)						0.35		
2.39	20.70	0	0			0	0.35		
2.50	20.70	0	0	0	0.125	0	0.35	0.20	0.35
2.74	*3 (20.7)						0.35		
3.00	20.70	0	0	0	0.15	0	0.35	0.20	0.35
3.18	20.70	0	0			0	0.35	0.20	
3.24	*3 (20.7)						0.35		
4.00	25.65	0	0	0	0.20	0	0.30	0.15	
4.24	*3 (25.65)						0.30		
4.75	25.65	0	0			0	0.30	0.15	
5.00	25.65	0	0	0	0.30	0	0.30	0.15	
5.24	*3 (25.65)						0.30		
6.00	25.65	0	0	0		0	0.30	0.25	
6.31	*3 (25.65)						0.30		
6.35	25.65	0	0				0.30	0.25	
8.00	30.50		0	0				0.30	

*1 This value is used at the described holder dimension.
*2 ■ when there is no applicable breaker.
*3 The standard dimensions shown here use an approximate insert width.

GY SERIES (External for Swiss style lathes)

1 00° type holder NEW



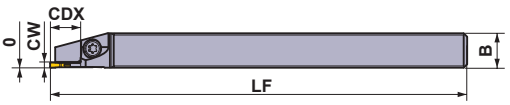


Fig. 1

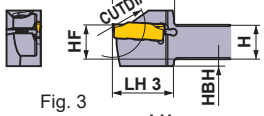


Fig. 2

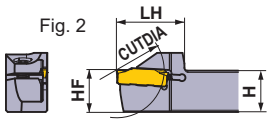
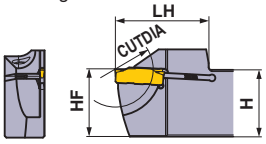


Fig. 3



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX*4	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
C	1.50	8	16	Mono Block	R	GYSR1010JX00-C08	●	1
					L	GYSL1010JX00-C08	●	1
				Mono Block	R	GYSR1212JX00-C08	●	2
					L	GYSL1212JX00-C08	●	2
		12	24	Mono Block	R	GYSR1212JX00-C12	●	1
					L	GYSL1212JX00-C12	●	1
		13	26	Mono Block	R	GYSR1616JX00-C13	●	2
					L	GYSL1616JX00-C13	●	2
				Mono Block	R	GYSR2012JX00-C13	●	3
					L	GYSL2012JX00-C13	●	3
D	2.00 2.24	10	20	Mono Block	R	GYSR1010JX00-D10	●	1
					L	GYSL1010JX00-D10	●	1
		12	24	Mono Block	R	GYSR1212JX00-D12	●	1
					L	GYSL1212JX00-D12	●	1
		13	26	Mono Block	R	GYSR1616JX00-D13	●	2
					L	GYSL1616JX00-D13	●	2
		16	32	Mono Block	R	GYSR1616JX00-D16	●	2
					L	GYSL1616JX00-D16	●	2
		17	34	Mono Block	R	GYSR1915K00-D17	●	3
					L	GYSL1915K00-D17	●	3
				Mono Block	R	GYSR2012JX00-D17	●	3
					L	GYSL2012JX00-D17	●	3
				Mono Block	R	GYSR2020K00-D17	●	2
					L	GYSL2020K00-D17	●	2
				Mono Block	R	GYSR2525M00-D17	●	2
					L	GYSL2525M00-D17	●	2
E	2.39 2.50 2.74	10	20	Mono Block	R	GYSR1010JX00-E10	●	1
					L	GYSL1010JX00-E10	●	1
		12	24	Mono Block	R	GYSR1212JX00-E12	●	1
					L	GYSL1212JX00-E12	●	1
		13	26	Mono Block	R	GYSR1616JX00-E13	●	2
					L	GYSL1616JX00-E13	●	2
		16	32	Mono Block	R	GYSR1616JX00-E16	●	2
					L	GYSL1616JX00-E16	●	2
		17	34	Mono Block	R	GYSR1915K00-E17	●	3
					L	GYSL1915K00-E17	●	3
				Mono Block	R	GYSR2012JX00-E17	●	3
					L	GYSL2012JX00-E17	●	3
				Mono Block	R	GYSR2020K00-E17	●	2
					L	GYSL2020K00-E17	●	2
				Mono Block	R	GYSR2525M00-E17	●	2
					L	GYSL2525M00-E17	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **LH 3** values may vary.

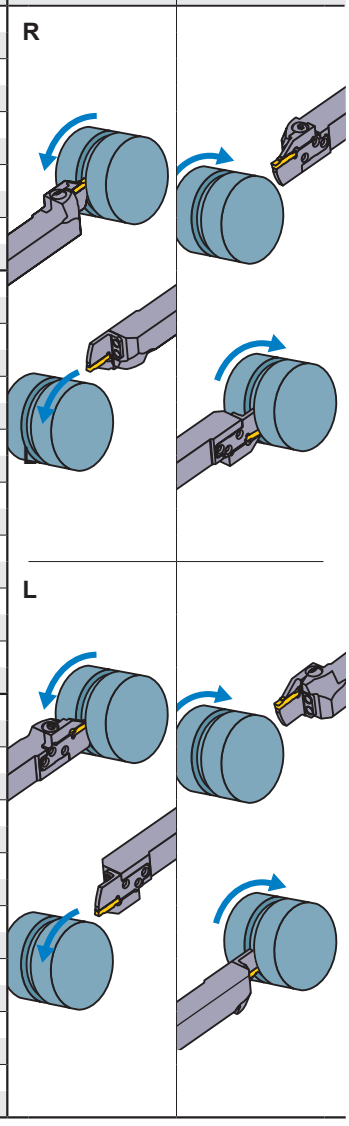
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

● : **Inventory maintained in Japan.**

SPARE PARTS

Holder	 Clamp Screw	 Wrench
GYSR/L1010JX00	CS350990T	TKY10R
GYSR/L1212JX00		
GYSR/L1616JX00	TS4SBL	TKY15R
GYSR/L1915K00		
GYSR/L2012JX00	CS350990T	TKY10R
GYSR/L2020K00	HSC05018	TKY40R
GYSR/L2525K00		

Dimensions (mm) ∗3							Cutting Mode	
H	B	LF	LH	LH 3	HF	HBH	Clockwise	Anticlockwise
10	10	120	17.5	17.5	10	2	R	
10	10	120	17.5	17.5	10	2		
12	12	120	19.5	—	12	—		
12	12	120	19.5	—	12	—		
12	12	120	19.5	19.5	12	2		
12	12	120	19.5	19.5	12	2		
16	16	120	25	—	16	—		
16	16	120	25	—	16	—		
20	12	120	28	—	20	—		
20	12	120	28	—	20	—		
10	10	120	17.5	17.5	10	2		
10	10	120	17.5	17.5	10	2		
12	12	120	19.5	19.5	12	2		
12	12	120	19.5	19.5	12	2		
16	16	120	25	—	16	—		
16	16	120	25	—	16	—		
16	16	120	28	—	16	—		
16	16	120	28	—	16	—		
19.05	15.875	125	28	—	19.05	—		
19.05	15.875	125	28	—	19.05	—		
20	12	120	28	—	20	—		
20	12	120	28	—	20	—		
20	20	125	35	—	20	—		
20	20	125	35	—	20	—		
25	25	150	40	—	25	—		
25	25	150	40	—	25	—		
10	10	120	17.5	17.5	10	2	L	
10	10	120	17.5	17.5	10	2		
12	12	120	19.5	19.5	12	2		
12	12	120	19.5	19.5	12	2		
16	16	120	25	—	16	—		
16	16	120	25	—	16	—		
16	16	120	28	—	16	—		
16	16	120	28	—	16	—		
19.05	15.875	125	28	—	19.05	—		
19.05	15.875	125	28	—	19.05	—		
20	12	120	28	—	20	—		
20	12	120	28	—	20	—		
20	20	125	35	—	20	—		
20	20	125	35	—	20	—		
25	25	150	40	—	25	—		
25	25	150	40	—	25	—		



Insert selection

Seat Size	Geometry name
C	GY○○0150C○○○○–Breaker shown below
D	GY○○0200/0224D○○○○–Breaker shown below
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	With hand	Neutral
C	1.50mm		●	●			
D	2.00mm	●	●	●	●	●	●
E	2.39mm	●	●	●			●
	2.50mm	●	●	●	●	●	●

For multifunctional grooving breaker➢ F012, F013

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
C	1.50mm				
D	2.00mm	●	●	●	●
	2.24mm	●			
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

● : Standard insert with dimensions

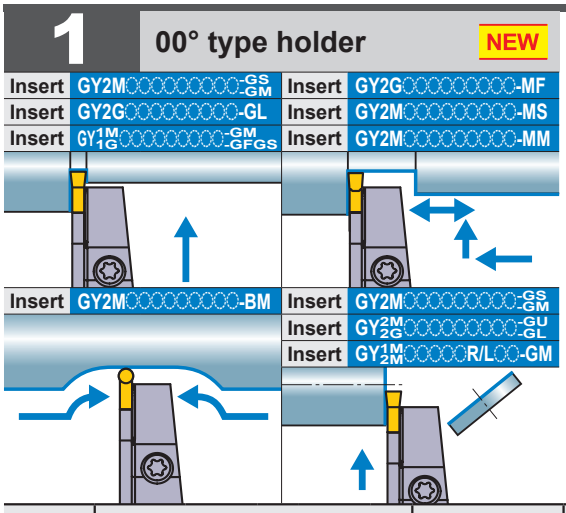
F

GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (External for Swiss style lathes)

1 00° type holder NEW



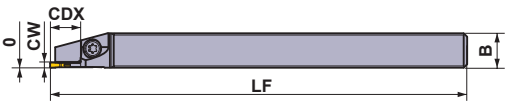


Fig. 1

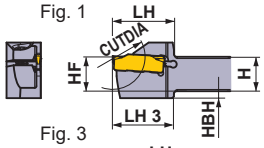


Fig. 2

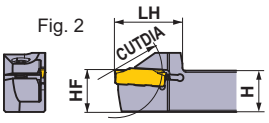
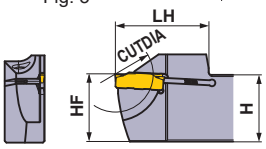


Fig. 3



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number		Fig.
	CW	CDX*4	CUTDIA			Holder	Stock	
F	3.00 3.18 3.24	12	24	Mono Block	R	**GYSR1212JX00-F12**	●	1
					L	**GYSL1212JX00-F12**	●	1
		13	26	Mono Block	R	**GYSR1616JX00-F13**	●	2
					L	**GYSL1616JX00-F13**	●	2
		16	32	Mono Block	R	**GYSR1616JX00-F16**	●	2
					L	**GYSL1616JX00-F16**	●	2
		17	34	Mono Block	R	**GYSR1915K00-F17**	●	3
					L	**GYSL1915K00-F17**	●	3
				Mono Block	R	**GYSR2012JX00-F17**	●	3
					L	**GYSL2012JX00-F17**	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **LH 3** values may vary.

*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

● : **Inventory maintained in Japan.**

SPARE PARTS

Holder	 Clamp Screw	 Wrench
GYSR/L1010JX00	CS350990T	TKY10R
GYSR/L1212JX00		
GYSR/L1616JX00	TS4SBL	TKY15R
GYSR/L1915K00		
GYSR/L2012JX00	CS350990T	TKY10R
GYSR/L2020K00	HSC05018	TKY40R
GYSR/L2525K00		

Dimensions (mm) ⁎3							Cutting Mode	
H	**B**	**LF**	**LH**	**LH 3**	**HF**	**HBH**	Clockwise	Anticlockwise
12	12	120	19.5	19.5	12	2	R	
12	12	120	19.5	19.5	12	2		
16	16	120	25	—	16	—		
16	16	120	25	—	16	—		
16	16	120	28	—	16	—		
16	16	120	28	—	16	—		
19.05	15.875	125	28	—	19.05	—		
19.05	15.875	125	28	—	19.05	—		
20	12	120	28	—	20	—		
20	12	120	28	—	20	—		
							L	

Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	GL (Aluminium) Neutral	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
F	3.00mm	●	●	●	●	●	●
	3.18mm	●	●	●			●

For multifunctional grooving breaker➢ F012, F013

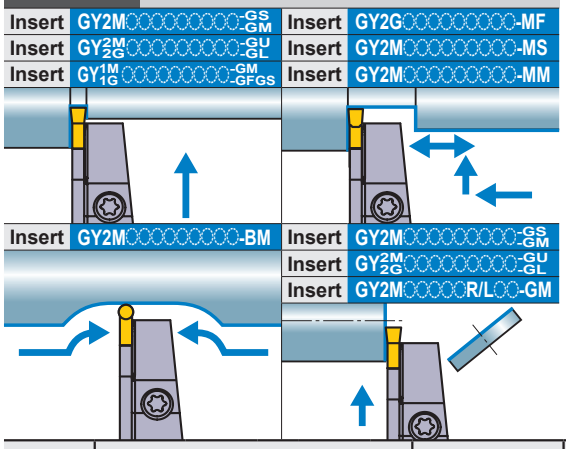
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

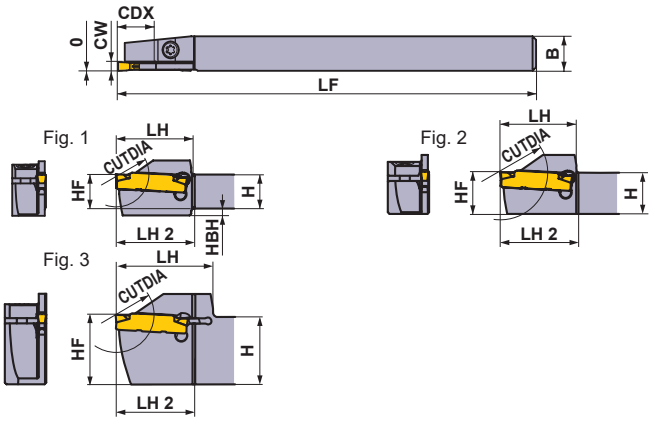
● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (External for Swiss style lathes)

1 00° type holder





Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number		Fig.
	CW	CDX*4	CUTDIA			Holder	Stock	
C	1.50	11	22	Mono Block	R	GYSR1010JX00-C11	▲	1
					L	GYSL1010JX00-C11	▲	1
		13	26	Mono Block	R	GYSR1212JX00-C13	▲	2
					L	GYSL1212JX00-C13	▲	2
		17*1	34*2	Mono Block	R	GYSR1616JX00-C17	▲	2
					L	GYSL1616JX00-C17	▲	2
		18*1	36*2	Mono Block	R	GYSR2012JX00-C18	▲	3
					L	GYSL2012JX00-C18	▲	3
D	2.00 2.24	11	22	Mono Block	R	GYSR1010JX00-D11	▲	1
					L	GYSL1010JX00-D11	▲	1
		13	26	Mono Block	R	GYSR1212JX00-D13	▲	2
					L	GYSL1212JX00-D13	▲	2
		17	34	Mono Block	R	GYSR1616JX00-D17	▲	2
					L	GYSL1616JX00-D17	▲	2
		18	36	Mono Block	R	GYSR2012JX00-D18	▲	3
					L	GYSL2012JX00-D18	▲	3
E	2.39 2.50 2.74	11	22	Mono Block	R	GYSR1010JX00-E11	▲	1
					L	GYSL1010JX00-E11	▲	1
		13	26	Mono Block	R	GYSR1212JX00-E13	▲	2
					L	GYSL1212JX00-E13	▲	2
		17	34	Mono Block	R	GYSR1616JX00-E17	▲	2
					L	GYSL1616JX00-E17	▲	2
		18	36	Mono Block	R	GYSR2012JX00-E18	▲	3
					L	GYSL2012JX00-E18	▲	3
F	3.00 3.18 3.24	11	22	Mono Block	R	GYSR1010JX00-F11	▲	1
					L	GYSL1010JX00-F11	▲	1
		13	26	Mono Block	R	GYSR1212JX00-F13	▲	2
					L	GYSL1212JX00-F13	▲	2
		17	34	Mono Block	R	GYSR1616JX00-F17	▲	2
					L	GYSL1616JX00-F17	▲	2
		18	36	Mono Block	R	GYSR2012JX00-F18	▲	3
					L	GYSL2012JX00-F18	▲	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.

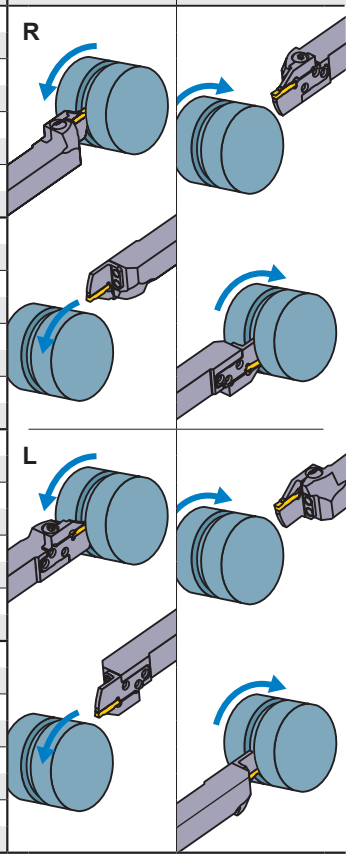
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

▲ : **Inventory maintained in Japan. To be replaced by new products.**

SPARE PARTS

Holder	 Clamp Screw	 Wrench
GYSR/L1010JX00-○11	CS350990T (Clamp Torque : 2.5N·m)	TKY10R
GYSR/L1212JX00-○13		
GYSR/L2012JX00-○18		
GYSR/L1616JX00-○17	TS4SBL (Clamp Torque : 3.5N·m)	TKY15R

Dimensions (mm) ⁎3							Cutting Mode	
H	B	LF	LH	LH 2	HF	HBH	Clockwise	Anticlockwise
10	10	120	22	16	10	2	R	
10	10	120	22	16	10	2		
12	12	120	22	16	12	—		
12	12	120	22	16	12	—		
16	16	120	27	17	16	—		
16	16	120	27	17	16	—		
20	12	120	28	16	20	—		
20	12	120	28	16	20	—		
10	10	120	22	23	10	2		
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		
10	10	120	22	23	10	2	L	
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		
10	10	120	22	23	10	2		
10	10	120	22	23	10	2		
12	12	120	22	23	12	—		
12	12	120	22	23	12	—		
16	16	120	27	24	16	—		
16	16	120	27	24	16	—		
20	12	120	28	23	20	—		
20	12	120	28	23	20	—		



Insert selection

Seat Size	Geometry name
C	GY○○0150C○○○○−Breaker shown below
D	GY○○0200/0224D○○○○−Breaker shown below
E	GY○○0239/0250/0274E○○○○−Breaker shown below
F	GY○○0300/0318/0324F○○○○−Breaker shown below

For grooving/cutting off breaker➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	With hand	Neutral
C	1.50mm		●	●			
D	2.00mm	●	●	●	●	●	●
E	2.39mm	●	●	●			●
	2.50mm	●	●	●	●	●	●
F	3.00mm	●	●	●	●	●	●
	3.18mm	●	●	●			●

For multifunctional grooving breaker➢ F012, F013

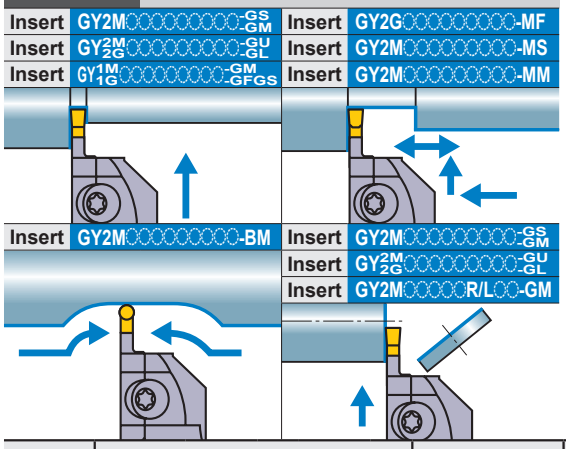
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

● : Standard insert with dimensions

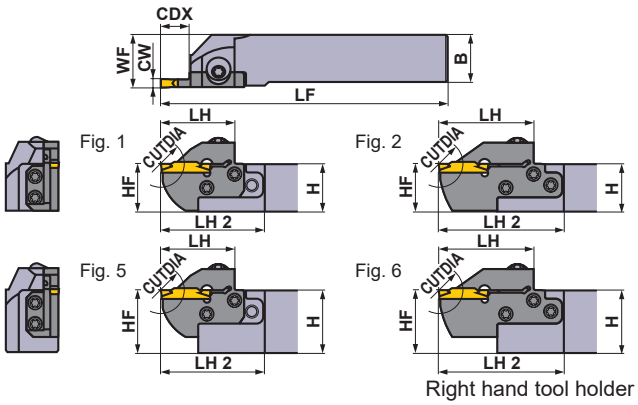
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



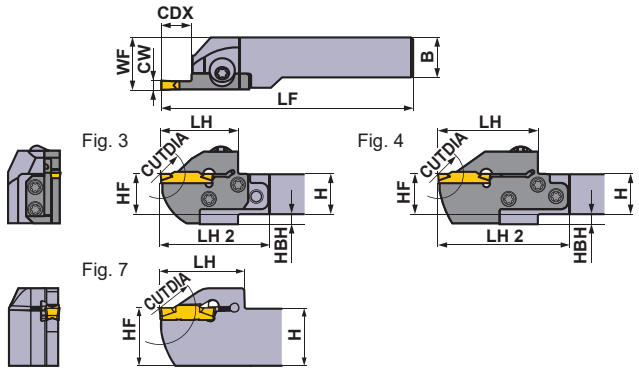
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-D06	●	3
				Mono Block	R	GYQR2020K00-D06	▲	—	—	7
					L	GYQL2020K00-D06	▲	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-D06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-D06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-D06	●	3
				Mono Block	R	GYQR2525M00-D06	▲	—	—	7
					L	GYQL2525M00-D06	▲	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-D06	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D06	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-D06	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D06	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-D06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-D10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-D10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-D10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-D10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-D12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-D12	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D12	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-D12	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D12	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-D12	●	5
		18 ✶4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-D18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-D18	●	4
				Mono Block	R	GYQR2020K00-D18	▲	—	—	7
					L	GYQL2020K00-D18	▲	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-D18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-D18	●	2
		20 ✶1	40 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-D20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-D20	●	4
				Mono Block	R	GYQR2525M00-D20	▲	—	—	7
					L	GYQL2525M00-D20	▲	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-D20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-D20	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-D20	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-D20	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-D20	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-D20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.
✶3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
✶4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.



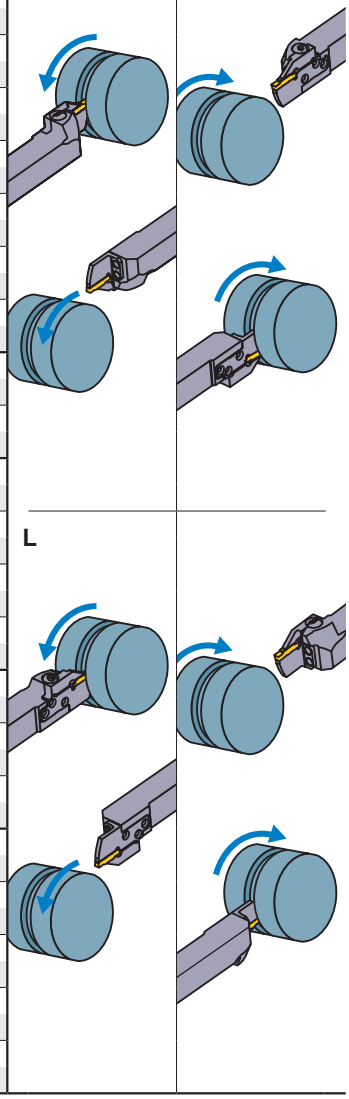
Right hand tool holder shown.

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L○○○○○○○-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	125	36	—	20	20.15	—		
20	20	125	36	—	20	20.15	—		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	150	36	—	25	25.15	—		
25	25	150	36	—	25	25.15	—		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4		
16	16	116	40	56	16	20	4		
20	20	125	39	—	20	20.1	—		
20	20	125	39	—	20	20.1	—		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	150	41	—	25	25.1	—		
25	25	150	41	—	25	25.1	—		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	With hand	With hand	Neutral
D	2.00mm	●	●	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

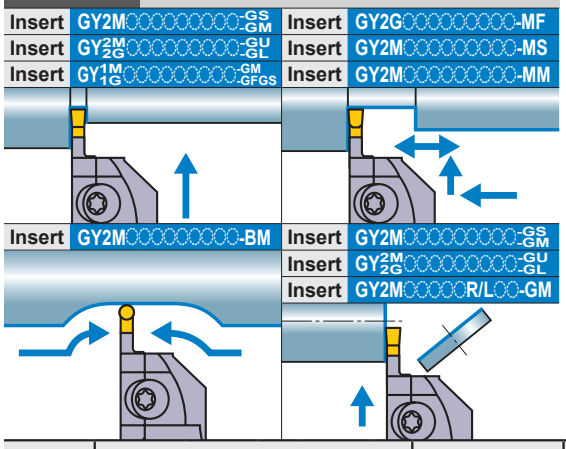
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			

● : Standard insert with dimensions

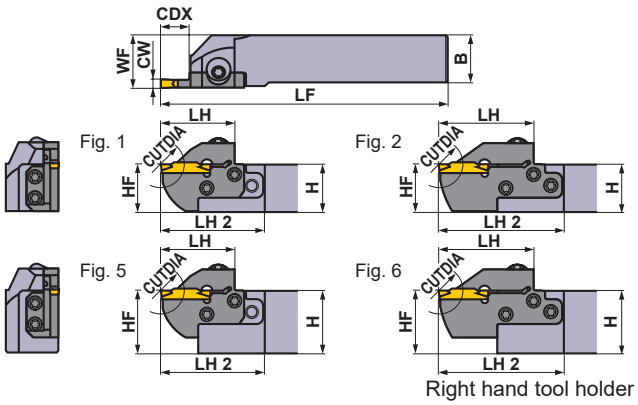
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F100
CAUTION FOR USE ➤ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-E06	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-E06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-E06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-E06	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-E06	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-E06	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-E06	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-E06	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-E06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-E10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-E10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-E12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-E12	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-E12	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-E12	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-E12	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-E12	●	5
		18 ∗4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-E18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-E18	●	4
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-E18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-E18	●	2
		20 ∗1	40 ∗2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-E20	●	4
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-E20	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-E20	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-E20	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-E20	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-E20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.
∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.
∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
∗4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L○○○○○○○-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

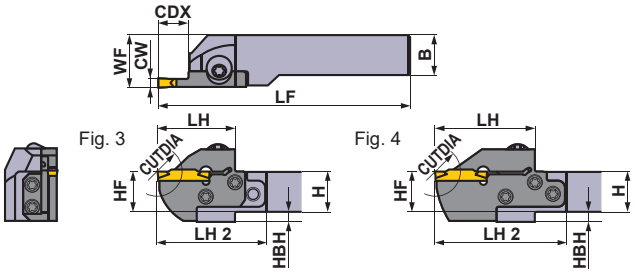


Fig. 3 Fig. 4

Right hand tool holder shown.

Dimensions (mm) ★3							
H	B	LF	LH	LH 2	HF	WF	HBH
16	16	104	28	44	16	20	4
16	16	104	28	44	16	20	4
20	20	119	28	43	20	23	—
20	20	119	28	43	20	23	—
20	20	117	31	52	20	26	5
20	20	117	31	52	20	26	5
25	25	142	31	49	25	28	—
25	25	142	31	49	25	28	—
32	25	162	31	49	32	28	—
32	25	162	31	49	32	28	—
32	32	162	31	49	32	35	—
32	32	162	31	49	32	35	—
16	16	110	34	50	16	20	4
16	16	110	34	50	16	20	4
20	20	125	34	49	20	23	—
20	20	125	34	49	20	23	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
16	16	116	40	56	16	20	4
16	16	116	40	56	16	20	4
20	20	131	40	55	20	23	—
20	20	131	40	55	20	23	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

Clockwise	Anticlockwise
R	
L	

Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	GL (Aluminium) With hand	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
E	2.39mm	●	●	●			●
	2.50mm	●	●	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

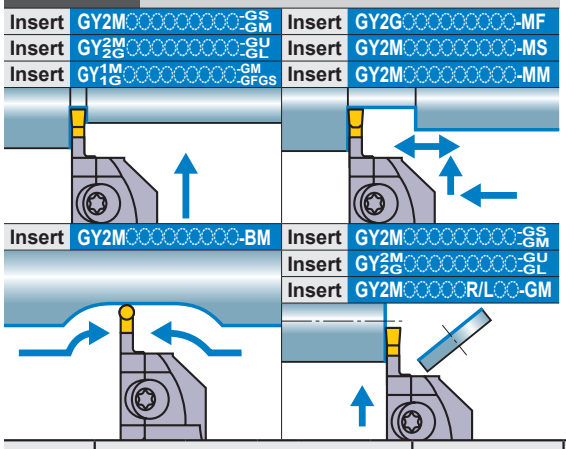
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

● : Standard insert with dimensions

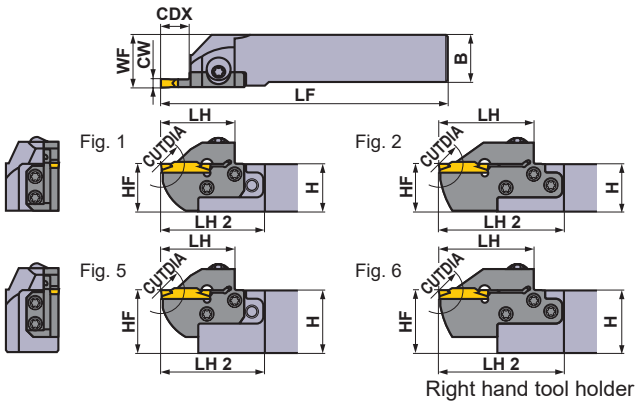
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F100
CAUTION FOR USE ➤ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-F06	●	3
				Mono Block	R	GYQR2020K00-F06	▲	—	—	7
					L	GYQL2020K00-F06	▲	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-F06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-F06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-F06	●	3
				Mono Block	R	GYQR2525M00-F06	▲	—	—	7
					L	GYQL2525M00-F06	▲	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-F06	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-F06	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-F06	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-F06	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-F06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-F10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-F10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-F12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-F12	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-F12	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-F12	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-F12	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-F12	●	5
		18 *4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-F18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-F18	●	4
				Mono Block	R	GYQR2020K00-F18	▲	—	—	7
					L	GYQL2020K00-F18	▲	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-F18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-F18	●	2
		20 *1	40 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-F20	●	4
				Mono Block	R	GYQR2525M00-F20	▲	—	—	7
					L	GYQL2525M00-F20	▲	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-F20	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-F20	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-F20	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-F20	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-F20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

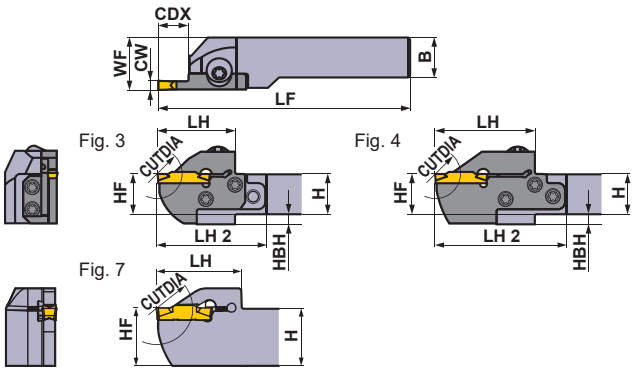
*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.
*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

★ Wrench : ① : Clamp Screw, ② : Blade Screw

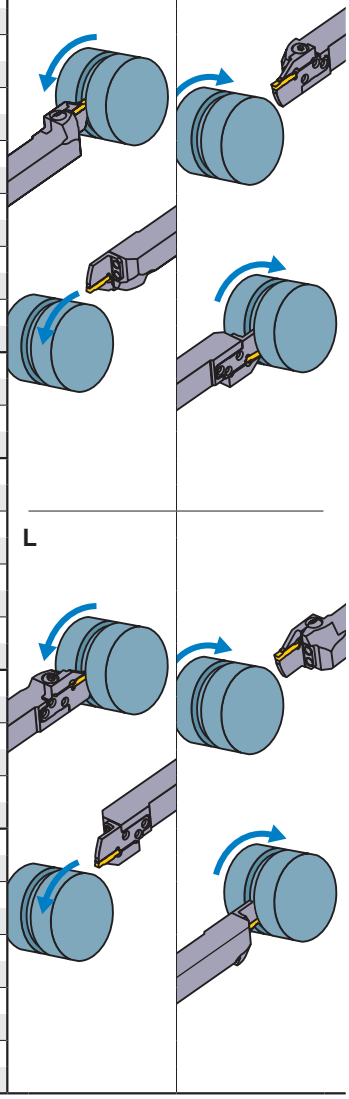
SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L○○○○○○○-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D



Right hand tool holder shown.

	Dimensions (mm) ★3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	16	16	104	28	44	16	20	4	R	
	16	16	104	28	44	16	20	4		
	20	20	125	36	—	20	20.3	—		
	20	20	125	36	—	20	20.3	—		
	20	20	119	28	43	20	23	—		
	20	20	119	28	43	20	23	—		
	20	20	117	31	52	20	26	5		
	20	20	117	31	52	20	26	5		
	25	25	150	36	—	25	25.3	—		
	25	25	150	36	—	25	25.3	—		
	25	25	142	31	49	25	28	—		
	25	25	142	31	49	25	28	—		
	32	25	162	31	49	32	28	—		
	32	25	162	31	49	32	28	—		
	32	32	162	31	49	32	35	—		
	32	32	162	31	49	32	35	—		
	16	16	110	34	50	16	20	4		
	16	16	110	34	50	16	20	4		
	20	20	125	34	49	20	23	—		
	20	20	125	34	49	20	23	—		
	20	20	125	39	60	20	26	5		
	20	20	125	39	60	20	26	5		
	25	25	150	39	57	25	28	—	L	
	25	25	150	39	57	25	28	—		
	32	25	170	39	57	32	28	—		
	32	25	170	39	57	32	28	—		
	32	32	170	39	57	32	35	—		
	32	32	170	39	57	32	35	—		
	16	16	116	40	56	16	20	4		
	16	16	116	40	56	16	20	4		
	20	20	125	39	—	20	20.25	—		
	20	20	125	39	—	20	20.25	—		
	20	20	131	40	55	20	23	—		
	20	20	131	40	55	20	23	—		
	20	20	131	45	66	20	26	5		
	20	20	131	45	66	20	26	5		
	25	25	150	41	—	25	25.25	—		
	25	25	150	41	—	25	25.25	—		
	25	25	156	45	63	25	28	—		
	25	25	156	45	63	25	28	—		
	32	25	176	45	63	32	28	—		
	32	25	176	45	63	32	28	—		
	32	32	176	45	63	32	35	—		
	32	32	176	45	63	32	35	—		



Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	With hand	With hand	Neutral
F	3.00mm	●	●	●	●	●	●
	3.18mm	●	●	●			●

For multifunctional grooving breaker ➤ F012, F013

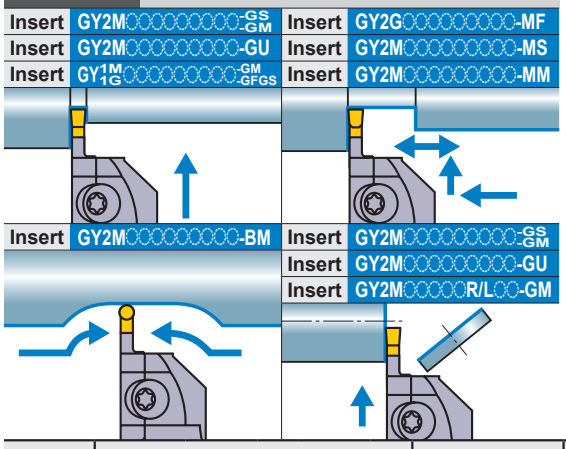
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

● : Standard insert with dimensions

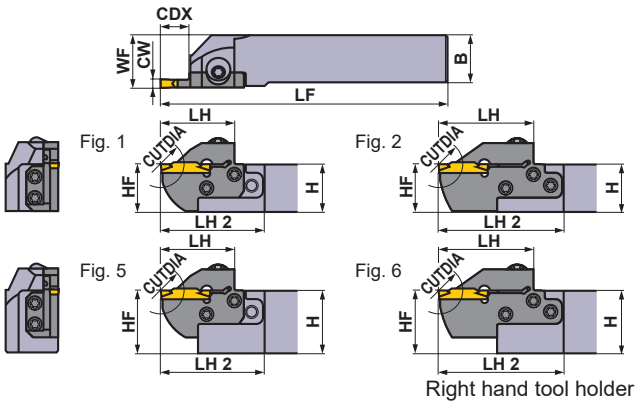
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F100
CAUTION FOR USE ➤ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
G	4.00 4.24	8	16	Mono Block	R	GYQR2020K00-G08	●	—	—	7
					L	GYQL2020K00-G08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G08	●	3
				Mono Block	R	GYQR2525M00-G08	●	—	—	7
					L	GYQL2525M00-G08	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G08	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-G08	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-G08	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-G08	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-G08	●	5
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-G12	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-G12	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-G12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-G12	●	1
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-G14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G14	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-G14	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-G14	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-G14	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-G14	●	5
		25 ∗1	50 ∗2	Mono Block	R	GYQR2020K00-G25	●	—	—	8
					L	GYQL2020K00-G25	●	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-G25	●	4
				Mono Block	R	GYQR2525M00-G25	●	—	—	7
					L	GYQL2525M00-G25	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-G25	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-G25	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-G25	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-G25	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-G25	●	6

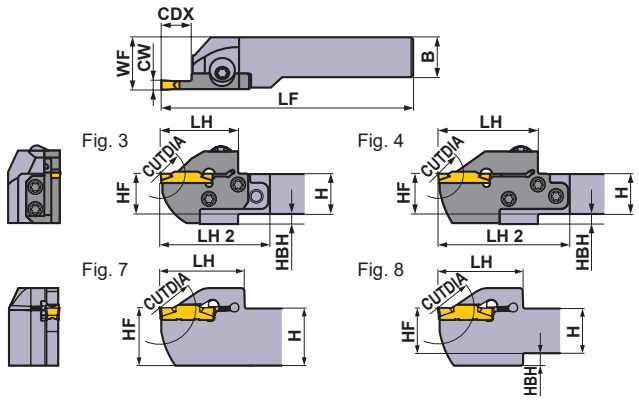
CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L○○○○○○○-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Insert selection

Seat Size	Geometry name
G	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	With hand	Neutral
G	4.00mm	●	●	●	●	●

For multifunctional grooving breaker ➢ F012, F013

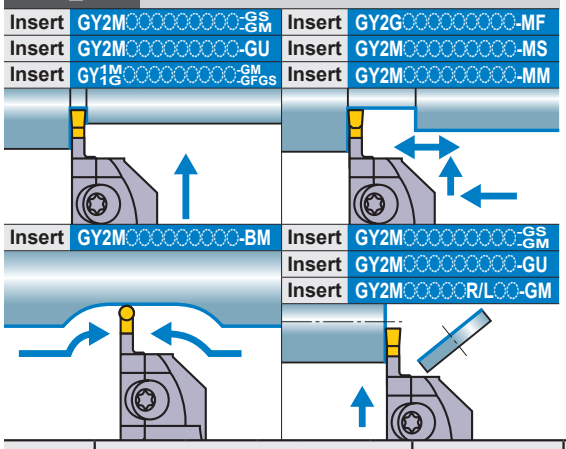
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

● : Standard insert with dimensions

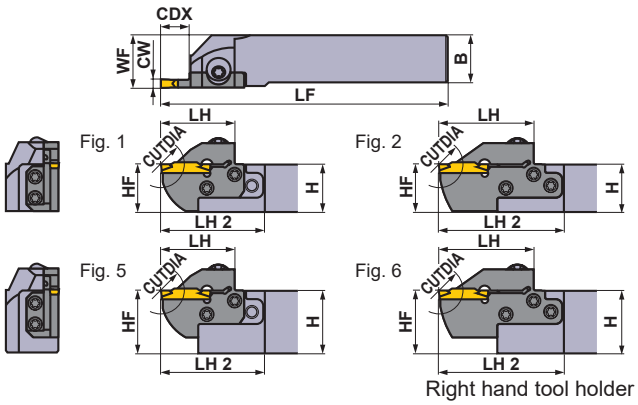
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	8	16	Mono Block	R	GYQR2020K00-H08	●	—	—	7
					L	GYQL2020K00-H08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-H08	●	3
				Mono Block	R	GYQR2525M00-H08	●	—	—	7
					L	GYQL2525M00-H08	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-H08	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-H08	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-H08	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-H08	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-H08	●	5
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-H12	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-H12	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-H12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-H12	●	1
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-H14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-H14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-H14	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-H14	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-H14	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-H14	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-H14	●	5
		25 ∗1	50 ∗2	Mono Block	R	GYQR2020K00-H25	●	—	—	8
					L	GYQL2020K00-H25	●	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-H25	●	4
				Mono Block	R	GYQR2525M00-H25	●	—	—	7
					L	GYQL2525M00-H25	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-H25	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-H25	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-H25	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-H25	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-H25	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

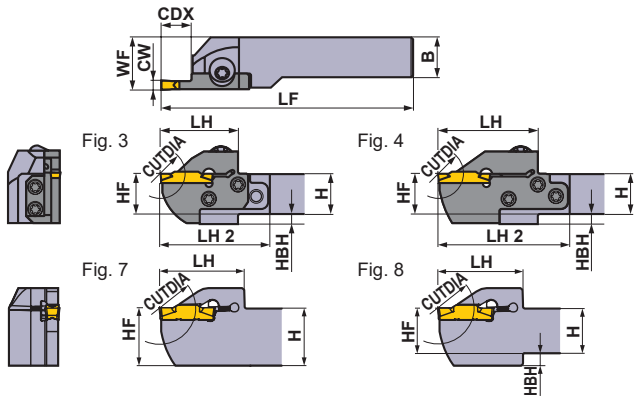
∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L○○○○○○○-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4	L	
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
H	4.75mm	●	●	●		●
	5.00mm	●	●	●	●	●

For multifunctional grooving breaker➢ F012, F013

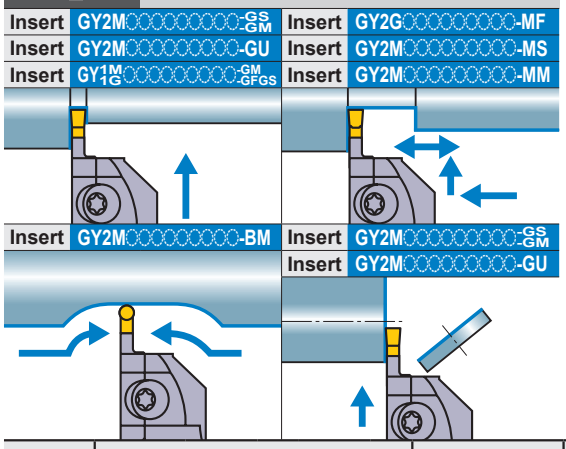
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

● : Standard insert with dimensions

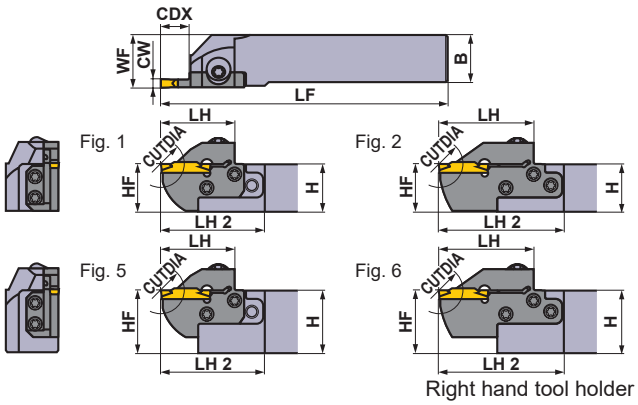
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (EXTERNAL)

1 00° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	8	16	Mono Block	R	GYQR2020K00-J08	●	—	—	7
					L	GYQL2020K00-J08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-J08	●	3
				Mono Block	R	GYQR2525M00-J08	●	—	—	7
					L	GYQL2525M00-J08	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-J08	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-J08	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-J08	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-J08	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-J08	●	5
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-J14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-J14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-J14	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-J14	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-J14	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-J14	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-J14	●	5
		25 ∗1	50 ∗2	Mono Block	R	GYQR2020K00-J25	●	—	—	8
					L	GYQL2020K00-J25	●	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-J25	●	4
				Mono Block	R	GYQR2525M00-J25	●	—	—	7
					L	GYQL2525M00-J25	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-J25	●	2
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-J25	●	6
					L	GYHL3225P00-M25L	●	GYM25LA-J25	●	6
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-J25	●	6
					L	GYHL3232P00-M25L	●	GYM25LA-J25	●	6

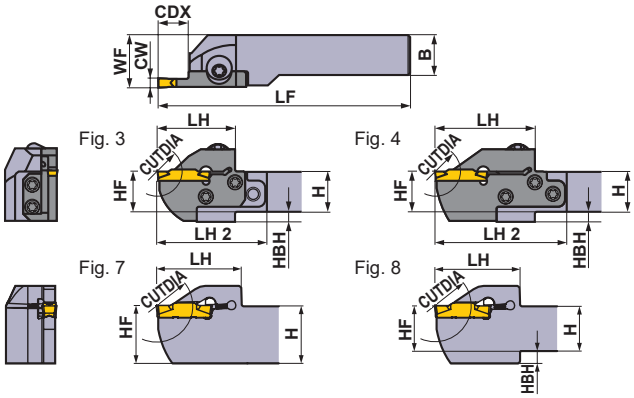
CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYQR/L○○○○○○○○-○○○	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L○○○○○○○○-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4	L	
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
J	6.00mm	●	●	●		●
	6.35mm	●	●	●		

For multifunctional grooving breaker ➢ F012, F013

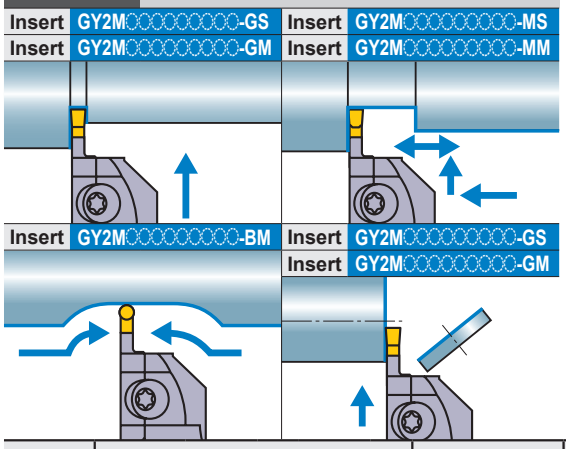
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (EXTERNAL)

1 00° type holder



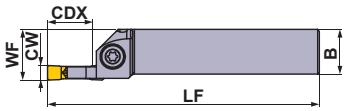




Fig. 1

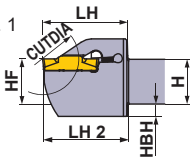
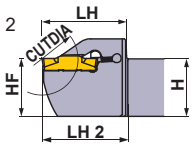


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
K	8.00	25 ∗1	50 ∗2	Mono Block	R	**GYPR2525M00-K25**	●	—	—	1
					L	**GYPL2525M00-K25**	●	—	—	1
				Mono Block	R	**GYPR3225P00-K25**	●	—	—	2
					L	**GYPL3225P00-K25**	●	—	—	2
				Mono Block	R	**GYPR3232P00-K25**	●	—	—	3
					L	**GYPL3232P00-K25**	●	—	—	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : **Inventory maintained in Japan.**

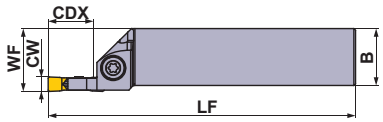
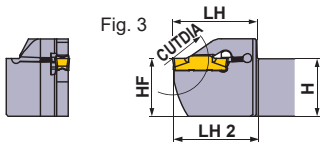


Fig. 3

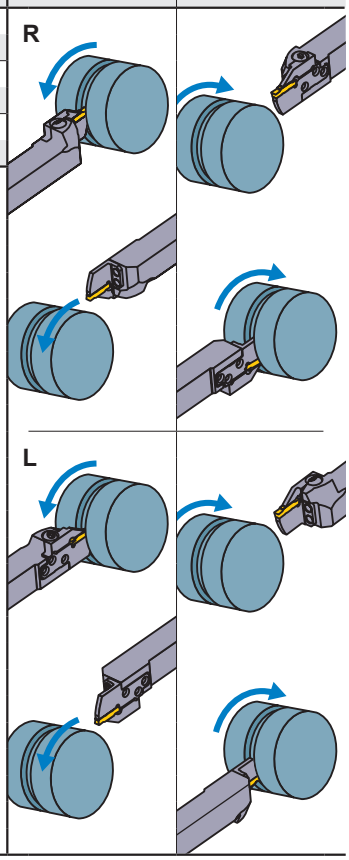


Right hand tool holder shown.

SPARE PARTS

Holder	Clamp Screw	Wrench
GYPR/L○○○○○00-K25	GY06013M (Clamp Torque : 6.0N·m)	TKY30R

Dimensions (mm) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
25	25	150	47	48	25	28	7		
25	25	150	47	48	25	28	7		
32	25	170	47	48	32	28	—		
32	25	170	47	48	32	28	—		
32	32	170	47	48	32	35	—		
32	32	170	47	48	32	35	—		



Insert selection

Seat Size	Geometry name
K	GY○○0800K○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	05-GM (Cutting off)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	With hand	Neutral
K	8.00mm		●	●		

For multifunctional grooving breaker ➢ F012, F013

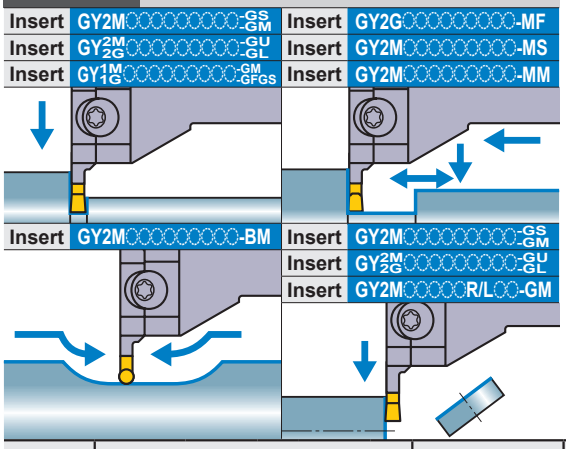
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball shape
K	8.00mm				●
	RE 0.8		●	●	
	RE 1.2			●	

● : Standard insert with dimensions

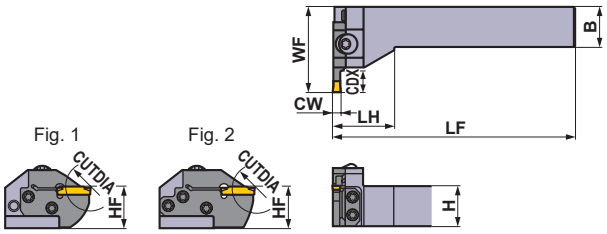
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (EXTERNAL)

2 90° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-D06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-D06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-D06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-D10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-D12	●	1
		18 ✶4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-D18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-D18	●	2
		20 ✶1	40 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-D20	●	2
E	2.39 2.50 2.74	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-E06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-E06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-E06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-E10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-E12	●	1
		18 ✶4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-E18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-E18	●	2
		20 ✶1	40 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-E20	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.
✶3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

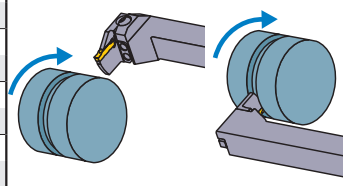
● : **Inventory maintained in Japan.**

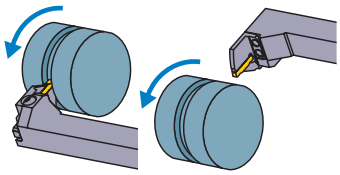
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
20	20	125	35	20	39	**R**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	
20	20	125	35	20	39	**L**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	





Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	GL (Aluminium) With hand	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
D	2.00mm	●	●	●	●	●	●
E	2.39mm	●	●	●			●
	2.50mm	●	●	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

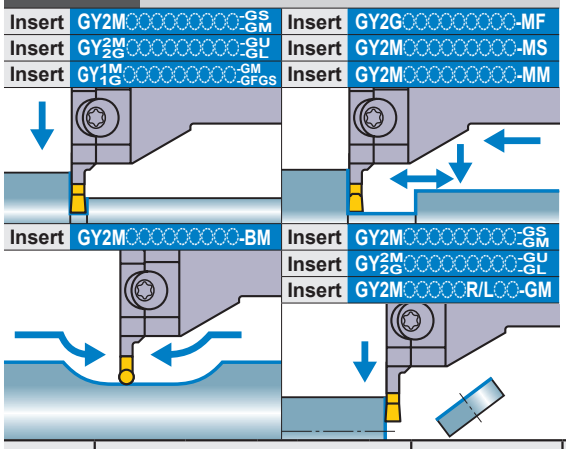
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

● : Standard insert with dimensions

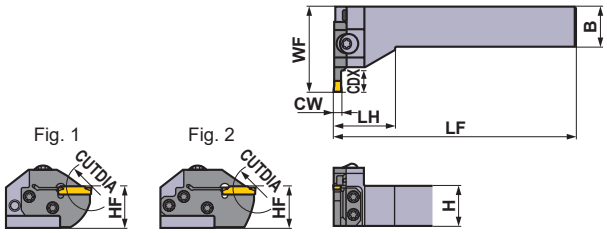
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F100
CAUTION FOR USE ➤ F106

GY SERIES (EXTERNAL)

2 90° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-F06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-F06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-F06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-F10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-F12	●	1
		18∗4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-F18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-F18	●	2
		20∗1	40∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-F20	●	2
G	4.00 4.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G08	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-G08	●	1
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-G12	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-G12	●	1
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G14	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-G14	●	1
		25∗1	50∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G25	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-G25	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

∗1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.
∗2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.
∗3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
∗4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F104.

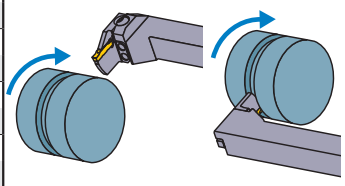
● : **Inventory maintained in Japan.**

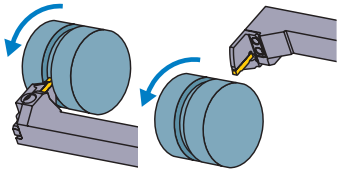
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
20	20	125	35	20	39	**R**
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	47	**L**
25	25	150	38	25	47	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	





Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	GL (Aluminium) With hand	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
F	3.00mm	●	●	●	●	●	●
	3.18mm	●	●	●			●
G	4.00mm	●	●	●			●

For multifunctional grooving breaker ➤ F012, F013

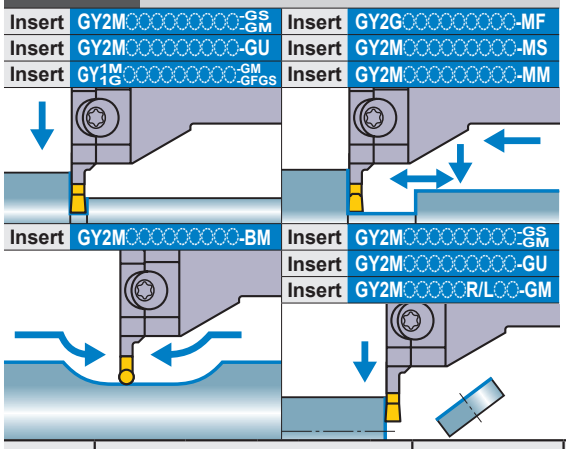
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

● : Standard insert with dimensions

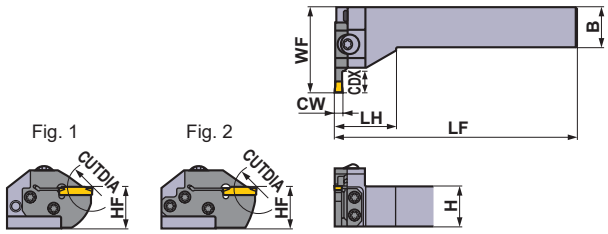
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F100
CAUTION FOR USE ➤ F106

GY SERIES (EXTERNAL)

2 90° type holder



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX	CUTDIA	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H08	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-H08	●	1
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-H12	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-H12	●	1
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H14	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-H14	●	1
		25 ✶1	50 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-H25	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-H25	●	2
J	6.00 6.31 6.35	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J08	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-J08	●	1
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J14	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-J14	●	1
		25 ✶1	50 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-J25	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-J25	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011—F013.

✶3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

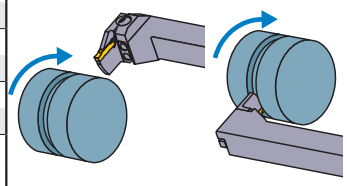
● : **Inventory maintained in Japan.**

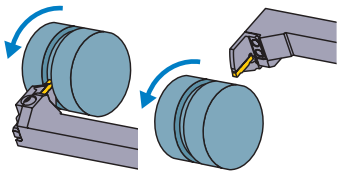
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

	Dimensions (mm) ∗3						Cutting Mode
	H	B	LF	LH	HF	WF	
	25	25	150	38	25	47	R
	25	25	150	38	25	47	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	47	L
	25	25	150	38	25	47	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	





Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker➢ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	05-GM (Cutting off) With hand	GFGS (Hardened steel) Neutral
H	4.75mm	●	●	●		●
	5.00mm	●	●	●	●	●
J	6.00mm	●	●	●		●
	6.35mm	●	●	●		

For multifunctional grooving breaker➢ F012, F013

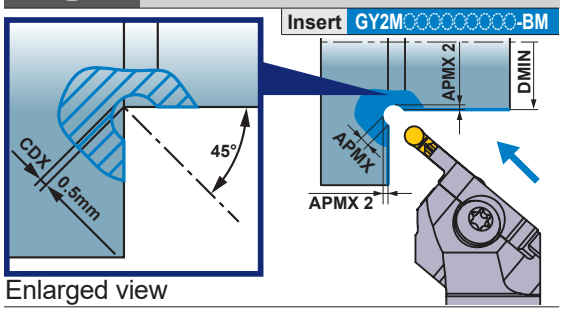
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F100
CAUTION FOR USE ➢ F106

GY SERIES (FOR EXTERNAL RECESSING)

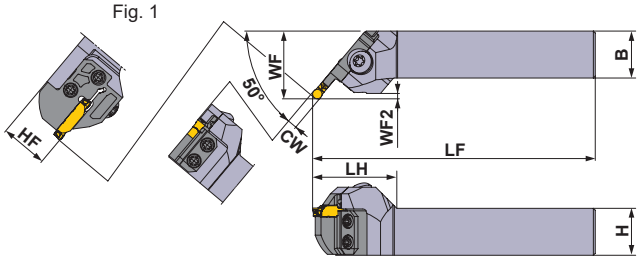
3 For 50° recessing holder



Enlarged view

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

Fig. 1



Right hand tool holder shown.

Seat Size	Dimensions (mm)					Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	DMIN	APMX	APMX 2			Holder	Stock	Modular Blade	Stock	
D	2.00	0.5	30	1.5	0.646	Modular	R	GYHR2020K50-M20L	●	GYM20LC-D005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-D005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-D005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-D005	●	1
E	2.50			1.75	0.72	Modular	R	GYHR2020K50-M20L	●	GYM20LC-E005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-E005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-E005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-E005	●	1
F	3.00 3.18			2	0.793	Modular	R	GYHR2020K50-M20L	●	GYM20LC-F005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-F005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-F005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-F005	●	1
G	4.00		20	2.5	0.939	Modular	R	GYHR2020K50-M20L	●	GYM20LC-G005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-G005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-G005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-G005	●	1
H	4.75 5.00			2.88	1.049	Modular	R	GYHR2020K50-M20L	●	GYM20LC-H005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-H005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-H005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-H005	●	1
J	6.00 6.35			3.5	1.232	Modular	R	GYHR2525M50-M25L	●	GYM25LC-J005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-J005	●	1

∗1 Cannot be used because external and face grooving blade interferes with the work.
∗2 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH**, **WF** and **WF2** values may vary.

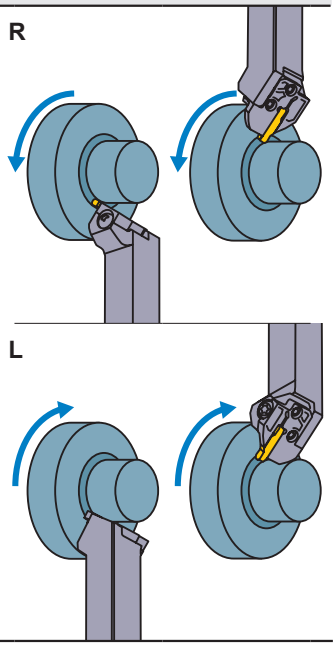
● : Inventory maintained in Japan.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (4 pcs.)	Wrench ∗
GYHR/L2020K50-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY25D
GYHR/L2525M50-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

	Dimensions (mm) ∗2							Cutting Mode
	H	B	LF	LH	HF	WF	WF2	
	20	20	125	40	20	32	1.6	
	20	20	125	40	20	32	1.6	
	25	25	150	45	25	35	1.6	
	25	25	150	45	25	35	1.6	
	20	20	125	40	20	32	1.8	
	20	20	125	40	20	32	1.8	
	25	25	150	45	25	35	1.8	
	25	25	150	45	25	35	1.8	
	20	20	125	40	20	32	2.0	
	20	20	125	40	20	32	2.0	
	25	25	150	45	25	35	2.0	
	25	25	150	45	25	35	2.0	
	20	20	125	40	20	32	2.4	
	20	20	125	40	20	32	2.4	
	25	25	150	45	25	35	2.4	
	25	25	150	45	25	35	2.4	
	20	20	125	40	20	33	2.8	
	20	20	125	40	20	33	2.8	
	25	25	150	45	25	36	2.8	
	25	25	150	45	25	36	2.8	
	25	25	150	44	25	36	3.4	
	25	25	150	44	25	36	3.4	



Insert selection

Geometry name
GY2M○○○○○○○○N-BM

For multifunctional grooving breaker ➤ F013

Seat Size	Breaker / CW	BM (Copying, Recessing) Ball shape
D	2.00mm	●
E	2.50mm	●
F	3.00mm	●
	3.18mm	●
G	4.00mm	●
H	4.75mm	●
	5.00mm	●
J	6.00mm	●
	6.35mm	●

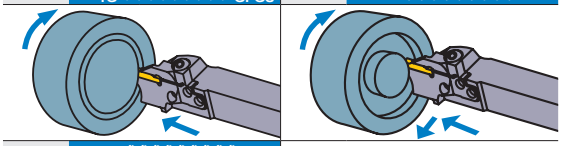
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F105
CAUTION FOR USE ➤ F105

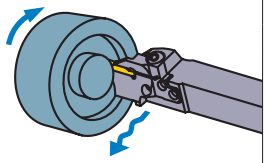
GY SERIES (FACE GROOVING)

4 00° type holder

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

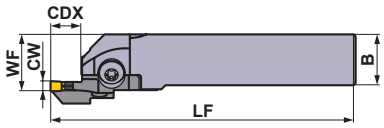


Fig. 1

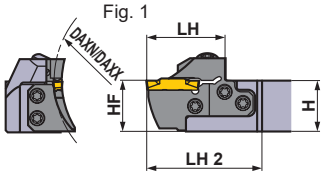
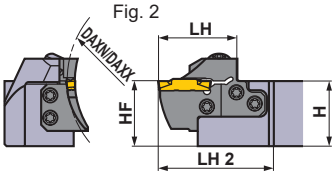


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-040	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-040	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-050	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-050	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-050	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-050	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-050	●	2
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-060	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-060	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-060	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-060	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-060	●	2
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-075	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-075	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-075	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-075	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-075	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-075	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-075	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : **Inventory maintained in Japan.**

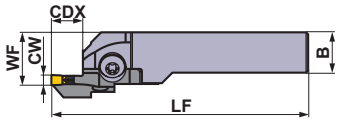
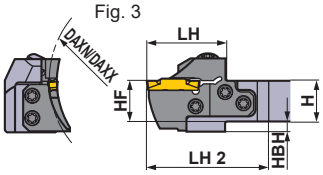


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

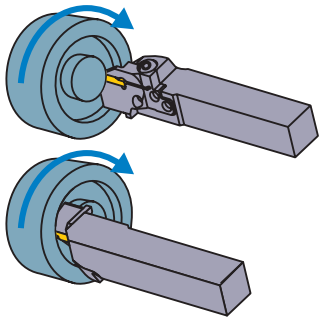
SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

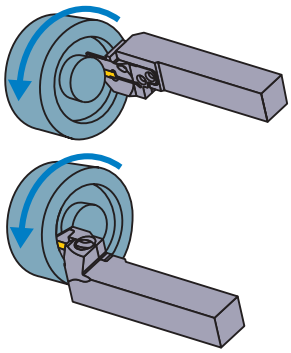
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●

For multifunctional grooving breaker ➢ F012, F013

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			

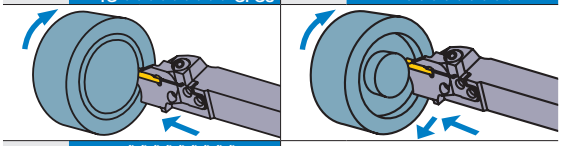
● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F110
CAUTION FOR USE ➢ F112

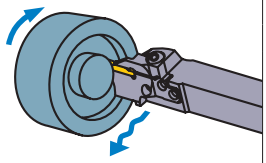
GY SERIES (FACE GROOVING)

4 00° type holder

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

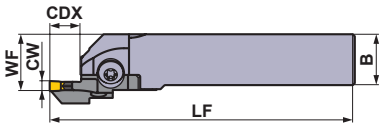


Fig. 1

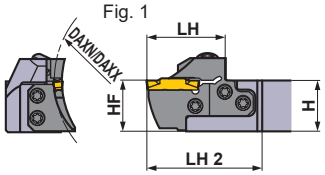
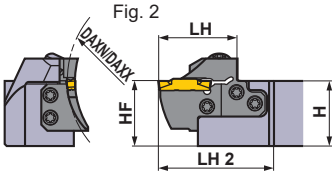


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-100	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-100	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-100	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-100	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-100	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-100	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-100	●	2
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-135	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-135	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-135	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-135	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-135	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-135	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-135	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-135	●	2
		180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-180	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-180	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-180	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-180	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-180	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : **Inventory maintained in Japan.**

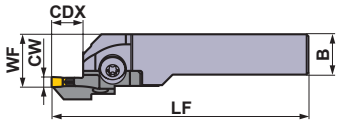
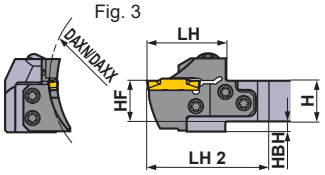


Fig. 3



Right hand tool holder shown.

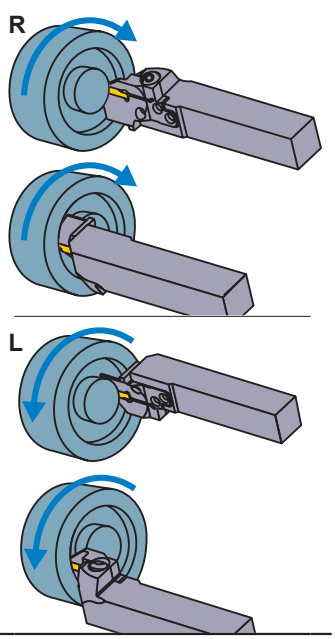
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●

For multifunctional grooving breaker ➢ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			

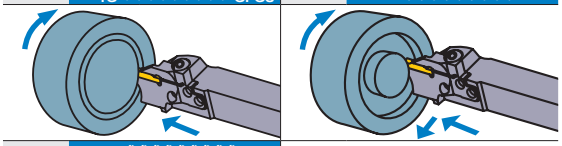
● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F110
CAUTION FOR USE ➢ F112

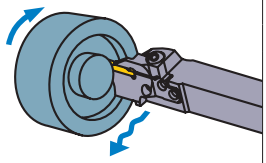
GY SERIES (FACE GROOVING)

4 00° type holder

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

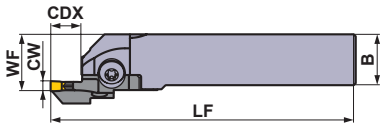


Fig. 1

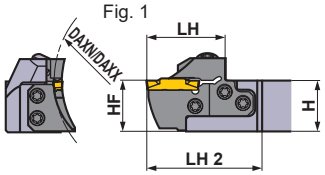
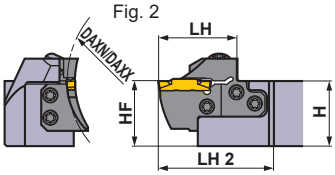


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-040	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-040	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-040	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-040	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-050	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-050	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-050	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-050	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-050	●	2
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-060	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-060	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-060	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-060	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-060	●	2
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-075	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-075	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-075	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-075	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-075	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-075	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-075	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : **Inventory maintained in Japan.**

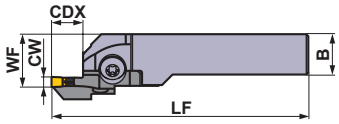
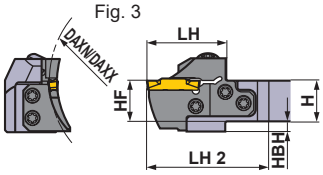


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

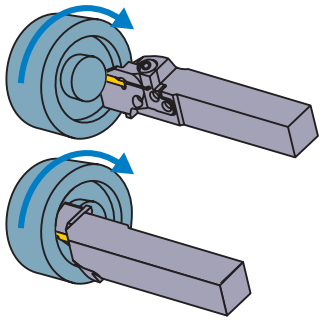
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

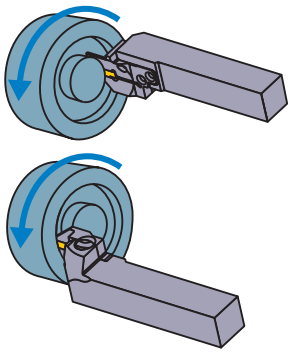
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	2.39mm	●	●	●	●
	2.50mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

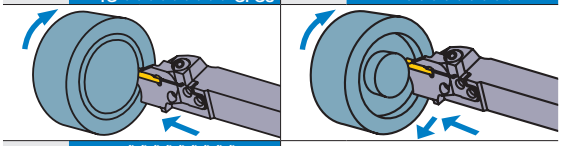
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

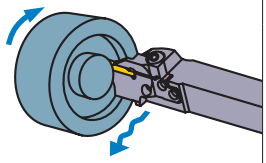
GY SERIES (FACE GROOVING)

4 00° type holder

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

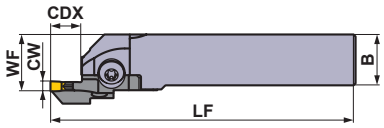


Fig. 1

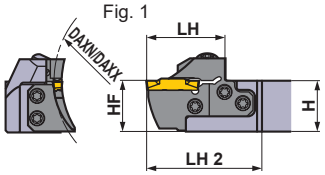
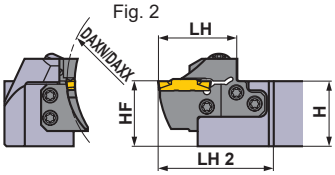


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-100	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-100	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-100	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-100	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-100	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-100	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-100	●	2
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-135	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-135	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-135	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-135	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-135	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-135	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-135	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-135	●	2
		180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-180	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-180	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-E12-180	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-180	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-E12-180	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : **Inventory maintained in Japan.**

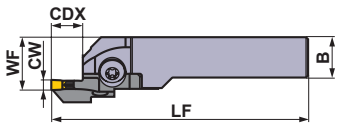
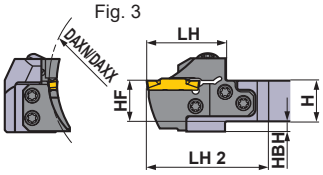


Fig. 3



Right hand tool holder shown.

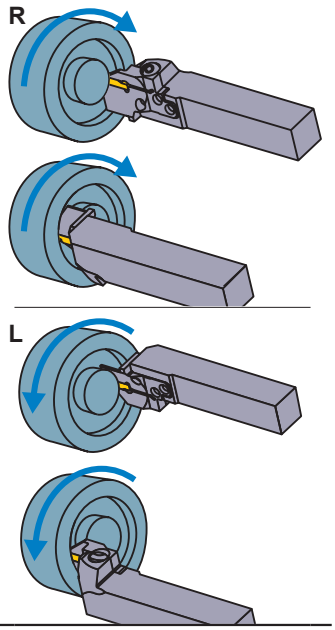
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	2.39mm	●	●	●	●
	2.50mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

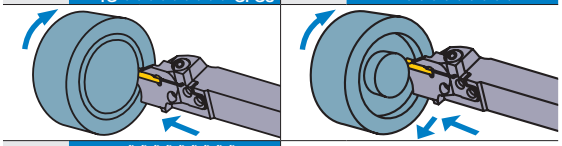
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

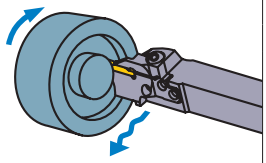
GY SERIES (FACE GROOVING)

4 00° type holder

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

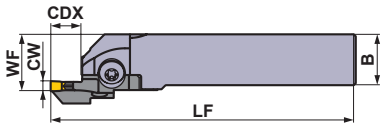


Fig. 1

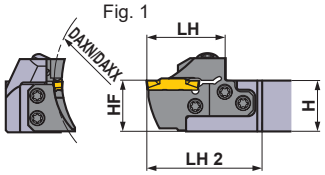
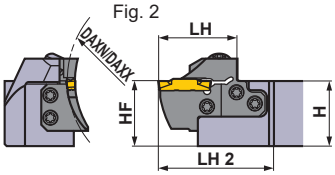


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-035	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-035	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-035	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-035	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-035	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-F12-035	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-035	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-F12-035	●	2
		40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-040	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-040	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-F12-040	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-040	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-F12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-050	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-050	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-F12-050	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-050	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-F12-050	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : **Inventory maintained in Japan.**

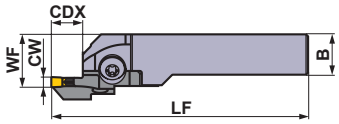
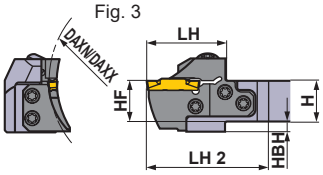


Fig. 3



Right hand tool holder shown.

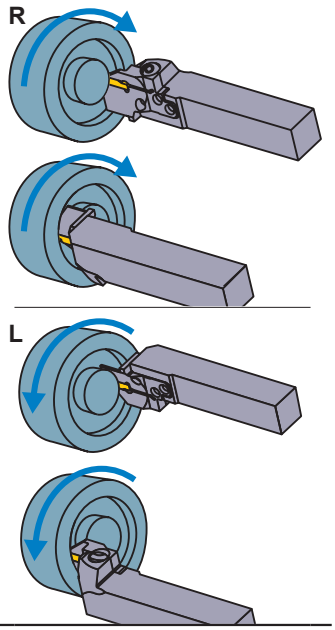
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

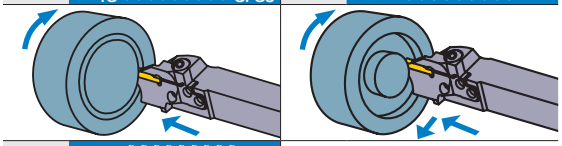
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

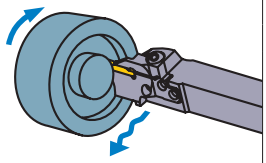
GY SERIES (FACE GROOVING)

4 00° type holder

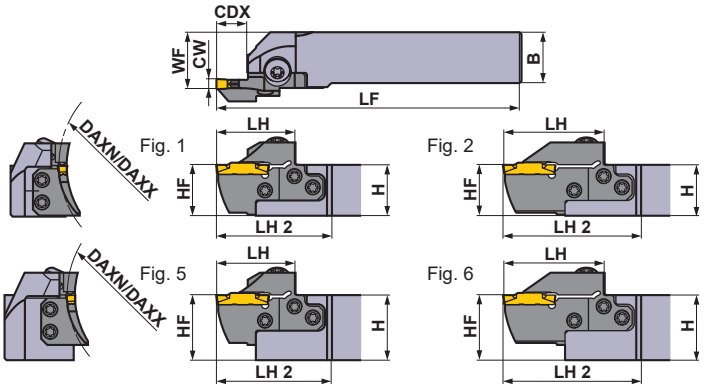
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



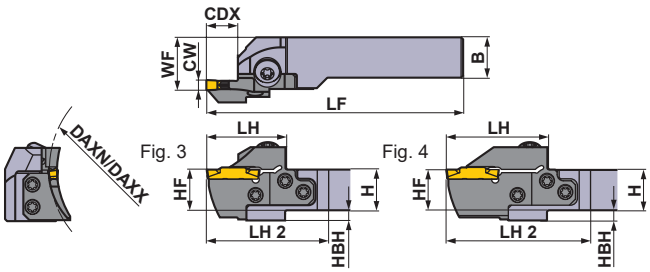
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	60	75	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-060**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-060**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-060**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-060**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-060**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-060**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-060**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-060**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-060**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-060**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-060**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-060**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-060**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-060**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-060**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-060**	●	6
		75	100	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-075**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-075**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-075**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-075**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-075**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-075**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-075**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-075**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-075**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-075**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-075**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-075**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-075**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-075**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-075**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-075**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

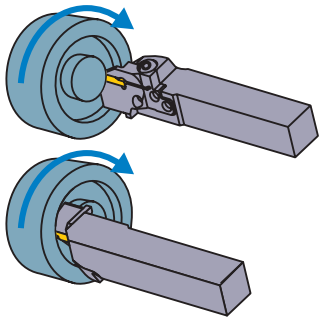
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

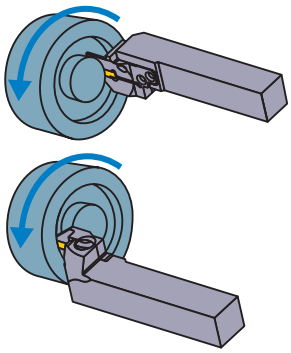
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

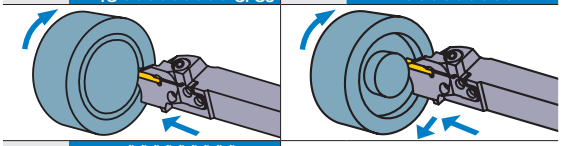
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

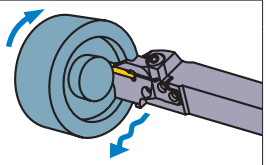
GY SERIES (FACE GROOVING)

4 00° type holder

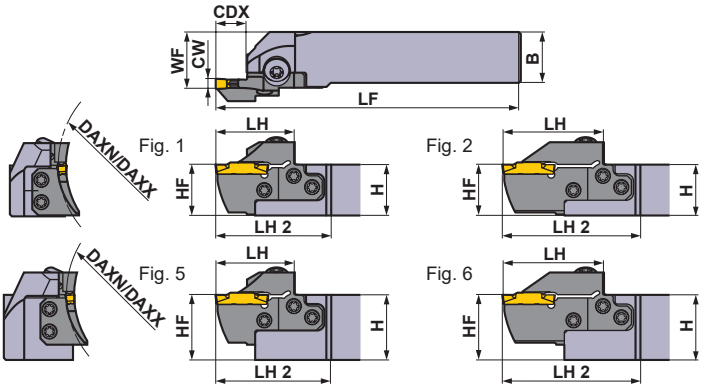
Insert GY2M○○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M○○○○○○○○○○-GU
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○○-MM



Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



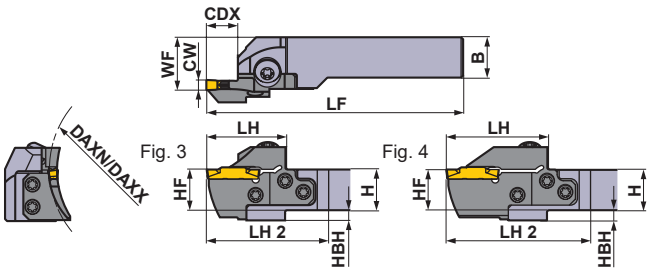
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	100	150	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-100**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-100**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-100**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-100**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-100**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-100**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-100**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-100**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-100**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-100**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-100**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-100**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-100**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-100**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-100**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-100**	●	6
		135	200	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-135**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-135**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-135**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-135**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-135**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-135**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-135**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-135**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-135**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-135**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-135**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-135**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-135**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-135**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-135**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-135**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

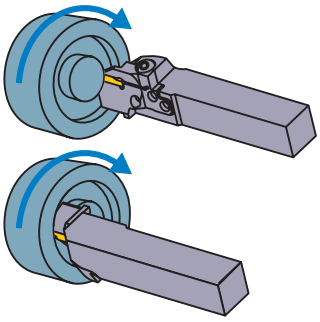
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

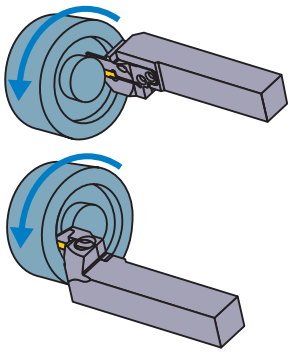
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

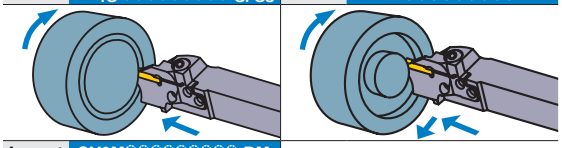
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

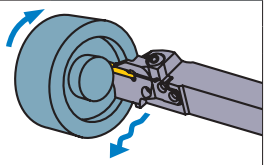
GY SERIES (FACE GROOVING)

4 00° type holder

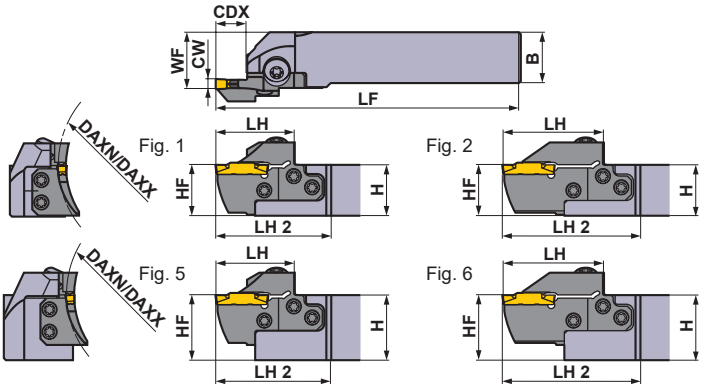
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



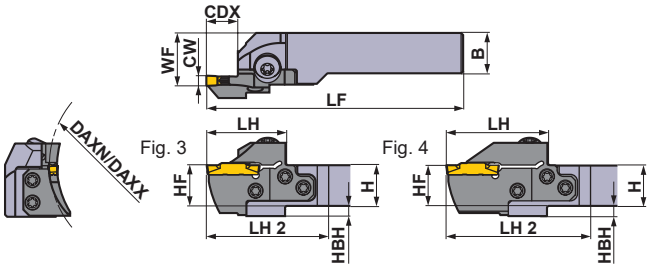
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	180	250	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-180**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-180**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-180**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-180**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-180**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-180**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-180**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-180**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-180**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-180**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-180**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-180**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-180**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-180**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-180**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-180**	●	6
		225	999	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F12-225**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F12-225**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F12-225**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F12-225**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F12-225**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F12-225**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F12-225**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F12-225**	●	5
				20 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-F20-225**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-F20-225**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-F20-225**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-F20-225**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-F20-225**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-F20-225**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-F20-225**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-F20-225**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

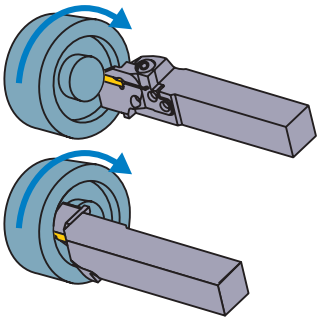
SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

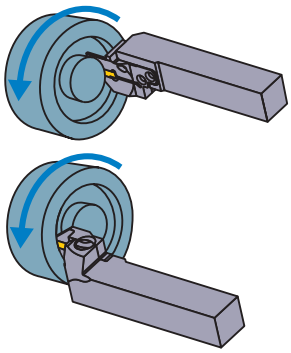
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

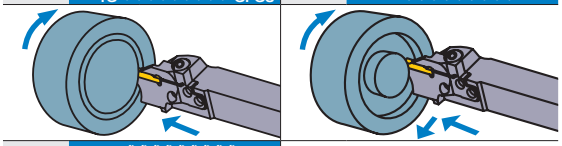
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

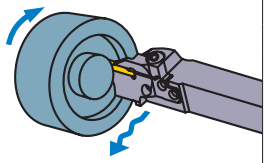
GY SERIES (FACE GROOVING)

4 00° type holder

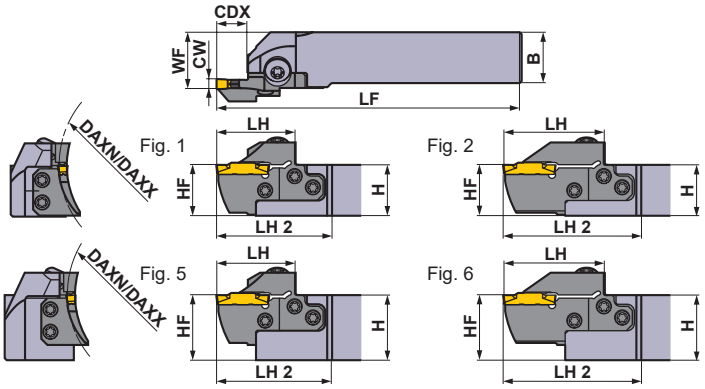
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



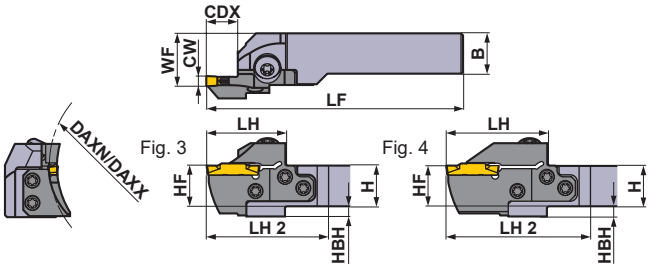
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G14-040**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G14-040**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G14-040**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G14-040**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G14-040**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G14-040**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G14-040**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G14-040**	●	5
		50	60	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G14-050**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G14-050**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G14-050**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G14-050**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G14-050**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G14-050**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G14-050**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G14-050**	●	5
		60	85	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G14-060**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G14-060**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G14-060**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G14-060**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G14-060**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G14-060**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G14-060**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G14-060**	●	5
				25 ∗2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G25-060**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G25-060**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G25-060**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G25-060**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G25-060**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G25-060**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G25-060**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G25-060**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

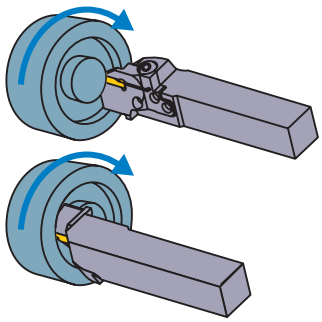
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

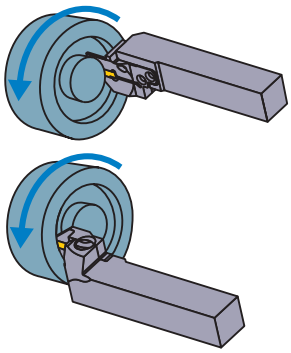
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

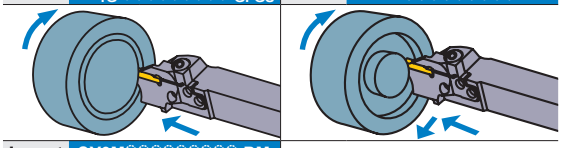
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

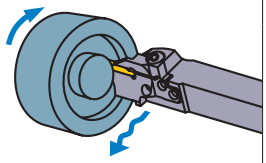
GY SERIES (FACE GROOVING)

4 00° type holder

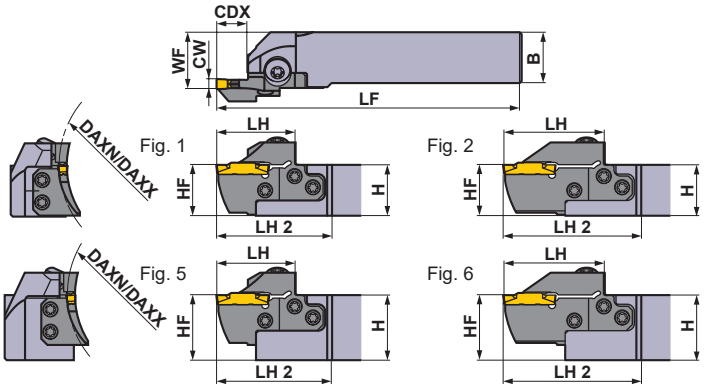
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



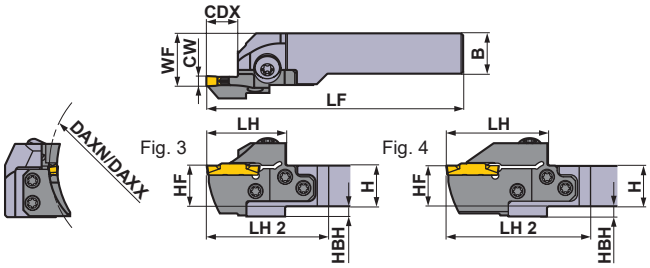
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-085	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-085	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-085	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-085	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-085	●	5
						L	GYHL3225P00-M25L	●	GYM25LD-G14-085	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-085	●	5
						L	GYHL3232P00-M25L	●	GYM25LD-G14-085	●	5
				25 ⋆2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-085	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-085	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-085	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-085	●	2
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-085	●	6
						L	GYHL3225P00-M25L	●	GYM25LD-G25-085	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-085	●	6
						L	GYHL3232P00-M25L	●	GYM25LD-G25-085	●	6
		125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-125	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-125	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-125	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-125	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-125	●	5
						L	GYHL3225P00-M25L	●	GYM25LD-G14-125	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-125	●	5
						L	GYHL3232P00-M25L	●	GYM25LD-G14-125	●	5
				25 ⋆2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-125	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-125	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-125	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-125	●	2
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-125	●	6
						L	GYHL3225P00-M25L	●	GYM25LD-G25-125	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-125	●	6
						L	GYHL3232P00-M25L	●	GYM25LD-G25-125	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

⋆1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⋆2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

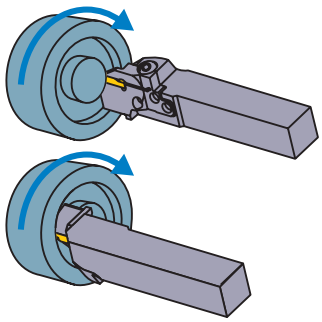
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

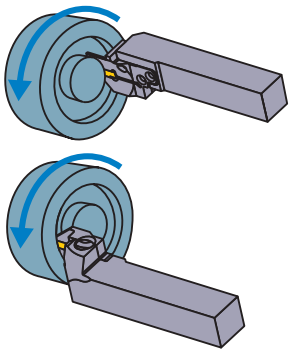
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

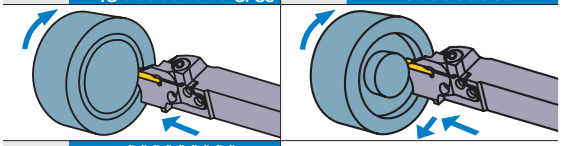
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

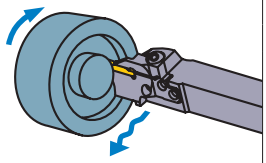
GY SERIES (FACE GROOVING)

4 00° type holder

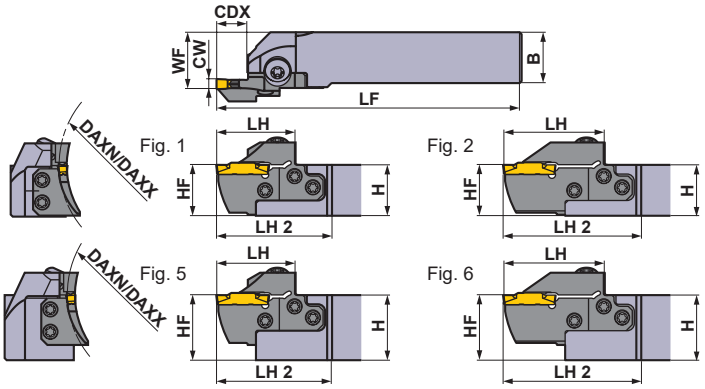
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



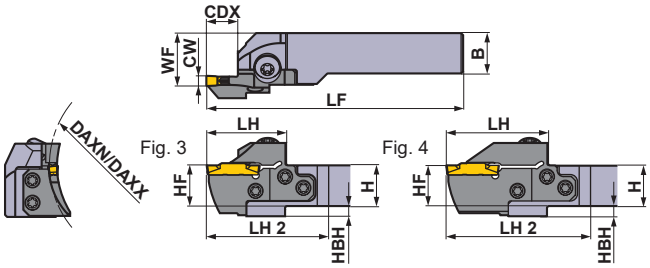
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	180	280	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G14-180**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G14-180**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G14-180**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G14-180**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G14-180**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G14-180**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G14-180**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G14-180**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G25-180**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G25-180**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G25-180**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G25-180**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G25-180**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G25-180**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G25-180**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G25-180**	●	6
		250	999	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G14-250**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G14-250**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G14-250**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G14-250**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G14-250**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G14-250**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G14-250**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G14-250**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-G25-250**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-G25-250**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-G25-250**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-G25-250**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-G25-250**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-G25-250**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-G25-250**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-G25-250**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



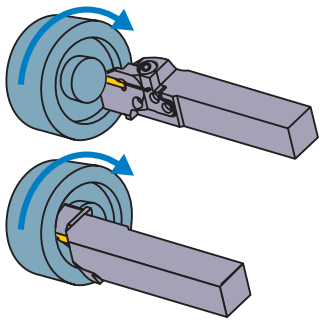
Right hand tool holder shown.

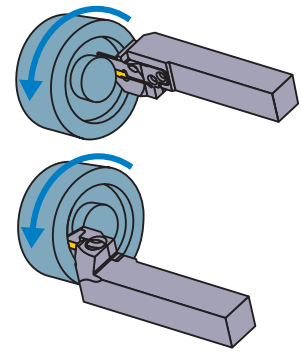
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

	Dimensions (mm) ∗1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	R
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	136	50	71	20	26	5	
	20	20	136	50	71	20	26	5	
	25	25	161	50	68	25	28	—	
	25	25	161	50	68	25	28	—	
	32	25	181	50	68	32	28	—	
	32	25	181	50	68	32	28	—	
	32	32	181	50	68	32	35	—	
	32	32	181	50	68	32	35	—	
	20	20	125	39	60	20	26	5	L
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	136	50	71	20	26	5	
	20	20	136	50	71	20	26	5	
	25	25	161	50	68	25	28	—	
	25	25	161	50	68	25	28	—	
	32	25	181	50	68	32	28	—	
	32	25	181	50	68	32	28	—	
	32	32	181	50	68	32	35	—	
	32	32	181	50	68	32	35	—	





Insert selection

Seat Size	Geometry name
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

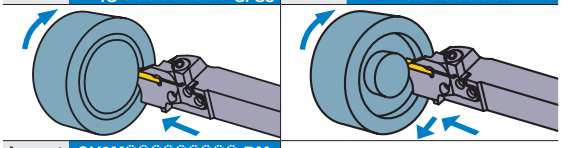
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

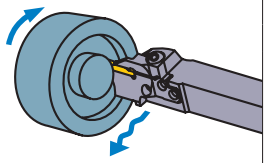
GY SERIES (FACE GROOVING)

4 00° type holder

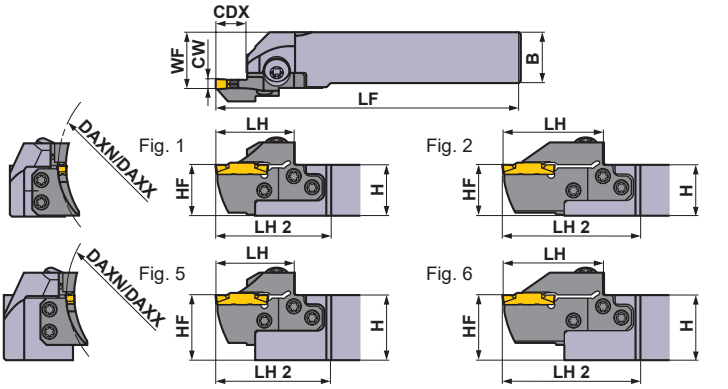
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



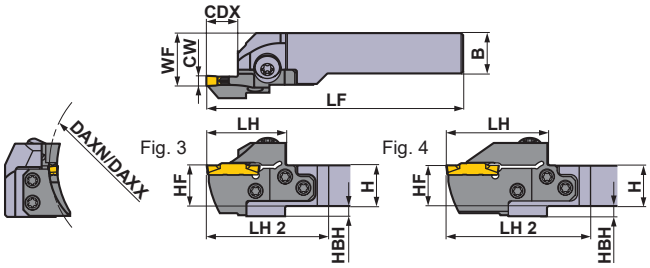
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-050**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-050**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-050**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-050**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-050**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-050**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-050**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-050**	●	5
		60	85	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-060**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-060**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-060**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-060**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-060**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-060**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-060**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-060**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H25-060**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H25-060**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H25-060**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H25-060**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H25-060**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H25-060**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H25-060**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H25-060**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

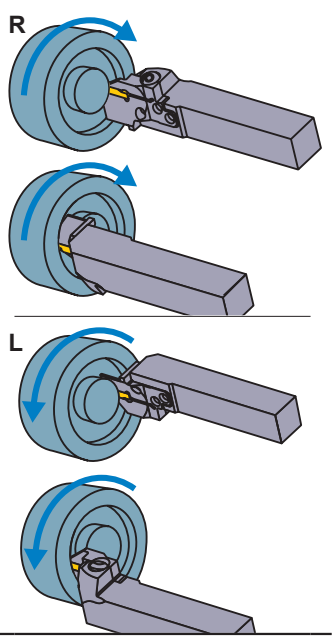
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

	Dimensions (mm) ∗1							
	H	B	LF	LH	LH 2	HF	WF	HBH
	20	20	125	39	60	20	26	5
	20	20	125	39	60	20	26	5
	25	25	150	39	57	25	28	—
	25	25	150	39	57	25	28	—
	32	25	170	39	57	32	28	—
	32	25	170	39	57	32	28	—
	32	32	170	39	57	32	35	—
	32	32	170	39	57	32	35	—
	20	20	125	39	60	20	26	5
	20	20	125	39	60	20	26	5
	25	25	150	39	57	25	28	—
	25	25	150	39	57	25	28	—
	32	25	170	39	57	32	28	—
	32	25	170	39	57	32	28	—
	32	32	170	39	57	32	35	—
	32	32	170	39	57	32	35	—
	20	20	136	50	71	20	26	5
	20	20	136	50	71	20	26	5
	25	25	161	50	68	25	28	—
	25	25	161	50	68	25	28	—
	32	25	181	50	68	32	28	—
	32	25	181	50	68	32	28	—
	32	32	181	50	68	32	35	—
	32	32	181	50	68	32	35	—

Cutting Mode



Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

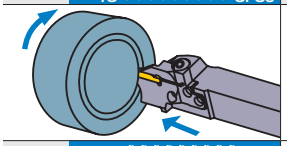
● : Standard insert with dimensions

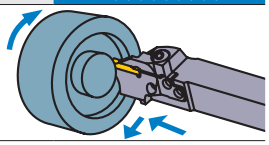
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

GY SERIES (FACE GROOVING)

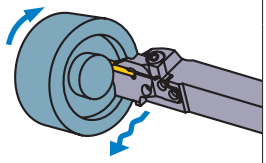
4 00° type holder

Insert GY2M○○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M○○○○○○○○○○-GU
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○○-MM

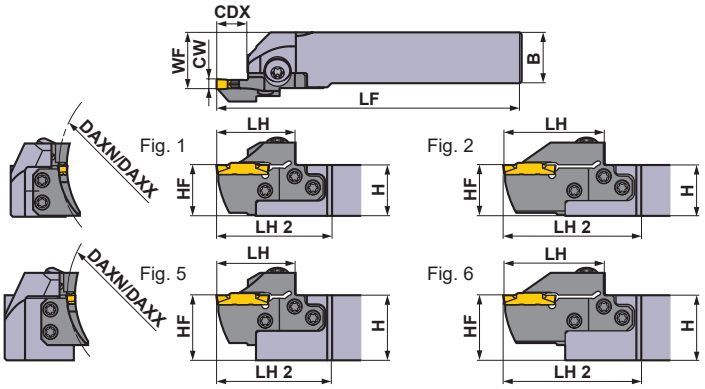




Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



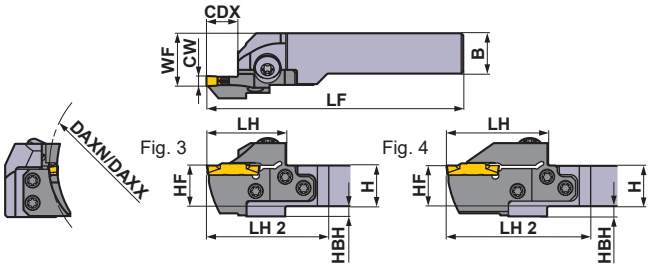
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	85	125	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-085**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-085**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-085**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-085**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-085**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-085**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-085**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-085**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H25-085**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H25-085**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H25-085**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H25-085**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H25-085**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H25-085**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H25-085**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H25-085**	●	6
		125	200	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-125**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-125**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-125**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-125**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-125**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-125**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-125**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-125**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H25-125**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H25-125**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H25-125**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H25-125**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H25-125**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H25-125**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H25-125**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H25-125**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

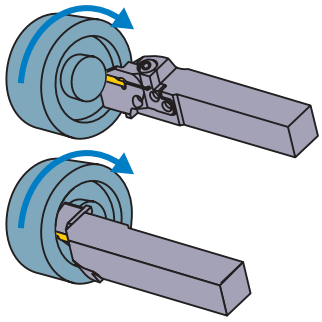
SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗ (① ②)
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

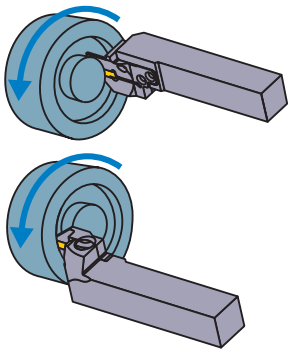
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

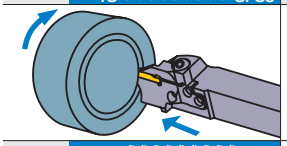
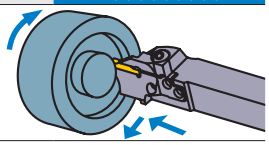
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

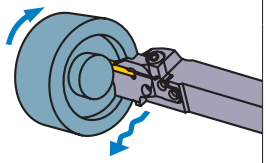
GY SERIES (FACE GROOVING)

4 00° type holder

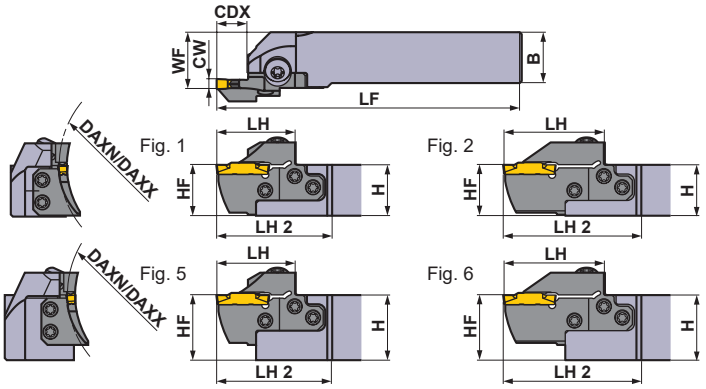
Insert GY2M○○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M○○○○○○○○○○-GU
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○○-MM

Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



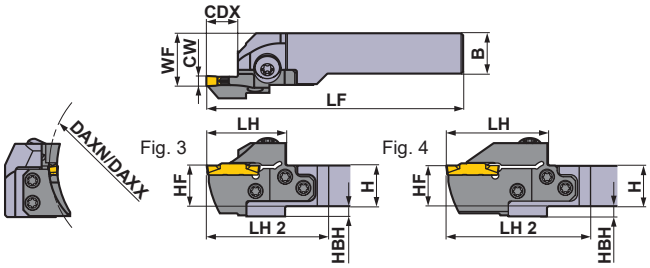
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	180	280	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-180**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-180**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-180**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-180**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-180**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-180**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-180**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-180**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H25-180**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H25-180**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H25-180**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H25-180**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H25-180**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H25-180**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H25-180**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H25-180**	●	6
		250	999	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H14-250**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H14-250**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H14-250**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H14-250**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H14-250**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H14-250**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H14-250**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H14-250**	●	5
				25 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-H25-250**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-H25-250**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-H25-250**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-H25-250**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-H25-250**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-H25-250**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-H25-250**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-H25-250**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

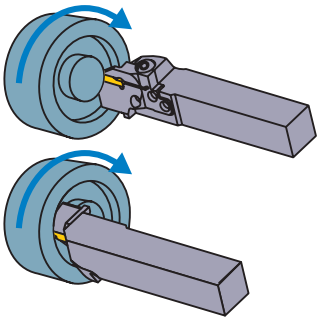
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

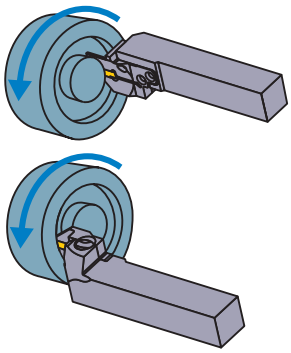
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

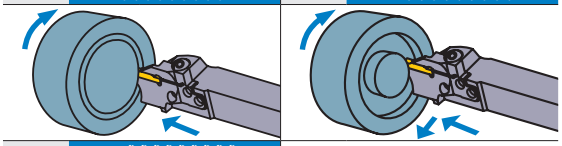
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

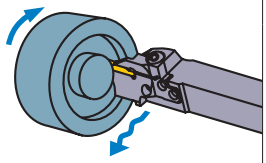
GY SERIES (FACE GROOVING)

4 00° type holder

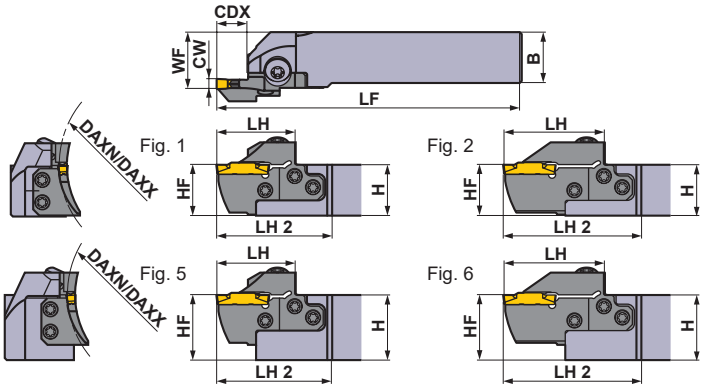
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



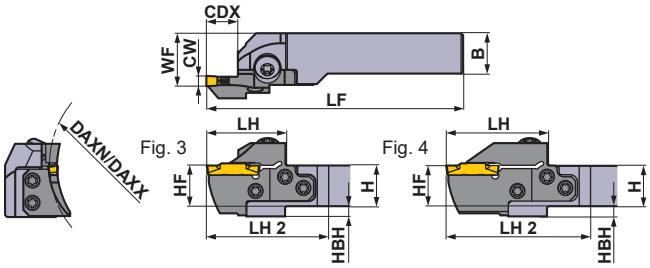
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-050	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-050	●	5
						L	GYHL3225P00-M25L	●	GYM25LD-J14-050	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-050	●	5
						L	GYHL3232P00-M25L	●	GYM25LD-J14-050	●	5
		70	110	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-070	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-070	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-070	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-070	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-070	●	5
						L	GYHL3225P00-M25L	●	GYM25LD-J14-070	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-070	●	5
						L	GYHL3232P00-M25L	●	GYM25LD-J14-070	●	5
				25 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-070	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-070	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-070	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-070	●	2
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-070	●	6
						L	GYHL3225P00-M25L	●	GYM25LD-J25-070	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-070	●	6
						L	GYHL3232P00-M25L	●	GYM25LD-J25-070	●	6
		110	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-110	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-110	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-110	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-110	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-110	●	5
						L	GYHL3225P00-M25L	●	GYM25LD-J14-110	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-110	●	5
						L	GYHL3232P00-M25L	●	GYM25LD-J14-110	●	5
				25 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-110	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-110	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-110	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-110	●	2
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-110	●	6
						L	GYHL3225P00-M25L	●	GYM25LD-J25-110	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-110	●	6
						L	GYHL3232P00-M25L	●	GYM25LD-J25-110	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

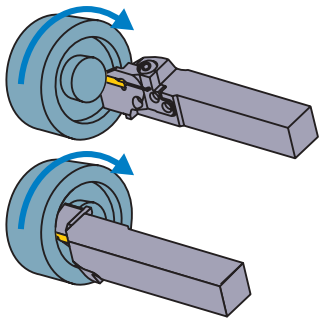
SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

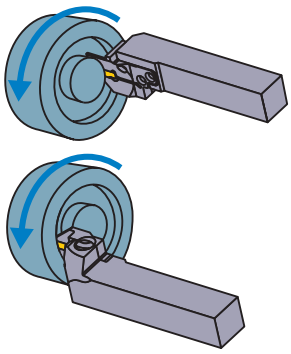
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	

For multifunctional grooving breaker ➢ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

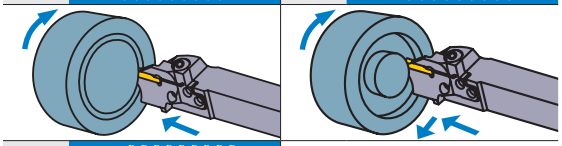
● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F110
CAUTION FOR USE ➢ F112

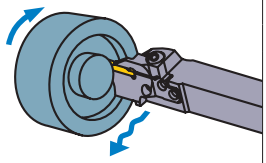
GY SERIES (FACE GROOVING)

4 00° type holder

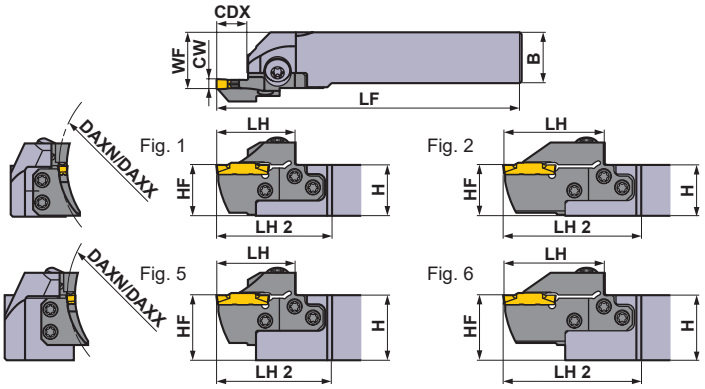
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



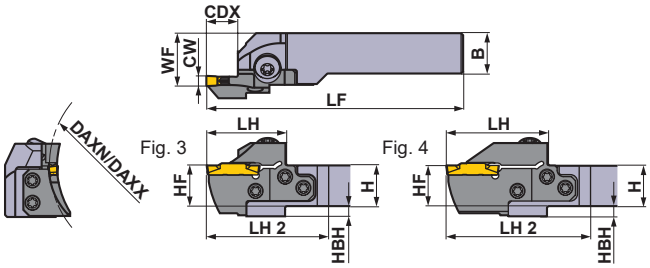
Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	170	280	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-J14-170**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-J14-170**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-J14-170**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-J14-170**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-J14-170**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-J14-170**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-J14-170**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-J14-170**	●	5
				25 ⋆2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-J25-170**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-J25-170**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-J25-170**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-J25-170**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-J25-170**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-J25-170**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-J25-170**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-J25-170**	●	6
		250	999	14	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-J14-250**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-J14-250**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-J14-250**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-J14-250**	●	1
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-J14-250**	●	5
						L	**GYHL3225P00-M25L**	●	**GYM25LD-J14-250**	●	5
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-J14-250**	●	5
						L	**GYHL3232P00-M25L**	●	**GYM25LD-J14-250**	●	5
				25 ⋆2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-J25-250**	●	4
						L	**GYHL2020K00-M25L**	●	**GYM25LD-J25-250**	●	4
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-J25-250**	●	2
						L	**GYHL2525M00-M25L**	●	**GYM25LD-J25-250**	●	2
					Modular	R	**GYHR3225P00-M25R**	●	**GYM25RD-J25-250**	●	6
						L	**GYHL3225P00-M25L**	●	**GYM25LD-J25-250**	●	6
					Modular	R	**GYHR3232P00-M25R**	●	**GYM25RD-J25-250**	●	6
						L	**GYHL3232P00-M25L**	●	**GYM25LD-J25-250**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

⋆1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
⋆2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

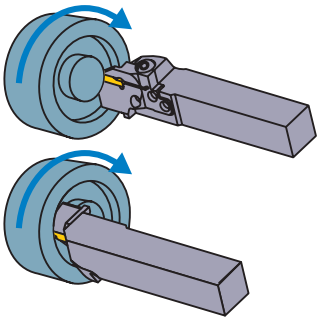
SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

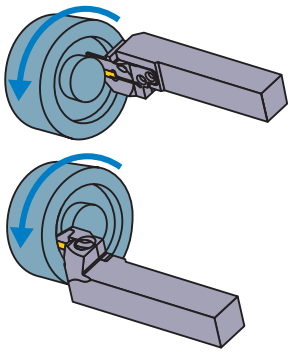
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	

For multifunctional grooving breaker ➢ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

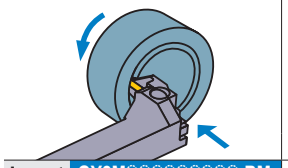
● : Standard insert with dimensions

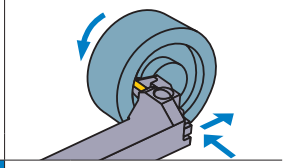
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F110
CAUTION FOR USE ➢ F112

GY SERIES (FACE GROOVING)

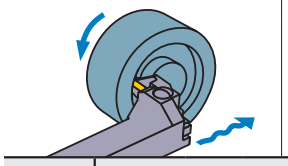
5 90° type holder

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

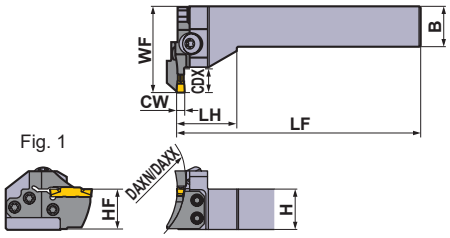


Fig. 1

Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-060	●	1
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-075	●	1
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-100	●	1
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-135	●	1
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-180	●	1
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-060	●	1
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-075	●	1
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-100	●	1
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-135	●	1
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-180	●	1

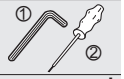
CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.

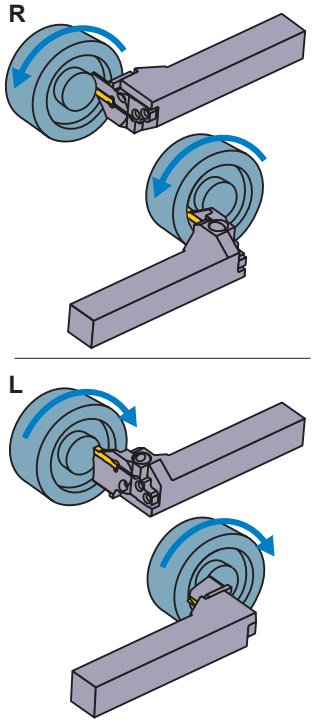
● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	 Clamp Screw	 5 pcs. Blade Screw	 Wrench ★
GYHR2525M90-M25L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

	Dimensions (mm) ★1						Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	
	25	25	150	38	25	53	R
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	L
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	



Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●
E	2.39mm	●	●	●	●
	2.50mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

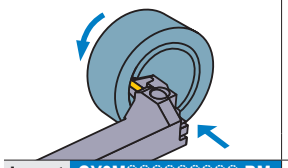
● : Standard insert with dimensions

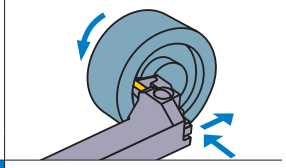
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

GY SERIES (FACE GROOVING)

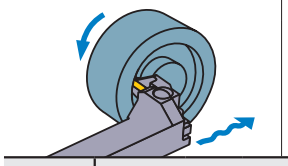
5 90° type holder

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

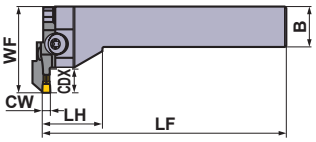


Fig. 1

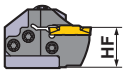


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-035	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-035	●	1
		40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-060	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-060	●	2
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-075	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-075	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-075	●	2
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-100	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-100	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-100	●	2
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-135	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-135	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-135	●	2
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-180	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-180	●	2
		225	999	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-225	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-225	●	1
				20 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-225	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-225	●	2

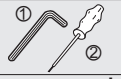
CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

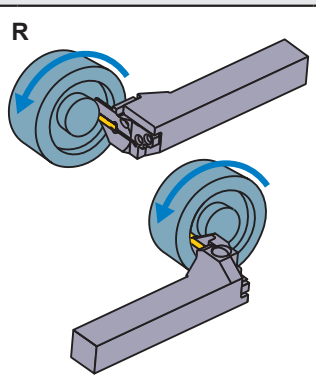
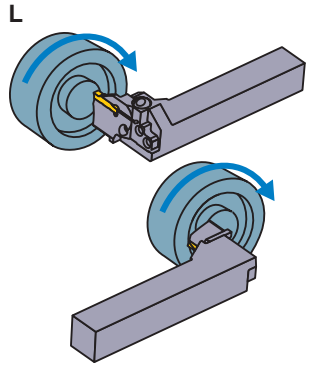
⋆1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
⋆2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	 Clamp Screw	 5 pcs. Blade Screw	 Wrench ★
GYHR2525M90-M25L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ★1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R 
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	L 
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	

Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

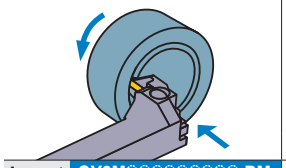
● : Standard insert with dimensions

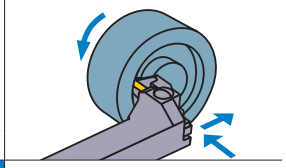
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

GY SERIES (FACE GROOVING)

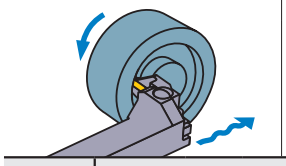
5 90° type holder

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

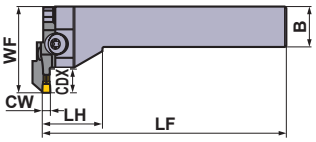


Fig. 1

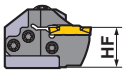


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-040	●	1
		50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-050	●	1
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-060	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-060	●	2
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-085	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-085	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-085	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-085	●	2
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-125	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-125	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-125	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-125	●	2
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-180	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-180	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-250	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

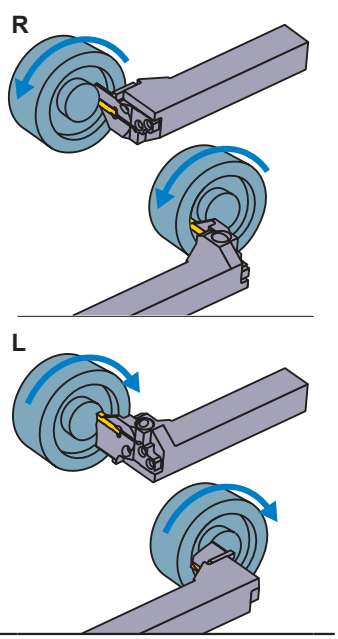
● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYHR2525M90-M25L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ★1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	L
25	25	150	38	25	64	



Insert selection

Seat Size	Geometry name
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

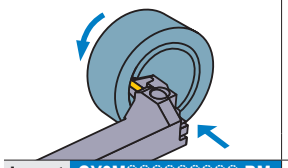
● : Standard insert with dimensions

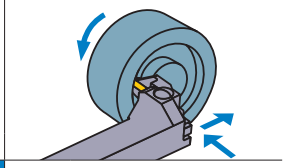
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

GY SERIES (FACE GROOVING)

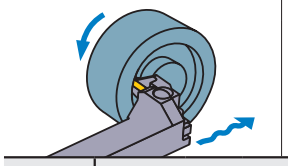
5 90° type holder

Insert GY2M○○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M○○○○○○○○○○-GU
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○○-MM





Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

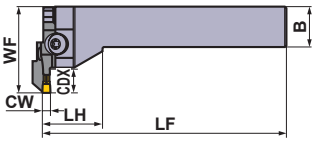


Fig. 1

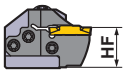


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-050	●	1
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-060	●	1
				25 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-060	●	2
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-085	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-085	●	1
				25 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-085	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-085	●	2
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-125	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-125	●	1
				25 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-125	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-125	●	2
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-180	●	1
				25 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-180	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-250	●	1
				25 ⋆2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

⋆1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
⋆2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

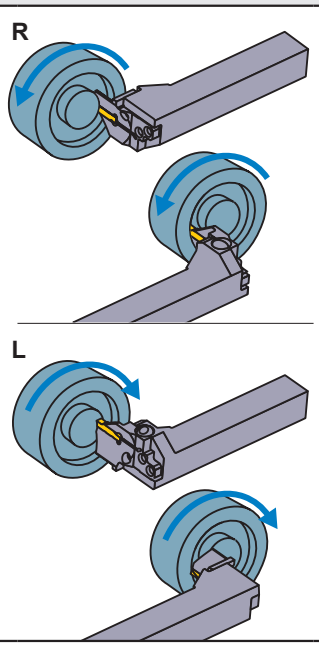
● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYHR2525M90-M25L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ★1						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	L
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	



Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

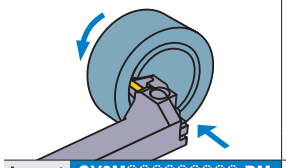
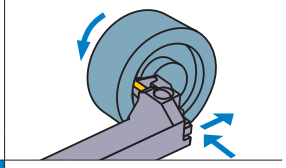
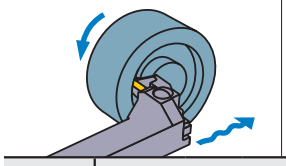
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

GY SERIES (FACE GROOVING)

5 90° type holder

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

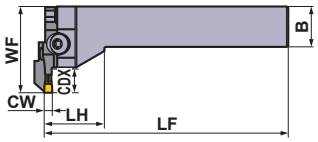


Fig. 1

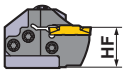


Fig. 2



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	DAXN	DAXX	CDX	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-050	●	1
		70	110	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-070	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-070	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-070	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-070	●	2
		110	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-110	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-110	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-110	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-110	●	2
		170	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-170	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-170	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-170	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-170	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-250	●	1
				25 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when standard insert is used. If other insert geometries are used then **LF**, **LH** and **WF** values may vary.
✶2 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011—F013.

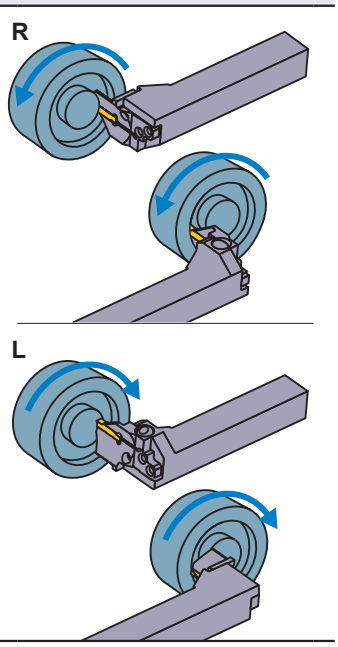
● : **Inventory maintained in Japan.**

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	Clamp Screw	Blade Screw (5 pcs.)	Wrench ★
GYHR2525M90-M25L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ★1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	



Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

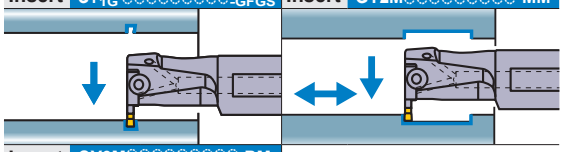
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F110
CAUTION FOR USE ➤ F112

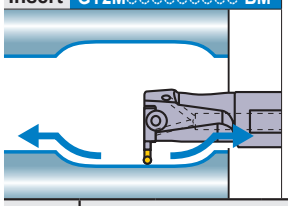
GY SERIES (INTERNAL GROOVING)

6 90° type holder

Insert GY2M○○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○○-GU/GL
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○○-MM

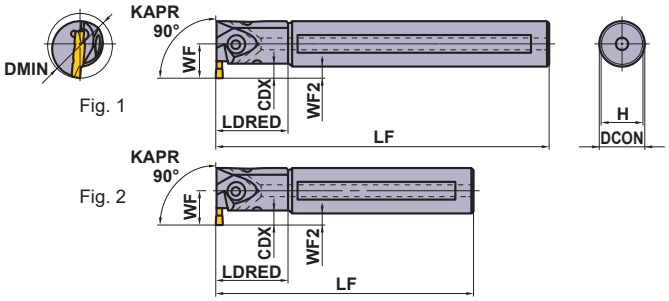


Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX *3	DMIN	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00 2.24	6	25	Mono Block	R	GYAR20K90A-D06	●	—	—	2
					L	GYAL20K90A-D06	●	—	—	2
				Mono Block	R	GYAR20Q90A-D06	●	—	—	1
					L	GYAL20Q90A-D06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-D06	●	—	—	2
					L	GYAL25K90B-D06	●	—	—	2
				Mono Block	R	GYAR25R90B-D06	●	—	—	1
					L	GYAL25R90B-D06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-D10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-D10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-D10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-D10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-D10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-D10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-D12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-D12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-D12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-D12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-D12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-D12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F116.
*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension **LDRED**.

● : Inventory maintained in Japan.

●Modular blade type (Air / coolant through)

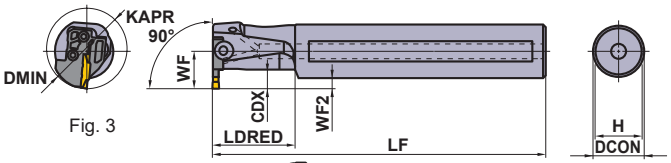


Fig. 3

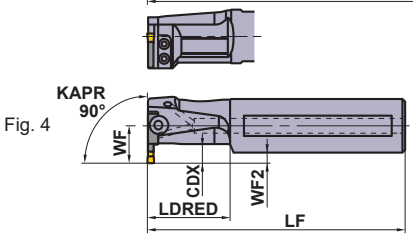


Fig. 4

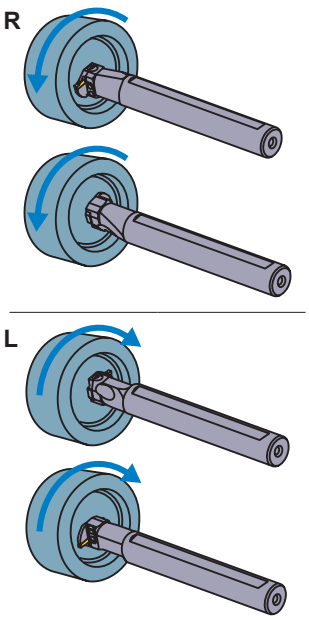
Right hand tool holder shown.

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ★
GYAR/L20○90A-○06 GYAR/L25○90B-○06	①GY05016S (Clamp Torque : 5.0N·m)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
20	125	30	14.5	4.5	18	R
20	125	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
25	125	40	19	6.5	23	
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6	30	
32	140	50	22	6	30	
32	250	50	22	6	30	
32	250	50	22	6	30	
40	150	60	28	8	37	L
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	



Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	Breaker CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
D	2.00mm	●	●	●	●
	2.24mm	●			

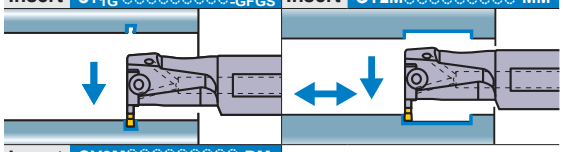
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F117
CAUTION FOR USE ➤ F120

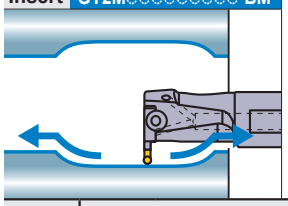
GY SERIES (INTERNAL GROOVING)

6 90° type holder

Insert GY2M□□□□□□□□□□-GS/GM
Insert GY2G□□□□□□□□□□-MF
Insert GY2M/GY2G□□□□□□□□□□-GU/GL
Insert GY2M□□□□□□□□□□-MS
Insert GY1M/GY1G□□□□□□□□□□-GM/GFGS
Insert GY2M□□□□□□□□□□-MM



Insert GY2M□□□□□□□□□□-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

●Mono block type (Air / coolant through)

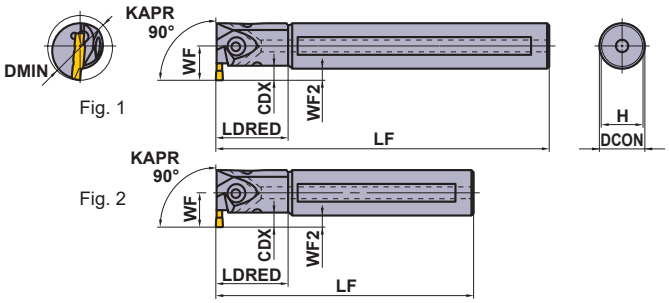


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX *3	DMIN	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	25	Mono Block	R	GYAR20K90A-E06	●	—	—	2
					L	GYAL20K90A-E06	●	—	—	2
				Mono Block	R	GYAR20Q90A-E06	●	—	—	1
					L	GYAL20Q90A-E06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-E06	●	—	—	2
					L	GYAL25K90B-E06	●	—	—	2
				Mono Block	R	GYAR25R90B-E06	●	—	—	1
					L	GYAL25R90B-E06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-E10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-E10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-E10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-E10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-E10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-E10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-E12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-E12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-E12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-E12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-E12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-E12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F116.
*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension **LDRED**.

● : **Inventory maintained in Japan.**

●Modular blade type (Air / coolant through)

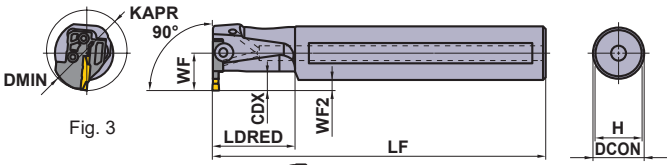


Fig. 3

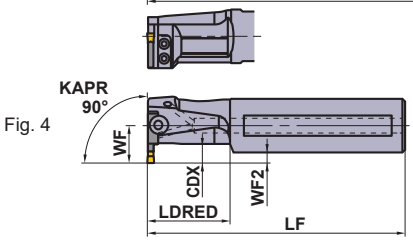


Fig. 4

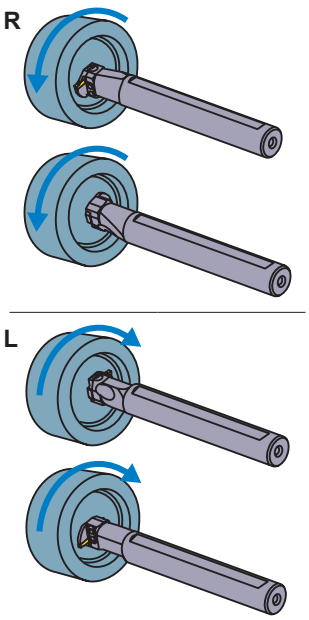
Right hand tool holder shown.

★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ★
GYAR/L20○90A-○06 GYAR/L25○90B-○06	①GY05016S (Clamp Torque : 5.0N·m)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
20	125	30	14.5	4.5	18	R
20	125	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
25	125	40	19	6.5	23	
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6	30	
32	140	50	22	6	30	
32	250	50	22	6	30	
32	250	50	22	6	30	
40	150	60	28	8	37	L
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	



Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○–Breaker shown below

For grooving/cutting off breaker ➢ F011, F012

Seat Size	Breaker / CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	GFGS (Hardened steel)
E	2.39mm	●	●	●		●
	2.50mm	●	●	●	●	●

For multifunctional grooving breaker ➢ F012, F013

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

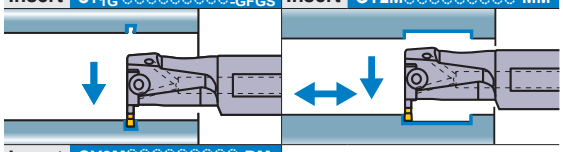
● : Standard insert with dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F117
CAUTION FOR USE ➢ F120

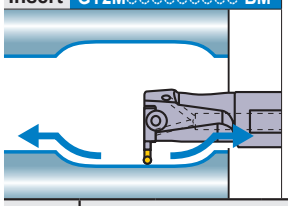
GY SERIES (INTERNAL GROOVING)

6 90° type holder

Insert GY2M□□□□□□□□□-GS/GM
Insert GY2G□□□□□□□□□-MF
Insert GY2M/2G□□□□□□□□□-GU/GL
Insert GY2M□□□□□□□□□-MS
Insert GY1M/1G□□□□□□□□□-GM/GFGS
Insert GY2M□□□□□□□□□-MM



Insert GY2M□□□□□□□□□-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

●Mono block type (Air / coolant through)

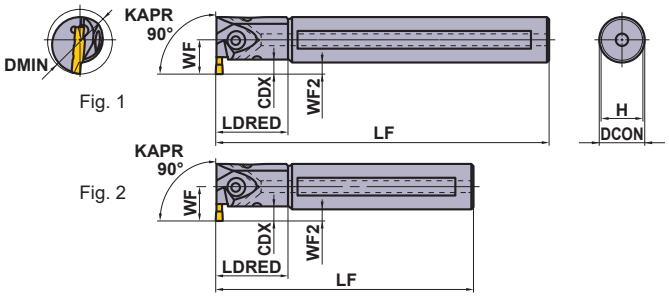


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX *3	DMIN	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	25	Mono Block	R	GYAR20K90A-F06	●	—	—	2
					L	GYAL20K90A-F06	●	—	—	2
				Mono Block	R	GYAR20Q90A-F06	●	—	—	1
					L	GYAL20Q90A-F06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-F06	●	—	—	2
					L	GYAL25K90B-F06	●	—	—	2
				Mono Block	R	GYAR25R90B-F06	●	—	—	1
					L	GYAL25R90B-F06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-F10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-F10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-F10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-F10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-F10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-F10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-F12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-F12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-F12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-F12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-F12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-F12	●	3
G	4.00 4.24	7	32	Mono Block	R	GYAR25K90B-G07	●	—	—	2
					L	GYAL25K90B-G07	●	—	—	2
				Mono Block	R	GYAR25R90B-G07	●	—	—	1
					L	GYAL25R90B-G07	●	—	—	1
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-G12	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-G12	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-G12	●	3
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-G12	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-G12	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-G12	●	3
		7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-G14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-G14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-G14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-G14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-G14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-G14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F116.
*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension **LDRED**.

● : **Inventory maintained in Japan.**

●Modular blade type (Air / coolant through)

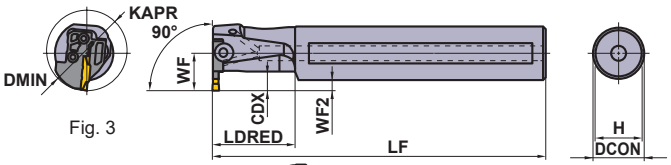


Fig. 3

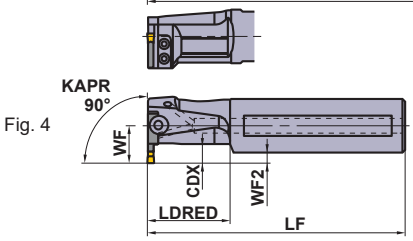


Fig. 4

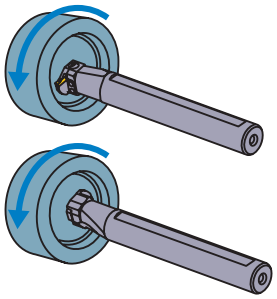
Right hand tool holder shown.

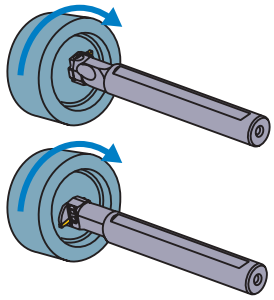
★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ★
GYAR/L20○90A-F06 GYAR/L25○90B-○○○	①GY05016S (Clamp Torque : 5.0N·m)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Dimensions (mm) ★2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
20	125	30	14.5	4.5	18	R
20	125	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
25	125	40	19	6.5	23	
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6	30	
32	140	50	22	6	30	
32	250	50	22	6	30	
32	250	50	22	6	30	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	
25	125	40	19	6.5	23	L
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6	30	
32	140	50	22	6	30	
32	250	50	22	6	30	
32	250	50	22	6	30	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	





Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium)	GFGS (Hardened steel)
F	3.00mm	●	●	●	●	●
	3.18mm	●	●	●		●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	Breaker CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

Seat Size	Geometry name
G	GY○○0400/0424G○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	Breaker CW	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	Breaker CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

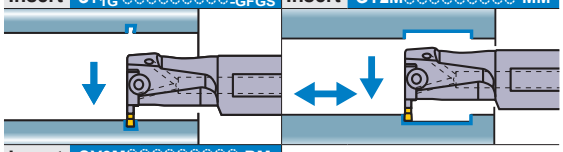
● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F117
CAUTION FOR USE ➤ F120

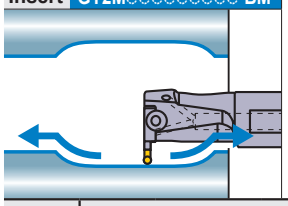
GY SERIES (INTERNAL GROOVING)

6 90° type holder

Insert GY2M○○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○○-MF
Insert GY2M○○○○○○○○○○-GU
Insert GY2M○○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○○-GM/GFGS
Insert GY2M○○○○○○○○○○-MM

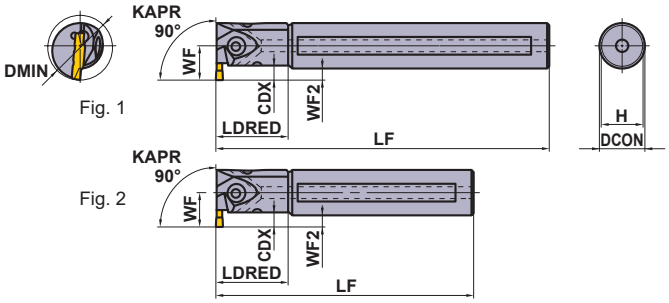


Insert GY2M○○○○○○○○○○-BM



Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.

●Mono block type (Air / coolant through)



Right hand tool holder shown.

Seat Size	Dimensions (mm) CW	CDX *3	DMIN	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	7	32	Mono Block	R	GYAR25K90B-H07	●	—	—	2
					L	GYAL25K90B-H07	●	—	—	2
				Mono Block	R	GYAR25R90B-H07	●	—	—	1
					L	GYAL25R90B-H07	●	—	—	1
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-H12	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-H12	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-H12	●	3
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-H12	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-H12	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-H12	●	3
		7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-H14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-H14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-H14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-H14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-H14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-H14	●	3
J	6.00 6.31 6.35	7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-J14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-J14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-J14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-J14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-J14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-J14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F116.
*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension **LDRED**.

● : **Inventory maintained in Japan.**

●Modular blade type (Air / coolant through)

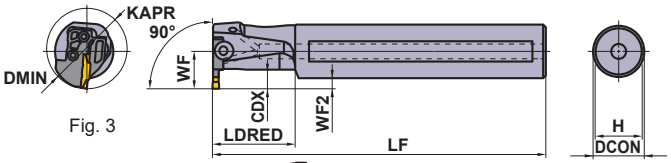


Fig. 3

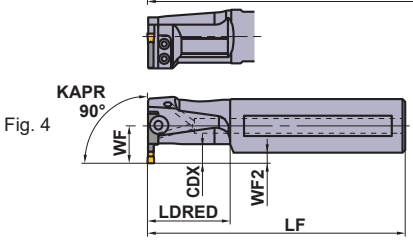


Fig. 4

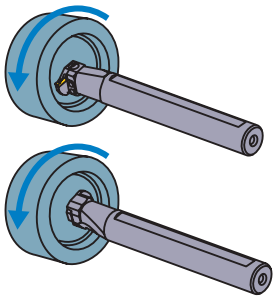
Right hand tool holder shown.

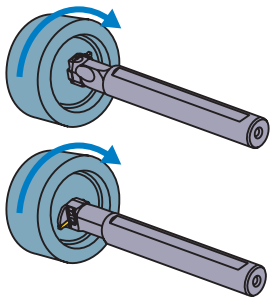
★ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ★
GYAR/L25○90B-○07	①GY05016S (Clamp Torque : 5.0N·m)	–	①TKY20R
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ★2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
25	125	40	19	6.5	23	R
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6	30	
32	140	50	22	6	30	
32	250	50	22	6	30	
32	250	50	22	6	30	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
40	150	60	28	8	37	
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	
40	150	60	28	8	37	L
40	150	60	28	8	37	
40	300	60	28	8	37	
40	300	60	28	8	37	
50	170	80	34	9	47	
50	170	80	34	9	47	
50	300	80	34	9	47	
50	300	80	34	9	47	





Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○–Breaker shown below

For grooving/cutting off breaker ➤ F011, F012

Seat Size	CW \ Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	6.00mm	●	●	●	
	6.35mm	●	●	●	

For multifunctional grooving breaker ➤ F012, F013

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball nose
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			

● : Standard insert with dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F117
CAUTION FOR USE ➤ F120

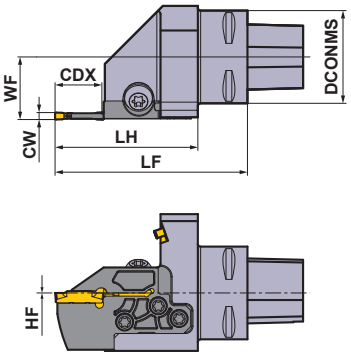
GY SERIES (EXTERNAL / FACE GROOVING)

PSC 00° type holder NEW

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Difficult-to-Cut Materials	Hardened Steel





Right hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM00-M25R	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM00-M25L	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM00-M25R	●	R	External	PSC50	50	2.0—6.35
C5-GYHELM00-M25L	●	L	External	PSC50	50	2.0—6.35
C6-GYHERM00-M25R	●	R	External	PSC63	63	2.0—6.35
C6-GYHELM00-M25L	●	L	External	PSC63	63	2.0—6.35

Set Dimensions with Modular Blades

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM00-M25R/L	GYM25R/L○-D06	2.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D12	2.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D20	2.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E06	2.5	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E12	2.5	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E20	2.5	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F06	3.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F12	3.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F20	3.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G08	4.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G14	4.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G25	4.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H08	5.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H14	5.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H25	5.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J08	6.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J14	6.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J25	6.0	25	27.0	0	88	66.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ Select the inserts and recommended conditions from "TOOL NEWS B255J-G GYGW Inserts".

● : Inventory maintained in Japan.

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM00-M25R/L	**GYM25R/L○-D06**	2.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-D12**	2.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-D20**	2.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-E06**	2.5	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-E12**	2.5	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-E20**	2.5	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-F06**	3.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-F12**	3.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-F20**	3.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-G08**	4.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-G14**	4.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-G25**	4.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-H08**	5.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-H14**	5.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-H25**	5.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-J08**	6.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-J14**	6.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	**GYM25R/L○-J25**	6.0	25	35.0	0	88	66.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-D06**	2.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-D12**	2.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-D20**	2.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-E06**	2.5	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-E12**	2.5	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-E20**	2.5	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-F06**	3.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-F12**	3.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-F20**	3.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-G08**	4.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-G14**	4.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-G25**	4.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-H08**	5.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-H14**	5.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-H25**	5.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-J08**	6.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-J14**	6.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	**GYM25R/L○-J25**	6.0	25	45.0	0	90	66.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255J-G GYGW Inserts".

SPARE PARTS

 *		 *							
Clamp Screw		Blade Screw		Plug		Nozzle		Wrench 1	Wrench 2
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (N • m) : GY06013M=6.0, TS55=5.0
Nozzle Exchange Key : NZKH050S

IDENTIFICATION ➢ F010
INSERTS ➢ F011—F013
CUTTING CONDITIONS ➢ F100, F110
CAUTION FOR USE ➢ F106, F112

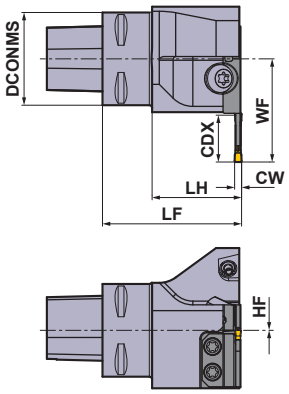
GY SERIES (EXTERNAL / FACE GROOVING)

PSC 90° type holder NEW

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S Difficult-to-Cut Materials | H Hardened Steel

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.





Left hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM90-M25L	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM90-M25R	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM90-M25L	●	R	External	PSC50	50	2.0—6.35
C5-GYHELM90-M25R	●	L	External	PSC50	50	2.0—6.35
C6-GYHERM90-M25L	●	R	External	PSC63	63	2.0—6.35
C6-GYHELM90-M25R	●	L	External	PSC63	63	2.0—6.35

Set Dimensions with Modular Blades

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM90-M25L/R	GYM25L/R○-D06	2.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-D12	2.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-D20	2.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E06	2.5	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E12	2.5	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E20	2.5	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F06	3.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F12	3.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F20	3.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G08	4.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G14	4.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G25	4.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H08	5.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H14	5.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H25	5.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J08	6.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J14	6.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J25	6.0	25	49.5	0	60	38.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ Select the inserts and recommended conditions from "TOOL NEWS B255J-G GYGW Inserts".

● : Inventory maintained in Japan.

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D06**	2.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D12**	2.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D20**	2.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E06**	2.5	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E12**	2.5	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E20**	2.5	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F06**	3.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F12**	3.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F20**	3.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G08**	4.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G14**	4.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G25**	4.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H08**	5.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H14**	5.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H25**	5.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J08**	6.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J14**	6.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J25**	6.0	25	52.0	0	60	38.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D06**	2.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D12**	2.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D20**	2.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E06**	2.5	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E12**	2.5	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E20**	2.5	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F06**	3.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F12**	3.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F20**	3.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G08**	4.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G14**	4.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G25**	4.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H08**	5.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H14**	5.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H25**	5.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J08**	6.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J14**	6.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J25**	6.0	25	59.0	0	70	46.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255J-G GYGW Inserts".

SPARE PARTS

 *		 *							
Clamp Screw		Blade Screw		Plug		Nozzle		Wrench 1	Wrench 2
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (N • m) : GY06013M=6.0, TS55=5.0
Nozzle Exchange Key : NZKH050S

IDENTIFICATION ➤ F010
INSERTS ➤ F011—F013
CUTTING CONDITIONS ➤ F100, F110
CAUTION FOR USE ➤ F106, F112

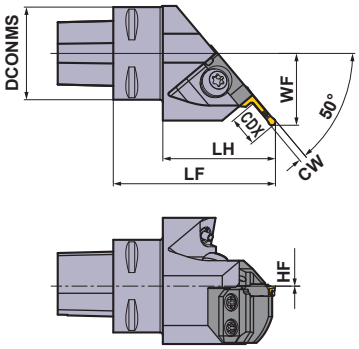
GY SERIES (FOR RECESSING)

PSC For 50° recessing holder NEW

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S Difficult-to-Cut Materials | H Hardened Steel

Note 1) Please order the modular blade and modular holder separately.
Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.





Left hand tool holder shown.

(mm)

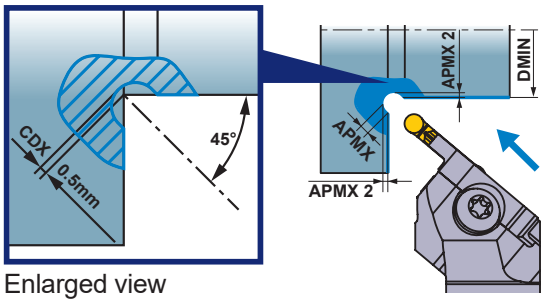
Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM50-M25L	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM50-M25R	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM50-M25L	●	R	External	PSC50	50	2.0—6.35
C5-GYHELM50-M25R	●	L	External	PSC50	50	2.0—6.35
C6-GYHERM50-M25L	●	R	External	PSC63	63	2.0—6.35
C6-GYHELM50-M25R	●	L	External	PSC63	63	2.0—6.35

SPARE PARTS

 * Clamp Screw		 * Blade Screw		 Plug		 Nozzle		 Wrench 1	 Wrench 2
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	4	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (N • m) : GY06013M=6.0, TS55=5.0
Nozzle Exchange Key : NZKH050S

● : Inventory maintained in Japan.



Enlarged view

Set Dimensions with Modular Blades

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	DMIN	APMX	APMX2	WF	HF	LF	LH
C4-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	30.6	0	70.2	48.8
C4-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	30.8	0	70.1	48.7
C4-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	31.0	0	70.0	48.6
C4-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	31.4	0	69.8	48.4
C4-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	31.8	0	69.6	48.2
C4-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	32.4	0	69.4	48.0
C5-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	32.6	0	70.2	48.8
C5-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	32.8	0	70.1	48.7
C5-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	33.0	0	70.0	48.6
C5-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	33.4	0	69.8	48.4
C5-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	33.8	0	69.6	48.2
C5-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	34.4	0	69.4	48.0
C6-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	39.6	0	70.2	46.8
C6-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	39.8	0	70.1	46.7
C6-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	40.0	0	70.0	46.6
C6-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	40.4	0	69.8	46.4
C6-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	40.8	0	69.6	46.2
C6-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	41.4	0	69.4	46.0

DMIN = Minimum cutting diameter

Note 1) The indicated dimensions are values for standard inserts (BM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from “TOOL NEWS B255J-G GYGW Inserts”.

IDENTIFICATION ➤ F010
INSERTS ➤ F013
CUTTING CONDITIONS ➤ F105
CAUTION FOR USE ➤ F105

RECOMMENDED CUTTING SPEED [For External Grooving / Cutting Off]

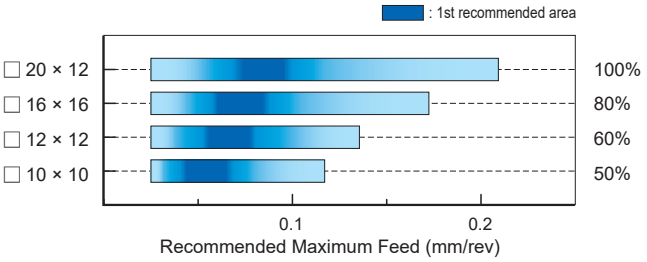
	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min) 50 100 150 200 250 300 500
P	Mild Steel	≤160HB	VP20RT	100–220
			VP10RT	110–230
			NX2525	90–210
	Carbon Steel Alloy Steel	160–280HB	VP20RT	80–180
			VP10RT	90–190
			MY5015	110–250
			NX2525	70–170
		≥280HB	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
			NX2525	55–135
M	Stainless Steel	≤270HB	VP20RT	60–140
			VP10RT	70–150
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	80–180
			VP10RT	90–190
			MY5015	140–300
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	40–100
			MP9025	30–90
			VP20RT	30–60
			VP10RT/ RT9010	40–70
H	Hardened Steel	≥50HRC	BC8110	80–120
N	Aluminium Alloys (A6061, 7075)	Content Si<5%	RT9010	200–500
	Aluminium Alloys (AC4B)	Content 5%≤Si≤10%	RT9010	200–500
	Aluminium Alloys (ADC12, A390)	Content Si>10%	RT9010	100–200

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For External Grooving / Cutting Off]

Recommended cutting conditions when combining a GYHR/L2525M00/90-M25R/L modular holder and GYM25R/LA-○○○ modular blade.

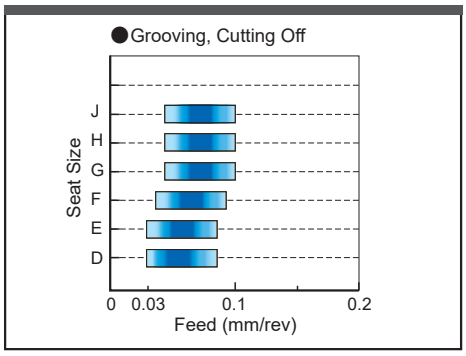
■ In the case of mono block type holder for Swiss style lathes



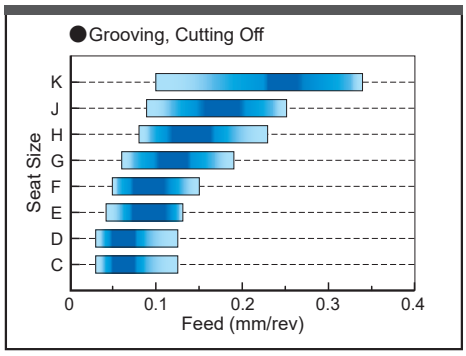
Please refer to the tables above on recommended cutting conditions for external grooving and cutting off.
Apply the percentage ratio shown on each shank size with the values in the table.

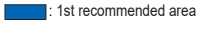
■ Recommended feed rate and depth of cut

GU BREAKER

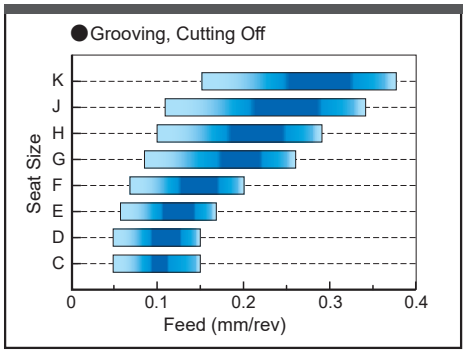


GS BREAKER

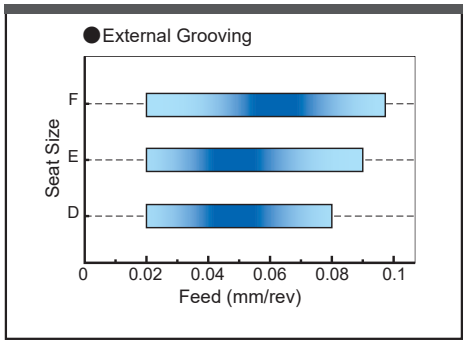




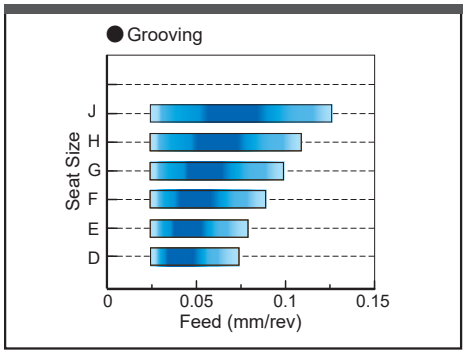
GM BREAKER



GL BREAKER

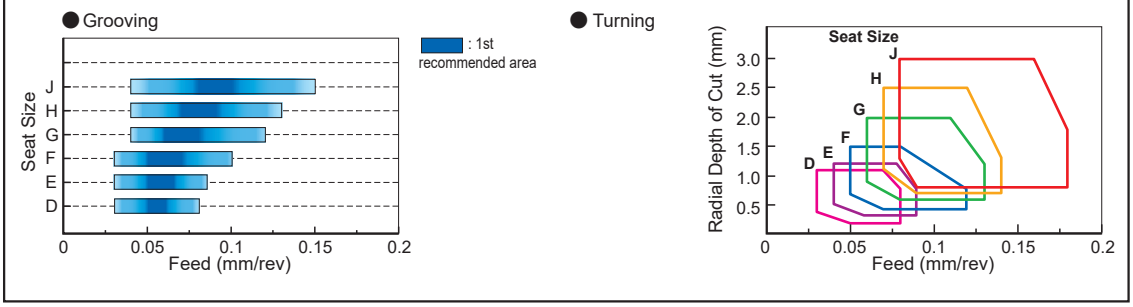


FLAT TOP GFGS (CBN)



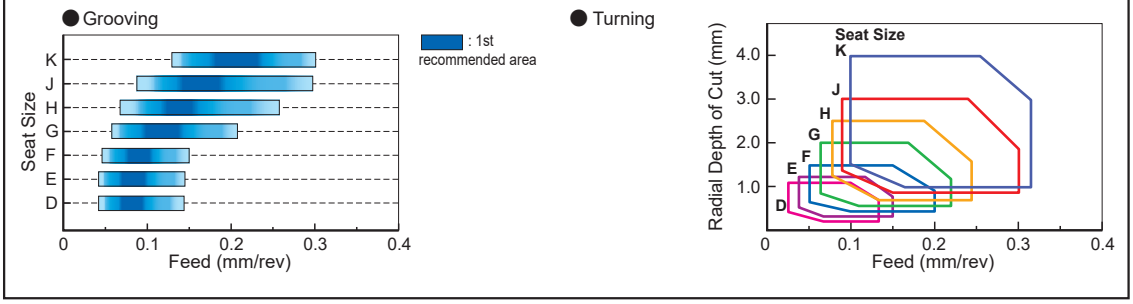
	Seat Size
	Insert Width (mm)
C	1.50
D	2.00 2.24
E	2.39 2.50 2.74
F	3.00 3.18 3.24
G	4.00 4.24
H	4.75 5.00 5.24
J	6.00 6.31 6.35
K	8.00

MF BREAKER

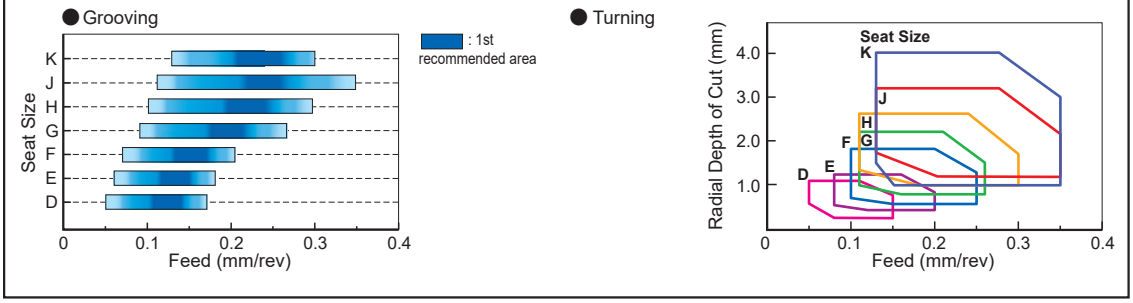


Seat Size	Insert Width (mm)
D	2.00 2.24
E	2.39 2.50 2.74
F	3.00 3.18 3.24
G	4.00 4.24
H	4.75 5.00 5.24
J	6.00 6.31 6.35
K	8.00

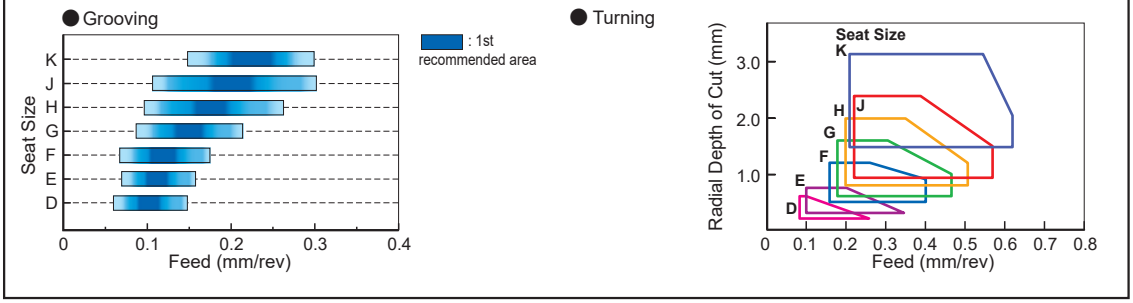
MS BREAKER



MM BREAKER

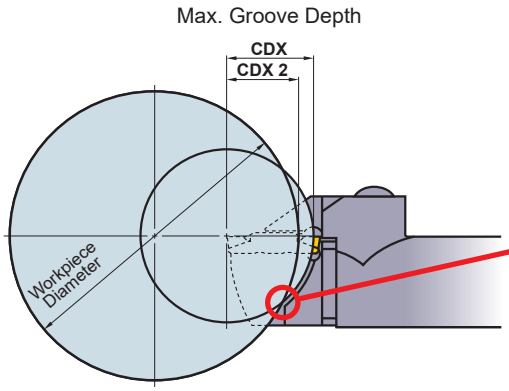


BM BREAKER



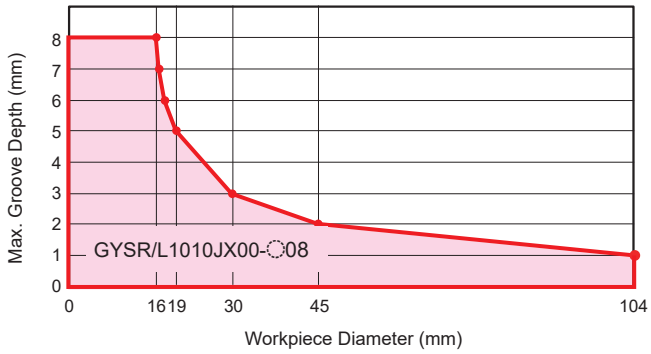
LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

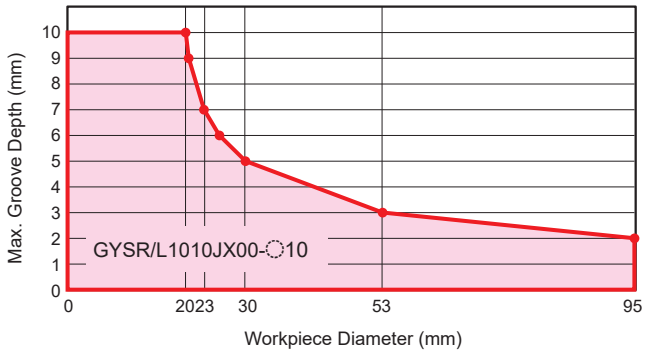
The maximum groove depth is limited by the workpiece diameter.



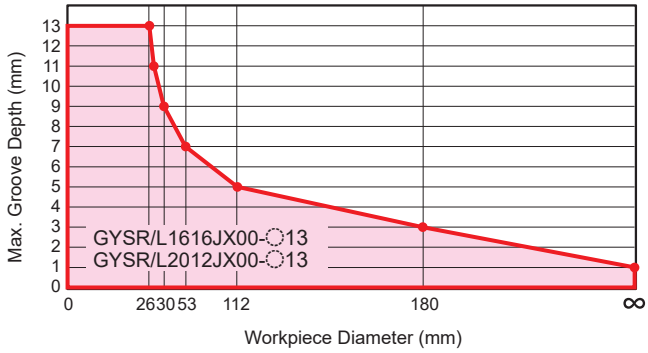


Due to interference, the maximum groove depth is limited by the workpiece diameter.

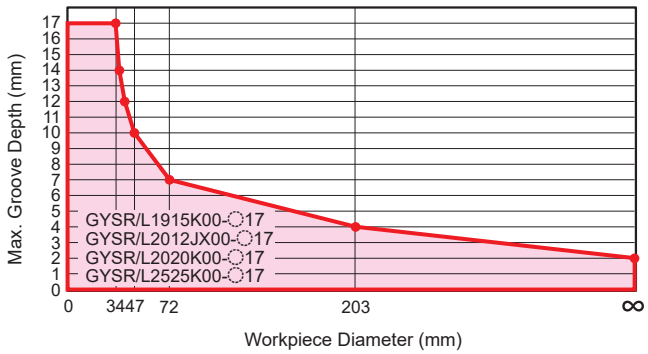








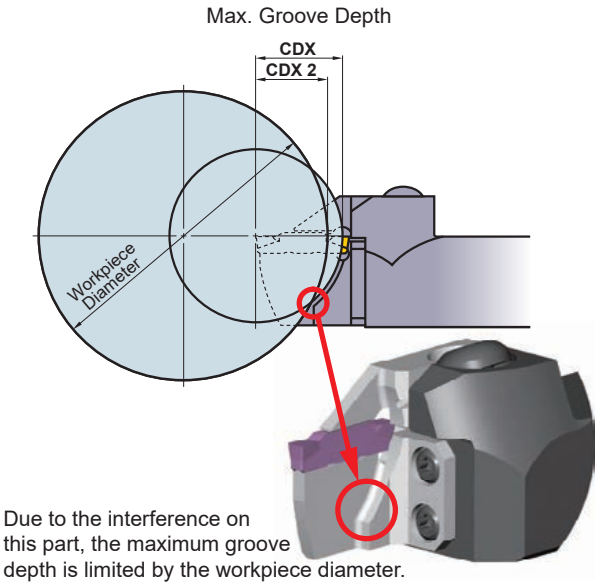


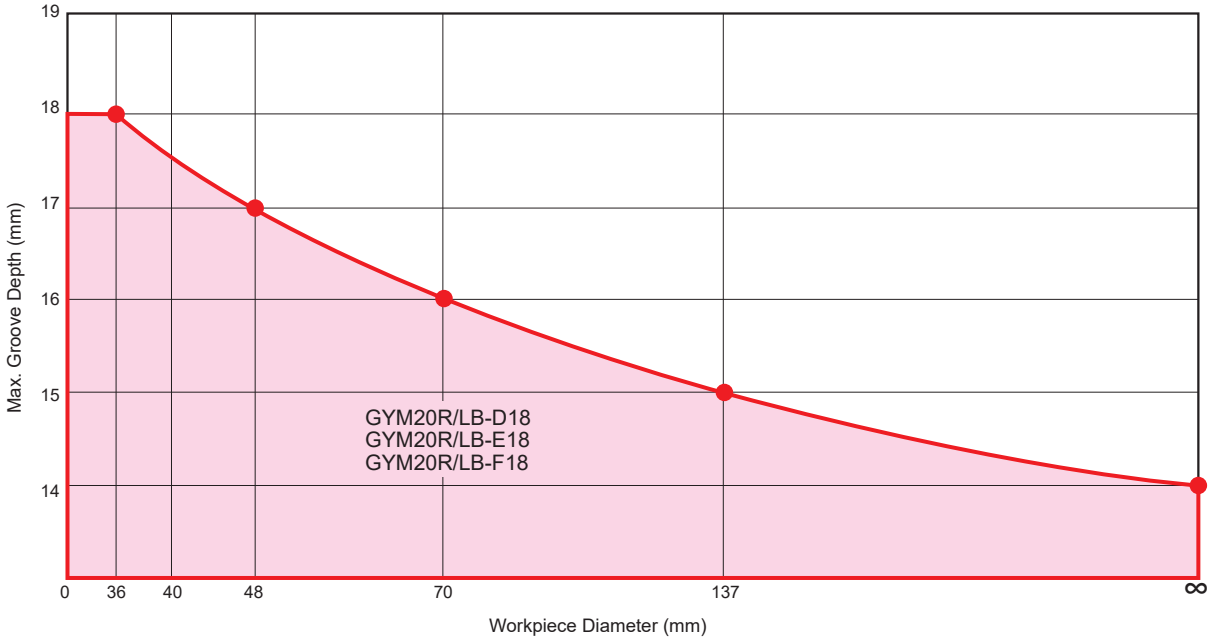


LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

•When using the modular blade GYM○○R/LA-○○○
The maximum groove depth is not limited by the workpiece diameter.

•When using the modular blade GYM○○R/LB-○○○
The maximum groove depth is limited by the workpiece diameter.





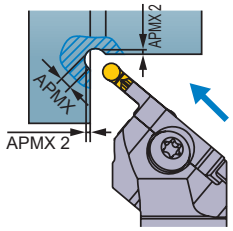
RECOMMENDED CUTTING SPEED [For External Recessing]

	Workpiece Material	Hardness	Grade	Cutting Speed vc (m/min)
P	Mild Steel	≤180HB	VP20RT	80–180
			VP10RT	90–190
	Carbon Steel Alloy Steel	180–280HB	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
			NX2525	55–135
	Carbon Steel Alloy Steel	280–350HB	VP20RT	50–110
			VP10RT	60–120
			MY5015	80–160
			NX2525	45–105
M	Stainless Steel	≤350HB	VP20RT	50–110
			VP10RT	60–120
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	50–110
			VP10RT	60–120
			MY5015	80–160
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	40–100
			MP9025	30–90
			VP20RT	30–60
			VP10RT	40–70

Cutting Speed vc (m/min): 50, 100, 150, 200, 250

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

DISTANCE FROM WORK SURFACE TO RECESS DEPTH

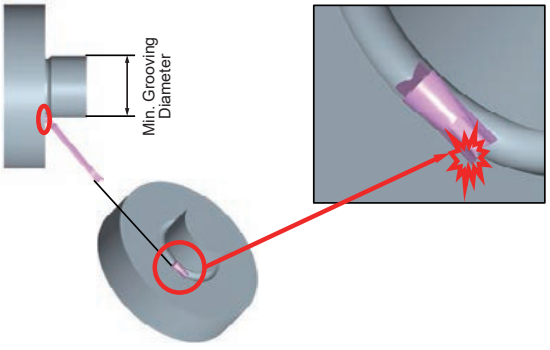


Cutting Width CW (mm)	Recess Depth APMX (mm)	Distance from Work Surface to Recess Depth APMX 2 (mm)
2.00	1.50	0.646
2.50	1.75	0.720
3.00	2.00	0.793
3.18	2.09	0.819
4.00	2.50	0.939
4.75	2.88	1.049
5.00	3.00	1.086
6.00	3.50	1.232
6.35	3.68	1.283

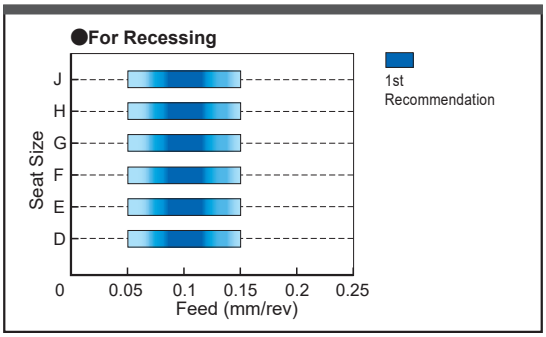
BM BREAKER

Minimum grooving diameter

Ensure the tool is suitable for the diameter being machined. Refer to the Min. Grooving Diameter as shown in the table on the “page number” to avoid a collision with the workpiece shown below.



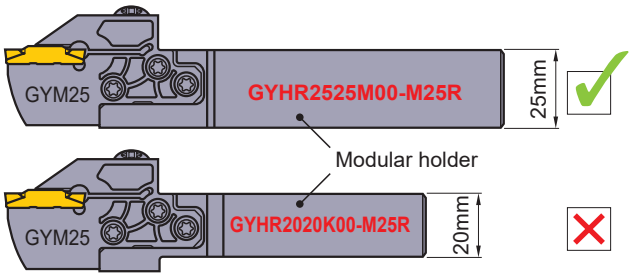
■Recommended feed rate and depth of cut



TOOL SELECTION

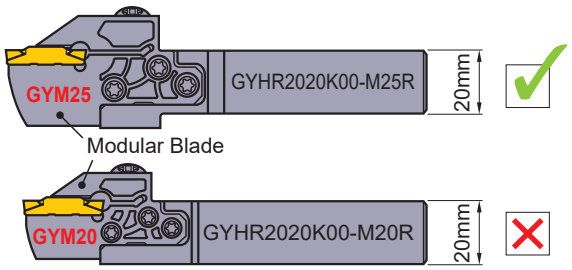
Notes when selecting the tool body

Precautions when selecting a modular holder.



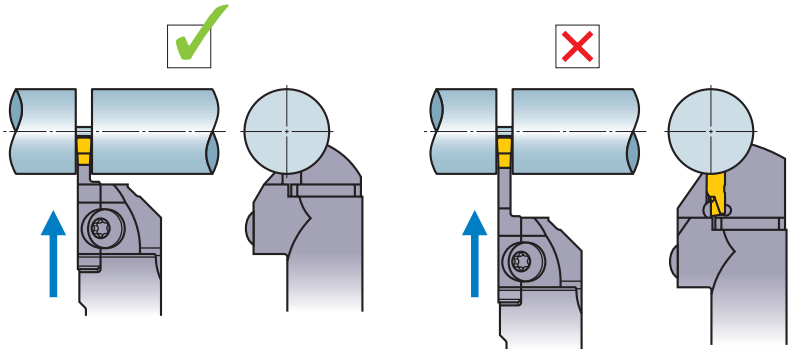
●Select a modular holder with the largest possible shank size to maintain mounting rigidity.

Modular blade (1)



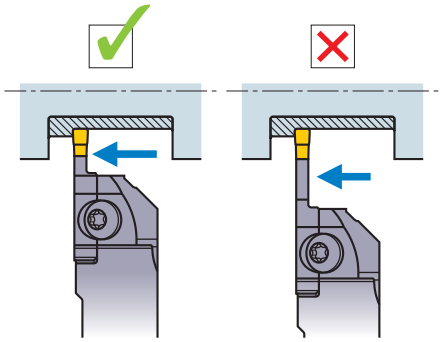
●If there is no restriction for use, select the largest modular blade for the same shank size.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

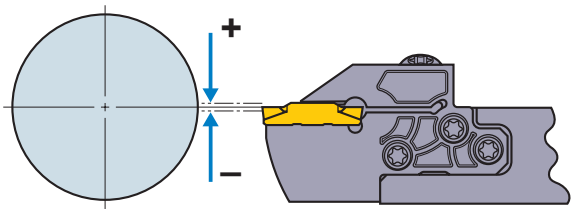
Modular blade (3)



●Select the shortest possible blade suitable for the application.

Notes when setting the tool

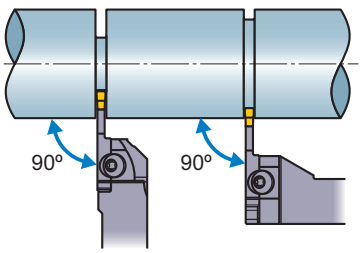
Setting of cutting edge height



<Grooving/Cross-feed machining>
Set the cutting edge height to ±0.1mm parallel to the central axis.

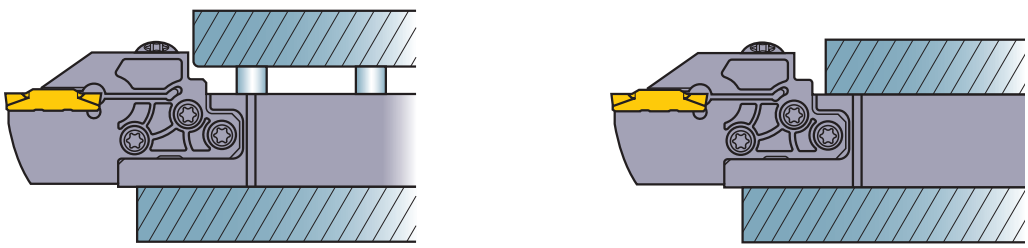
<Cutting off>
Set the cutting edge height to 0–+0.2mm parallel to the central axis.

Tool body setting angle



●Set the insert perpendicular to the central axis.

Overhang

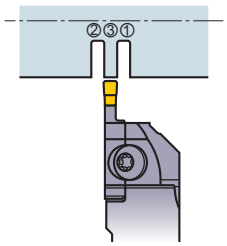


●When setting the tool, ensure that the overhang is as short as possible and avoid the step difference part as above figure shows.

MACHINING RECOMMENDATIONS

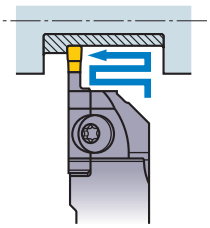
Notes on multi-functional machining (MF, MS and MM breakers)

Machining narrow grooves



●It is recommended to carry out plunging in several passes. Following the steps above makes it difficult for chips to elongate. This also improves the accuracy of workpiece wall surface.

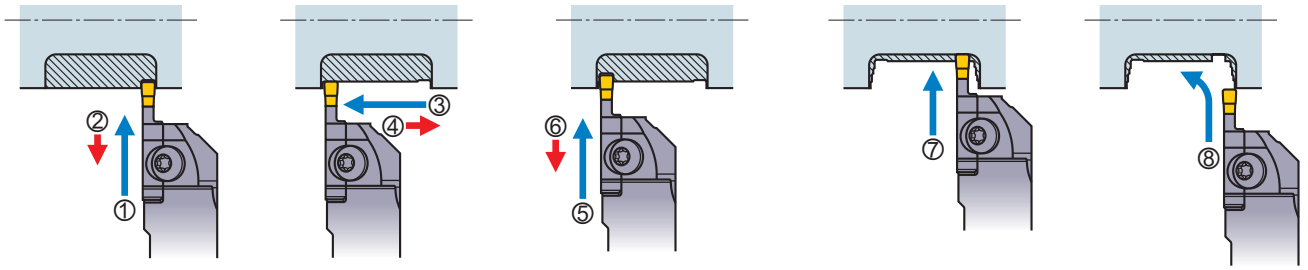
Machining wide grooves



●It is recommended that cross-feed machining is used.

Machining wide grooves

ROUGHING **FINISHING**



①Carry out grooving.
②Retract the tool approx 0.1mm.

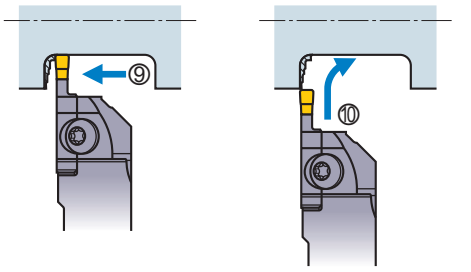
③Carry out cross feed machining.
④Retract the tool approx 0.1mm.

⑤Carry out grooving.
⑥Retract the tool approx 0.1mm.
* Repeat the steps ①–⑥.

⑦Carry out grooving to the end point of the corner radius.

⑧Machining of the wall surface, corner radius and bottom face should be carried out in one process.

FINISHING

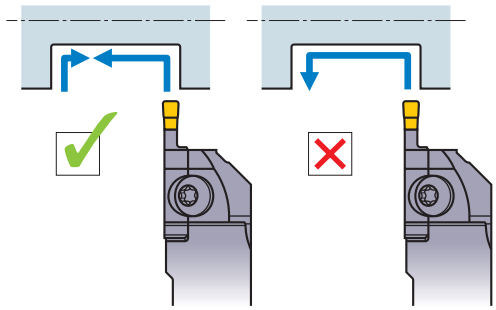


⑨Stop at the bottom of the corner radius.

⑩Machine the counter wall to the corner radius in one process.

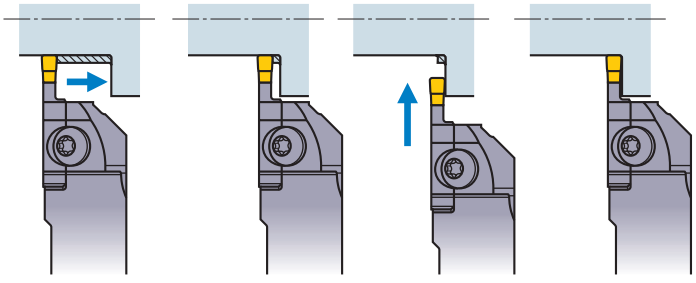
⑪Finish machining.

Precautions when finishing walls



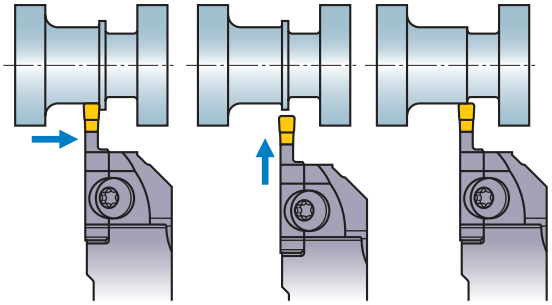
●To produce high accuracy walls using MS or MM breaker insert, do not carry out back turning. Plunging is recommended.

Wall machining



●When machining a wall, chip jamming can occur. In this case, stop cross feed machining just before the wall (at a point less than the insert width) then remove the remaining material by plunging.

Machining of a ring section

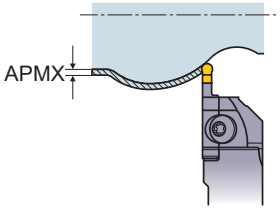


●When a ring remains in a cross feed end process, finish cross feed machining 1–1.5mm short of the end point, then remove the ring by plunging.

MACHINING RECOMMENDATIONS

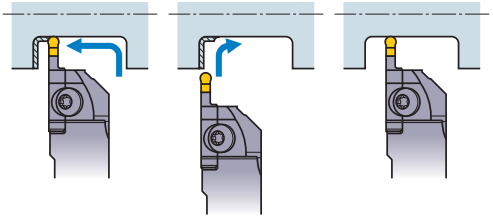
Notes on multi-functional machining (BM breaker)

Copying



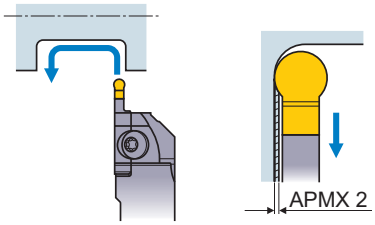
●With the BM breaker insert, 3 dimensional copying is possible.
Set the depth of cut (APMX) to 40% less than the insert width.

Roughing



●Use plunging and cross-feed machining.
When machining the corner, vibration is likely to occur.
To avoid this, reduce the feed by 50%.

Finishing



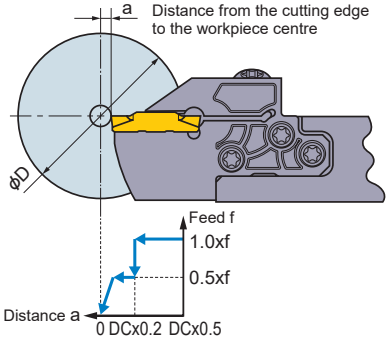
●Carry out finishing in one process.
For the depth of cut (APMX 2) when back turning, refer to the table on the right.

Insert	APMX 2 (mm)
GY2M0200D100N-BM	0.05
GY2M0250E125N-BM	0.10
GY2M0300F150N-BM	0.15
GY2M0318F159N-BM	
GY2M0400G200N-BM	0.20
GY2M0475H238N-BM	0.24
GY2M0500H250N-BM	
GY2M0600J300N-BM	0.30
GY2M0635J318N-BM	
GY2M0800K400N-BM	0.40

Notes for cutting off

Feed

<Feed>

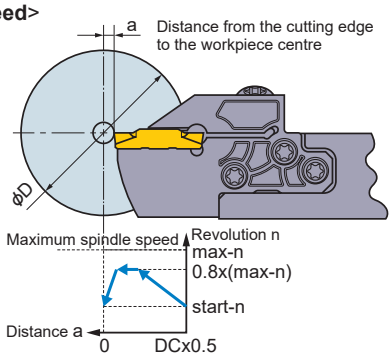


●When the cutting edge approaches the centre, reduce the feed by 50%.

●If necessary, stop the feed prior to reaching the centre of the workpiece to prevent it falling under its own weight.

Revolution

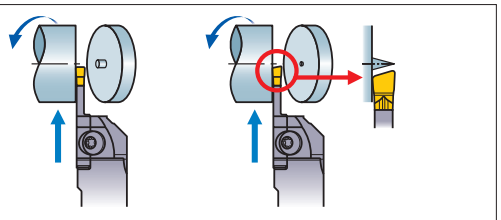
<Spindle speed>

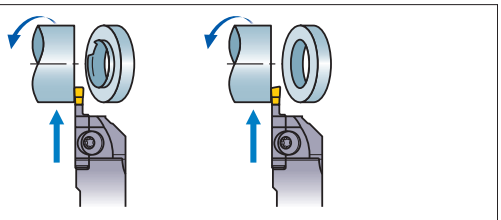


●When using constant cutting speed during a cutting off cycle, it is recommended to limit the spindle speed to 80% of maximum to ensure stability.

●To prevent the workpiece from being expelled, lower the spindle speed before finishing the grooving operation.

Insert

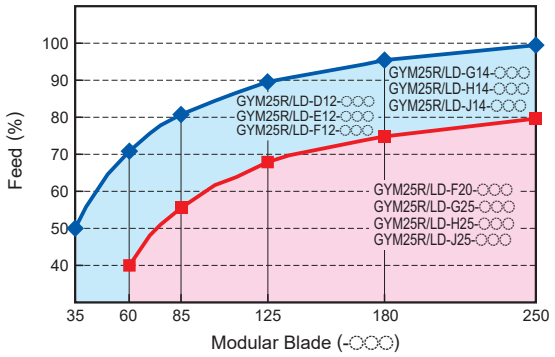




●When there is a centre stub on solid bar work or burrs are formed on pipe material, it is possible to decrease them by using a handed insert.
With a handed insert, machining tends to be less stable when compared to using a neutral insert.
Pay special attention to avoid fracturing of the cutting edge and decrease the feed when necessary.

Memo

RELATIONSHIP BETWEEN THE MODULAR BLADE AND FEED PER ROTATION [For Face Grooving]



Note 1) Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

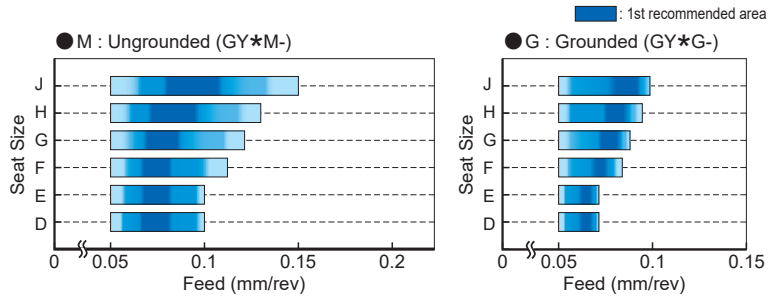
RECOMMENDED CUTTING SPEED [For Face Grooving]

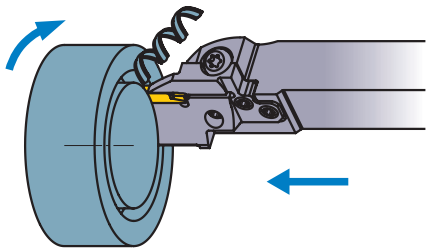
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min) 50 100 150 200 250 300
P	Mild Steel	≤160HB	VP20RT	80 – 180
			VP10RT	90 – 190
			NX2525	70 – 170
	Carbon Steel Alloy Steel	160–280HB	VP20RT	60 – 140
			VP10RT	70 – 150
			MY5015	90 – 210
			NX2525	55 – 135
		≥280HB	VP20RT	50 – 110
			VP10RT	60 – 120
			MY5015	80 – 160
			NX2525	45 – 105
M	Stainless Steel	≤270HB	VP20RT	50 – 110
			VP10RT	60 – 120
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	60 – 140
			VP10RT	70 – 150
			MY5015	90 – 210
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	50 – 110
			VP10RT	60 – 120
			MY5015	80 – 160
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	40 – 100
			MP9025	30 – 90
			VP20RT	30 – 60
			VP10RT	40 – 70
			RT9010	40 – 70
H	Hardened Steel	≥50HRC	BC8110	60 – 120

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

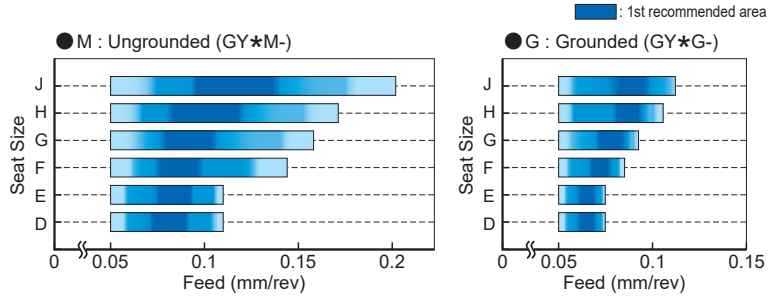
RECOMMENDED CUTTING CONDITIONS [For Face Grooving]

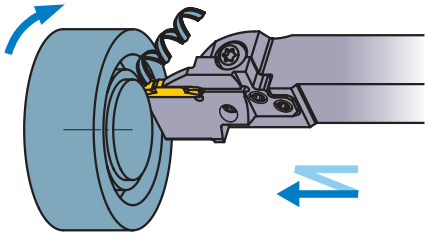
GROOVING





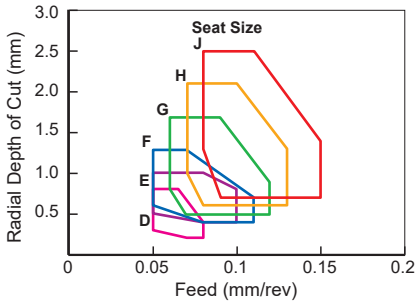
PLUNGING





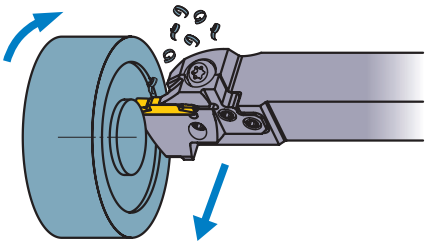
✱ After the 1st plunge, the width of cut should be set narrower than insert with CW.

TRAVERSE MACHINING (MF BREAKER)

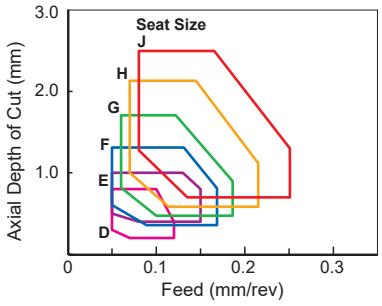


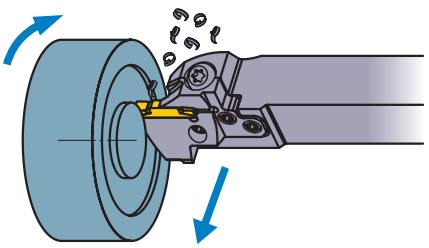
Seat Size	Insert Width (mm)
D	2.00 2.24
E	2.39 2.50 2.74
F	3.00 3.18 3.24

Seat Size	Insert Width (mm)
G	4.00 4.24
H	4.75 5.00 5.24
J	6.00 6.31 6.35

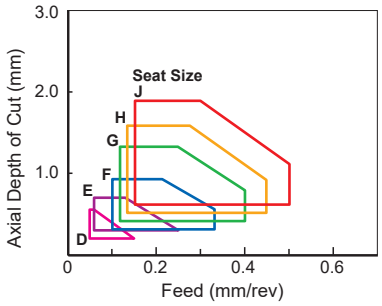


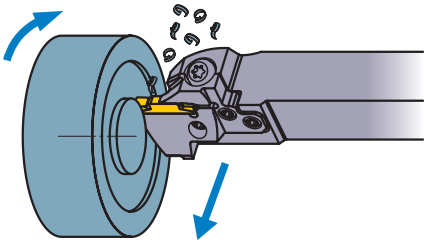
TRAVERSE MACHINING (MM/MS BREAKER)





TRAVERSE MACHINING (BM BREAKER)



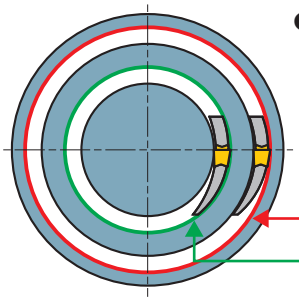


Note 1) GL chip breaker is not recommended for face grooving.

TOOL SELECTION

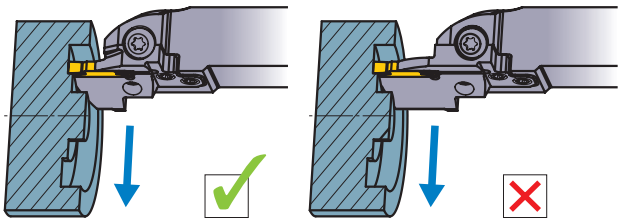
Notes when selecting the tool body

Modular blade (1)



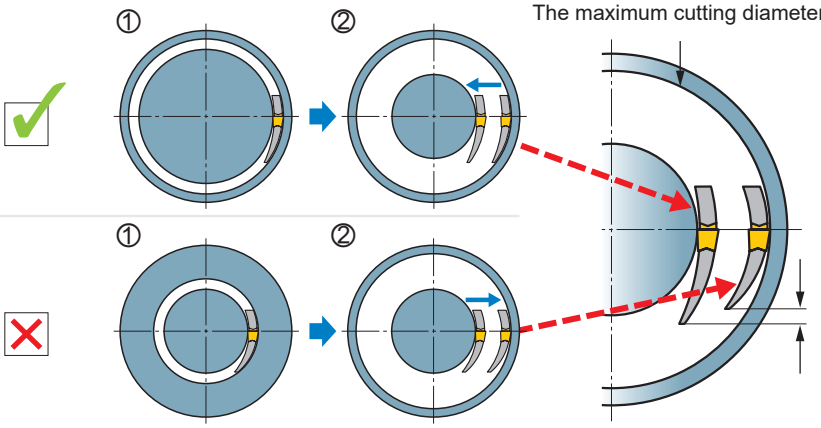
●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of DAXN minimum and DAXX maximum that are described in the table of dimensions.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

Modular blade (3)



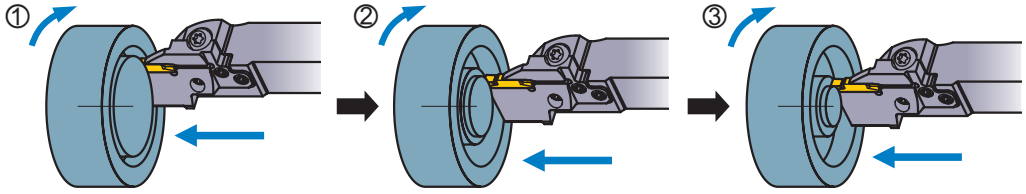
●Select the largest size blade within the maximum cutting diameter of the workpiece.

●Machine from the outer diameter towards the centre.

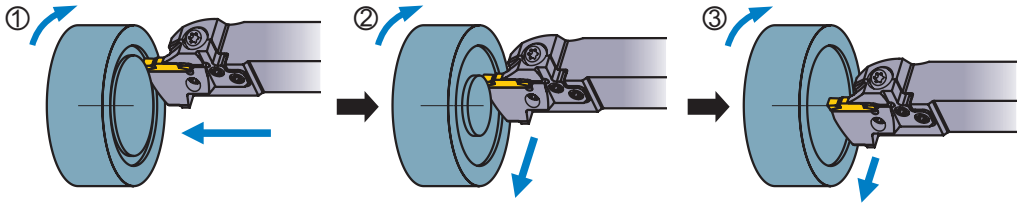
●Increased machining stability and rigidity is possible if a modular blade with the largest possible back metal is used.

At first machine the maximum cutting diameter, there is no restriction in the cutting diameter on the remaining process.

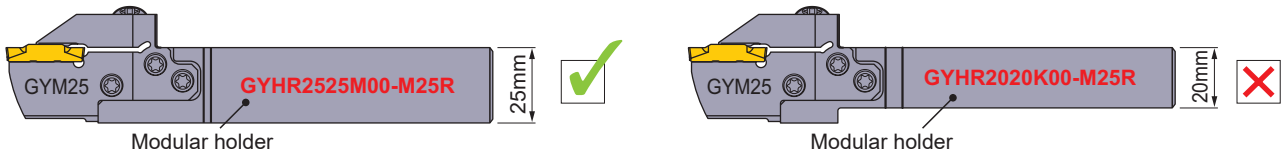
●When plunging in several passes.



●When combining plunging and infeed machining.



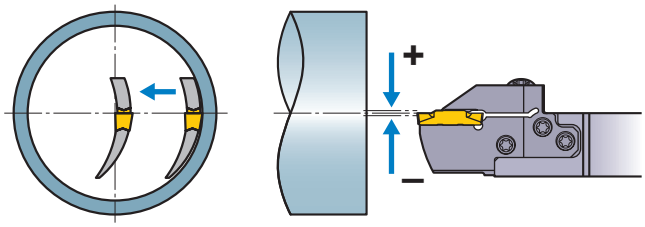
Precautions when selecting a modular holder.



●Select a modular holder with the largest possible shank size to maintain mounting rigidity.

Notes when setting the tool

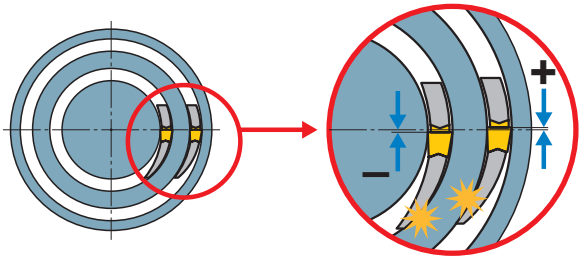
Setting the cutting edge height



●Set the cutting edge height to ±0.1mm parallel to the central axis.

●Cutting edge centre height check should be done by traverse machining towards the centre with a very small depth of cut and ensure that an even surface and no material remains at the centre point afterwards.

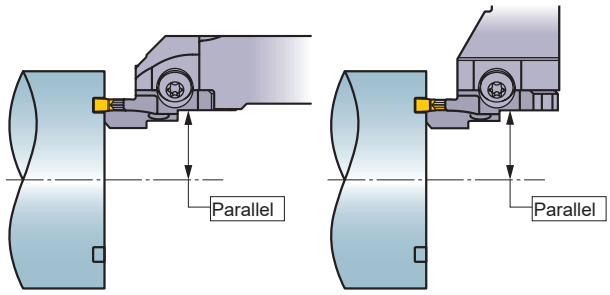
When interfering the wall of groove and the Modular blade



●If interference occurs even when the correct blade is used, the cutting edge height could be incorrect.

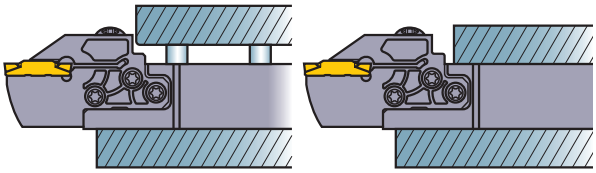
When interference occurs on the inner side of the blade, the cutting edge height is set too high.
When interference occurs on the outer side of the blade, the cutting edge height is set too low.

Setting the tool



●Set the insert parallel to the central axis.

Tool overhang



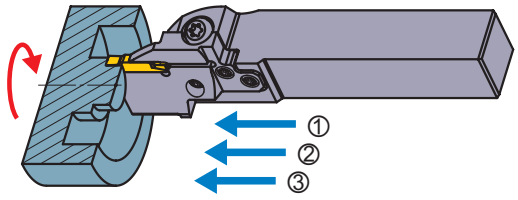
●When setting the tool, ensure that the overhang is as short as possible and avoid the step difference part as above figure shows.

MACHINING RECOMMENDATIONS

Notes when face grooving

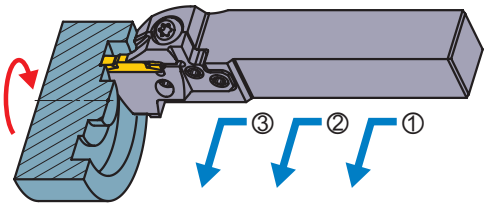
●**Always machine from the outer diameter towards the centre.**

Machining narrow grooves



●Plunging in several passes is recommended.

Machining wide grooves

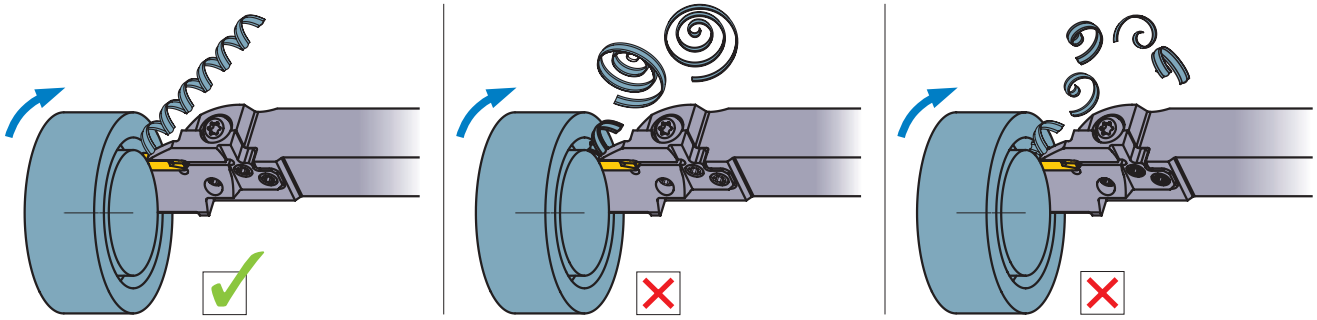


●Cross feed machining is recommended.

MACHINING RECOMMENDATIONS

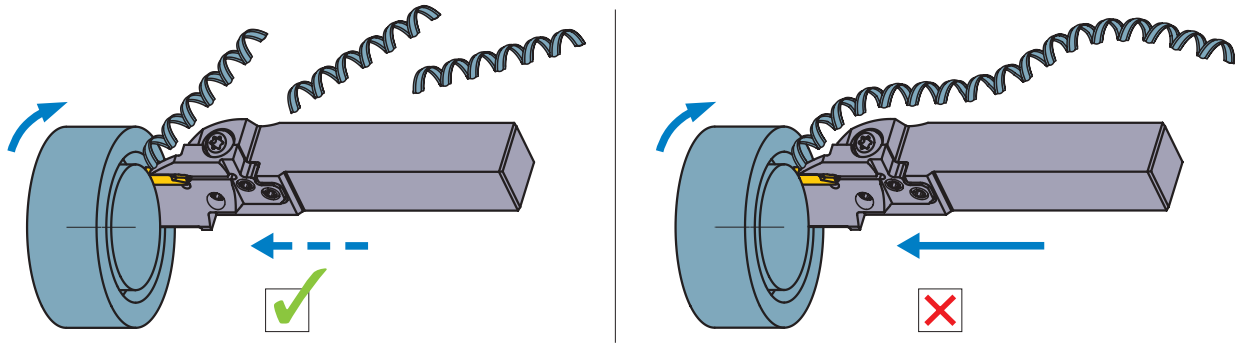
Notes when face grooving

Notes on the first pass (1)



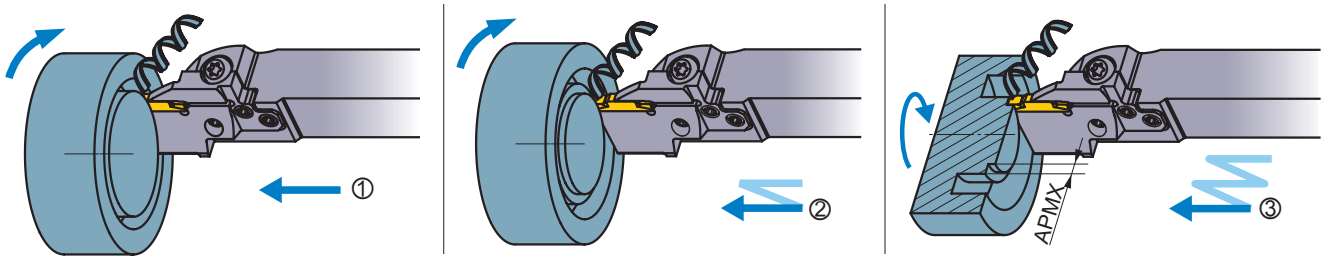
●During the first face grooving pass it is difficult to disperse broken chips and can lead to problems such as a chipped insert. Maintain longer chips that disperse easily by decreasing the feed per rotation.

Notes on the first pass (2)



●When chips become too long, use peck feed to break them into a suitable length.

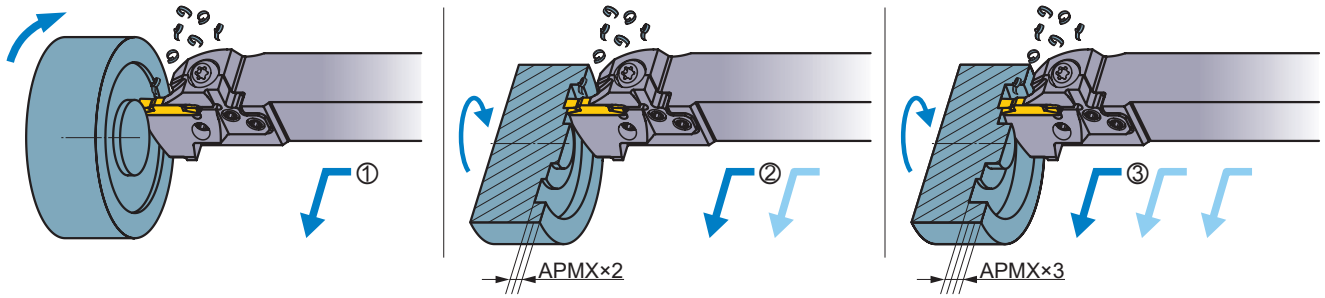
Notes when wide face grooving by plunging in several passes



●When machining a face groove in several passes, machine from the outer diameter towards the centre so that space for discharging chips is created to prevent insert damage caused by chip jamming.

●Plunging width of cut is recommended to be set at 60 - 80% of the insert width. This enhances the effect of the chip breaker by enlarging the width of the groove to improve chip dispersal.

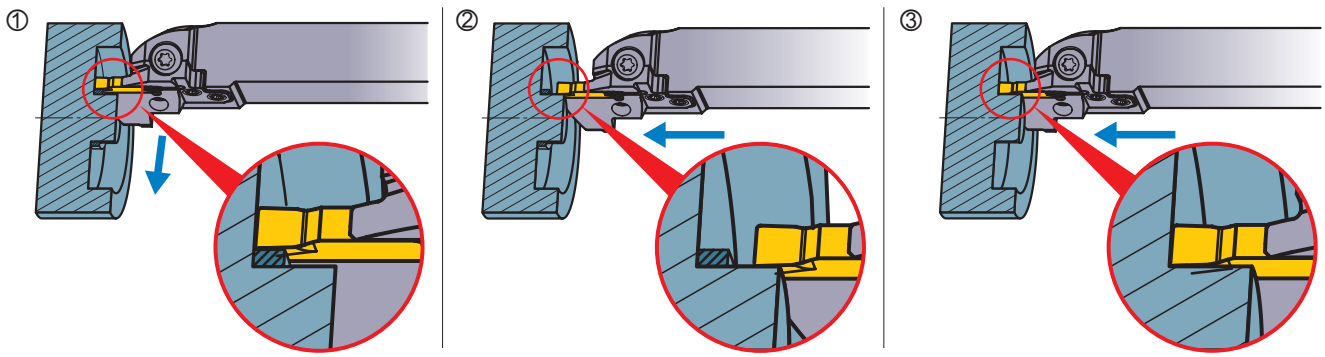
Notes when wide face grooving by combination of plunging and traverse machining (1)



●When face groove machining by using plunge feed and traverse machining, always machine from the outer diameter towards the centre to disperse chips outward to avoid chip jamming problems.

●Set the depth of cut within 40% of the insert width.

Notes when wide face grooving by combination of plunging and traverse machining (2)



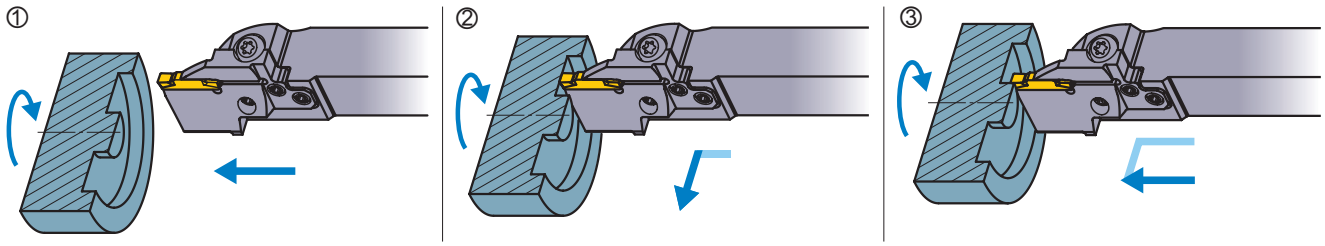
●When infeed machining at the bottom of a deep groove, chips may interfere on the cutting edge near the centre wall.
In such cases, stop infeed machining just before the centre wall (at a point less than the insert width) then remove the remaining material by plunging.

Notes when copying (BM Breaker)



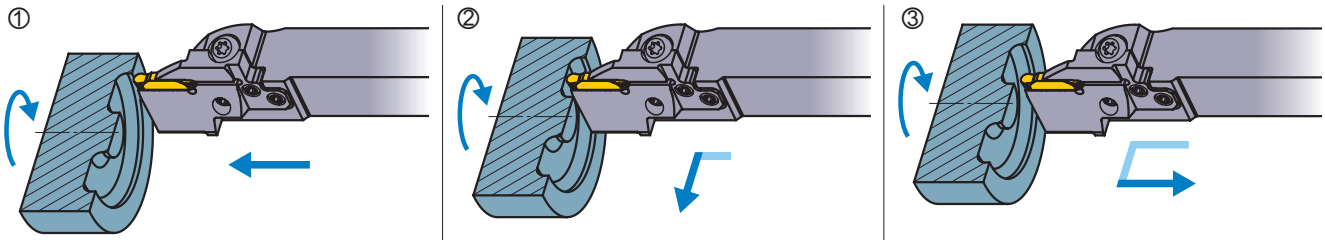
●With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (APMX 2) to 30% less than the insert width.

Finishing (1)

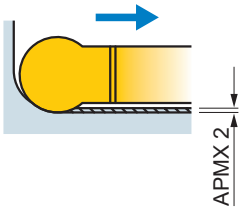


●When finish cutting, machine continuously from the outer wall to the bottom of the groove, then finally plunge cut the centre wall.

Finishing (2) (BM Breaker)



●Carry out finishing in one process.
For the depth of cut (APMX 2) when back turning, refer to the table on the right.

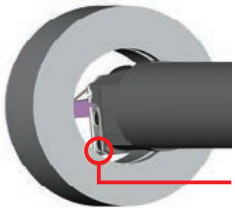


Insert	APMX 2 (mm)
GY2M0200D100N-BM	0.10
GY2M0250E125N-BM	
GY2M0300F150N-BM	
GY2M0318F159N-BM	
GY2M0400G200N-BM	0.15
GY2M0475H238N-BM	0.20
GY2M0500H250N-BM	
GY2M0600J300N-BM	0.25
GY2M0635J318N-BM	

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For Internal Grooving]

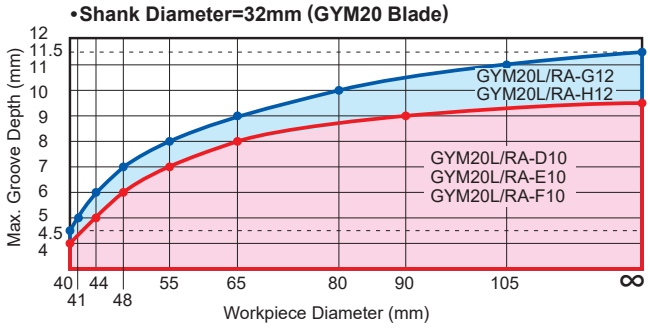
•When using the mono block type
The maximum groove depth is not limited by the cutting diameter.

•When using the modular blade type
The maximum groove depth is limited by the cutting diameter.

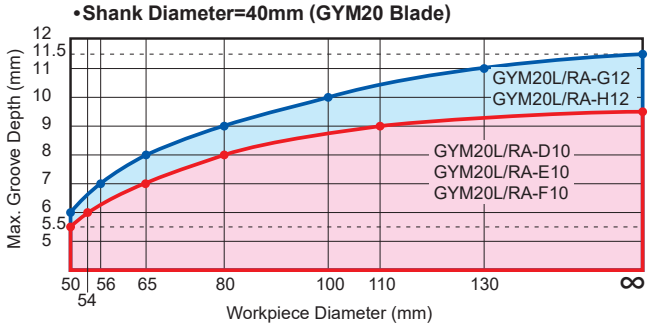


Due to interference of this part, the maximum groove depth is limited by the cutting diameter.

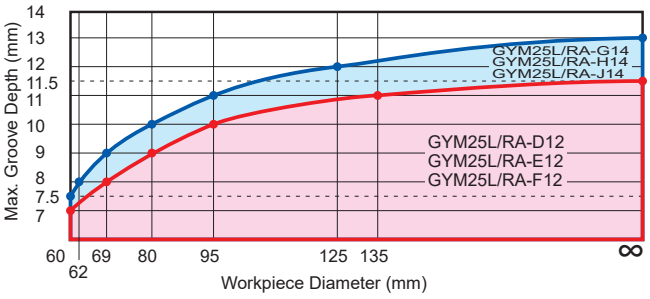
•Shank Diameter=32mm (GYM20 Blade)



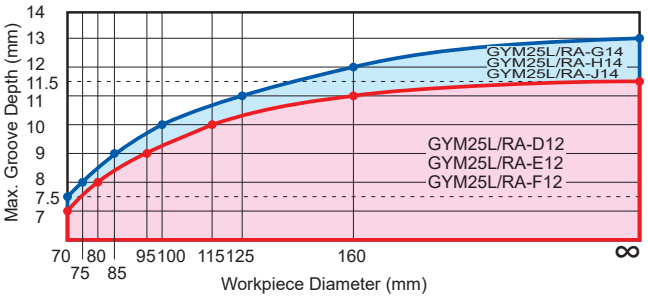
•Shank Diameter=40mm (GYM20 Blade)



•Shank Diameter=40mm (GYM25 Blade)



•Shank Diameter=50mm (GYM25 Blade)



RECOMMENDED CUTTING SPEED [For Internal Grooving]

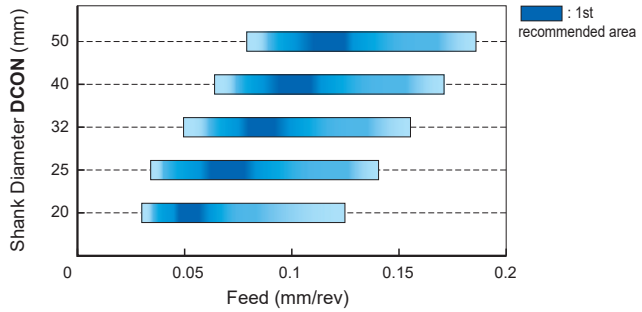
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min) 50 100 150 200 250 300 400
P	Mild Steel	≤160HB	VP20RT	80–180
			VP10RT	90–190
			NX2525	70–170
	Carbon Steel Alloy Steel	160–280HB	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
			NX2525	55–135
		≥280HB	VP20RT	50–110
			VP10RT	60–120
			MY5015	80–160
			NX2525	45–105
M	Stainless Steel	≤270HB	VP20RT	50–110
			VP10RT	60–120
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	60–140
			VP10RT	70–150
			MY5015	90–210
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	50–110
			VP10RT	60–120
			MY5015	80–160
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	40–100
			MP9025	30–90
			VP20RT	30–60
			VP10RT/RT9010	40–70
H	Hardened Steel	≥50HRC	BC8110	60–100
N	Aluminium Alloys (A6061, 7075)	Content Si<5%	RT9010	150–400
	Aluminium Alloys (AC4B)	Content 5%≤Si≤10%	RT9010	150–400
	Aluminium Alloys (ADC12, A390)	Content Si>10%	RT9010	80–160

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

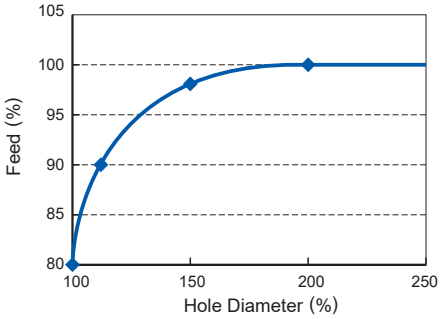
RECOMMENDED CUTTING CONDITIONS [For Internal Grooving]

GROOVING

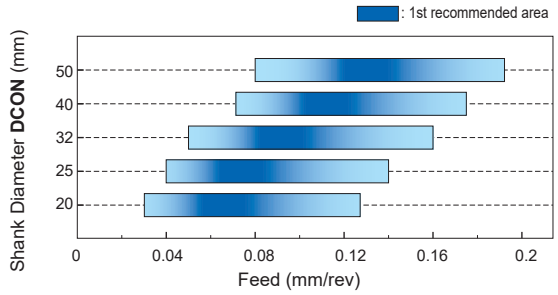
Note) When using an MF breaker, use 60% of the maximum feed rate according to the recommended conditions below when machining.



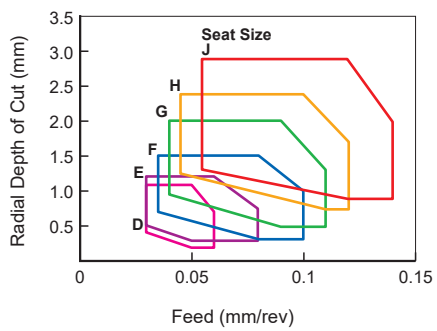
Note 1) The cutting diameter 100% represents the minimum cutting diameter (DMIN).
Note 2) The graph on the left shows the cutting conditions when setting the feed to 100%.



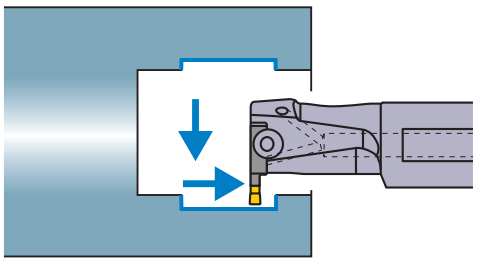
GROOVING (GL BREAKER)



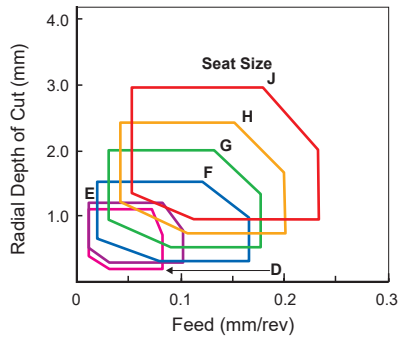
TRAVERSE MACHINING (MF BREAKER)



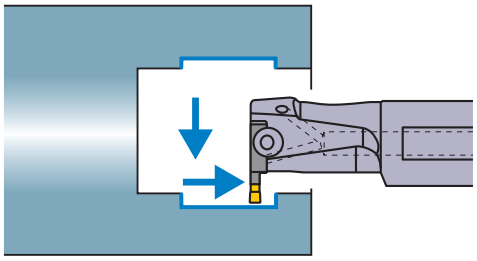
● When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



TRAVERSE MACHINING (MM/MS BREAKER)

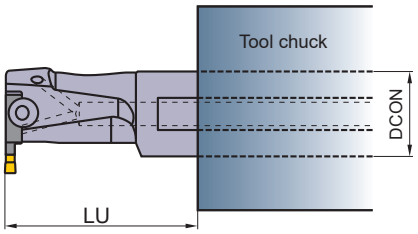


●When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



Note 1) The above cutting conditions are for when using the tool overhang (LU) 1.6-2.0 times larger than the shank diameter (DCON). (L/D=1.6-2.0)
When using L/D larger than 2.0, reduce the cutting conditions.

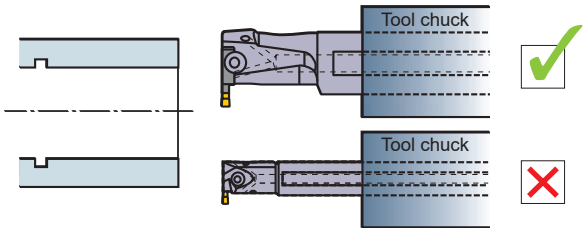
Seat Size			
	Insert Width (mm)		Insert Width (mm)
D	2.00 2.24	G	4.00 4.24
E	2.39 2.50 2.74	H	4.75 5.00 5.24
F	3.00 3.18 3.24	J	6.00 6.31 6.35



TOOL SELECTION

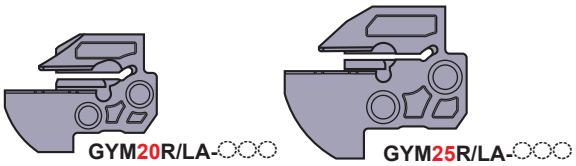
Notes when selecting the tool body

Holder



●When the overhang is the same, select a holder with the largest possible shank size to ensure sufficient clamping rigidity.

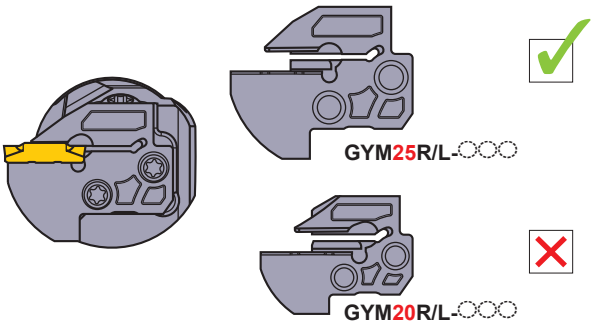
Modular blade (1)



GYM20R/LA-D10	GYM25R/LA-D12
GYM20R/LA-E10	GYM25R/LA-E12
GYM20R/LA-F10	GYM25R/LA-F12
GYM20R/LA-G12	GYM25R/LA-G14
GYM20R/LA-H12	GYM25R/LA-H14
	GYM25R/LA-J14

●For an internal holder, select a modular blade listed above.

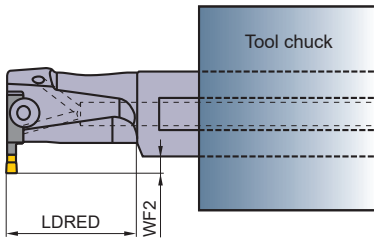
Modular blade (2)



●For a ø40 shank holder, if there is no restriction for use, select a holder suitable for GYM25 blade.

Notes when setting the tool

Overhang

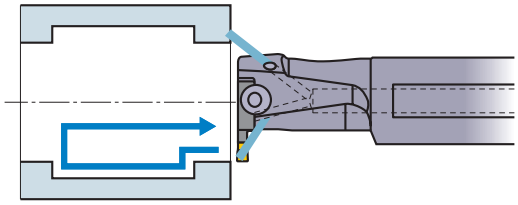


●The maximum groove depth is limited to the dimension LDRED. When machining with longer overhangs, refer to the dimension WF2 of the tool used.

Notes on multi-function machining (MF, MS and MM breakers)

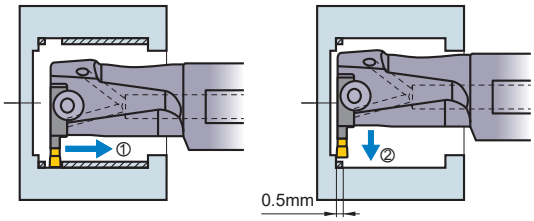
For internal grooving, the machining methods for external grooving can be used, but please note the following precautions.

Coolant



●Supply large amounts of coolant for effective chip disposal during cutting. Maintain supply until the tool has been retracted completely for improved chip disposal.

Machining blind holes

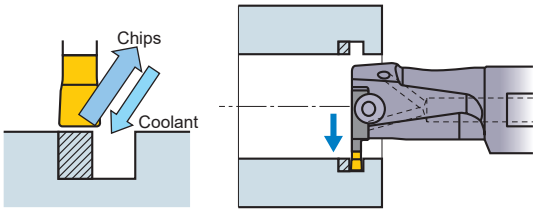


●As continuous chips tend to elongate at the back of the bore, the above operation is recommended.
The recommended width of cut for ② is 0.5mm.

Machining Wide Grooves

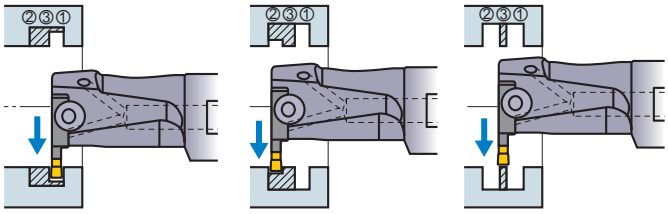
Grooving

●When the cutting edge width is x 2 ≥ groove width



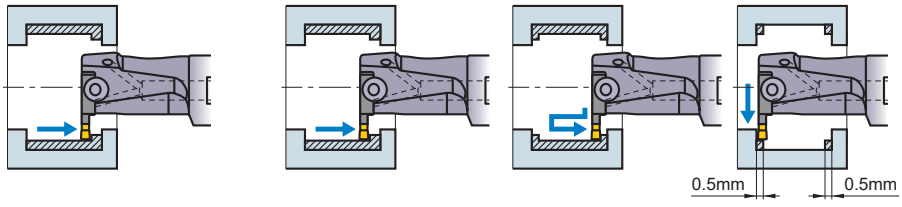
●When the depth of cut is shallower than the cutting edge width, continuous chips are usually produced. When plunging in several passes, it is recommended to carry out machining in the steps above. This ensures that coolant reaches the cutting edge and chips are easily discharged.

●When the cutting edge width is x 2 < groove width



●When the groove depth is larger than the cutting edge width, carry out plunging in the steps above to break up chips efficiently.

Turning

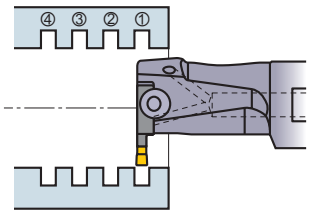


●When chip breaking and disposal are especially important, cross-feed machining is recommended.

●Wide face grooving when the corner R of the work piece is equal to the corner R of the insert, machine as shown above. (When corner R of the work piece is larger than corner R of the insert, refer to the description of external wide grooving.)

●If the groove depth exceeds a given level, chips may elongate at the wall. In such a case, increase the feed and carry out machining as shown above.

Machining instruction



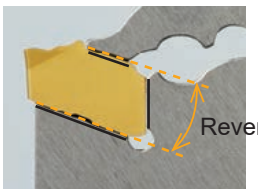
●It is recommended to carry out grooving from the front end of the workpiece.
This reduces workpiece deflection.

GW SERIES
Long Lasting, Easy to Use Cutting Off & Grooving System
Easy to Utilize Configuration that Improves Tool Handling

Clamp

Simple insert clamping method offering high rigidity.

To prevent the insert from being pulled out during machining a reverse taper angle has been designed from the front of the insert, additionally the design also includes 3 large locating faces between the insert and the blade offering increased cutting edge reliability. The blade itself is made from a special alloy steel to suit this application.
In respect to insert indexing a unique wrench is supplied to ensure ease when changing the insert.


Reverse Taper Angle

Voice of Developer

Just how easy is it to set an insert?

With the use of a unique wrench, it is possible to locate and remove the insert with one simply action making it easier for use in the workshop.



Through Coolant Blade

Increased wear resistance due to the use of 2 through coolant ejection holes.



2 through coolant holes supply the coolant to both the rake and flank face, leading to effective cutting edge cooling and increased wear resistance.
Additionally this blade can also be used for both low pressure and high pressure coolant (7MPa).

Voice of Developer

How is it possible to reduce heat generation?

The 2 coolant holes used in the blade are capable of using high coolant pressures of up (7MPa), this is achieved by using as large as possible a through coolant hole diameter.
The ejection holes are located close to the cutting edge so as to improve the cutting edge cooling effect and increasing wear resistance.

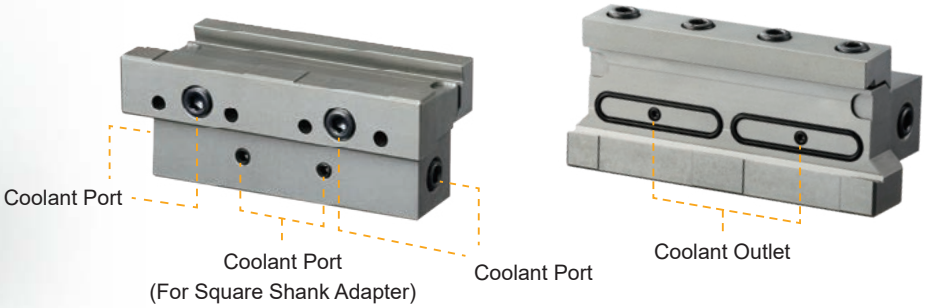
You Tube

Coolant Ports

Flexible set up possible with the use of 6 coolant ports.

There are 6 coolant ports designed into the tool block. This makes it easier for the end user to set up the tool block and blade to a configuration that suits their needs. If necessary it is also possible to use coolant hose. The ejection type coolant also improves cutting edge cooling and chip evacuation.





Voice of Developer

Possible to set up to suit the requirements of the workshop environment.

One of the objectives of this product is to respond to the customers complaints that “the product did not fit and could not be used”. Starting with the coolant outlet that prevents leaks even when oil quantity or overhangs change, everything from the material and the shape of the O-ring, to the length of the hose has been tailored to the effective use in the workshop.

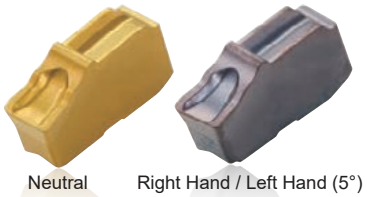
Breaker System Offering Excellent Chip Disposal Properties

Low Feeds



GS Breaker

Medium Feeds

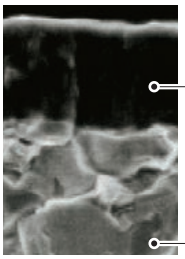


GM Breaker

INSERT GRADE

Machining Condition \ Workpiece Material	P Steel	M Stainless Steel	K Cast Iron	S Heat Resistant Alloy / Titanium Alloy
Stable ↑ Machining Condition ↓ Unstable	MY5015		MY5015	VP10RT
	VP10RT	VP10RT	VP10RT	
	VP20RT	VP20RT	VP20RT	VP20RT
	VP30RT	VP30RT		

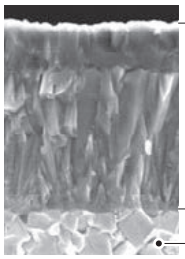
VP20RT



● PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MIRACLE Coating
Carbide Substrate (90.5HRA)

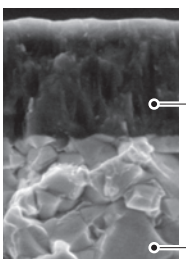
MY5015



● MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast irons. Also suitable for high-speed continuous cutting of steels.

CVD Coated Carbide
Carbide Substrate

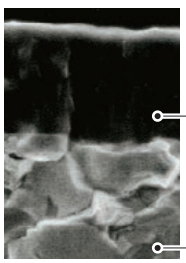
VP10RT



● PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

MIRACLE Coating
Carbide Substrate (92.0HRA)

VP30RT



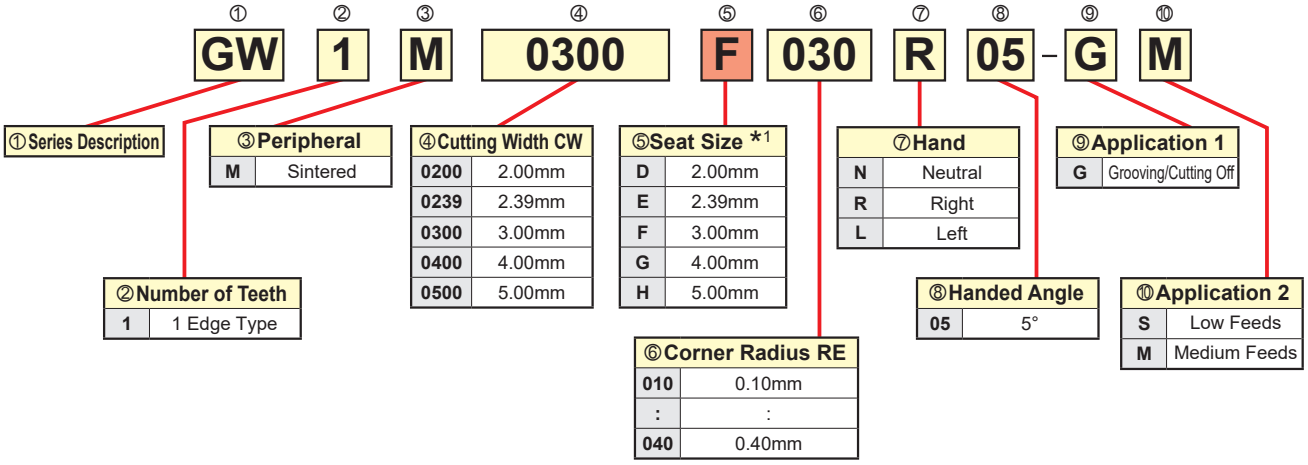
● A combination of a tough, special cemented carbide substrate and MIRACLE coating. Ideal for heavy interrupted cutting of stainless and general steels.

MIRACLE Coating (Al,Ti)N
Carbide Substrate (88.8HRA)

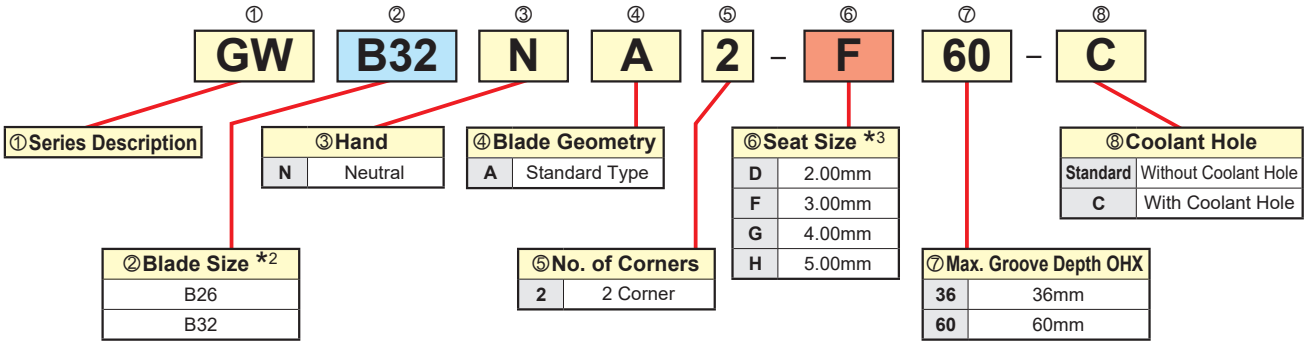
GW SERIES ORDER NUMBER

■ Insert / Blade / Tool Block

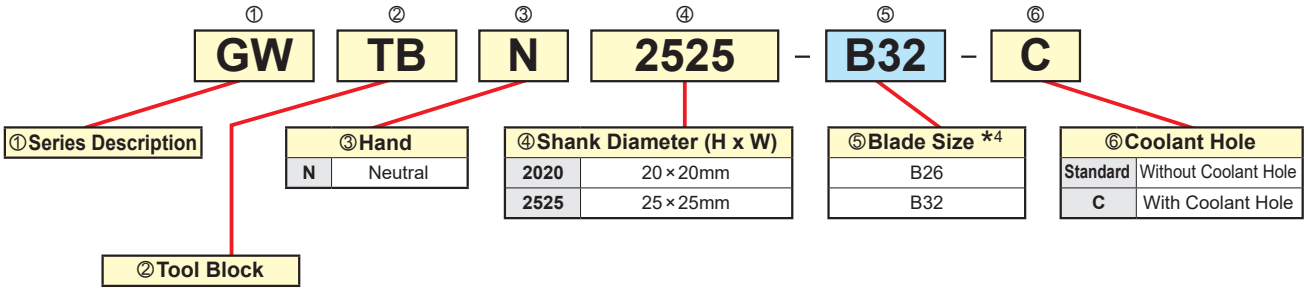
● Insert



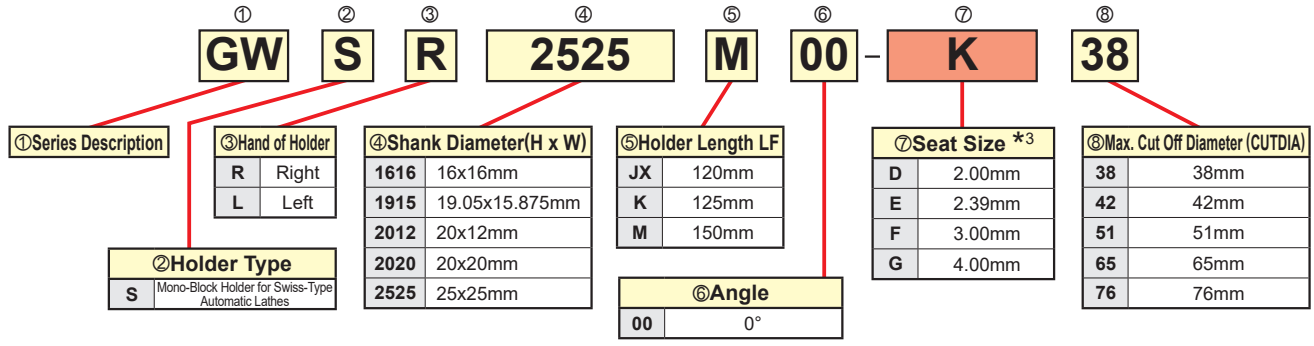
● Blade



● Tool Block



● MONO BLOCK HOLDER

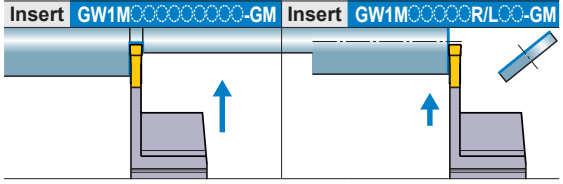


*1 Select the mono-block holder with the same seat size symbol as the modular blade.
*2 Select blade size with the same symbol as that of tool block.
*3 Select seat size with the same symbol of the insert.
*4 Select blade size with the same symbol as that of blade.

GW SERIES (External for Swiss style lathes)

1 00° type holder NEW

Insert GW1M○○○○○○○○○-GS Insert GW1M○○○○○R○○-GS
Insert GW1M○○○○○○○○○-GM Insert GW1M○○○○○R/L○○-GM



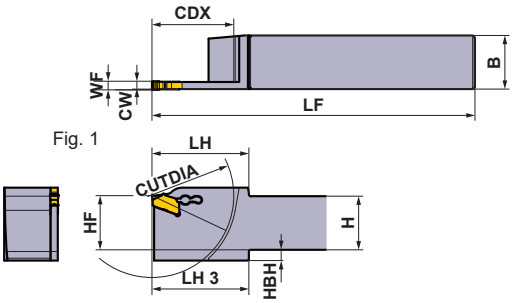


Fig. 1

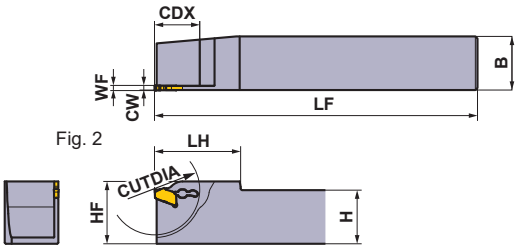
Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number		Fig.
	CW	CDX	CUTDIA			Holder	Stock	
D	2.00	19	38	Mono Block	R	GWSR1616JX00-D38	●	1
					L	GWSL1616JX00-D38	●	1
			38	Mono Block	R	GWSR1915K00-D38	●	1
					L	GWSL1915K00-D38	●	1
		21	42	Mono Block	R	GWSR2020K00-D42	●	1
					L	GWSL2020K00-D42	●	1
				Mono Block	R	GWSR2012K00-D42	●	1
					L	GWSL2012K00-D42	●	1
				Mono Block	R	GWSR2525M00-D42	●	2
					L	GWSL2525M00-D42	●	2
E	2.39	19	38	Mono Block	R	GWSR1915K00-E38	●	1
					L	GWSL1915K00-E38	●	1
		21	42	Mono Block	R	GWSR2020K00-E42	●	1
					L	GWSL2020K00-E42	●	1
				Mono Block	L	GWSL2020K00-E42-M	●	3
				Mono Block	R	GWSR2012K00-E42	●	1
					L	GWSL2012K00-E42	●	1
				Mono Block	R	GWSR2525M00-E42	●	2
					L	GWSL2525M00-E42	●	2
F	3.00	19	38	Mono Block	R	GWSR1915K00-F38	●	1
					L	GWSL1915K00-F38	●	1
		21	42	Mono Block	R	GWSR2012K00-F42	●	1
					L	GWSL2012K00-F42	●	1
				Mono Block	R	GWSR2020K00-F42	●	1
					L	GWSL2020K00-F42	●	1
				Mono Block	L	GWSL2020K00-F42-M	●	3
		25.5	51	Mono Block	R	GWSR2020K00-F51	●	1
					L	GWSL2020K00-F51	●	1
				Mono Block	L	GWSL2020K00-F51-M	●	3
				Mono Block	R	GWSR2525M00-F51	●	1
					L	GWSL2525M00-F51	●	1
		32.5	65	Mono Block	R	GWSR2020M00-F65	●	1
					L	GWSL2020M00-F65	●	1
		38	76	Mono Block	R	GWSR2525M00-F76	●	1
					L	GWSL2525M00-F76	●	1
G	4.00	38	76	Mono Block	R	GWSR2525M00-G76	●	1
					L	GWSL2525M00-G76	●	1

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

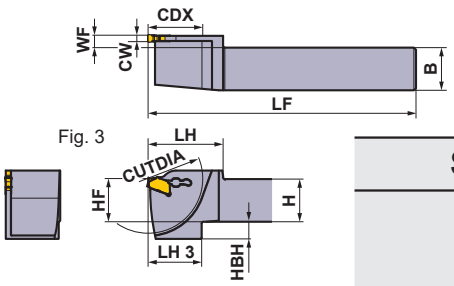
● : Inventory maintained in Japan.

Fig. 2



Right hand tool holder shown.

Fig. 3

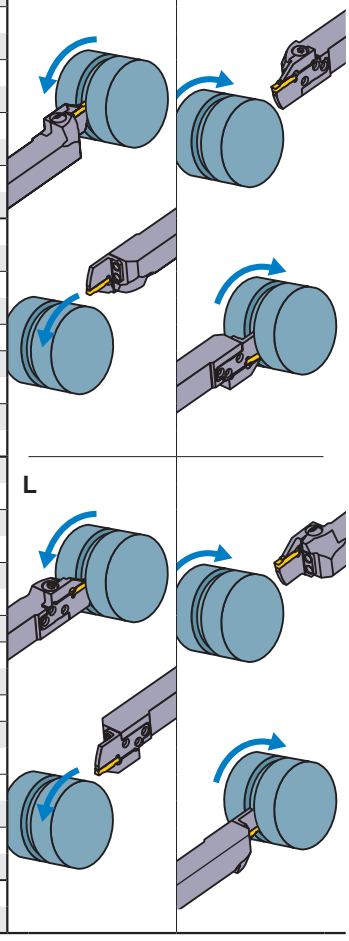


Left hand tool holder shown.

SPARE PARTS

Holder	Wrench
GWSR/L1616JX00-D38	GWY39L
GWSR/L○○○○○○00-○○○	
GWSR/L2020K00-○○○-M	

Dimensions (mm)								Cutting Mode	
H	B	LF	LH	LH 3	HF	WF	HBH	Clockwise	Anticlockwise
16	16	120	30	30	16	0.3	6	R	
16	16	120	30	30	16	0.3	6		
19.05	15.875	125	35	35	19.05	0.3	3		
19.05	15.875	125	35	35	19.05	0.3	3		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
25	25	150	40	—	25	0.3	—		
25	25	150	40	—	25	0.3	—		
19.05	15.875	125	35	35	19.05	0.2	3		
19.05	15.875	125	35	35	19.05	0.2	3		
20	20	125	35	25	20	0.2	4		
20	20	125	35	25	20	0.2	4		
20	20	125	35	25	20	5.7	8		
20	12	125	35	25	20	0.2	4		
20	12	125	35	25	20	0.2	4		
25	25	150	40	—	25	0.2	—		
25	25	150	40	—	25	0.2	—		
19.05	15.875	125	35	35	19.05	0.3	3	L	
19.05	15.875	125	35	35	19.05	0.3	3		
20	12	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	5.8	8		
20	20	125	35	25	20	0.3	8		
20	20	125	35	25	20	0.3	8		
20	20	125	35	25	20	5.8	8		
25	25	150	40	40	25	0.3	3		
25	25	150	40	40	25	0.3	3		
20	20	150	40	33	20	0.3	10		
20	20	150	40	33	20	0.3	10		
25	25	150	45	45	25	0.3	5		
25	25	150	45	45	25	0.3	5		
25	25	150	45	45	25	0.4	5		
25	25	150	45	45	25	0.4	5		



Insert selection

Seat Size	Geometry name
D	GW1M0200D○○○N−Breaker shown below
	GW1M0200D○○○R/L○○−Breaker shown below
E	GW1M0239E○○○N−Breaker shown below
	GW1M0239E○○○R/L○○−Breaker shown below
F	GW1M0300F○○○N−Breaker shown below
	GW1M0300F○○○R/L○○−Breaker shown below
G	GW1M0400G○○○N−Breaker shown below
	GW1M0400G○○○R/L○○−Breaker shown below

For grooving/cutting off breaker ➢ F130

Seat Size	Breaker / CW	GS (Low) Neutral	GM (Medium) Neutral	05-GS (Low) With hand	05-GS (Low) With hand	05-GM (Cutting off) With hand
D	2.00mm	●	●	●	●	●
E	2.39mm	●	●	●	●	●
F	3.00mm	●	●	●	●	●
G	4.00mm	●	●			●

● : Standard insert with dimensions

IDENTIFICATION ➢ F125
INSERTS ➢ F130
CUTTING CONDITIONS ➢ F132
CAUTION FOR USE ➢ F134

GW SERIES (EXTERNAL)

GW HOLDER

For External Cutting Off / Grooving

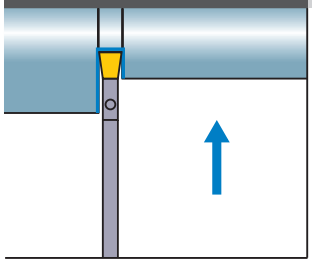


Fig.1

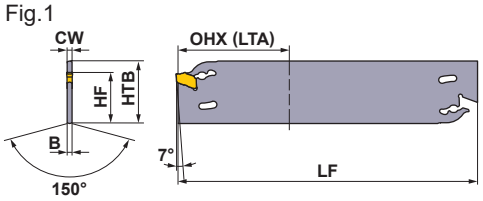
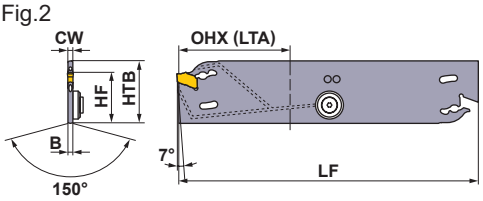


Fig.2



Without Coolant Hole

(mm)

Seat Size	CW	∗1 CUTDIA	Order Number	Stock	∗2 OHN	∗3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type	Wrench	Tool Block Type
D	2.00	72	GWB26NA2-D36	●	16	36	1.55	110	26	21.4	1	GW1M0200D	GWY39L	GWTBN-B26
		120	GWB32NA2-D60	●	16	60	1.55	150	32	25	1	GW1M0200D	GWY39L	GWTBN-B32
F	3.00	72	GWB26NA2-F36	●	16	36	2.45	110	26	21.4	1	GW1M0300F	GWY39L	GWTBN-B26
		120	GWB32NA2-F60	●	16	60	2.45	150	32	25	1	GW1M0300F	GWY39L	GWTBN-B32
G	4.00	72	GWB26NA2-G36	●	19	36	3.35	110	26	21.4	1	GW1M0400G	GWY39L	GWTBN-B26
		120	GWB32NA2-G60	●	19	60	3.35	150	32	25	1	GW1M0400G	GWY39L	GWTBN-B32
H	5.00	72	GWB26NA2-H36	●	19	36	4.25	110	26	21.4	1	GW1M0500H	GWY39L	GWTBN-B26
		120	GWB32NA2-H60	●	19	60	4.25	150	32	25	1	GW1M0500H	GWY39L	GWTBN-B32

With Coolant Hole

(mm)

Seat Size	CW	∗1 CUTDIA	Order Number	Stock	∗2 OHN	∗3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type	Wrench	Tool Block Type
D	2.00	72	GWB26NA2-D36-C	●	16	36	1.55	110	26	21.4	2	GW1M0200D	GWY39L	GWTBN-B26-C
		120	GWB32NA2-D60-C	●	26	60	1.55	150	32	25	2	GW1M0200D	GWY39L	GWTBN-B32-C
F	3.00	72	GWB26NA2-F36-C	●	16	36	2.45	110	26	21.4	2	GW1M0300F	GWY39L	GWTBN-B26-C
		120	GWB32NA2-F60-C	●	26	60	2.45	150	32	25	2	GW1M0300F	GWY39L	GWTBN-B32-C
G	4.00	72	GWB26NA2-G36-C	●	19	36	3.35	110	26	21.4	2	GW1M0400G	GWY39L	GWTBN-B26-C
		120	GWB32NA2-G60-C	●	26	60	3.35	150	32	25	2	GW1M0400G	GWY39L	GWTBN-B32-C
H	5.00	72	GWB26NA2-H36-C	●	19	36	4.25	110	26	21.4	2	GW1M0500H	GWY39L	GWTBN-B26-C
		120	GWB32NA2-H60-C	●	26	60	4.25	150	32	25	2	GW1M0500H	GWY39L	GWTBN-B32-C

∗1 CUTDIA : Maximum Cut Off Diameter ∗2 OHN : Minimum Overhang Length ∗3 OHX(LTA) : Maximum Overhang Length

Note 1) Recommended Maximum Coolant Pressure : 7MPa

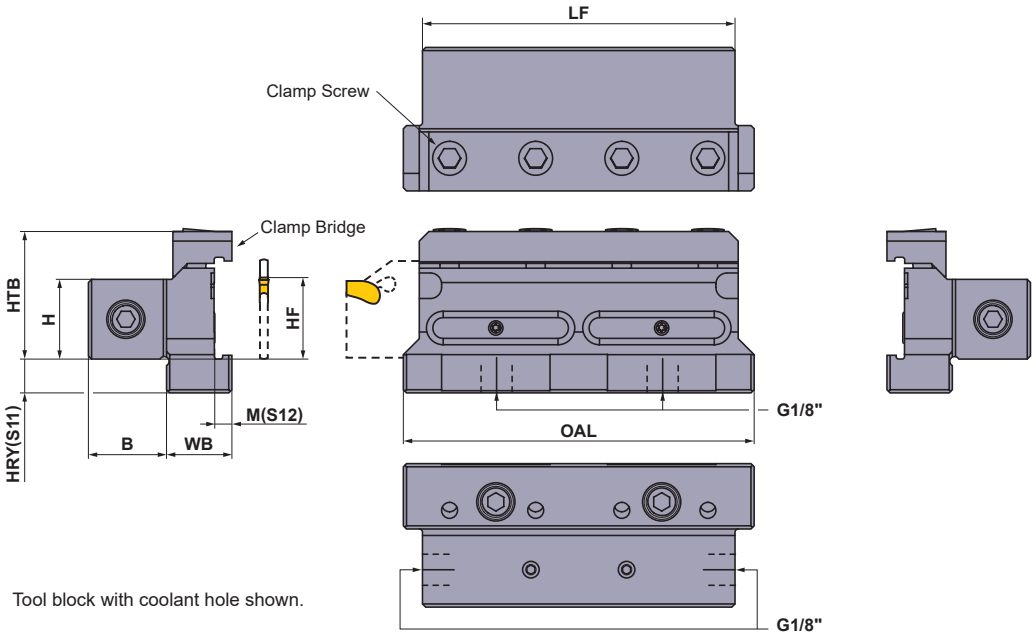
Spare Parts for Blades with Coolant Hole

(mm)

Order Number	CW	① ② Washer	Clamp Screw	Wrench
GWB26NA2-D36-C	2.0	①GWW04038	GW04005F	HKY20R
GWB32NA2-D60-C	2.0	①GWW04038	GW04005F	HKY20R
GWB26NA2-F36-C	3.0	①GWW04038	GW04005F	HKY20R
GWB32NA2-F60-C	3.0	①GWW04038	GW04005F	HKY20R
GWB26NA2-G36-C	4.0	②GWW04026	GW04005F	HKY20R
GWB32NA2-G60-C	4.0	②GWW04026	GW04005F	HKY20R
GWB26NA2-H36-C	5.0	②GWW04026	GW04005F	HKY20R
GWB32NA2-H60-C	5.0	②GWW04026	GW04005F	HKY20R

● : Inventory maintained in Japan.

■ Tool Block



Tool block with coolant hole shown.

Without Coolant Hole (mm)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	①② Clamp Bridge	* Clamp Screw	Wrench
GWTBN2020-B26	●	20	20	33.5	11	19.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2020-B32	●	20	20	35.0	15.6	19.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R
GWTBN2525-B26	●	25	25	38.5	6	24.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2525-B32	●	25	25	40.0	10.6	24.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R

With Coolant Hole (mm)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	①② Clamp Bridge	* Clamp Screw	Wrench
GWTBN2020-B26-C	●	20	20	33.5	11	19.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2020-B32-C	●	20	20	35.0	15.6	19.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R
GWTBN2525-B26-C	●	25	25	38.5	6	24.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2525-B32-C	●	25	25	40.0	10.6	24.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R

* Clamp Torque (N • m) : HSC06020=7.0
Note 1) Recommended Maximum Coolant Pressure : 7MPa

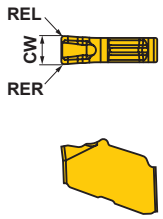
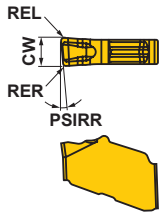
Spare Parts for Tool Block with Coolant Hole

Order Number	①② O-ring	Plug	Plug	Wrench	Plug	Wrench
GWTBN2020-B26-C	ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2020-B32-C	ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2525-B26-C	ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2525-B32-C	ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

GW SERIES INSERTS

(mm)

Application	Order Number	Stock: Coating MY5015	Stock: Coating VP10RT	Stock: Coating VP20RT	Stock: Coating VP30RT	Stock: Carbide RT9010	Stock: Carbide RT9020	CW: Cutting Width	CW: Tolerance	REL	RER	PSIRR PSIRL	Geometry
Grooving, Cutting Off	GW1M0200D020N-GS		●	●	●			2.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	NEW GW1M0239E020N-GS		●	●	●			2.39	±0.03	0.2	0.2	—	
Grooving, Cutting Off	GW1M0300F020N-GS		●	●	●			3.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	GW1M0400G020N-GS		●	●	●			4.00	±0.04	0.2	0.2	—	
Grooving, Cutting Off	GW1M0500H030N-GS		●	●	●			5.00	±0.04	0.3	0.3	—	
Grooving, Cutting Off	GW1M0200D020N-GM	●	●	●	●			2.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	NEW GW1M0239E020N-GM	●	●	●	●			2.39	±0.03	0.2	0.2	—	
Grooving, Cutting Off	GW1M0300F030N-GM	●	●	●	●			3.00	±0.03	0.3	0.3	—	
Grooving, Cutting Off	GW1M0400G030N-GM	●	●	●	●			4.00	±0.04	0.3	0.3	—	
Grooving, Cutting Off	GW1M0500H040N-GM	●	●	●	●			5.00	±0.04	0.4	0.4	—	
Cutting off, Low Feed	NEW GW1M0200D020R05-GS		●	●	●			2.00	±0.03	0.2	0.2	5	
Cutting off, Low Feed	NEW GW1M0239E020R05-GS		●	●	●			2.39	±0.03	0.2	0.2	5	
Cutting off, Low Feed	NEW GW1M0300F020R05-GS		●	●	●			3.00	±0.03	0.2	0.2	5	
Cutting off Low Feed, Lead Angle 8°	NEW GW1M0200D003R08-GS		●	●	●			2.00	±0.03	0.03	0.03	8	
Cutting off Low Feed, Lead Angle 8°	NEW GW1M0239E003R08-GS		●	●	●			2.39	±0.03	0.03	0.03	8	
Cutting off Low Feed, Lead Angle 8°	NEW GW1M0300F003R08-GS		●	●	●			3.00	±0.03	0.03	0.03	8	
Cutting Off	GW1M0200D020R05-GM		●	●	●			2.00	±0.03	0.2	0.2	5	
Cutting Off	GW1M0200D020L05-GM		●	●	●			2.00	±0.03	0.2	0.2	5	
Cutting Off	NEW GW1M0239E020R05-GM		●	●	●			2.39	±0.03	0.2	0.2	5	
Cutting Off	NEW GW1M0239E020L05-GM		●	●	●			2.39	±0.03	0.2	0.2	5	
Cutting Off	GW1M0300F030R05-GM		●	●	●			3.00	±0.03	0.3	0.3	5	
Cutting Off	GW1M0300F030L05-GM		●	●	●			3.00	±0.03	0.3	0.3	5	
Cutting Off	GW1M0400G030R05-GM		●	●	●			4.00	±0.04	0.3	0.3	5	
Cutting Off	GW1M0400G030L05-GM		●	●	●			4.00	±0.04	0.3	0.3	5	
Cutting Off	GW1M0500H040R05-GM		●	●	●			5.00	±0.04	0.4	0.4	5	
Cutting Off	GW1M0500H040L05-GM		●	●	●			5.00	±0.04	0.4	0.4	5	Right hand insert shown.

● = NEW

Blank Inserts

(mm)

Geometry	Order Number	Carbide RT9010	Carbide RT9020	CW: Grooving Width	CW: Tolerance	RER	REL
1 Edge Type NEW 	GW1B0320D020N	●	●	3.24	±0.10	0.2	0.2
	GW1B0440F020N	●	●	4.44	±0.10	0.2	0.2
	GW1B0540G020N	●	●	5.44	±0.10	0.2	0.2
	GW1B0640H020N	●	●	6.44	±0.10	0.2	0.2

* Insert blank is not suitable for machining without grinding.

● = NEW

● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

Proper Use of GW Series Right Hand Inserts

First Recommended

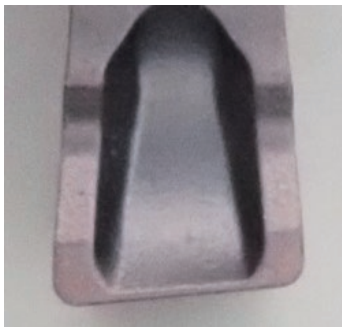
Improved Fracture Resistance — Reduction of Burrs and Core Residue

GM Breaker
PSIRR=5°
RE=0.20

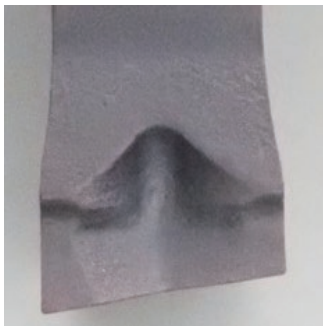
GS Breaker
PSIRR=5°
RE=0.20

GS Breaker
PSIRR=8°
RE=0.03

Reduction of Cutting Resistance — Improved Fracture Resistance







Coolant Hose Kit

(mm)

Connector Type	Order Number	Stock	Hose Length	Kit Details								
				Hose	Banjo Adapter		Banjo Bolt		Adapter		Washer	
				Code No.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.
Straight	**CS-1/8-150SS**	●	150	HOSE-1/8-150	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-200SS**	●	200	HOSE-1/8-200	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-250SS**	●	250	HOSE-1/8-250	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-300SS**	●	300	HOSE-1/8-300	—	—	—	—	AD-G1/8	2	WA-M10	2
Elbow Straight	**CS-1/8-150BS**	●	150	HOSE-1/8-150	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-200BS**	●	200	HOSE-1/8-200	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-250BS**	●	250	HOSE-1/8-250	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-300BS**	●	300	HOSE-1/8-300	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow	**CS-1/8-150BB**	●	150	HOSE-1/8-150	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-200BB**	●	200	HOSE-1/8-200	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-250BB**	●	250	HOSE-1/8-250	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-300BB**	●	300	HOSE-1/8-300	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4

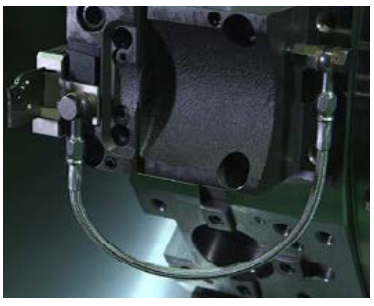
Connection Screw Size = G1/8"

Mounting Example

Elbow Straight Type



Elbow Type



SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

RECOMMENDED CUTTING CONDITIONS

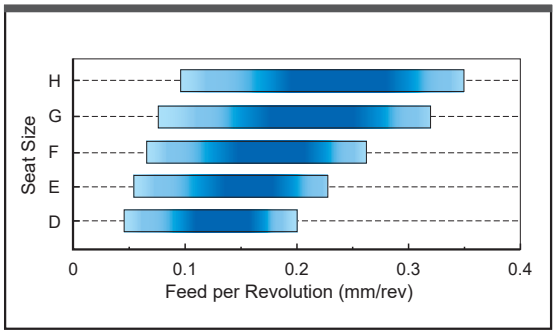
■ Cutting Speed

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min) 50 100 150 200 250 300
P	Mild Steel	≤160HB	VP20RT	100 – 240
			VP10RT	110 – 250
	Carbon Steel Alloy Steel	160–280HB	VP20RT	80 – 200
			VP10RT	90 – 210
			VP30RT	60 – 180
			MY5015	110 – 250
		≥280HB	VP20RT	60 – 160
			VP10RT	70 – 170
			VP30RT	40 – 140
			MY5015	90 – 210
M	Stainless Steel	≤270HB	VP20RT	60 – 180
			VP10RT	70 – 190
			VP30RT	40 – 160
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	80 – 200
			VP10RT	90 – 210
			MY5015	140 – 300
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	60 – 160
			VP10RT	70 – 170
			MY5015	90 – 210
S	Heat Resistant Alloy Titanium Alloy	—	VP20RT	30 – 60
			VP10RT	40 – 70

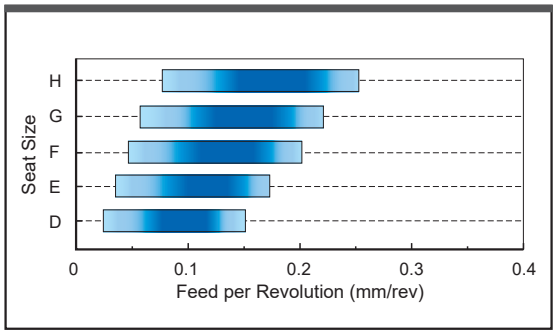
Note 1) VP20RT is the first recommended grade for materials.
Note 2) For VP10RT, VP20RT, VP30RT and MY5015, wet cutting is recommended.

■ Feed per Revolution

GM Breaker



GS Breaker



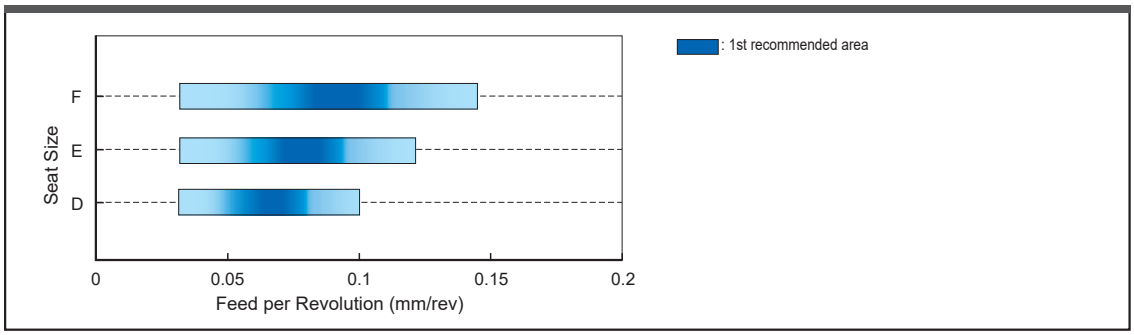
: 1st recommended area

Seat Size	Insert Width (mm)
D	2.00
E	2.39
F	3.00
G	4.00
H	5.00

Chip Breaker	Feed per Revolution (mm/rev)				
	Seat Size D	Seat Size E	Seat Size F	Seat Size G	Seat Size H
GM Breaker	0.05–0.20	0.06–0.23	0.07–0.26	0.08–0.32	0.10–0.35
GS Breaker	0.03–0.15	0.04–0.17	0.05–0.20	0.06–0.22	0.08–0.25

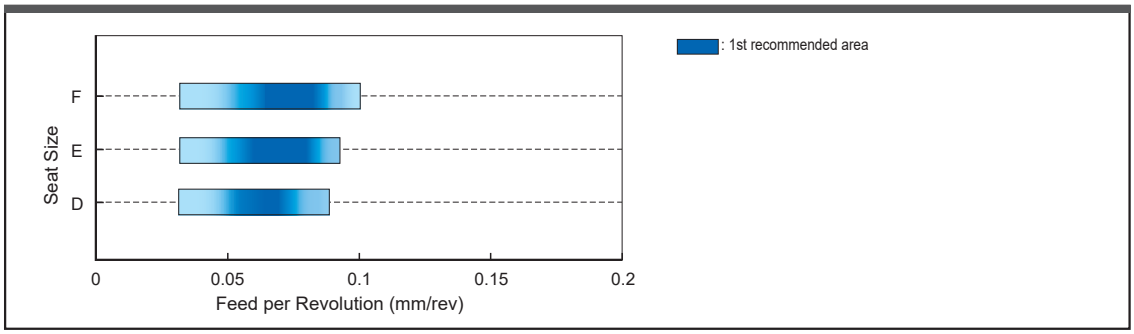
■ Cutting Off Feed per Revolution

R05-GS Breaker

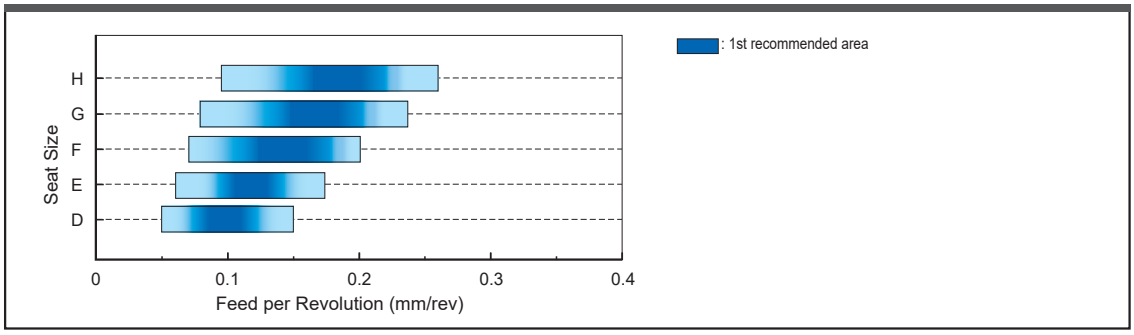


Seat Size	Insert Width (mm)
D	2.00
E	2.39
F	3.00
G	4.00
H	5.00

R08-GS Breaker



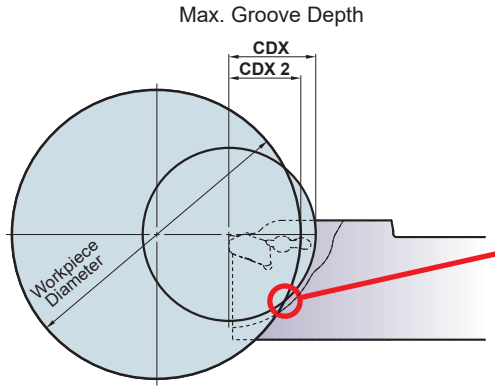
R/L05-GM Breaker

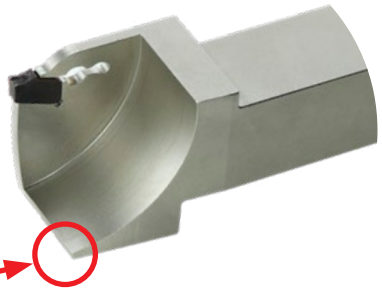


Chip Breaker	PSIPR	Hand	Feed per Revolution (mm/rev)				
			Seat Size D	Seat Size E	Seat Size F	Seat Size G	Seat Size H
R05-GS	5°	R	0.03–0.10	0.03–0.12	0.03–0.14	–	–
R08-GS	8°	R	0.03–0.08	0.03–0.09	0.03–0.14	–	–
R05-GM	5°	R/L	0.05–0.15	0.06–0.17	0.07–0.20	0.08–0.23	0.10–0.26

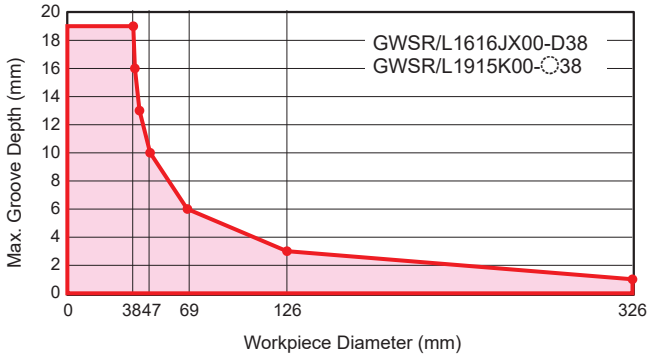
LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

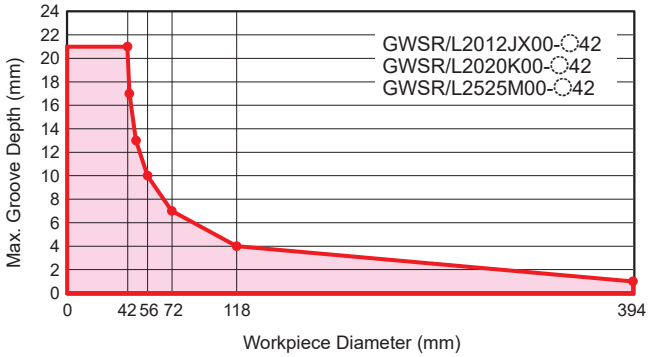
The maximum groove depth is limited by the workpiece diameter.

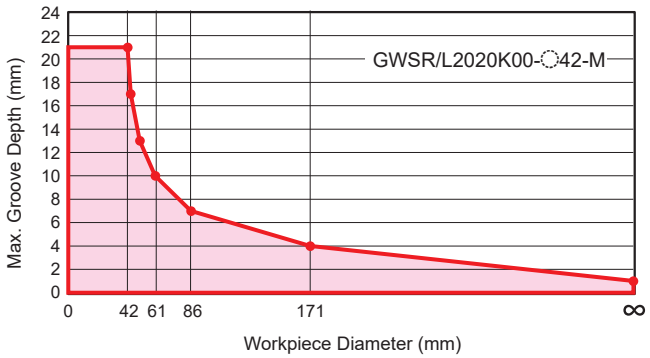


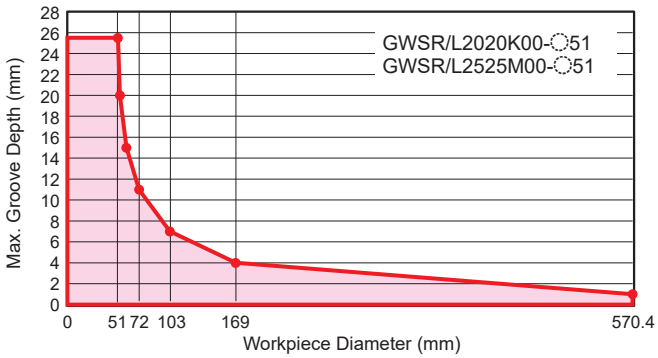


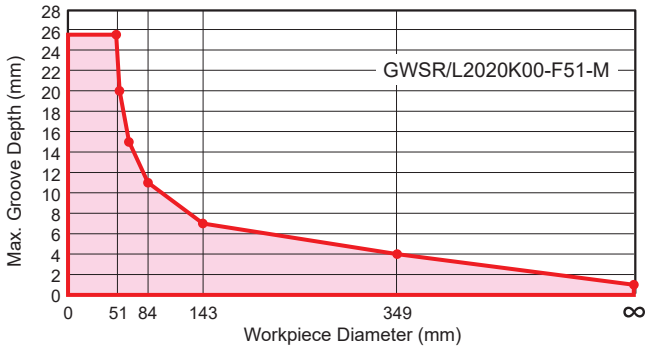
Due to interference, the maximum groove depth is limited by the workpiece diameter.

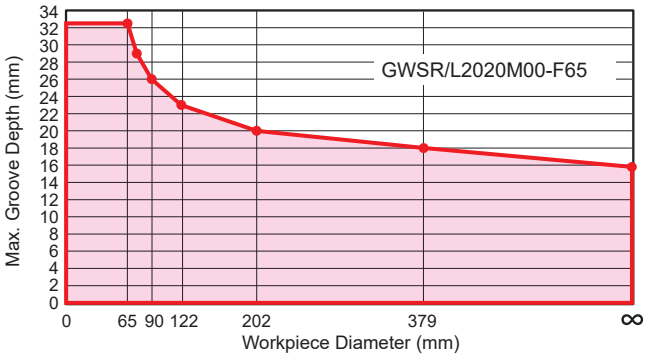


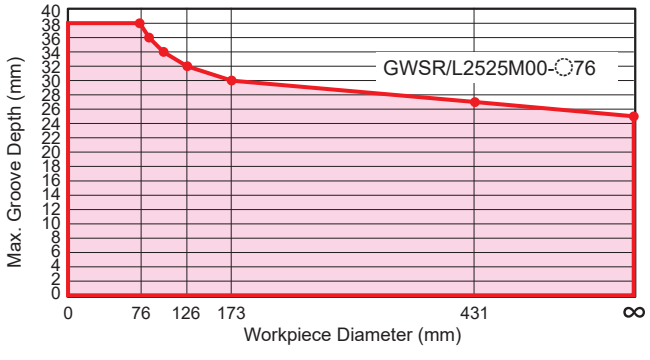












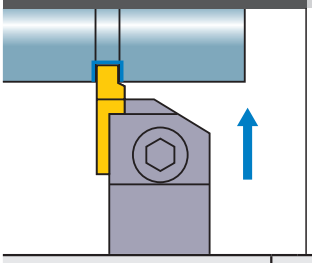
Memo

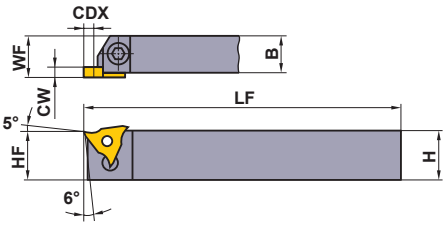
MG HOLDER

- Clamp-on type
- Positive insert suffers from negligible chattering and thus produces a good finished surface.
- Cutting width CW 1.25–6.0mm

MGH

External grooving





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions(mm)						
	R	L			CW	CDX	H	B	LF	HF	WF
MGHR/L2020K3315	●	●	MGTR/L	33125 I 33400	1.25	1.2	20	20	125	20	20.2
					1.45	1.5					
					1.5≤CW≤2.3	3.0					
MGHR/L2020K3323	●	●			2.3＜CW≤3.3	3.0	20	20	125	20	20.2
MGHR/L2525M3315	●	●			1.25	1.2	25	25	150	25	25.2
					1.45	1.5					
					1.5≤CW≤2.3	3.0					
MGHR/L2525M3323	●	●			2.3＜CW≤3.3	3.0	25	25	150	25	25.2
MGHR/L2525M3333	●	●			3.3＜CW≤4.7	3.0	25	25	150	25	25.2
MGHR/L2020K4315	●	●	MGTR/L	43125 I 43470	1.25	1.2 (2.0)*	20	20	125	20	20.2
					1.45	1.5					
					1.5≤CW≤2.3	3.0 (3.5)*					
MGHR/L2020K4323	●	●			2.3＜CW≤3.3	4.5 (4.0)*	20	20	125	20	20.2
MGHR/L2020K4333	●	●			3.3＜CW≤4.7(4.0)*	4.5 (5.0)*	20	20	125	20	20.2
MGHR/L2525M4315	●	●			1.25	1.2 (2.0)*	25	25	150	25	25.2
					1.45	1.5					
					1.5≤CW≤2.3	3.0 (3.5)*					
MGHR/L2525M4323	●	●			2.3＜CW≤3.3	4.5 (4.0)*	25	25	150	25	25.2
MGHR/L2525M4333	●	●			3.3＜CW≤4.7(4.0)*	4.5 (5.0)*	25	25	150	25	25.2
MGHR/L2525M4447	●	●	MGTR/L	44500 I 44600	4.7＜CW≤6.3	4.5	25	25	150	25	25.2

* Dimensions when installing the CBN insert.

SPARE PARTS

Order Number		 *		
	Clamp Bridge	Clamp Screw	Spring	Wrench
MGHR/L2020K3315 I MGHR/L2525M4447	MTK1R/L	HBH06020	MES3	HKY40R

* Clamp Torque (N • m) : HBH06020=7.0

RECOMMENDED CUTTING CONDITIONS

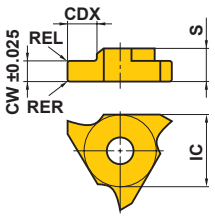
Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180–280HB	**VP20MF**	120 (100–140)	0.14 (0.03–0.25)
			NX2525	130 (100–160)	0.12 (0.03–0.2)
M	Stainless Steel	≤200HB	**VP20MF**	120 (100–140)	0.12 (0.03–0.18)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP20MF**	120 (100–140)	0.12 (0.03–0.18)

Note) For machining a narrow groove, apply a lower feed within the recommended range.

● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

INSERTS

Order Number	Stock						Dimensions(mm)					Geometry
	Coated		Cermet		Carbide							
	VP20MF		NX2525		UTi20T		CW	CDX	IC	S	RER/L	
	R	L	R	L	R	L						
MGTR/L33125	●	●	●		●	●	1.25	1.2	9.525	4.76	0.2	**MGTR/L...**
MGTR/L33145	●	●	●		●	●	1.45	1.5	9.525	4.76	0.2	
MGTR/L33150	●	●	●	●	●	●	1.5	3	9.525	4.76	0.2	
MGTR/L33175	●	●	●	●	●	●	1.75	3	9.525	4.76	0.2	
MGTR/L33200	●	●	●	●	●	●	2	3	9.525	4.76	0.2	
MGTR/L33230	●	●			●	●	2.3	3	9.525	4.76	0.2	
MGTR/L33250	●	●	●	●	●	●	2.5	3	9.525	4.76	0.3	
MGTR/L33270	●	●			●	●	2.7	3	9.525	4.76	0.3	
MGTR/L33280	●	●			●	●	2.8	3	9.525	4.76	0.3	
MGTR/L33300	●	●	●	●	●	●	3	3	9.525	4.76	0.3	
MGTR/L33320	●	●			●		3.2	3	9.525	4.76	0.3	
MGTR/L33330		●			●	●	3.3	3	9.525	4.76	0.3	
MGTR/L33350	●	●	●		●	●	3.5	3	9.525	4.76	0.3	
MGTR/L33400	●	●	●	●	●	●	4	3	9.525	4.76	0.3	
MGTR/L43125	●	●	●	●	●	●	1.25	1.2	12.7	4.76	0.2	
MGTR/L43145	●	●		●	●	●	1.45	1.5	12.7	4.76	0.2	
MGTR/L43150	●	●	●	●	●	●	1.5	3	12.7	4.76	0.2	
MGTR/L43175	●	●	●	●	●	●	1.75	3	12.7	4.76	0.2	
MGTR/L43200	●	●	●	●	●	●	2	3.5	12.7	4.76	0.2	
MGTR/L43230	●	●	●	●	●	●	2.3	3	12.7	4.76	0.2	
MGTR/L43250	●	●	●	●	●	●	2.5	4.5	12.7	4.76	0.3	
MGTR/L43260	●	●	●		●	●	2.6	4.5	12.7	4.76	0.3	
MGTR/L43270	●	●			●	●	2.7	4.5	12.7	4.76	0.3	
MGTR/L43280		●		●	●	●	2.8	4.5	12.7	4.76	0.3	
MGTR/L43300	●	●	●	●	●	●	3	4.5	12.7	4.76	0.3	
MGTR/L43320	●				●	●	3.2	4.5	12.7	4.76	0.3	
MGTR/L43330		●		●	●	●	3.3	4.5	12.7	4.76	0.3	
MGTR/L43350	●	●	●	●	●	●	3.5	4.5	12.7	4.76	0.3	
MGTR/L43400	●	●	●		●	●	4	4.5	12.7	4.76	0.3	
MGTR/L43420	●	●	●		●	●	4.2	4.5	12.7	4.76	0.4	
MGTR/L43430	●	●	●		●	●	4.3	4.5	12.7	4.76	0.4	
MGTR/L43450	●	●	●	●	●	●	4.5	4.5	12.7	4.76	0.4	
MGTR/L43470	●	●	●	●	●	●	4.7	4.5	12.7	4.76	0.4	
MGTR/L44500	●	●			●	●	5	4.5	12.7	6.35	0.4	
MGTR/L44550	●				●		5.5	4.5	12.7	6.35	0.4	
MGTR/L44600	●				●	●	6	4.5	12.7	6.35	0.4	



Right hand insert shown.

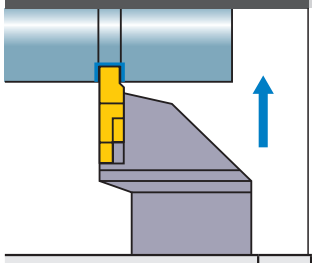
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

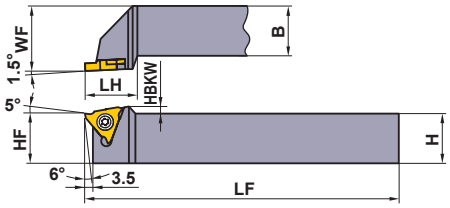
SMG HOLDER

- Screw-on type
- Positive insert suffers from negligible chattering.
- Applicable to narrow grooving and threading.
- Cutting width CW 0.5—1.3mm

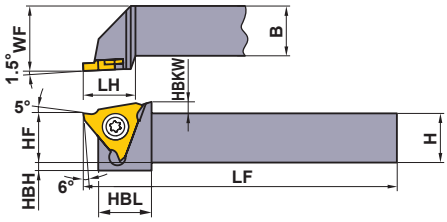
SMGH

External grooving, Threading





Right hand tool holder only.



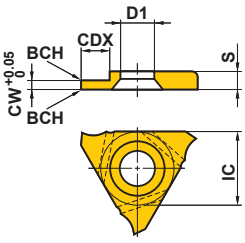
SMGHR1010E16, SMGHR1212F16

Order Number	Stock	Insert Number		Dimensions(mm)									*	
	R	Grooving	Threading	H	B	LF	LH	HF	WF	HBKW	HBH	HBL	Clamp Screw	Wrench
SMGHR1010E16	●	SMGTR 16×2○○○ 16×2○○○C	SMTTR 160360○○	10	10	70	16.5	10	12	2.5	4	13	FC400890T	TKY10F
SMGHR1212F16	●			12	12	80	16.5	12	16	2.5	2	13	FC400890T	TKY10F
SMGHR1616H16	●			16	16	100	20	16	20	—	—	—	FC400890T	TKY10F
SMGHR2020K16	●			20	20	125	20	20	25	—	—	—	FC400890T	TKY10F
SMGHR2525M16	●			25	25	150	20	25	32	—	—	—	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

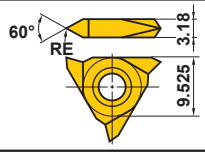
SMG INSERTS (GROOVING)

Order Number	Stock				Dimensions(mm)						Geometry
	Cermet		Carbide		CW	CDX	IC	S	D1	BCH	
	NX2525		UTi20T	HTi10							
SMGTR16X2050				●	0.5	1.5	9.525	2	4.5	—	
SMGTR16X2060	●		●	●	0.6	1.5	9.525	2	4.5	—	
SMGTR16X2050C	●		●	●	0.5	1.5	9.525	2	4.5	0.05	
SMGTR16X2060C	●		●	●	0.6	1.5	9.525	2	4.5	0.05	
SMGTR16X2070C	●		●	●	0.7	2	9.525	2	4.5	0.05	
SMGTR16X2075C	●		●	●	0.75	2	9.525	2	4.5	0.05	
SMGTR16X2080C	●		●	●	0.8	2	9.525	2	4.5	0.1	
SMGTR16X2090C	●		●	●	0.9	2	9.525	2	4.5	0.1	
SMGTR16X2095C	●		●	●	0.95	2	9.525	2	4.5	0.1	
SMGTR16X2100C	●		●	●	1	2.5	9.525	2	4.5	0.1	
SMGTR16X2110C	●		●	●	1.1	2.5	9.525	2	4.5	0.1	
SMGTR16X2120C	●		●	●	1.2	2.5	9.525	2	4.5	0.1	
SMGTR16X2130C	●		●	●	1.3	2.5	9.525	2	4.5	0.1	



SMT INSERTS (THREADING)

Order Number	Stock	Dimensions(mm)	Thread Pitch (mm)	Geometry
	Carbide			
	UTi20T	RE		
SMTTR16036001	●	0.1	1.0—1.5	
SMTTR16036002	●	0.2	1.75—2.0	



Note 1) When installing the threading insert to the tool body, a difference occurs. Please refer to page G031.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	100 (80—120)	0.07 (0.03—0.1)
			NX2525	130 (100—160)	0.07 (0.03—0.1)
M	Stainless Steel	≤200HB	**UTi20T**	130 (100—160)	0.1 (0.05—0.15)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UTi20T HTi10**	100 (80—120)	0.1 (0.05—0.15)
N	Aluminium Alloy	—	**HTi10**	350 (300—400)	0.1 (0.05—0.15)
	Brass	—	**HTi10**	250 (200—300)	0.1 (0.03—0.15)
	Acrylic	—	**HTi10**	250 (200—300)	0.1 (0.03—0.15)

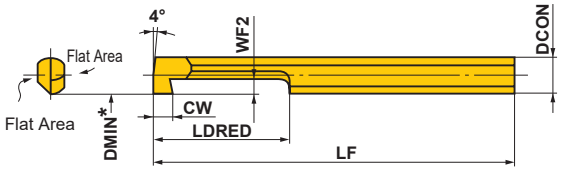
● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

MICRO-MINI

- Solid carbide type with min. cutting diameter 3.2mm.
- l/d is 5 times the diameter.
- Insert can be ground to suit the application.
- Suitable for a wide range of tooling including threading and grooving.

MICRO-MINI STANDARD (SOLID CARBIDE BORING BAR)

Order Number	Stock	Dimensions(mm)						Geometry
	TF15	CW	DCON	LF	LDRED	DMIN*	WF2	
C03FR-BLS	●	2.0	3	80	15	3.2	1.0	
C04FR-BLS	●	2.5	4	80	20	4.2	1.5	
C05HR-BLS	●	3.0	5	100	25	5.2	2.0	



Right hand tool only.

* DMIN : Min. Cutting Diameter

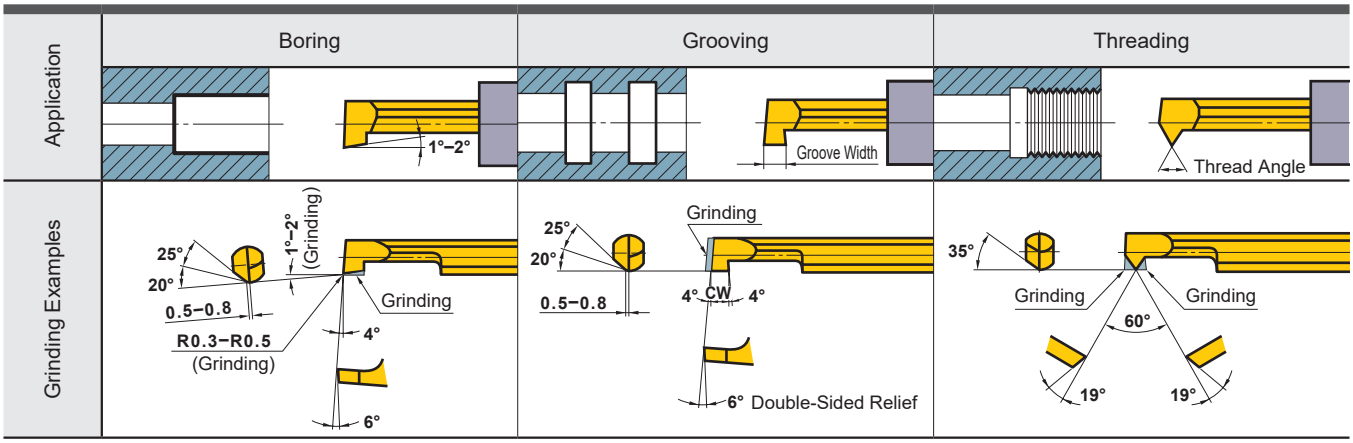
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Excrescence Quantity (l /d)	Edge Condition	
						Corner Radius or BCH *	Honing *
P	Carbon Steel · Alloy Steel 180—280HB	40 (30—50)	0.05 (—0.1)	0.2 (0.1—0.3)	5	0.1—0.5	0.01—0.05
M	Stainless Steel ≤200HB	40 (30—50)	0.05 (—0.1)	0.2 (0.1—0.3)	5	≤0.4	≤0.03 (Honing not required)
K	Gray Cast Iron ≤350MPa	40 (30—50)	0.05 (—0.05)	0.2 (0.1—0.3)	5	0.1—0.5	0.01—0.05
N	Non-ferrous Metal	80 (60—100)	0.05 (—0.1)	0.3 (0.1—0.5)	5	0.1—0.5	≤0.03 (Honing not required)

*Cutting edge is not honed. Please hone according to the application before machining.

■ GRINDING THE CUTTING EDGE OF MICRO-MINI

- MICRO-MINI can be applied to boring and grooving as supplied. But, it can also be reground as shown below.
- For shaping and regrinding, use a diamond whetstone approximately #250—#400. Please grind according to the application using the figure below as a reference.

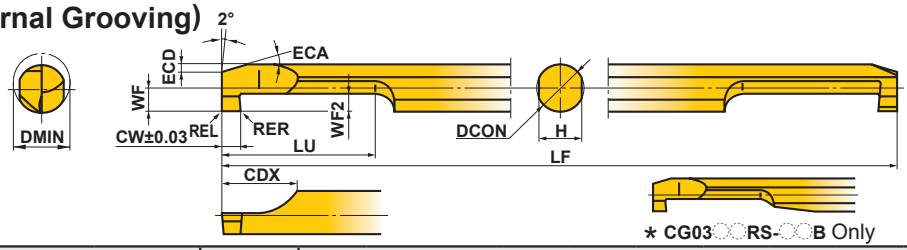


● : Inventory maintained in Japan.
(MICRO MINI is available in 1 piece in one pack.)

SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

MICRO-MINI TWIN

■CG TYPE (Internal Grooving)



Order Number	Stock		Breaker	Dimensions (mm)											
	Micro-Grain Carbide	Coated													
	TF15	VP15TF		DMIN	CW	WF2	RER/L	DCON	LF	LU	CDX	WF	H	ECA	ECD
CG0305RS-10	●	●	Without	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0305RS-10B	●	●	With	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0306RS-20	●	●	Without	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG0306RS-20B	●	●	With	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG03RS-10	●	●	Without	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-10B	●	●	With	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-20	●	●	Without	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG03RS-20B	●	●	With	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG0407RS-10	●	●	Without	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0407RS-10B	●	●	With	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0408RS-20	●	●	Without	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG0408RS-20B	●	●	With	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG04RS-10	●	●	Without	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-10B	●	●	With	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-20	●	●	Without	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG04RS-20B	●	●	With	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG0510RS-10	●	●	Without	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0510RS-10B	●	●	With	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0511RS-20	●	●	Without	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG0511RS-20B	●	●	With	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG05RS-10	●	●	Without	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-10B	●	●	With	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-20	●	●	Without	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG05RS-20B	●	●	With	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG0610RS-10	●	●	Without	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0610RS-10B	●	●	With	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0611RS-20	●	●	Without	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG0611RS-20B	●	●	With	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG06RS-10	●	●	Without	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-10B	●	●	With	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-20	●	●	Without	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG06RS-20B	●	●	With	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG0712RS-10	●	●	Without	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0712RS-10B	●	●	With	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0713RS-20	●	●	Without	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG0713RS-20B	●	●	With	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG07RS-10	●	●	Without	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-10B	●	●	With	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-20	●	●	Without	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7
CG07RS-20B	●	●	With	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7

● : Inventory maintained in Japan.
(MICRO-MINI TWIN is available in 1 piece in one pack.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Speed (m/min)	Feed (mm/rev)		Recommended Tool Overhang (mm)
				CG03RS/CG04RS	CG05RS/CG06RS/CG07RS	
P	Carbon Steel · Alloy Steel	180−280HB	80 (40−120)	0.02 (0.01−0.03)	0.03 (0.01−0.05)	CG Type Micro-Mini Twin LU + 2 (mm) Holder
M	Stainless Steel	≤200HB	80 (40−120)	0.02 (0.01−0.03)	0.03 (0.01−0.05)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	80 (40−120)	0.03 (0.01−0.05)	0.03 (0.01−0.05)	
N	Non-ferrous Metal	−	120 (80−160)	0.03 (0.01−0.05)	0.05 (0.01−0.08)	

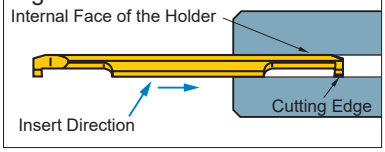
Note 1) Wet cutting is recommended.

■ PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

●When using a holder for general purpose / small automatic lathe:

1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

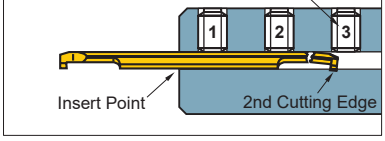
Fig.1



2 When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

◎When using Mitsubishi holders
When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. The set torque value for clamping screw is 2.0 N•m.

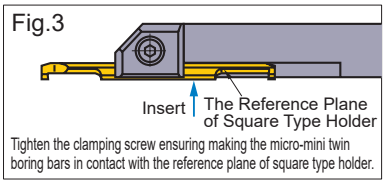
Fig.2



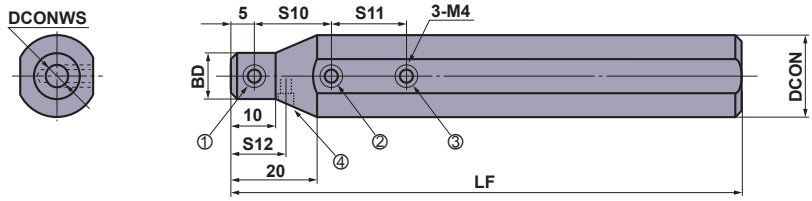
●When using a square type holder:

1 When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.
2 Make sure that the clamping screws are tightened to the recommended values.
3 Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

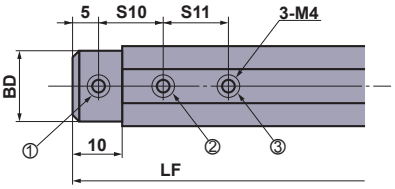
Fig.3



ROUND TYPE HOLDER



RBH22◯◯N has a temporary set screw for different machine specifications.
(Represented by number 4)



RBH158◯◯N, RBH16◯◯N,
RBH190◯◯N

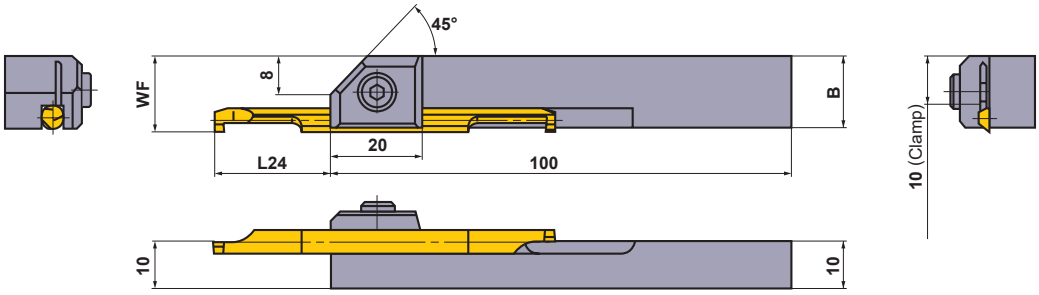
Order Number	Stock	Dimensions (mm)							MICRO-MINI C	MICRO-MINI TWIN CG	✱1 Clamp Screw				Wrench	Torque (N • m)
		DCON	DCONWS	BD	LF	S10	S11	S12			①	②	③	④		
RBH15830N	●	15.875	3	15	100	10	10	—	03FR-BLS	03RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH15840N	●	15.875	4	15	100	15	15	—	04FR-BLS	04RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH15850N	●	15.875	5	15	100	15	15	—	05HR-BLS	05RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH15860N	●	15.875	6	15	100	15	15	—	—	06RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH15870N	●	15.875	7	15	100	20	20	—	—	07RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH1630N	●	16	3	15	100	10	10	—	03FR-BLS	03RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	04FR-BLS	04RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	05HR-BLS	05RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	—	06RS-◯◯(B)	A	A	A	—	HKY20F	2.0
RBH1670N	●	16	7	15	100	20	20	—	—	07RS-◯◯(B)	A	A	A	—	HKY20F	2.0
✱2 RBH19030N	●	19.05	3	18	125	10	10	—	03FR-BLS	03RS-◯◯(B)	B	B	B	—	HKY20F	2.0
✱2 RBH19040N	●	19.05	4	18	125	15	15	—	04FR-BLS	04RS-◯◯(B)	B	B	B	—	HKY20F	2.0
✱2 RBH19050N	●	19.05	5	18	125	15	15	—	05HR-BLS	05RS-◯◯(B)	B	B	B	—	HKY20F	2.0
✱2 RBH19060N	●	19.05	6	18	125	15	15	—	—	06RS-◯◯(B)	B	B	B	—	HKY20F	2.0
✱2 RBH19070N	●	19.05	7	18	125	20	20	—	—	07RS-◯◯(B)	B	B	B	—	HKY20F	2.0
RBH2030N	●	20	3	12	125	10	10	—	03FR-BLS	03RS-◯◯(B)	A	A	B	—	HKY20F	2.0
RBH2040N	●	20	4	13	125	15	15	—	04FR-BLS	04RS-◯◯(B)	A	B	B	—	HKY20F	2.0
RBH2050N	●	20	5	14	125	15	15	—	05HR-BLS	05RS-◯◯(B)	A	B	B	—	HKY20F	2.0
RBH2060N	●	20	6	15	125	15	15	—	—	06RS-◯◯(B)	A	B	B	—	HKY20F	2.0
RBH2070N	●	20	7	16	125	20	20	—	—	07RS-◯◯(B)	A	B	B	—	HKY20F	2.0
RBH2230N	●	22	3	12	125	10	10	10	03FR-BLS	03RS-◯◯(B)	A	B	C	A	HKY20F	2.0
RBH2240N	●	22	4	13	125	15	15	12.5	04FR-BLS	04RS-◯◯(B)	A	B	B	A	HKY20F	2.0
RBH2250N	●	22	5	14	125	15	15	12.5	05HR-BLS	05RS-◯◯(B)	A	B	B	A	HKY20F	2.0
RBH2260N	●	22	6	15	125	15	15	15	—	06RS-◯◯(B)	A	B	B	A	HKY20F	2.0
RBH2270N	●	22	7	16	125	20	20	15	—	07RS-◯◯(B)	A	B	B	A	HKY20F	2.0
RBH2530N	●	25	3	12	150	10	10	—	03FR-BLS	03RS-◯◯(B)	A	B	C	—	HKY20F	2.0
RBH2540N	●	25	4	13	150	15	15	—	04FR-BLS	04RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH2550N	●	25	5	14	150	15	15	—	05HR-BLS	05RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH2560N	●	25	6	15	150	15	15	—	—	06RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH2570N	●	25	7	16	150	20	20	—	—	07RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH25430N	●	25.4	3	12	150	10	10	—	03FR-BLS	03RS-◯◯(B)	A	B	C	—	HKY20F	2.0
RBH25440N	●	25.4	4	13	150	15	15	—	04FR-BLS	04RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH25450N	●	25.4	5	14	150	15	15	—	05HR-BLS	05RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH25460N	●	25.4	6	15	150	15	15	—	—	06RS-◯◯(B)	A	C	C	—	HKY20F	2.0
RBH25470N	●	25.4	7	16	150	20	20	—	—	07RS-◯◯(B)	A	C	C	—	HKY20F	2.0

✱1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008
✱2 Revised order number.

Conventional Order Number	Revised Order Number
RBH1930N	RBH19030N
RBH1940N	RBH19040N
RBH1950N	RBH19050N
RBH1960N	RBH19060N
RBH1970N	RBH19070N

● : Inventory maintained in Japan.

SQUARE TYPE HOLDER



Order Number	Stock	Dimensions (mm) MICRO-MINI TWIN **CG** B	WF	L24 * Width of Cutting Edge 1mm	L24 * Width of Cutting Edge 2mm	MICRO-MINI TWIN **CG**	Clamp Screw	Wrench	Torque (N • m)
SBH1030R	●	13.8	13.8	13－17.5 (14)	14－16.5 (15)	03RS-10(B),03RS-20(B)	HSC05012	HKY40R	9.5
SBH1040R	●	14.7	14.8	18－22.5 (19)	19－21.5 (20)	04RS-10(B),04RS-20(B)	HSC05012	HKY40R	9.5
SBH1050R	●	15.6	15.8	23－27.5 (24)	24－26.5 (25)	05RS-10(B),05RS-20(B)	HSC05012	HKY40R	9.5
SBH1060R	●	16.5	16.8	23－32.5 (24)	24－31.5 (25)	06RS-10(B),06RS-20(B)	HSC05012	HKY40R	9.5
SBH1070R	●	17.4	17.8	28－38 (29)	29－37 (30)	07RS-10(B),07RS-20(B)	HSC05012	HKY40R	9.5

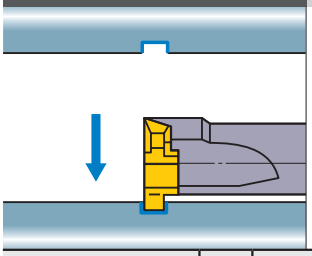
Note 1) The MICRO-MINI cannot be fit to square holders.
* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.

F TYPE

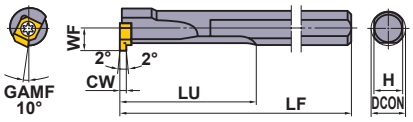
- Min. cutting diameter 10mm
- Screw-on type
- Usable for various applications.
- Max. groove depth : 3mm

FSL51

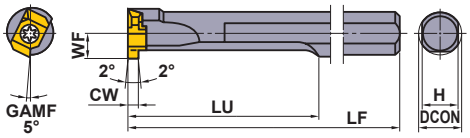
Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)



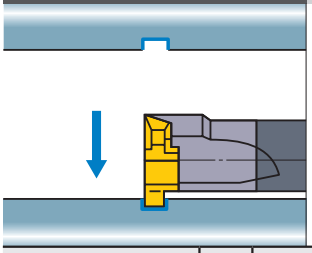
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions(mm)							Max. Groove Depth (mm)	✶2 Clamp Screw	✶2 Wrench
	R	Grooving	Threading	DCON	LF	LU	WF	H	CW	DMIN ✶1			
FSL5108R	●	MLG10◌◌L	MLT1001L	8	125	30	4.8	7	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5110R	●	MLG10◌◌L	MLT1001L	10	150	40	5.8	9		**12**	1.0	TS25	TKY08F
FSL5112R	●	MLG14◌◌L	MLT1401L	12	180	50	6.8	10.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5114R	●	MLG14◌◌L	MLT1401L	14	180	60	7.8	12.4		**16**	2.0	TS32	TKY08F
FSL5116R	●	MLG20◌◌L	MLT2001L	16	200	70	9.7	14	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

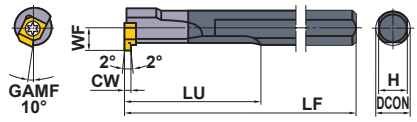
✶1 DMIN : Min. Cutting Diameter
✶2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

FSL52

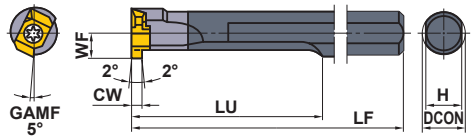
(Carbide shank) Internal grooving, Threading



1 Corner type (FSL5208R,5210R)



2 Corner type (FSL5212R,5214R,5216R)



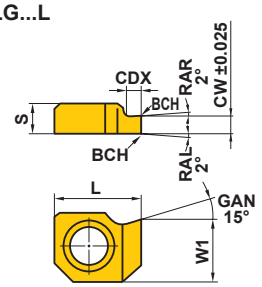
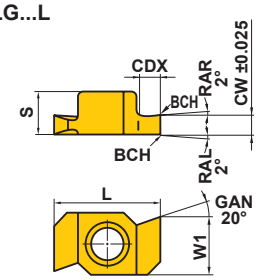
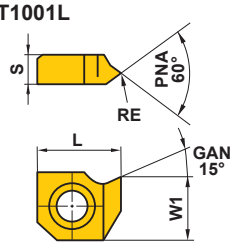
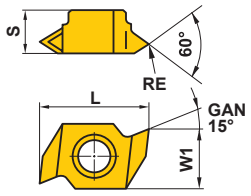
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions(mm)							Max. Groove Depth (mm)	✶2 Clamp Screw	✶2 Wrench
	R	Grooving	Threading	DCON	LF	LU	WF	H	CW	DMIN ✶1			
FSL5208R	●	MLG10◌◌L	MLT1001L	8	125	60	4.8	7	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5210R	●	MLG10◌◌L	MLT1001L	10	150	70	5.8	9		**12**	1.0	TS25	TKY08F
FSL5212R	●	MLG14◌◌L	MLT1401L	12	180	80	6.8	10.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5214R	●	MLG14◌◌L	MLT1401L	14	180	85	7.8	12.4		**16**	2.0	TS32	TKY08F
FSL5216R	●	MLG20◌◌L	MLT2001L	16	200	115	9.7	14	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

✶1 DMIN : Min. Cutting Diameter
✶2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

INSERTS

Application	CW and pitch (mm)	Order Number	Coated UP20M	Carbide UTi20T	L	W1	CDX	S	RE	BCH	Geometry
Grooving	1.2	**MLG1012L**		●	7	5	1	2.38	—	0.1	**MLG...L** 
	1.5	**MLG1015L**		●	7	5	1	2.38	—	0.1	
	2	**MLG1020L**		●	7	5	1	2.38	—	0.1	
	1.5	**MLG1415L**		●	11.8	6.5	2	4.76	—	0.1	**MLG...L** 
	2	**MLG1420L**		●	11.8	6.5	2	4.76	—	0.1	
	3	**MLG1430L**		●	11.8	6.5	2	4.76	—	0.1	
	2	**MLG2020L**		●	16.8	9.03	3	6.35	—	0.1	
	3	**MLG2030L**		●	16.8	9.03	3	6.35	—	0.1	
	4	**MLG2040L**		●	16.8	9.03	3	6.35	—	0.1	
Threading	Pitch 1.5—2.0	**MLT1001L**	●	●	7	5	—	2.38	0.1	—	**MLT** **MLT1001L** 
	Pitch 1.5—2.5	**MLT1401L**	●	●	11.8	6.5	—	4.76	0.1	—	
	Pitch 1.5—3.5	**MLT2001L**	●	●	16.8	9.03	—	6.35	0.1	—	**MLT1401L/2001L** 

RECOMMENDED CUTTING CONDITIONS

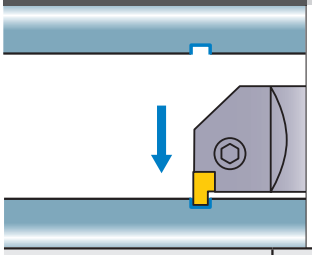
Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)			
					1.2, 1.5mm	2.0mm	3.0mm	4.0mm
P	Carbon Steel Alloy Steel	180—280HB	**UP20M • UTi20T**	90 (60—120)	0.05 (0.02—0.08)	0.05 (0.02—0.08)	0.05 (0.02—0.08)	0.05 (0.02—0.08)
		280—350HB	**UP20M • UTi20T**	80 (50—100)	0.03 (0.02—0.04)	0.03 (0.02—0.04)	0.03 (0.02—0.04)	0.03 (0.02—0.04)

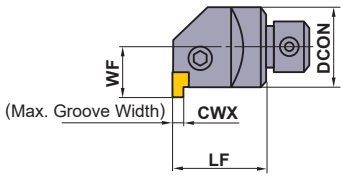
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

D TYPE BORING HEAD

- Min. cutting diameter : 40mm
- Pin lock type
- Exchangeable head type
- Cutting width CW 1.25—4.7mm

DPT4 — Internal grooving





Right hand tool holder only.

Order Number	Stock	Insert Number	Dimensions(mm)					Lock Pin	Lock Screw *2	Stop Ring	Wrench
	R		CWX	DCON	LF	WF	DMIN *1				
DPT4132R	●	MGTL43○○○	4.7	32	40	20	**40**	P21S	HSP08014	E01	HKY40R
DPT4140R	●		4.7	40	50	25	**50**	P21S	HSP08014	E01	HKY40R

Note 1) Please use left hand insert.
*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (N • m) : HSP08014=7.0

F

GROOVING / CUTTING OFF

STANDARD ARBOR FOR D TYPE BORING HEAD

① **B** ② **1** ③ **32** ④ **32**

①Designation

②Arbor Length (mm)

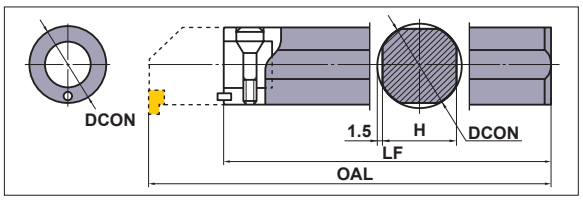
Symbol	DCON	LF	OAL
1	32	260	300
	40	310	360

③Arbor Diameter (mm)

Symbol	Diameter(DCON)
32	32
40	40

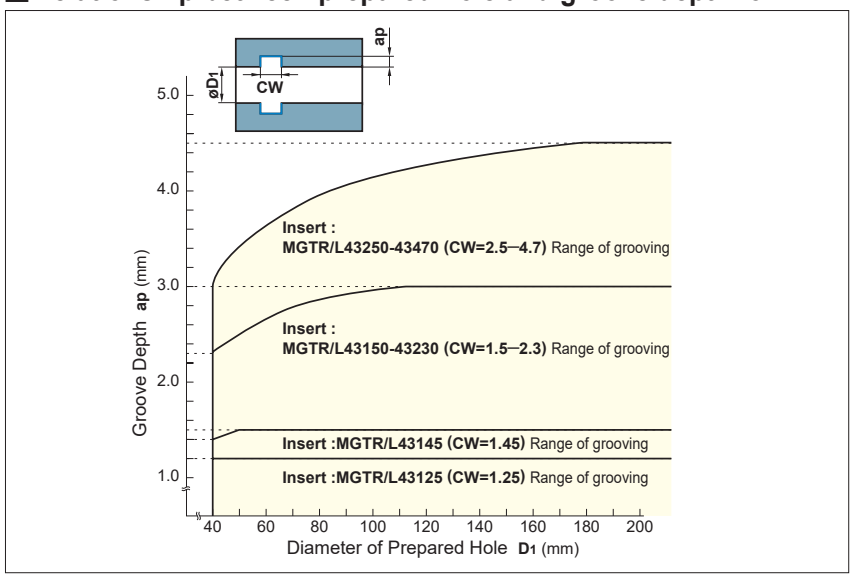
④Head Diameter (mm)

Symbol	Diameter(BD)
32	32
40	40



Order Number	Stock	Dimensions (mm)				Set Bolt	Wrench	Head Order Number
		DCON	LF	H	OAL			
B13232	●	32	260	29	300	SD32	HKY60R	**DPT4132R**
B14040	●	40	310	37	360	SD40	HKY60R	**DPT4140R**

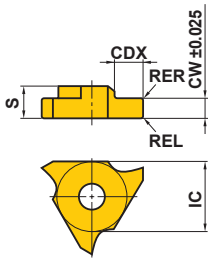
■Relationship between prepared hole and groove depth for DPT4 type



● : Inventory maintained in Japan.
(Contains 10 inserts per case.)

INSERTS

Order Number	Stock			Dimensions(mm)					Geometry
	Coated	Cermet	Carbide						
	VP20MF	NX2525	UTi20T	CW	CDX	IC	S	RER/L	
MGTL43125	●	●	●	1.25	1.2	12.7	4.76	0.2	**MGTL...**
MGTL43145	●	●	●	1.45	1.5	12.7	4.76	0.2	
MGTL43150	●	●	●	1.5	3.0	12.7	4.76	0.2	
MGTL43175	●	●	●	1.75	3.0	12.7	4.76	0.2	
MGTL43200	●	●	●	2	3.0	12.7	4.76	0.2	
MGTL43230	●	●	●	2.3	3.0	12.7	4.76	0.2	
MGTL43250	●	●	●	2.5	4.5	12.7	4.76	0.3	
MGTL43260	●		●	2.6	4.5	12.7	4.76	0.3	
MGTL43270	●		●	2.7	4.5	12.7	4.76	0.3	
MGTL43280	●	●	●	2.8	4.5	12.7	4.76	0.3	
MGTL43300	●	●	●	3	4.5	12.7	4.76	0.3	
MGTL43320			●	3.2	4.5	12.7	4.76	0.3	
MGTL43330	●	●	●	3.3	4.5	12.7	4.76	0.3	
MGTL43350	●	●	●	3.5	4.5	12.7	4.76	0.3	
MGTL43400	●		●	4	4.5	12.7	4.76	0.3	
MGTL43420	●		●	4.2	4.5	12.7	4.76	0.4	
MGTL43430	●		●	4.3	4.5	12.7	4.76	0.4	
MGTL43450	●	●	●	4.5	4.5	12.7	4.76	0.4	
MGTL43470	●	●	●	4.7	4.5	12.7	4.76	0.4	



RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180−280HB	**VP20MF**	120 (100−140)	0.14 (0.03−0.25)
			NX2525	130 (100−160)	0.12 (0.03−0.2)
M	Stainless Steel	≤200HB	**VP20MF**	120 (100−140)	0.12 (0.03−0.18)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP20MF**	120 (100−140)	0.12 (0.03−0.18)

Note 1) For machining a narrow groove, apply a lower feed within the recommended range.

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

HOW TO READ THE STANDARD OF THREADING

●How this section page is organised

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

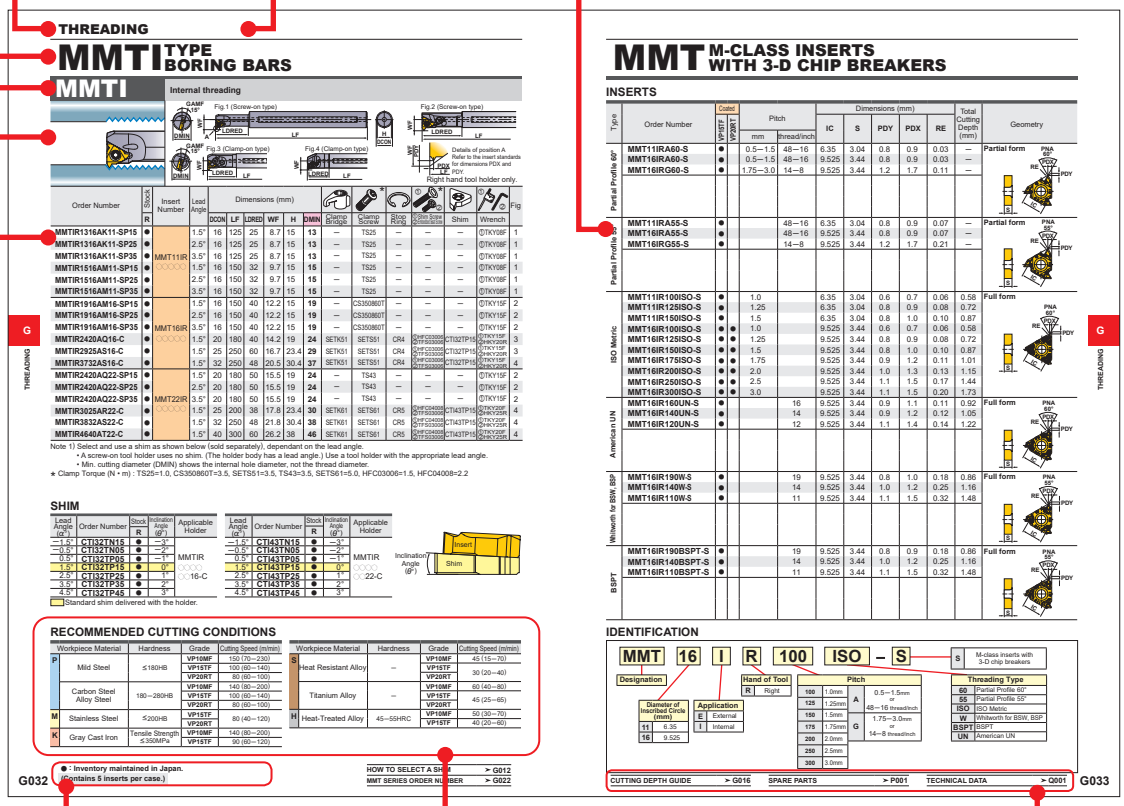
FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications, such as external and internal threading.

TYPE OF TOOL HOLDER
indicates the initial letters for the order number and cutting applications.

TITLE OF PRODUCT
PRODUCT SECTION

INDICATION OF EXTERNAL /INTERNAL APPLICATION

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PAGE REFERENCE ·SPARE PARTS
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, holder dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each workpiece material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K, S, and H.

●To Order : For holder, please specify ①order number and hand of tool (right/left).
For insert, please specify ①insert number and ②grade.

TURNING TOOLS

THREADING

CLASSIFICATION (EXTERNAL THREADING) ···· G002
CLASSIFICATION (INTERNAL THREADING)····· G003
CROSS REFERENCE OF THREAD PITCHES
EXTERNAL ····· G004
INTERNAL ····· G006
STANDARD THREAD AND CORRESPONDING INSERT / HOLDER···· G008

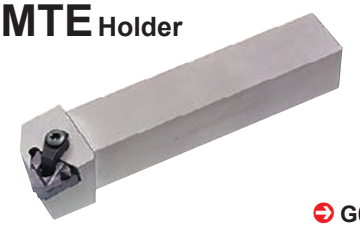
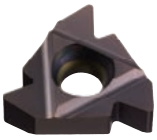
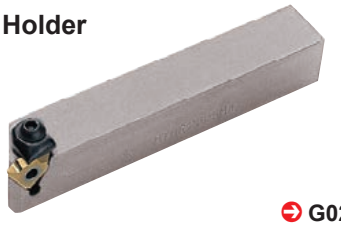
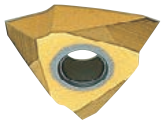
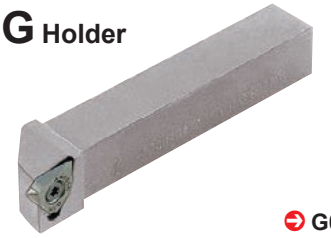
STANDARD OF THREADING TOOLS
MMT SERIES
FEATURES ····· G010
CUTTING CONDITIONS····· G012
STANDARD OF DEPTH OF CUT····· G014
THREADING METHODS····· G018
EXTERNAL THREADING
MMTE HOLDER ····· G023
MT HOLDER ····· G028
SMG HOLDER ····· G030
INTERNAL THREADING
MMTI TYPE BORING BARS····· G032
MICRO-MINI TWIN BORING BARS ····· G037
F TYPE BORING BARS····· G040
D TYPE BORING HEAD ····· G042



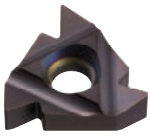
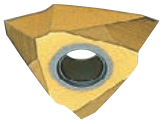
*Arranged by Alphabetical order

G037 **CT**
G042 **DPT2**
G040 **FSL51**
G040 **FSL52**
G041 **MLG (INTERNAL INSERTS)**
G041 **MLT (INTERNAL INSERTS)**
G024 **MMT (EXTERNAL INSERTS)**
G033 **MMT (INTERNAL INSERTS)**
G023 **MMTE**
G032 **MMTI**
G028 **MT1**
G028 **MTH**
G029 **MTT (EXTERNAL INSERTS)**
G043 **MTT (INTERNAL INSERTS)**
G039 **RBH**
G038 **SBH**
G030 **SMGH**
G031 **SMGT (EXTERNAL INSERTS)**
G031 **SMTT (EXTERNAL INSERTS)**

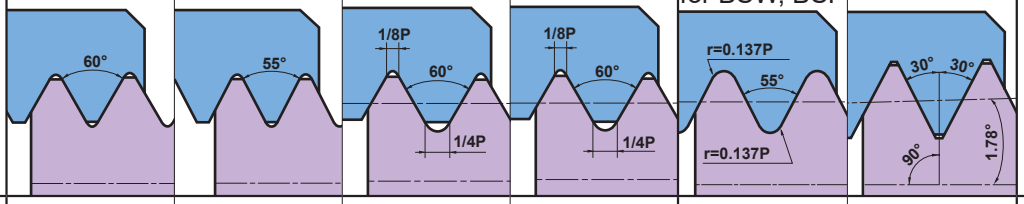
CLASSIFICATION (EXTERNAL THREADING)

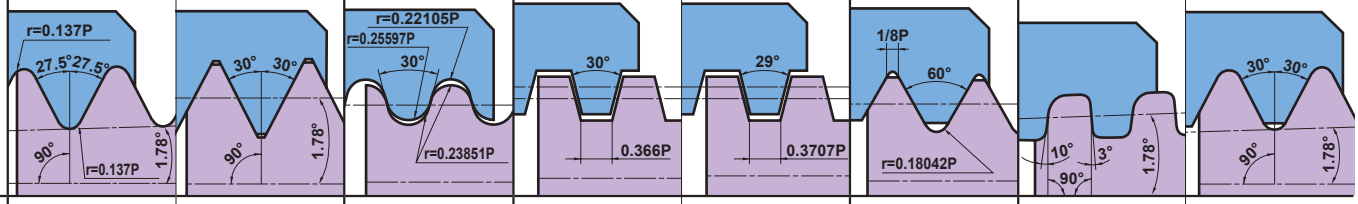
Name of Tool Holder	Insert Shape	Features	Shank Size (H x W x L) (mm)
MMTE Holder  G023		●Various insert types. ●M-class 3-D breaker inserts and G-class ground inserts available. ●Available with a wiper cutting edge to provide a precise thread geometry. ●Able to change lead angle by replacing shim.	12 x 12 x 100 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
MT Holder  G028		●Clamp-on type. ●Precision class insert. ●Positive insert suffers from negligible chattering and thus produces good finished surface.	16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
SMG Holder  G030		●Screw-on type. ●Precision class insert. ●Positive insert suffers from negligible chattering and thus produces good finished surface. ●Holder is capable of performing both threading and grooving.	10 x 10 x 70 12 x 12 x 80 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150
SMALL TOOLS **TTAH**  D024		●Tools to be equipped on Gang type tool posts. ●Small Shank: 8mm—16mm ●High rigidity due to designing of vertical insert. ●The screw designed for common use on front and back enables back clamping. ●Most suitable for threading diameters of 2 mm or smaller. ●Screw-on type.	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120
CSVH  D027		●Tools to be equipped on Cam type tool posts. ●Small Shank: 7mm—12mm ●Single holder for front turning, back turning, grooving, threading and cutting off operations. ●The most suitable for machining of small parts with work diameter 5mm or less. ●Screw-on type.	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x 10 x 140 12 x 12 x 140

CLASSIFICATION (INTERNAL THREADING)

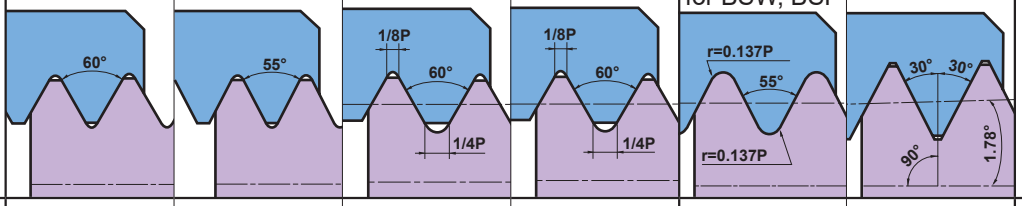
Name of Tool Holder	Insert Shape	Features	Shank Size (Dia. x L x Min. Cutting Dia.) (mm)
MMTI  ➔ G032		●Minimum cutting diameter 13mm. ●Various insert types. ●M-class 3-D breaker inserts and G-class ground inserts available. ●Available with a wiper cutting edge to provide a precise thread geometry. ●Able to change lead angle by replacing shim.	16 x 125 x 13 16 x 150 x 15 20 x 170 x 24 25 x 200 x 29 32 x 250 x 37 40 x 300 x 46
FSL5  ➔ G040		●Minimum cutting diameter 10mm. ●Screw-on type. ●Precision class insert. ●Applicable for threading, grooving and boring. ●Available with a carbide shank to prevent vibration when machining deep holes.	8 x 125 x 10 10 x 150 x 12 12 x 180 x 14 14 x 180 x 16 16 x 200 x 20
DPT2  ➔ G042		●Minimum cutting diameter 40mm. ●Pin lock type. ●Precision class insert. ●Exchangeable head type.	32 x 300 x 40 40 x 360 x 50
MICRO-MINI TWIN Boring Bars  ➔ G037	–	●Minimum cutting diameter 3mm. ●Solid carbide type. ●Economical two cutting edge type.	3 x 50 x 3 4 x 60 x 4.5 5 x 70 x 6 6 x 75 x 7
MICRO-MINI Boring Bars  ➔ E030	–	●Minimum cutting diameter 3.2mm. ●Solid carbide type. ●Insert can be ground to suit the application.	3 x 80 x 3.2 4 x 80 x 4.2 5 x 100 x 5.2

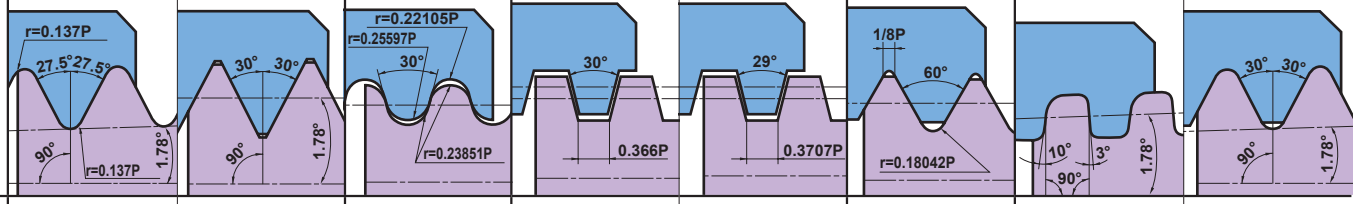
CROSS REFERENCE OF THREAD PITCHS (EXTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water		
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT	
								
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT	
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch	
MMT Holder  G023	Full form	–	–	0.5—5.0	32—5	28—5	27, 18, 14 11.5, 8	
	Partial form	0.5—5.0 (48—5)	48—5	0.5—5.0	48—5	–	–	
MT Holder  G028	Partial form	0.25—4.5 (64—6)	20—9	0.25—4.5	64—6	–	–	
SMG Holder  G030	Partial form	0.25—2.0 (48—13)	–	0.25—2.0	48—13	–	–	

	Steam, gas and water line pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing&Tubing
							
	R(PT) Rc(PT) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	28, 19 14, 11	27, 18, 14 11.5, 8	10, 8 6, 4	1.5, 2 3, 4, 5	12, 10 8, 6, 5	32—8	5	10, 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

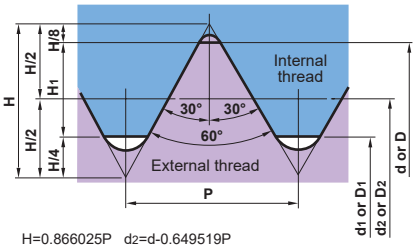
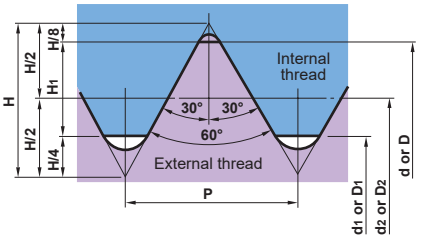
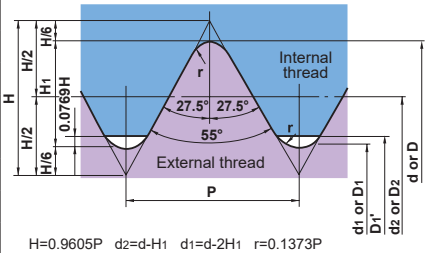
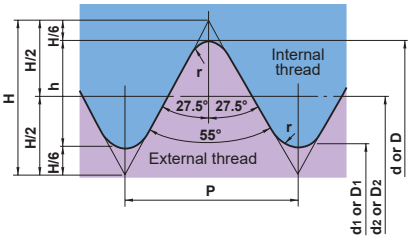
CROSS REFERENCE OF THREAD PITCHS (INTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water		
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT	
								
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT	
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch	
MMT **Boring Bars**  G032	Full form	—	—	0.5—5.0	32—5	28—5	27, 18, 14 11.5, 8	
	Partial form	0.5—5.0 (48—5)	48—5	0.5—5.0	48—5	—	—	
FSL5 **Boring Bars**  G040	Partial form	1.5—3.5 (16—8)	—	1.5—3.5	16—8	—	—	
DPT2 **Boring Head**  G042	Partial form	1.0—3.5	—	1.0—3.5	—	—	—	
MICRO-MINI TWIN  G037	Partial form	0.5—1.75 (36—16)	—	0.5—1.75	36—16	—	—	

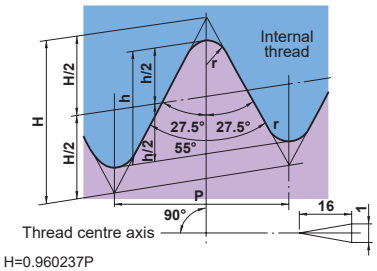
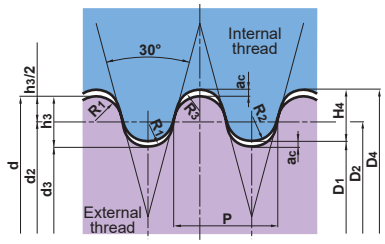
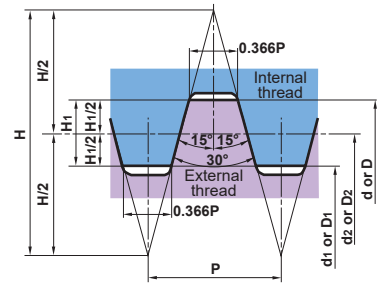
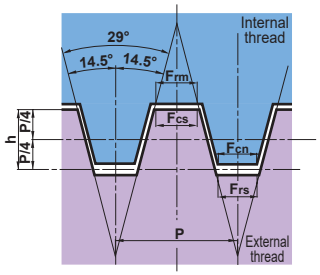
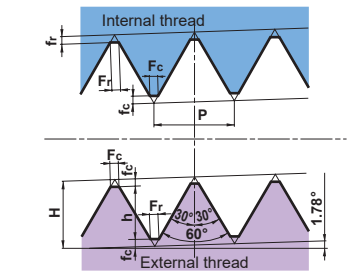
	Steam, gas and water line pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing&Tubing
							
	R(PT) Rc(PT) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	19, 14, 11	14, 11.5, 8	10, 8 6, 4	1.5, 2 3, 4, 5	12, 10 8, 6, 5	–	5	10, 8
	–	–	–	–	–	* –	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

* When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.

STANDARD THREAD AND CORRESPONDING INSERT / HOLDER

Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/ General	Tool Holder	Page
ISO Metric	 H=0.866025P d2=d-0.649519P H1=0.541266P d1=d-1.082532P D=d D2=d2 D1=d1	M	Ext.	MMT○○ER○○○ISO	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○ISO-S	Wiper		
				MMT○○ER○○○60	General		
				MMT○○ER○○○60-S	General		
				SMTTR/L160360○○	General	SMGHR/L○○○○16	G030
				MTTR/L4360○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○ISO	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○ISO-S	Wiper		
				MMT○○IR○○○60	General		
				MMT○○IR○○○60-S	General		
				MTTR/L4360○○	General	DPT2○○○R	G042
American UN	 H=0.866025P d2=d-0.649519P H1=0.541266P d1=d-1.082532P D=d D2=d2 D1=d1 P=25.4/thread	UNC UNF	Ext.	MMT○○ER○○○UN	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○UN-S	Wiper		
				MMT○○ER○○○60	General		
				MMT○○ER○○○60-S	General		
				SMTTR/L160360○○	General	SMGHR/L○○○○16	G030
				MTTR/L4360○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○UN	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○UN-S	Wiper		
				MMT○○IR○○○60	General		
				MMT○○IR○○○60-S	General		
				MTTR/L4360○○	General	DPT2○○○R	G042
Whitworth for BSW, BSP	 H=0.9605P d2=d-H1 d1=d-2H1 r=0.1373P H1=0.6403P D1'=d1+2×0.0769H D=d D2=d2 D1=d1 P=25.4/thread	W	Ext.	MMT○○ER○○○W	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○W-S	Wiper		
				MMT○○ER○○○55	General		
				MMT○○ER○○○55-S	General		
				MTTR/L4355○○	General	MTHR/L○○○○○4 MT1R/L○○○○○4	G028
			Int.	MMT○○IR○○○W	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○W-S	Wiper		
				MMT○○IR○○○55	General		
				MMT○○IR○○○55-S	General		
				MTTR/L4355○○	General	DPT2○○○R	G042
Parallel Pipe Thread	 H=0.960491P d2=d-h d1=d-2h r=0.137329P h=0.640327P D=d D2=d2 D1=d1 P=25.4/thread	PF G Rp	Ext.	MMT○○ER○○○W	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○W-S	Wiper		
			Int.	MMT○○IR○○○W	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○W-S	Wiper		

Wiper : Insert order number is determined by selected pitch.
General : An insert is applicable to several pitch types.

Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/ General	Tool Holder	Page
BSPT	 H=0.960237P h=0.640327P r=0.137278P P=25.4/thread	BSPT	Ext.	MMT○○ER○○○BSPT	Wiper	MMTER○○○○○-C	G023
				MMT○○ER○○○BSPT-S	Wiper		
			Int.	MMT○○IR○○○BSPT	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
				MMT○○IR○○○BSPT-S	Wiper		
Round DIN 405	 ac=0.05P h3=H4=0.5P R1=0.238507P R2=0.255967P R3=0.221047P P=25.4/thread	Rd	Ext.	MMT○○ER○○○RD	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○RD	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
ISO Trapezoidal 30°	 H=1.866P d2=d-0.5P d1=d-P H1=0.5P D=d D2=d2 D1=d1	Tr	Ext.	MMT○○ER○○○TR	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○TR	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
American ACME		ACME	Ext.	MMT○○ER○○○ACME	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○TACME	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032
American NPT	 H=0.866025P h=0.800000p	NPT	Ext.	MMT○○ER○○○NPT	Wiper	MMTER○○○○○-C	G023
			Int.	MMT○○IR○○○NPT	Wiper	MMTIR○○A○○○-SP○ MMTIR○○A○16-C	G032

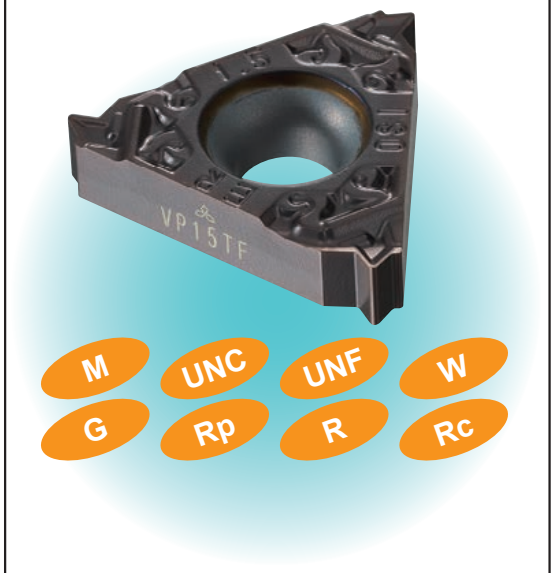
Wiper : Insert order number is determined by selected pitch.
General : An insert is applicable to several pitch types.

FEATURES OF MMT SERIES

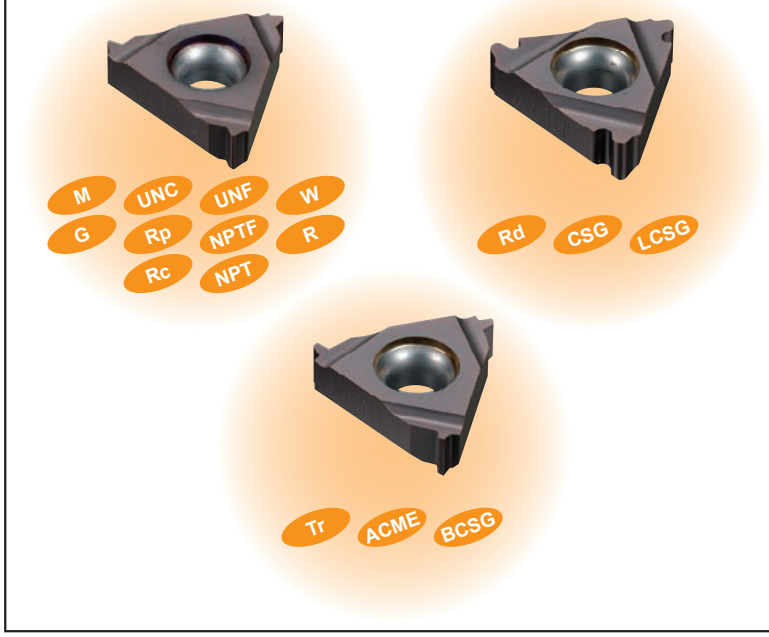
■A WIDE VARIETY OF PRODUCTS

Mitsubishi Miracle Threading (MMT) series. 283 inserts and 26 holders.

M-CLASS INSERTS WITH 3-D CHIP BREAKERS



G-CLASS GROUND INSERTS



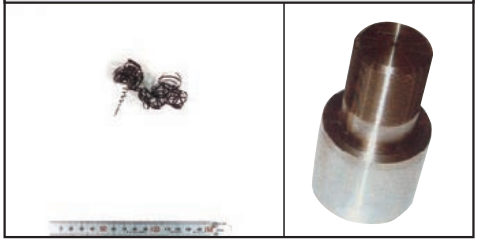
■IDEAL CHIP CONTROL EVEN IN THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIP BREAKERS)

ISO metric external thread pitch 1.5mm　Final pass (6th pass)

Conventional insert

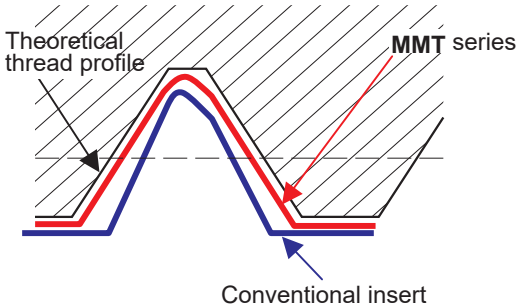


MMT



<Cutting Conditions>
Workpiece : JIS SCM440
Insert : MMT16ER150ISO-S
Grade : VP15TF
Cutting speed : 120m/min
Cutting method : Radial Infeed
Depth of cut : Fixed cut area
Pass : 6 times
Coolant : Wet

■A HIGHER LEVEL OF PRECISION THAN CONVENTIONAL INSERTS (G-CLASS GROUND INSERTS)

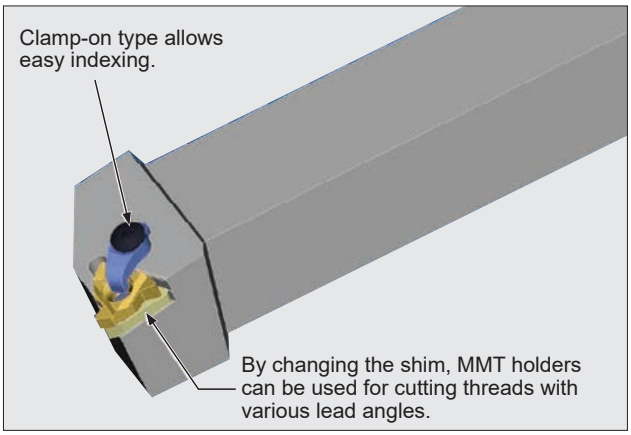


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

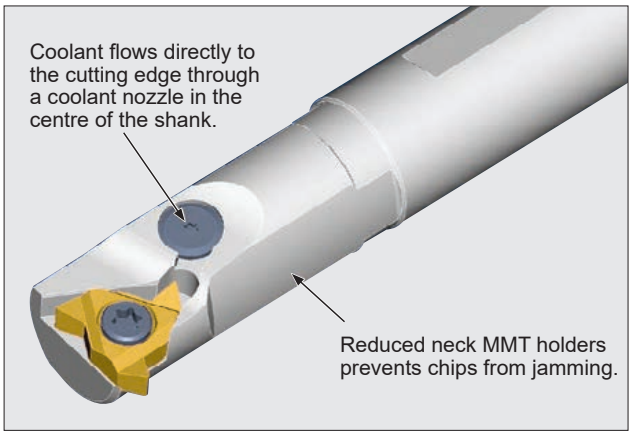
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard NPT
American NPTF	Class2

■HOLDER (Use of special surface treatment)

External

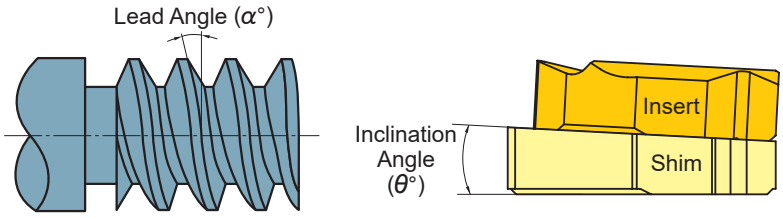


Internal



* Order number of coolant guide screw: TFS03006
(Except MMTIR1316/MMTIR1516)

■SUITABLE FOR THREADING WITH A LARGE LEAD ANGLE



By changing only the shim, MMT holders can be used for turning of threads with various lead angles as well as the turning of left hand threads.

Lead Angle (α°)	Inclination Angle (θ°)
−1.5°	−3°
−0.5°	−2°
0.5°	−1°
1.5°	0°
2.5°	1°
3.5°	2°
4.5°	3°

Standard shim delivered with the holder.

■GRADE

VP10MF (G-class ground insert only)

●Superior wear and plastic deformation resistance

- High wear and plastic deformation resistance for threading when maintaining the thread form is important. Suitable for continuous high precision machining with extensive tool life.
- Effective in combination with G-class inserts for high precision threading.

VP15TF (G-class ground insert, M-class insert with 3-D chip breakers)

●Wide versatility

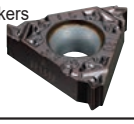
- High fracture resistance during low rigidity applications such as bar feed machining. Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.
- Effective combination of high cost performance M-class inserts with 3-D chip breakers.

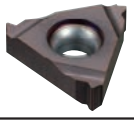
VP20RT (M-class insert with 3-D chip breakers)

●Excellent fracture resistance

- Suitable for stainless steel boring and unstable machining where inserts are vulnerable to fracturing.
- Effective combination of high cost performance M-class inserts with 3-D chip breakers.

■CHOOSING M-CLASS INSERTS WITH 3-D CHIP BREAKERS OR G-CLASS INSERTS

Insert	Chip control	Precision of thread
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precision of thread
G-class inserts 	○	◎

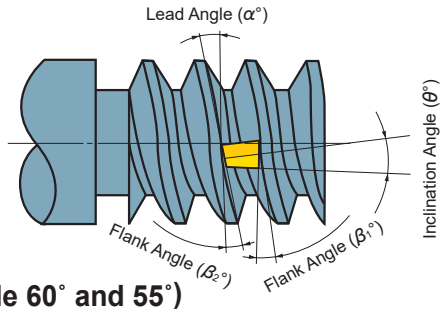
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
- G-class inserts are recommended where higher precision is required.

CUTTING CONDITIONS OF MMT SERIES

SELECTING A SHIM FOR THE MMT SERIES

■ FLANK ANGLE AND LEAD ANGLE

Lead angle (α) depends on a combination of thread diameter and pitch. Select a shim so that the lead angle of the thread can coincide with the flank angles of the thread and insert (β_1, β_2). No need to change a shim for general threading with an MMT holder. When threading with a small diameter or large pitch, change the shim depending on the lead angle, referring to the table and graph below. When threading left hand threads, change to a shim with a negative inclination angle.



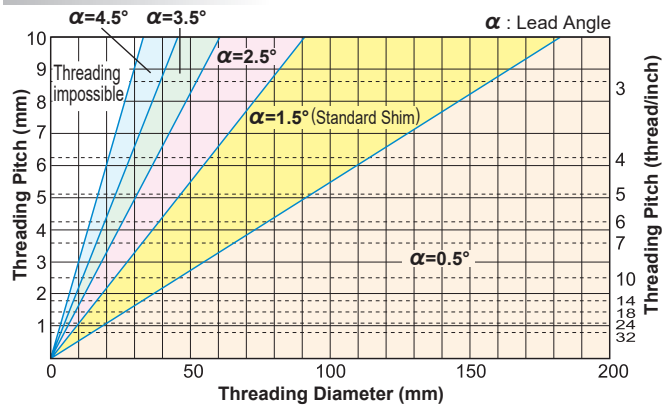
■ SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 60˚ and 55˚)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm) *		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.7	ϕ1.7 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ3.6	ϕ3.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.5	ϕ2.5 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ5.5	ϕ5.5 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.3	ϕ3.3 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ7.3	ϕ7.3 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.1	ϕ4.1 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ9.1	ϕ9.1 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.0	ϕ5.0 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ10.9	ϕ10.9 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ5.8	ϕ5.8 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ12.8	ϕ12.8 − ϕ31.9	≥ϕ31.9
2	≤ϕ6.6	ϕ6.6 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ14.6	ϕ14.6 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ8.3	ϕ8.3 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ18.2	ϕ18.2 − ϕ45.6	≥ϕ45.6
3	≤ϕ9.9	ϕ9.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ21.9	ϕ21.9 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ11.6	ϕ11.6 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ25.5	ϕ25.5 − ϕ63.8	≥ϕ63.8
4	≤ϕ13.2	ϕ13.2 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ29.2	ϕ29.2 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ14.9	ϕ14.9 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ32.8	ϕ32.8 − ϕ82.1	≥ϕ82.1
5	≤ϕ16.5	ϕ16.5 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ36.5	ϕ36.5 − ϕ91.2	≥ϕ91.2

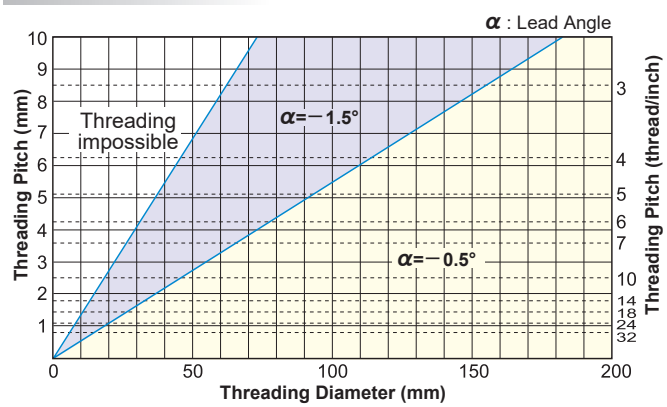
* Back turning in the case of left hand threads.

■ SHIM REFERENCE GRAPH (Thread angle 60˚ and 55˚)

Right Hand Thread



Left Hand Thread



Note 1) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table on page G013 for the calculation of thread lead angle and tool flank angle.)

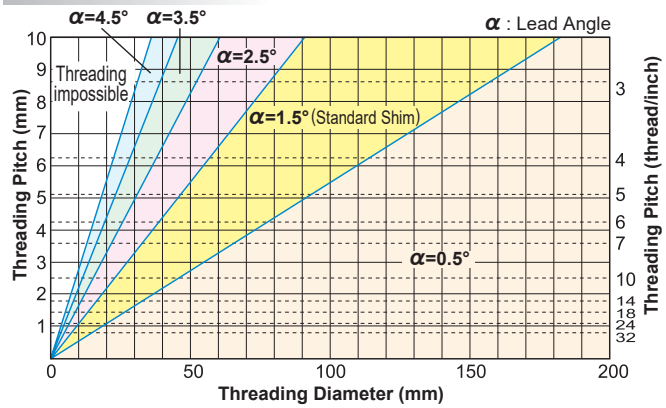
■ SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 30˚ and 29˚)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm) *		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.8	ϕ1.8 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.7	ϕ2.7 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.6	ϕ3.6 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.5	ϕ4.5 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.5	ϕ5.5 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ6.4	ϕ6.4 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9
2	≤ϕ7.3	ϕ7.3 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ9.1	ϕ9.1 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6
3	≤ϕ10.9	ϕ10.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ12.7	ϕ12.7 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8
4	≤ϕ14.6	ϕ14.6 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ16.4	ϕ16.4 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1
5	≤ϕ18.2	ϕ18.2 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2

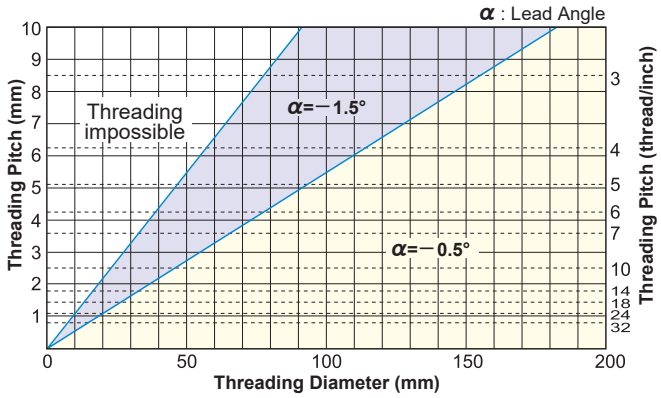
* Back turning in the case of left hand threads.

■ SHIM REFERENCE GRAPH (Thread angle 30˚ and 29˚)

Right Hand Thread



Left Hand Thread



Note 1) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

■ Selection table

Lead Angle	Opening angle 60°/55° Right Hand Thread		Opening angle 60°/55°* Left Hand Thread		Opening angle 30°/29° Right Hand Thread		Opening angle 30°/29°* Left Hand Thread	
0	P05	P05	N05	N05	P05	P05	N05	N05
0.5	P05	P05	N05	N05	P05	P05	N05	N05
1	P15	P15	N15	N15	P15	P15	N15	N15
1.5	P15	P15	N15	N15	P15	P15	N15	N15
2	P25	P25	N15	N15	P25	P25	Compatible	Compatible
2.5	P25	P25	Compatible	Compatible	P25	P25	Compatible	Compatible
3	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
3.5	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
4	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
4.5	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
5	P45	P45	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
5.5	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible

* Back turning in the case of left hand threads.

When replacing a shim, check if the difference between the thread lead angle and shim inclination angle is within:
2.5°−0.5° where thread helix angle is 60° (55°)
2°−1° where thread helix angle is 30° (29°)
*** Inclination angle of a standard shim is 0°.**
*** The holder has a 1.5° lead angle.**

■ CALCULATION OF THREAD LEAD ANGLE

$$\tan\alpha = \frac{l}{\pi d} = \frac{nP}{\pi d}$$

α: Lead angle
l : Lead
n : Number of threads
P : Pitch
d : Effective diameter of thread

■ EXAMPLE OF SELECTING A SHIM

• When the thread lead angle is 2.2°
①In the case when the thread helix angle is 60°
(2.2° lead angle) − (2.5−0.5°) = -0.3°−1.7° shim inclination angle is appropriate.
Threading with a standard shim (0° inclination angle) is possible. But, replacing with a shim with a 1° inclination angle is recommended, refer to Standard Shim List on pages G023 and G032.
②In the case when the thread helix angle is 30°
(2.2° lead angle) − (2−1°) = -0.2°−1.2° shim inclination angle is appropriate.
Replacing with a shim with a 1° inclination angle is recommended, referring to Standard Shim List on pages G023 and G032.

■ RELIEF ANGLE OF AN INSERT SET ON A HOLDER

Thread Helix Angle	Internal Relief Angle	External Relief Angle
60°	8.8°	5.8°
55°	7.9°	5.2°
30°	4.1°	2.7°
29°	4°	2.6°

• Relief angles (β_2, β_1) of an insert become small when the thread helix angle of a trapezoidal, round, or other thread is small. Take care when selecting a shim.

*** Please refer to the "Calculation of Thread Lead Angle" on the website from given QR Code.**

https://www.mitsubishicarbide.com/index.php?cID=2884

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

■ ISO Metric

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
0.5	0.31	0.10	0.08	0.07	0.06											MMT16ER050ISO	—
0.75	0.46	0.16	0.14	0.10	0.06											MMT16ER075ISO	—
1.0	0.61	0.18	0.15	0.12	0.10	0.06										MMT16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06									MMT16ER125ISO	MMT16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06									MMT16ER150ISO	MMT16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06							MMT16ER175ISO	MMT16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06							MMT16ER200ISO	MMT16ER200ISO-S
2.5	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.06					MMT16ER250ISO	MMT16ER250ISO-S
3.0	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06			MMT16ER300ISO	MMT16ER300ISO-S
3.5	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06			MMT22ER350ISO	—
4.0	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06	MMT22ER400ISO	—
4.5	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER450ISO	—
5.0	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06	MMT22ER500ISO	—

■ American UN

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
32	0.49	0.17	0.15	0.11	0.06											MMT16ER320UN	—
28	0.56	0.17	0.14	0.10	0.09	0.06										MMT16ER280UN	—
24	0.65	0.18	0.16	0.14	0.11	0.06										MMT16ER240UN	—
20	0.78	0.20	0.18	0.13	0.11	0.10	0.06									MMT16ER200UN	—
18	0.87	0.22	0.20	0.15	0.13	0.11	0.06									MMT16ER180UN	—
16	0.97	0.22	0.20	0.15	0.12	0.11	0.11	0.06								MMT16ER160UN	MMT16ER160UN-S
14	1.11	0.23	0.21	0.16	0.13	0.11	0.11	0.10	0.06							MMT16ER140UN	MMT16ER140UN-S
13	1.20	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.06							MMT16ER130UN	—
12	1.30	0.28	0.23	0.18	0.16	0.14	0.13	0.12	0.06							MMT16ER120UN	MMT16ER120UN-S
11	1.42	0.28	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.06						MMT16ER110UN	—
10	1.56	0.28	0.24	0.19	0.16	0.14	0.13	0.13	0.12	0.11	0.06					MMT16ER100UN	—
9	1.73	0.34	0.29	0.22	0.17	0.15	0.14	0.13	0.12	0.11	0.06					MMT16ER090UN	—
8	1.95	0.35	0.30	0.24	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06				MMT16ER080UN	—
7	2.22	0.37	0.33	0.28	0.24	0.20	0.17	0.16	0.15	0.14	0.12	0.06				MMT22ER070UN	—
6	2.60	0.42	0.35	0.29	0.25	0.21	0.18	0.17	0.16	0.15	0.13	0.12	0.11	0.06		MMT22ER060UN	—
5	3.12	0.43	0.39	0.31	0.27	0.24	0.22	0.20	0.19	0.19	0.18	0.17	0.15	0.12	0.06	MMT22ER050UN	—

■ Whitworth for BSW, BSP

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
28	0.58	0.17	0.14	0.11	0.10	0.06										MMT16ER280W	—
26	0.63	0.18	0.15	0.13	0.11	0.06										MMT16ER260W	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06									MMT16ER200W	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06									MMT16ER190W	MMT16ER190W-S
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06									MMT16ER180W	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06							MMT16ER160W	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06							MMT16ER140W	MMT16ER140W-S
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06							MMT16ER120W	—
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06						MMT16ER110W	MMT16ER110W-S
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06					MMT16ER100W	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06				MMT16ER090W	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06			MMT16ER080W	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06			MMT22ER070W	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER060W	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06	MMT22ER050W	—

■ BSPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9						G-class ground inserts	M-class inserts with 3-D chip breakers
28	0.58	0.17	0.14	0.11	0.10	0.06										MMT16ER280BSPT	—
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06									MMT16ER190BSPT	MMT16ER190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06							MMT16ER140BSPT	MMT16ER140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06						MMT16ER110BSPT	MMT16ER110BSPT-S

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

■ Round DIN 405

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06								MMT16ER100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06						MMT16ER080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06				MMT16ER060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06		MMT22ER040RD

■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06										MMT16ER150TR
2.0	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06									MMT16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06							MMT16ER300TR
4.0	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06				MMT22ER400TR
5.0	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06		MMT22ER500TR

■ American ACME

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06									MMT16ER120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06							MMT16ER100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06					MMT16ER080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06			MMT22ER060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06		MMT22ER050ACME

■ UNJ

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					
32	0.46	0.16	0.14	0.10	0.06												MMT16ER320UNJ
28	0.52	0.16	0.12	0.09	0.09	0.06											MMT16ER280UNJ
24	0.61	0.17	0.14	0.14	0.10	0.06											MMT16ER240UNJ
20	0.73	0.19	0.16	0.13	0.10	0.09	0.06										MMT16ER200UNJ
18	0.81	0.23	0.18	0.14	0.10	0.10	0.06										MMT16ER180UNJ
16	0.92	0.26	0.21	0.14	0.12	0.10	0.09										MMT16ER160UNJ
14	1.05	0.26	0.23	0.17	0.12	0.11	0.10	0.06									MMT16ER140UNJ
12	1.22	0.28	0.27	0.20	0.17	0.13	0.11	0.06									MMT16ER120UNJ
10	1.47	0.30	0.29	0.21	0.15	0.13	0.12	0.11	0.10	0.06							MMT16ER100UNJ
8	1.83	0.31	0.30	0.23	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.06					MMT16ER080UNJ

■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11					
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06					MMT22ER050APBU

■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12				
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06						MMT16ER100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.11	0.06				MMT16ER080APRD

■ American NPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06										MMT16ER270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16ER180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16ER140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06				MMT16ER115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16ER080NPT

■ American NPTF

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
27	0.64	0.16	0.14	0.11	0.09	0.08	0.06										MMT16ER270NPTF
18	1.00	0.19	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16ER180NPTF
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16ER140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06				MMT16ER115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16ER080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

■ISO Metric

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
0.5	0.29	0.09	0.07	0.07	0.06											MMT11IR050ISO	MMT16IR050ISO	—	—
0.75	0.43	0.15	0.13	0.09	0.06											MMT11IR075ISO	MMT16IR075ISO	—	—
1.0	0.58	0.17	0.15	0.11	0.09	0.06										MMT11IR100ISO	MMT16IR100ISO	MMT11IR100ISO-S	MMT16IR100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									MMT11IR125ISO	MMT16IR125ISO	MMT11IR125ISO-S	MMT16IR125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									MMT11IR150ISO	MMT16IR150ISO	MMT11IR150ISO-S	MMT16IR150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							MMT11IR175ISO	MMT16IR175ISO	—	MMT16IR175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							MMT11IR200ISO	MMT16IR200ISO	—	MMT16IR200ISO-S
2.5	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06					—	MMT16IR250ISO	—	MMT16IR250ISO-S
3.0	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06			—	MMT16IR300ISO	—	MMT16IR300ISO-S
3.5	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06			—	MMT22IR350ISO	—	—
4.0	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06	—	MMT22IR400ISO	—	—
4.5	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06	—	MMT22IR450ISO	—	—
5.0	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06	—	MMT22IR500ISO	—	—

■American UN

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
32	0.46	0.16	0.14	0.10	0.06											MMT11IR320UN	MMT16IR320UN	—
28	0.52	0.16	0.13	0.09	0.08	0.06										MMT11IR280UN	MMT16IR280UN	—
24	0.61	0.17	0.15	0.13	0.10	0.06										MMT11IR240UN	MMT16IR240UN	—
20	0.73	0.18	0.15	0.13	0.11	0.10	0.06									MMT11IR200UN	MMT16IR200UN	—
18	0.81	0.20	0.18	0.14	0.12	0.11	0.06									MMT11IR180UN	MMT16IR180UN	—
16	0.92	0.20	0.18	0.15	0.12	0.11	0.10	0.06								MMT11IR160UN	MMT16IR160UN	MMT16IR160UN-S
14	1.05	0.21	0.18	0.15	0.13	0.11	0.11	0.10	0.06							MMT11IR140UN	MMT16IR140UN	MMT16IR140UN-S
13	1.13	0.22	0.19	0.16	0.14	0.13	0.12	0.11	0.06							—	MMT16IR130UN	—
12	1.22	0.24	0.22	0.18	0.16	0.13	0.12	0.11	0.06							—	MMT16IR120UN	MMT16IR120UN-S
11	1.33	0.24	0.22	0.20	0.15	0.12	0.12	0.11	0.11	0.06						—	MMT16IR110UN	—
10	1.47	0.25	0.22	0.21	0.14	0.13	0.12	0.12	0.11	0.11	0.06					—	MMT16IR100UN	—
9	1.63	0.31	0.23	0.21	0.17	0.15	0.14	0.13	0.12	0.11	0.06					—	MMT16IR090UN	—
8	1.83	0.31	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.06				—	MMT16IR080UN	—
7	2.09	0.36	0.30	0.24	0.21	0.18	0.17	0.16	0.15	0.14	0.12	0.06				—	MMT22IR070UN	—
6	2.44	0.40	0.33	0.25	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.06		—	MMT22IR060UN	—
5	2.93	0.41	0.35	0.31	0.26	0.23	0.21	0.20	0.19	0.17	0.15	0.14	0.13	0.12	0.06	—	MMT22IR050UN	—

■Whitworth for BSW, BSP

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
28	0.58	0.17	0.14	0.11	0.10	0.06										—	MMT16IR280W	—
26	0.63	0.18	0.15	0.13	0.11	0.06										—	MMT16IR260W	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06									—	MMT16IR200W	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06									MMT11IR190W	MMT16IR190W	MMT16IR190W-S
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06									—	MMT16IR180W	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06							—	MMT16IR160W	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06							MMT11IR140W	MMT16IR140W	MMT16IR140W-S
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06							—	MMT16IR120W	MMT16IR120W-S
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06						—	MMT16IR110W	—
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06					—	MMT16IR100W	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06				—	MMT16IR090W	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06			—	MMT16IR080W	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06			—	MMT22IR070W	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06	—	MMT22IR060W	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06	—	MMT22IR050W	—

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

■ BSPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9						G-class ground inserts		M-class inserts with 3-D chip breakers
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06									MMT11IR190BSPT	MMT16IR190BSPT	MMT16IR190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06							MMT11IR140BSPT	MMT16IR140BSPT	MMT16IR140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06						—	MMT16IR110BSPT	MMT16IR110BSPT-S

■ Round DIN 405

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06							MMT16IR100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06					MMT16IR080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06			MMT16IR060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06	MMT22IR040RD

■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16IR150TR
2	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16IR200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16IR300TR
4	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22IR400TR
5	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22IR500TR

■ American ACME

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06								MMT16IR120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06						MMT16IR100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06				MMT16IR080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06		MMT22IR060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06	MMT22IR050ACME

■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06				MMT22IR050APBU

■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12			
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06					MMT16IR100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.11	0.06			MMT16IR080APRD

■ American NPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06										MMT16IR270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06								MMT16IR180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16IR140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06				MMT16IR115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16IR080NPT

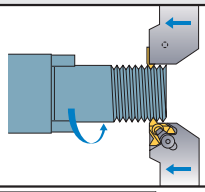
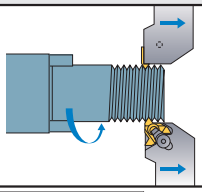
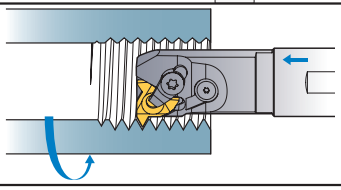
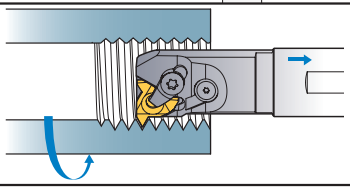
■ American NPTF

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06						MMT16IR140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06				MMT16IR115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06	MMT16IR080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.
• Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
• Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

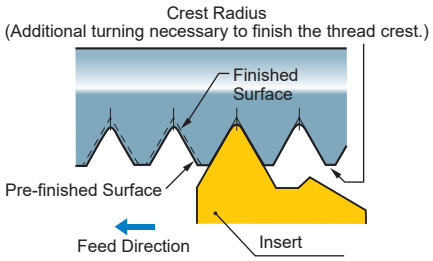
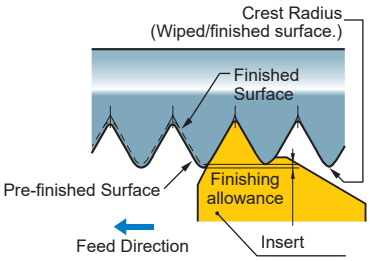
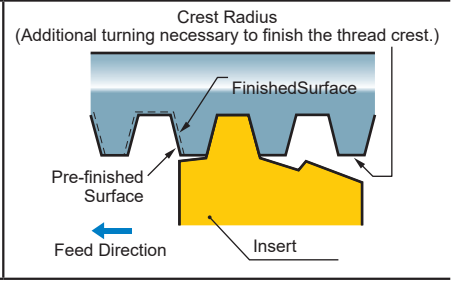
THREADING METHODS

THREADING METHODS

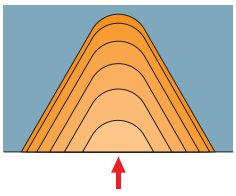
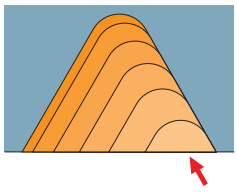
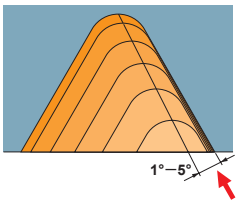
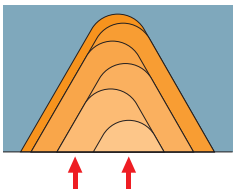
	Right Hand Thread	Left Hand Thread
EXTERNAL	 Holder Reversed	 Holder Reversed
INTERNAL		

- Usually, threads are cut with the feed towards the chuck.
- When machining left hand threads, note that clamping rigidity is lowered due the application of back turning.
- When machining left hand threads, the lead angle is negative. Ensure an appropriate lead angle by changing the shim.

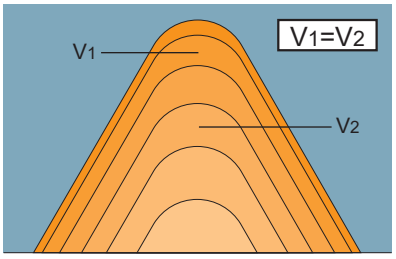
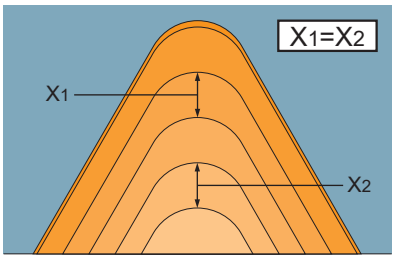
INSERT TYPES

Partial form	Full form	Semi-full form (Trapezoidal threads only)
● The same insert can be used for a range of pitches. ● Shorter tool life because the corner radius of the insert is smaller than that of the full form insert. ● Finishing with another operation is necessary.	● No deburring needed after threading. ● Requires different threading inserts.	● No deburring needed after threading. ● Requires different threading inserts. ● Finishing with another operation is necessary.
		

INFEED METHODS

Features		Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
					
	Advantages	● Easiest to use. (Standard programme for threading) ● Wide application. (Cutting conditions easy to change.) ● Uniform wear of the right and left sides of the cutting edge.	● Relatively easy to use. (Semi-standard programme for threading.) ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Preventing flank wear on the right side of the cutting edge. ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Uniform flank wear of the right and left sides of the cutting edge. ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily.
	Disadvantages	● Difficult chip control. ● Subject to vibration in the later in stages of cutting. ● Ineffective for large pitch threading. ● Heavy load on the corner radius.	● Large flank wear on the right side of the cutting edge. ● Relatively difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary) ● Difficult chip control.

THREADING DEPTH

	Features	
	Advantages	Disadvantages
 Fixed cut area	● Easy to use. (Standard programme for threading.) ● Superior resistance to vibration. (Constant cutting force.)	● Long chips generated during the final pass. ● Complex calculation of cutting depth when changing the number of passes.
 Fixed cutting depth	● Reduced load on corner radius during the first half of the passes. ● Easy chip control. (Optional setting of chip thickness) ● Easy to calculate cutting depth when changing the number of passes. ● Good chip control.	● Subject to vibration in the later stages of cutting. (Increased cutting force) ● In some cases, changing the NC programme is necessary.

Note 1) It is recommended to set the depth of cut of the final pass to 0.05mm—0.025mm.
Large cutting depths can cause vibration, leading to a poor surface finish.

■ FORMULAE

● Formulae to calculate infeed for each pass in a reduced series.

$$\triangle ap_n = \frac{ap}{\sqrt{n_{ap}-1}} \times \sqrt{b}$$

$\triangle ap_n$: Depth of cut
n : Actual pass
ap : Total depth of cut
n_{ap} : Number of passes
b : 1st pass 0.3
2nd pass 2—1 = 1
3rd pass 3—1 = 2
•
•
nth pass n—1

(Example)
External threading (ISO Metric)
Pitch : 1.0mm
ap : 0.6mm
n_{ap} : 5 passes

1st Pass $\triangle ap_1 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{0.3} = 0.16 \rightarrow$ **0.16** ($\triangle ap_1$)

2st Pass $\triangle ap_2 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{2-1} = 0.3 \rightarrow$ **0.14** ($\triangle ap_2 - \triangle ap_1$)

3st Pass $\triangle ap_3 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{3-1} = 0.42 \rightarrow$ **0.12** ($\triangle ap_3 - \triangle ap_2$)

4st Pass $\triangle ap_4 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{4-1} = 0.52 \rightarrow$ **0.1** ($\triangle ap_4 - \triangle ap_3$)

5st Pass $\triangle ap_5 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{5-1} = 0.6 \rightarrow$ **0.08** ($\triangle ap_5 - \triangle ap_4$)

■ NC PROGRAMME FOR MODIFIED FLANK INFEED

● Example) M12×1.0 5 passes modified 5°

External Threading	Internal Threading
G00 Z = 5.0 X = 14.0 G92 U—4.34 Z—13.0 F1.0 G00 W—0.07 G92 U—4.64 Z—13.0 F1.0 G00 W—0.06 G92 U—4.88 Z—13.0 F1.0 G00 W—0.05 G92 U—5.08 Z—13.0 F1.0 G00 W—0.03 G92 U—5.20 Z—13.0 F1.0 G00	G00 Z = 5.0 X = 10.0 G92 U4.34 Z—13.0 F1.0 G00 W—0.07 G92 U4.64 Z—13.0 F1.0 G00 W—0.05 G92 U4.84 Z—13.0 F1.0 G00 W—0.04 G92 U5.02 Z—13.0 F1.0 G00 W—0.03 G92 U5.14 Z—13.0 F1.0 G00

THREADING METHODS

SELECTING CUTTING CONDITIONS

		Priority					
		Tool Life	Cutting Force	Surface Finish	Precision of Thread	Chip Discharge	Efficiency (Reduced Passes)
Threading Methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting Depth	Fixed Cutting Depth					○	
	Fixed Cut Area	○	○	○	○		○

Note 1) Tool life and surface finish accuracy can be increased by changing the threading method from flank infeed to modified flank infeed. Chip control can be improved by increasing the cutting depth in the later half of passes.

CUTTING DEPTH AND THE NUMBER OF PASSES

● Selection of the appropriate cutting depth and the right number of passes is vital for threading.

- For most threading, use a "threading cycle programme," which has originally been installed on machines, and specify "total cutting depth" and "cutting depth in the first or final pass."
- Cutting depth and the number of passes are easy to change for the radial infeed method, thus making it easy to determine the appropriate cutting conditions.

FEATURES AND BENEFITS OF MITSUBISHI PRODUCTS

- Insert grades with high wear and plastic deformation resistance, specially produced for threading tools, ensure highly efficient cutting by enabling high-speed machining and a reduced number of passes.

Machining Cost Reduction

ADVICE ON IMPROVED THREADING

● Increasing tool life

- To prevent damage to the corner radius - Recommended method - Modified flank infeed
- To have uniform flank wear on both sides of a cutting edge - Recommended method - Radial infeed
- To prevent crater wear - Recommended method - Flank infeed

● Preventing chip problems

- Change to flank or modified infeed.
- During radial infeed cutting, use an inverted holder and change the coolant supply to a downward direction.
- When using the radial infeed method, set the minimum cutting depth at around 0.2mm to make the chips thicker.

● To achieve highly efficient machining

- Increase cutting speed. (Dependant on the maximum revolution and rigidity of the machine.)
- Reduce the number of passes. (Reduce by 30-40%.)
- A reduced number of passes can improve chip discharge because of the thicker chips generated.

● Preventing vibration

- Change to flank or modified infeed.
- When using radial infeed, reduce cutting depth in the later half of passes and lower the cutting speed.

● Increased surface finish accuracy

- A final wiping pass should be performed at the same depth of cut as the last regular pass.
- When using the flank infeed method, change to radial infeed only during the final pass.

Pipe Threads and Tool Selection

■Parallel Pipe Thread G(PF)

min	Thread	Number of Threads	Standard Internal Diameter
—	G 1/16	28	6.561
1min	G 1/8		8.556
2min	G 1/4	19	11.445
3min	G 3/8		14.950
4min	G 1/2	14	18.631
5min	G 5/8		20.587
6min	G 3/4		24.117
7min	G 7/8		27.877
8min	G 1	11	30.291
9min	G 1 1/8		34.939
10min	G 1 1/4		38.952

Note 1) Same as PF.

■Taper Pipe Thread R, Rc(PT)

min	Thread	Number of Threads	Standard Internal Diameter
—	R 1/16	28	6.561
1min	R 1/8		8.556
2min	R 1/4	19	11.445
3min	R 3/8		14.950
4min	R 1/2	14	18.631
5min	—	—	—
6min	R 3/4	14	24.117
7min	—	—	—
8min	R 1	11	30.291
9min	—	—	—
10min	R 1 1/4	11	38.952

Note 1) Same as Rc, PT.

- Please note that as part of industry practice, pipe screws are sometimes referred to as "minutes" in inch conversion units.
- One "minute" equals 1/8 inch (1 inch= 25.4mm)
- 1 1/4 inches are sometimes referred to as "inch 2 minutes" (1/4= 2/8= 2 minutes).
- The pitch is pre-determined for each nominal diameter. Note the minimum machining diameter especially when internal threading.

MMT SERIES ORDER NUMBER

HOLDERS

EXTERNAL

MMT E R 12 12 H 16 – C

Designation

Application

E	External

Hand of Tool

R	Right

Tool Size (mm) (Height and Width)

12	12
16	16
20	20
25	25
32	32

Tool Length (mm)

H	100
K	125
M	150
P	170

Insert Size (mm)

16	9.525
22	12.7

Method of Holding

C	Clamp-on

INTERNAL

MMT I R 13 16 A K 11 – S P15

Designation

Application

I	Internal

Hand of Tool

R	Right

Min.Cutting Diameter (mm)

Shank Diameter (mm)

Shank Material

A	Steel Shank with Coolant Hole

Tool Length (mm)

K	125	R	200
M	150	S	250
Q	180	T	300

Insert Size (mm)

11	6.35
16	9.525
22	12.7

Method of Holding

S	Screw-on
C	Clamp-on

Lead Angle

P15	1.5°
P25	2.5°
P35	3.5°

INSERTS

M-CLASS

MMT 16 E R 100 ISO – S

S	M-class inserts with 3-D chip breakers

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

100	1.0mm	A	0.5—1.5mm or 48—16 thread/inch
125	1.25mm		
150	1.5mm	G	1.75—3.0mm or 14—8 thread/inch
175	1.75mm		
200	2.0mm		
250	2.5mm		
300	3.0mm		

Threading Type

60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

G-CLASS

MMT 16 E R 050 ISO

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	G	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	AG	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm		
400	4.0mm	N	3.5—5.0mm or 7—5 thread/inch
450	4.5mm		
500	5.0mm		

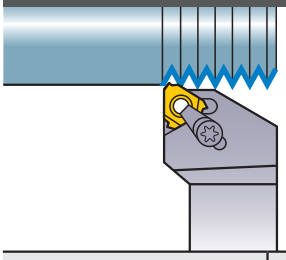
Threading Type

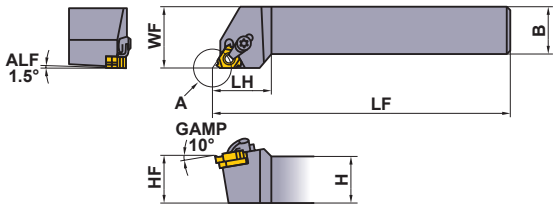
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

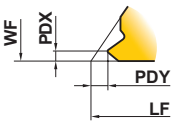
MMTE HOLDER

MMTE

External threading







Details of position A
Refer to the insert standards for dimensions PDX and PDY.

Right hand tool holder only.

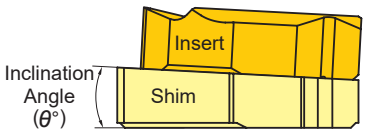
Order Number	Stock	Insert Number	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench
	R		H	B	LF	LH	HF	WF						
MMTER1212H16-C	●	MMT16ER ○○○○○	12	12	100	25	12	16	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER1616H16-C	●		16	16	100	25	16	20	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2020K16-C	●		20	20	125	26	20	25	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M16-C	●		25	25	150	28	25	32	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER3232P16-C	●		32	32	170	32	32	40	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M22-C	●	MMT22ER ○○○○○	25	25	150	32	25	32	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER3232P22-C	●		32	32	170	32	32	40	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.
∗ Clamp Torque (N • m) : SETS51=3.5, SETS61=5.0, HFC03008=1.5, HFC04010=2.2

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTE32TN15**	●	−3°	MMTER ○○○○○ 16-C
−0.5°	**CTE32TN05**	●	−2°	
0.5°	**CTE32TP05**	●	−1°	
1.5°	**CTE32TP15**	●	0°	
2.5°	**CTE32TP25**	●	1°	
3.5°	**CTE32TP35**	●	2°	
4.5°	**CTE32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTE43TN15**	●	−3°	MMTER ○○○○○ 22-C
−0.5°	**CTE43TN05**	●	−2°	
0.5°	**CTE43TP05**	●	−1°	
1.5°	**CTE43TP15**	●	0°	
2.5°	**CTE43TP25**	●	1°	
3.5°	**CTE43TP35**	●	2°	
4.5°	**CTE43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**VP10MF**	150 (70—230)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	140 (80—200)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Stainless Steel	≤200HB	**VP15TF**	80 (40—120)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	140 (80—200)
			VP15TF	90 (60—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
S	Heat Resistant Alloy	—	**VP10MF**	45 (15—70)
			VP15TF	30 (20—40)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	60 (40—80)
			VP15TF	45 (25—65)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	50 (30—70)
			VP15TF	40 (20—60)

● : Inventory maintained in Japan.

HOW TO SELECT A SHIM ➤ G012
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	MMT16ERA60-S	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.06	—	Partial form PNA 60°
	MMT16ERG60-S	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.23	—	
Partial Profile 55°	MMT16ERA55-S	●			48—16	9.525	3.44	0.8	0.9	0.07	—	Partial form PNA 55°
	MMT16ERG55-S	●			14—8	9.525	3.44	1.2	1.7	0.23	—	
ISO Metric	MMT16ER100ISO-S	●	●	1.0		9.525	3.44	0.7	0.7	0.13	0.61	Full form PNA 60°
	MMT16ER125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT16ER150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT16ER175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT16ER200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT16ER250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT16ER300ISO-S	●	●	3.0		9.525	3.44	1.2	1.6	0.40	1.84	
American UN	MMT16ER160UN-S	●			16	9.525	3.44	0.9	1.1	0.23	0.97	Full form PNA 60°
	MMT16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT16ER120UN-S	●			12	9.525	3.44	1.1	1.4	0.30	1.30	
Whitworth for BSW, BSP	MMT16ER190W-S	●			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form PNA 55°
	MMT16ER140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110W-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	MMT16ER190BSPT-S	●			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form PNA 55°
	MMT16ER140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110BSPT-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	

IDENTIFICATION

MMT 16 E R 100 ISO – S

S	M-class inserts with 3-D chip breakers

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

100	1.0mm	A	0.5—1.5mm or 48—16 thread/inch
125	1.25mm		
150	1.5mm	G	1.75—3.0mm or 14—8 thread/inch
175	1.75mm		
200	2.0mm		
250	2.5mm		
300	3.0mm		

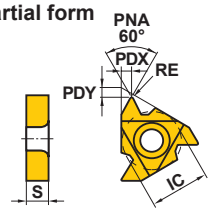
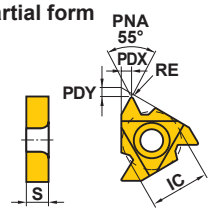
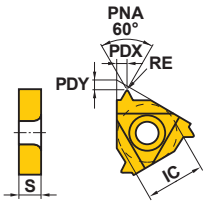
Threading Type

60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	—	**MMT16ERA60**	●	●	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form 
		MMT16ERG60	●	●	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27	—	
		MMT16ERAG60	●		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08	—	
		MMT22ERN60	●		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.53	—	
Partial Profile 55°	—	**MMT16ERA55**	●	●		48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form 
		MMT16ERG55	●	●		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16ERAG55	●			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22ERN55	●			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6g	**MMT16ER050ISO**	●		0.5		9.525	3.44	0.6	0.4	0.06	0.31	Full form 
		MMT16ER075ISO	●		0.75		9.525	3.44	0.6	0.6	0.10	0.46	
		MMT16ER100ISO	●	●	1.0		9.525	3.44	0.7	0.7	0.16	0.61	
		MMT16ER125ISO	●	●	1.25		9.525	3.44	0.8	0.9	0.19	0.77	
		MMT16ER150ISO	●	●	1.5		9.525	3.44	0.8	1.0	0.23	0.92	
		MMT16ER175ISO	●	●	1.75		9.525	3.44	0.9	1.2	0.21	1.07	
		MMT16ER200ISO	●	●	2.0		9.525	3.44	1.0	1.3	0.31	1.23	
		MMT16ER250ISO	●	●	2.5		9.525	3.44	1.1	1.5	0.32	1.53	
		MMT16ER300ISO	●	●	3.0		9.525	3.44	1.2	1.6	0.46	1.84	
		MMT22ER350ISO	●		3.5		12.7	4.64	1.6	2.3	0.45	2.15	
		MMT22ER400ISO	●		4.0		12.7	4.64	1.6	2.3	0.52	2.45	
		MMT22ER450ISO	●		4.5		12.7	4.64	1.7	2.4	0.58	2.76	
		MMT22ER500ISO	●		5.0		12.7	4.64	1.7	2.5	0.63	3.07	

IDENTIFICATION

MMT **16** **E** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	G	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	AG	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm	N	3.5—5.0mm or 7—5 thread/inch
400	4.0mm		
450	4.5mm		
500	5.0mm		

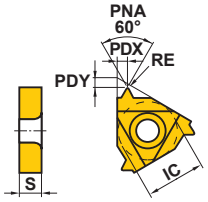
Threading Type

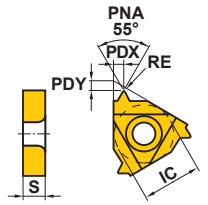
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

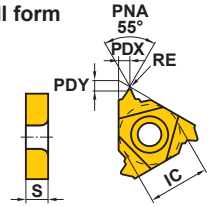
MMT G-CLASS GROUND INSERTS

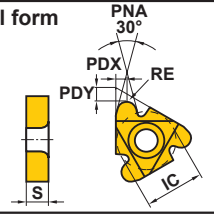
INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
American UN	2A	MMT16ER320UN	●			32	9.525	3.44	0.6	0.6	0.09	0.49	Full form
		MMT16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		MMT16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		MMT16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		MMT16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		MMT16ER160UN	●	●		16	9.525	3.44	0.9	1.1	0.24	0.97	
		MMT16ER140UN	●	●		14	9.525	3.44	1.0	1.2	0.22	1.11	
		MMT16ER130UN	●			13	9.525	3.44	1.0	1.3	0.24	1.20	
		MMT16ER120UN	●	●		12	9.525	3.44	1.1	1.4	0.32	1.30	
		MMT16ER110UN	●			11	9.525	3.44	1.1	1.5	0.29	1.42	
		MMT16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		MMT16ER090UN	●			9	9.525	3.44	1.2	1.7	0.35	1.73	
		MMT16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		MMT22ER070UN	●			7	12.7	4.64	1.6	2.3	0.47	2.22	
		MMT22ER060UN	●			6	12.7	4.64	1.6	2.3	0.53	2.60	
		MMT22ER050UN	●			5	12.7	4.64	1.7	2.5	0.64	3.12	
Whitworth for BSW, BSP	Medium Class A	MMT16ER280W	●			28	9.525	3.44	0.6	0.7	0.09	0.58	Full form
		MMT16ER260W	●			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16ER200W	●			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16ER190W	●	●		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16ER180W	●			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16ER160W	●			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16ER140W	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER120W	●			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16ER110W	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16ER100W	●			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16ER090W	●			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16ER080W	●			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22ER070W	●			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22ER060W	●			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22ER050W	●			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	MMT16ER280BSPT	●			28	9.525	3.44	0.6	0.6	0.09	0.58	Full form
		MMT16ER190BSPT	●	●		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16ER140BSPT	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER110BSPT	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7h	MMT16ER100RD	●			10	9.525	3.44	1.1	1.2	0.60	1.27	Full form
		MMT16ER080RD	●			8	9.525	3.44	1.4	1.3	0.75	1.59	
		MMT16ER060RD	●			6	9.525	3.44	1.5	1.7	1.00	2.12	
		MMT22ER040RD	●			4	12.7	4.64	2.2	2.3	1.51	3.18	

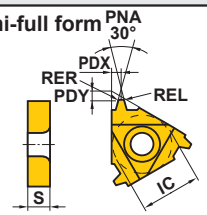
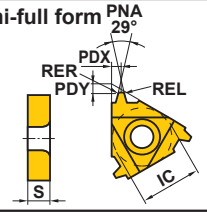
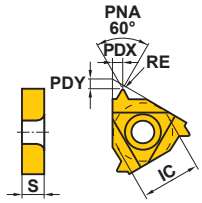
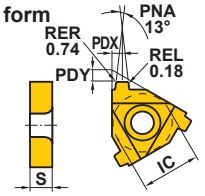
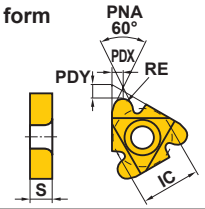
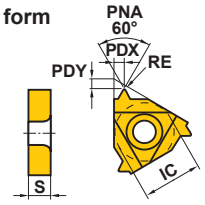
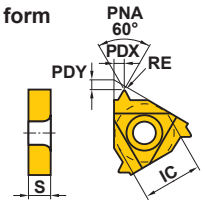








● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

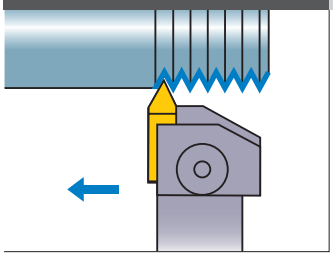
Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE RER/L	Total Cutting Depth (mm)	Geometry
ISO Trapezoidal 30°	7e	MMT16ER150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form 
		MMT16ER200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16ER300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22ER400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22ER500TR	●	5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	MMT16ER120ACME	●		12	9.525	3.44	1.1	1.2	0.08	1.19	Semi-full form 
		MMT16ER100ACME	●		10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT16ER080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22ER060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22ER050ACME	●		5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ	3A	MMT16ER320UNJ	●		32	9.525	3.44	0.6	0.7	0.13	0.46	Full form 
		MMT16ER280UNJ	●		28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT16ER240UNJ	●		24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT16ER200UNJ	●		20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT16ER180UNJ	●		18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT16ER160UNJ	●		16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT16ER140UNJ	●		14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT16ER120UNJ	●		12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT16ER100UNJ	●		10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT16ER080UNJ	●		8	9.525	3.44	1.2	1.6	0.51	1.83	
API Buttress Casing	Standard API	MMT22ER050APBU	●		5	12.7	4.64	3.1	1.9	0.74/0.18	1.55	Full form 
API Round Casing&Tubing	Standard API RD	MMT16ER100APRD	●		10	9.525	3.44	1.2	1.4	0.34	1.41	Full form 
		MMT16ER080APRD	●		8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	MMT16ER270NPT	●		27	9.525	3.44	0.7	0.8	0.04	0.66	Full form 
		MMT16ER180NPT	●		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16ER140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16ER115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16ER080NPT	●		8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	MMT16ER270NPTF	●		27	9.525	3.44	0.7	0.8	0.04	0.64	Full form 
		MMT16ER180NPTF	●		18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT16ER140NPTF	●		14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16ER115NPTF	●		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16ER080NPTF	●		8	9.525	3.44	1.3	1.8	0.04	2.38	

MT HOLDER

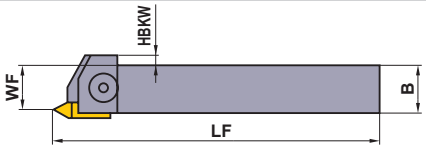
- Clamp-on type.
- Positive insert suffers from negligible chattering and thus produces good finished surfaces.
- Thread pitch ≤4.5mm.

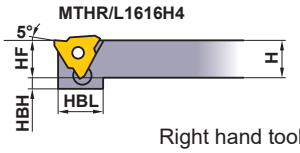
MTH

External threading



Note 1) Cutting in the opposite direction is not possible.





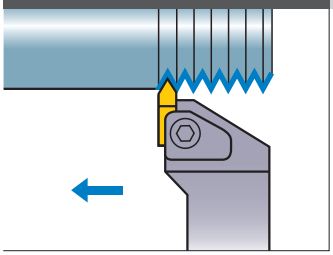
Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)								Clamp Bridge	Clamp Screw *	Spring	Wrench
	R	L		H	B	LF	HF	HBH	HBL	WF	HBKW				
MTHR/L1616H4	●	●	MTTR/L43○○○○	16	16	100	16	3	21	13.8	3	MTK1R/L	HBH06020	MES3	HKY40R
MTHR/L2020K4	●	●		20	20	125	20	—	—	17.8	—	MTK1R/L	HBH06020	MES3	HKY40R
MTHR/L2525M4	●	●		25	25	150	25	—	—	22.8	—	MTK1R/L	HBH06020	MES3	HKY40R

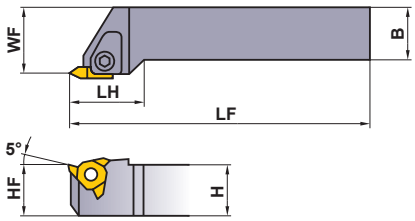
∗ Clamp Torque (N • m) : HBH06020=7.0

MT1

External threading



Note 1) Cutting in the opposite direction is not possible.



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Spring	Wrench
	R	L		H	B	LF	LH	HF	WF				
MT1R/L2020K4	●	●	MTTR/L43○○○○	20	20	125	30	20	25	MTK1R/L	HBH06020	MES3	HKY40R
MT1R/L2525M4	●	●		25	25	150	30	25	32	MTK1R/L	HBH06020	MES3	HKY40R
MT1R/L3232P4	●	●		32	32	170	30	32	40	MTK1R/L	HBH06020	MES3	HKY40R

∗ Clamp Torque (N • m) : HBH06020=7.0

RECOMMENDED CUTTING CONDITIONS

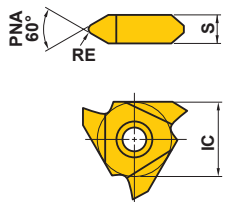
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			NX2525	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			NX2525	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)
			HTi10	100 (70—130)

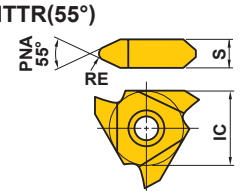
● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

INSERTS

Type	Order Number	Class	Coated	Cermet		Carbide		ISO Pitch mm (thread/inch)	Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10		IC	S	RE	
Partial Profile 60°	**MTTR436000**	G		●		●		−0.8	12.7	4.76	0	**MTTR/L(60°)**
	MTTR436001	G	●	●		●	●	1.0−1.75	12.7	4.76	0.1	
	MTTL436001	G	●			●	●	1.0−1.75	12.7	4.76	0.1	
	MTTR436002	G	●	●		●	●	2.0−2.5	12.7	4.76	0.2	
	MTTL436002	G		●		●		2.0−2.5	12.7	4.76	0.2	
	MTTR436003	G	●	●		●	●	3.0−3.5	12.7	4.76	0.3	
	MTTL436003	G		●		●		3.0−3.5	12.7	4.76	0.3	
	MTTR436004	G		●		●		4.0−4.5	12.7	4.76	0.4	
Partial Profile 55°	**MTTR435501**	G		●		●		(28−10)	12.7	4.76	0.1	**MTTR(55°)**
	MTTR435502	G		●		●		(16−8)	12.7	4.76	0.2	
	MTTR435503	G		●		●		(11−8)	12.7	4.76	0.3	



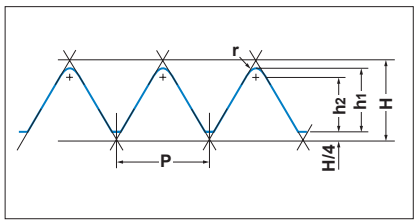
Right hand insert shown.



Right hand insert only.

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2−3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h_1		0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
h_2		0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

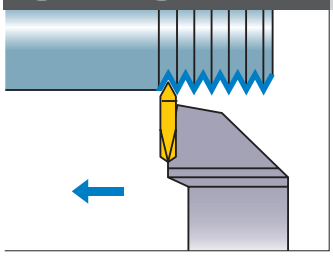
Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4−0.5mm maximum.

SMG HOLDER

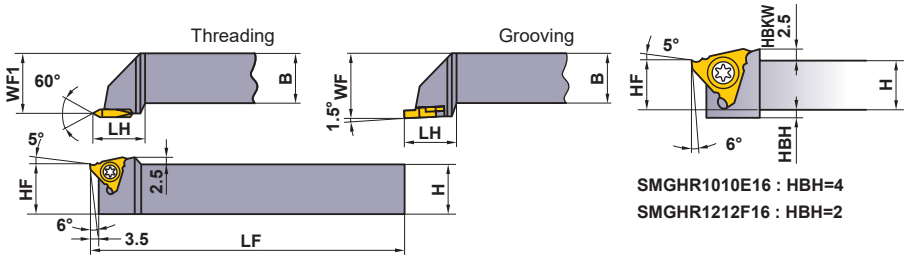
- Screw-on type.
- Positive insert suffers from negligible chattering.
- Suitable for narrow grooving and threading.
- Thread pitch ≤2.0 mm.

SMGH

External threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



SMGHR1010E16 : HBH=4
SMGHR1212F16 : HBH=2

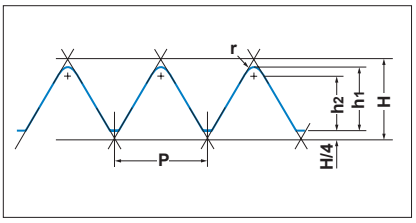
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)							*	
	R	Threading	Grooving	H	B	LF	LH	HF	WF1	WF2	Clamp Screw	Wrench
SMGHR1010E16	●	SMTTR160360◌◌	SMGTR16X2◌◌◌ SMGTR16X2◌◌◌C	10	10	70	16.5	10	11.7	12	FC400890T	TKY10F
SMGHR1212F16	●			12	12	80	16.5	12	15.7	16	FC400890T	TKY10F
SMGHR1616H16	●			16	16	100	20	16	19.7	20	FC400890T	TKY10F
SMGHR2020K16	●			20	20	125	20	20	24.7	25	FC400890T	TKY10F
SMGHR2525M16	●			25	25	150	20	25	31.7	32	FC400890T	TKY10F

∗ Clamp Torque (N • m) : FC400890T=2.5

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00
h1		0.46	0.61	0.77	0.92	1.07	1.23
h2		0.35	0.47	0.59	0.70	0.82	0.94
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25
	2	0.13	0.15	0.18	0.20	0.20	0.25
	3	0.10	0.10	0.12	0.15	0.20	0.20
	4	0.05	0.10	0.12	0.15	0.15	0.15
	5		0.06	0.10	0.10	0.12	0.15
	6			0.05	0.07	0.10	0.10
	7					0.05	0.08
	8						0.05
	9						

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

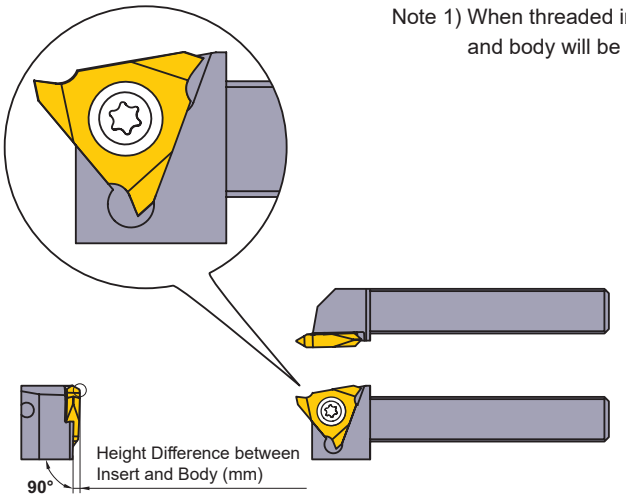
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**NX2525**	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**NX2525**	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UTi20T**	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UTi20T**	80 (60—100)
			HTi10	100 (70—130)

● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

Conditions when Inserts are Installed



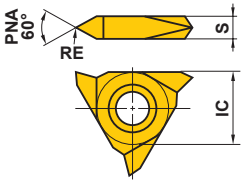
Note 1) When threaded inserts are installed on the body, the height difference between the insert and body will be as shown in the following table.

Height Difference between Insert and Body (mm)

Threading	Grooving
1.23	0.05

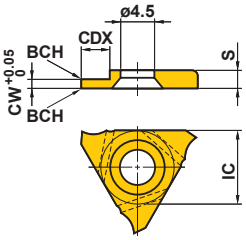
SMT INSERTS (Threading)

Order Number	Carbide	Thread Pitch (mm)	Dimensions (mm)			Geometry
	UTi20T		IC	S	RE	
SMTTR16036001	●	1.0—1.5	9.525	3.18	0.1	
SMTTR16036002	●	1.75—2.0	9.525	3.18	0.2	



SMG INSERTS (Grooving)

Order Number	Cermet	Carbide		Dimensions (mm)					Geometry
	NX2525	UTi20T	HTi10	CW	CDX	IC	S	BCH	
SMGTR16X2050			●	0.5	1.5	9.525	2	—	
SMGTR16X2060	●	●	●	0.6	1.5	9.525	2	—	
SMGTR16X2050C	●	●	●	0.5	1.5	9.525	2	0.05	
SMGTR16X2060C	●	●	●	0.6	1.5	9.525	2	0.05	
SMGTR16X2070C	●	●	●	0.7	2	9.525	2	0.05	
SMGTR16X2075C	●	●	●	0.75	2	9.525	2	0.05	
SMGTR16X2080C	●	●	●	0.8	2	9.525	2	0.1	
SMGTR16X2090C	●	●	●	0.9	2	9.525	2	0.1	
SMGTR16X2095C	●	●	●	0.95	2	9.525	2	0.1	
SMGTR16X2100C	●	●	●	1	2.5	9.525	2	0.1	
SMGTR16X2110C	●	●	●	1.1	2.5	9.525	2	0.1	
SMGTR16X2120C	●	●	●	1.2	2.5	9.525	2	0.1	
SMGTR16X2130C	●	●	●	1.3	2.5	9.525	2	0.1	



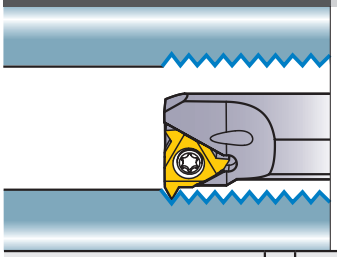
Note 1) Please refer to the page F138 for cutting conditions of grooving.

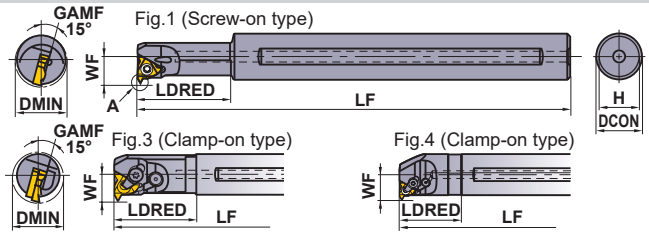
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

MMTI TYPE BORING BARS

MMTI

Internal threading





Right hand tool holder only.

Order Number	Stock R	Insert Number	Lead Angle	Dimensions (mm) DCON	LF	LDRED	WF	H	DMIN	Clamp Bridge	Clamp Screw *	Stop Ring	①Shim Screw ②Embedded Seat Screw *	Shim	Wrench ①/②	Fig
MMTIR1316AK11-SP15	●	MMT11IR	1.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP25	●		2.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP35	●		3.5°	16	125	25	8.7	15	**13**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP15	●	○○○○○	1.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP25	●		2.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP35	●		3.5°	16	150	32	9.7	15	**15**	—	TS25	—	—	—	①TKY08F	1
MMTIR1916AM16-SP15	●	MMT16IR	1.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP25	●		2.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP35	●		3.5°	16	150	40	12.2	15	**19**	—	CS350860T	—	—	—	①TKY15F	2
MMTIR2420AQ16-C	●	○○○○○	1.5°	20	180	40	14.2	19	**24**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR2925AS16-C	●		1.5°	25	250	60	16.7	23.4	**29**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR3732AS16-C	●		1.5°	32	250	48	20.5	30.4	**37**	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR2420AQ22-SP15	●	MMT22IR	1.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP25	●		2.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP35	●		3.5°	20	180	50	15.5	19	**24**	—	TS43	—	—	—	①TKY15F	2
MMTIR3025AR22-C	●	○○○○○	1.5°	25	200	38	17.8	23.4	**30**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR3832AS22-C	●		1.5°	32	250	48	21.8	30.4	**38**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR4640AT22-C	●		1.5°	40	300	60	26.2	38	**46**	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4

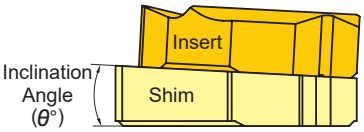
Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.
- A screw-on tool holder uses no shim. (The holder body has a lead angle.) Use a tool holder with the appropriate lead angle.
- Min. cutting diameter (DMIN) shows the internal hole diameter, not the thread diameter.

* Clamp Torque (N • m) : TS25=1.0, CS350860T=3.5, SETS51=3.5, TS43=3.5, SETS61=5.0, HFC03006=1.5, HFC04008=2.2

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTI32TN15**	●	−3°	MMTIR ○○○○ ○○16-C
−0.5°	**CTI32TN05**	●	−2°	
0.5°	**CTI32TP05**	●	−1°	
1.5°	**CTI32TP15**	●	0°	
2.5°	**CTI32TP25**	●	1°	
3.5°	**CTI32TP35**	●	2°	
4.5°	**CTI32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
−1.5°	**CTI43TN15**	●	−3°	MMTIR ○○○○ ○○22-C
−0.5°	**CTI43TN05**	●	−2°	
0.5°	**CTI43TP05**	●	−1°	
1.5°	**CTI43TP15**	●	0°	
2.5°	**CTI43TP25**	●	1°	
3.5°	**CTI43TP35**	●	2°	
4.5°	**CTI43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**VP10MF**	150 (70—230)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	140 (80—200)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Stainless Steel	≤200HB	**VP15TF**	80 (40—120)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	140 (80—200)
			VP15TF	90 (60—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
S	Heat Resistant Alloy	—	**VP10MF**	45 (15—70)
			VP15TF	30 (20—40)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	60 (40—80)
			VP15TF	45 (25—65)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	50 (30—70)
			VP15TF	40 (20—60)

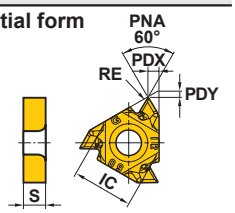
● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

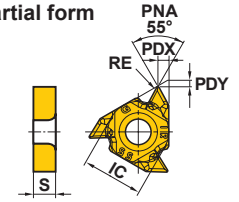
HOW TO SELECT A SHIM ➤ G012
MMT SERIES ORDER NUMBER ➤ G022

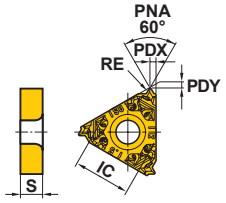
MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

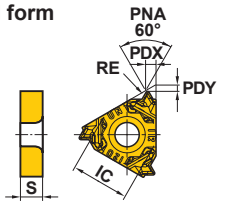
INSERTS

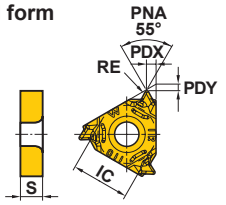
Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	MMT11IRA60-S	●		0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.03	—	Partial form
	MMT16IRA60-S	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	MMT16IRG60-S	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.11	—	
Partial Profile 55°	MMT11IRA55-S	●			48—16	6.35	3.04	0.8	0.9	0.07	—	Partial form
	MMT16IRA55-S	●			48—16	9.525	3.44	0.8	0.9	0.07	—	
	MMT16IRG55-S	●			14—8	9.525	3.44	1.2	1.7	0.21	—	
ISO Metric	MMT11IR100ISO-S	●		1.0		6.35	3.04	0.6	0.7	0.06	0.58	Full form
	MMT11IR125ISO-S	●		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT11IR150ISO-S	●		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT16IR100ISO-S	●	●	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT16IR125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT16IR150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT16IR175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT16IR200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT16IR250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT16IR300ISO-S	●	●	3.0		9.525	3.44	1.1	1.5	0.20	1.73	
American UN	MMT16IR160UN-S	●			16	9.525	3.44	0.9	1.1	0.11	0.92	Full form
	MMT16IR140UN-S	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT16IR120UN-S	●			12	9.525	3.44	1.1	1.4	0.14	1.22	
Whitworth for BSW, BSP	MMT16IR190W-S	●			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form
	MMT16IR140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110W-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	MMT16IR190BSPT-S	●			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form
	MMT16IR140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110BSPT-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	

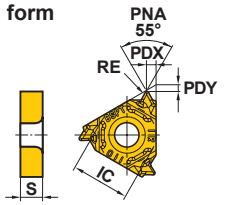












IDENTIFICATION

MMT | **16** | **I** | **R** | **100** | **ISO** – **S**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

100	1.0mm	A	0.5—1.5mm or 48—16 thread/inch
125	1.25mm		
150	1.5mm	G	1.75—3.0mm or 14—8 thread/inch
175	1.75mm		
200	2.0mm		
250	2.5mm		
300	3.0mm		

Threading Type

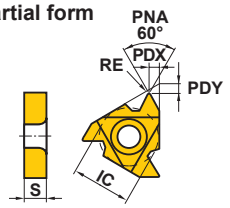
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN

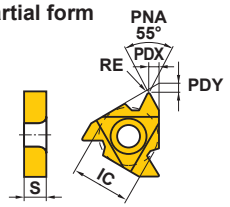
S	M-class inserts with 3-D chip breakers

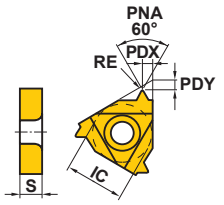
MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total Cutting Depth (mm)	Geometry
Partial Profile 60°	—	MMT11IRA60	●	●	0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA60	●	●	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG60	●	●	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		MMT16IRAG60	●		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		MMT22IRN60	●		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.30	—	
Partial Profile 55°	—	MMT11IRA55	●	●		48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA55	●	●		48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG55	●	●		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16IRAG55	●			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22IRN55	●			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6H	MMT11IR050ISO	●		0.5		6.35	3.04	0.6	0.4	0.03	0.29	Full form
		MMT11IR075ISO	●		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT11IR100ISO	●	●	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT11IR125ISO	●	●	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT11IR150ISO	●	●	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT11IR175ISO	●		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT11IR200ISO	●		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT16IR050ISO	●		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT16IR075ISO	●		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT16IR100ISO	●	●	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT16IR125ISO	●	●	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT16IR150ISO	●	●	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT16IR175ISO	●	●	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT16IR200ISO	●	●	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT16IR250ISO	●	●	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT16IR300ISO	●	●	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT22IR350ISO	●		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT22IR400ISO	●		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT22IR450ISO	●		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT22IR500ISO	●		5.0		12.7	4.64	1.6	2.3	0.32	2.89	







IDENTIFICATION

MMT **16** **I** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

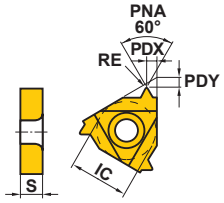
050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm		
125	1.25mm	G	1.75—3.0mm or 14—8 thread/inch
150	1.5mm		
175	1.75mm		
200	2.0mm	AG	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm	N	3.5—5.0mm or 7—5 thread/inch
400	4.0mm		
450	4.5mm		
500	5.0mm		

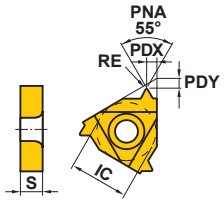
Threading Type

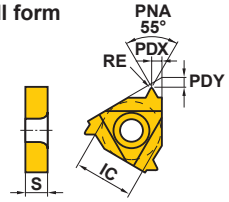
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing&Tubing
NPT	NPT
NPTF	NPTF

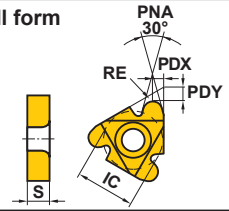
● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE		
American UN	2B	MMT11IR320UN	●			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form
		MMT11IR280UN	●			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT11IR240UN	●			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT11IR200UN	●			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT11IR180UN	●			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT11IR160UN	●			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT11IR140UN	●			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT16IR320UN	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT16IR280UN	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT16IR240UN	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT16IR200UN	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT16IR180UN	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT16IR160UN	●	●		16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT16IR140UN	●	●		14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT16IR130UN	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT16IR120UN	●	●		12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT16IR110UN	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT16IR100UN	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT16IR090UN	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT16IR080UN	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		MMT22IR070UN	●			7	12.7	4.64	1.6	2.3	0.23	2.09	
		MMT22IR060UN	●			6	12.7	4.64	1.6	2.3	0.26	2.44	
		MMT22IR050UN	●			5	12.7	4.64	1.6	2.3	0.32	2.93	
Whitworth for BSW, BSP	Medium Class A	MMT11IR190W	●			19	6.35	3.04	0.8	1.0	0.19	0.86	Full form
		MMT11IR140W	●			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT16IR280W	●			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT16IR260W	●			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16IR200W	●			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16IR190W	●	●		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16IR180W	●			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16IR160W	●			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16IR140W	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR120W	●			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16IR110W	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16IR100W	●			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16IR090W	●			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16IR080W	●			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22IR070W	●			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22IR060W	●			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22IR050W	●			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT	Standard BSPT	MMT11IR190BSPT	●			19	6.35	3.04	0.8	0.9	0.14	0.86	Full form
		MMT11IR140BSPT	●			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT16IR190BSPT	●	●		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16IR140BSPT	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR110BSPT	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7H	MMT16IR100RD	●			10	9.525	3.44	1.1	1.2	0.55	1.27	Full form
		MMT16IR080RD	●			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT16IR060RD	●			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT22IR040RD	●			4	12.7	4.64	2.2	2.3	1.40	3.18	





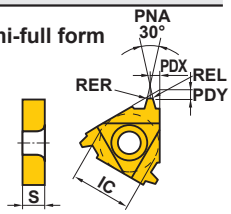


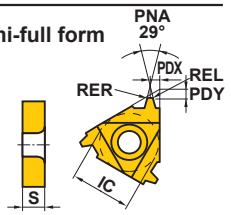


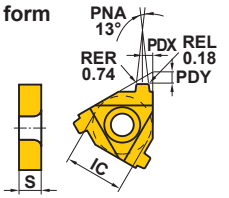
MMT G-CLASS GROUND INSERTS

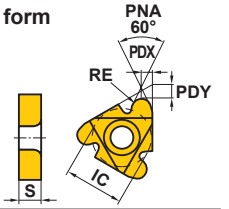
INSERTS

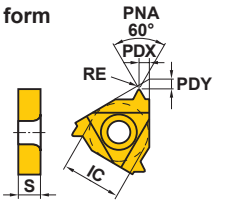
Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE RER/L	Total Cutting Depth (mm)	Geometry
ISO Trapezoidal 30°	7H	MMT16IR150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT16IR200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16IR300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22IR400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22IR500TR	●	5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	MMT16IR120ACME	●		12	9.525	3.44	1.2	1.3	0.05	1.19	Semi-full form
		MMT16IR100ACME	●		10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT16IR080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22IR060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22IR050ACME	●		5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ		When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.										
API Buttress Casing	Standard API	MMT22IR050APBU	●		5	12.7	4.64	2.8	1.9	0.74/0.18	1.55	Full form
API Round Casing&Tubing	Standard API RD	MMT16IR100APRD	●		10	9.525	3.44	1.2	1.4	0.34	1.41	Full form
		MMT16IR080APRD	●		8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	MMT16IR270NPT	●		27	9.525	3.44	0.7	0.8	0.04	0.66	Full form
		MMT16IR180NPT	●		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16IR140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16IR115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16IR080NPT	●		8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	MMT16IR140NPTF	●		14	9.525	3.44	0.9	1.2	0.04	1.35	Full form
		MMT16IR115NPTF	●		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16IR080NPTF	●		8	9.525	3.44	1.3	1.8	0.04	2.38	

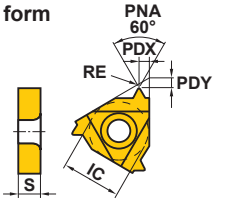










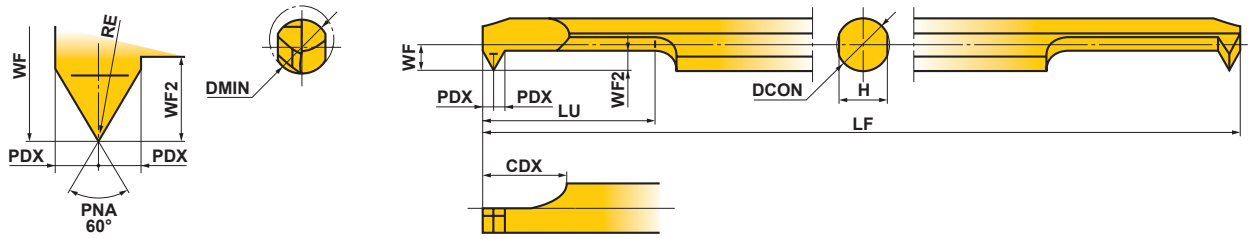


● : Inventory maintained in Japan.
(Contains 5 inserts per case.)

CUTTING DEPTH GUIDE ➤ G016

MICRO-MINI TWIN

■CT STANDARD



Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro-Grain Carbide	Coated		Metric Screw		Unified Coarse Screw											
	TF15	VP15TF		Thread	Pitch (mm)	Thread	Pitch (thread/inch)	DMIN	RE	DCON	LF	LU	CDX	WF	PDX	WF2	H
CT0305RS-M4	●	●	Without	≥M4	0.5—1.0	≥NO.8-32UNC	36—24	**3**	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
CT03RS-M4	●	●	Without	≥M4	0.5—1.0	≥NO.8-36UNF	36—24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT03RS-M4B	●	●	With	≥M4	0.5—1.0		36—24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT0407RS-M6	●	●	Without	≥M6	0.75—1.25	≥1/4-20UNC	28—20	**4.5**	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
CT04RS-M6	●	●	Without	≥M6	0.75—1.25	≥1/4-28UNF	28—20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT04RS-M6B	●	●	With	≥M6	0.75—1.25		28—20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT0511RS-M8	●	●	Without	≥M8	0.75—1.5	≥5/16-18UNC	24—18	**6**	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≥M8	0.75—1.5	≥5/16-24UNF	24—18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT05RS-M8B	●	●	With	≥M8	0.75—1.5		24—18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT0611RS-M10	●	●	Without	≥M10	0.75—1.75	≥3/8-16UNC	24—16	**7**	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≥M10	0.75—1.75	≥3/8-24UNF	24—16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4
CT06RS-M10B	●	●	With	≥M10	0.75—1.75		24—16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Cutting Speed (m/min)	Recommended Tool Overhang (mm)
P	Carbon Steel Alloy Steel	50 (30—80)	Micro-Mini Twin CT, LU+2(mm), Holder
M	Stainless Steel	50 (30—80)	
K	Cast Iron	50 (30—80)	
N	Non-Ferrous Metal	80 (50—100)	

Note 1) Wet cutting is recommended.
Note 2) Pay special attention to machining of small diameters at high revolutions as the feed rate cannot keep up with the speed.

■STANDARD OF DEPTH OF CUT

●The chart on the right shows the cutting depths when machining external ISO metric screw threads.

● Metric

(mm)

P(Pitch)		0.50	0.75	1.00	1.25	1.50	1.75
Total Cutting Depth		**0.29**	**0.43**	**0.58**	**0.72**	**0.87**	**1.01**
Number of Passes	1	0.06	0.06	0.07	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.07	0.07	0.07
	3	0.05	0.05	0.06	0.07	0.07	0.07
	4	0.04	0.05	0.05	0.07	0.07	0.07
	5	0.03	0.04	0.05	0.06	0.06	0.07
	6	0.03	0.04	0.05	0.06	0.06	0.06
	7	0.02	0.04	0.04	0.05	0.06	0.06
	8	0.01	0.03	0.04	0.05	0.06	0.06
	9	—	0.03	0.04	0.05	0.05	0.06
	10	—	0.02	0.03	0.04	0.05	0.05
	11	—	0.01	0.03	0.04	0.05	0.05
	12	—	—	0.03	0.03	0.04	0.05
	13	—	—	0.02	0.03	0.04	0.04
	14	—	—	0.01	0.02	0.03	0.04
	15	—	—	—	0.01	0.03	0.04
	16	—	—	—	—	0.03	0.03
	17	—	—	—	—	0.02	0.03
	18	—	—	—	—	0.01	0.03
	19	—	—	—	—	—	0.03
	20	—	—	—	—	—	0.02
	21	—	—	—	—	—	0.01

● : Inventory maintained in Japan.
(MICRO-MINI TWIN is available in 1 piece in one pack.)

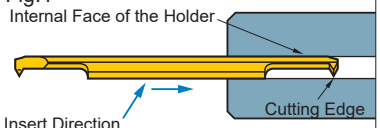
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

■ PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

●When using a holder for general purpose / small automatic lathe:

1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

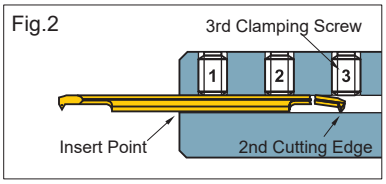
Fig.1



2 When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

◎When using Mitsubishi holders
When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. The set torque value for clamping screw is 2.0 N • m.

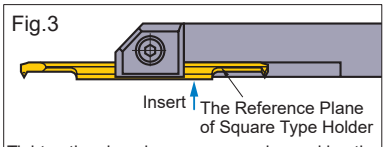
Fig.2



●When using a square type holder:

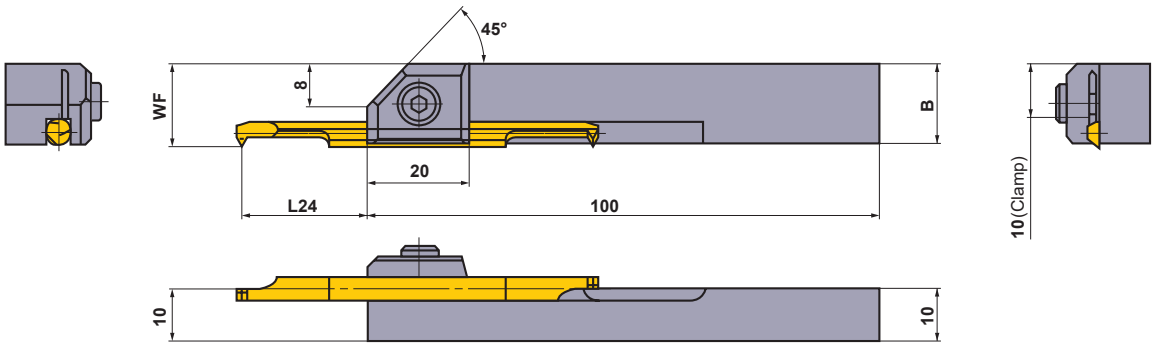
1 When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.
2 Make sure that the clamping screws are tightened to the recommended values.
3 Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

Fig.3



Tighten the clamping screw ensuring making the micro-mini twin boring bars in contact with the reference plane of square type holder.

SQUARE TYPE HOLDER

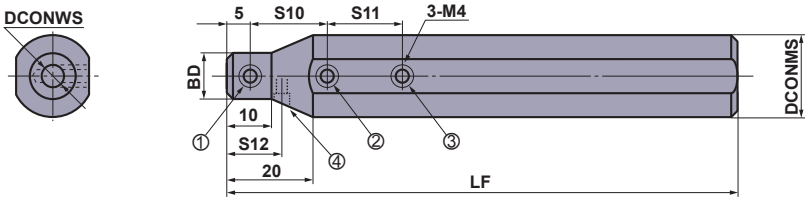


Order Number	Stock	Dimensions (mm) Micro-Mini Twin **CT** B	WF	* L24	Micro-Mini Twin **CT**	Clamp Screw	Wrench	Torque (N•m)
SBH1030R	●	13.8	13.8	13—17.5(14)	0305RS-M4, 03RS-M4(B)	HSC05012	HKY40R	9.5
SBH1040R	●	14.7	14.8	18.5—22(19.5)	0407RS-M6, 04RS-M6(B)	HSC05012	HKY40R	9.5
SBH1050R	●	15.6	15.8	24—26.5(25)	0511RS-M8, 05RS-M8(B)	HSC05012	HKY40R	9.5
SBH1060R	●	16.5	16.8	24—31.5(25)	0611RS-M10, 06RS-M10(B)	HSC05012	HKY40R	9.5

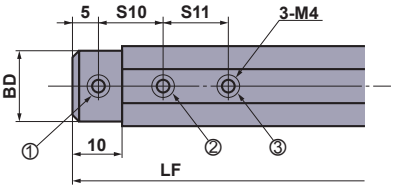
* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.

● : **Inventory maintained in Japan.**

ROUND TYPE HOLDER



RBH22□□N has a temporary set screw for different machine specifications.
(Represented by number 4)



RBH158□□N, RBH16□□N,
RBH190□□N

Order Number	Stock	Dimensions (mm)							Micro-Mini Twin CT	∗1 Clamp Screw				Wrench	Torque (N•m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		①	②	③	④		
RBH15830N	●	15.875	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH15840N	●	15.875	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH15850N	●	15.875	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH15860N	●	15.875	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
RBH1630N	●	16	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
∗2 RBH19030N	●	19.05	3	18	125	10	10	—	0305RS-M4, 03RS-M4(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19040N	●	19.05	4	18	125	15	15	—	0407RS-M6, 04RS-M6(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19050N	●	19.05	5	18	125	15	15	—	0511RS-M8, 05RS-M8(B)	B	B	B	—	HKY20F	2.0
∗2 RBH19060N	●	19.05	6	18	125	15	15	—	0611RS-M10, 06RS-M10(B)	B	B	B	—	HKY20F	2.0
RBH2030N	●	20	3	12	125	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	B	—	HKY20F	2.0
RBH2040N	●	20	4	13	125	15	15	—	0407RS-M6, 04RS-M6(B)	A	B	B	—	HKY20F	2.0
RBH2050N	●	20	5	14	125	15	15	—	0511RS-M8, 05RS-M8(B)	A	B	B	—	HKY20F	2.0
RBH2060N	●	20	6	15	125	15	15	—	0611RS-M10, 06RS-M10(B)	A	B	B	—	HKY20F	2.0
RBH2230N	●	22	3	12	125	10	10	10	0305RS-M4, 03RS-M4(B)	A	B	C	A	HKY20F	2.0
RBH2240N	●	22	4	13	125	15	15	12.5	0407RS-M6, 04RS-M6(B)	A	B	B	A	HKY20F	2.0
RBH2250N	●	22	5	14	125	15	15	12.5	0511RS-M8, 05RS-M8(B)	A	B	B	A	HKY20F	2.0
RBH2260N	●	22	6	15	125	15	15	15	0611RS-M10, 06RS-M10(B)	A	B	B	A	HKY20F	2.0
RBH2530N	●	25	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH2540N	●	25	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH2550N	●	25	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH2560N	●	25	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0
RBH25430N	●	25.4	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH25440N	●	25.4	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH25450N	●	25.4	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH25460N	●	25.4	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0

∗1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008
∗2 Revised order number.

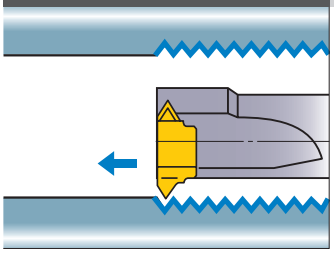
Conventional Order Number	Revised Order Number
RBH1930N	RBH19030N
RBH1940N	RBH19040N
RBH1950N	RBH19050N
RBH1960N	RBH19060N

F TYPE BORING BARS

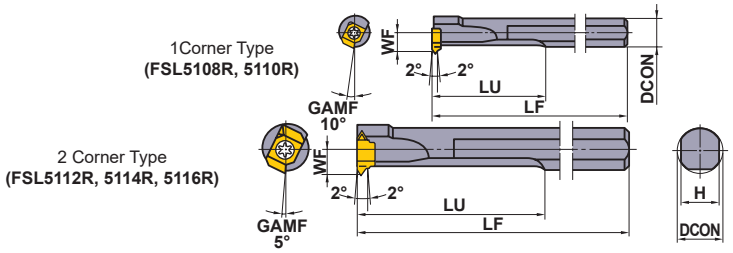
- Minimum cutting diameter 10mm.
- Screw-on type.
- Applicable to threading, grooving.
- Thread pitch 1.5—3.5mm.

FSL51

Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



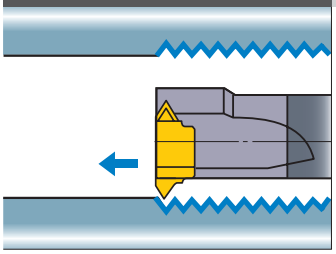
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5108R	●	MLT1001L	MLG10○○L	8	125	30	4.8	7	**10**	TS25	TKY08F
FSL5110R	●	MLT1001L	MLG10○○L	10	150	40	5.8	9	**12**	TS25	TKY08F
FSL5112R	●	MLT1401L	MLG14○○L	12	180	50	6.8	10.8	**14**	TS32	TKY08F
FSL5114R	●	MLT1401L	MLG14○○L	14	180	60	7.8	12.4	**16**	TS32	TKY08F
FSL5116R	●	MLT2001L	MLG20○○L	16	200	70	9.7	14	**20**	TS43	TKY15F

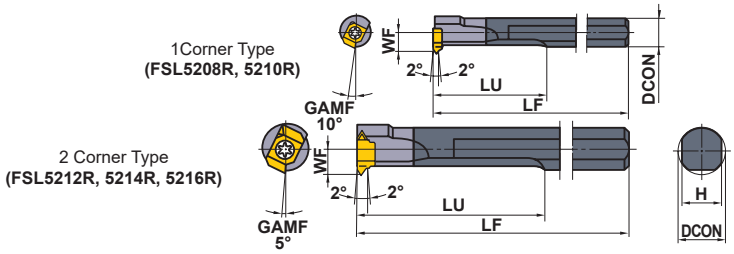
*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

FSL52

(Carbide shank) Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5208R	●	MLT1001L	MLG10○○L	8	125	60	4.8	7	**10**	TS25	TKY08F
FSL5210R	●	MLT1001L	MLG10○○L	10	150	70	5.8	9	**12**	TS25	TKY08F
FSL5212R	●	MLT1401L	MLG14○○L	12	180	80	6.8	11	**14**	TS32	TKY08F
FSL5214R	●	MLT1401L	MLG14○○L	14	180	85	7.8	12	**16**	TS32	TKY08F
FSL5216R	●	MLT2001L	MLG20○○L	16	200	115	9.7	14	**20**	TS43	TKY15F

*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (N • m) : TS25=1.0, TS32=1.0, TS43=3.5

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			UTi20T	100 (70—120)

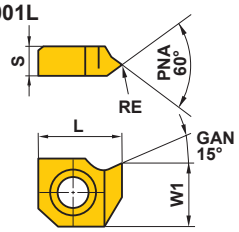
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)

● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

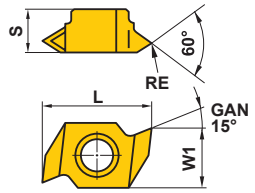
INSERTS

Type	Order Number	Coated UP20M	Carbide UTi20T	Pitch and CW (mm)	Dimensions (mm) L	W1	CDX	S	BCH	RE	Geometry
Threading	**MLT1001L**	●	●	Pitch 1.5—2.0	7	5	—	2.38	—	0.1	**MLT**
	MLT1401L	●	●	Pitch 1.5—2.5	11.8	6.5	—	4.76	—	0.1	
	MLT2001L	●	●	Pitch 1.5—3.5	16.8	9.03	—	6.35	—	0.1	
Grooving	**MLG1012L**		●	1.2	7	5	1.0	2.38	0.1	—	**MLG...L**
	MLG1015L		●	1.5	7	5	1.0	2.38	0.1	—	
	MLG1020L		●	2	7	5	1.0	2.38	0.1	—	
	MLG1415L		●	1.5	11.8	6.5	2.0	4.76	0.1	—	**MLG...L**
	MLG1420L		●	2	11.8	6.5	2.0	4.76	0.1	—	
	MLG1430L		●	3	11.8	6.5	2.0	4.76	0.1	—	
	MLG2020L		●	2	16.8	9.03	3.0	6.35	0.1	—	
	MLG2030L		●	3	16.8	9.03	3.0	6.35	0.1	—	
	MLG2040L		●	4	16.8	9.03	3.0	6.35	0.1	—	

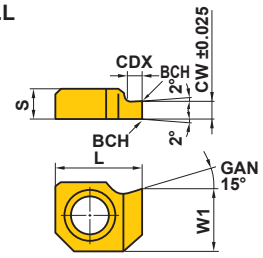
MLT1001L



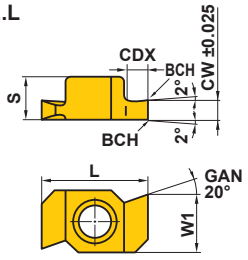
MLT1401L/2001L



MLG...L



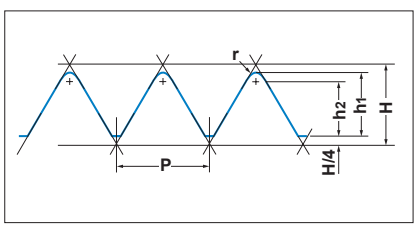
MLG...L



Note 1) Please refer to the page F145 for cutting conditions of grooving.

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50
h_1		0.43	0.58	0.72	0.87	1.01	1.15	1.44	1.73	2.02
h_2		0.38	0.51	0.63	0.76	0.88	1.01	1.21	1.51	1.77
r (Corner Radius)		0.05	0.07	0.09	0.11	0.13	0.14	0.18	0.22	0.25
Number of Passes	1	0.10	0.15	0.18	0.20	0.23	0.25	0.25	0.25	0.30
	2	0.10	0.13	0.15	0.20	0.20	0.20	0.22	0.25	0.25
	3	0.10	0.10	0.12	0.15	0.20	0.15	0.20	0.22	0.22
	4	0.08	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20
	5	0.05	0.05	0.10	0.10	0.10	0.15	0.15	0.20	0.20
	6		0.05	0.05	0.07	0.08	0.10	0.10	0.15	0.20
	7					0.05	0.10	0.10	0.12	0.15
	8						0.05	0.10	0.10	0.15
	9							0.07	0.10	0.10
	10							0.05	0.09	0.10
	11								0.05	0.10
	12									0.05

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

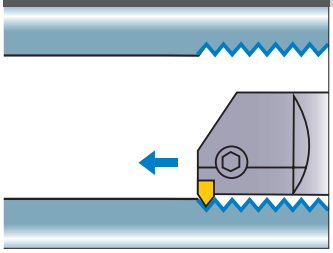
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

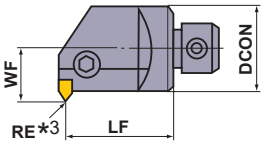
D TYPE BORING HEAD

- Minimum cutting diameter 40mm.
- Pin lock type.
- Exchangeable head type.
- Thread pitch ≤4.5mm.

DPT2

Internal threading





Right hand tool holder only.

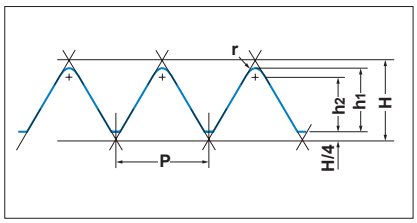
Order Number	Stock R	Insert Number	Dimensions (mm) DCON	LF	WF	DMIN*2	RE*3	Lock Pin	Lock Screw *1	Stop Ring	Wrench
DPT2132R	●	MTTL4360◌◌	32	40	20	**40**	0.1	P21S	HSP08014	E01	HKY40R
DPT2140R	●		40	50	25	**50**	0.1	P21S	HSP08014	E01	HKY40R

*1 Clamp Torque (N • m) : HSP08014=7.0
*2 DMIN : Min.Cutting Diameter
*3 Dimensions shown for insert corner RE 0.1.

G
THREADING

■STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC SCREW THREAD

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h1		0.43	0.58	0.72	0.87	1.01	1.15	1.44	1.73	2.02	2.31	2.60
h2		0.38	0.51	0.63	0.76	0.88	1.01	1.21	1.51	1.77	2.02	2.28
r (Corner Radius)		0.05	0.07	0.09	0.11	0.13	0.14	0.18	0.22	0.25	0.29	0.32
Number of Passes	1	0.10	0.15	0.18	0.20	0.23	0.25	0.25	0.25	0.30	0.30	0.35
	2	0.10	0.13	0.15	0.20	0.20	0.20	0.22	0.25	0.25	0.25	0.30
	3	0.10	0.10	0.12	0.15	0.20	0.15	0.20	0.22	0.22	0.25	0.25
	4	0.08	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5	0.05	0.05	0.10	0.10	0.10	0.15	0.15	0.20	0.20	0.23	0.25
	6		0.05	0.05	0.07	0.08	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.10	0.10	0.12	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.07	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.08	0.10
	13										0.05	0.10
	14											0.05

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

RECOMMENDED CUTTING CONDITIONS

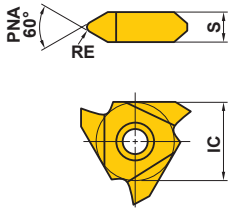
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			NX2525	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	120 (100—150)
			NX2525	170 (150—200)
			UTi20T	100 (70—120)

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)
			HTi10	100 (70—130)

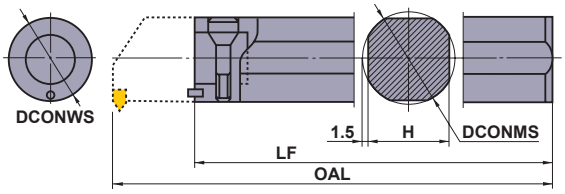
● : **Inventory maintained in Japan.**
(Contains 10 inserts per case.)

INSERTS

Type	Order Number	Class	Coated	Cermet		Carbide		ISO Pitch mm	Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10		IC	S	RE	
Partial Profile 60°	**MTTL436001**	G	●			●	●	1.0—1.75	12.7	4.76	0.1	**MTTL(60°)**
	MTTL436002	G		●		●		2.0—2.5	12.7	4.76	0.2	
	MTTL436003	G		●		●		3.0—3.5	12.7	4.76	0.3	

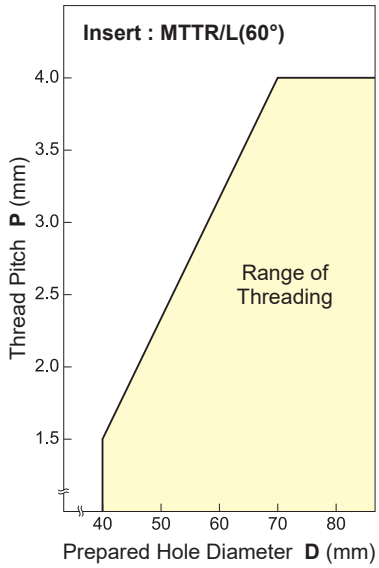


STANDARD ARBOR FOR D TYPE BORING HEAD



Order Number	Stock	Dimensions (mm)					Set Bolt	Wrench	Head
		DCONWS	DCONMS	LF	H	OAL			
B13232	●	32	32	260	29	300	SD32	HKY60R	DPT2132R
B14040	●	40	40	310	37	360	SD40	HKY60R	DPT2140R

■RANGE OF MACHINING



SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

HOW TO READ THE STANDARD OF HSK-T TOOLS

●How this section page is organised

①Organised by application. (Refer to the index on the next page.)

PRODUCT TYPE
indicates the first four letters of the order number, as well as cutting applications.

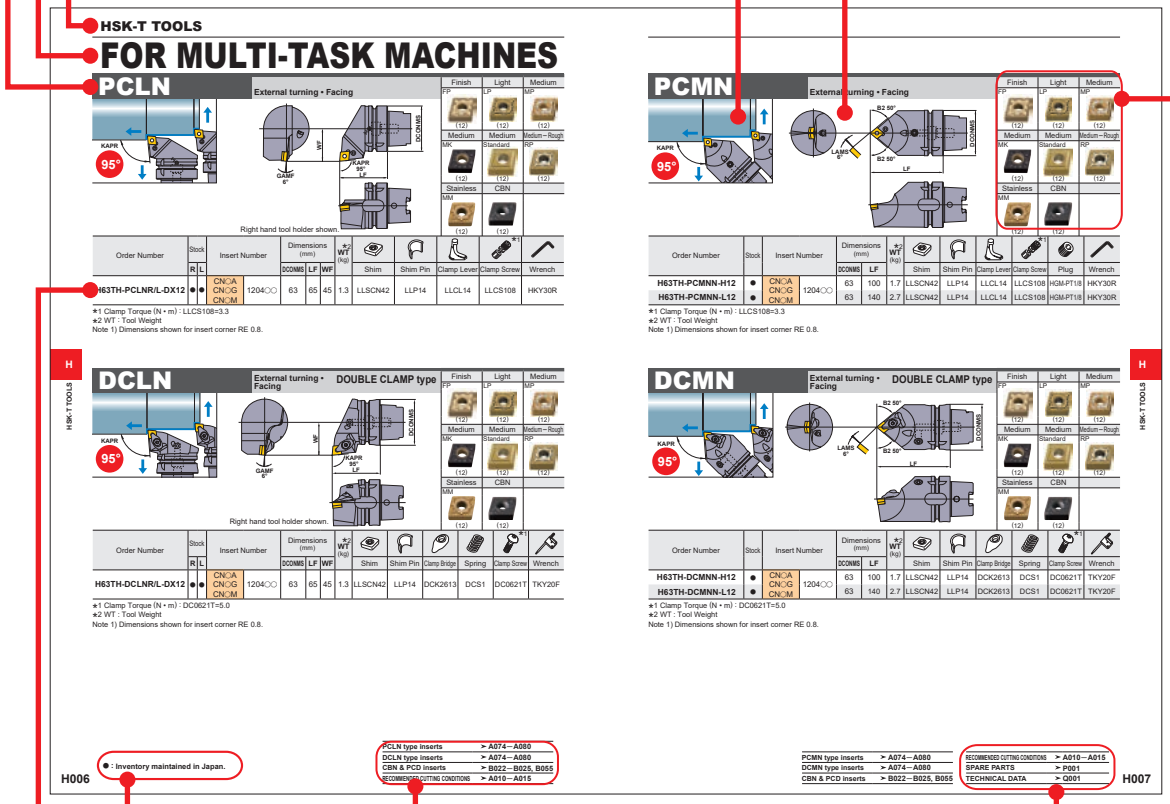
TITLE OF PRODUCT SERIES

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the title product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify
①order number and hand of tool (right/left).

HSK-T TOOLS

OVERVIEW OF HSK-T TOOLS ····· H002
CLASSIFICATION OF HSK-T TOOLS ····· H004
HSK-T TOOL STANDARDS

EXTERNAL TURNING • FACING
CN○○ INSERTS TOOL HOLDERS ····· H006
DN○○ INSERTS TOOL HOLDERS ····· H011

EXTERNAL TURNING • FACING • BORING
CN○○ INSERTS TOOL HOLDERS ····· H008

EXTERNAL TURNING • COPYING
DN○○ INSERTS TOOL HOLDERS ····· H009

EXTERNAL TURNING • FACING • COPYING
RC○○ INSERTS TOOL HOLDERS ····· H012

FACING • COPYING
VB○○ INSERTS TOOL HOLDERS ····· H013

GROOVING
MG INSERTS TOOL HOLDERS ····· H014

THREADING
MMT INSERTS TOOL HOLDERS ····· H016
MT INSERTS TOOL HOLDERS ····· H017

EXTERNAL TURNING TOOL HOLDERS ··· H019
BORING BAR HOLDERS ····· H021
BORING BAR SLEEVES ····· H022



*Arranged by Alphabetical order

H022 **H100TH-B○○-○○○**
H020 **H100TH-EN3232R/L-130**
H019 **H100TH-EV3232R/L-180**
H008 **H63TH-A○○○DCLNR/L12**
H021 **H63TH-B○○-○○**
H008 **H63TH-DCLNL-L12-3**
H006 **H63TH-DCLNR/L-DX12**
H007 **H63TH-DCMNN-H/L12**
H011 **H63TH-DDJNL-L15-3**
H009 **H63TH-DDJNR/L-DX15**
H010 **H63TH-DDNNN-H/L15**
H020 **H63TH-EN2525R/L-115**
H021 **H63TH-EV2020R/L-105-3**
H019 **H63TH-EV2525R/L-112**
H014 **H63TH-MGHR/L-DX43○○**
H016 **H63TH-MMTENR-H/L16**
H016 **H63TH-MMTER-DX16**
H017 **H63TH-MTHR/L-DX43**
H006 **H63TH-PCLNR/L-DX12**
H007 **H63TH-PCMNN-H/L12**
H009 **H63TH-PDJNR/L-DX15**
H010 **H63TH-PDNNN-H/L15**
H012 **H63TH-PRDCN-H/L12**
H012 **H63TH-PRGCR/L-DX12**
H013 **H63TH-SVPBR/L-DX16**
H013 **H63TH-SVVBN-H/L16**
H022 **SL32○○-90**

Tooling system
for turning on
multi-task machines

HSK TOOLS

HSK-T System

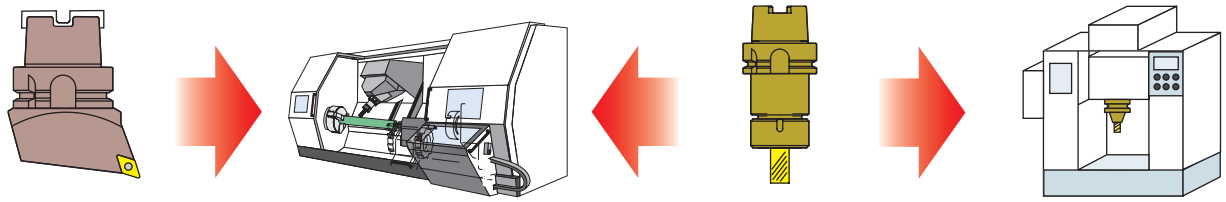
HSK-T is a new HSK system designed for turning on multi-task machines that are compatible with HSK-A type (ISO standard: ISO12164-1:2001).
The HSK system was developed by a consortium of 17 Japanese manufacturers and registered in ISO standard (ISO12164-3:2008) under the name HSK-T type in 2008 and JIS standard (JIS B6064-3) in 2013.



High accuracy cutting edge positioning

The HSK-T type has a closer tolerance between the spindle key and tool holder keyway than the HSK-A type. This results in higher cutting edge positional accuracies. For milling, the conventional HSK-A type tools can be still used.

Compatible with both multi-task machines and machining centres



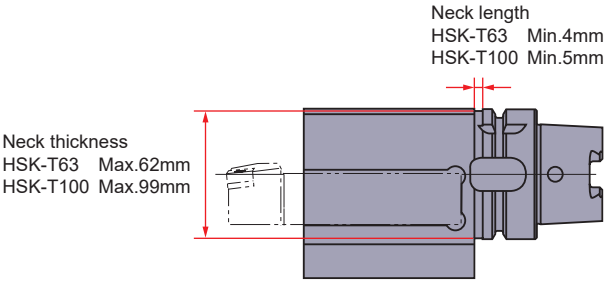
HSK-T
Turning tool holder

HSK-T spindle
Multi-task machines

HSK-A
Rotating tool holder

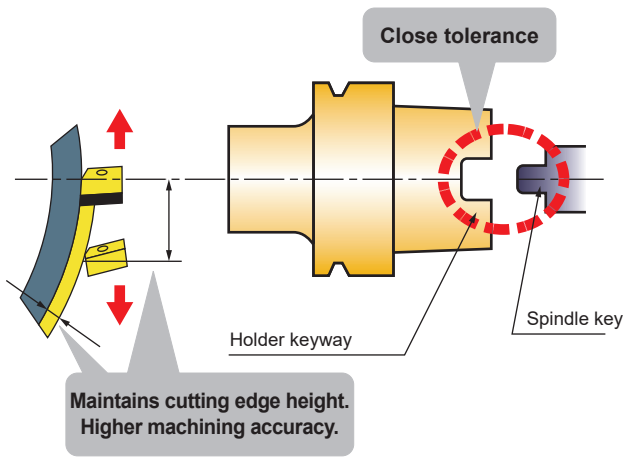
HSK-A spindle
Machining centre

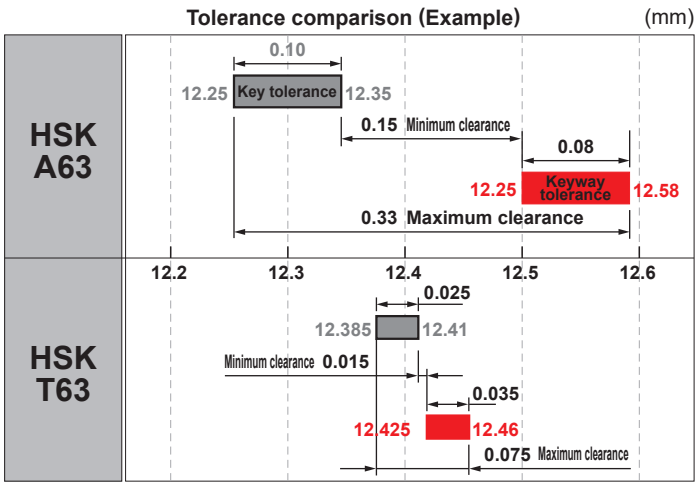
*Note
Short neck length from the flange with thick body of the HSK-T turning tool as shown in the figure at the left.
Because there are machines which cannot be mounted depending on the ATC specifications of the multi-task machine(HSK-A type), please check beforehand.
Also be careful of interference of the magazine with adjacent tools.



HSK-T turning tool standard (Example)

Improved keyway tolerance



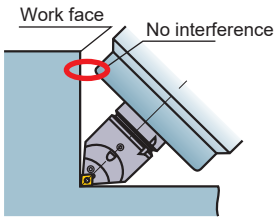


High accuracy and rigidity HSK-T type tooling system developed for use on multi-task machines.

Straight type tools suitable for use on multi-task machines

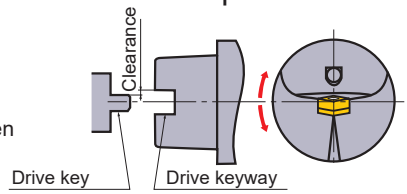
Avoid workpiece interference with improved tool accessibility.

By tilting the machines B spindle (main axis of the tool) at 45 deg, interference between the spindle, holder, workpiece and chuck can be avoided.



Improve centreline height by positioning the cutting edge at the centre of the spindle.

Increased stability and accuracy can be achieved because the cutting edge centreline height is not affected by the gap between the spindle and the key.



New one-action type double clamp series

The double clamp mechanism offers high rigidity, accuracy and reliability that ensures secure insert clamping. Therefore making it suitable turning of difficult to machine materials such as stainless and heat resistant alloys.



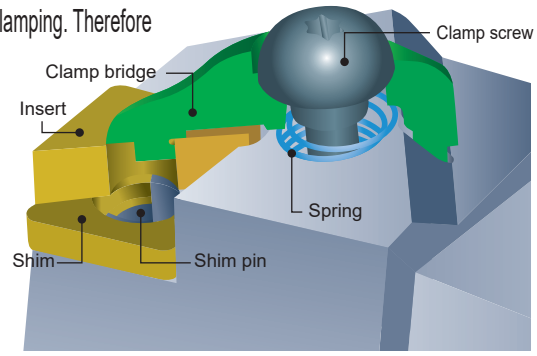
Handed type for turning and facing



Straight type for turning and facing



For turning, facing and boring



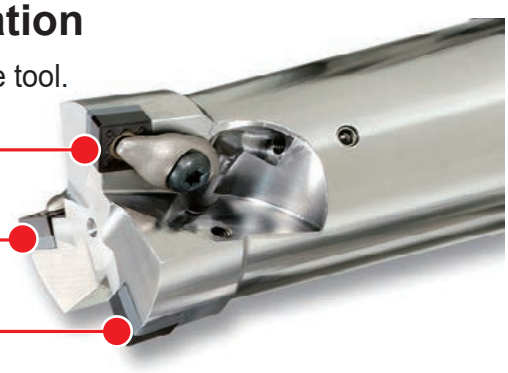
3 on 1 tool for process and tool consolidation

3 turning inserts of the same geometry can be installed on a single tool.

The same type of inserts can be installed for quick change with spare tools.

Different types of inserts can be installed for different applications (roughing, semi finishing and finishing)

Inserts in different grade types can be installed to cover various kinds of workpieces.



New HSK-T100 size for large workpieces

Larger tool holder sizes for high efficiency machining.

Square shank holder type



Boring bar / Drill type



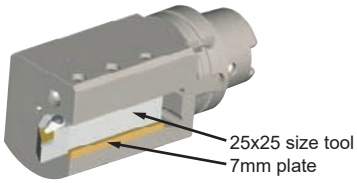
Sleeve



A single tool can be used with different sized tool holders.

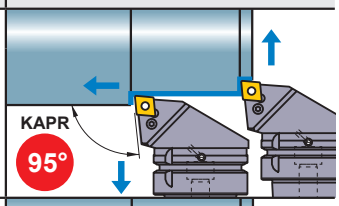
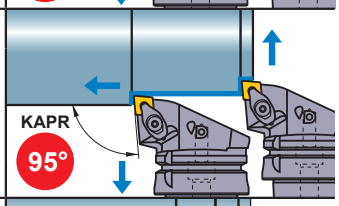
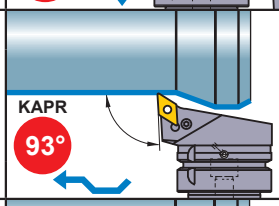
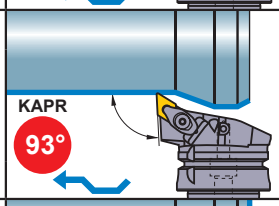
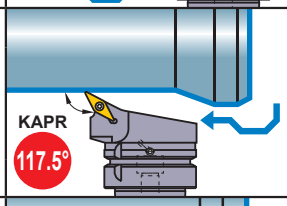
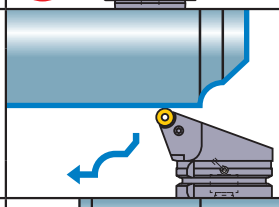
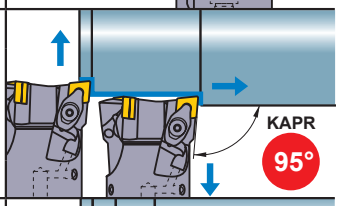
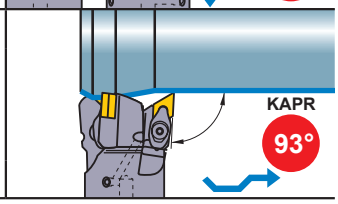
- Available for use with JIS B4126 (ISO 5610) 32x32 and 32x25 tools.
- Possible to fit a 25x25 tool by using a 7mm plate.

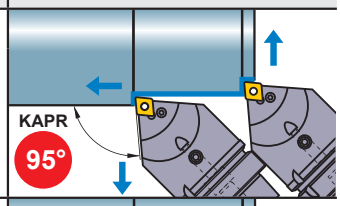
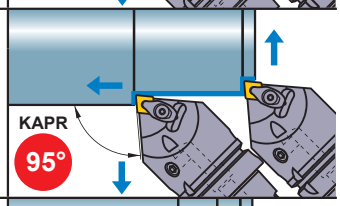
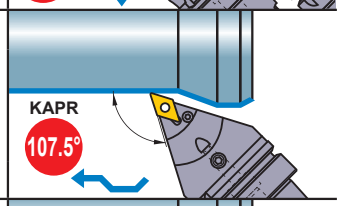
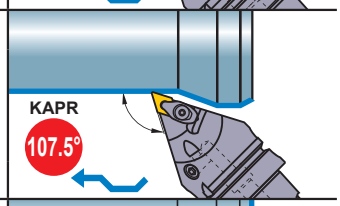
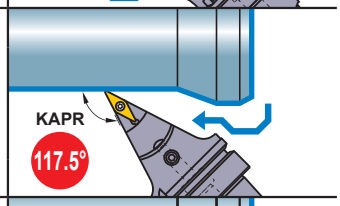
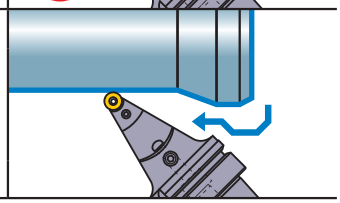
*Please prepare a plate on your own.



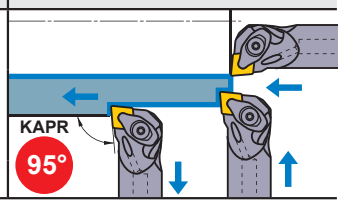
CLASSIFICATION OF HSK-T TOOLS

EXTERNAL TURNING • FACING • COPYING

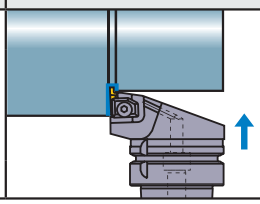
Order Number	Cutting Mode
H63TH-PCLNR/L-DX12  H006	
H63TH-DCLNR/L-DX12  H006	
H63TH-PDJNR/L-DX15  H009	
H63TH-DDJNR/L-DX15  H009	
H63TH-SVPBR/L-DX16  H013	
H63TH-PRGCR/L-DX12  H012	
H63TH-DCLNL-L12-3  H008	
H63TH-DDJNL-L15-3  H011	

Order Number	Cutting Mode
H63TH-PCMNN-H/L12  H007	
H63TH-DCMNN-H/L12  H007	
H63TH-PDNNN-H/L15  H010	
H63TH-DDNNN-H/L15  H010	
H63TH-SVVBN-H/L16  H013	
H63TH-PRDCN-H/L12  H012	

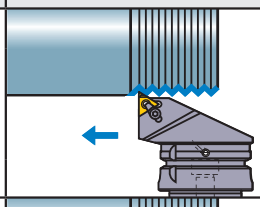
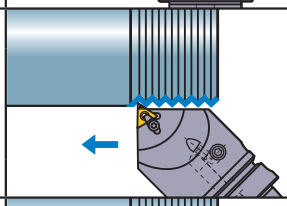
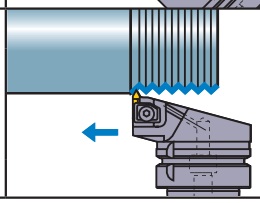
EXTERNAL TURNING • FACING• BORING

Order Number	Cutting Mode
H63TH-A25KDCLNR/L12 **H63TH-A32LDCLNR/L12**  H008	

GROOVING

Order Number	Cutting Mode
H63TH-MGHR/L-DX43○○  ➲ H014	

THREADING

Order Number	Cutting Mode
H63TH-MMTER-DX16  ➲ H016	
H63TH-MMTENR-H/L16  ➲ H016	
H63TH-MTHR/L-DX43  ➲ H017	

EXTERNAL TURNING TOOL HOLDERS

Order Number	Holder
H63TH-EV2525R/L-112 ➲ H019	
H100TH-EV3232R/L-180 ➲ H019	
H63TH-EN2525R/L-115 ✶1 ➲ H020	
H100TH-EN3232R/L-130 ✶1 ➲ H020	
H63TH-EV2020R/L-105-3 ➲ H021	

BORING BAR HOLDERS

Order Number	Holder
H63TH-B○○-○○ ➲ H021	
H100TH-B○○-○○○ ➲ H022	
SL32○○-90 (Sleeve) ✶2 ➲ H022	

Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

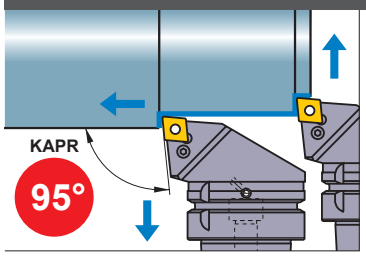
✶1 Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI CO., LTD under Patent No.3720202.

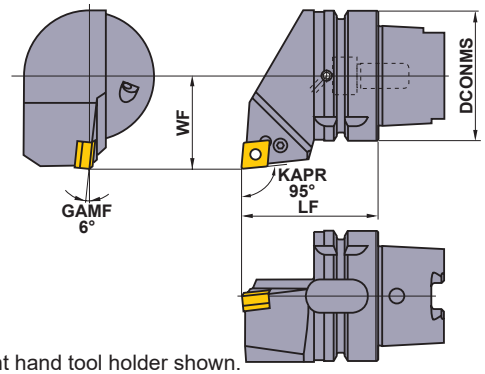
✶2 The SL32○○-90 sleeve is only for use with H100TH-B32-135.

FOR MULTI-TASK MACHINES

PCLN

External turning • Facing





Right hand tool holder shown.

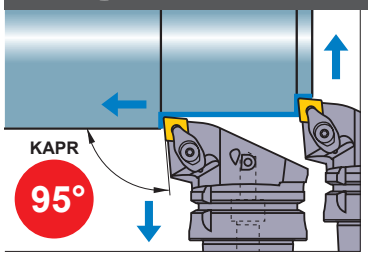
Finish	Light	Medium
FP	LP	MP
		
(12)	(12)	(12)
Medium	**Medium**	**Medium–Rough**
MK	Standard	RP
		
(12)	(12)	(12)
Stainless	**CBN**	
MM		
		
(12)	(12)	

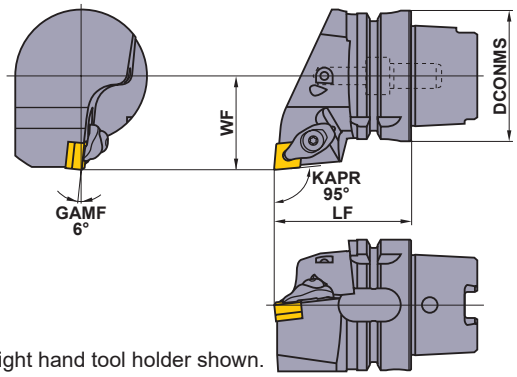
Order Number	Stock		Insert Number		Dimensions (mm)			*2 WT (kg)	Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Wrench
	R	L			DCONMS	LF	WF						
H63TH-PCLNR/L-DX12	●	●	CN○A CN○G CN○M	1204○○	63	65	45	1.3	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

*1 Clamp Torque (N • m) : LLCS108=3.3
*2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

DCLN

External turning • Facing **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium
FP	LP	MP
		
(12)	(12)	(12)
Medium	**Medium**	**Medium–Rough**
MK	Standard	RP
		
(12)	(12)	(12)
Stainless	**CBN**	
MM		
		
(12)	(12)	

Order Number	Stock		Insert Number		Dimensions (mm)			*2 WT (kg)	Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
	R	L			DCONMS	LF	WF							
H63TH-DCLNR/L-DX12	●	●	CN○A CN○G CN○M	1204○○	63	65	45	1.3	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (N • m) : DC0621T=5.0
*2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

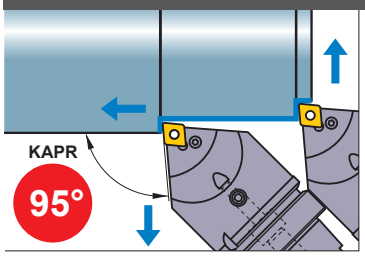
H
HSK-T TOOLS

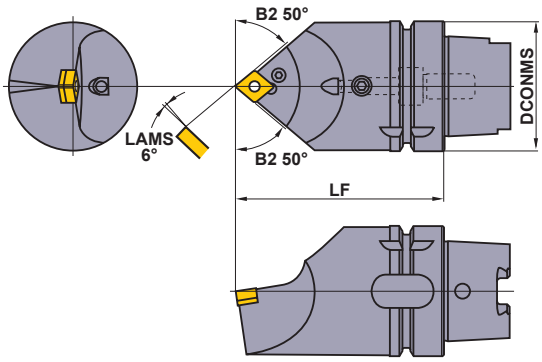
● : Inventory maintained in Japan.

PCLN type inserts	➤ A074–A080
DCLN type inserts	➤ A074–A080
CBN & PCD inserts	➤ B022–B025, B055
RECOMMENDED CUTTING CONDITIONS	➤ A010–A015

PCMN

External turning • Facing





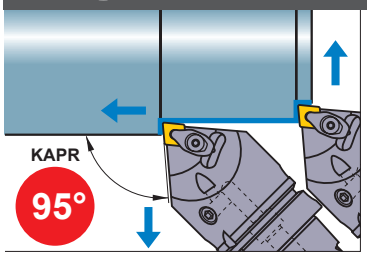
Finish	Light	Medium
FP	LP	MP
		
(12)	(12)	(12)
Medium	**Medium**	**Medium–Rough**
MK	Standard	RP
		
(12)	(12)	(12)
Stainless	**CBN**	
MM		
		
(12)	(12)	

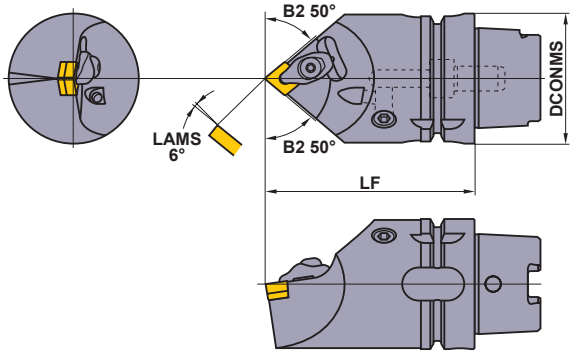
Order Number	Stock	Insert Number		Dimensions (mm)		∗2 WT (kg)	Shim	Shim Pin	Clamp Lever	Clamp Screw ∗1	Plug	Wrench
				DCONMS	LF							
H63TH-PCMNN-H12	●	CN○A CN○G CN○M	1204○○	63	100	1.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R
H63TH-PCMNN-L12	●			63	140	2.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R

∗1 Clamp Torque (N • m) : LLCS108=3.3
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

DCMN

External turning • Facing **DOUBLE CLAMP type**





Finish	Light	Medium
FP	LP	MP
		
(12)	(12)	(12)
Medium	**Medium**	**Medium–Rough**
MK	Standard	RP
		
(12)	(12)	(12)
Stainless	**CBN**	
MM		
		
(12)	(12)	

Order Number	Stock	Insert Number		Dimensions (mm)		∗2 WT (kg)	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw ∗1	Wrench
				DCONMS	LF							
H63TH-DCMNN-H12	●	CN○A CN○G CN○M	1204○○	63	100	1.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DCMNN-L12	●			63	140	2.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

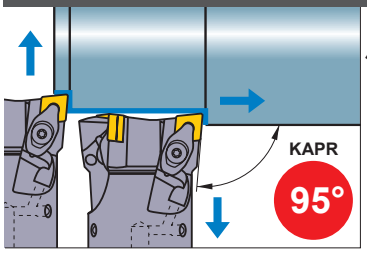
∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

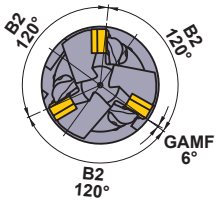
PCMN type inserts	**➤ A074–A080**	RECOMMENDED CUTTING CONDITIONS	**➤ A010–A015**
DCMN type inserts	**➤ A074–A080**	**SPARE PARTS**	**➤ P001**
CBN & PCD inserts	**➤ B022–B025, B055**	**TECHNICAL DATA**	**➤ Q001**

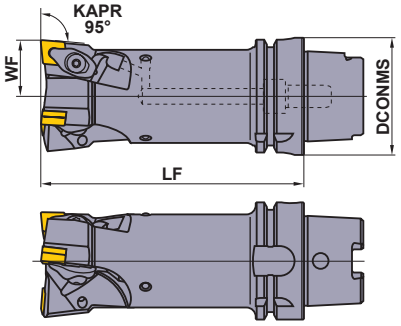
FOR MULTI-TASK MACHINES

DCLN

External turning • Facing **DOUBLE CLAMP type**







Left hand tool holder only.

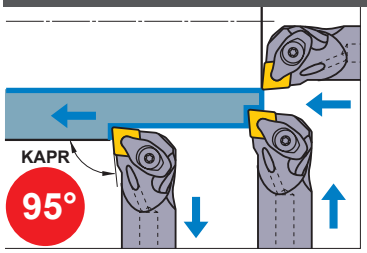
Finish	Light	Medium
FP (12)	LP (12)	MP (12)
Medium	**Medium**	**Medium–Rough**
MK (12)	Standard (12)	RP (12)
Stainless	**CBN**	
MM (12)	(12)	

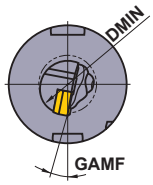
Order Number	Stock	Insert Number		Dimensions (mm)			∗2 WT (kg)	Shim	Shim Pin	Clamp Bridge	Spring	∗1 Clamp Screw	Wrench
	L			DCONMS	LF	WF							
H63TH-DCLNL-L12-3	●	CN○A CN○G CN○M	1204○○	63	140	30	2.2	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

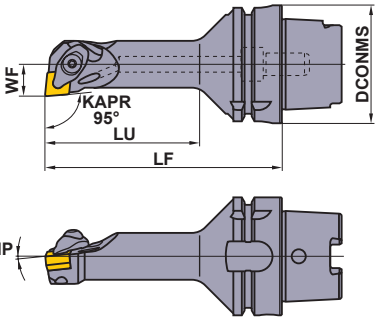
∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

DCLN

External turning • Facing • Boring **DOUBLE CLAMP type**







Right hand tool holder shown.

Finish	Light	Medium
FP (12)	LP (12)	MP (12)
Medium	**Medium**	**Medium–Rough**
MK (12)	Standard (12)	RP (12)
Stainless	**CBN**	
MM (12)	(12)	

Order Number	Stock		Insert Number		Dimensions (mm)					DMIN (mm)	∗2 WT (kg)	Shim	Shim Pin	Clamp Bridge	Spring	∗1 Clamp Screw	Wrench
	R	L			DCONMS	LF	LU	WF	GAMF								
H63TH-A25KDCLNR/L12	●	●	CN○A CN○G CN○M	1204○○	63	125	82	17	11°	32	1.1	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-A32LDCLNR/L12	●	●			63	140	100	22	13°	40	1.4	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

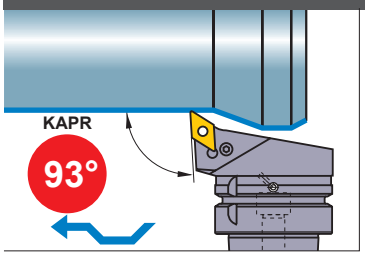
∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

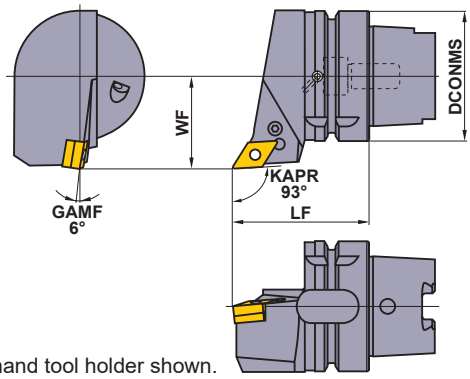
● : Inventory maintained in Japan.

DCLN type inserts	➤ A074—A080
CBN & PCD inserts	➤ B022—B025, B055
RECOMMENDED CUTTING CONDITIONS	➤ A010—A015

PDJN

External turning • Copying





Right hand tool holder shown.

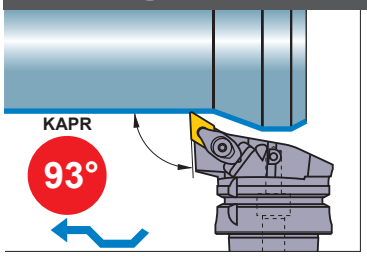
Finish	Light	Medium
FP	LP	MP
(15)	(15)	(15)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
(15)	(15)	(15)
G Class	**CBN**	
R/L		
(15)	(15)	

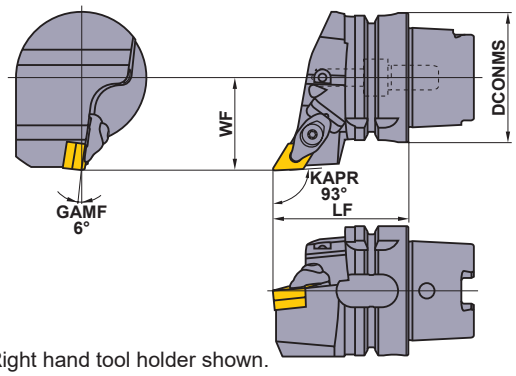
Order Number	Stock		Insert Number		Dimensions (mm)			∗3 WT (kg)	∗2			∗1	
	R	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
H63TH-PDJNR/L-DX15	●	●	DN○A DN○G DN○M DNMX	1504○○	63	65	45	1.2	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

∗1 Clamp Torque (N • m) : LLCS108=3.3
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.
∗3 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

DDJN

External turning • Copying **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium
FP	LP	MP
(15)	(15)	(15)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
(15)	(15)	(15)
G Class	**CBN**	
R/L		
(15)	(15)	

Order Number	Stock		Insert Number		Dimensions (mm)			∗3 WT (kg)	∗2				∗1	
	R	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNR/L-DX15	●	●	DN○A DN○G DN○M DNMX	1504○○	63	65	45	1.2	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

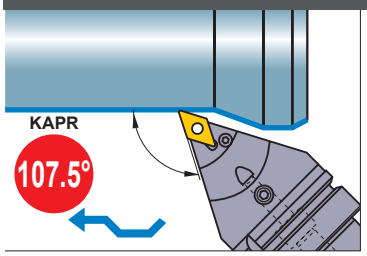
∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.
∗3 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

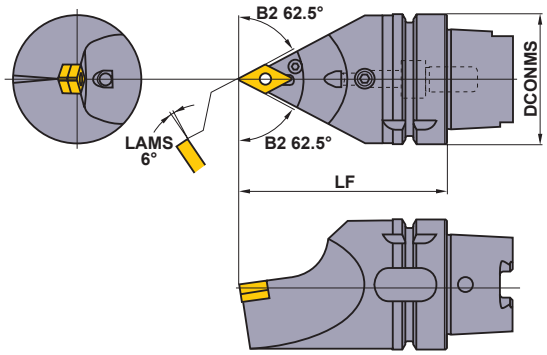
PDJN type inserts	➤ A081—A087	RECOMMENDED CUTTING CONDITIONS	➤ A010—A015
DDJN type inserts	➤ A081—A087	SPARE PARTS	➤ P001
CBN & PCD inserts	➤ B026—B030, B055	TECHNICAL DATA	➤ Q001

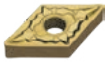
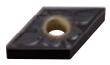
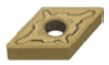
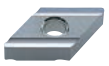
FOR MULTI-TASK MACHINES

PDNN

External turning • Copying





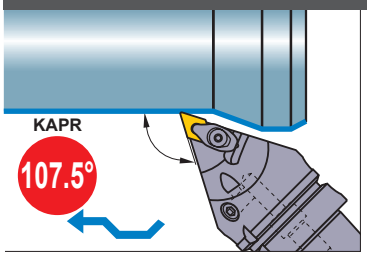
Finish	Light	Medium
FP	LP	MP
		
(15)	(15)	(15)
Medium	**Medium–Rough**	**Stainless**
MK	RP	MM
		
(15)	(15)	(15)
G Class	**CBN**	
R/L		
		
(15)	(15)	

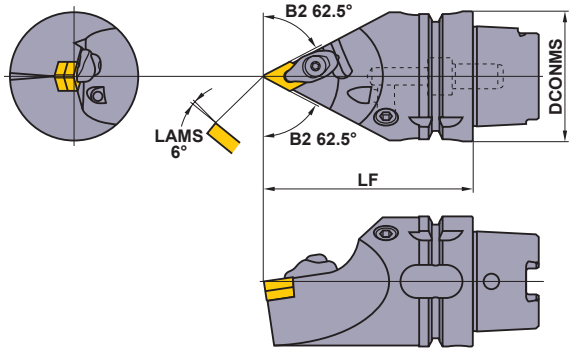
Order Number	Stock	Insert Number		Dimensions (mm) DCONMS	LF	∗3 WT (kg)	∗2 Shim	Shim Pin	Clamp Lever	∗1 Clamp Screw	Plug	Wrench
H63TH-PDNNN-H15	●	DN○A DN○G DN○M	1504○○	63	100	1.6	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R
H63TH-PDNNN-L15	●			63	140	2.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R

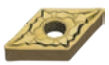
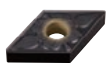
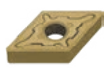
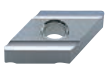
∗1 Clamp Torque (N • m) : LLCS108=3.3
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.
∗3 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

DDNN

External turning • Copying **DOUBLE CLAMP type**





Finish	Light	Medium
FP	LP	MP
		
(15)	(15)	(15)
Medium	**Medium–Rough**	**Stainless**
MK	RP	MM
		
(15)	(15)	(15)
G Class	**CBN**	
R/L		
		
(15)	(15)	

Order Number	Stock	Insert Number		Dimensions (mm) DCONMS	LF	∗3 WT (kg)	∗2 Shim	Shim Pin	Clamp Bridge	Spring	∗1 Clamp Screw	Wrench
H63TH-DDNNN-H15	●	DN○A DN○G DN○M	1504○○	63	100	1.6	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DDNNN-L15	●			63	140	2.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.
∗3 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

H
HSK-T TOOLS

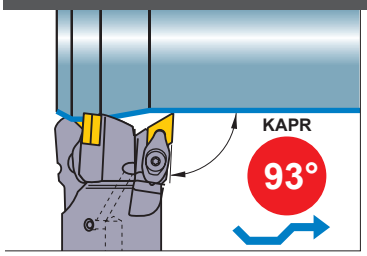
● : Inventory maintained in Japan.

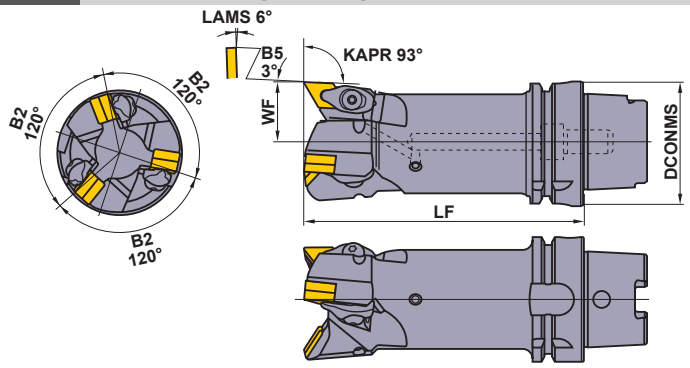
PDNN type inserts	➤ A081–A087
DDNN type inserts	➤ A081–A087
CBN & PCD inserts	➤ B026–B030, B055
RECOMMENDED CUTTING CONDITIONS	➤ A010–A015

DDJN

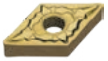
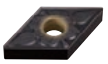
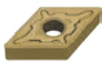
External turning • Facing

DOUBLE CLAMP type





Left hand tool holder only.

Finish	Light
FP	LP
	
(15)	(15)
Medium	**Medium**
MP	MK
	
(15)	(15)
Medium – Rough	**Stainless**
RP	MM
	
(15)	(15)

Order Number	Stock	Insert Number		Dimensions (mm)			∗3 WT (kg)	∗2				∗1	
	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNL-L15-3	●	DN○A DN○G DN○M DNMX	1504○○	63	140	30	2.2	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

∗1 Clamp Torque (N • m) : DC0621T=5.0
∗2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.
∗3 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

H
HSK-T TOOLS

DDNN type inserts	➤ A081—A087
CBN & PCD inserts	➤ B026—B030, B055

RECOMMENDED CUTTING CONDITIONS	➤ A010—A015
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

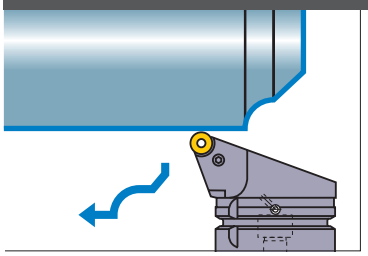
FOR MULTI-TASK MACHINES

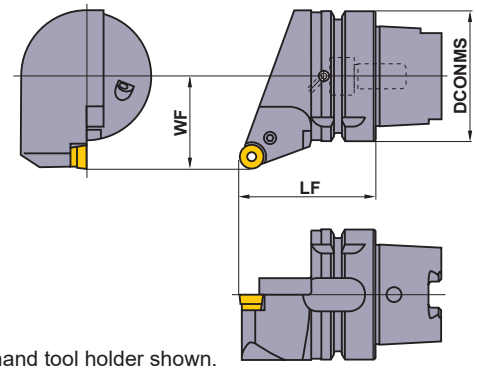
PRGC

External turning • Facing • Copying

Medium

(12)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)			*2 WT (kg)	Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Wrench
	R	L			DCONMS	LF	WF		LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
H63TH-PRGCR/L-DX12	●	●	RCMX	1204M0	63	65	45	1.2					

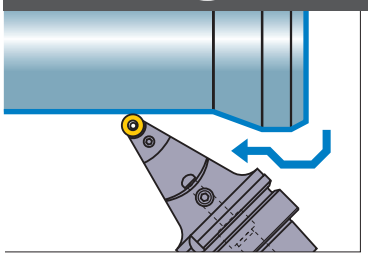
*1 Clamp Torque (N • m) : LLCS106=2.2
*2 WT : Tool Weight

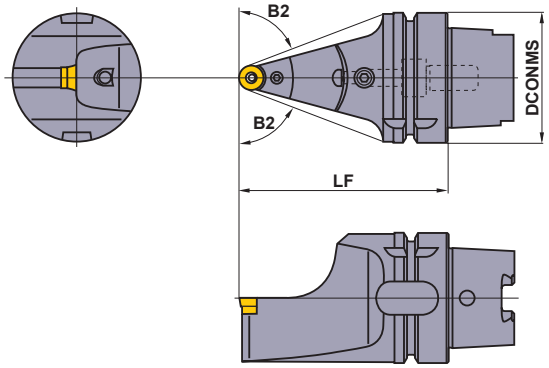
PRDC

External turning • Facing • Copying

Medium

(12)





Order Number	Stock	Insert Number		Dimensions (mm)			*2 WT (kg)	Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Plug	Wrench
				DCONMS	LF	B2		LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R
H63TH-PRDCN-H12	●	RCMX	1204M0	63	100	69°	1.4						
H63TH-PRDCN-L12	●			63	140	75°	2.3						

*1 Clamp Torque (N • m) : LLCS106=2.2
*2 WT : Tool Weight

RECOMMENDED CUTTING CONDITIONS

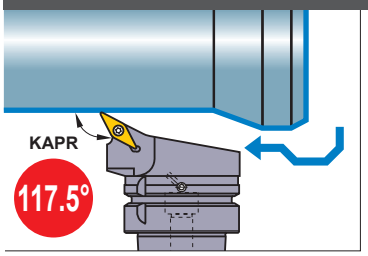
	Workpiece Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	Medium Cutting	**Standard**	**UE6110**	245—440
	Carbon Steel • Alloy Steel	180HB—350HB	Medium Cutting	**Standard**	**UE6110**	200—300
M	Stainless Steel	≤200HB	Medium Cutting	**Standard**	**US735**	70—130

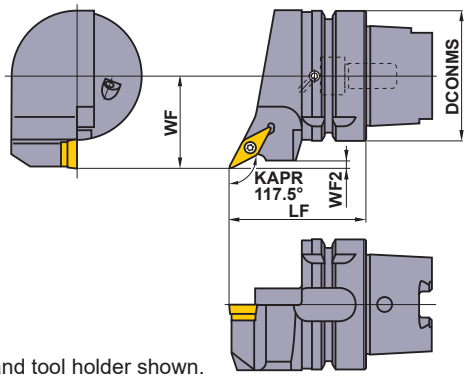
● : Inventory maintained in Japan.

PRGC type inserts ➤ A131
PRDC type inserts ➤ A131

SVPB

Facing • Copying





Right hand tool holder shown.

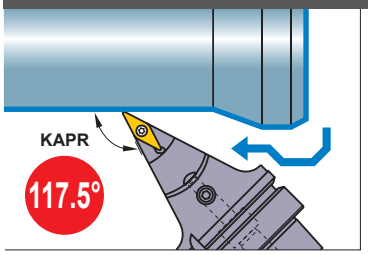
Finish	Light
R/L-F	SV
 (16)	 (16)
Medium	**Medium**
MV	MP
 (16)	 (16)
CBN	
 (16)	

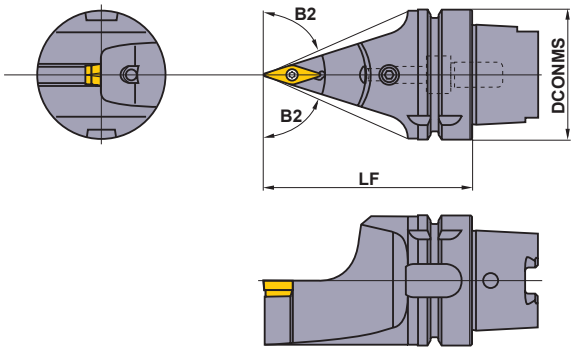
Order Number	Stock		Insert Number		Dimensions (mm)				∗2 WT (kg)	Shim	Shim Pin	∗1 Clamp Screw	Wrench
	R	L			DCONMS	LF	WF	WF2					
H63TH-SVPBR/L-DX16	●	●	VB○T VB○W	1604○○	63	65	45	3.8	1.1	SPSVN32	BCP141	TS35D	TKY15F

∗1 Clamp Torque (N • m) : TS35D=3.5
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

SVVB

Facing • Copying





Finish	Light
R/L-F	SV
 (16)	 (16)
Medium	**Medium**
MV	MP
 (16)	 (16)
CBN	
 (16)	

Order Number	Stock	Insert Number		Dimensions (mm)			∗2 WT (kg)	Shim	Shim Pin	∗1 Clamp Screw	Plug	Wrench
				DCONMS	LF	B2						
H63TH-SVVBN-H16	●	VB○T VB○W	1604○○	63	100	66.5°	1.3	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F
H63TH-SVVBN-L16	●			63	140	72.5°	2.2	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F

∗1 Clamp Torque (N • m) : TS35D=3.5
∗2 WT : Tool Weight
Note 1) Dimensions shown for insert corner RE 0.8.

RECOMMENDED CUTTING CONDITIONS

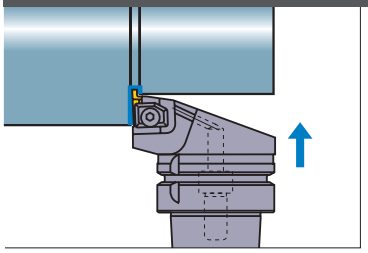
	Workpiece Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	Finish Cutting	**F**	**AP25N**	250 (150—300)
			Medium Cutting	**MP**	**UE6020**	250 (180—330)
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**F**	**AP25N**	210 (150—260)
			Medium Cutting	**MP**	**UE6020**	210 (160—260)
M	Stainless Steel	≤200HB	Medium Cutting	**MM**	**MP7035**	100 (70—120)
K	Gray Cast Iron	Tensile Strength≤350MPa	Medium Cutting	**MK**	**UE6020**	220 (160—290)

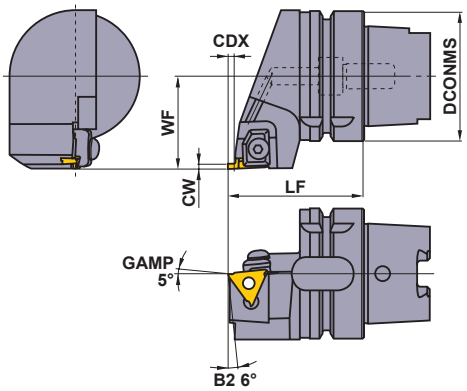
SVPB type inserts ➤ **A142—A144**
SVVB type inserts ➤ **A142—A144**
CBN inserts ➤ **B049**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

FOR MULTI-TASK MACHINES

MG

Grooving





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)					∗2 WT (kg)	Clamp Bridge	∗1 Clamp Screw	Spring	Wrench
	R	L			DCONMS	CW	CDX	LF	WF					
H63TH-MGHR/L-DX4315	●	●	MGTR/L	43125 I 43470	63	1.25	1.2	65	45	1.2	MTK1R/L	HBH06020	MES3	HKY40R
						1.45	1.5							
						1.5≤CW≤2.3	3							
H63TH-MGHR/L-DX4323	●	●				2.3<CW≤3.3	4.5							
H63TH-MGHR/L-DX4333	●	●				3.3<CW≤4.7	4.5							

∗1 Clamp Torque (N • m) : HBH06020=7.0
∗2 WT : Tool Weight

H
HSK-T TOOLS

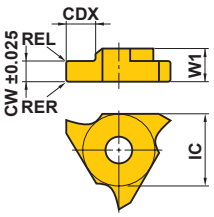
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180—350HB	**VP20MF**	120 (100—140)	0.10 (0.03—0.18)
			NX2525	130 (100—160)	0.12 (0.03—0.2)
M	Stainless Steel	≤200HB	**VP20MF**	120 (100—140)	0.10 (0.03—0.18)
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP20MF**	120 (100—140)	0.10 (0.03—0.18)

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS FOR MG TYPE

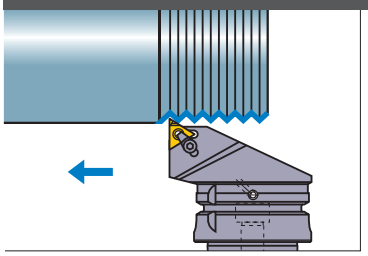
Order Number	Stock						Dimensions (mm)						Geometry
	Coated		Cermet		Carbide								
	VP20MF		NX2525		UTi20T		CW	CDX	IC	W1	RER/L	LE	
	R	L	R	L	R	L							
MGTR/L43125	●	●	●	●	●	●	1.25	1.2	12.7	4.76	0.2	2.7	**MGTR/L...**
MGTR/L43145	●	●		●	●	●	1.45	1.5	12.7	4.76	0.2	–	
MGTR/L43150	●	●	●	●	●	●	1.5	3	12.7	4.76	0.2	2.7	
MGTR/L43175	●	●	●	●	●	●	1.75	3	12.7	4.76	0.2	–	
MGTR/L43200	●	●	●	●	●	●	2	3	12.7	4.76	0.2	2.7	
MGTR/L43230	●	●	●	●	●	●	2.3	3	12.7	4.76	0.2	–	
MGTR/L43250	●	●	●	●	●	●	2.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43260	●	●	●		●	●	2.6	4.5	12.7	4.76	0.3	–	
MGTR/L43270	●	●			●	●	2.7	4.5	12.7	4.76	0.3	–	
MGTR/L43280		●		●	●	●	2.8	4.5	12.7	4.76	0.3	–	
MGTR/L43300	●	●	●	●	●	●	3	4.5	12.7	4.76	0.3	2.7	
MGTR/L43320	●				●	●	3.2	4.5	12.7	4.76	0.3	–	
MGTR/L43330		●		●	●	●	3.3	4.5	12.7	4.76	0.3	–	
MGTR/L43350	●	●	●	●	●	●	3.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43400	●	●	●		●	●	4	4.5	12.7	4.76	0.3	2.7	
MGTR/L43420	●	●	●		●	●	4.2	4.5	12.7	4.76	0.4	–	
MGTR/L43430	●	●	●		●	●	4.3	4.5	12.7	4.76	0.4	–	
MGTR/L43450	●	●	●	●	●	●	4.5	4.5	12.7	4.76	0.4	–	
MGTR/L43470	●	●	●	●	●	●	4.7	4.5	12.7	4.76	0.4	–	Right hand insert shown.

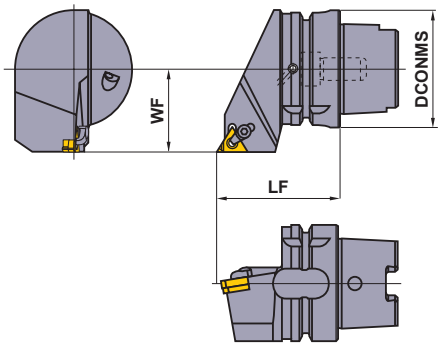


FOR MULTI-TASK MACHINES

MMTE

Threading





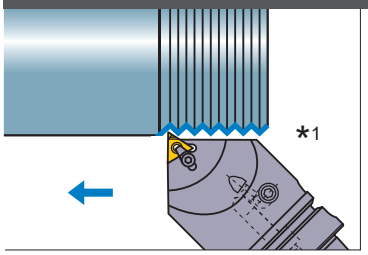
Right hand tool holder only.

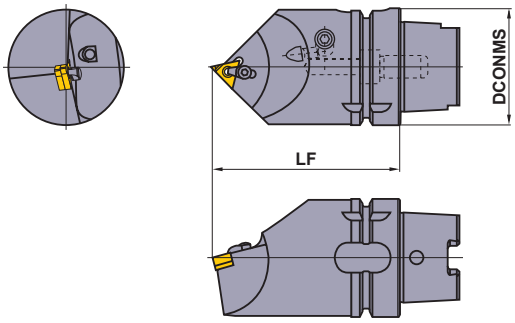
Order Number	Stock	Insert Number		Dimensions (mm)			∗2 WT (kg)	Clamp Bridge	Clamp Screw ∗1	Stop Ring	Shim	Shim Screw ∗1	F R Wrench
	R			DCONMS	LF	WF							
H63TH-MMTER-DX16	●	MMT16ER	○○○○○	63	65	45	1.2	SETK51	SETS51	CR4	CTE32TP15	HFC03008	TKY15F HKY20R

∗1 Clamp Torque (N • m) : SETS51=3.5, HFC03008=1.5
∗2 WT : Tool Weight

MMTEN

Threading





Tool holder for right hand insert only.

Order Number	Stock	Insert Number		Dimensions (mm)		∗3 WT (kg)	Clamp Bridge	Clamp Screw ∗2	Stop Ring	Shim	Shim Screw ∗2	Plug	F R Wrench
				DCONMS	LF								
H63TH-MMTENR-H16	●	MMT16ER	○○○○○	63	100	1.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R
H63TH-MMTENR-L16	●			63	140	2.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R

∗1 For use with B axis tilted at 45 degrees.
∗2 Clamp Torque (N • m) : SETS51=3.5, HFC03008=1.5
∗3 WT : Tool Weight

RECOMMENDED CUTTING CONDITIONS

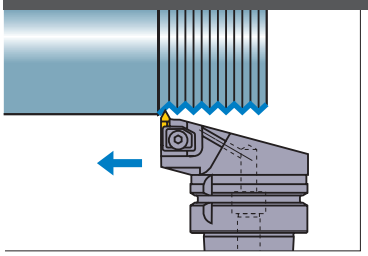
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**VP10MF**	150 (70—230)
			VP15TF	100 (60—140)
	Carbon Steel Alloy Steel	180—350HB	**VP10MF**	140 (80—200)
			VP15TF	100 (60—140)
M	Stainless Steel	≤200HB	**VP10MF**	130 (80—180)
			VP15TF	80 (40—120)
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP10MF**	140 (80—200)
			VP15TF	90 (60—120)

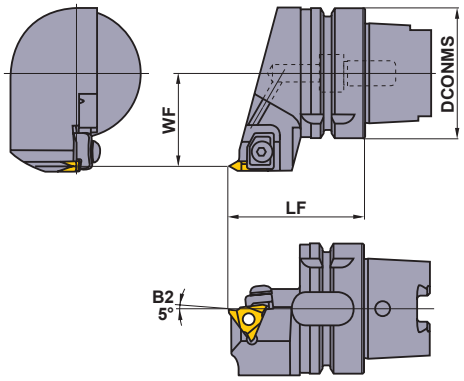
● : **Inventory maintained in Japan.**

APPLICABLE INSERT ➤ G024 — G027

MT

Threading





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)			∗2 WT (kg)		∗1		
	R	L			DCONMS	LF	WF		Clamp Bridge	Clamp Screw	Spring	Wrench
H63TH-MTHR/L-DX43	●	●	MTTR/L	43○○○○	63	65	45	1.2	MTK1R/L	HBH06020	MES3	HKY40R

∗1 Clamp Torque (N • m) : HBH06020=7.0
∗2 WT : Tool Weight

H

HSK-T TOOLS

RECOMMENDED CUTTING CONDITIONS

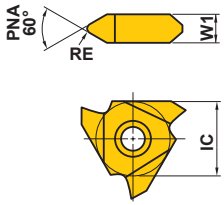
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	**UP20M**	140 (100—180)
			NX2525	200 (150—250)
			UTi20T	120 (100—150)
	Carbon Steel Alloy Steel	180HB—350HB	**UP20M**	120 (100—150)
			NX2525	170 (150—200)
			UTi20T	100 (70—120)
M	Stainless Steel	≤200HB	**UP20M**	120 (80—150)
			UTi20T	100 (70—130)
K	Gray Cast Iron	Tensile Strength≤350MPa	**UP20M**	80 (60—100)
			UTi20T	80 (60—100)
			HTi10	100 (70—130)

APPLICABLE INSERT ➤ H018
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

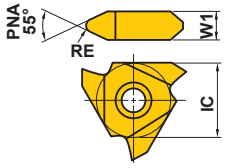
FOR MULTI-TASK MACHINES

INSERTS FOR MT TYPE

Type	Order Number	Class	Coated UP20M	Cermet NX2525		Carbide UTi20T	Carbide HTi10	ISO Pitch mm (thread/inch)	Dimensions (mm) IC	W1	RE	Geometry
General • 60°	**MTTR436000**	G		●		●		—0.8	12.7	4.76	0	**MTTR/L(60°)** (G Class)
	MTTR436001	G	●	●		●	●	1.0—1.75	12.7	4.76	0.1	
	MTTL436001	G	●			●	●	1.0—1.75	12.7	4.76	0.1	
	MTTR436002	G	●	●		●	●	2.0—2.5	12.7	4.76	0.2	
	MTTL436002	G		●		●		2.0—2.5	12.7	4.76	0.2	
	MTTR436003	G	●	●		●	●	3.0—3.5	12.7	4.76	0.3	
	MTTL436003	G		●		●		3.0—3.5	12.7	4.76	0.3	
	MTTR436004	G		●		●		4.0—4.5	12.7	4.76	0.4	
General • 55°	**MTTR435501**	G		●		●		(28—10)	12.7	4.76	0.1	**MTTR(55°)** (G Class)
	MTTR435502	G		●		●		(16—8)	12.7	4.76	0.2	
	MTTR435503	G		●		●		(11—8)	12.7	4.76	0.3	



Right hand insert shown.



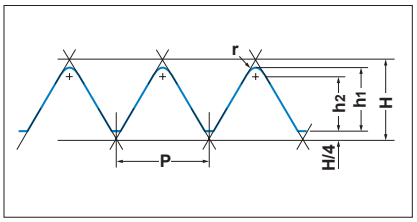
Right hand insert shown.

H

HSK-T TOOLS

■ STANDARD DEPTH OF CUT

●The chart on the right shows the cutting depths when machining external ISO metric screw threads.
●When you use cermet grades or cut stainless steel, please increase the number of passes by 2—3 times.



●METRIC THREAD

Unit : mm

P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h_1		0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
h_2		0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

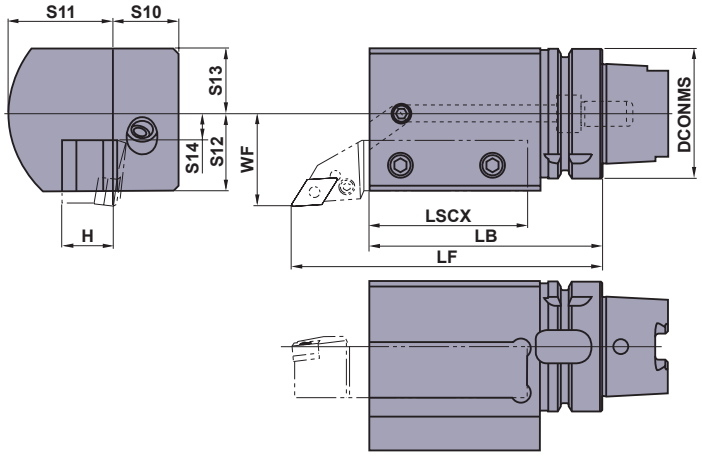
Note 1) The first pass causes a high load on the cutting edge.
In order to avoid damage, keep the depth of cut to 0.4—0.5mm maximum.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

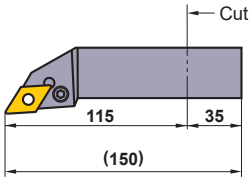
SPARE PARTS ➢ P001

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



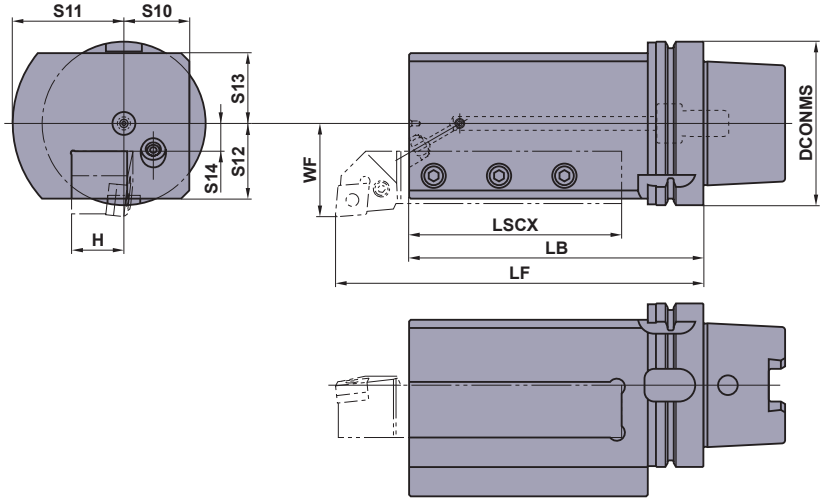
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)											* WT (kg)
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12	S13	
H63TH-EV2525R/L-112	●	●	63	150	112	77	25	32	53	45	13	38	32	3.9

* WT : Tool Weight

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 32×32 and 32×25 size tools.

Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)											* WT (kg)
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12	S13	
H100TH-EV3232R/L-180	●	●	100	220	180	130	32	40	68	57	17	46	43	11.7

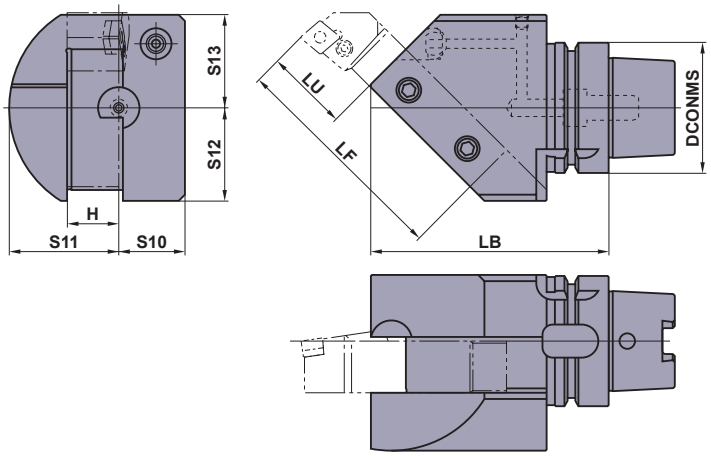
* WT : Tool Weight
Note 1) Possible to fit a 25 x 25 tool by using a 7mm plate.

SPARE PARTS ➤ P046
TECHNICAL DATA ➤ Q001

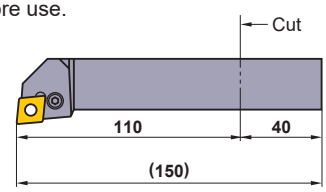
FOR MULTI-TASK MACHINES

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI CO., LTD under Patent No.3720202.

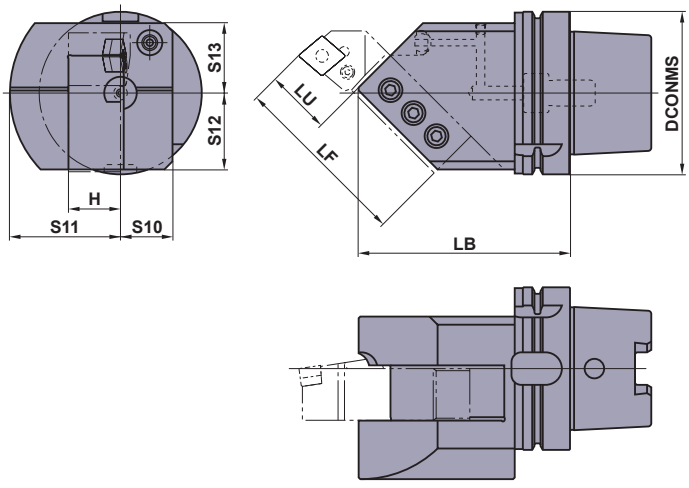
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									*WT (kg)
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13	
H63TH-EN2525R/L-115	●	●	63	115	40	110	25	32	53	45	45	3.7

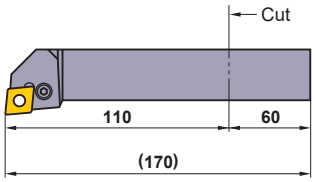
∗ WT : Tool Weight

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 32×32 and 32×25 size tools.
Please shorten the tool as shown below before use.



Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI CO., LTD under Patent No.3720202.

Right hand tool holder shown.

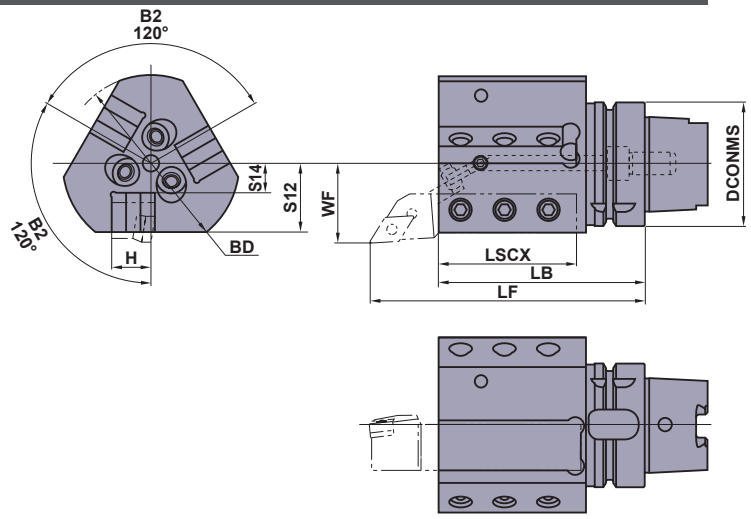
Order Number	Stock		Dimensions (mm)									*WT (kg)
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13	
H100TH-EN3232R/L-130	●	●	100	130	40	110	32	32	68	47	43	6.6

∗ WT : Tool Weight
Note 1) Possible to fit a 25 x 25 tool by using a 7mm plate.

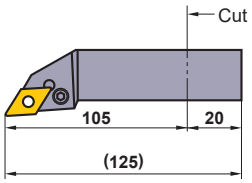
● : **Inventory maintained in Japan.**

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■ This holder is for 20×20 size tools.
Please shorten the tool as shown below before use.



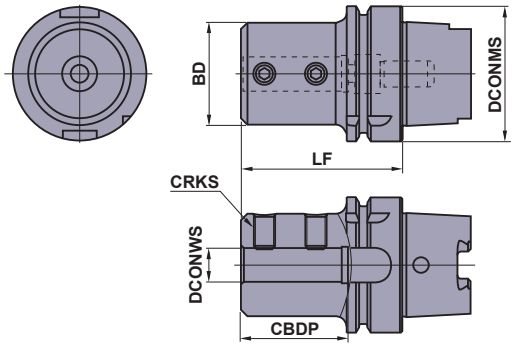
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									* WT (kg)
	R	L	DCONMS	LF	LB	LSCX	H	BD	WF	S14	S12	
H63TH-EV2020R/L-105-3	●	●	63	140	105	70	20	90	40	15	35	2.9

* WT : Tool Weight

BORING BAR HOLDERS

Boring



Order Number	Stock	Dimensions (mm)						* WT (kg)
		DCONMS	BD	DCONWS	LF	CBDP	CRKS	
H63TH-B08-65	●	63	28	8	65	40	M8	0.9
H63TH-B10-70	●	63	35	10	70	45	M8	1.0
H63TH-B12-70	●	63	42	12	70	45	M8	1.1
H63TH-B16-75	●	63	48	16	75	50	M10	1.3
H63TH-B20-75	●	63	52	20	75	50	M10	1.4
H63TH-B25-83	●	63	62	25	83	58	M12	1.7
H63TH-B32-87	●	63	62	32	87	62	M12	1.7
H63TH-B40-97	●	63	65	40	97	72	M16	1.8

* WT : Tool Weight

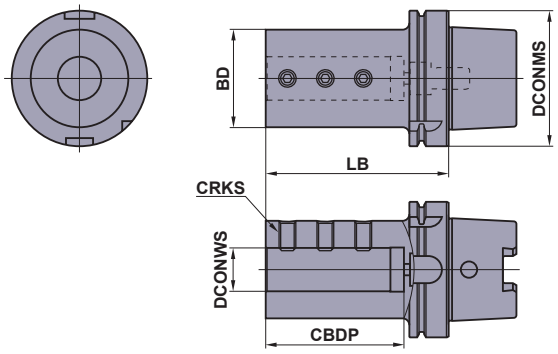
Note 1) Please shorten a boring bar to the required shank length. This holder is for boring bars and indexable type drills.

SPARE PARTS ➤ P046
TECHNICAL DATA ➤ Q001

FOR MULTI-TASK MACHINES

BORING BAR HOLDERS

Boring



Order Number	Stock	Dimensions (mm)						WT* (kg)
		DCONMS	BD	DCONWS	LB	CBDP	CRKS	
H100TH-B25-120	●	100	62	25	120	88	M12	3.9
H100TH-B32-135	●	100	72	32	135	102	M12	4.8
H100TH-B40-150	●	100	82	40	150	117	M16	5.9
H100TH-B50-180	●	100	92	50	180	147	M16	7.7

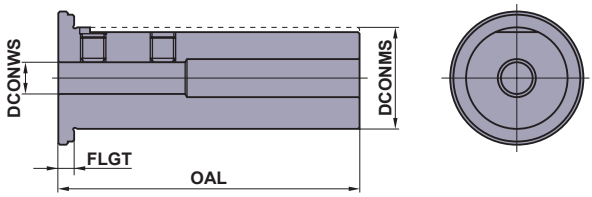
* WT : Tool Weight

Note 1) Please shorten a boring bar to the required shank length. This holder is for boring bars and indexable type drills.

H

HSK-T TOOLS

BORING BAR SLEEVES FOR H100TH-B32-135



Order Number	Stock	Dimensions (mm)				WT* (kg)
		DCONWS	DCONMS	OAL	FLGT	
SL3208-90	●	8	32	95	5	0.6
SL3210-90	●	10	32	95	5	0.5
SL3212-90	●	12	32	95	5	0.5
SL3216-90	●	16	32	95	5	0.5
SL3220-90	●	20	32	95	5	0.4

* WT : Tool Weight

Note 1) These sleeves are only compatible with H100TH-B32-135 holder.

● : Inventory maintained in Japan.

SPARE PARTS ➢ P046
TECHNICAL DATA ➢ Q001

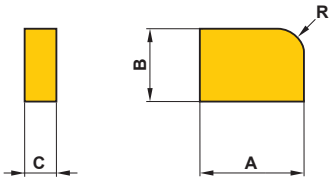
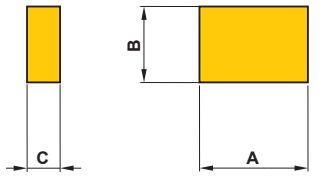
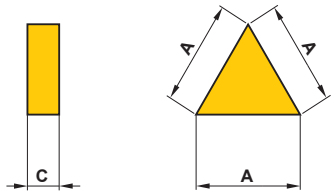
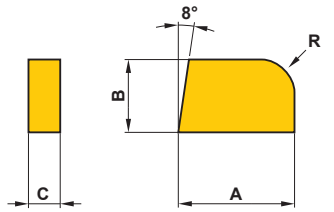
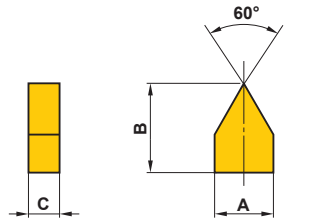
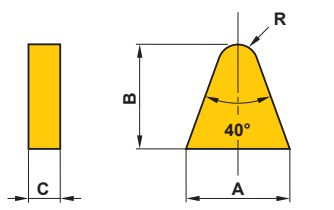
TURNING TOOLS

BRAZED TOOLS

CARBIDE BLANK FOR TURNING TOOLS ····· I002
CARBIDE RODS (MITSUBISHI STANDARD)····· I004
BRAZED TOOL HOLDERS ····· I005

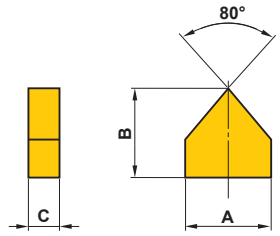
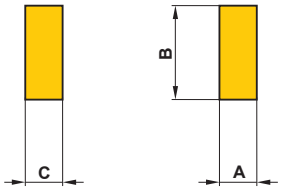
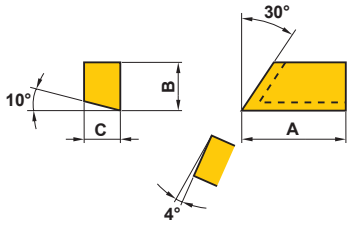


CARBIDE BLANK FOR TURNING TOOLS

Type	Geometry	Order Number	Stock								Dimensions (mm)			
			P			M	K							
			STi10 (HW-P10) *	STi20 (HW-P20) *	STi40T (HW-P40) *	UTi20T (HW-M20) *	HTi03A (HW-K01) *	HTi05T (HW-K01) *	HTi10 (HW-K10) *	HTi20 (HW-K20) *	A	B	C	R
01 Type		01-0	▲	▲	□	▲	▲	▲	▲	□	10	6	3	4
		01-1	▲	▲	▲	▲	▲	▲	▲	▲	13	9	3	5
		01-2	▲	▲	▲	▲	▲	▲	▲	▲	16	11	4	5
		01-3	▲	▲	▲	▲	□	□	▲	▲	19	13	5	5
		01-4	□	▲	▲	▲	□	□	□	□	22	15	6	8
		01-5	□	□	□	▲	□	□	□	□	25	17	7	8
For 31,32 Type		01-6	□	□	□	□	□	□	□	□	30	20	8	8
02 Type		02-0	▲	▲	▲	▲	▲	▲	▲	▲	10	6	3	—
		02-1	▲	▲	▲	▲	▲	▲	▲	▲	13	9	3	—
		02-2	▲	▲	▲	▲	▲	▲	▲	▲	16	11	4	—
		02-3	▲	▲	▲	▲	▲	▲	▲	▲	19	13	5	—
		02-4	▲	▲	▲	▲	□	▲	▲	▲	22	15	6	—
		02-5	□	▲	▲	▲	□	▲	▲	▲	25	17	7	—
For 41,42 Type		02-6	□	▲	▲	▲	□	▲	▲	▲	30	20	8	—
03 Type		03-0	□	▲	□	▲	□	□	□	□	10	—	3	—
		03-1	□	▲	□	▲	▲	□	▲	□	12	—	3	—
		03-2	□	▲	□	▲	▲	□	▲	□	15	—	4	—
		03-3	□	▲	□	▲	□	▲	▲	▲	18	—	5	—
		03-4	□	□	□	□	□	□	□	□	24	—	6	—
		03-5	□	□	□	□	□	□	□	□	24	—	7	—
For 37,38,47 Type		03-6	□	□	□	□	□	□	□	□	28	—	8	—
04 Type		04-0	▲	▲	□	▲	▲	▲	▲	▲	10	6	3	4
		04-1	▲	▲	□	▲	▲	▲	▲	▲	13	9	3	5
		04-2	▲	▲	▲	▲	▲	▲	▲	▲	16	11	4	5
		04-3	▲	▲	▲	▲	▲	▲	▲	▲	19	13	5	5
		04-4	□	▲	□	▲	□	□	▲	□	22	15	6	8
		04-5	□	□	□	□	□	□	□	□	25	17	7	8
For 33,34 Type		04-6	□	□	□	□	□	□	□	□	30	20	8	8
05 Type		05-1	□	▲	□	▲	□	□	▲	□	5	8	3	—
		05-2	▲	▲	□	▲	□	□	▲	□	6	10	4	—
		05-3	▲	▲	□	▲	□	□	▲	□	7	12	5	—
		05-4	□	▲	□	▲	□	□	□	□	9	16	6	—
		05-5	□	□	□	□	□	□	□	□	10	18	7	—
		05-6	□	□	□	□	□	□	□	□	11	20	8	—
For 49,51 Type														
06 Type		06-0	▲	▲	▲	▲	▲	▲	▲	▲	10	10	3	2
		06-1	▲	▲	▲	▲	▲	▲	▲	▲	13	13	3	2.5
		06-2	▲	▲	▲	▲	▲	▲	▲	▲	16	16	4	3
		06-3	▲	▲	▲	▲	▲	▲	▲	▲	19	19	5	4
		06-4	□	▲	□	▲	□	▲	▲	▲	22	22	6	4
		06-5	□	□	□	□	□	□	□	□	25	25	7	5
		06-6	□	□	□	□	□	□	□	□	30	30	8	6
For 36,39,40 Type														

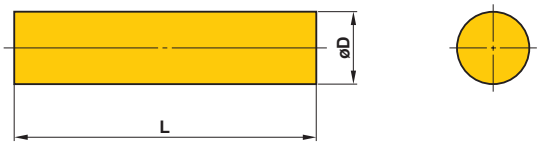
∗( ) : Materials for cemented carbide tools and the classification for usage. (Based on TAS6000)

▲ : Inventory maintained in Japan. To be replaced by new products. □ : Non stock, produced to order only.
(Contains 10 pieces per case.)

Type	Geometry	Order Number	Stock								Dimensions (mm)			
			P			M	K							
			STi10 (HW-P10) *	STi20 (HW-P20) *	STi40T (HW-P40) *	UTi20T (HW-M20) *	HTi03A (HW-K01) *	HTi05T (HW-K01) *	HTi10 (HW-K10) *	HTi20 (HW-K20) *	A	B	C	R
07 Type		**07-0**	▲	▲	□	▲	□	▲	▲	□	10	10	3	—
		07-1	□	▲	□	▲	□	□	▲	□	13	13	3	—
		07-2	□	▲	□	▲	□	□	▲	□	16	16	4	—
		07-3	□	▲	□	▲	□	□	▲	□	19	19	5	—
		07-4	□	□	□	□	□	□	□	□	25	20	6	—
		07-5	□	□	□	□	□	□	□	□	25	22	7	—
For 35 Type		**07-6**	□	□	□	□	□	□	□	□	30	25	8	—
08 Type		**08-1**	▲	▲	▲	▲	▲	▲	▲	▲	3	8	3	—
		08-3	▲	▲	▲	▲	▲	▲	▲	▲	4	13	4	—
		08-4	▲	▲	▲	▲	▲	▲	▲	▲	5	15	5	—
		08-5	▲	▲	▲	▲	□	▲	▲	▲	6	17	6	—
		08-6	▲	▲	□	▲	□	□	▲	▲	8	20	8	—
For 43 Type														
09E Type		**09E1**	▲	▲	□	□	□	□	□	□	20	10	7	—
For 95 Type														

∗( ) : Materials for cemented carbide tools and the classification for usage. (Based on TAS6000)

CARBIDE RODS



LRB SERIES

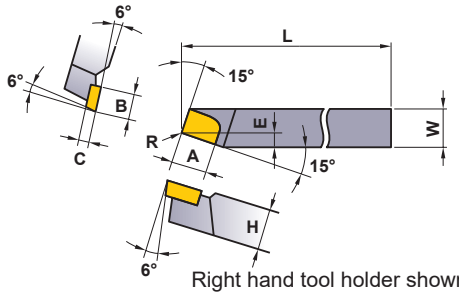
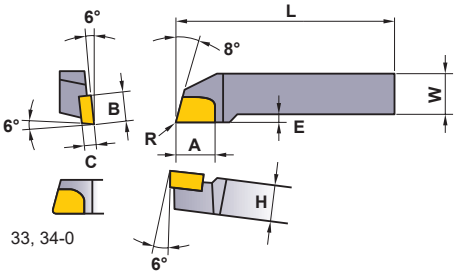
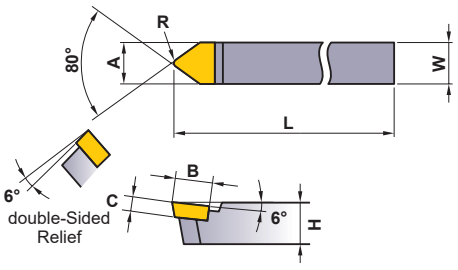
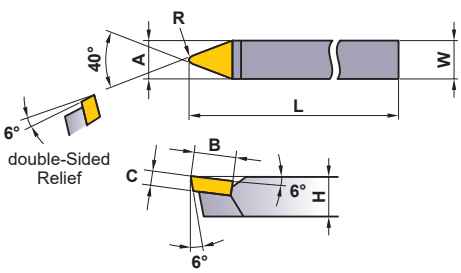
Order Number	Stock			Dimensions (mm)	
	HTi10	TF15	MF10	D	L
LRB030	▲	▲	▲	3	330
LRB040	▲	▲	▲	4	330
LRB050	▲	▲	▲	5	330
LRB060	▲	▲	▲	6	330
LRB070	▲	▲	▲	7	330
LRB080	▲	▲	▲	8	330
LRB100	▲	▲	▲	10	330
LRB120	▲	▲	▲	12	330

Symbol	Dimensions (mm)	Tolerance (mm)
D	3—8	+0.5 +0.3
	10—12	+0.6 +0.3

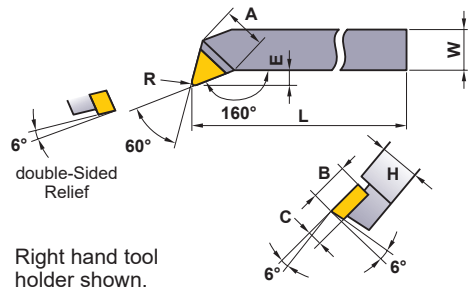
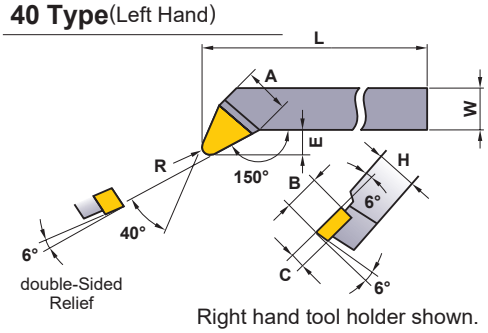
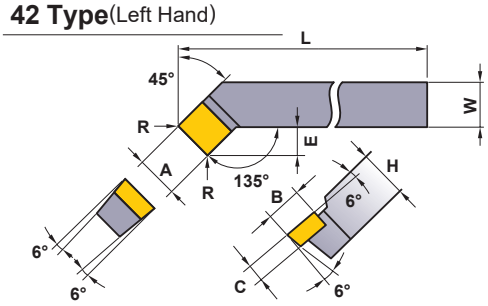
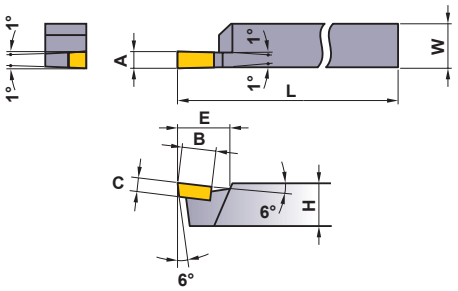
Symbol	Dimensions (mm)	Tolerance (mm)	Bend (mm)
L	330	+10 0	0.3

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(LRB030~LRB080:10pcs/case LRB100&LRB120:5pcs/case)

BRAZED TOOL HOLDERS

Geometry	Order Number	R/L	Stock							Dimensions (mm)								Blank No.
			P			M	K			Shank				Carbide				
			STi10	STi20	STi40T	UTi20T	HTi05T	HTi10	HTi20	W	H	L	E	A	B	C	R	
31 Type(Right Hand) **32 Type**(Left Hand)	**31-0**	R		●		●				10	10	80	2.7	10	6	3	0.3	01-0
	32-0	L		●						10	10	80	2.7	10	6	3	0.3	01-0
	31-1	R		●		●		●		13	13	100	4	13	9	3	0.5	01-1
	32-1	L		●		●		●		13	13	100	4	13	9	3	0.5	01-1
	31-2	R		●		●		●		16	16	120	4.5	16	11	4	0.5	01-2
	32-2	L		●		●		●		16	16	120	4.5	16	11	4	0.5	01-2
	31-3	R	●	●		●	●	●	●	19	19	140	5.5	19	13	5	0.5	01-3
	32-3	L		●		●				19	19	140	5.5	19	13	5	0.5	01-3
	31-4	R	●	●		●	●	●		25	25	160	6.5	22	15	6	1	01-4
 Right hand tool holder shown.	**32-4**	L		●	●	●		●		25	25	160	6.5	22	15	6	1	01-4
33 Type(Right Hand) **34 Type**(Left Hand)	**33-0**	R	●	●		●	●	●	●	10	10	80	—	10	6	3	0.3	04-0
	34-0	L	●	●		●	●	●	●	10	10	80	—	10	6	3	0.3	04-0
	33-1	R	●	●	●	●	●	●	●	13	13	100	4	13	9	3	0.5	04-1
	34-1	L	●	●		●	●	●	●	13	13	100	4	13	9	3	0.5	04-1
	33-2	R	●	●	●	●	●	●	●	16	16	120	4	16	11	4	0.5	04-2
	34-2	L	●	●		●	●	●	●	16	16	120	4	16	11	4	0.5	04-2
	33-3	R	●	●	●	●	●	●	●	19	19	140	5	19	13	5	0.5	04-3
	34-3	L	●	●	●	●	●	●	●	19	19	140	5	19	13	5	0.5	04-3
	33-4	R	●	●	●	●	●	●	●	25	25	160	5	22	15	6	1	04-4
 33, 34-0	**34-4**	L	●	●	●	●	●	●	●	25	25	160	5	22	15	6	1	04-4
	33-5	R		●		●				25	30	180	6	25	17	7	1	04-5
	34-5	L		●						25	30	180	6	25	17	7	1	04-5
	33-6	R		●		●				30	35	200	6	30	20	8	1	04-6
Right hand tool holder shown.	**34-6**	L		●		●				30	35	200	6	30	20	8	1	04-6
35 Type	**35-0**	—	●	●		●	●	●	●	10	10	80	—	10	10	3	0.3	07-0
	35-1	—	●	●		●	●	●	●	13	13	100	—	13	13	3	0.5	07-1
	35-2	—	●	●		●	●	●	●	16	16	120	—	16	16	4	0.5	07-2
	35-3	—	●	●		●	●	●	●	19	19	140	—	19	19	5	0.5	07-3
	35-4	—		●		●	●	●		25	25	160	—	25	20	6	1	07-4
 double-Sided Relief																		
36 Type	**36-0**	—	●	●		●	●	●	●	10	10	80	—	10	10	3	2	06-0
	36-1	—	●	●		●	●	●	●	13	13	100	—	13	13	3	2.5	06-1
	36-2	—	●	●		●	●	●	●	16	16	120	—	16	16	4	3	06-2
	36-3	—	●	●	●	●	●	●	●	19	19	140	—	19	19	5	4	06-3
	36-4	—	●	●	●	●	●	●	●	25	25	160	—	22	22	6	4	06-4
	36-5	—		●				●		25	30	180	—	25	25	7	5	06-5
	36-6	—		●		●	●	●		30	35	200	—	30	30	8	6	06-6
 double-Sided Relief																		

BRAZED TOOL HOLDERS

Geometry	Order Number	R/L	Stock P STi10	Stock P STi20	Stock P STi40T	Stock M UTi20T	Stock K HTi05T	Stock K HTi10	Stock K HTi20	Dimensions (mm) Shank W	Shank H	Shank L	Shank E	Carbide A	Carbide B	Carbide C	Carbide R	Blank No.
37 Type(Right Hand) **38 Type**(Left Hand)  Right hand tool holder shown.	**37-1**	R	●	●		●	●	●		13	13	100	5	12	—	3	0.5	03-1
	38-1	L		●				●		13	13	100	5	12	—	3	0.5	03-1
	37-2	R	●	●		●	●	●		16	16	120	6	15	—	4	0.5	03-2
	38-2	L		●		●		●		16	16	120	6	15	—	4	0.5	03-2
	37-3	R	●	●		●	●	●		19	19	140	7	18	—	5	0.5	03-3
	38-3	L		●		●	●	●	●	19	19	140	7	18	—	5	0.5	03-3
	37-4	R	●	●		●	●	●		25	25	160	10	24	—	6	1	03-4
	38-4	L		●				●		25	25	160	10	24	—	6	1	03-4
39 Type(Right Hand) **40 Type**(Left Hand)  Right hand tool holder shown.	**39-0**	R	●	●		●	●	●	●	10	10	80	5	10	10	3	2	06-0
	40-0	L		●		●	●	●	●	10	10	80	5	10	10	3	2	06-0
	39-1	R	●	●		●	●	●	●	13	13	100	7	13	13	3	2.5	06-1
	40-1	L	●	●		●	●	●	●	13	13	100	7	13	13	3	2.5	06-1
	39-2	R	●	●	●	●	●	●	●	16	16	120	10	16	16	4	3	06-2
	40-2	L	●	●		●	●	●	●	16	16	120	10	16	16	4	3	06-2
	39-3	R	●	●	●	●	●	●	●	19	19	140	12	19	19	5	4	06-3
	40-3	L	●	●	●	●	●	●	●	19	19	140	12	19	19	5	4	06-3
	39-4	R	●	●	●	●	●	●	●	25	25	160	13	22	22	6	4	06-4
	40-4	L		●		●	●	●	●	25	25	160	13	22	22	6	4	06-4
41 Type(Right Hand) **42 Type**(Left Hand)  Right hand tool holder shown.	**41-0**	R		●		●				10	10	80	6	10	6	3	0.3	02-0
	41-1	R	●	●		●		●	●	13	13	100	7	13	9	3	0.5	02-1
	42-1	L		●		●		●		13	13	100	7	13	9	3	0.5	02-1
	41-2	R	●	●		●	●	●		16	16	120	10	16	11	4	0.5	02-2
	42-2	L		●		●		●		16	16	120	10	16	11	4	0.5	02-2
	41-3	R	●	●		●	●	●	●	19	19	140	12	19	13	5	0.5	02-3
	42-3	L	●	●		●	●	●		19	19	140	12	19	13	5	0.5	02-3
	41-4	R	●	●		●	●	●		25	25	160	13	22	15	6	1	02-4
	42-4	L		●		●		●		25	25	160	13	22	15	6	1	02-4
43 Type 	**43-1**	—	●	●		●	●	●	●	10	16	100	13	3	8	3	—	08-1
	43-2	—	●	●		●	●	●	●	13	19	120	16	3	8	3	—	08-1
	43-3	—	●	●	●	●	●	●	●	16	22	140	20	4	13	4	—	08-3
	43-4	—	●	●		●	●	●	●	19	25	160	25	5	15	5	—	08-4
	43-5	—		●		●				22	32	180	30	6	17	6	—	08-5

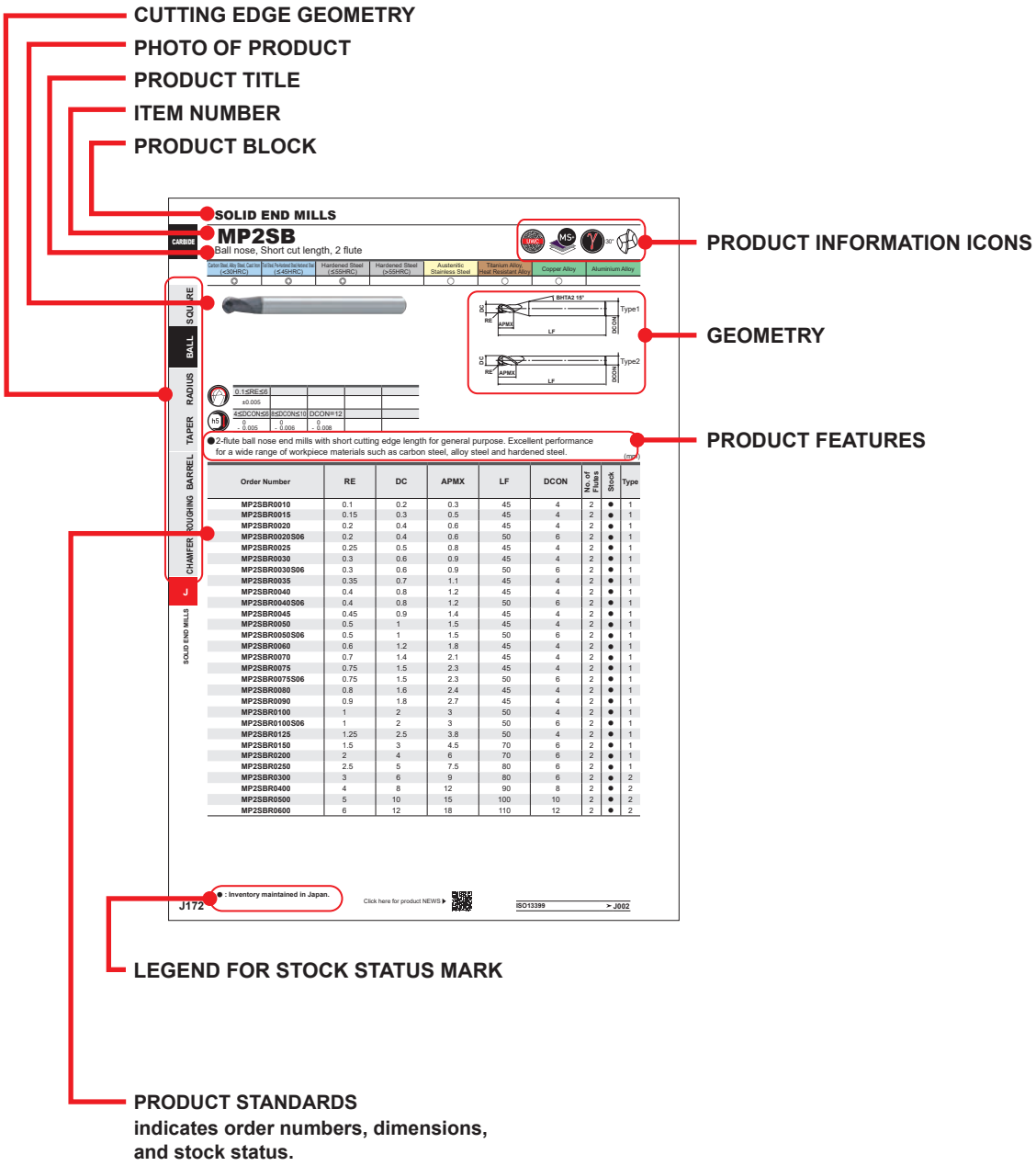
● : Inventory maintained in Japan.

Geometry	Order Number	R/L	Stock					Dimensions (mm)										Blank No.
			P		M	K		Shank						Carbide				
			STi10	STi20	UTi20T	HTi05T	HTi10	W	H	L	d	E	l	A	B	C	R	
47Type (Right Hand)	**47-1**	R	●	●	●	●	●	13	13	140	12	7	50	10	–	3	0.5	03-0
	47-2	R	●	●	●	●	●	16	16	160	15	8	60	12	–	3	0.5	03-1
	47-3	R	●	●	●	●	●	19	19	190	18	9	80	15	–	4	0.5	03-2
	47-4	R		●	●			25	25	230	22	10	100	18	–	5	1	03-3
49Type (Right Hand)	**49-1**	R			●			13	13	100	–	–	–	5	8	3	–	05-1
	49-2	R	●	●	●		●	16	16	120	–	–	–	6	10	4	–	05-2
	49-3	R	●	●	●	●		19	19	140	–	–	–	7	12	5	–	05-3
	49-4	R	●	●	●			25	25	160	–	–	–	9	16	6	–	05-4
51Type (Right Hand)	**51-1**	R		●	●			13	13	140	12	8	50	5	8	3	–	05-1
	51-2	R		●	●			16	16	160	15	10	60	6	10	4	–	05-2
	51-3	R		●	●			19	19	190	18	12	80	7	12	5	–	05-3
95Type	**95-1**	R	●	●				25	25	160	–	5	–	20	10	7	1	09E1

HOW TO READ THE STANDARD OF SOLID END MILLS

●How this section page is organised

①Organised according to cutting mode for milling. (Refer to END MILL LIST.)



●To Order:
For solid end mills, please specify ①order number.

MILLING TOOLS

SOLID END MILLS

IDENTIFICATION ····· J002
SYMBOL DESCRIPTIONS ····· J003
COATING TECHNOLOGY ····· J004
END MILLS SELECTION CHART CARBIDE ··· J006
END MILLS SELECTION CHART HSS ··· J016

SELECTION CHART BY BLADE DIAMETER
- CARBIDE
  - SQUARE ····· J018
  - BALL ····· J030
  - RADIUS ····· J042
  - OTHERS ····· J052
  - CERAMICS/CBN ····· J052
- HSS ····· J053

SOLID END MILLS STANDARD
- CARBIDE
  - SQUARE ····· J056
  - BALL ····· J171
  - RADIUS ····· J245
  - TAPER BALL ····· J324
  - BARREL ····· J332
  - ROUGHING ····· J336
  - CHAMFER ····· J348
- HSS
  - SQUARE ····· J350
  - ROUGHING ····· J370

*Arranged by Alphabetical order

J351	**1LA**
J350	**1MA**
J360	**2LS**
J362	**2MK**
J358	**2MS**
J356	**2SS**
J368	**4LC**
J366	**4MC**
J113	**A3SA**
J251	**A3SARB**
J092	**C2MA**
J094	**C2MHA**
J116	**C3SA**
J253	**C3SARB**
J330	**C4LATB**
J310	**CE4SRB**
J310	**CE6SRB**
J346	**CMRA**
J208	**CRN2MB**
J248	**CRN2MRB**
J085	**CRN2MS**
J087	**CRN2XL**
J210	**CRN2XLB**
J249	**CRN2XLRB**
J159	**CRN4JC**
J344	**CSRA**
J213	**DC2SB**
J215	**DC2XLB**
J217	**DF2XLB**
J220	**DF2XLBF**
J160	**DF4JC**
J161	**DFC4JC**
J170	**DFCJRT**
J114	**DLC3SA**
J255	**DLC3SARB**
J328	**DLC4LATB**
J349	**GBE**
J074	**MP2ES**
J173	**MP2MB**
J172	**MP2SB**
J175	**MP2SDB**
J171	**MP2SSB**
J177	**MP2XLB**
J098	**MP3ES**
J222	**MP3XB**
J138	**MP4EC**
J122	**MPJHV**
J118	**MPMHV**
J257	**MPMHVRB**
J261	**MPXLRB**
J376	**MR**
J077	**MS2ES**
J062	**MS2JS**
J064	**MS2LS**
J060	**MS2MD**
J245	**MS2MRB**
J057	**MS2MS**
J056	**MS2SS**
J066	**MS2XL**
J070	**MS2XL6**
J101	**MS3ES**
J141	**MS4EC**
J132	**MS4JC**
J130	**MS4MC**
J267	**MS4MRB**
J128	**MS4SC**
J134	**MS4XL**
J125	**MSMHD**
J096	**MSMHZD**
J124	**MSSHD**
J363	**S2SDA**
J089	**SED2KMG**
J090	**SED2KPG**
J162	**SEG4SA**
J354	**VA2MS**
J352	**VA2SS**
J364	**VA4MC**
J372	**VAMFPR**
J374	**VAMR**
J370	**VASFPR**
J348	**VC2C**
J308	**VC4JRB**
J324	**VC4STB**
J168	**VCLD**
J157	**VCMDSC**
J302, J306	**VCPSRB**
J079	**VF2MD**
J081	**VF2MV**
J199	**VF2WB**
J083	**VF2XL**
J202	**VF2XLB**
J200	**VF2XLBS**
J228	**VF3XB**
J243	**VF4MB**
J153	**VF4MD**
J155	**VF4MV**
J164	**VF6MHV**
J316	**VF6MHVRB**
J343	**VF6SVRCH**
J169	**VF8MHVCH**
J322	**VF8MHVRBCH**
J300	**VFFDRB**
J290, J296	**VFHVRB**
J166	**VFMD**
J320	**VFMDRB**
J342	**VFMFPR**
J156	**VFMHVCH**
J288	**VFMHVRBCH**
J191	**VFR2SB**
J193	**VFR2SBF**
J189	**VFR2SSB**
J195	**VFR2XLB**
J283	**VFRPSRB**
J165	**VFSD**
J318	**VFSDRB**
J339	**VFSFPR**
J341	**VFSFPRCH**
J187	**VQ2XLB**
J234	**VQ4SVB**
J236	**VQ4WB**
J163	**VQ6MHVCH**
J314	**VQ6MHVRBCH**
J281	**VQFDRB**
J279	**VQHVRB**
J147	**VQJHV**
J143	**VQMHV**
J270	**VQMHVRB**
J275	**VQMHVRBF**
J103	**VQMHZV**
J109	**VQMHZVOH**
J185	**VQN2MB**
J239	**VQN4MB**
J241	**VQN4MBF**
J277	**VQN4MVRB**
J277	**VQN6MVRB**
J336	**VQSVR**
J312	**VQT5MVRB**
J332	**VQT6UR**
J149	**VQXL**



IDENTIFICATION

ORDER NUMBER OF END MILLS

VQ 4 S VB R0100 *

End Mill Names

- **VQ** : SMART MIRACLE end mills
- **VQT** : SMART MIRACLE end mills focused on machining Ti-alloys
- **VQN** : SMART MIRACLE end mills focused on machining Ni-based alloys
- **VFR** : IMPACT MIRACLE REVOLUTION end mills
- **VF** : Impact Miracle end mills
- **MP** : MS plus end mills
- **MS** : Mstar end mills
- **VC** : Miracle end mills
- **CRN** : CRN coated end mills
- **DLC** : DLC coated end mills
- **A** : ALIMASTER end mills
- **DFC** : CVD diamond coated end mills
- **DF** : Diamond coated end mills
- **DC** : Diamond coated end mills
- **CE** : Ceramic end mills
- **C** : Carbide end mills
- **VA** : Violet end mills
- **S** : KHAS end mills (High-grade powder high-speed steel)
- **None** : Cobalt high-speed steel

Number of Flutes

- **1** : 1flute
- **2** : 2flute
- **3** : 3flute
- **4** : 4flute
- **5** : 5flute
- **6** : 6flute
- **8** : 8flute
- • • •

Flute Length

- **ES** : Extra short
- **S** : Short
- **M** : Medium
- **J** : Semi long
- **L** : Long
- **XL** : Long neck
- **X** : Taper neck

Features

- **S** : General-use
- **U** : For stainless steel
- **K** : For keyway
- **A** : For light alloy
- **C** : Center cut, chamfering
- **D** : For deep cut
- **V** : Irregular spiral helix angle
- **B** : Ball nose
- **VB** : Irregular spiral helix angle, Ball nose
- **R** : Roughing
- **FPR** : Fine roughing
- **H** : High helix
- **T** : Taper
- **TB** : Taper ball nose
- **WB** : Wide ball nose
- **RB** : Corner radius
- **FDRB** : Duplex corner radius
- **CH** : Coolant holes (side)
- **OH** : Coolant holes (end)
- **UR** : Multi step radius
- **Z** : Drilling
- **3** : 3mm shank
- **6** : 6mm shank

Dimensions

D✱✱✱✱ : Diameter

ex.

D0050 →ϕ0.5

D0500 →ϕ5

R✱✱✱✱ : Radius of ball nose

ex.

R0050 → R0.5

R0500 → R5

Others

S✱✱ : Shank diameter

ex.

S03 →ϕ3

S10 →ϕ10

N✱✱✱ : Neck length

T✱✱✱✱ : Taper angle one side

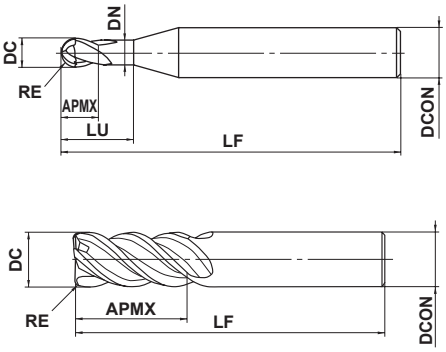
L✱✱ : Flute length

A✱✱✱ : Overall Length

✱✱C : Coolant holes (center)

✱Other types are available by special order.

GUIDE FOR ISO13399 SYMBOLS



Symbol	Content
APMX	Depth of cut maximum
DC	Cutting diameter
DN	Neck diameter
LF	Functional length
LU	Usable length
RE	Corner radius

✱There are exceptions other than those listed above. For more details, please refer to the technical data (page Q002).

SYMBOL DESCRIPTIONS

Tool Material



Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.



Cubic Boron Nitride
Mitsubishi's original CBN is used.



Ceramic
Ceramic is used as the substrate material.



High Hardness Powder Metallurgy HSS
High hardness powder metallurgy HSS is used as the substrate material.



Ultra Micro Grain HSS
Cobalt high speed steel is used as the substrate material.



High Speed Steel
High speed steel is used as the substrate material.

Tolerances



Outside Diameter Tolerance
Indicates diameter tolerance of end mill.



R Tolerance
Indicates the radial tolerance of a ball nose end mill.



R Tolerance
Indicates the radial tolerance of an end mill with a corner radius.



Tolerance of Taper Angle
Indicates the tolerance of the taper angle.



Tolerance of Point Angle
Indicates the tolerance of the point angle.



Shank Diameter Tolerance
Indicates the shank diameter tolerance of end mill.

Angle, Coolant hole, Sharp corner edge and Gash land



Helix Angle
Indicates the helix angle of the end mill.



End Cutting Edge with Coolant Hole



Peripheral Cutting Edge with Coolant Hole



Sharp Corner Edge
Indicates the end mill has a sharp corner edge.



Gash Land
Indicates the end mill cutting edge has a gash land.

Coating



SMART MIRACLE Coating
(Al, Cr)N Coaitng optimum for difficult-to-cut materials.



SMART MIRACLE VQT Coating
(Al, Cr)N coating optimum for Ti-alloys.



SMART MIRACLE VQN Coating
(Al, Ti, Si)N coating optimum for Ni-based alloys.



IMPACT MIRACLE REVOLUTION Coating
A coating which adds the excellent high oxidation temperature of (AL, Cr, Si) N-based films to the nano crystal technology of VF.



IMPACT MIRACLE Coating
Single phase nano crystal coating technology for higher film hardness and heat resistance.



MS PLUS Coating
Offers higher versatility for carbon steel, alloy steel and hardened steel.



MS Coating
PVD offers higher versatility.



MIRACLE Coating
The original Miracle (Al, Ti)N coating also suitable for dry cutting of carbon steels and hardened steels.



CRN Coating
Newly developed CrN coating for Copper Electrodes machining.



DLC Coating
Hardness similar to that of CVD diamond coating achieved with high adhesion strength.
(Jointly developed with SHINMAYWA INDUSTRIES, LTD.)



CVD Diamond Coated End Mills
Suitable for CFRP



CVD Diamond Coated End Mills
High performance coating for hard brittle materials excelling in film adhesion to the substrate.



Diamond Coating
Suitable for graphite machining.

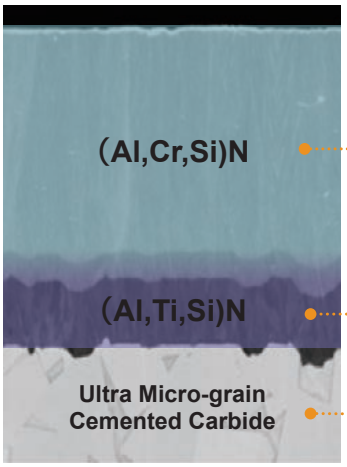


VIOLET Coating
The original Miracle (Al, Ti)N coating achieves longer tool life.

COATING TECHNOLOGY

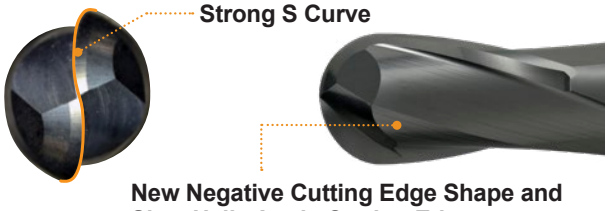
IMPACT MIRACLE REVOLUTION Coating

The combination of the (Al, Cr, Si) N coating (newly-developed), which has a high oxidation temperature and high lubricity, together with the (Al, Ti, Si) N coating, which has better wear resistance and high adhesion, allows hardened steel with even greater strength to be maintained.



★High Oxidation Temperature
★High Lubricity

★Better Wear Resistance
★High Adhesion



Strong S Curve

New Negative Cutting Edge Shape and Slow Helix Angle Cutting Edge

New ZERO-μ Surface
Newly-developed Surface Reforming Technology



New Ball Geometry for Mirror Finish Cutting

ÍMPACT MIRACLE Coating

For higher hardness, higher speed and longer tool life!

In comparison with the conventional coating single-phase nano crystal coating technology offers higher coating hardness and heat resistance. When machining hardened steels it can be seen that the IMPACT MIRACLE coating offers a lower friction of coefficient and as such prevents abnormal damage such as chipping.



Properties of IMPACT MIRACLE COATING

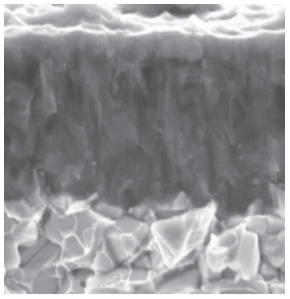
	ÍMPACT MIRACLE Single-phase nano coating (Al,Ti,Si)N	(Al,Ti,Si)N	(Al,Ti)N
Hardness (HV)	**3700**	3200	2800
Oxidation Temperature (℃)	**1300**	1100	840
Adhesion (N)[1)]	**100**	80	80
Wear Coefficient[2)] (800℃)	**0.48**	0.53	0.58

1) Adhesion : Measured by critical load scratch test.
2) Coefficient of friction : Measured by ball-on-disk method.
(Counter gear : AISI D2 60HRC)

MS plus Coating

Suitable coating for a broad range of workpiece materials such as carbon steel, alloy steel and hardened steel of approx. 50HRC.

Our original coating technology enables a multilayer of (Al,Ti)N and (Al,Cr)N. It allows machining of a wide range of workpiece materials.



Properties of MS plus coating

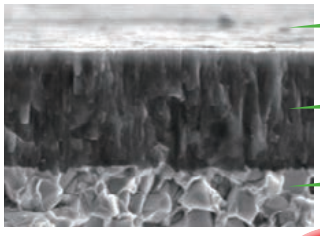
	(Al,Ti,Cr)N multilayer	(Al,Ti)N	(Al,Cr)N
Hardness (HV)	**3200**	2800	3100
Oxidation Temperature (℃)	**1100**	800	1100
Adhesion (N)	**100**	80	80

Note 1) The composition of the coating is optimized according to the diameter.

SMART MIRACLE Coating

SMART MIRACLE Coating (For machining Ti-based alloys)

Newly-developed (Al,Cr)N coating with improved wear resistance.
The smoothening treatment of the coating layer reduces the cutting resistance and improves chip discharge significantly. This next-generation coating offers longer tool life and higher efficiency in machining difficult-to-cut materials.



Smoothed Surface"Zero-μ Surface"

Newly Developed(Al,Cr)N Coating

Super Fine Grade Substrate



SMART MIRACLE Coating

ZERO- μ Surface

The original surface treatment technology offers smooth coating layer. A good balance of smooth surface and sharp edge allows smooth chip discharge and reduces the cutting resistance. Machining efficiency and tool life is improved.



SMART MIRACLE Coating (For machining Ni-based, super heat resistant alloys)

The (Al, Ti, Si) based coatings maintain their film hardness and heat resistant properties under the harshest of conditions, making it highly suitable for applying to end mills for machining heat resistant super alloys.

DLC Coating

Newly developed DLC coating.
Hardness similar to that of CVD diamond coating achieved with high adhesion strength.

Mitsubishi Materials and SHINMAYWA INDUSTRIES, LTD. have jointly developed a unique DLC coating that has substantially increased "adhesion strength" compared to previous DLC coating.

Diamond Coating (DC)

Proprietary CVD diamond coating produces excellent wear resistance and smooth hole surface.

The newly developed CVD diamond coated carbide material achieves outstanding abrasion resistance and smoothness due to a proprietary fine multilayer diamond crystal control technology.
Suitable for cutting hard brittle materials such as cemented carbide.

Diamond Coating (DF)

Diamond coating for non-ferrous and new non-metal materials.

Owing to Mitsubishi's unique plasma chemical vapor deposition (CVD) coating technology, great combination of coating hardness similar to that of natural diamond has been combined with a good adhesion to carbide substrates.
DF end mill series suitable for graphite machining.

VIOLET Coating

(Al,Ti)N coating, excellent adhesion strength for HSS tools.

Violet coating is the name of the technology of successfully applying a Miracle type coating to HSS substrate tools. The newly developed technology of applying (Al,Ti)N coating at the low temperatures required for HSS substrates, means that Violet coating has the same level of adhesion strength as Miracle coating. Additionally high film hardness and excellent oxidation resistance properties have also been realised.

Note 1) The composition of the coating is optimized according to the diameter.

CARBIDE

END MILLS SELECTION CHART CARBIDE(By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool steel, Pre-hardened Steel, Hardened Steel	H: Hardened Steel(-55HRC)	H: Hardened Steel(55HRC-)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminium Alloy	Page
SQUARE															
	1	For Hardened Steels	CBN	GBE	End mill, 1 flute, Brazed type (CBN)	DC 6–12				◎					J349
	2	General Use	MS	MS2SS	End mill, Short cut length, 2 flute	DC 0.1–12	◎	◎	○		○	○	○		J056
			MS	MS2MS	End mill, Medium cut length, 2 flute	DC 0.2–20	◎	◎	○		○	○	○		J057
			MS	MS2MD	End mill, Medium cut length, 2 flute, Strong geometry type	DC 1–12	◎	◎	○		○	○			J060
			MS	MS2JS	End mill, Semi long cut length, 2 flute	DC 0.1–12	◎	◎	○		○	○	○		J062
			MS	MS2LS	End mill, Long cut length, 2 flute	DC 0.2–12	◎	◎	○		○	○	○		J064
		For Key Way Slotting	MS	SED2KPG	End mill, Medium cut length, 2 flute, + Tolerance	DC 2–16	◎	◎			○				J090
			MS	SED2KMG	End mill, Medium cut length, 2 flute, + Tolerance	DC 2–16	◎	◎			○				J089
		For Small Automatic Lathes	MS+	NEW MP2ES	End mill, For small automatic lathes, 2 flute	DC 3–10	◎	◎	○		○	○	○		J074
			MS	MS2ES	End mill, 2 flute, For small automatic lathes	DC 3–12	◎	◎	○		○	○	○		J077
		For Hardened Steels	VF	VF2MD	End mill, Medium cut length, 2 flute, For hardened materials	DC 0.5–6		○	◎	◎					J079
			VF	VF2MV	End mill, Medium cut length, 2 flute, Irregular helix flutes	DC 0.5–6		○	◎	◎					J081
		For Copper Electrodes	CRN	CRN2MS	End mill, Medium cut length, 2 flute, For copper electrodes	DC 0.2–12							◎	○	J085
		For Aluminium Alloys	UWC	C2MA	End mill, Medium cut length, 2 flute, For aluminium alloy	DC 1–20								◎	J092
			UWC	C2MHA	End mill, Medium cut length, 2 flute, For aluminium alloy	DC 3–25								◎	J094
	3	General Use	MS	MSMHZD	Slotting, Medium cut length, 3 flute	DC 1–20	◎	◎	○		○	○	○		J096

* DC : Cutting Diameter

J

SOLID END MILLS

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-hardened Steel, Hardened Steel	H – Hardened Steel (-55HRC)	H – Hardened Steel (55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
	3	For Small Automatic Lathes	MS+	NEW MP3ES	End mill, For small automatic lathes, 3 flute	DC 3–12	◎	◎	○		○	○	○		J101
			MS	MS3ES	End mill, 3 flute, For small automatic lathes	DC 3–12	◎	◎	○		○	○	○		J101
		For Difficult-to-cut Materials	VQ	VQMHZV	End mill, Medium cutting length, 3 flute for drilling and slotting	DC 1–20	◎	◎			◎	◎	○		J103
			VQ	VQMHZVOH	End mill, Medium cutting length, 3 flute for drilling and slotting with internal through coolant holes	DC 6–16	◎	◎			◎	◎	○		J109
		For Aluminium Alloys	DLC	NEW DLC3SA	End mill, Short cut length, 3 flute, with multiple internal through coolant holes	DC 12–25								◎	J114
			UWC	NEW A3SA	End mill, Short cut length, 3 flute, with multiple internal through coolant holes	DC 12–25								◎	J113
			UWC	C3SA	End mill, Short cut length, 3 flute, For aluminium alloy	DC 10–26								◎	J116
	4	General Use	MS+	MPMHV	End mill, Medium cut length, 4 flute, Irregular helix flutes	DC 1–22	◎	◎	○		◎	○	○		J118
			MS+	MPJHV	End mill, Semi long cut length, 4 flute, Irregular helix flutes	DC 1–20	◎	◎	○		◎	○	○		J122
			MS	MS4SC	End mill, Short cut length, 4 flute	DC 1–12	◎	◎	○		○	○	○		J128
			MS	MS4MC	End mill, Medium cut length, 4 flute	DC 1–20	◎	◎	○		○	○	○		J130
			MS	MS4JC	End mill, Semi long cut length, 4 flute	DC 1–12	◎	◎	○		○	○	○		J132
			MS	MSSHD	High power, Short cut length, 4 flute	DC 3–20	◎	◎	○		○	○	○		J124
			MS	MSMHD	High power, Medium cut length, 4 flute	DC 2–25	◎	◎	○		○	○	○		J125
		For Small Automatic Lathes	MS+	NEW MP4EC	End mill, For small automatic lathes, 4 flute	DC 3–14	◎	◎	○		○	○	○		J138
			MS	MS4EC	End mill, 4 flute, For small automatic lathes	DC 3–14	◎	◎	○		○	○	○		J141
		For Hardened Steels	VF	VF4MD	End mill, Medium cut length, 4 flute, For hardened materials	DC 1–20		○	◎	◎					J153
			VF	VF4MV	End mill, Medium cut length, 4 flute, Irregular helix flutes	DC 6–20		○	◎	◎					J155

CARBIDE

END MILLS SELECTION CHART CARBIDE(By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool steel, Pre-hardened Steel, Hardened Steel	H: Hardened Steel(-55HRC)	H: Hardened Steel(55HRC-)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminium Alloy	Page
SQUARE															
	4	For Difficult-to-cut Materials	VQ	VQMHV	End mill, Medium cutting length, 4 flute, Irregular helix flutes	DC 1–25	◎	◎			◎	◎	○		J143
			VQ	VQJHV	End mill, Semi long cut length, 4 flute, Irregular helix flutes	DC 1–20	◎	◎			◎	◎	○		J147
			VF	VFMHVCH	End mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J156
		For Copper Electrodes	CRN	CRN4JC	End mill, Semi long cut length, 4 flute, For copper electrodes	DC 3–12							◎	○	J159
		For CFRP	DFC	DFC4JC	End mill, Semi long cut length, 4 flute	DC 6–12	CFRP : ◎								J161
		For Graphite	DF	DF4JC	End mill, Semi long cut length, 4 flute, For graphite	DC 3–12	Graphite : ◎ GFRP/CFRP : ○ Machineable Ceramics : ○						◎	○	J160
		For Aluminium Alloys	UWC	SEG4SA	End mill, Medium cut length, 4 flute, Irregular spiral helix angle, For aluminium alloy	DC 6–25							○	◎	J162
	4 6	For Hardened Steels	VF	VFSD	End mill, Short cut length, For hardened materials	DC 1–12		○	◎	◎					J165
			VF	VFMD	End mill, Medium cut length, For hardened materials	DC 1–25		○	◎	◎					J166
			VC	VCMDSC	End mill, Medium cut length, 4–6 flute	DC 0.5–3		○	◎	◎					J157
	6		VC	VCLD	End mill, Long cut length, 6 flute	DC 6–25		○	◎	◎					J168
	6	For Difficult-to-cut Materials	VF	VF6MHV	End mill, Medium cut length, 6 flute, Irregular helix flutes	DC 6–20	○	○			◎	◎			J164
			VQ	VQ6MHVCH	End mill, Medium cut length, 6 flute, Irregular helix flutes, With multiple internal through coolant	DC 10–20	○	○			◎	◎	○		J163
	8		VF	VF8MHVCH	End mill, Medium cut length, Irregular helix flutes, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J169
	10 12	For CFRP	DFC	DFCJRT	Diamond coating endmill with cross-nick	DC 6–12	CFRP : ◎								J170

* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

J

SOLID END MILLS

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-hardened Steel, Hardened Steel	H – Hardened Steel(-55HRC)	H – Hardened Steel(55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
LONG NECK SQUARE															
	3 4	For Difficult-to-cut Materials	VQ	VQXL	End mill, Short cut length, 3–4 flute, Long neck	DC 0.2–1	◎	◎			◎	◎	○		J149
	2	For Deep Slotting	MS	MS2XL	End mill, Short cut length, 2 flute, Long neck	DC 0.2–6	◎	◎	○		○	○	○		J066
	2	For Deep Slotting	MS	MS2XL6	End mill, Short cut length, 2 flute, 6mm shank	DC 0.3–2.5	◎	◎	○		○	○	○		J070
	2	For Deep Slotting – Hardened Steels	VF	VF2XL	End mill, 2 flute, Long neck	DC 0.1–3	○	◎	◎	◎					J083
	2	For Deep Slotting – Copper electrodes	CRN	CRN2XL	End mill, Medium cut length, 2 flute, Long neck, For copper electrodes	DC 0.2–6							◎	○	J087
	4	For Deep Slotting – General Use	MS	MS4XL	End mill, Short cut length, 4 flute, Long neck	DC 1–10	◎	◎	○		○	○	○		J134
BALL															
	2	General Use	MS+	MP2SSB	Ball nose, Short cut length, 2 flute, Short shank	RE 0.1–6	◎	◎	◎		○	○	○		J171
	2	General Use	MS+	MP2SB	Ball nose, Short cut length, 2 flute	RE 0.1–6	◎	◎	◎		○	○	○		J172
	2	General Use	MS+	MP2MB	Ball nose, Medium cutting length, 2 flute	RE 0.25–6	◎	◎	◎		○	○	○		J173
	2	General Use	MS+	MP2SDB	Ball nose, Short cut length, 2 flute, High strength	RE 0.5–6	○	◎	◎						J175
	2	For Hardened Steels	VFR	VFR2SSB	Ball nose, Short cut length, 2 flute, Short shank	RE 0.5–6		○	◎	◎					J189
	2	For Hardened Steels	VFR	VFR2SB	Ball nose, Short cut length, 2 flute	RE 0.1–10		○	◎	◎					J191
	2	For Hardened Steels	VFR	VFR2SBF	Ball nose, Short cut length, 2 flute, For Mirror finish cutting	RE 0.5–3		○	◎	◎					J193
	2	For Difficult-to-cut Materials	VQN	NEW VQN2MB	Ball nose, Medium cut length, 2 flute	RE 0.5–6						◎			J185
	2	For Copper Electrodes	CRN	CRN2MB	Ball nose, Medium cut length, 2 flute, For copper electrodes	RE 0.2–6							◎	○	J208

END MILLS SELECTION CHART CARBIDE(By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-hardened Steel, Hardened Steel	H – Hardened Steel(-55HRC)	H – Hardened Steel(55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
BALL															
	2	For Hard Brittle Materials	DC	DC2SB	Ball nose, Short cut length, 2 flute, For hard brittle materials	RE 0.1–3	Cemented Carbide : ◎ Alumina / Zirconia : ○ Silicon Carbide / Nitride : ○ Quartz Glass : ○								J213
	4	For Hardened Steels	VF	VF4MB	Ball nose, Medium cut length, 4 flute	RE 0.5–6		○	◎	◎					J243
		For Difficult-to-cut Materials	VQN	NEW VQN4MB	Ball nose, Medium cut length, 4 flute	RE 1–6						◎			J239
			VQN	NEW VQN4MBF	Ball nose, Medium cut length, 4 flute	RE 1–6						◎			J241
			VQ	VQ4SVB	Ball nose, Short cut length, 4 flute	RE 1–6	◎	◎			◎	◎	○		J234
LONG NECK BALL															
	2	General Use	MS+	MP2XLB	Ball nose, Short cut length, 2 flute, Long neck	RE 0.05–3	◎	◎	◎		○	○	○		J177
		For Profiling of Special Geometry	VF	VF2WB	Wide ball nose, Medium cut length, 2 flute	RE 1–3	○	○	○		◎	◎			J199
		For Deep Slotting of Hardened Steels	VFR	NEW VFR2XLB	Ball nose, Long neck, 2 flute	RE 0.1–3		○	◎	◎					J195
			VF	VF2XLBS	Ball nose, Medium cut length, 2 flute, Short shank	RE 0.2–1	○	◎	◎	◎					J200
			VF	VF2XLB	Ball nose, 2 flute, Long neck	RE 0.1–3	○	◎	◎	◎					J202
			VQ	NEW VQ2XLB	Ball nose, Short cut length, 2 flute, Long neck	RE 0.5–1.5						◎			J187
		For Copper Electrodes	CRN	CRN2XLB	Ball nose, Medium cut length, 2 flute, Long neck, For copper electrodes	RE 0.1–3							◎	○	J210
		For Hard Brittle Materials	DC	DC2XLB	Ball nose, Short cut length, 2 flute, For hard brittle materials	RE 0.1–3	Cemented Carbide : ◎ Alumina / Zirconia : ○ Silicon Carbide / Nitride : ○ Quartz Glass : ○								J215
		For Graphite	DF	DF2XLB	Ball nose, Medium cut length, 2 flute, Long neck, For graphite	RE 0.1–3	Graphite : ◎ GFRP/CFRP : ○ Machineable Ceramics : ○						◎	○	J217
			DF	DF2XLBF	Ball nose, Medium cut length, 2 flute, Long neck, For graphite	RE 0.3–1.5	Graphite : ◎ Zirconia : ◎ Rigid Composite Resin : ◎ Machineable Ceramics : ○						◎	○	J220
	4	For Profiling of Special Geometry	VQ	NEW VQ4WB	Multi-functional lollipop, Short cut length, 4 flute	RE 0.5–3	◎	◎			◎	◎	○		J236

* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-hardened Steel, Hardened Steel	H – Hardened Steel (-55HRC)	H – Hardened Steel (55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
TAPER NECK BALL															
	3	For Deep Slotting – General Use	MS+	MP3XB	Ball nose, 3 flute, Taper neck	RE 0.5–6	◎	◎	◎		○	○	○		J222
		For Deep Slotting – Hardened Steels	VF	VF3XB	Ball nose, Medium cut length, 3 flute, Taper neck	RE 0.4–2.5	○	◎	◎	◎					J228
RADIUS															
	2	General Use	MS	MS2MRB	Corner radius end mill, Medium cut length, 2 flute	DC 1–12	◎	◎	○		○	○	○		J245
		For Copper Electrodes	CRN	CRN2MRB	Corner radius, Medium cut length, 2 flute, For copper electrodes	DC 6–12							◎	○	J248
	3	For Aluminium Alloys	DLC	NEW DLC3SARB	Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes	DC 12–25								◎	J255
			UWC	NEW A3SARB	Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes	DC 12–25								◎	J251
			UWC	C3SARB	Corner radius, Short cut length, 3 flute, For aluminium alloy	DC 12–25								◎	J253
	2 4	For High-Precision Machining	VC	VCPSRB	Corner radius end mill, Short cut length, 2–4 flute, High precision	DC 0.6–12		◎	◎	○					J302
	4	General Use	MS+	MPMHVRB	End mill, Medium cut length, 4 flute, Irregular helix flutes	DC 1–20	◎	◎	○		◎	○	○		J257
		For High Efficiency Machining	VF	VFHVRB	4 flute, Corner radius, Short cut length, Irregular helix flutes	DC 1–16	◎	◎	◎	○	○	○			J290
		General Use	MS	MS4MRB	Corner radius end mill, Medium cut length, 4 flute	DC 3–20	◎	◎	○		○	○	○		J267
			VC	VC4JRB	Corner radius end mill, Semi long cut length, 4 flute	DC 3–20	○	◎	○		○	○			J308
		For Hardened Steels	VFR	NEW VFRPSRB	Corner radius end mill, Short cut length, High precision, 4 flute	DC 0.5–12		○	◎	◎					J283
		For Difficult-to-cut Materials	VQ	NEW VQHVRB	Corner radius, Short cut length, 4 flute, Irregular helix flutes	DC 1–4						◎			J279
			VQ	NEW VQFDRB	Duplex corner radius end mill for high-speed cutting	DC 3–6						◎			J281

CARBIDE

END MILLS SELECTION CHART CARBIDE(By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool steel, Pre-hardened Steel, Hardened Steel	H: Hardened Steel(-55HRC)	H: Hardened Steel(55HRC-)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminium Alloy	Page
RADIUS															
	4	For Difficult-to-cut Materials	VQ	VQMHVRB	Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes	DC 2–20	◎	◎			◎	◎	○		J270
	4	For Difficult-to-cut Materials	VQ	VQMHVRBF	Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes (for finishing)	DC 6–16	◎	◎			◎	◎	○		J275
	4	For Difficult-to-cut Materials	VF	VFMHVRBCH	Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J288
	4	For Hardened Steels	VF	VFFDRB	Multi-task corner radius end mill for impact miracle high speed cutting	DC 3–12		○	◎	◎					J300
	6	For Difficult-to-cut Materials	VQN	NEW VQN4MVRB/ VQN6MVRB	Corner Radius, Medium cut length, 4, 6 flute	DC 3–12						◎			J277
	6	For Hardened Steels	VF	VFSDRB	Corner radius end mill, 6 flute (S)	DC 3–12		○	◎	◎					J318
	6	For Hardened Steels	VF	VFMDRB	Corner radius, Medium cut length, 6 flute, For hardened materials	DC 3–20		○	◎	◎					J320
	6	For Difficult-to-cut Materials	VF	VF6MHVRB	Corner radius, Medium cut length, 6 flute, Irregular helix flutes	DC 6–20	○	○			◎	◎			J316
	6	For Difficult-to-cut Materials	VQ	VQ6MHVRBCH	Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes	DC 10–20	○	○			◎	◎	○		J314
	5	For Difficult-to-cut Materials	VQT	VQT5MVRB	Corner radius, Medium cut length, 5 flute, Irregular helix flutes, With coolant hole	DC 16,20,25						◎			J312
	8	For Difficult-to-cut Materials	VF	VF8MHVRBCH	Corner radius end mill, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J322
	4	For Heat Resistant Alloy	CERAMIC	CE4SRB	Corner radius end mill, short cut length, 4 flute	DC 6–12						◎			J310
	6	For Heat Resistant Alloy	CERAMIC	CE6SRB	Corner radius end mill, short cut length, 6 flute	DC 6–12						◎			J310

* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

J

SOLID END MILLS

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(-55HRC)	H – Hardened Steel(55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
LONG NECK CORNER RADIUS															
	2	For Copper Electrodes	CRN	CRN2XLRB	Corner radius, Medium cut length, 2 flute, For copper electrodes	DC 0.5–6							◎	○	J249
	2 4	General Use	MS+	MPXLRB	Corner radius, short cut length, long neck	DC 0.2–6	◎	◎	◎		○	○	○		J261
TAPER NECK RADIUS															
	2 4	For High-Precision Machining	VC	VCPSRB	Corner radius end mill, Short cut length, 2–4 flute, High precision	DC 1.5–12		◎	◎	○					J306
	4	For High Efficiency Machining	VF	VFHVRB	4 flute, Corner radius, Short cut length,Irregular helix flutes	DC 1–12	◎	◎	◎	○	○	○			J296
TAPER BALL															
	4	For Hardened Steels	VC	VC4STB	Ball nose taper end mill, Short cut length, 4 flute	RE 0.3–4		○	◎	◎					J324
		For Aluminium Alloys	DLC	NEW DLC4LATB	Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers	RE 0.5–2								◎	J328
			UWC	C4LATB	Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers	RE 0.5–2								◎	J330
BARREL ENDMILL															
	6	For Profiling of Special Geometry	VQT	VQT6UR	Barrel, Medium cut length, 6 flute	DC 8–12					○	◎		○	J332

CARBIDE

END MILLS SELECTION CHART CARBIDE(By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool steel, Pre-hardened Steel, Hardened Steel	H: Hardened Steel(-55HRC)	H: Hardened Steel(55HRC-)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminium Alloy	Page
ROUGHING															
	3 4	For Difficult-to-cut Materials	VQ	VQSVR	Roughing end mill, Short cut length, 3–4 flute, Irregular helix flutes	DC 3–20	◎	◎			◎	◎	○		J336
	3 4	For Difficult-to-cut Materials	VF	VFSFPR	Roughing end mill, Short cut length, 3–4 flute	DC 3–20	○	○			◎	◎			J339
	4	For Difficult-to-cut Materials	VF	VFMFPR	Roughing end mill, Medium cut length, 4 flute	DC 5–20	○	○			◎	◎			J342
	4	For Difficult-to-cut Materials	VF	VFSFPRCH	Roughing end mill, Short cut length, 4 flute, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J341
	6	For Difficult-to-cut Materials	VF	VF6SVRCH	Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes	DC 16,20	○	○			◎	◎			J343
	3	For Aluminium Alloys	UWC	CSRA	Roughing end mill, Short cut length, 3 flute, For aluminium alloy	DC 10–25								◎	J344
	3	For Aluminium Alloys	UWC	CMRA	Roughing end mill, Medium cut length, 3 flute, For aluminium alloy	DC 3–25								◎	J346
CHAMFER CUTTER															
	2	For Chamfering	VC	VC2C	Chamfer cutter, 2 flute	DC 2–12	◎	◎	○		◎	◎	○	○	J348

* DC : Cutting Diameter

J

SOLID END MILLS

Memo

END MILLS SELECTION CHART HSS (By Shape)

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-hardened Steel, Hardened Steel	H – Hardened Steel(-55HRC)	H – Hardened Steel(55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminium Alloy	Page
SQUARE															
	1	For Aluminium Sashes	HSS	1MA	End mill, Medium cut length, 1 flute	DC 3–8								◎	J350
			HSS	1LA	End mill, Long cut length, 1 flute	DC 4–12								◎	J351
	2	General Use	V	VA2SS	End mill, Short cut length, 2 flute	DC 3–20	◎	○			○	○			J352
			V	VA2MS	End mill, Medium cut length, 2 flute	DC 3–40	◎	○			○	○			J354
			CO HSS	2SS	End mill, Short cut length, 2 flute	DC 0.5–20	◎	○			○	○		○	J356
			CO HSS	2MS	End mill, Medium cut length, 2 flute	DC 1–60	◎	○			○	○		○	J358
			CO HSS	2LS	End mill, Long cut length, 2 flute	DC 1–40	◎	○			○	○		○	J360
		For Key Way Slotting	CO HSS	2MK	End mill, Short cut length, 2 flute, For key ways	DC 3–20	◎	○			○			○	J362
		For Aluminium Alloys	KHA S	S2SDA	End mill, Short cut length, 2 flute, For aluminium alloy	DC 3–20							○	◎	J363
	4	General Use	V	VA4MC	End mill, Medium cut length, 4 flute	DC 3–30	◎	○			○	○			J364
			CO HSS	4MC	End mill, Medium cut length, 4 flute, Center cutting	DC 2.5–40	◎	○			○	○		○	J366
			CO HSS	4LC	End mill, Long cut length, 4 flute, Center cutting	DC 3–40	◎	○			○	○		○	J368

* DC : Cutting Diameter

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel(-55HRC)	H: Hardened Steel(55HRC-)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminium Alloy	Page
ROUGHING															
	4 5	For Roughing	V	VASFPR	 Roughing end mill, Short cut length, 4–6 flute, Fine pitch form	DC 5–50	◎	○			◎	○			J370
	4 5 6		V	VAMFPR	 Roughing end mill, Medium cut length, 4–6 flute, Fine pitch form	DC 5–50	◎	○			◎	○			J372
	4 5		V	VAMR	 Roughing end mill, Medium cut length, 4–6 flute	DC 5–50	◎	○			◎	○			J374
			CO HSS	MR	 Roughing end mill, Medium cut length, 4–6 flute	DC 5–50	◎	○			○	○		○	J376

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
MS2SSD0010	0.1	—	0.15	40	4	J056
MS2JSD0010	0.1	—	0.3	40	4	J062
MS2XLD0020N005	0.2	0.5	0.3	45	4	J066
VQXLD0020N006	0.2	0.6	0.3	40	4	J149
VF2XLD0020N006	0.2	0.6	0.3	45	4	J083
MS2XLD0020N010	0.2	1	0.3	45	4	J066
MS2XLD0020N015	0.2	1.5	0.3	45	4	J066
MS2SSD0020	0.2	—	0.3	40	4	J056
CRN2MSD0020S04	0.2	—	0.4	40	4	J085
MS2MSD0020	0.2	—	0.4	40	4	J057
MS2JSD0020	0.2	—	0.6	40	4	J062
MS2LSD0020	0.2	—	0.8	40	4	J064
VQXLD0030N009	0.3	0.9	0.5	40	4	J149
MS2XLD0030N010	0.3	1	0.4	45	4	J066
VF2XLD0030N010	0.3	1	0.5	45	4	J083
CRN2XLD0030N010S04	0.3	1	0.5	50	4	J087
VQXLD0030N015	0.3	1.5	0.5	40	4	J149
MS2XL6D0030N015	0.3	1.5	0.5	50	6	J070
MS2XLD0030N020	0.3	2	0.4	45	4	J066
MS2XLD0030N030	0.3	3	0.4	45	4	J066
CRN2XLD0030N030S04	0.3	3	0.5	50	4	J087
MS2XLD0030N060	0.3	6	0.4	45	4	J066
MS2XLD0030N090	0.3	9	0.4	45	4	J066
MS2SSD0030	0.3	—	0.45	40	4	J056
CRN2MSD0030S04	0.3	—	0.6	40	4	J085
MS2MSD0030	0.3	—	0.6	40	4	J057
MS2XL6D0030N008	0.3	—	0.8	50	6	J070
MS2JSD0030	0.3	—	0.9	40	4	J062
MS2LSD0030	0.3	—	1.2	40	4	J064
VQXLD0040N010	0.4	1	0.6	40	4	J149
VF2XLD0040N010	0.4	1	0.6	45	4	J083
MS2XL6D0040N010	0.4	1	0.6	50	6	J070
VQXLD0040N018	0.4	1.8	0.6	40	4	J149
MS2XLD0040N020	0.4	2	0.6	45	4	J066
VF2XLD0040N020	0.4	2	0.6	45	4	J083
CRN2XLD0040N020S04	0.4	2	0.6	50	4	J087
MS2XL6D0040N020	0.4	2	0.6	50	6	J070
MS2XLD0040N030	0.4	3	0.6	45	4	J066
MS2XLD0040N040	0.4	4	0.6	45	4	J066
MS2XLD0040N080	0.4	8	0.6	45	4	J066
MS2XLD0040N120	0.4	12	0.6	45	4	J066
MS2SSD0040	0.4	—	0.6	40	4	J056
CRN2MSD0040S04	0.4	—	0.8	40	4	J085
MS2MSD0040	0.4	—	0.8	40	4	J057
MS2JSD0040	0.4	—	1.2	40	4	J062
MS2LSD0040	0.4	—	1.6	40	4	J064
MS2XL6D0050N013	0.5	1.3	0.8	50	6	J070
VQXLD0050N015	0.5	1.5	0.7	40	4	J149
MS2XLD0050N020	0.5	2	0.7	45	4	J066
VF2XLD0050N020	0.5	2	0.8	45	4	J083
CRN2XLD0050N020S04	0.5	2	0.8	50	4	J087
VQXLD0050N025	0.5	2.5	0.7	40	4	J149
MS2XL6D0050N025	0.5	2.5	0.8	50	6	J070
VQXLD0050N030	0.5	3	0.7	40	4	J149
MS2XLD0050N040	0.5	4	0.7	45	4	J066
VF2XLD0050N040	0.5	4	0.8	45	4	J083
CRN2XLD0050N040S04	0.5	4	0.8	50	4	J087
MS2XLD0050N060	0.5	6	0.7	45	4	J066
CRN2XLD0050N060S04	0.5	6	0.8	50	4	J087
MS2XLD0050N080	0.5	8	0.7	50	4	J066
MS2XLD0050N100	0.5	10	0.7	50	4	J066
MS2XLD0050N150	0.5	15	0.7	50	4	J066
MS2SSD0050	0.5	—	0.75	40	4	J056
CRN2MSD0050S04	0.5	—	1	40	4	J085
MS2MSD0050	0.5	—	1	40	4	J057
VCMDSCD0050	0.5	—	1	45	6	J157
VF2MDD0050	0.5	—	1.3	40	4	J079
VF2MVD0050	0.5	—	1.3	40	4	J081
MS2JSD0050	0.5	—	1.5	40	4	J062
MS2LSD0050	0.5	—	2	40	4	J064
MS2XL6D0060N015	0.6	1.5	0.9	50	6	J070
MS2XLD0060N020	0.6	2	0.9	45	4	J066
VF2XLD0060N020	0.6	2	0.9	45	4	J083
VQXLD0060N030	0.6	3	0.9	40	4	J149
MS2XL6D0060N030	0.6	3	0.9	50	6	J070
MS2XLD0060N040	0.6	4	0.9	45	4	J066
VF2XLD0060N040	0.6	4	0.9	45	4	J083
MS2XLD0060N060	0.6	6	0.9	45	4	J066
MS2XLD0060N080	0.6	8	0.9	50	4	J066
MS2XLD0060N100	0.6	10	0.9	50	4	J066
MS2XLD0060N120	0.6	12	0.9	50	4	J066
MS2XLD0060N180	0.6	18	0.9	50	4	J066
MS2SSD0060	0.6	—	0.9	40	4	J056
CRN2MSD0060S04	0.6	—	1.2	40	4	J085
MS2MSD0060	0.6	—	1.2	40	4	J057
MS2JSD0060	0.6	—	1.8	40	4	J062
MS2LSD0060	0.6	—	2.4	40	4	J064
MS2XL6D0070N018	0.7	1.8	1.1	50	6	J070
MS2XLD0070N020	0.7	2	1	45	4	J066
VQXLD0070N035	0.7	3.5	1	40	4	J149
MS2XL6D0070N035	0.7	3.5	1.1	50	6	J070
MS2XLD0070N040	0.7	4	1	45	4	J066
MS2XLD0070N060	0.7	6	1	45	4	J066
MS2XLD0070N080	0.7	8	1	50	4	J066
MS2XLD0070N100	0.7	10	1	50	4	J066
MS2SSD0070	0.7	—	1.1	40	4	J056
CRN2MSD0070S04	0.7	—	1.4	40	4	J085
MS2MSD0070	0.7	—	1.4	40	4	J057
MS2JSD0070	0.7	—	2.1	40	4	J062
MS2LSD0070	0.7	—	2.8	40	4	J064

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
MS2XL6D0080N020	0.8	2	1.2	50	6	J070
VQXLD0080N024	0.8	2.4	1.2	40	4	J149
VQXLD0080N030	0.8	3	1.2	40	4	J149
VQXLD0080N040	0.8	4	1.2	40	4	J149
MS2XLD0080N040	0.8	4	1.2	45	4	J066
VF2XLD0080N040	0.8	4	1.2	45	4	J083
CRN2XLD0080N040S04	0.8	4	1.2	50	4	J087
MS2XL6D0080N040	0.8	4	1.2	50	6	J070
MS2XLD0080N060	0.8	6	1.2	45	4	J066
VF2XLD0080N060	0.8	6	1.2	45	4	J083
MS2XLD0080N080	0.8	8	1.2	50	4	J066
MS2XLD0080N100	0.8	10	1.2	50	4	J067
MS2XLD0080N120	0.8	12	1.2	50	4	J067
MS2XLD0080N160	0.8	16	1.2	50	4	J067
MS2XLD0080N240	0.8	24	1.2	60	4	J067
MS2SSD0080	0.8	—	1.2	40	4	J056
CRN2MSD0080S04	0.8	—	1.6	40	4	J085
MS2MSD0080	0.8	—	1.6	40	4	J057
MS2JSD0080	0.8	—	2.4	40	4	J062
MS2LSD0080	0.8	—	3.2	40	4	J064
MS2XL6D0090N023	0.9	2.3	1.4	50	6	J070
MS2XL6D0090N045	0.9	4.5	1.4	50	6	J070
MS2XLD0090N060	0.9	6	1.4	45	4	J067
MS2XLD0090N080	0.9	8	1.4	50	4	J067
MS2XLD0090N100	0.9	10	1.4	50	4	J067
MS2XLD0090N150	0.9	15	1.4	60	4	J067
MS2SSD0090	0.9	—	1.4	40	4	J056
MS2MSD0090	0.9	—	1.8	40	4	J057
MS2JSD0090	0.9	—	2.7	40	4	J062
MS2LSD0090	0.9	—	3.6	40	4	J064
MS2XL6D0100N025	1	2.5	1.5	50	6	J070
MS4XLD0100N040	1	4	1	50	4	J134
MS2XLD0100N040	1	4	1.5	50	4	J067
VF2XLD0100N040	1	4	1.5	50	4	J083
VQXLD0100N050	1	5	1.5	40	4	J149
MS2XL6D0100N050	1	5	1.5	50	6	J070
MS4XLD0100N060	1	6	1	50	4	J134
CRN2XLD0100N060S04	1	6	1.5	50	4	J087
MS2XLD0100N060	1	6	1.5	50	4	J067
VF2XLD0100N060	1	6	1.5	50	4	J083
CRN2XLD0100N060S06	1	6	1.5	50	6	J087
MS4XLD0100N080	1	8	1	50	4	J134
CRN2XLD0100N080S04	1	8	1.5	50	4	J087
MS2XLD0100N080	1	8	1.5	50	4	J067
VF2XLD0100N080	1	8	1.5	50	4	J083
MS4XLD0100N100	1	10	1	50	4	J134
CRN2XLD0100N100S04	1	10	1.5	50	4	J087
MS2XLD0100N100	1	10	1.5	50	4	J067
MS4XLD0100N120	1	12	1	50	4	J134
CRN2XLD0100N120S04	1	12	1.5	50	4	J087

Order Number	DC	LU	APMX	LF	DCON	Page
MS2XLD0100N120	1	12	1.5	50	4	J067
VF2XLD0100N120	1	12	1.5	50	4	J083
MS4XLD0100N160	1	16	1	60	4	J134
MS2XLD0100N160	1	16	1.5	60	4	J067
MS2XLD0100N200	1	20	1.5	60	4	J067
MS2XLD0100N250	1	25	1.5	70	4	J067
MS2XLD0100N300	1	30	1.5	70	4	J067
MS2SSD0100	1	—	1.5	40	4	J056
MS4SCD0100	1	—	1.5	40	4	J128
MS2MSD0100	1	—	2	40	4	J057
MSMHZDD0100	1	—	2	45	4	J096
VQMHVD0100	1	—	2	45	4	J143
VQMHZVD0100	1	—	2	45	4	J103
VFSDD0100	1	—	2	45	6	J165
C2MAD0100	1	—	2.5	40	4	J092
CRN2MSD0100S04	1	—	2.5	40	4	J085
MS2MDD0100	1	—	2.5	40	4	J060
MS4MCD0100	1	—	2.5	40	4	J130
VF2MDD0100	1	—	2.5	40	4	J079
VF2MVD0100	1	—	2.5	40	4	J081
VF4MDD0100	1	—	2.5	40	4	J153
MPMHVD0100	1	—	2.5	45	4	J118
CRN2MSD0100S06	1	—	2.5	45	6	J085
VCMDSCD0100	1	—	2.5	45	6	J157
MS2JSD0100	1	—	3	40	4	J062
VFMDD0100	1	—	3.5	60	6	J166
MS2LSD0100	1	—	4	40	4	J064
MS4JCD0100	1	—	4	40	4	J132
MPJHVD0100AP04	1	—	4	45	4	J122
VQJHVD0100	1	—	4	45	4	J147
MS2XL6D0110N028	1.1	2.8	1.7	50	6	J070
MS2XL6D0110N055	1.1	5.5	1.7	50	6	J070
MS4XLD0110N060	1.1	6	1.1	50	4	J134
MS4XLD0110N100	1.1	10	1.1	50	4	J134
MS4XLD0110N160	1.1	16	1.1	60	4	J134
MS2MSD0110	1.1	—	2.2	40	4	J057
VQMHZVD0110	1.1	—	2.2	45	4	J103
MS2XL6D0120N030	1.2	3	1.8	50	6	J070
MS4XLD0120N060	1.2	6	1.2	50	4	J134
MS2XLD0120N060	1.2	6	1.8	50	4	J067
MS2XL6D0120N060	1.2	6	1.8	50	6	J070
MS4XLD0120N080	1.2	8	1.2	50	4	J134
MS2XLD0120N080	1.2	8	1.8	50	4	J067
MS4XLD0120N100	1.2	10	1.2	50	4	J134
MS2XLD0120N100	1.2	10	1.8	50	4	J067
MS4XLD0120N120	1.2	12	1.2	50	4	J134
MS2XLD0120N120	1.2	12	1.8	50	4	J067
MS4XLD0120N160	1.2	16	1.2	60	4	J134
MS2XLD0120N160	1.2	16	1.8	60	4	J067
MS2XLD0120N200	1.2	20	1.8	60	4	J067

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
MS2SSD0120	1.2	—	1.8	40	4	J056
MS2MSD0120	1.2	—	2.4	40	4	J057
VQMHZVD0120	1.2	—	2.4	45	4	J103
MS2JSD0120	1.2	—	3.6	40	4	J062
MS2XL6D0130N033	1.3	3.3	2	50	6	J070
MS4XLD0130N060	1.3	6	1.3	50	4	J134
MS2XL6D0130N065	1.3	6.5	2	50	6	J070
MS4XLD0130N120	1.3	12	1.3	50	4	J134
MS4XLD0130N180	1.3	18	1.3	60	4	J134
MS2MSD0130	1.3	—	2.6	40	4	J057
VQMHZVD0130	1.3	—	2.6	45	4	J103
MS2XL6D0140N035	1.4	3.5	2.1	50	6	J070
MS4XLD0140N060	1.4	6	1.4	50	4	J134
MS2XL6D0140N070	1.4	7	2.1	50	6	J070
MS4XLD0140N080	1.4	8	1.4	50	4	J134
MS4XLD0140N100	1.4	10	1.4	50	4	J134
MS4XLD0140N120	1.4	12	1.4	50	4	J134
MS4XLD0140N140	1.4	14	1.4	60	4	J134
MS4XLD0140N160	1.4	16	1.4	60	4	J134
MS4XLD0140N220	1.4	22	1.4	60	4	J134
MS2MSD0140	1.4	—	2.8	40	4	J057
VQMHZVD0140	1.4	—	2.8	45	4	J103
MS2XL6D0150N038	1.5	3.8	2.3	50	6	J070
MS4XLD0150N060	1.5	6	1.5	50	4	J134
CRN2XLD0150N060S04	1.5	6	2.3	50	4	J087
MS2XLD0150N060	1.5	6	2.3	50	4	J067
VF2XLD0150N060	1.5	6	2.3	50	4	J083
MS2XL6D0150N075	1.5	7.5	2.3	50	6	J070
MS4XLD0150N080	1.5	8	1.5	50	4	J134
CRN2XLD0150N080S04	1.5	8	2.3	50	4	J087
MS2XLD0150N080	1.5	8	2.3	50	4	J067
VF2XLD0150N080	1.5	8	2.3	50	4	J083
MS4XLD0150N100	1.5	10	1.5	50	4	J134
CRN2XLD0150N100S04	1.5	10	2.3	50	4	J087
MS2XLD0150N100	1.5	10	2.3	50	4	J067
VF2XLD0150N100	1.5	10	2.3	50	4	J083
MS4XLD0150N120	1.5	12	1.5	50	4	J134
CRN2XLD0150N120S04	1.5	12	2.3	50	4	J087
MS2XLD0150N120	1.5	12	2.3	50	4	J067
VF2XLD0150N120	1.5	12	2.3	50	4	J083
MS4XLD0150N140	1.5	14	1.5	60	4	J134
MS2XLD0150N140	1.5	14	2.3	60	4	J067
MS4XLD0150N160	1.5	16	1.5	60	4	J134
MS2XLD0150N160	1.5	16	2.3	60	4	J067
VF2XLD0150N160	1.5	16	2.3	60	4	J083
MS4XLD0150N180	1.5	18	1.5	60	4	J134
MS2XLD0150N180	1.5	18	2.3	60	4	J067
MS4XLD0150N200	1.5	20	1.5	60	4	J134
MS2XLD0150N200	1.5	20	2.3	60	4	J067
MS2XLD0150N250	1.5	25	2.3	70	4	J067

Order Number	DC	LU	APMX	LF	DCON	Page
MS2XLD0150N300	1.5	30	2.3	70	4	J067
MS2XLD0150N380	1.5	38	2.3	80	4	J067
MS2XLD0150N450	1.5	45	2.3	80	4	J067
MS2SSD0150	1.5	—	2.3	40	4	J056
MS4SCD0150	1.5	—	2.3	40	4	J128
MS2MSD0150	1.5	—	3	40	4	J057
MSMHZDD0150	1.5	—	3	45	4	J096
VQMHVD0150	1.5	—	3	45	4	J143
VQMHZVD0150	1.5	—	3	45	4	J103
VFSDD0150	1.5	—	3	45	6	J165
MS2MDD0150	1.5	—	3.8	40	4	J060
MS4MCD0150	1.5	—	3.8	40	4	J130
VF2MDD0150	1.5	—	3.8	40	4	J079
VF2MVD0150	1.5	—	3.8	40	4	J081
VF4MDD0150	1.5	—	3.8	40	4	J153
MPMHVD0150	1.5	—	3.8	45	4	J118
C2MAD0150	1.5	—	4	40	4	J092
CRN2MSD0150S04	1.5	—	4	40	4	J085
CRN2MSD0150S06	1.5	—	4	45	6	J085
VCMDSCD0150	1.5	—	4	45	6	J157
MS2JSD0150	1.5	—	4.5	40	4	J062
VFMDD0150	1.5	—	5	60	6	J166
MS2LSD0150	1.5	—	6	40	4	J064
MS4JCD0150	1.5	—	6	40	4	J132
MPJHVD0150AP06	1.5	—	6	45	4	J122
VQJHVD0150	1.5	—	6	45	4	J147
MS2XL6D0160N040	1.6	4	2.4	50	6	J070
MS4XLD0160N060	1.6	6	1.6	50	4	J134
MS4XLD0160N080	1.6	8	1.6	50	4	J134
MS2XL6D0160N080	1.6	8	2.4	50	6	J070
MS4XLD0160N100	1.6	10	1.6	50	4	J135
MS4XLD0160N120	1.6	12	1.6	50	4	J135
MS4XLD0160N140	1.6	14	1.6	60	4	J135
MS4XLD0160N160	1.6	16	1.6	60	4	J135
MS4XLD0160N180	1.6	18	1.6	60	4	J135
MS4XLD0160N200	1.6	20	1.6	60	4	J135
MS4XLD0160N260	1.6	26	1.6	70	4	J135
MS2MSD0160	1.6	—	3.2	40	4	J057
VQMHZVD0160	1.6	—	3.2	45	4	J103
MS2XL6D0170N043	1.7	4.3	2.6	50	6	J070
MS4XLD0170N060	1.7	6	1.7	50	4	J135
MS2XL6D0170N085	1.7	8.5	2.6	50	6	J070
MS4XLD0170N140	1.7	14	1.7	60	4	J135
MS4XLD0170N240	1.7	24	1.7	70	4	J135
MS2MSD0170	1.7	—	3.4	40	4	J057
VQMHZVD0170	1.7	—	3.4	45	4	J103
CRN2MSD0170S04	1.7	—	4	40	4	J085
MS2XL6D0180N045	1.8	4.5	2.7	50	6	J070
MS4XLD0180N060	1.8	6	1.8	50	4	J135
MS4XLD0180N080	1.8	8	1.8	50	4	J135

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
MS2XL6D0180N090	1.8	9	2.7	50	6	J070
MS4XLD0180N100	1.8	10	1.8	50	4	J135
MS4XLD0180N120	1.8	12	1.8	50	4	J135
MS4XLD0180N140	1.8	14	1.8	60	4	J135
MS4XLD0180N160	1.8	16	1.8	60	4	J135
MS4XLD0180N180	1.8	18	1.8	60	4	J135
MS4XLD0180N200	1.8	20	1.8	60	4	J135
MS4XLD0180N250	1.8	25	1.8	70	4	J135
MS2SSD0180	1.8	—	2.7	40	4	J056
MS2MSD0180	1.8	—	3.6	40	4	J057
VQMHZVD0180	1.8	—	3.6	45	4	J103
MS2JSD0180	1.8	—	5.4	40	4	J062
MS2XL6D0190N048	1.9	4.8	2.9	50	6	J070
MS4XLD0190N060	1.9	6	1.9	50	4	J135
MS2XL6D0190N095	1.9	9.5	2.9	50	6	J070
MS4XLD0190N160	1.9	16	1.9	60	4	J135
MS4XLD0190N280	1.9	28	1.9	70	4	J135
MS2MSD0190	1.9	—	3.8	40	4	J057
VQMHZVD0190	1.9	—	3.8	45	4	J103
MS2XL6D0200N050	2	5	3	50	6	J071
MS4XLD0200N060	2	6	2	50	4	J135
MS2XLD0200N060	2	6	3	50	4	J067
VF2XLD0200N060	2	6	3	50	4	J083
CRN2XLD0200N060S06	2	6	3	50	6	J087
MS4XLD0200N080	2	8	2	50	4	J135
MS2XLD0200N080	2	8	3	50	4	J067
CRN2XLD0200N080S06	2	8	3	50	6	J087
MS4XLD0200N100	2	10	2	50	4	J135
MS2XLD0200N100	2	10	3	50	4	J067
VF2XLD0200N100	2	10	3	50	4	J083
CRN2XLD0200N100S06	2	10	3	50	6	J087
MS2XL6D0200N100	2	10	3	50	6	J071
MS4XLD0200N120	2	12	2	50	4	J135
MS2XLD0200N120	2	12	3	50	4	J067
VF2XLD0200N120	2	12	3	50	4	J083
CRN2XLD0200N120S06	2	12	3	50	6	J087
MS4XLD0200N140	2	14	2	60	4	J135
MS2XLD0200N140	2	14	3	60	4	J067
MS4XLD0200N160	2	16	2	60	4	J135
MS2XLD0200N160	2	16	3	60	4	J067
VF2XLD0200N160	2	16	3	60	4	J083
MS4XLD0200N180	2	18	2	60	4	J135
MS2XLD0200N180	2	18	3	60	4	J067
MS4XLD0200N200	2	20	2	60	4	J135
MS2XLD0200N200	2	20	3	60	4	J067
VF2XLD0200N200	2	20	3	60	4	J083
CRN2XLD0200N200S06	2	20	3	60	6	J087
MS4XLD0200N250	2	25	2	70	4	J135
MS2XLD0200N250	2	25	3	70	4	J067
MS4XLD0200N300	2	30	2	70	4	J135
MS2XLD0200N300	2	30	3	70	4	J067
MS2XLD0200N350	2	35	3	80	4	J067
MS2XLD0200N400	2	40	3	90	4	J067
MS2XLD0200N500	2	50	3	100	4	J067
MS2XLD0200N600	2	60	3	110	4	J067
MS2SSD0200	2	—	3	40	4	J056
MS4SCD0200	2	—	3	40	4	J128
SED2020KMG	2	—	3	45	4	J089
SED2020KPG	2	—	3	45	4	J090
MS2MSD0200	2	—	4	40	4	J057
MSMHDD0200	2	—	4	45	4	J125
VQMHVD0200	2	—	4	45	4	J143
VFSDD0200	2	—	4	45	6	J165
MSMHZDD0200	2	—	4	50	6	J096
VQMHZVD0200	2	—	4	50	6	J103
MS2MDD0200	2	—	5	40	4	J060
MS4MCD0200	2	—	5	40	4	J130
VF2MDD0200	2	—	5	40	4	J079
VF2MVD0200	2	—	5	40	4	J081
VF4MDD0200	2	—	5	40	4	J153
MPMHVD0200	2	—	5	45	4	J118
C2MAD0200	2	—	6	40	4	J092
MS2JSD0200	2	—	6	40	4	J062
CRN2MSD0200S06	2	—	6	45	6	J085
VCMDSCD0200	2	—	6	45	6	J157
MPJHVD0200AP06	2	—	6.5	60	6	J122
VFMDD0200	2	—	7	60	6	J166
MS2LSD0200	2	—	8	40	4	J064
MS4JCD0200	2	—	8	40	4	J132
MPJHVD0200AP08	2	—	8	60	6	J122
VQJHVD0200	2	—	8	60	6	J147
MS2XL6D0210N053	2.1	5.3	3.2	50	6	J071
MS2XL6D0210N105	2.1	10.5	3.2	60	6	J071
MS2MSD0210	2.1	—	4.2	40	4	J057
VQMHZVD0210	2.1	—	4.2	50	6	J103
MSMHDD0210	2.1	—	5	45	4	J125
MS2XL6D0220N055	2.2	5.5	3.3	50	6	J071
MS2XL6D0220N110	2.2	11	3.3	60	6	J071
MS2MSD0220	2.2	—	4.4	40	4	J057
VQMHZVD0220	2.2	—	4.4	50	6	J103
MSMHDD0220	2.2	—	5	45	4	J125
MS2XL6D0230N058	2.3	5.8	3.5	50	6	J071
MS2XL6D0230N115	2.3	11.5	3.5	60	6	J071
MS2MSD0230	2.3	—	4.6	40	4	J057
VQMHZVD0230	2.3	—	4.6	50	6	J103
MSMHDD0230	2.3	—	5	45	4	J125
MS2XL6D0240N060	2.4	6	3.6	50	6	J071
MS2XL6D0240N120	2.4	12	3.6	60	6	J071
MS2MSD0240	2.4	—	4.8	40	4	J057
VQMHZVD0240	2.4	—	4.8	50	6	J103

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
MSMHDD0240	2.4	—	5	45	4	J125
MS2XL6D0250N063	2.5	6.3	3.8	50	6	J071
MS4XLD0250N080	2.5	8	2.5	50	4	J135
MS2XLD0250N080	2.5	8	3.7	50	4	J067
MS4XLD0250N120	2.5	12	2.5	50	4	J135
MS2XLD0250N120	2.5	12	3.7	50	4	J067
MS2XL6D0250N125	2.5	12.5	3.8	60	6	J071
MS4XLD0250N160	2.5	16	2.5	60	4	J135
MS2XLD0250N160	2.5	16	3.7	60	4	J067
MS4XLD0250N200	2.5	20	2.5	60	4	J135
MS2XLD0250N200	2.5	20	3.7	60	4	J068
CRN2XLD0250N200S06	2.5	20	3.8	65	6	J087
MS4XLD0250N250	2.5	25	2.5	70	4	J135
MS2XLD0250N250	2.5	25	3.7	70	4	J068
MS2XLD0250N300	2.5	30	3.7	70	4	J068
MS2XLD0250N400	2.5	40	3.7	90	4	J068
MS2XLD0250N500	2.5	50	3.7	100	4	J068
MS2SSD0250	2.5	—	3.8	40	4	J056
MS4SCD0250	2.5	—	3.8	40	4	J128
MS2MSD0250	2.5	—	5	40	4	J057
MSMHDD0250	2.5	—	5	45	4	J125
VQMHVD0250	2.5	—	5	45	4	J143
VFSDD0250	2.5	—	5	45	6	J165
MSMHZDD0250	2.5	—	5	50	6	J096
VQMHZVD0250	2.5	—	5	50	6	J103
MS2MDD0250	2.5	—	6.3	40	4	J060
MS4MCD0250	2.5	—	6.3	40	4	J130
VF2MDD0250	2.5	—	6.3	40	4	J079
VF2MVD0250	2.5	—	6.3	40	4	J081
VF4MDD0250	2.5	—	6.3	40	4	J153
MPMHVD0250	2.5	—	6.3	45	4	J118
MS2JSD0250	2.5	—	7.5	40	4	J062
C2MAD0250	2.5	—	8	40	4	J092
CRN2MSD0250S06	2.5	—	8	45	6	J085
VCMDSCD0250	2.5	—	8	45	6	J157
VFMDD0250	2.5	—	8	60	6	J166
MS2LSD0250	2.5	—	10	50	4	J064
MS4JCD0250	2.5	—	10	50	4	J132
MPJHVD0250AP10	2.5	—	10	60	6	J122
VQJHVD0250	2.5	—	10	60	6	J147
MS2MSD0260	2.6	—	5.2	40	4	J057
VQMHZVD0260	2.6	—	5.2	50	6	J103
MSMHDD0260	2.6	—	6	45	4	J125
MS2MSD0270	2.7	—	5.4	40	4	J057
VQMHZVD0270	2.7	—	5.4	50	6	J103
MSMHDD0270	2.7	—	6	45	4	J125
MS2MSD0280	2.8	—	5.6	40	4	J057
VQMHZVD0280	2.8	—	5.6	50	6	J103
MSMHDD0280	2.8	—	6	45	4	J125
MS2MSD0290	2.9	—	5.8	40	4	J057

Order Number	DC	LU	APMX	LF	DCON	Page
VQMHZVD0290	2.9	—	5.8	50	6	J103
MSMHDD0290	2.9	—	6	45	4	J125
MS4XLD0300N080	3	8	3	50	6	J135
MS2XLD0300N080	3	8	4.5	50	6	J068
MS4XLD0300N120	3	12	3	50	6	J135
MS2XLD0300N120	3	12	4.5	50	6	J068
VF2XLD0300N120	3	12	4.5	50	6	J083
MS4XLD0300N160	3	16	3	60	6	J135
MS2XLD0300N160	3	16	4.5	60	6	J068
MS4XLD0300N200	3	20	3	60	6	J135
MS2XLD0300N200	3	20	4.5	60	6	J068
VF2XLD0300N200	3	20	4.5	60	6	J083
CRN2XLD0300N200S06	3	20	4.5	65	6	J087
MS4XLD0300N250	3	25	3	70	6	J135
MS2XLD0300N250	3	25	4.5	70	6	J068
MS4XLD0300N300	3	30	3	70	6	J135
MS2XLD0300N300	3	30	4.5	70	6	J068
MS2XLD0300N400	3	40	4.5	90	6	J068
MS2XLD0300N500	3	50	4.5	100	6	J068
MS2ESD0300L35S04	3	—	3	35	4	J077
MS3ESD0300L35S04	3	—	3	35	4	J101
MS4ECD0300L35S04	3	—	3	35	4	J141
MS2ESD0300L45S04	3	—	3	45	4	J077
MS3ESD0300L45S04	3	—	3	45	4	J101
MS4ECD0300L45S04	3	—	3	45	4	J141
MS2SSD0300	3	—	4.5	45	6	J056
MSSHDD0300	3	—	4.5	45	6	J124
NEW MP2ESD0300S04	3	—	4.5	50	4	J074
NEW MP3ESD0300S04	3	—	4.5	50	4	J098
NEW MP4ECD0300S04	3	—	4.5	50	4	J138
MS4SCD0300	3	—	4.5	50	6	J128
SED2030KMG	3	—	5	45	6	J089
SED2030KPG	3	—	5	45	6	J090
MS2MSD0300	3	—	6	45	6	J057
VFSDD0300	3	—	6	45	6	J165
MSMHZDD0300	3	—	6	50	6	J096
VFSFPRD0300	3	—	6	50	6	J339
VQMHZVD0300	3	—	6	50	6	J103
VQSVRD0300	3	—	6	60	6	J336
MPMHVD0300	3	—	7.5	45	6	J118
MS2MDD0300	3	—	7.5	50	6	J060
MS4MCD0300	3	—	7.5	50	6	J130
VF2MDD0300	3	—	7.5	50	6	J079
VF2MVD0300	3	—	7.5	50	6	J081
VF4MDD0300	3	—	7.5	50	6	J153
C2MAD0300	3	—	8	45	6	J092
CRN2MSD0300S06	3	—	8	45	6	J085
MSMHDD0300	3	—	8	45	6	J125
VCMDSCD0300	3	—	8	45	6	J157
VQMHVD0300	3	—	8	45	6	J143

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
CMRAD0300	3	—	8	50	6	J346
MS2JSD0300	3	—	9	45	6	J062
C2MHAD0300	3	—	9	60	6	J094
MPJHVD0300AP10	3	—	10	60	6	J122
VFMDD0300	3	—	10	60	6	J166
CRN4JCD0300	3	—	12	50	6	J159
MS2LSD0300	3	—	12	50	6	J064
MS4JCD0300	3	—	12	50	6	J132
DF4JCD0300	3	—	12	60	6	J160
MPJHVD0300AP12	3	—	12	60	6	J122
VQJHVD0300	3	—	12	60	6	J147
MS2MSD0310	3.1	—	6.2	45	6	J057
VQMHZVD0310	3.1	—	7	50	6	J103
MSMHDD0310	3.1	—	8	45	6	J125
MS2MSD0320	3.2	—	6.4	45	6	J057
VQMHZVD0320	3.2	—	7	50	6	J103
MSMHDD0320	3.2	—	8	45	6	J125
MS2MSD0330	3.3	—	6.6	45	6	J057
VQMHZVD0330	3.3	—	7	50	6	J103
MSMHDD0330	3.3	—	8	45	6	J125
MS2MSD0340	3.4	—	6.8	45	6	J057
VQMHZVD0340	3.4	—	7	50	6	J103
MSMHDD0340	3.4	—	8	45	6	J125
MS4XLD0350N150	3.5	15	3.5	60	6	J135
MS4XLD0350N250	3.5	25	3.5	70	6	J135
MS4XLD0350N350	3.5	35	3.5	80	6	J135
MS2ESD0350L35S04	3.5	—	3.5	35	4	J077
MS3ESD0350L35S04	3.5	—	3.5	35	4	J101
MS4ECD0350L35S04	3.5	—	3.5	35	4	J141
MS2ESD0350L45S04	3.5	—	3.5	45	4	J077
MS3ESD0350L45S04	3.5	—	3.5	45	4	J101
MS4ECD0350L45S04	3.5	—	3.5	45	4	J141
NEW MP4ECD0350S04	3.5	—	5	50	4	J138
MSSHDD0350	3.5	—	5.3	45	6	J124
MS2MSD0350	3.5	—	7	45	6	J057
VFSDD0350	3.5	—	7	45	6	J165
MSMHDD0350	3.5	—	8	45	6	J125
VQMHVD0350	3.5	—	8	45	6	J143
MSMHZDD0350	3.5	—	8	50	6	J096
VQMHZVD0350	3.5	—	8	50	6	J103
MS4MCD0350	3.5	—	9	50	6	J130
VQJHVD0350	3.5	—	14	60	6	J147
MS2MSD0360	3.6	—	7.2	45	6	J058
VQMHZVD0360	3.6	—	8	50	6	J103
MSMHDD0360	3.6	—	11	45	6	J125
MS2MSD0370	3.7	—	7.4	45	6	J058
VQMHZVD0370	3.7	—	8	50	6	J103
MSMHDD0370	3.7	—	11	45	6	J125
MS2MSD0380	3.8	—	7.6	45	6	J058
VQMHZVD0380	3.8	—	8	50	6	J103

Order Number	DC	LU	APMX	LF	DCON	Page
MSMHDD0380	3.8	—	11	45	6	J125
MS2MSD0390	3.9	—	7.8	45	6	J058
VQMHZVD0390	3.9	—	8	50	6	J103
MSMHDD0390	3.9	—	11	45	6	J125
MS4XLD0400N120	4	12	4	50	6	J135
MS2XLD0400N120	4	12	6	50	6	J068
MS4XLD0400N160	4	16	4	60	6	J135
MS2XLD0400N160	4	16	6	60	6	J068
MS4XLD0400N200	4	20	4	60	6	J135
MS2XLD0400N200	4	20	6	60	6	J068
CRN2XLD0400N200S06	4	20	6	65	6	J087
MS4XLD0400N250	4	25	4	70	6	J135
MS2XLD0400N250	4	25	6	70	6	J068
MS4XLD0400N300	4	30	4	70	6	J135
MS2XLD0400N300	4	30	6	70	6	J068
MS4XLD0400N350	4	35	4	80	6	J135
MS2XLD0400N350	4	35	6	80	6	J068
MS4XLD0400N400	4	40	4	90	6	J136
MS2XLD0400N400	4	40	6	90	6	J068
MS4XLD0400N450	4	45	4	90	6	J136
MS2XLD0400N450	4	45	6	90	6	J068
MS4XLD0400N500	4	50	4	100	6	J136
MS2XLD0400N500	4	50	6	100	6	J068
MS2XLD0400N600	4	60	6	110	6	J068
MS2ESD0400L35S04	4	—	4	35	4	J077
MS3ESD0400L35S04	4	—	4	35	4	J101
MS4ECD0400L35S04	4	—	4	35	4	J141
MS2ESD0400L45S04	4	—	4	45	4	J077
MS3ESD0400L45S04	4	—	4	45	4	J101
MS4ECD0400L45S04	4	—	4	45	4	J141
MSSHDD0400	4	—	6	45	6	J124
SED2040KMG	4	—	6	45	6	J089
SED2040KPG	4	—	6	45	6	J090
NEW MP2ESD0400S04	4	—	6	50	4	J074
NEW MP3ESD0400S04	4	—	6	50	4	J098
NEW MP4ECD0400S04	4	—	6	50	4	J138
MS2SSD0400	4	—	6	50	6	J056
MS4SCD0400	4	—	6	50	6	J128
VFSDD0400	4	—	8	45	6	J165
MS2MSD0400	4	—	8	50	6	J058
MSMHZDD0400	4	—	8	50	6	J096
VFSFPRD0400	4	—	8	50	6	J339
VQMHZVD0400	4	—	8	50	6	J103
VQSVRD0400	4	—	8	60	6	J336
MPMHVD0400	4	—	10	45	6	J118
MS2MDD0400	4	—	10	50	6	J060
MS4MCD0400	4	—	10	50	6	J130
VF2MDD0400	4	—	10	50	6	J079
VF2MVD0400	4	—	10	50	6	J081
VF4MDD0400	4	—	10	50	6	J153

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
C2MAD0400	4	—	11	45	6	J092
CRN2MSD0400S06	4	—	11	45	6	J085
MSMHDD0400	4	—	11	45	6	J125
VQMHVD0400	4	—	11	45	6	J143
CMRAD0400	4	—	11	50	6	J346
MS2JSD0400	4	—	12	50	6	J062
C2MHAD0400	4	—	12	60	6	J094
VFMDD0400	4	—	12	60	6	J166
MPJHVD0400AP13	4	—	13	60	6	J122
CRN4JCD0400	4	—	15	50	6	J159
MS2LSD0400	4	—	16	50	6	J064
MS4JCD0400	4	—	16	50	6	J132
DF4JCD0400	4	—	16	60	6	J160
MPJHVD0400AP16	4	—	16	60	6	J122
VQJHVD0400	4	—	16	60	6	J147
MS2MSD0410	4.1	—	8.2	50	6	J058
MSMHDD0410	4.1	—	12	45	6	J125
MS2MSD0420	4.2	—	8.4	50	6	J058
MSMHDD0420	4.2	—	12	45	6	J125
MS2MSD0430	4.3	—	8.6	50	6	J058
MSMHDD0430	4.3	—	12	45	6	J125
MS2MSD0440	4.4	—	8.8	50	6	J058
MSMHDD0440	4.4	—	12	45	6	J125
MSSHDD0450	4.5	—	6.8	45	6	J124
MS2MSD0450	4.5	—	9	50	6	J058
MSMHZDD0450	4.5	—	10	50	6	J096
VQMHZVD0450	4.5	—	10	50	6	J103
MS4MCD0450	4.5	—	11.5	50	6	J130
MSMHDD0450	4.5	—	12	45	6	J125
VQJHVD0450	4.5	—	18	60	6	J147
MS2MSD0460	4.6	—	9.2	50	6	J058
MSMHDD0460	4.6	—	13	50	6	J125
MS2MSD0470	4.7	—	9.4	50	6	J058
MSMHDD0470	4.7	—	13	50	6	J125
MS2MSD0480	4.8	—	9.6	50	6	J058
MSMHDD0480	4.8	—	13	50	6	J125
MS2MSD0490	4.9	—	9.8	50	6	J058
MSMHDD0490	4.9	—	13	50	6	J125
MS4XLD0500N160	5	16	5	60	6	J136
MS2XLD0500N160	5	16	7.5	60	6	J068
MS4XLD0500N250	5	25	5	70	6	J136
CRN2XLD0500N250S06	5	25	7.5	70	6	J087
MS2XLD0500N250	5	25	7.5	70	6	J068
MS4XLD0500N350	5	35	5	80	6	J136
MS2XLD0500N350	5	35	7.5	80	6	J068
MS4XLD0500N500	5	50	5	110	6	J136
MS2XLD0500N500	5	50	7.5	110	6	J068
MS2XLD0500N600	5	60	7.5	120	6	J068
MS2ESD0500L35S05	5	—	5	35	5	J077
MS3ESD0500L35S05	5	—	5	35	5	J101

Order Number	DC	LU	APMX	LF	DCON	Page
MS4ECD0500L35S05	5	—	5	35	5	J141
MS2ESD0500L35S06	5	—	5	35	6	J077
MS3ESD0500L35S06	5	—	5	35	6	J101
MS4ECD0500L35S06	5	—	5	35	6	J141
MS2ESD0500L45S06	5	—	5	45	6	J077
MS3ESD0500L45S06	5	—	5	45	6	J101
MS4ECD0500L45S06	5	—	5	45	6	J141
NEW MP2ESD0500S06	5	—	7.5	50	6	J074
NEW MP3ESD0500S06	5	—	7.5	50	6	J098
NEW MP4ECD0500S06	5	—	7.5	50	6	J138
MS2SSD0500	5	—	7.5	50	6	J056
MS4SCD0500	5	—	7.5	50	6	J128
MSSHDD0500	5	—	7.5	50	6	J124
SED2050KMG	5	—	8	50	6	J089
SED2050KPG	5	—	8	50	6	J090
MS2MSD0500	5	—	10	50	6	J058
MSMHZDD0500	5	—	10	50	6	J096
VFSDD0500	5	—	10	50	6	J165
VFSFPRD0500	5	—	10	50	6	J339
VQMHZVD0500	5	—	10	50	6	J104
VQSVRD0500	5	—	10	60	6	J336
MPMHVD0500	5	—	12.5	50	6	J118
MS2MDD0500	5	—	12.5	50	6	J060
MS4MCD0500	5	—	12.5	50	6	J130
VF2MDD0500	5	—	12.5	50	6	J079
VF2MVD0500	5	—	12.5	50	6	J081
VF4MDD0500	5	—	12.5	50	6	J153
C2MAD0500	5	—	13	50	6	J092
CMRAD0500	5	—	13	50	6	J346
CRN2MSD0500S06	5	—	13	50	6	J085
MSMHDD0500	5	—	13	50	6	J125
VQMHVD0500	5	—	13	50	6	J143
MS2JSD0500	5	—	15	50	6	J062
C2MHAD0500	5	—	15	60	6	J094
VFMDD0500	5	—	15	60	6	J166
VFMFPRD0500	5	—	15	60	6	J342
MPJHVD0500AP17	5	—	17	60	6	J122
MPJHVD0500AP20	5	—	20	60	6	J122
MS2LSD0500	5	—	20	60	6	J064
MS4JCD0500	5	—	20	60	6	J132
VQJHVD0500	5	—	20	60	6	J147
MS2MSD0510	5.1	—	10.2	50	6	J058
MSMHDD0510	5.1	—	13	50	6	J125
MS2MSD0520	5.2	—	10.4	50	6	J058
MSMHDD0520	5.2	—	13	50	6	J125
MS2MSD0530	5.3	—	10.6	50	6	J058
MSMHDD0530	5.3	—	13	50	6	J125
MS2MSD0540	5.4	—	10.8	50	6	J058
MSMHDD0540	5.4	—	13	50	6	J126
MSSHDD0550	5.5	—	8.3	50	6	J124

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
MS2MSD0550	5.5	—	11	50	6	J058
MSMHDD0550	5.5	—	13	50	6	J126
MSMHZDD0550	5.5	—	13	50	6	J096
VQMHZVD0550	5.5	—	13	50	6	J104
MS4MCD0550	5.5	—	14	50	6	J130
MS2MSD0560	5.6	—	11.2	50	6	J058
MSMHDD0560	5.6	—	13	50	6	J126
MS2MSD0570	5.7	—	11.4	50	6	J058
MSMHDD0570	5.7	—	13	50	6	J126
MS2MSD0580	5.8	—	11.6	50	6	J058
MSMHDD0580	5.8	—	13	50	6	J126
MS2MSD0590	5.9	—	11.8	50	6	J058
MSMHDD0590	5.9	—	13	50	6	J126
MS4XLD0600N200	6	20	6	80	6	J136
MS2XLD0600N200	6	20	9	80	6	J068
MS4XLD0600N300	6	30	6	90	6	J136
CRN2XLD0600N300S06	6	30	9	70	6	J087
MS2XLD0600N300	6	30	9	90	6	J068
MS4XLD0600N400	6	40	6	100	6	J136
MS2XLD0600N400	6	40	9	100	6	J068
MS4XLD0600N500	6	50	6	110	6	J136
MS2XLD0600N500	6	50	9	110	6	J068
MS2XLD0600N600	6	60	9	120	6	J068
MS2ESD0600L35S05	6	—	6	35	5	J077
MS3ESD0600L35S05	6	—	6	35	5	J101
MS4ECD0600L35S05	6	—	6	35	5	J141
MS2ESD0600L35S06	6	—	6	35	6	J077
MS3ESD0600L35S06	6	—	6	35	6	J101
MS4ECD0600L35S06	6	—	6	35	6	J141
MS2ESD0600L45S06	6	—	6	45	6	J077
MS3ESD0600L45S06	6	—	6	45	6	J101
MS4ECD0600L45S06	6	—	6	45	6	J141
NEW MP2ESD0600S06	6	—	9	50	6	J074
NEW MP3ESD0600S06	6	—	9	50	6	J098
NEW MP4ECD0600S06	6	—	9	50	6	J138
MS2SSD0600	6	—	9	50	6	J056
MS4SCD0600	6	—	9	50	6	J128
MSSHDD0600	6	—	9	50	6	J124
SED2060KMG	6	—	9	50	6	J089
SED2060KPG	6	—	9	50	6	J090
MS2MSD0600	6	—	12	50	6	J058
VFSDD0600	6	—	12	50	6	J165
VFSFPRD0600	6	—	12	50	6	J339
VQSVRD0600	6	—	12	70	6	J336
C2MAD0600	6	—	13	50	6	J092
CMRAD0600	6	—	13	50	6	J346
CRN2MSD0600S06	6	—	13	50	6	J085
MSMHDD0600	6	—	13	50	6	J126
VF6MHVD0600	6	—	13	50	6	J164
VQMHVD0600	6	—	13	50	6	J143

Order Number	DC	LU	APMX	LF	DCON	Page
MSMHZDD0600	6	—	13	60	6	J096
VQMHZVD0600	6	—	13	60	6	J104
VQMHZVOHD0600	6	—	13	60	6	J109
SEG4060SA	6	—	14	50	6	J162
MS2MDD0600	6	—	15	50	6	J060
MS4MCD0600	6	—	15	50	6	J130
VF2MDD0600	6	—	15	50	6	J079
VF2MVD0600	6	—	15	50	6	J081
VF4MDD0600	6	—	15	50	6	J153
VF4MVD0600	6	—	15	50	6	J155
MPMHVD0600	6	—	15	60	6	J118
VFMDD0600	6	—	15	60	6	J166
VFMFPRD0600	6	—	17	60	6	J342
MS2JSD0600	6	—	18	50	6	J062
C2MHAD0600	6	—	18	60	6	J094
CRN4JCD0600	6	—	20	60	6	J159
MPJHVD0600AP20	6	—	20	60	6	J122
DFC4JCD0600	6	—	20	70	6	J161
DFCJRTD0600	6	—	20	70	6	J170
DF4JCD0600	6	—	24	60	6	J160
MPJHVD0600AP24	6	—	24	60	6	J122
MS2LSD0600	6	—	24	60	6	J064
MS4JCD0600	6	—	24	60	6	J132
VQJHVD0600	6	—	24	60	6	J147
VCLDD0600	6	—	26	70	6	J168
MSSHDD0650	6.5	—	9.8	60	8	J124
MS2MSD0650	6.5	—	13	60	8	J058
MSMHDD0650	6.5	—	16	60	8	J126
MSMHZDD0650	6.5	—	16	60	8	J096
VQMHZVD0650	6.5	—	16	60	8	J104
MS4MCD0650	6.5	—	16.5	60	8	J130
MS2ESD0700L35S07	7	—	6	35	7	J077
MS3ESD0700L35S07	7	—	6	35	7	J101
MS4ECD0700L35S07	7	—	6	35	7	J141
MS2ESD0700L45S07	7	—	7	45	7	J077
MS3ESD0700L45S07	7	—	7	45	7	J101
MS4ECD0700L45S07	7	—	7	45	7	J141
SED2070KMG	7	—	10	60	8	J089
SED2070KPG	7	—	10	60	8	J090
NEW MP2ESD0700S07	7	—	10.5	50	7	J074
NEW MP3ESD0700S07	7	—	10.5	50	7	J098
NEW MP4ECD0700S07	7	—	10.5	50	7	J138
MS2SSD0700	7	—	10.5	60	8	J056
MSSHDD0700	7	—	10.5	60	8	J124
MS2MSD0700	7	—	14	60	8	J058
MSMHZDD0700	7	—	16	60	8	J096
VQMHZVD0700	7	—	16	60	8	J104
VFSFPRD0700	7	—	17	60	8	J339
VQSVRD0700	7	—	17	80	8	J336
MS4MCD0700	7	—	17.5	60	8	J130

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
MPMHVD0700	7	—	17.5	70	8	J118
MPMHVD0700S06	7	—	17.5	80	6	J118
MSMHDD0700	7	—	19	60	8	J126
VQMHVD0700	7	—	19	60	8	J143
VFMFPRD0700	7	—	22	75	8	J342
VQJHVD0700	7	—	25	80	8	J147
MSSHDD0750	7.5	—	11.3	60	8	J124
MS2MSD0750	7.5	—	15	60	8	J058
MSMHZDD0750	7.5	—	16	60	8	J096
VQMHZVD0750	7.5	—	16	60	8	J104
MS4MCD0750	7.5	—	19	60	8	J130
MSMHDD0750	7.5	—	19	60	8	J126
MS4XLD0800N300	8	30	8	90	8	J136
MS4XLD0800N500	8	50	8	110	8	J136
MS4XLD0800N700	8	70	8	130	8	J136
MS2ESD0800L35S07	8	—	6	35	7	J077
MS3ESD0800L35S07	8	—	6	35	7	J101
MS4ECD0800L35S07	8	—	6	35	7	J141
MS2ESD0800L35S08	8	—	6	35	8	J077
MS3ESD0800L35S08	8	—	6	35	8	J101
MS4ECD0800L35S08	8	—	6	35	8	J141
MS2ESD0800L45S07	8	—	8	45	7	J077
MS3ESD0800L45S07	8	—	8	45	7	J101
MS4ECD0800L45S07	8	—	8	45	7	J141
MS2ESD0800L45S08	8	—	8	45	8	J077
MS3ESD0800L45S08	8	—	8	45	8	J101
MS4ECD0800L45S08	8	—	8	45	8	J141
NEW MP4ECD0800S07	8	—	12	50	7	J138
NEW MP2ESD0800S08	8	—	12	50	8	J074
NEW MP3ESD0800S08	8	—	12	50	8	J098
NEW MP4ECD0800S08	8	—	12	50	8	J138
MS2SSD0800	8	—	12	60	8	J056
MS4SCD0800	8	—	12	60	8	J128
MSSHDD0800	8	—	12	60	8	J124
SED2080KMG	8	—	12	60	8	J089
SED2080KPG	8	—	12	60	8	J090
MS2MSD0800	8	—	16	60	8	J058
VFSDD0800	8	—	16	60	8	J165
VFSFPRD0800	8	—	17	60	8	J339
VQSVRD0800	8	—	17	80	8	J336
C2MAD0800	8	—	19	60	8	J092
CMRAD0800	8	—	19	60	8	J346
CRN2MSD0800S08	8	—	19	60	8	J085
MSMHDD0800	8	—	19	60	8	J126
SEG4080SA	8	—	19	60	8	J162
VF6MHVD0800	8	—	19	60	8	J164
VQMHVD0800	8	—	19	60	8	J143
MSMHZDD0800	8	—	19	70	8	J096
VQMHZVD0800	8	—	19	70	8	J104
VQMHZVOHD0800	8	—	19	70	8	J109

Order Number	DC	LU	APMX	LF	DCON	Page
MS2MDD0800	8	—	20	60	8	J060
MS4MCD0800	8	—	20	60	8	J130
VF4MDD0800	8	—	20	60	8	J153
VF4MVD0800	8	—	20	60	8	J155
MPMHVD0800	8	—	20	70	8	J118
C2MHAD0800	8	—	20	75	8	J094
VFMDD0800	8	—	20	75	8	J166
MPMHVD0800S06	8	—	20	90	6	J118
MS2JSD0800	8	—	24	70	8	J062
CRN4JCD0800	8	—	25	70	8	J159
MPJHVD0800AP26	8	—	26	80	8	J122
DF4JCD0800	8	—	28	70	8	J160
VFMFPRD0800	8	—	28	75	8	J342
VQJHVD0800	8	—	28	80	8	J147
DFC4JCD0800	8	—	30	80	8	J161
DFCJRTD0800	8	—	30	80	8	J170
MS2LSD0800	8	—	32	70	8	J064
MS4JCD0800	8	—	32	70	8	J132
MPJHVD0800AP32	8	—	32	80	8	J122
VCLDD0800	8	—	36	90	8	J168
MSSHDD0850	8.5	—	12.8	70	10	J124
MS2MSD0850	8.5	—	17	70	10	J058
MSMHDD0850	8.5	—	19	70	10	J126
MSMHZDD0850	8.5	—	19	70	10	J096
VQMHZVD0850	8.5	—	19	70	10	J104
MS4MCD0850	8.5	—	21.5	70	10	J130
NEW MP3ESD0900S10	9	—	13.5	50	10	J098
NEW MP4ECD0900S10	9	—	13.5	50	10	J138
MS2SSD0900	9	—	13.5	70	10	J056
MSSHDD0900	9	—	13.5	70	10	J124
MS2MSD0900	9	—	18	70	10	J058
MSMHZDD0900	9	—	19	70	10	J096
VQMHZVD0900	9	—	19	70	10	J104
MSMHDD0900	9	—	22	70	10	J126
VFSFPRD0900	9	—	22	70	10	J339
VQMHVD0900	9	—	22	70	10	J143
VQMHVD0900S08	9	—	22	75	8	J143
VQSVRD0900	9	—	22	90	10	J336
MS4MCD0900	9	—	22.5	70	10	J130
MPMHVD0900S08	9	—	22.5	90	8	J118
VFMFPRD0900	9	—	28	100	10	J342
VQJHVD0900	9	—	32	90	10	J147
MSSHDD0950	9.5	—	14.3	70	10	J124
MS2MSD0950	9.5	—	19	70	10	J058
MSMHZDD0950	9.5	—	19	70	10	J096
VQMHZVD0950	9.5	—	19	70	10	J104
MSMHDD0950	9.5	—	22	70	10	J126
MS4MCD0950	9.5	—	24	70	10	J130
CSRAD1000	10	25	12	75	10	J344
C3SAD1000N300	10	30	12	75	10	J116

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
C3SAD1000N350	10	35	12	100	10	J116
MS4XLD1000N400	10	40	10	100	10	J136
MS4XLD1000N600	10	60	10	120	10	J136
MS4XLD1000N800	10	80	10	140	10	J136
MS2ESD1000L35S07	10	—	6	35	7	J077
MS3ESD1000L35S07	10	—	6	35	7	J101
MS4ECD1000L35S07	10	—	6	35	7	J141
MS2ESD1000L35S10	10	—	6	35	10	J077
MS3ESD1000L35S10	10	—	6	35	10	J101
MS4ECD1000L35S10	10	—	6	35	10	J141
MS2ESD1000L45S07	10	—	10	45	7	J077
MS3ESD1000L45S07	10	—	10	45	7	J101
MS4ECD1000L45S07	10	—	10	45	7	J141
MS2ESD1000L45S10	10	—	10	45	10	J077
MS3ESD1000L45S10	10	—	10	45	10	J101
MS4ECD1000L45S10	10	—	10	45	10	J141
C3SAD1000A100S08	10	—	12	100	8	J116
NEW MP4ECD1000S07	10	—	15	50	7	J138
NEW MP2ESD1000S10	10	—	15	50	10	J074
NEW MP3ESD1000S10	10	—	15	50	10	J098
NEW MP4ECD1000S10	10	—	15	50	10	J138
SED2100KMG	10	—	15	65	10	J089
SED2100KPG	10	—	15	65	10	J090
MS2SSD1000	10	—	15	70	10	J056
MS4SCD1000	10	—	15	70	10	J128
MSSHDD1000	10	—	15	70	10	J124
MS2MSD1000	10	—	20	70	10	J058
VFSDD1000	10	—	20	70	10	J165
C2MAD1000	10	—	22	70	10	J092
CRN2MSD1000S10	10	—	22	70	10	J085
MSMHDD1000	10	—	22	70	10	J126
VF6MHVD1000	10	—	22	70	10	J164
VFSFPRD1000	10	—	22	70	10	J339
VQ6MHVCHD1000	10	—	22	70	10	J163
VQMHVD1000	10	—	22	70	10	J143
CMRAD1000	10	—	22	75	10	J346
MSMHZDD1000	10	—	22	80	10	J096
VQMHZVD1000	10	—	22	80	10	J104
VQMHZVOHD1000	10	—	22	80	10	J109
VFSFPRD1000S08	10	—	22	90	8	J339
VQSVRD1000S08	10	—	22	90	8	J336
VQSVRD1000	10	—	22	90	10	J336
VQMHVD1000S08	10	—	22	100	8	J143
SEG4100SA	10	—	24	70	10	J162
MS2MDD1000	10	—	25	70	10	J060
MS4MCD1000	10	—	25	70	10	J130
VF4MDD1000	10	—	25	70	10	J153
VF4MVD1000	10	—	25	70	10	J155
C2MHAD1000	10	—	25	75	10	J094
MPMHVD1000	10	—	25	80	10	J118

Order Number	DC	LU	APMX	LF	DCON	Page
VFMDD1000	10	—	25	80	10	J166
MPMHVD1000S08	10	—	25	100	8	J118
CRN4JCD1000	10	—	30	90	10	J159
DFC4JCD1000	10	—	30	90	10	J161
DFCJRTD1000	10	—	30	90	10	J170
MS2JSD1000	10	—	30	90	10	J062
MPJHVD1000AP33	10	—	33	100	10	J122
VFMFPRD1000	10	—	34	100	10	J342
DF4JCD1000	10	—	35	90	10	J160
VQJHVD1000	10	—	35	90	10	J147
MS2LSD1000	10	—	40	90	10	J064
MS4JCD1000	10	—	40	90	10	J132
MPJHVD1000AP40	10	—	40	100	10	J122
VCLDD1000	10	—	46	100	10	J168
MS2SSD1100	11	—	16.5	75	12	J056
MSSHDD1100	11	—	16.5	75	12	J124
MS2MSD1100	11	—	22	75	12	J058
MSMHZDD1100	11	—	22	80	12	J096
VQMHZVD1100	11	—	22	80	12	J104
MSMHDD1100	11	—	26	75	12	J126
VQMHVD1100	11	—	26	75	12	J143
VQMHVD1100S10	11	—	26	100	10	J143
MS4MCD1100	11	—	27.5	75	12	J130
MPMHVD1100S10	11	—	28	100	10	J118
C3SAD1200N300	12	30	15	75	12	J116
CSRAD1200	12	30	15	75	12	J344
C3SAD1200N350	12	35	15	100	12	J116
NEW A3SA120N36C	12	36	18	80	12	J113
NEW DLC3SA120N36C	12	36	18	80	12	J114
C3SAD1200N400	12	40	15	125	12	J116
MS2ESD1200L35S10	12	—	6	35	10	J077
MS3ESD1200L35S10	12	—	6	35	10	J101
MS4ECD1200L35S10	12	—	6	35	10	J141
MS2ESD1200L45S10	12	—	12	45	10	J077
MS3ESD1200L45S10	12	—	12	45	10	J101
MS4ECD1200L45S10	12	—	12	45	10	J141
NEW MP3ESD1200S10	12	—	15	50	10	J098
NEW MP4ECD1200S10	12	—	15	50	10	J138
NEW MP3ESD1200S12	12	—	15	50	12	J098
NEW MP4ECD1200S12	12	—	15	50	12	J138
SED2120KMG	12	—	15	65	12	J089
SED2120KPG	12	—	15	65	12	J090
C3SAD1200A150S10	12	—	15	150	10	J116
MS2SSD1200	12	—	18	75	12	J056
MS4SCD1200	12	—	18	75	12	J128
MSSHDD1200	12	—	18	75	12	J124
MS2MSD1200	12	—	24	75	12	J058
VFSDD1200	12	—	24	75	12	J165
C2MHAD1200	12	—	25	75	12	J094
MSMHDD1200S10	12	—	26	75	10	J126

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/SQUARE

Order Number	DC	LU	APMX	LF	DCON	Page
C2MAD1200	12	—	26	75	12	J092
CMRAD1200	12	—	26	75	12	J346
CRN2MSD1200S12	12	—	26	75	12	J085
MSMHDD1200	12	—	26	75	12	J126
VF6MHVD1200	12	—	26	75	12	J164
VQ6MHVCHD1200	12	—	26	75	12	J163
VQMHVD1200	12	—	26	75	12	J143
MSMHZDD1200	12	—	26	90	12	J096
VQMHZVD1200	12	—	26	90	12	J104
VQMHZVOHD1200	12	—	26	90	12	J109
VQMHVD1200S10	12	—	26	110	10	J143
VFSFPRD1200	12	—	27	75	12	J339
VFSFPRD1200S10	12	—	27	100	10	J339
VQSVRD1200S10	12	—	27	100	10	J336
VQSVRD1200	12	—	27	100	12	J336
SEG4120SA	12	—	29	75	12	J162
CRN4JCD1200	12	—	30	90	12	J159
MS2MDD1200	12	—	30	90	12	J060
MS4MCD1200	12	—	30	90	12	J130
VF4MDD1200	12	—	30	90	12	J153
VF4MVD1200	12	—	30	90	12	J155
DFC4JCD1200	12	—	30	100	12	J161
DFCJRTD1200	12	—	30	100	12	J170
MPMHVD1200	12	—	30	100	12	J118
VFMDD1200	12	—	30	100	12	J166
MPMHVD1200S10	12	—	30	110	10	J118
MS2JSD1200	12	—	36	90	12	J062
DF4JCD1200	12	—	36	110	12	J160
VQJHVD1200	12	—	40	100	12	J147
MPJHVD1200AP40	12	—	40	110	12	J122
VFMFPRD1200	12	—	40	110	12	J342
MPJHVD1200AP48	12	—	48	110	12	J122
MS2LSD1200	12	—	48	110	12	J064
MS4JCD1200	12	—	48	110	12	J132
VCLDD1200	12	—	56	110	12	J168
MSSHDD1300	13	—	19.5	75	12	J124
MSMHDD1300	13	—	26	75	12	J126
VQMHVD1300	13	—	26	75	12	J143
MSMHZDD1300	13	—	26	90	12	J096
VQMHZVD1300	13	—	26	90	12	J104
VQMHVD1300S12	13	—	26	110	12	J143
MPMHVD1300S12	13	—	32	110	12	J118
MS4ECD1400L45S10	14	—	14	45	10	J141
NEW MP4ECD1400S10	14	—	15	50	10	J138
SED2140KMG	14	—	15	70	16	J089
SED2140KPG	14	—	15	70	16	J090
MSSHDD1400	14	—	21	90	16	J124
C2MAD1400	14	—	26	75	12	J092
MSMHZDD1400	14	—	26	90	12	J096
VQMHZVD1400	14	—	26	90	12	J104
VFSFPRD1400	14	—	27	75	12	J339
VQSVRD1400	14	—	27	130	12	J336
MSMHDD1400	14	—	30	90	16	J126
VQMHVD1400	14	—	30	90	16	J143
C2MHAD1400	14	—	32	75	12	J094
VQMHVD1400S12	14	—	32	130	12	J143
MS4MCD1400	14	—	35	90	12	J130
VFMDD1400	14	—	35	105	12	J166
MPMHVD1400S12	14	—	35	130	12	J118
SED2150KMG	15	—	15	70	16	J089
SED2150KPG	15	—	15	70	16	J090
MSSHDD1500	15	—	22.5	90	16	J124
MSMHZDD1500	15	—	26	110	16	J096
VQMHZVD1500	15	—	26	110	16	J104
C2MAD1500	15	—	30	80	16	J092
MSMHDD1500	15	—	35	90	16	J126
VFMDD1500	15	—	40	110	16	J166
C3SAD1600N300	16	30	15	75	16	J116
CSRAD1600	16	35	18	100	16	J344
C3SAD1600N400	16	40	15	100	16	J116
C3SAD1600N450	16	45	15	125	16	J116
NEW A3SA160N48C	16	48	24	90	16	J113
NEW DLC3SA160N48C	16	48	24	90	16	J114
SED2160KMG	16	—	15	70	16	J089
SED2160KPG	16	—	15	70	16	J090
C3SAD1600A200S14	16	—	15	200	14	J116
MSSHDD1600	16	—	24	90	16	J124
MSMHZDD1600	16	—	30	110	16	J096
VQMHZVD1600	16	—	30	110	16	J104
VQMHZVOHD1600	16	—	30	110	16	J109
C2MAD1600	16	—	32	90	16	J092
MS2MSD1600	16	—	32	90	16	J058
VF6MHVD1600	16	—	32	90	16	J164
VF8MHVCHD1600	16	—	32	90	16	J169
VQ6MHVCHD1600	16	—	32	90	16	J163
C2MHAD1600	16	—	32	100	16	J094
CMRAD1600	16	—	32	100	16	J346
VF6SVRCHD1600	16	—	33	90	16	J343
VFSFPRCHD1600	16	—	33	90	16	J341
VFSFPRD1600	16	—	33	90	16	J339
VQSVRD1600	16	—	33	125	16	J336
MSMHDD1600	16	—	35	90	16	J126
VFMHVCHD1600	16	—	35	90	16	J156
VQMHVD1600	16	—	35	90	16	J143
SEG4160SA	16	—	38	90	16	J162
MS4MCD1600	16	—	40	100	16	J130
VF4MDD1600	16	—	40	100	16	J153
VF4MVD1600	16	—	40	100	16	J155
MPMHVD1600	16	—	40	110	16	J118
VFMDD1600	16	—	40	110	16	J166

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	LU	APMX	LF	DCON	Page
VFMFPRD1600	16	—	48	125	16	J342
MPJHVD1600AP53	16	—	53	125	16	J122
VQJHVD1600	16	—	55	125	16	J147
MPJHVD1600AP64	16	—	64	125	16	J122
VCLDD1600	16	—	66	130	16	J168
C3SAD1700A150S16	17	—	18	150	16	J116
MSSHDD1700	17	—	25.5	100	16	J124
MSMHDD1700	17	—	35	100	16	J126
C3SAD1800A200S16	18	—	18	200	16	J116
CSRAD1800	18	—	22	100	16	J344
MSSHDD1800	18	—	27	100	16	J124
C2MAD1800	18	—	32	90	16	J092
VFSFPRD1800	18	—	33	90	16	J339
VQSVRD1800	18	—	33	150	16	J336
MS2MSD1800	18	—	36	90	16	J058
MSMHDD1800	18	—	40	100	16	J126
VQMHVD1800	18	—	40	100	16	J143
VFMDD1800	18	—	40	120	16	J166
VQMHVD1800S16	18	—	42	150	16	J143
MS4MCD1800	18	—	45	100	16	J130
MPMHVD1800S16	18	—	45	150	16	J118
MSSHDD1900	19	—	28.5	110	20	J124
MSMHDD1900	19	—	40	110	20	J126
C3SAD2000N400	20	40	20	100	20	J116
CSRAD2000	20	50	25	125	20	J344
NEW A3SA200N55C	20	55	30	100	20	J113
NEW DLC3SA200N55C	20	55	30	100	20	J114
C3SAD2000N600	20	60	20	125	20	J116
C3SAD2000N850	20	85	20	150	20	J116
C3SAD2000A200S18	20	—	20	200	18	J116
MSSHDD2000	20	—	30	110	20	J124
MSMHZDD2000	20	—	32	140	20	J096
VQMHZVD2000	20	—	32	140	20	J104
C2MAD2000	20	—	38	100	20	J092
VF6MHVD2000	20	—	38	100	20	J164
VF6SVRCHD2000	20	—	38	100	20	J343
VF8MHVCHD2000	20	—	38	100	20	J169
VFSFPRCHD2000	20	—	38	100	20	J341
VFSFPRD2000	20	—	38	100	20	J339
VQ6MHVCHD2000	20	—	38	100	20	J163
C2MHAD2000	20	—	38	125	20	J094
CMRAD2000	20	—	38	125	20	J346
VQSVRD2000	20	—	38	140	20	J336
MS2MSD2000	20	—	40	100	20	J058
MSMHDD2000	20	—	45	110	20	J126
VFMHVCHD2000	20	—	45	110	20	J156
VQMHVD2000	20	—	45	110	20	J143
VFMDD2000	20	—	45	125	20	J166
SEG4200SA	20	—	48	110	20	J162
MS4MCD2000	20	—	50	110	20	J130

Order Number	DC	LU	APMX	LF	DCON	Page
VF4MDD2000	20	—	50	110	20	J153
VF4MVD2000	20	—	50	110	20	J155
MPMHVD2000	20	—	50	125	20	J118
VFMFPRD2000	20	—	57	140	20	J342
MPJHVD2000AP66	20	—	66	140	20	J122
VQJHVD2000	20	—	70	140	20	J147
VCLDD2000	20	—	76	140	20	J168
MPJHVD2000AP80	20	—	80	140	20	J122
CSRAD2200	22	—	25	125	20	J344
VFMDD2200	22	—	45	135	20	J166
MSMHDD2200	22	—	50	125	20	J126
MPMHVD2200S20	22	—	55	160	20	J118
C3SAD2500N500	25	50	20	100	25	J116
NEW A3SA250N55C	25	55	37.5	100	25	J113
NEW DLC3SA250N55C	25	55	37.5	100	25	J114
CSRAD2500	25	60	30	125	25	J344
C3SAD2500N650	25	65	20	125	25	J116
C3SAD2500N900	25	90	20	150	25	J116
C2MHAD2500	25	—	38	125	25	J094
CMRAD2500	25	—	45	125	25	J346
MSMHDD2500	25	—	55	125	25	J126
VQMHVD2500	25	—	55	125	25	J143
SEG4250SA	25	—	59	125	25	J162
VFMDD2500	25	—	60	160	25	J166
VCLDD2500	25	—	92	180	25	J168
C3SAD2600A200S25	26	—	20	200	25	J116

DC = Cutting diameter LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0005N003	0.05	0.3	0.08	50	4	J177
MP2XLBR0005N005	0.05	0.5	0.08	50	4	J177
VFR2SBR0010	0.1	0.4	0.2	45	4	J191
VFR2SBR0010S06	0.1	0.4	0.2	50	6	J191
DC2XLBR0010N005	0.1	0.5	0.12	50	4	J215
MP2XLBR0010N005	0.1	0.5	0.15	50	4	J177
NEW VFR2XLBR0010N005	0.1	0.5	0.15	50	4	J195
VF2XLBR0010N005S04	0.1	0.5	0.16	50	4	J202
VF2XLBR0010N005S06	0.1	0.5	0.16	50	6	J202
MP2XLBR0010N008	0.1	0.75	0.15	50	4	J177
VF2XLBR0010N008S04	0.1	0.75	0.16	50	4	J202
MP2XLBR0010N010	0.1	1	0.15	50	4	J177
NEW VFR2XLBR0010N010	0.1	1	0.15	50	4	J195
VF2XLBR0010N010S04	0.1	1	0.16	50	4	J202
VF2XLBR0010N010S06	0.1	1	0.16	50	6	J202
MP2XLBR0010N013	0.1	1.25	0.15	50	4	J177
VF2XLBR0010N013S04	0.1	1.25	0.16	50	4	J202
MP2XLBR0010N015	0.1	1.5	0.15	50	4	J177
VF2XLBR0010N015S04	0.1	1.5	0.16	50	4	J202
VF2XLBR0010N015S06	0.1	1.5	0.16	50	6	J202
MP2XLBR0010N018	0.1	1.75	0.15	50	4	J177
VF2XLBR0010N018S04	0.1	1.75	0.16	50	4	J202
MP2XLBR0010N020	0.1	2	0.15	50	4	J177
VF2XLBR0010N020S04	0.1	2	0.16	50	4	J202
MP2XLBR0010N025	0.1	2.5	0.15	50	4	J177
VF2XLBR0010N025S04	0.1	2.5	0.16	50	4	J202
DC2SBR0010	0.1	—	0.12	50	4	J213
MP2SSBR0010	0.1	—	0.2	40	4	J171
MP2SBR0010	0.1	—	0.3	45	4	J172
MP2XLBR0015N005	0.15	0.5	0.24	50	4	J177
VFR2SBR0015	0.15	0.6	0.3	45	4	J191
VFR2SBR0015S06	0.15	0.6	0.3	50	6	J191
MP2XLBR0015N008	0.15	0.75	0.24	50	4	J177
MP2XLBR0015N010	0.15	1	0.24	50	4	J177
VF2XLBR0015N010S04	0.15	1	0.24	50	4	J202
NEW VFR2XLBR0015N010	0.15	1	0.24	50	4	J195
MP2XLBR0015N010S06	0.15	1	0.24	50	6	J177
VF2XLBR0015N010S06	0.15	1	0.24	50	6	J202
CRN2XLBR0015N010S04	0.15	1	0.3	50	4	J210
MP2XLBR0015N013	0.15	1.25	0.24	50	4	J177
VF2XLBR0015N013S04	0.15	1.25	0.24	50	4	J202
MP2XLBR0015N013S06	0.15	1.25	0.24	50	6	J177
MP2XLBR0015N015	0.15	1.5	0.24	50	4	J177
VF2XLBR0015N015S04	0.15	1.5	0.24	50	4	J202
NEW VFR2XLBR0015N015	0.15	1.5	0.24	50	4	J195
MP2XLBR0015N015S06	0.15	1.5	0.24	50	6	J177
VF2XLBR0015N015S06	0.15	1.5	0.24	50	6	J202
CRN2XLBR0015N015S04	0.15	1.5	0.3	50	4	J210
MP2XLBR0015N018	0.15	1.75	0.24	50	4	J177
VF2XLBR0015N018S04	0.15	1.75	0.24	50	4	J202

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0015N020	0.15	2	0.24	50	4	J177
VF2XLBR0015N020S04	0.15	2	0.24	50	4	J202
NEW VFR2XLBR0015N020	0.15	2	0.24	50	4	J195
VF2XLBR0015N020S06	0.15	2	0.24	50	6	J202
CRN2XLBR0015N020S04	0.15	2	0.3	50	4	J210
DF2XLBR0015N020	0.15	2	0.3	50	4	J217
MP2XLBR0015N025	0.15	2.5	0.24	50	4	J177
VF2XLBR0015N025S04	0.15	2.5	0.24	50	4	J202
MP2XLBR0015N030	0.15	3	0.24	50	4	J177
VF2XLBR0015N030S04	0.15	3	0.24	50	4	J202
MP2XLBR0015N035	0.15	3.5	0.24	50	4	J177
MP2XLBR0015N040	0.15	4	0.24	50	4	J177
VF2XLBR0015N040S04	0.15	4	0.24	50	4	J202
MP2SBR0015	0.15	—	0.5	45	4	J172
MP2XLBR0020N005	0.2	0.5	0.3	50	4	J177
MP2XLBR0020N008	0.2	0.75	0.3	50	4	J177
VFR2SBR0020	0.2	0.8	0.4	45	4	J191
VFR2SBR0020S06	0.2	0.8	0.4	50	6	J191
DC2XLBR0020N010	0.2	1	0.24	50	4	J215
MP2XLBR0020N010	0.2	1	0.3	50	4	J177
NEW VFR2XLBR0020N010	0.2	1	0.3	50	4	J195
MP2XLBR0020N010S06	0.2	1	0.3	50	6	J177
VF2XLBSR0020N010	0.2	1	0.32	40	4	J200
VF2XLBR0020N010S04	0.2	1	0.32	50	4	J202
VF2XLBR0020N010S06	0.2	1	0.32	50	6	J202
CRN2XLBR0020N010S04	0.2	1	0.4	50	4	J210
MP2XLBR0020N015	0.2	1.5	0.3	50	4	J177
NEW VFR2XLBR0020N015	0.2	1.5	0.3	50	4	J195
VF2XLBR0020N015S04	0.2	1.5	0.32	50	4	J202
VF2XLBR0020N015S06	0.2	1.5	0.32	50	6	J202
CRN2XLBR0020N015S04	0.2	1.5	0.4	50	4	J210
MP2XLBR0020N020	0.2	2	0.3	50	4	J177
NEW VFR2XLBR0020N020	0.2	2	0.3	50	4	J195
MP2XLBR0020N020S06	0.2	2	0.3	50	6	J177
VF2XLBSR0020N020	0.2	2	0.32	40	4	J200
VF2XLBR0020N020S04	0.2	2	0.32	50	4	J202
VF2XLBR0020N020S06	0.2	2	0.32	50	6	J202
CRN2XLBR0020N020S04	0.2	2	0.4	50	4	J210
MP2XLBR0020N025	0.2	2.5	0.3	50	4	J177
NEW VFR2XLBR0020N025	0.2	2.5	0.3	50	4	J195
VF2XLBR0020N025S04	0.2	2.5	0.32	50	4	J202
VF2XLBR0020N025S06	0.2	2.5	0.32	50	6	J202
MP2XLBR0020N030	0.2	3	0.3	50	4	J178
NEW VFR2XLBR0020N030	0.2	3	0.3	50	4	J195
VF2XLBSR0020N030	0.2	3	0.32	40	4	J200
VF2XLBR0020N030S04	0.2	3	0.32	50	4	J202
VF2XLBR0020N030S06	0.2	3	0.32	50	6	J202
CRN2XLBR0020N030S04	0.2	3	0.4	50	4	J210
MP2XLBR0020N035	0.2	3.5	0.3	50	4	J178
MP2XLBR0020N040	0.2	4	0.3	50	4	J178

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	RE	LU	APMX	LF	DCON	Page
NEW VFR2XLBR0020N040	0.2	4	0.3	50	4	J195
VF2XLBSR0020N040	0.2	4	0.32	40	4	J200
VF2XLBR0020N040S04	0.2	4	0.32	50	4	J202
DF2XLBR0020N040	0.2	4	0.6	60	4	J217
MP2XLBR0020N045	0.2	4.5	0.3	50	4	J178
MP2XLBR0020N050	0.2	5	0.3	50	4	J178
VF2XLBR0020N050S04	0.2	5	0.32	50	4	J202
MP2XLBR0020N055	0.2	5.5	0.3	50	4	J178
MP2XLBR0020N060	0.2	6	0.3	50	4	J178
DF2XLBR0020N080	0.2	8	0.6	60	4	J217
DC2SBR0020	0.2	—	0.24	50	4	J213
MP2SSBR0020	0.2	—	0.4	40	4	J171
MP2SBR0020	0.2	—	0.6	45	4	J172
MP2SBR0020S06	0.2	—	0.6	50	6	J172
CRN2MBR0020S04	0.2	—	0.8	45	4	J208
MP2XLBR0025N010	0.25	1	0.37	50	4	J178
MP2XLBR0025N015	0.25	1.5	0.37	50	4	J178
NEW VFR2XLBR0025N015	0.25	1.5	0.37	50	4	J195
MP2XLBR0025N015S06	0.25	1.5	0.37	50	6	J178
VF2XLBR0025N015S04	0.25	1.5	0.4	50	4	J203
VF2XLBR0025N015S06	0.25	1.5	0.4	50	6	J203
CRN2XLBR0025N015S04	0.25	1.5	0.5	50	4	J210
MP2XLBR0025N020	0.25	2	0.37	50	4	J178
NEW VFR2XLBR0025N020	0.25	2	0.37	50	4	J195
MP2XLBR0025N020S06	0.25	2	0.37	50	6	J178
VF2XLBR0025N020S04	0.25	2	0.4	50	4	J203
VF2XLBR0025N020S06	0.25	2	0.4	50	6	J203
CRN2XLBR0025N020S04	0.25	2	0.5	50	4	J210
MP2XLBR0025N025	0.25	2.5	0.37	50	4	J178
NEW VFR2XLBR0025N025	0.25	2.5	0.37	50	4	J195
MP2XLBR0025N025S06	0.25	2.5	0.37	50	6	J178
VF2XLBR0025N025S04	0.25	2.5	0.4	50	4	J203
MP2XLBR0025N030	0.25	3	0.37	50	4	J178
NEW VFR2XLBR0025N030	0.25	3	0.37	50	4	J195
MP2XLBR0025N030S06	0.25	3	0.37	50	6	J178
VF2XLBR0025N030S04	0.25	3	0.4	50	4	J203
VF2XLBR0025N030S06	0.25	3	0.4	50	6	J203
CRN2XLBR0025N030S04	0.25	3	0.5	50	4	J210
CRN2XLBR0025N030S06	0.25	3	0.5	50	6	J210
MP2XLBR0025N035	0.25	3.5	0.37	50	4	J178
VF2XLBR0025N035S04	0.25	3.5	0.4	50	4	J203
MP2XLBR0025N040	0.25	4	0.37	50	4	J178
NEW VFR2XLBR0025N040	0.25	4	0.37	50	4	J195
VF2XLBSR0025N040	0.25	4	0.4	40	4	J200
VF2XLBR0025N040S04	0.25	4	0.4	50	4	J203
VF2XLBR0025N040S06	0.25	4	0.4	50	6	J203
CRN2XLBR0025N040S04	0.25	4	0.5	50	4	J210
DF2XLBR0025N040	0.25	4	0.6	60	4	J217
MP2XLBR0025N045	0.25	4.5	0.37	50	4	J178
MP2XLBR0025N050	0.25	5	0.37	50	4	J178

Order Number	RE	LU	APMX	LF	DCON	Page
VF2XLBR0025N050S04	0.25	5	0.4	50	4	J203
VF2XLBR0025N050S06	0.25	5	0.4	50	6	J203
MP2XLBR0025N055	0.25	5.5	0.37	50	4	J178
MP2XLBR0025N060	0.25	6	0.37	50	4	J178
VF2XLBSR0025N060	0.25	6	0.4	40	4	J200
VF2XLBR0025N060S04	0.25	6	0.4	50	4	J203
VF2XLBR0025N060S06	0.25	6	0.4	60	6	J203
CRN2XLBR0025N060S04	0.25	6	0.5	50	4	J210
MP2XLBR0025N070	0.25	7	0.37	50	4	J178
MP2XLBR0025N080	0.25	8	0.37	50	4	J178
CRN2XLBR0025N080S04	0.25	8	0.5	50	4	J210
DF2XLBR0025N080	0.25	8	0.6	60	4	J217
MP2XLBR0025N090	0.25	9	0.37	50	4	J178
MP2XLBR0025N100	0.25	10	0.37	50	4	J178
MP2SBR0025	0.25	—	0.8	45	4	J172
MP2MBR0025	0.25	—	1	45	4	J173
VFR2SBR0030	0.3	1.2	0.6	45	4	J191
VFR2SBR0030S06	0.3	1.2	0.6	50	6	J191
DC2XLBR0030N015	0.3	1.5	0.36	50	4	J215
MP2XLBR0030N015	0.3	1.5	0.45	50	4	J178
MP2XLBR0030N015S06	0.3	1.5	0.45	50	6	J178
MP2XLBR0030N020	0.3	2	0.45	50	4	J178
NEW VFR2XLBR0030N020	0.3	2	0.45	50	4	J195
MP2XLBR0030N020S06	0.3	2	0.45	50	6	J178
NEW VFR2XLBR0030N020S06	0.3	2	0.45	50	6	J195
VF2XLBSR0030N020	0.3	2	0.48	40	4	J200
VF2XLBR0030N020S04	0.3	2	0.48	50	4	J203
VF2XLBR0030N020S06	0.3	2	0.48	50	6	J203
CRN2XLBR0030N020S04	0.3	2	0.6	50	4	J210
MP2XLBR0030N025	0.3	2.5	0.45	50	4	J178
VF2XLBR0030N025S04	0.3	2.5	0.48	50	4	J203
MP2XLBR0030N030	0.3	3	0.45	50	4	J178
NEW VFR2XLBR0030N030	0.3	3	0.45	50	4	J195
MP2XLBR0030N030S06	0.3	3	0.45	50	6	J178
NEW VFR2XLBR0030N030S06	0.3	3	0.45	50	6	J195
VF2XLBSR0030N030	0.3	3	0.48	40	4	J200
VF2XLBR0030N030S04	0.3	3	0.48	50	4	J203
VF2XLBR0030N030S06	0.3	3	0.48	50	6	J203
MP2XLBR0030N035	0.3	3.5	0.45	50	4	J178
VF2XLBR0030N035S04	0.3	3.5	0.48	50	4	J203
MP2XLBR0030N040	0.3	4	0.45	50	4	J178
NEW VFR2XLBR0030N040	0.3	4	0.45	50	4	J195
MP2XLBR0030N040S06	0.3	4	0.45	50	6	J178
VF2XLBSR0030N040	0.3	4	0.48	40	4	J200
VF2XLBR0030N040S04	0.3	4	0.48	50	4	J203
VF2XLBR0030N040S06	0.3	4	0.48	50	6	J203
CRN2XLBR0030N040S04	0.3	4	0.6	50	4	J210
MP2XLBR0030N045	0.3	4.5	0.45	50	4	J178
MP2XLBR0030N050	0.3	5	0.45	50	4	J178
NEW VFR2XLBR0030N050	0.3	5	0.45	50	4	J195

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0030N050S06	0.3	5	0.45	50	6	J178
VF2XLBR0030N050S04	0.3	5	0.48	50	4	J203
VF2XLBR0030N050S06	0.3	5	0.48	50	6	J203
VC4STBR0030T0130N05	0.3	5	1	60	6	J324
VC4STBR0030T0200N05	0.3	5	1	60	6	J324
VC4STBR0030T0500N05	0.3	5	1	60	6	J324
MP2XLBR0030N055	0.3	5.5	0.45	50	4	J178
MP2XLBR0030N060	0.3	6	0.45	50	4	J178
NEW VFR2XLBR0030N060	0.3	6	0.45	50	4	J195
MP2XLBR0030N060S06	0.3	6	0.45	50	6	J178
VF2XLBSR0030N060	0.3	6	0.48	40	4	J200
VF2XLBR0030N060S04	0.3	6	0.48	50	4	J203
VF2XLBR0030N060S06	0.3	6	0.48	50	6	J203
CRN2XLBR0030N060S04	0.3	6	0.6	50	4	J210
DF2XLBR0030N060	0.3	6	0.9	60	4	J217
MP2XLBR0030N065	0.3	6.5	0.45	50	4	J178
MP2XLBR0030N070	0.3	7	0.45	50	4	J178
VF2XLBR0030N070S04	0.3	7	0.48	50	4	J203
MP2XLBR0030N080	0.3	8	0.45	50	4	J178
MP2XLBR0030N080S06	0.3	8	0.45	50	6	J178
VF2XLBR0030N080S04	0.3	8	0.48	50	4	J203
VF2XLBR0030N080S06	0.3	8	0.48	60	6	J203
CRN2XLBR0030N080S04	0.3	8	0.6	50	4	J210
MP2XLBR0030N085	0.3	8.5	0.45	50	4	J178
MP2XLBR0030N090	0.3	9	0.45	50	4	J178
MP2XLBR0030N095	0.3	9.5	0.45	50	4	J178
DF2XLBFR0030N100	0.3	10	0.45	50	4	J220
MP2XLBR0030N100	0.3	10	0.45	50	4	J178
CRN2XLBR0030N100S04	0.3	10	0.6	50	4	J210
DF2XLBR0030N100	0.3	10	0.9	60	4	J217
MP2XLBR0030N110	0.3	11	0.45	50	4	J179
MP2XLBR0030N120	0.3	12	0.45	50	4	J179
VC4STBR0030T1000N15	0.3	15	1	60	6	J324
DC2SBR0030	0.3	—	0.42	50	4	J213
MP2SSBR0030	0.3	—	0.6	40	4	J171
MP2SBR0030	0.3	—	0.9	45	4	J172
MP2SBR0030S06	0.3	—	0.9	50	6	J172
CRN2MBR0030S04	0.3	—	1.2	45	4	J208
MP2MBR0030	0.3	—	1.2	45	4	J173
MP2SBR0035	0.35	—	1.1	45	4	J172
VF3XBR0040T0024L006	0.4	1.5	0.5	60	4	J228
VF3XBR0040T0024L008	0.4	1.5	0.5	60	4	J228
VF3XBR0040T0024L012	0.4	1.5	0.5	60	4	J228
VF3XBR0040T0054L008	0.4	1.5	0.5	60	4	J228
VF3XBR0040T0054L012	0.4	1.5	0.5	60	4	J228
VF3XBR0040T0054L016	0.4	1.5	0.5	60	4	J228
VFR2SBR0040	0.4	1.6	0.8	45	4	J191
VFR2SBR0040S06	0.4	1.6	0.8	50	6	J191
DC2XLBR0040N020	0.4	2	0.48	50	4	J215
MP2XLBR0040N020	0.4	2	0.6	50	4	J179

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0040N020S06	0.4	2	0.6	50	6	J179
VF2XLBR0040N020S04	0.4	2	0.64	50	4	J203
VF2XLBR0040N020S06	0.4	2	0.64	50	6	J203
CRN2XLBR0040N020S04	0.4	2	0.8	50	4	J210
MP2XLBR0040N024S06	0.4	2.4	0.6	50	6	J179
MP2XLBR0040N030	0.4	3	0.6	50	4	J179
NEW VFR2XLBR0040N030	0.4	3	0.6	50	4	J195
MP2XLBR0040N030S06	0.4	3	0.6	50	6	J179
VF2XLBR0040N030S04	0.4	3	0.64	50	4	J203
VF2XLBR0040N030S06	0.4	3	0.64	50	6	J203
MP2XLBR0040N040	0.4	4	0.6	50	4	J179
NEW VFR2XLBR0040N040	0.4	4	0.6	50	4	J195
MP2XLBR0040N040S06	0.4	4	0.6	50	6	J179
VF2XLBSR0040N040	0.4	4	0.64	40	4	J200
VF2XLBR0040N040S04	0.4	4	0.64	50	4	J203
VF2XLBR0040N040S06	0.4	4	0.64	50	6	J203
CRN2XLBR0040N040S04	0.4	4	0.8	50	4	J210
MP2XLBR0040N050	0.4	5	0.6	50	4	J179
VF2XLBR0040N050S04	0.4	5	0.64	50	4	J203
MP2XLBR0040N060	0.4	6	0.6	50	4	J179
NEW VFR2XLBR0040N060	0.4	6	0.6	50	4	J195
VF2XLBSR0040N060	0.4	6	0.64	40	4	J200
VF2XLBR0040N060S04	0.4	6	0.64	50	4	J203
VF2XLBR0040N060S06	0.4	6	0.64	50	6	J203
CRN2XLBR0040N060S04	0.4	6	0.8	50	4	J210
MP2XLBR0040N070	0.4	7	0.6	50	4	J179
VF2XLBR0040N070S04	0.4	7	0.64	50	4	J203
MP2XLBR0040N080	0.4	8	0.6	50	4	J179
NEW VFR2XLBR0040N080	0.4	8	0.6	50	4	J195
VF2XLBR0040N080S04	0.4	8	0.64	50	4	J203
VF2XLBR0040N080S06	0.4	8	0.64	50	6	J203
CRN2XLBR0040N080S04	0.4	8	0.8	50	4	J210
DF2XLBR0040N080	0.4	8	1.2	60	4	J217
MP2XLBR0040N090	0.4	9	0.6	50	4	J179
MP2XLBR0040N100	0.4	10	0.6	50	4	J179
VF2XLBR0040N100S04	0.4	10	0.64	50	4	J203
VF2XLBR0040N100S06	0.4	10	0.64	60	6	J203
CRN2XLBR0040N100S04	0.4	10	0.8	50	4	J210
VC4STBR0040T0130N10	0.4	10	2	60	6	J324
VC4STBR0040T0200N10	0.4	10	2	60	6	J324
VC4STBR0040T0500N10	0.4	10	2	60	6	J324
VC4STBR0040T0700N10	0.4	10	7	60	6	J324
MP2XLBR0040N120	0.4	12	0.6	50	4	J179
VC4STBR0040T0130N15	0.4	15	2	60	6	J324
VC4STBR0040T1000N15	0.4	15	3	60	6	J324
DC2SBR0040	0.4	—	0.56	50	4	J213
MP2SSBR0040	0.4	—	0.8	40	4	J171
MP2SBR0040	0.4	—	1.2	45	4	J172
MP2SBR0040S06	0.4	—	1.2	50	6	J172
CRN2MBR0040S04	0.4	—	1.6	45	4	J208

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	RE	LU	APMX	LF	DCON	Page
MP2MBR0040	0.4	—	1.6	45	4	J173
MP2SBR0045	0.45	—	1.4	45	4	J172
VFR2SSBR0050S04	0.5	2	1	40	4	J189
VFR2SSBR0050	0.5	2	1	40	6	J189
MP2SDBR0050	0.5	2	1	45	4	J175
VFR2SBFR0050	0.5	2	1	45	4	J193
VFR2SBR0050	0.5	2	1	45	4	J191
VFR2SBR0050S06	0.5	2	1	50	6	J191
MP3XBR0050N008T05	0.5	2.3	0.8	60	6	J222
MP3XBR0050N010T10	0.5	2.3	0.8	60	6	J222
MP3XBR0050N010T15	0.5	2.3	0.8	60	6	J222
MP3XBR0050N010T30	0.5	2.3	0.8	60	6	J222
MP3XBR0050N012T05	0.5	2.3	0.8	60	6	J222
MP3XBR0050N016T05	0.5	2.3	0.8	60	6	J222
MP3XBR0050N016T10	0.5	2.3	0.8	60	6	J222
MP3XBR0050N016T15	0.5	2.3	0.8	60	6	J222
MP3XBR0050N020T05	0.5	2.3	0.8	60	6	J222
MP3XBR0050N020T10	0.5	2.3	0.8	60	6	J222
MP3XBR0050N020T15	0.5	2.3	0.8	60	6	J222
MP3XBR0050N020T30	0.5	2.3	0.8	60	6	J222
MP3XBR0050N025T50	0.5	2.3	0.8	60	6	J222
VF3XBR0050T0024L008	0.5	2.3	0.8	60	6	J228
VF3XBR0050T0024L010	0.5	2.3	0.8	60	6	J228
VF3XBR0050T0024L012	0.5	2.3	0.8	60	6	J228
VF3XBR0050T0054L008	0.5	2.3	0.8	60	6	J228
VF3XBR0050T0054L012	0.5	2.3	0.8	60	6	J228
VF3XBR0050T0130L012	0.5	2.3	0.8	60	6	J228
MP3XBR0050N023T15	0.5	2.3	0.8	70	6	J222
MP3XBR0050N025T05	0.5	2.3	0.8	70	6	J222
MP3XBR0050N025T10	0.5	2.3	0.8	70	6	J222
MP3XBR0050N025T15	0.5	2.3	0.8	70	6	J222
MP3XBR0050N030T05	0.5	2.3	0.8	70	6	J222
MP3XBR0050N030T10	0.5	2.3	0.8	70	6	J222
MP3XBR0050N030T30	0.5	2.3	0.8	70	6	J222
VF3XBR0050T0024L016	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0024L020	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0024L025	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0054L016	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0054L020	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0054L025	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0130L016	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0130L020	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0130L025	0.5	2.3	0.8	70	6	J228
VF3XBR0050T0024L030	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0024L035	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0054L030	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0054L035	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0054L040	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0130L030	0.5	2.3	0.8	80	6	J228
VF3XBR0050T0130L035	0.5	2.3	0.8	80	6	J228

Order Number	RE	LU	APMX	LF	DCON	Page
MP3XBR0050N035T10	0.5	2.3	0.8	90	6	J222
MP3XBR0050N042T30	0.5	2.3	0.8	90	6	J222
MP3XBR0050N050T05	0.5	2.3	0.8	90	6	J222
MP3XBR0050N050T10	0.5	2.3	0.8	90	6	J222
VF3XBR0050T0054L050	0.5	2.3	0.8	110	6	J228
VF3XBR0050T0054L060	0.5	2.3	0.8	110	6	J228
VF3XBR0050T0054L070	0.5	2.3	0.8	110	6	J228
DC2XLBR0050N025	0.5	2.5	0.6	50	4	J215
MP2XLBR0050N030	0.5	3	0.75	50	4	J179
NEW VFR2XLBR0050N030	0.5	3	0.75	50	4	J195
MP2XLBR0050N030S06	0.5	3	0.75	50	6	J179
NEW VFR2XLBR0050N030S06	0.5	3	0.75	50	6	J195
VF2XLBSR0050N030	0.5	3	0.8	40	4	J200
VF2XLBR0050N030S04	0.5	3	0.8	50	4	J203
VF2XLBR0050N030S06	0.5	3	0.8	50	6	J203
CRN2XLBR0050N030S04	0.5	3	1	50	4	J210
MP2XLBR0050N040	0.5	4	0.75	50	4	J179
NEW VFR2XLBR0050N040	0.5	4	0.75	50	4	J195
MP2XLBR0050N040S06	0.5	4	0.75	50	6	J179
NEW VFR2XLBR0050N040S06	0.5	4	0.75	50	6	J195
VF2XLBSR0050N040	0.5	4	0.8	40	4	J200
VF2XLBR0050N040S04	0.5	4	0.8	50	4	J203
VF2XLBR0050N040S06	0.5	4	0.8	50	6	J203
CRN2XLBR0050N040S04	0.5	4	1	50	4	J210
NEW VQN2MBR0050	0.5	4	1	60	6	J185
DF2XLBR0050N040	0.5	4	1.5	60	4	J217
DC2XLBR0050N050	0.5	5	0.6	50	4	J215
MP2XLBR0050N050	0.5	5	0.75	50	4	J179
MP2XLBR0050N050S06	0.5	5	0.75	50	6	J179
VF2XLBR0050N050S04	0.5	5	0.8	50	4	J203
VF2XLBR0050N050S06	0.5	5	0.8	50	6	J203
CRN2XLBR0050N050S04	0.5	5	1	50	4	J210
CRN2XLBR0050N050S06	0.5	5	1	50	6	J210
MP2XLBR0050N060	0.5	6	0.75	50	4	J179
NEW VFR2XLBR0050N060	0.5	6	0.75	50	4	J195
MP2XLBR0050N060S06	0.5	6	0.75	50	6	J179
NEW VFR2XLBR0050N060S06	0.5	6	0.75	50	6	J196
VF2XLBSR0050N060	0.5	6	0.8	40	4	J200
VF2XLBR0050N060S04	0.5	6	0.8	50	4	J203
VF2XLBR0050N060S06	0.5	6	0.8	50	6	J203
NEW VQ4WBR0050N06E280	0.5	6	0.88	50	4	J236
CRN2XLBR0050N060S04	0.5	6	1	50	4	J210
CRN2XLBR0050N060S06	0.5	6	1	50	6	J210
MP2XLBR0050N070	0.5	7	0.75	50	4	J179
VF2XLBR0050N070S04	0.5	7	0.8	50	4	J203
MP2XLBR0050N080	0.5	8	0.75	50	4	J179
NEW VFR2XLBR0050N080	0.5	8	0.75	50	4	J196
NEW VQ2XLBR0050N080	0.5	8	0.75	50	4	J187
MP2XLBR0050N080S06	0.5	8	0.75	50	6	J179
NEW VQ2XLBR0050N080S06	0.5	8	0.75	50	6	J187

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
VF2XLBSR0050N080	0.5	8	0.8	40	4	J200
VF2XLBR0050N080S04	0.5	8	0.8	50	4	J204
VF2XLBR0050N080S06	0.5	8	0.8	50	6	J204
CRN2XLBR0050N080S04	0.5	8	1	50	4	J210
CRN2XLBR0050N080S06	0.5	8	1	50	6	J210
MP2XLBR0050N090	0.5	9	0.75	50	4	J179
VF2XLBR0050N090S04	0.5	9	0.8	50	4	J204
MP2XLBR0050N100	0.5	10	0.75	50	4	J179
NEW VFR2XLBR0050N100	0.5	10	0.75	50	4	J196
NEW VQ2XLBR0050N100	0.5	10	0.75	50	4	J187
NEW VQ2XLBR0050N100S06	0.5	10	0.75	55	6	J187
MP2XLBR0050N100S06	0.5	10	0.75	60	6	J179
VF2XLBR0050N100S04	0.5	10	0.8	50	4	J204
VF2XLBR0050N100S06	0.5	10	0.8	50	6	J204
CRN2XLBR0050N100S04	0.5	10	1	50	4	J210
DF2XLBR0050N100	0.5	10	1.5	60	4	J217
VC4STBR0050T0130N10	0.5	10	2	60	6	J324
VC4STBR0050T0200N10	0.5	10	2	60	6	J324
VC4STBR0050T0500N10	0.5	10	3	60	6	J324
VC4STBR0050T0700N10	0.5	10	7	60	6	J324
MP2XLBR0050N120	0.5	12	0.75	50	4	J179
NEW VFR2XLBR0050N120	0.5	12	0.75	50	4	J196
NEW VQ2XLBR0050N120S06	0.5	12	0.75	55	6	J187
MP2XLBR0050N120S06	0.5	12	0.75	60	6	J179
VF2XLBR0050N120S04	0.5	12	0.8	50	4	J204
VF2XLBR0050N120S06	0.5	12	0.8	60	6	J204
CRN2XLBR0050N120S04	0.5	12	1	50	4	J210
DF2XLBFR0050N120	0.5	12	1.5	50	4	J220
DF2XLBR0050N120	0.5	12	1.5	60	4	J217
MP2XLBR0050N140	0.5	14	0.75	55	4	J179
VF2XLBR0050N140S04	0.5	14	0.8	60	4	J204
VC4STBR0050T1000N14	0.5	14	3	60	6	J324
VC4STBR0050T0130N15	0.5	15	2	60	6	J324
VC4STBR0050T0200N15	0.5	15	2	60	6	J324
VC4STBR0050T0500N15	0.5	15	3	60	6	J324
VC4STBR0050T0700N15	0.5	15	7	60	6	J324
MP2XLBR0050N160	0.5	16	0.75	55	4	J179
MP2XLBR0050N160S06	0.5	16	0.75	65	6	J179
VF2XLBR0050N160S04	0.5	16	0.8	60	4	J204
VF2XLBR0050N160S06	0.5	16	0.8	70	6	J204
CRN2XLBR0050N160S04	0.5	16	1	55	4	J211
DF2XLBFR0050N160	0.5	16	1.5	50	4	J220
DF2XLBR0050N160	0.5	16	1.5	80	4	J217
MP2XLBR0050N180	0.5	18	0.75	55	4	J179
VF2XLBR0050N180S04	0.5	18	0.8	60	4	J204
MP2XLBR0050N200	0.5	20	0.75	55	4	J179
MP2XLBR0050N200S06	0.5	20	0.75	65	6	J179
VF2XLBR0050N200S04	0.5	20	0.8	60	4	J204
VF2XLBR0050N200S06	0.5	20	0.8	70	6	J204
CRN2XLBR0050N200S04	0.5	20	1	55	4	J211

Order Number	RE	LU	APMX	LF	DCON	Page
DF2XLBFR0050N200	0.5	20	1.5	50	4	J220
DF2XLBR0050N200	0.5	20	1.5	80	4	J217
VC4STBR0050T0130N20	0.5	20	2	60	6	J324
VC4STBR0050T0200N20	0.5	20	3	60	6	J324
VC4STBR0050T0500N20	0.5	20	3	60	6	J324
VC4STBR0050T0700N20	0.5	20	7	60	6	J324
DF2XLBR0050N300	0.5	30	1.5	80	4	J217
DC2SBR0050	0.5	—	0.7	50	4	J213
MP2SSBR0050	0.5	—	1	40	4	J171
MP2SSBR0050S06	0.5	—	1	40	6	J171
MP2SBR0050	0.5	—	1.5	45	4	J172
MP2SBR0050S06	0.5	—	1.5	50	6	J172
CRN2MBR0050S04	0.5	—	2.5	45	4	J208
MP2MBR0050	0.5	—	2.5	45	4	J173
CRN2MBR0050S06	0.5	—	2.5	50	6	J208
VF4MBR0050	0.5	—	2.5	50	6	J243
C4LATBR050T040AP20	0.5	—	20	70	6	J330
NEW DLC4LATBR050T040AP20	0.5	—	20	70	6	J328
VFR2SBR0060	0.6	2.4	1.2	45	4	J191
VFR2SBR0060S06	0.6	2.4	1.2	50	6	J191
MP2XLBR0060N060	0.6	6	0.9	50	4	J179
MP2XLBR0060N060S06	0.6	6	0.9	55	6	J179
VF2XLBR0060N060S04	0.6	6	0.96	50	4	J204
VF2XLBR0060N060S06	0.6	6	0.96	50	6	J204
MP2XLBR0060N080	0.6	8	0.9	50	4	J179
MP2XLBR0060N080S06	0.6	8	0.9	55	6	J179
VF2XLBR0060N080S04	0.6	8	0.96	50	4	J204
VF2XLBR0060N080S06	0.6	8	0.96	50	6	J204
MP2XLBR0060N100	0.6	10	0.9	50	4	J179
MP2XLBR0060N100S06	0.6	10	0.9	55	6	J179
VF2XLBR0060N100S04	0.6	10	0.96	50	4	J204
VF2XLBR0060N100S06	0.6	10	0.96	50	6	J204
MP2XLBR0060N120	0.6	12	0.9	50	4	J179
MP2XLBR0060N120S06	0.6	12	0.9	65	6	J179
VF2XLBR0060N120S04	0.6	12	0.96	50	4	J204
VF2XLBR0060N120S06	0.6	12	0.96	50	6	J204
MP2XLBR0060N140	0.6	14	0.9	55	4	J179
VF2XLBR0060N140S04	0.6	14	0.96	60	4	J204
MP2XLBR0060N160	0.6	16	0.9	55	4	J179
MP2XLBR0060N160S06	0.6	16	0.9	65	6	J179
VF2XLBR0060N160S04	0.6	16	0.96	60	4	J204
VF2XLBR0060N160S06	0.6	16	0.96	70	6	J204
MP2XLBR0060N180	0.6	18	0.9	60	4	J179
MP2XLBR0060N200	0.6	20	0.9	60	4	J180
MP2XLBR0060N240	0.6	24	0.9	60	4	J180
MP2SBR0060	0.6	—	1.8	45	4	J172
MP2MBR0060	0.6	—	2.5	45	4	J173
NEW VQ4WBR0065N08E280	0.65	8	1.14	50	4	J236
VFR2SBR0070	0.7	2.8	1.4	45	4	J191
VFR2SBR0070S06	0.7	2.8	1.4	50	6	J191

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0070N080	0.7	8	1.05	50	4	J180
VF2XLBR0070N080S04	0.7	8	1.12	50	4	J204
MP2XLBR0070N120	0.7	12	1.05	50	4	J180
VF2XLBR0070N120S04	0.7	12	1.12	50	4	J204
MP2XLBR0070N160	0.7	16	1.05	50	4	J180
VF2XLBR0070N160S04	0.7	16	1.12	60	4	J204
MP2SBR0070	0.7	—	2.1	45	4	J172
MP2MBR0070	0.7	—	3	45	4	J173
MP3XBR0075N010T05	0.75	2.7	1.2	60	6	J222
MP3XBR0075N010T10	0.75	2.7	1.2	60	6	J222
MP3XBR0075N010T15	0.75	2.7	1.2	60	6	J223
MP3XBR0075N016T05	0.75	2.7	1.2	60	6	J222
MP3XBR0075N016T10	0.75	2.7	1.2	60	6	J222
MP3XBR0075N016T15	0.75	2.7	1.2	60	6	J223
MP3XBR0075N020T05	0.75	2.7	1.2	60	6	J222
MP3XBR0075N020T10	0.75	2.7	1.2	60	6	J222
MP3XBR0075N020T15	0.75	2.7	1.2	60	6	J223
MP3XBR0075N025T15	0.75	2.7	1.2	80	6	J223
MP3XBR0075N030T05	0.75	2.7	1.2	80	6	J222
MP3XBR0075N030T10	0.75	2.7	1.2	80	6	J222
MP3XBR0075N030T15	0.75	2.7	1.2	80	6	J223
MP3XBR0075N046T30	0.75	2.7	1.2	80	6	J223
VF3XBR0075T0024L010	0.75	2.8	1.3	60	6	J228
VF3XBR0075T0024L015	0.75	2.8	1.3	60	6	J228
VF3XBR0075T0054L015	0.75	2.8	1.3	60	6	J229
VF3XBR0075T0130L015	0.75	2.8	1.3	60	6	J229
VF3XBR0075T0024L020	0.75	2.8	1.3	70	6	J228
VF3XBR0075T0054L020	0.75	2.8	1.3	70	6	J229
VF3XBR0075T0130L020	0.75	2.8	1.3	70	6	J229
VF3XBR0075T0024L030	0.75	2.8	1.3	80	6	J229
VF3XBR0075T0054L030	0.75	2.8	1.3	80	6	J229
VF3XBR0075T0054L040	0.75	2.8	1.3	80	6	J229
VF3XBR0075T0130L030	0.75	2.8	1.3	80	6	J229
MP2XLBR0075N030	0.75	3	1.1	50	4	J180
VFR2SSBR0075S04	0.75	3	1.5	40	4	J189
VFR2SSBR0075	0.75	3	1.5	40	6	J189
VFR2SBFR0075	0.75	3	1.5	45	4	J193
VFR2SBR0075	0.75	3	1.5	45	4	J191
MP2SDBR0075S06	0.75	3	1.5	50	6	J175
VFR2SBR0075S06	0.75	3	1.5	50	6	J191
DC2XLBR0075N038	0.75	3.8	0.9	50	4	J215
MP2XLBR0075N040	0.75	4	1.1	50	4	J180
MP2XLBR0075N060	0.75	6	1.1	50	4	J180
NEW VFR2XLBR0075N060	0.75	6	1.1	50	4	J196
MP2XLBR0075N060S06	0.75	6	1.1	50	6	J180
NEW VFR2XLBR0075N060S06	0.75	6	1.1	50	6	J196
VF2XLBR0075N060S04	0.75	6	1.2	50	4	J204
VF2XLBR0075N060S06	0.75	6	1.2	50	6	J204
MP2XLBR0075N080	0.75	8	1.1	50	4	J180
NEW VFR2XLBR0075N080	0.75	8	1.1	50	4	J196

Order Number	RE	LU	APMX	LF	DCON	Page
NEW VFR2XLBR0075N080S06	0.75	8	1.1	50	6	J196
MP2XLBR0075N080S06	0.75	8	1.1	60	6	J180
VF2XLBR0075N080S04	0.75	8	1.2	50	4	J204
VF2XLBR0075N080S06	0.75	8	1.2	50	6	J204
CRN2XLBR0075N080S04	0.75	8	1.5	50	4	J211
CRN2XLBR0075N080S06	0.75	8	1.5	50	6	J211
MP2XLBR0075N100	0.75	10	1.1	50	4	J180
NEW VFR2XLBR0075N100	0.75	10	1.1	50	4	J196
NEW VQ2XLBR0075N100S06	0.75	10	1.1	55	6	J187
MP2XLBR0075N100S06	0.75	10	1.1	60	6	J180
VF2XLBR0075N100S04	0.75	10	1.2	50	4	J204
VF2XLBR0075N100S06	0.75	10	1.2	50	6	J204
CRN2XLBR0075N100S04	0.75	10	1.5	50	4	J211
CRN2XLBR0075N100S06	0.75	10	1.5	50	6	J211
VC4STBR0075T0200N10	0.75	10	3	60	6	J324
MP2XLBR0075N120	0.75	12	1.1	50	4	J180
NEW VFR2XLBR0075N120	0.75	12	1.1	50	4	J196
NEW VQ2XLBR0075N120S06	0.75	12	1.1	55	6	J187
MP2XLBR0075N120S06	0.75	12	1.1	60	6	J180
VF2XLBR0075N120S04	0.75	12	1.2	50	4	J204
VF2XLBR0075N120S06	0.75	12	1.2	50	6	J204
NEW VFR2XLBR0075N140	0.75	14	1.1	50	4	J196
MP2XLBR0075N140	0.75	14	1.1	55	4	J180
VF2XLBR0075N140S04	0.75	14	1.2	50	4	J204
VF2XLBR0075N140S06	0.75	14	1.2	50	6	J204
VC4STBR0075T0500N15	0.75	15	3	60	6	J324
MP2XLBR0075N160	0.75	16	1.1	55	4	J180
NEW VFR2XLBR0075N160	0.75	16	1.1	60	4	J196
MP2XLBR0075N160S06	0.75	16	1.1	60	6	J180
VF2XLBR0075N160S04	0.75	16	1.2	60	4	J204
VF2XLBR0075N160S06	0.75	16	1.2	60	6	J204
CRN2XLBR0075N160S04	0.75	16	1.5	55	4	J211
DF2XLBR0075N160	0.75	16	2.3	80	4	J217
MP2XLBR0075N180	0.75	18	1.1	60	4	J180
VF2XLBR0075N180S04	0.75	18	1.2	60	4	J204
MP2XLBR0075N200	0.75	20	1.1	60	4	J180
VF2XLBR0075N200S04	0.75	20	1.2	60	4	J204
VF2XLBR0075N200S06	0.75	20	1.2	70	6	J204
MP2XLBR0075N220	0.75	22	1.1	60	4	J180
DC2SBR0075	0.75	—	1	50	4	J213
MP2SSBR0075	0.75	—	1.5	40	4	J171
MP2SSBR0075S06	0.75	—	1.5	40	6	J171
MP2SBR0075	0.75	—	2.3	45	4	J172
MP2SBR0075S06	0.75	—	2.3	50	6	J172
CRN2MBR0075S04	0.75	—	4	45	4	J208
MP2MBR0075	0.75	—	4	45	4	J173
VFR2SBR0080	0.8	3.2	1.6	45	4	J191
VFR2SBR0080S06	0.8	3.2	1.6	50	6	J191
MP2XLBR0080N080	0.8	8	1.2	55	4	J180
VF2XLBR0080N080S04	0.8	8	1.28	50	4	J204

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
MP2XLBR0080N120	0.8	12	1.2	55	4	J180
VF2XLBR0080N120S04	0.8	12	1.28	50	4	J204
MP2XLBR0080N160	0.8	16	1.2	55	4	J180
VF2XLBR0080N160S04	0.8	16	1.28	60	4	J204
MP2XLBR0080N200	0.8	20	1.2	55	4	J180
VF2XLBR0080N200S04	0.8	20	1.28	60	4	J204
MP2SBR0080	0.8	—	2.4	45	4	J172
MP2MBR0080	0.8	—	4	45	4	J173
VFR2SBR0090	0.9	3.6	1.8	45	4	J191
VFR2SBR0090S06	0.9	3.6	1.8	50	6	J191
NEW VQ4WBR0090N06E280	0.9	6	1.58	50	4	J236
MP2XLBR0090N080	0.9	8	1.4	55	4	J180
VF2XLBR0090N080S04	0.9	8	1.44	50	4	J204
MP2XLBR0090N120	0.9	12	1.4	55	4	J180
VF2XLBR0090N120S04	0.9	12	1.44	50	4	J204
MP2XLBR0090N160	0.9	16	1.4	55	4	J180
VF2XLBR0090N160S04	0.9	16	1.44	60	4	J204
MP2XLBR0090N200	0.9	20	1.4	55	4	J180
VF2XLBR0090N200S04	0.9	20	1.44	60	4	J204
MP2SBR0090	0.9	—	2.7	45	4	J172
MP2MBR0090	0.9	—	5	45	4	J173
MP3XBR0100N016T05	1	3.6	1.6	60	6	J223
MP3XBR0100N016T10	1	3.6	1.6	60	6	J223
MP3XBR0100N016T15	1	3.6	1.6	60	6	J223
MP3XBR0100N020T05	1	3.6	1.6	60	6	J223
MP3XBR0100N020T10	1	3.6	1.6	60	6	J223
MP3XBR0100N020T15	1	3.6	1.6	60	6	J223
MP3XBR0100N020T30	1	3.6	1.6	60	6	J223
MP3XBR0100N027T50	1	3.6	1.6	60	6	J223
MP3XBR0100N025T10	1	3.6	1.6	70	6	J223
MP3XBR0100N025T15	1	3.6	1.6	70	6	J223
MP3XBR0100N030T05	1	3.6	1.6	70	6	J223
MP3XBR0100N030T10	1	3.6	1.6	70	6	J223
MP3XBR0100N030T15	1	3.6	1.6	70	6	J223
MP3XBR0100N030T30	1	3.6	1.6	70	6	J223
VF3XBR0100T0024L016	1	3.6	1.6	70	6	J229
VF3XBR0100T0024L020	1	3.6	1.6	70	6	J229
VF3XBR0100T0024L025	1	3.6	1.6	70	6	J229
VF3XBR0100T0054L020	1	3.6	1.6	70	6	J229
VF3XBR0100T0054L025	1	3.6	1.6	70	6	J229
VF3XBR0100T0130L025	1	3.6	1.6	70	6	J229
MP3XBR0100N035T05	1	3.6	1.6	80	6	J223
MP3XBR0100N035T10	1	3.6	1.6	80	6	J223
MP3XBR0100N035T15	1	3.6	1.6	80	6	J223
MP3XBR0100N040T05	1	3.6	1.6	80	6	J223
MP3XBR0100N040T10	1	3.6	1.6	80	6	J223
MP3XBR0100N040T15	1	3.6	1.6	80	6	J223
MP3XBR0100N042T30	1	3.6	1.6	80	6	J223
VF3XBR0100T0024L030	1	3.6	1.6	80	6	J229
VF3XBR0100T0024L035	1	3.6	1.6	80	6	J229

Order Number	RE	LU	APMX	LF	DCON	Page
VF3XBR0100T0024L040	1	3.6	1.6	80	6	J229
VF3XBR0100T0054L030	1	3.6	1.6	80	6	J229
VF3XBR0100T0054L035	1	3.6	1.6	80	6	J229
VF3XBR0100T0054L040	1	3.6	1.6	80	6	J229
VF3XBR0100T0130L030	1	3.6	1.6	80	6	J229
VF3XBR0100T0130L035	1	3.6	1.6	80	6	J229
VF3XBR0100T0130L040	1	3.6	1.6	80	6	J229
MP3XBR0100N050T10	1	3.6	1.6	110	6	J223
MP3XBR0100N070T10	1	3.6	1.6	110	6	J223
VF3XBR0100T0054L050	1	3.6	1.6	110	6	J229
VF3XBR0100T0054L060	1	3.6	1.6	110	6	J229
VF3XBR0100T0054L070	1	3.6	1.6	110	6	J229
MP2XLBR0100N040	1	4	1.5	50	4	J180
MP2XLBR0100N040S06	1	4	1.5	50	6	J180
VFR2SSBR0100	1	4	2	45	6	J189
MP2SDBR0100	1	4	2	50	4	J175
VFR2SBR0100	1	4	2	50	4	J191
MP2SDBR0100S06	1	4	2	60	6	J175
VFR2SBFR0100	1	4	2	60	6	J193
VFR2SBR0100S06	1	4	2	60	6	J191
VQ4SVBR0100	1	5	3	50	6	J234
DC2XLBR0100N060	1	6	1.2	50	4	J215
VF2WBR0100N060	1	6	1.3	60	6	J199
MP2XLBR0100N060	1	6	1.5	50	4	J180
NEW VFR2XLBR0100N060	1	6	1.5	50	4	J196
MP2XLBR0100N060S06	1	6	1.5	50	6	J180
NEW VFR2XLBR0100N060S06	1	6	1.5	50	6	J196
VF2XLBSR0100N060	1	6	1.6	40	4	J200
VF2XLBR0100N060S04	1	6	1.6	50	4	J204
VF2XLBR0100N060S06	1	6	1.6	50	6	J204
NEW VQ4WBR0100N06E280	1	6	1.76	60	6	J236
NEW VQN2MBR0100	1	6	2	60	6	J185
NEW VQN4MBFR0100	1	6	2	60	6	J241
NEW VQN4MBR0100	1	6	2	60	6	J239
VC4STBR0100T0200N06	1	6	4	60	6	J324
MP2XLBR0100N080	1	8	1.5	50	4	J180
NEW VFR2XLBR0100N080	1	8	1.5	50	4	J196
MP2XLBR0100N080S06	1	8	1.5	50	6	J180
NEW VFR2XLBR0100N080S06	1	8	1.5	50	6	J196
VF2XLBSR0100N080	1	8	1.6	40	4	J200
VF2XLBR0100N080S04	1	8	1.6	50	4	J205
VF2XLBR0100N080S06	1	8	1.6	50	6	J205
CRN2XLBR0100N080S04	1	8	2	50	4	J211
DC2XLBR0100N100	1	10	1.2	50	4	J215
MP2XLBR0100N100	1	10	1.5	50	4	J180
NEW VFR2XLBR0100N100	1	10	1.5	50	4	J196
NEW VQ2XLBR0100N100	1	10	1.5	50	4	J187
MP2XLBR0100N100S06	1	10	1.5	50	6	J180
NEW VFR2XLBR0100N100S06	1	10	1.5	50	6	J196
NEW VQ2XLBR0100N100S06	1	10	1.5	55	6	J187

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	RE	LU	APMX	LF	DCON	Page
VF2XLBSR0100N100	1	10	1.6	40	4	J200
VF2XLBR0100N100S04	1	10	1.6	50	4	J205
VF2XLBR0100N100S06	1	10	1.6	50	6	J205
CRN2XLBR0100N100S04	1	10	2	50	4	J211
CRN2XLBR0100N100S06	1	10	2	50	6	J211
VC4STBR0100T0130N10	1	10	4	60	6	J324
VC4STBR0100T0200N10	1	10	4	60	6	J324
VC4STBR0100T0500N10	1	10	4	60	6	J324
MP2XLBR0100N120	1	12	1.5	50	4	J180
NEW VFR2XLBR0100N120	1	12	1.5	50	4	J196
NEW VQ2XLBR0100N120	1	12	1.5	50	4	J187
NEW VFR2XLBR0100N120S06	1	12	1.5	50	6	J196
NEW VQ2XLBR0100N120S06	1	12	1.5	55	6	J187
MP2XLBR0100N120S06	1	12	1.5	60	6	J180
VF2XLBR0100N120S04	1	12	1.6	50	4	J205
VF2XLBR0100N120S06	1	12	1.6	50	6	J205
CRN2XLBR0100N120S04	1	12	2	50	4	J211
CRN2XLBR0100N120S06	1	12	2	50	6	J211
VC4STBR0100T1000N12	1	12	4	60	6	J325
MP2XLBR0100N140	1	14	1.5	55	4	J180
MP2XLBR0100N140S06	1	14	1.5	60	6	J180
VF2XLBR0100N140S04	1	14	1.6	50	4	J205
VF2XLBR0100N140S06	1	14	1.6	50	6	J205
CRN2XLBR0100N140S06	1	14	2	55	6	J211
VC4STBR0100T0130N15	1	15	4	60	6	J324
VC4STBR0100T0200N15	1	15	4	60	6	J324
VC4STBR0100T0500N15	1	15	4	60	6	J324
MP2XLBR0100N160	1	16	1.5	55	4	J180
NEW VFR2XLBR0100N160	1	16	1.5	60	4	J196
NEW VFR2XLBR0100N160S06	1	16	1.5	60	6	J196
MP2XLBR0100N160S06	1	16	1.5	65	6	J180
VF2XLBR0100N160S04	1	16	1.6	60	4	J205
VF2XLBR0100N160S06	1	16	1.6	60	6	J205
CRN2XLBR0100N160S04	1	16	2	55	4	J211
DF2XLBFR0100N160	1	16	3	50	4	J220
DF2XLBR0100N160	1	16	3	80	4	J217
VC4STBR0100T0700N17	1	17	7	60	6	J325
MP2XLBR0100N180	1	18	1.5	55	4	J180
MP2XLBR0100N180S06	1	18	1.5	65	6	J180
VF2XLBR0100N180S04	1	18	1.6	60	4	J205
VF2XLBR0100N180S06	1	18	1.6	60	6	J205
NEW VFR2XLBR0100N200	1	20	1.5	60	4	J196
NEW VFR2XLBR0100N200S06	1	20	1.5	60	6	J196
MP2XLBR0100N200	1	20	1.5	65	4	J180
MP2XLBR0100N200S06	1	20	1.5	65	6	J180
VF2XLBR0100N200S04	1	20	1.6	60	4	J205
VF2XLBR0100N200S06	1	20	1.6	60	6	J205
CRN2XLBR0100N200S04	1	20	2	60	4	J211
DF2XLBFR0100N200	1	20	3	50	4	J220
DF2XLBR0100N200	1	20	3	80	4	J217

Order Number	RE	LU	APMX	LF	DCON	Page
VC4STBR0100T0130N20	1	20	4	60	6	J324
MP2XLBR0100N220	1	22	1.5	65	4	J180
VF2XLBR0100N220S04	1	22	1.6	60	4	J205
VC4STBR0100T0500N23	1	23	4	60	6	J324
MP2XLBR0100N250	1	25	1.5	65	4	J180
MP2XLBR0100N250S06	1	25	1.5	90	6	J180
VF2XLBR0100N250S04	1	25	1.6	70	4	J205
VF2XLBR0100N250S06	1	25	1.6	70	6	J205
CRN2XLBR0100N250S06	1	25	2	65	6	J211
DF2XLBR0100N250	1	25	3	80	4	J217
MP2XLBR0100N300	1	30	1.5	80	4	J181
MP2XLBR0100N300S06	1	30	1.5	90	6	J181
VF2XLBR0100N300S04	1	30	1.6	70	4	J205
VF2XLBR0100N300S06	1	30	1.6	80	6	J205
CRN2XLBR0100N300S06	1	30	2	70	6	J211
MP2XLBR0100N350	1	35	1.5	80	4	J181
MP2XLBR0100N350S06	1	35	1.5	90	6	J181
VF2XLBR0100N350S04	1	35	1.6	80	4	J205
MP2XLBR0100N400	1	40	1.5	80	4	J181
MP2XLBR0100N400S06	1	40	1.5	90	6	J181
DF2XLBR0100N400	1	40	3	100	4	J217
DC2SBR0100	1	—	1.4	50	4	J213
MP2SSBR0100	1	—	2	45	6	J171
MP2SBR0100	1	—	3	50	4	J172
MP2SBR0100S06	1	—	3	50	6	J172
MP2MBR0100	1	—	6	50	4	J173
CRN2MBR0100S06	1	—	6	50	6	J208
VF4MBR0100	1	—	6	60	6	J243
C4LATBR100T040AP20	1	—	20	70	6	J330
NEW DLC4LATBR100T040AP20	1	—	20	70	6	J328
VF3XBR0125T0054L020	1.25	4.5	2	60	6	J229
VF3XBR0125T0130L020	1.25	4.5	2	60	6	J229
VF3XBR0125T0054L030	1.25	4.5	2	80	6	J229
VF3XBR0125T0054L040	1.25	4.5	2	80	6	J229
VF3XBR0125T0130L030	1.25	4.5	2	80	6	J229
VF3XBR0125T0130L040	1.25	4.5	2	80	6	J229
VFR2SBFR0125	1.25	5	2.5	60	6	J193
VFR2SBR0125S06	1.25	5	2.5	60	6	J191
MP2XLBR0125N100	1.25	10	1.9	55	4	J181
NEW VFR2XLBR0125N100	1.25	10	1.9	60	4	J196
VF2XLBR0125N100S06	1.25	10	2	60	6	J205
MP2XLBR0125N150	1.25	15	1.9	55	4	J181
NEW VFR2XLBR0125N150	1.25	15	1.9	60	4	J196
VF2XLBR0125N150S06	1.25	15	2	60	6	J205
VC4STBR0125T0500N15	1.25	15	4	60	6	J325
MP2XLBR0125N200	1.25	20	1.9	55	4	J181
VF2XLBR0125N200S06	1.25	20	2	70	6	J205
MP2XLBR0125N250	1.25	25	1.9	70	4	J181
VF2XLBR0125N250S06	1.25	25	2	70	6	J205
MP2XLBR0125N300	1.25	30	1.9	70	4	J181

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
VF2XLBR0125N300S06	1.25	30	2	80	6	J205
MP2XLBR0125N350	1.25	35	1.9	70	4	J181
VF2XLBR0125N350S06	1.25	35	2	80	6	J205
MP2SBR0125	1.25	—	3.8	50	4	J172
MP2MBR0125	1.25	—	6	50	4	J173
NEW VQ4WBR0140N16E280	1.4	16	2.47	60	6	J236
VF3XBR0150T0024L020	1.5	5	2	60	6	J229
VF3XBR0150T0054L020	1.5	5	2	60	6	J229
VF3XBR0150T0024L025	1.5	5	2	80	6	J229
VF3XBR0150T0024L030	1.5	5	2	80	6	J229
VF3XBR0150T0024L040	1.5	5	2	80	6	J229
VF3XBR0150T0054L030	1.5	5	2	80	6	J229
VF3XBR0150T0054L040	1.5	5	2	80	6	J229
VF3XBR0150T0130L040	1.5	5	2	80	6	J229
VF3XBR0150T0024L050	1.5	5	2	100	6	J229
VF3XBR0150T0054L050	1.5	5	2	100	6	J229
VF3XBR0150T0054L060	1.5	5	2	110	8	J229
VF3XBR0150T0130L050	1.5	5	2	110	8	J229
VF3XBR0150T0130L060	1.5	5	2	110	8	J229
VF3XBR0150T0054L070	1.5	5	2	120	8	J229
VF3XBR0150T0130L070	1.5	5	2	120	8	J229
MP3XBR0150N010T05	1.5	5.4	2.4	60	6	J223
MP3XBR0150N020T05	1.5	5.4	2.4	60	6	J223
MP3XBR0150N020T10	1.5	5.4	2.4	60	6	J223
MP3XBR0150N020T15	1.5	5.4	2.4	60	6	J223
MP3XBR0150N025T30	1.5	5.4	2.4	60	6	J223
MP3XBR0150N030T05	1.5	5.4	2.4	70	6	J223
MP3XBR0150N030T10	1.5	5.4	2.4	70	6	J223
MP3XBR0150N030T15	1.5	5.4	2.4	70	6	J223
MP3XBR0150N034T30	1.5	5.4	2.4	70	6	J223
MP3XBR0150N035T15	1.5	5.4	2.4	70	6	J223
MP3XBR0150N035T10	1.5	5.4	2.4	80	6	J223
MP3XBR0150N040T05	1.5	5.4	2.4	80	6	J223
MP3XBR0150N040T10	1.5	5.4	2.4	80	6	J223
MP3XBR0150N040T15	1.5	5.4	2.4	80	6	J223
MP3XBR0150N045T15	1.5	5.4	2.4	80	6	J223
MP3XBR0150N050T05	1.5	5.4	2.4	90	6	J223
MP3XBR0150N050T10	1.5	5.4	2.4	90	6	J223
MP3XBR0150N052T15	1.5	5.4	2.4	90	6	J223
MP3XBR0150N040T30	1.5	5.4	2.4	90	8	J224
MP3XBR0150N054T30	1.5	5.4	2.4	90	8	J224
MP3XBR0150N060T10	1.5	5.4	2.4	110	6	J223
MP3XBR0150N064T15	1.5	5.4	2.4	110	6	J223
MP3XBR0150N070T10	1.5	5.4	2.4	110	6	J223
MP2XLBR0150N060S03	1.5	6	2.3	60	3	J181
VFR2SSBR0150	1.5	6	3	45	6	J189
MP2SDBR0150	1.5	6	3	70	6	J175
VFR2SBFR0150	1.5	6	3	70	6	J193
VFR2SBR0150	1.5	6	3	70	6	J191
VQ4SVBR0150	1.5	7.5	4.5	50	6	J234

Order Number	RE	LU	APMX	LF	DCON	Page
DC2XLBR0150N080	1.5	8	1.8	60	6	J215
VF2WBR0150N080	1.5	8	2	60	6	J199
MP2XLBR0150N080	1.5	8	2.3	60	6	J181
VF2XLBR0150N080S06	1.5	8	2.4	60	6	J205
NEW VQ4WBR0150N08E280	1.5	8	2.64	60	6	J236
NEW VQN2MBR0150	1.5	8	3	60	6	J185
NEW VQN4MBFR0150	1.5	8	3	60	6	J241
NEW VQN4MBR0150	1.5	8	3	60	6	J239
MP2XLBR0150N100	1.5	10	2.3	60	6	J181
NEW VFR2XLBR0150N100	1.5	10	2.3	60	6	J196
VF2XLBR0150N100S06	1.5	10	2.4	60	6	J205
VC4STBR0150T0500N10	1.5	10	4	60	6	J325
NEW VQ2XLBR0150N120	1.5	12	2.3	55	6	J187
MP2XLBR0150N120	1.5	12	2.3	60	6	J181
NEW VFR2XLBR0150N120	1.5	12	2.3	60	6	J196
VF2XLBR0150N120S06	1.5	12	2.4	60	6	J205
MP2XLBR0150N140	1.5	14	2.3	60	6	J181
NEW VQ2XLBR0150N140	1.5	14	2.3	60	6	J187
VF2XLBR0150N140S06	1.5	14	2.4	60	6	J205
VC4STBR0150T0130N15	1.5	15	4	60	6	J325
VC4STBR0150T0300N15	1.5	15	4	60	6	J325
NEW VQ2XLBR0150N160	1.5	16	2.3	60	6	J187
MP2XLBR0150N160	1.5	16	2.3	70	6	J181
NEW VFR2XLBR0150N160	1.5	16	2.3	70	6	J196
VF2XLBR0150N160S06	1.5	16	2.4	60	6	J205
CRN2XLBR0150N160S06	1.5	16	3	60	6	J211
DF2XLBFR0150N160	1.5	16	4.5	50	4	J220
DF2XLBR0150N160	1.5	16	4.5	80	4	J217
VC4STBR0150T0500N18	1.5	18	4	60	6	J325
MP2XLBR0150N200	1.5	20	2.3	70	6	J181
NEW VFR2XLBR0150N200	1.5	20	2.3	70	6	J196
VF2XLBR0150N200S06	1.5	20	2.4	70	6	J205
VC4STBR0150T0130N20	1.5	20	4	60	6	J325
DF2XLBFR0150N200	1.5	20	4.5	50	4	J220
MP2XLBR0150N250	1.5	25	2.3	70	6	J181
NEW VFR2XLBR0150N250	1.5	25	2.3	70	6	J196
VF2XLBR0150N250S06	1.5	25	2.4	70	6	J205
CRN2XLBR0150N250S06	1.5	25	3	70	6	J211
DF2XLBR0150N250	1.5	25	4.5	80	4	J217
MP2XLBR0150N300	1.5	30	2.3	70	6	J181
NEW VFR2XLBR0150N300	1.5	30	2.3	70	6	J196
VF2XLBR0150N300S06	1.5	30	2.4	70	6	J205
MP2XLBR0150N350	1.5	35	2.3	90	6	J181
VF2XLBR0150N350S06	1.5	35	2.4	80	6	J205
CRN2XLBR0150N350S06	1.5	35	3	80	6	J211
MP2XLBR0150N400	1.5	40	2.3	90	6	J181
VF2XLBR0150N400S06	1.5	40	2.4	90	6	J205
DC2SBR0150	1.5	—	2.1	60	6	J213
MP2SSBR0150	1.5	—	3	45	6	J171
VFR2SBR0150S03	1.5	—	3	60	3	J191

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	RE	LU	APMX	LF	DCON	Page
MP2SBR0150	1.5	—	4.5	70	6	J172
MP2MBR0150S03	1.5	—	8	70	3	J173
CRN2MBR0150S06	1.5	—	8	70	6	J208
MP2MBR0150	1.5	—	8	70	6	J173
VF4MBR0150	1.5	—	8	70	6	J243
C4LATBR150T040AP20	1.5	—	20	75	8	J330
NEW DLC4LATBR150T040AP20	1.5	—	20	75	8	J328
MP2XLBR0175N150	1.75	15	2.6	65	6	J181
VC4STBR0175T0500N15	1.75	15	4	60	6	J325
VF2XLBR0175N160S06	1.75	16	2.8	60	6	J205
VF2XLBR0175N200S06	1.75	20	2.8	70	6	J205
MP2XLBR0175N250	1.75	25	2.6	65	6	J181
VF2XLBR0175N250S06	1.75	25	2.8	70	6	J205
VF2XLBR0175N300S06	1.75	30	2.8	80	6	J205
MP2XLBR0175N350	1.75	35	2.6	90	6	J181
VF2XLBR0175N350S06	1.75	35	2.8	80	6	J205
VF2XLBR0175N400S06	1.75	40	2.8	90	6	J205
MP2XLBR0175N450	1.75	45	2.6	90	6	J181
MP2MBR0175	1.75	—	8	70	6	J173
NEW VQ4WBR0190N12E280	1.9	12	3.35	60	6	J236
VF3XBR0200T0054L030	2	6	3	90	8	J229
VF3XBR0200T0054L040	2	6	3	90	8	J229
VF3XBR0200T0054L050	2	6	3	110	8	J229
VF3XBR0200T0054L060	2	6	3	110	8	J229
MP3XBR0200N020T10	2	6.2	3.2	70	6	J224
MP3XBR0200N030T05	2	6.2	3.2	70	6	J224
MP3XBR0200N030T10	2	6.2	3.2	70	6	J224
MP3XBR0200N035T10	2	6.2	3.2	70	6	J224
MP3XBR0200N040T05	2	6.2	3.2	80	6	J224
MP3XBR0200N040T10	2	6.2	3.2	80	6	J224
MP3XBR0200N045T10	2	6.2	3.2	80	6	J224
MP3XBR0200N030T30	2	6.2	3.2	90	8	J224
MP3XBR0200N045T30	2	6.2	3.2	90	8	J224
MP3XBR0200N050T15	2	6.2	3.2	90	8	J224
MP3XBR0200N060T05	2	6.2	3.2	100	6	J224
MP3XBR0200N066T10	2	6.2	3.2	100	6	J224
MP3XBR0200N084T15	2	6.2	3.2	120	8	J224
MP2XLBR0200N080S04	2	8	3	65	4	J181
VFR2SSBR0200	2	8	4	45	6	J189
MP2SDBR0200	2	8	4	60	4	J175
MP2SDBR0200S06	2	8	4	70	6	J175
VFR2SBFR0200	2	8	4	70	6	J193
VFR2SBR0200	2	8	4	70	6	J191
DC2XLBR0200N100	2	10	2.4	60	6	J215
VF2WBR0200N100	2	10	2.6	60	6	J199
MP2XLBR0200N100	2	10	3	65	6	J181
NEW VFR2XLBR0200N100	2	10	3	70	6	J196
VF2XLBR0200N100S06	2	10	3.2	70	6	J205
VQ4SVBR0200	2	10	6	50	6	J234
MP2XLBR0200N120	2	12	3	65	6	J181
NEW VFR2XLBR0200N120	2	12	3	70	6	J196
VF2XLBR0200N120S06	2	12	3.2	70	6	J205
NEW VQ4WBR0200N12E280	2	12	3.53	60	6	J236
VC4STBR0200T0500N13	2	13	4	60	6	J325
MP2XLBR0200N140	2	14	3	65	6	J181
VF2XLBR0200N140S06	2	14	3.2	70	6	J205
VC4STBR0200T0130N15	2	15	5	60	6	J325
MP2XLBR0200N160	2	16	3	70	6	J181
NEW VFR2XLBR0200N160	2	16	3	70	6	J196
VF2XLBR0200N160S06	2	16	3.2	70	6	J205
CRN2XLBR0200N160S06	2	16	4	70	6	J211
VC4STBR0200T0700N18	2	18	7	60	8	J325
MP2XLBR0200N200	2	20	3	70	6	J181
NEW VFR2XLBR0200N200	2	20	3	70	6	J196
VF2XLBR0200N200S06	2	20	3.2	70	6	J205
CRN2XLBR0200N200S06	2	20	4	70	6	J211
VC4STBR0200T0130N20	2	20	5	60	6	J325
VC4STBR0200T0300N21	2	21	4	60	6	J325
MP2XLBR0200N250	2	25	3	70	6	J181
NEW VFR2XLBR0200N250	2	25	3	70	6	J196
VF2XLBR0200N250S06	2	25	3.2	70	6	J205
NEW VFR2XLBR0200N300	2	30	3	70	6	J196
MP2XLBR0200N300	2	30	3	80	6	J181
VF2XLBR0200N300S06	2	30	3.2	70	6	J205
CRN2XLBR0200N300S06	2	30	4	70	6	J211
DF2XLBR0200N300	2	30	6	80	4	J217
MP2XLBR0200N350	2	35	3	80	6	J181
VF2XLBR0200N350S06	2	35	3.2	80	6	J205
MP2XLBR0200N400	2	40	3	90	6	J181
VF2XLBR0200N400S06	2	40	3.2	90	6	J205
CRN2XLBR0200N400S06	2	40	4	90	6	J211
MP2XLBR0200N450	2	45	3	90	6	J181
VF2XLBR0200N450S06	2	45	3.2	90	6	J205
MP2XLBR0200N500	2	50	3	100	6	J181
VF2XLBR0200N500S06	2	50	3.2	100	6	J206
DF2XLBR0200N600	2	60	6	100	4	J217
DC2SBR0200	2	—	2.8	60	6	J213
MP2SSBR0200	2	—	4	45	6	J171
VFR2SBR0200S04	2	—	4	60	4	J191
MP2SBR0200	2	—	6	70	6	J172
NEW VQN2MBR0200	2	—	8	60	6	J185
NEW VQN4MBFR0200	2	—	8	60	6	J241
NEW VQN4MBR0200	2	—	8	60	6	J239
MP2MBR0200S04	2	—	8	70	4	J173
CRN2MBR0200S06	2	—	8	70	6	J208
MP2MBR0200	2	—	8	70	6	J173
VF4MBR0200	2	—	8	70	6	J243
C4LATBR200T040AP30	2	—	30	75	8	J330
NEW DLC4LATBR200T040AP30	2	—	30	75	8	J328
NEW VQ4WBR0240N16E280	2.4	16	4.23	70	6	J236

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/BALL

Order Number	RE	LU	APMX	LF	DCON	Page
VF3XBR0250T0054L035	2.5	6.5	3.5	90	8	J229
VF3XBR0250T0054L040	2.5	6.5	3.5	90	8	J230
VF3XBR0250T0054L050	2.5	6.5	3.5	110	8	J230
VF3XBR0250T0054L060	2.5	6.5	3.5	110	8	J230
MP3XBR0250N038T10	2.5	7	4	80	6	J224
MP3XBR0250N036T30	2.5	7	4	90	8	J224
MP3XBR0250N050T10	2.5	7	4	90	8	J224
MP3XBR0250N065T10	2.5	7	4	110	8	J224
MP3XBR0250N066T15	2.5	7	4	110	8	J224
DC2XLBR0250N100	2.5	10	3	60	6	J215
VFR2SSBR0250	2.5	10	5	50	6	J189
MP2SDBR0250	2.5	10	5	80	6	J175
VFR2SBFR0250	2.5	10	5	80	6	J193
VFR2SBR0250	2.5	10	5	80	6	J191
NEW VQ4WBR0250N12E280	2.5	12	4.41	80	6	J236
VQ4SVBR0250	2.5	12.5	7.5	50	6	J234
MP2XLBR0250N150	2.5	15	3.8	70	6	J181
MP2XLBR0250N200	2.5	20	3.8	70	6	J181
NEW VFR2XLBR0250N200	2.5	20	3.8	70	6	J196
VF2XLBR0250N200S06	2.5	20	4	70	6	J206
CRN2XLBR0250N200S06	2.5	20	5	70	6	J211
MP2XLBR0250N250	2.5	25	3.8	70	6	J181
NEW VFR2XLBR0250N250	2.5	25	3.8	70	6	J196
VF2XLBR0250N250S06	2.5	25	4	70	6	J206
MP2XLBR0250N300	2.5	30	3.8	80	6	J181
VF2XLBR0250N300S06	2.5	30	4	80	6	J206
MP2XLBR0250N350	2.5	35	3.8	80	6	J181
VF2XLBR0250N350S06	2.5	35	4	80	6	J206
MP2XLBR0250N400	2.5	40	3.8	90	6	J181
DC2SBR0250	2.5	—	3.5	60	6	J213
MP2SSBR0250	2.5	—	5	50	6	J171
MP2SBR0250	2.5	—	7.5	80	6	J172
NEW VQN2MBR0250	2.5	—	12	60	6	J185
NEW VQN4MBFR0250	2.5	—	12	60	6	J241
NEW VQN4MBR0250	2.5	—	12	60	6	J239
MP2MBR0250	2.5	—	12	80	6	J173
VF4MBR0250	2.5	—	12	80	6	J243
DC2XLBR0300N100	3	10	3.6	60	6	J215
VF2WBR0300N120	3	12	4	80	6	J199
NEW VQ4WBR0300N12E280	3	12	5.29	80	6	J236
VFR2SSBR0300	3	12	6	50	6	J189
MP3XBR0300N032T30	3	12	9	80	8	J224
MP3XBR0300N040T10	3	12	9	80	8	J224
MP3XBR0300N050T10	3	12	9	90	8	J224
MP3XBR0300N053T15	3	12	9	90	8	J224
MP3XBR0300N073T10	3	12	9	110	8	J224
MP3XBR0300N090T10	3	12	9	140	10	J224
VC4STBR0300T0130N15	3	15	6	90	8	J325
VQ4SVBR0300	3	15	9	50	6	J234
NEW VFR2XLBR0300N180	3	18	6	80	6	J196

Order Number	RE	LU	APMX	LF	DCON	Page
MP2SDBR0300	3	18	12	80	6	J175
MP2SDBR0300A120	3	18	12	120	6	J175
MP2XLBR0300N200	3	20	6	70	6	J181
VC4STBR0300T0130N20	3	20	6	90	8	J325
VC4STBR0300T0300N22	3	22	6	90	8	J325
MP2XLBR0300N250	3	25	6	70	6	J181
VF2XLBR0300N300S06	3	30	4.8	80	6	J206
CRN2XLBR0300N300S06	3	30	6	80	6	J211
MP2XLBR0300N300	3	30	6	80	6	J181
NEW VFR2XLBR0300N300	3	30	6	80	6	J196
VF2XLBR0300N400S06	3	40	4.8	90	6	J206
MP2XLBR0300N400	3	40	6	90	6	J181
VF2XLBR0300N500S06	3	50	4.8	100	6	J206
CRN2XLBR0300N500S06	3	50	6	100	6	J211
MP2XLBR0300N500	3	50	6	100	6	J181
DC2SBR0300	3	—	4.2	60	6	J213
MP2SSBR0300	3	—	6	50	6	J171
MP2SBR0300	3	—	9	80	6	J172
NEW VQN2MBR0300	3	—	12	60	6	J185
NEW VQN4MBFR0300	3	—	12	60	6	J241
NEW VQN4MBR0300	3	—	12	60	6	J239
CRN2MBR0300S06	3	—	12	80	6	J208
MP2MBR0300	3	—	12	80	6	J173
VF4MBR0300	3	—	12	80	6	J243
VFR2SBFR0300	3	—	12	80	6	J193
VFR2SBR0300	3	—	12	80	6	J191
VFR2SSBR0400	4	14	8	60	8	J189
VC4STBR0400T0130N15	4	15	8	90	10	J325
MP3XBR0400N035T30	4	15	12	90	10	J224
MP3XBR0400N040T15	4	15	12	90	10	J224
MP3XBR0400N050T10	4	15	12	110	10	J224
MP3XBR0400N056T15	4	15	12	110	10	J224
MP3XBR0400N065T10	4	15	12	130	10	J224
MP3XBR0400N076T10	4	15	12	130	10	J224
MP3XBR0400N090T10	4	15	12	150	12	J224
VQ4SVBR0400	4	20	12	60	8	J234
VC4STBR0400T0300N22	4	22	8	90	10	J325
MP2SDBR0400	4	24	14	90	8	J175
MP2SDBR0400A130	4	24	14	130	8	J175
MP2SSBR0400	4	—	8	60	8	J171
MP2SBR0400	4	—	12	90	8	J172
NEW VQN2MBR0400	4	—	14	70	8	J185
NEW VQN4MBFR0400	4	—	14	70	8	J241
NEW VQN4MBR0400	4	—	14	70	8	J239
CRN2MBR0400S08	4	—	14	90	8	J208
MP2MBR0400	4	—	14	90	8	J173
VF4MBR0400	4	—	14	90	8	J243
VFR2SBR0400	4	—	14	90	8	J191
VFR2SSBR0500	5	18	10	70	10	J189
VQ4SVBR0500	5	25	15	70	10	J234

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

	Order Number	RE	LU	APMX	LF	DCON	Page
	MP3XBR0500N046T30	5	25	15	100	12	J224
	MP3XBR0500N050T15	5	25	15	100	12	J224
	MP3XBR0500N060T10	5	25	15	120	12	J224
	MP3XBR0500N068T15	5	25	15	120	12	J224
	MP3XBR0500N070T10	5	25	15	120	12	J224
	MP3XBR0500N100T10	5	25	15	160	16	J224
	MP2SDBR0500	5	30	18	100	10	J175
	MP2SDBR0500A140	5	30	18	140	10	J175
	MP2SSBR0500	5	—	10	70	10	J171
	MP2SBR0500	5	—	15	100	10	J172
NEW	VQN2MBR0500	5	—	18	80	10	J185
NEW	VQN4MBFR0500	5	—	18	80	10	J241
NEW	VQN4MBR0500	5	—	18	80	10	J239
	CRN2MBR0500S10	5	—	18	100	10	J208
	MP2MBR0500	5	—	18	100	10	J173
	VF4MBR0500	5	—	18	100	10	J243
	VFR2SBR0500	5	—	18	100	10	J191
	VFR2SSBR0600	6	22	12	75	12	J189
	MP3XBR0600N069T30	6	28	18	130	16	J224
	MP3XBR0600N070T10	6	28	18	130	16	J224
	MP3XBR0600N080T15	6	28	18	130	16	J224
	MP3XBR0600N100T10	6	28	18	160	16	J224
	VQ4SVBR0600	6	30	18	75	12	J234
	MP2SDBR0600	6	36	22	110	12	J175
	MP2SDBR0600A140	6	36	22	140	12	J175
	MP2SSBR0600	6	—	12	75	12	J171
	MP2SBR0600	6	—	18	110	12	J172
NEW	VQN2MBR0600	6	—	22	80	12	J185
NEW	VQN4MBFR0600	6	—	22	80	12	J241
NEW	VQN4MBR0600	6	—	22	80	12	J239
	MP2MBR0600	6	—	22	110	12	J173
	VF4MBR0600	6	—	22	110	12	J243
	VFR2SBR0600	6	—	22	110	12	J191
	VFR2SBR0800	8	—	30	140	16	J191
	VFR2SBR1000	10	—	38	160	20	J191

RE = Ball Nose End Mill Radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

CARBIDE/RADIUS

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MPXLRBD0020R005N005	0.2	0.05	0.5	0.2	50	4	J261
MPXLRBD0020R005N010	0.2	0.05	1	0.2	50	4	J261
MPXLRBD0030R005N010	0.3	0.05	1	0.3	50	4	J261
MPXLRBD0030R005N020	0.3	0.05	2	0.3	50	4	J261
MPXLRBD0040R005N020	0.4	0.05	2	0.4	50	4	J261
MPXLRBD0040R005N030	0.4	0.05	3	0.4	50	4	J261
MPXLRBD0040R005N040	0.4	0.05	4	0.4	50	4	J261
MPXLRBD0050R005N020	0.5	0.05	2	0.5	50	4	J261
NEW VFRPSRBD0050R005N020	0.5	0.05	2	0.5	50	6	J283
MPXLRBD0050R005N030	0.5	0.05	3	0.5	50	4	J261
CRN2XLRBD0050R005N04	0.5	0.05	4	0.5	50	4	J249
MPXLRBD0050R005N040	0.5	0.05	4	0.5	50	4	J261
MPXLRBD0050R005N050	0.5	0.05	5	0.5	50	4	J261
NEW VFRPSRBD0050R010N020	0.5	0.1	2	0.5	50	6	J283
CRN2XLRBD0050R010N04	0.5	0.1	4	0.5	50	4	J249
MPXLRBD0060R005N020	0.6	0.05	2	0.6	50	4	J261
VCPSRBD0060N02R005	0.6	0.05	2	0.6	50	6	J302
NEW VFRPSRBD0060R005N020	0.6	0.05	2	0.6	50	6	J283
MPXLRBD0060R005N040	0.6	0.05	4	0.6	50	4	J261
MPXLRBD0060R005N060	0.6	0.05	6	0.6	50	4	J261
VCPSRBD0060N02R01	0.6	0.1	2	0.6	50	6	J302
NEW VFRPSRBD0060R010N020	0.6	0.1	2	0.6	50	6	J283
VCPSRBD0060N04R01	0.6	0.1	4	0.6	50	6	J302
NEW VFRPSRBD0060R010N040	0.6	0.1	4	0.6	50	6	J283
VCPSRBD0060N02R02	0.6	0.2	2	0.6	50	6	J302
NEW VFRPSRBD0060R020N020	0.6	0.2	2	0.6	50	6	J283
VCPSRBD0060N04R02	0.6	0.2	4	0.6	50	6	J302
MPXLRBD0080R005N040	0.8	0.05	4	0.8	50	4	J261
VCPSRBD0080N04R005	0.8	0.05	4	0.8	50	6	J302
NEW VFRPSRBD0080R005N040	0.8	0.05	4	0.8	50	6	J283
MPXLRBD0080R005N060	0.8	0.05	6	0.8	50	4	J261
VCPSRBD0080N04R01	0.8	0.1	4	0.8	50	6	J302
NEW VFRPSRBD0080R010N040	0.8	0.1	4	0.8	50	6	J283
VCPSRBD0080N06R01	0.8	0.1	6	0.8	50	6	J302
VCPSRBD0080N04R02	0.8	0.2	4	0.8	50	6	J302
NEW VFRPSRBD0080R020N040	0.8	0.2	4	0.8	50	6	J283
VCPSRBD0080N06R02	0.8	0.2	6	0.8	50	6	J302
VCPSRBD0080N04R03	0.8	0.3	4	0.8	50	6	J302
NEW VFRPSRBD0080R030N040	0.8	0.3	4	0.8	50	6	J283
VCPSRBD0080N06R03	0.8	0.3	6	0.8	50	6	J302
VCPSRBD0080N08R03	0.8	0.3	8	0.8	50	6	J302
MPXLRBD0100R005N030	1	0.05	3	1	50	4	J261
MPXLRBD0100R005N040	1	0.05	4	1	50	4	J261
VCPSRBD0100N04R005	1	0.05	4	1	50	6	J302
NEW VFRPSRBD0100R005N040	1	0.05	4	1	50	6	J283
MPXLRBD0100R005N050	1	0.05	5	1	50	4	J261
MPXLRBD0100R005N060	1	0.05	6	1	50	4	J261
MPXLRBD0100R005N080	1	0.05	8	1	50	4	J261
MPXLRBD0100R005N100	1	0.05	10	1	50	4	J261
MPXLRBD0100R005N120	1	0.05	12	1	50	4	J261

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MPXLRBD0100R010N030	1	0.1	3	1	50	4	J261
MPXLRBD0100R010N040	1	0.1	4	1	50	4	J261
VCPSRBD0100N04R01	1	0.1	4	1	50	6	J302
NEW VFRPSRBD0100R010N040	1	0.1	4	1	50	6	J283
MPXLRBD0100R010N050	1	0.1	5	1	50	4	J261
MPXLRBD0100R010N060	1	0.1	6	1	50	4	J261
VCPSRBD0100N06R01	1	0.1	6	1	50	6	J302
NEW VFRPSRBD0100R010N060	1	0.1	6	1	50	6	J283
CRN2XLRBD0100R010N08	1	0.1	8	1	50	4	J249
MPXLRBD0100R010N080	1	0.1	8	1	50	4	J261
NEW VQHVRBD0100R01N080	1	0.1	8	1	50	6	J279
MPXLRBD0100R010N100	1	0.1	10	1	50	4	J261
MPXLRBD0100R010N120	1	0.1	12	1	50	4	J261
NEW VQHVRBD0100R01N120	1	0.1	12	1	55	6	J279
MS2MRBD0100R010	1	0.1	—	2	40	4	J245
MPMHVRBD0100R010	1	0.1	—	2.5	45	4	J257
VFHVRBD010R02N006T09	1	0.2	2.5	1	60	6	J296
VFHVRBD010R02N010T09	1	0.2	2.5	1	60	6	J296
VFHVRBD010R02N015T09	1	0.2	2.5	1	60	6	J296
VFHVRBD010R02N020T09	1	0.2	2.5	1	80	6	J296
VFHVRBD010R02N025T09	1	0.2	2.5	1	80	6	J296
VFHVRBD010R02N030T09	1	0.2	2.5	1	80	6	J296
VFHVRBD010R02N035T09	1	0.2	2.5	1	90	6	J296
VFHVRBD010R02N040T09	1	0.2	2.5	1	90	6	J296
VFHVRBD010R02N045T09	1	0.2	2.5	1	90	6	J296
VFHVRBD010R02N050T09	1	0.2	2.5	1	90	6	J296
VCPSRBD0100N04R02	1	0.2	4	1	50	6	J302
NEW VFRPSRBD0100R020N040	1	0.2	4	1	50	6	J283
VFHVRBD0100R02N004	1	0.2	4	1	60	6	J290
VCPSRBD0100N06R02	1	0.2	6	1	50	6	J302
NEW VFRPSRBD0100R020N060	1	0.2	6	1	50	6	J283
VFHVRBD0100R02N006	1	0.2	6	1	60	6	J290
VFHVRBD0100R02N008	1	0.2	8	1	60	6	J290
VFHVRBD0100R02N010	1	0.2	10	1	60	6	J290
VFHVRBD0100R02N015	1	0.2	15	1	60	6	J290
VFHVRBD0100R02N020	1	0.2	20	1	80	6	J290
MS2MRBD0100R020	1	0.2	—	2	40	4	J245
MPMHVRBD0100R020	1	0.2	—	2.5	45	4	J257
VCPSRBD0100N04R03	1	0.3	4	1	50	6	J302
NEW VFRPSRBD0100R030N040	1	0.3	4	1	50	6	J283
VCPSRBD0100N06R03	1	0.3	6	1	50	6	J302
CRN2XLRBD0100R030N08	1	0.3	8	1	50	4	J249
VCPSRBD0100N10R03	1	0.3	10	1	50	6	J302
CRN2XLRBD0100R030N12	1	0.3	12	1	55	4	J249
MS2MRBD0100R030	1	0.3	—	2	40	4	J245
VCPSRBD0100N04R04	1	0.4	4	1	50	6	J302
NEW VFRPSRBD0100R040N040	1	0.4	4	1	50	6	J283
VCPSRBD0100N06R04	1	0.4	6	1	50	6	J302
VCPSRBD0100N10R04	1	0.4	10	1	50	6	J302
MPXLRBD0120R010N100	1.2	0.1	10	1.2	50	4	J261

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

	Order Number	DC	RE	LU	APMX	LF	DCON	Page
	MPXLRBD0120R020N100	1.2	0.2	10	1.2	50	4	J261
	VCPSRBD0120N06R05	1.2	0.5	6	1.2	50	6	J302
	VCPSRBD0120N10R05	1.2	0.5	10	1.2	50	6	J302
	VCPSRBD0120N15R05	1.2	0.5	15	1.2	50	6	J302
	VCPSRBD0150N04R01	1.5	0.1	4	1.5	50	6	J302
NEW	VFRPSRBD0150R010N040	1.5	0.1	4	1.5	50	6	J283
	MPXLRBD0150R010N060	1.5	0.1	6	1.5	50	4	J261
	VCPSRBD0150N06R01	1.5	0.1	6	1.5	50	6	J302
NEW	VFRPSRBD0150R010N060	1.5	0.1	6	1.5	50	6	J283
	VCPSRBD0150N10R01	1.5	0.1	10	1.5	50	6	J303
NEW	VFRPSRBD0150R010N100	1.5	0.1	10	1.5	50	6	J283
	MPXLRBD0150R010N120	1.5	0.1	12	1.5	50	4	J261
	VCPSRBD0150N15R01	1.5	0.1	15	1.5	50	6	J303
	MPXLRBD0150R010N180	1.5	0.1	18	1.5	60	4	J262
	MS2MRBD0150R010	1.5	0.1	—	3	40	4	J245
	VCPSRBD0150N04R02	1.5	0.2	4	1.5	50	6	J302
NEW	VFRPSRBD0150R020N040	1.5	0.2	4	1.5	50	6	J283
	MPXLRBD0150R020N060	1.5	0.2	6	1.5	50	4	J262
	VCPSRBD0150N06R02	1.5	0.2	6	1.5	50	6	J302
NEW	VFRPSRBD0150R020N060	1.5	0.2	6	1.5	50	6	J283
	VCPSRBD0150N10R02	1.5	0.2	10	1.5	50	6	J303
NEW	VFRPSRBD0150R020N100	1.5	0.2	10	1.5	50	6	J283
	MPXLRBD0150R020N120	1.5	0.2	12	1.5	50	4	J262
	CRN2XLRBD0150R020N12	1.5	0.2	12	1.5	55	4	J249
	VCPSRBD0150N15R02	1.5	0.2	15	1.5	50	6	J303
	MPXLRBD0150R020N180	1.5	0.2	18	1.5	60	4	J262
	MS2MRBD0150R020	1.5	0.2	—	3	40	4	J245
	VFHVRBD015R03N010T09	1.5	0.3	3	1.5	60	6	J296
	VFHVRBD015R03N015T09	1.5	0.3	3	1.5	60	6	J296
	VFHVRBD015R03N020T09	1.5	0.3	3	1.5	80	6	J296
	VFHVRBD015R03N030T09	1.5	0.3	3	1.5	80	6	J296
	VFHVRBD015R03N040T09	1.5	0.3	3	1.5	90	6	J296
	VFHVRBD015R03N050T09	1.5	0.3	3	1.5	90	6	J296
	VCPSRBD0150N04R03	1.5	0.3	4	1.5	50	6	J302
NEW	VFRPSRBD0150R030N040	1.5	0.3	4	1.5	50	6	J283
	VFHVRBD0150R03N004	1.5	0.3	4	1.5	60	6	J290
	MPXLRBD0150R030N060	1.5	0.3	6	1.5	50	4	J262
	VCPSRBD0150N06R03	1.5	0.3	6	1.5	50	6	J302
NEW	VFRPSRBD0150R030N060	1.5	0.3	6	1.5	50	6	J283
	VFHVRBD0150R03N006	1.5	0.3	6	1.5	60	6	J290
	VCPSRBD0150N10R03	1.5	0.3	10	1.5	50	6	J303
NEW	VFRPSRBD0150R030N100	1.5	0.3	10	1.5	50	6	J283
	VFHVRBD0150R03N010	1.5	0.3	10	1.5	60	6	J290
	MPXLRBD0150R030N120	1.5	0.3	12	1.5	50	4	J262
	CRN2XLRBD0150R030N12	1.5	0.3	12	1.5	55	4	J249
	VCPSRBD0150N15R03	1.5	0.3	15	1.5	50	6	J303
	VFHVRBD0150R03N015	1.5	0.3	15	1.5	60	6	J290
	MPXLRBD0150R030N180	1.5	0.3	18	1.5	60	4	J262
	VCPSRBD0150N20R03	1.5	0.3	20	1.5	60	6	J303
	VFHVRBD0150R03N020	1.5	0.3	20	1.5	80	6	J290

	Order Number	DC	RE	LU	APMX	LF	DCON	Page
	VFHVRBD0150R03N025	1.5	0.3	25	1.5	80	6	J290
	VFHVRBD0150R03N030	1.5	0.3	30	1.5	80	6	J290
	MS2MRBD0150R030	1.5	0.3	—	3	40	4	J245
	VCPSRBD0150N03L06R05	1.5	0.5	3	1.5	50	6	J306
	VCPSRBD0150N03L10R05	1.5	0.5	3	1.5	50	6	J306
	VCPSRBD0150N04R05	1.5	0.5	4	1.5	50	6	J302
NEW	VFRPSRBD0150R050N040	1.5	0.5	4	1.5	50	6	J283
	VCPSRBD0150N06R05	1.5	0.5	6	1.5	50	6	J303
NEW	VFRPSRBD0150R050N060	1.5	0.5	6	1.5	50	6	J283
	VCPSRBD0150N10R05	1.5	0.5	10	1.5	50	6	J303
NEW	VFRPSRBD0150R050N100	1.5	0.5	10	1.5	50	6	J283
	VCPSRBD0150N15R05	1.5	0.5	15	1.5	50	6	J303
	VCPSRBD0150N20R05	1.5	0.5	20	1.5	60	6	J303
	MS2MRBD0150R050	1.5	0.5	—	3	40	4	J245
	VCPSRBD0200N06R01	2	0.1	6	2	50	6	J303
NEW	VFRPSRBD0200R010N060	2	0.1	6	2	50	6	J283
	MPXLRBD0200R010N080	2	0.1	8	2	50	4	J262
	VCPSRBD0200N10R01	2	0.1	10	2	50	6	J303
NEW	VFRPSRBD0200R010N100	2	0.1	10	2	50	6	J283
	MPXLRBD0200R010N120	2	0.1	12	2	50	4	J262
	CRN2XLRBD0200R010N12	2	0.1	12	2	55	4	J249
	VCPSRBD0200N15R01	2	0.1	15	2	50	6	J303
NEW	VFRPSRBD0200R010N150	2	0.1	15	2	50	6	J283
	MPXLRBD0200R010N160	2	0.1	16	2	60	4	J262
	MPXLRBD0200R010N200	2	0.1	20	2	60	4	J262
	MPXLRBD0200R010N240	2	0.1	24	2	70	4	J262
	MS2MRBD0200R010	2	0.1	—	4	40	4	J245
	MPMHVRBD0200R010	2	0.1	—	5	45	4	J257
	VCPSRBD0200N06R02	2	0.2	6	2	50	6	J303
NEW	VFRPSRBD0200R020N060	2	0.2	6	2	50	6	J283
	MPXLRBD0200R020N080	2	0.2	8	2	50	4	J262
	VCPSRBD0200N10R02	2	0.2	10	2	50	6	J303
NEW	VFRPSRBD0200R020N100	2	0.2	10	2	50	6	J283
	MPXLRBD0200R020N120	2	0.2	12	2	50	4	J262
	CRN2XLRBD0200R020N12	2	0.2	12	2	55	4	J249
NEW	VQHVRBD0200R02N120	2	0.2	12	2	55	6	J279
	VCPSRBD0200N15R02	2	0.2	15	2	50	6	J303
NEW	VFRPSRBD0200R020N150	2	0.2	15	2	50	6	J284
	CRN2XLRBD0200R020N16	2	0.2	16	2	55	4	J249
	MPXLRBD0200R020N160	2	0.2	16	2	60	4	J262
NEW	VQHVRBD0200R02N160	2	0.2	16	2	60	6	J279
	CRN2XLRBD0200R020N20	2	0.2	20	2	60	4	J249
	MPXLRBD0200R020N200	2	0.2	20	2	60	4	J262
	MPXLRBD0200R020N240	2	0.2	24	2	70	4	J262
	MS2MRBD0200R020	2	0.2	—	4	40	4	J245
	VQMHVRBD0200R020	2	0.2	—	4	45	4	J270
	MPMHVRBD0200R020	2	0.2	—	5	45	4	J257
	VCPSRBD0200N06R03	2	0.3	6	2	50	6	J303
NEW	VFRPSRBD0200R030N060	2	0.3	6	2	50	6	J284
	MPXLRBD0200R030N080	2	0.3	8	2	50	4	J262

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

SELECTION CHART BY BLADE DIAMETER

CARBIDE/RADIUS

Order Number	DC	RE	LU	APMX	LF	DCON	Page
VCPSRBD0200N10R03	2	0.3	10	2	50	6	J303
NEW VFRPSRBD0200R030N100	2	0.3	10	2	50	6	J284
MPXLRBD0200R030N120	2	0.3	12	2	50	4	J262
CRN2XLRBD0200R030N12	2	0.3	12	2	55	4	J249
VCPSRBD0200N15R03	2	0.3	15	2	50	6	J303
NEW VFRPSRBD0200R030N150	2	0.3	15	2	50	6	J284
CRN2XLRBD0200R030N16	2	0.3	16	2	55	4	J249
MPXLRBD0200R030N160	2	0.3	16	2	60	4	J262
MPXLRBD0200R030N200	2	0.3	20	2	60	4	J262
VCPSRBD0200N20R03	2	0.3	20	2	60	6	J303
NEW VFRPSRBD0200R030N200	2	0.3	20	2	60	6	J284
MPXLRBD0200R030N240	2	0.3	24	2	70	4	J262
VCPSRBD0200N25R03	2	0.3	25	2	60	6	J303
MS2MRBD0200R030	2	0.3	—	4	40	4	J245
VQMHVRBD0200R030	2	0.3	—	4	45	4	J270
MPMHVRBD0200R030	2	0.3	—	5	45	4	J257
VCPSRBD0200N04L10R05	2	0.5	4	2	60	6	J306
VCPSRBD0200N04L15R05	2	0.5	4	2	60	6	J306
VFHVRBD020R05N015T04	2	0.5	4	2	60	6	J296
VFHVRBD020R05N020T04	2	0.5	4	2	80	6	J296
VFHVRBD020R05N020T09	2	0.5	4	2	80	6	J296
VFHVRBD020R05N025T04	2	0.5	4	2	80	6	J296
VFHVRBD020R05N030T04	2	0.5	4	2	80	6	J296
VFHVRBD020R05N035T04	2	0.5	4	2	80	6	J296
VFHVRBD020R05N040T04	2	0.5	4	2	80	6	J296
VFHVRBD020R05N025T09	2	0.5	4	2	90	6	J296
VFHVRBD020R05N030T09	2	0.5	4	2	90	6	J296
VFHVRBD020R05N035T09	2	0.5	4	2	90	6	J296
VFHVRBD020R05N040T09	2	0.5	4	2	90	6	J296
VFHVRBD020R05N045T09	2	0.5	4	2	90	6	J296
VFHVRBD020R05N050T09	2	0.5	4	2	100	6	J296
VFHVRBD020R05N055T09	2	0.5	4	2	100	6	J296
VFHVRBD020R05N060T09	2	0.5	4	2	100	6	J296
VCPSRBD0200N06R05	2	0.5	6	2	50	6	J303
NEW VFRPSRBD0200R050N060	2	0.5	6	2	50	6	J284
VFHVRBD0200R05N006	2	0.5	6	2	60	6	J290
VCPSRBD0200N10R05	2	0.5	10	2	50	6	J303
NEW VFRPSRBD0200R050N100	2	0.5	10	2	50	6	J284
VFHVRBD0200R05N010	2	0.5	10	2	60	6	J290
CRN2XLRBD0200R050N12	2	0.5	12	2	55	4	J249
VCPSRBD0200N15R05	2	0.5	15	2	50	6	J303
NEW VFRPSRBD0200R050N150	2	0.5	15	2	50	6	J284
VFHVRBD0200R05N015	2	0.5	15	2	60	6	J290
VCPSRBD0200N20R05	2	0.5	20	2	60	6	J303
NEW VFRPSRBD0200R050N200	2	0.5	20	2	60	6	J284
VFHVRBD0200R05N020	2	0.5	20	2	80	6	J290
VCPSRBD0200N25R05	2	0.5	25	2	60	6	J303
VFHVRBD0200R05N025	2	0.5	25	2	80	6	J290
VFHVRBD0200R05N030	2	0.5	30	2	80	6	J290
VFHVRBD0200R05N035	2	0.5	35	2	90	6	J290
VFHVRBD0200R05N040	2	0.5	40	2	90	6	J290
MS2MRBD0200R050	2	0.5	—	4	40	4	J245
MPMHVRBD0200R050	2	0.5	—	5	45	4	J257
VCPSRBD0250N08R01	2.5	0.1	8	2.5	50	6	J303
MS2MRBD0250R010	2.5	0.1	—	5	40	4	J245
VCPSRBD0250N08R02	2.5	0.2	8	2.5	50	6	J303
MS2MRBD0250R020	2.5	0.2	—	5	40	4	J245
VCPSRBD0250N08R03	2.5	0.3	8	2.5	50	6	J303
NEW VFRPSRBD0250R030N080	2.5	0.3	8	2.5	50	6	J284
VCPSRBD0250N15R03	2.5	0.3	15	2.5	50	6	J303
NEW VFRPSRBD0250R030N150	2.5	0.3	15	2.5	50	6	J284
MS2MRBD0250R030	2.5	0.3	—	5	40	4	J245
VCPSRBD0250N08R05	2.5	0.5	8	2.5	50	6	J303
NEW VFRPSRBD0250R050N080	2.5	0.5	8	2.5	50	6	J284
VCPSRBD0250N15R05	2.5	0.5	15	2.5	50	6	J303
NEW VFRPSRBD0250R050N150	2.5	0.5	15	2.5	50	6	J284
MS2MRBD0250R050	2.5	0.5	—	5	40	4	J245
VCPSRBD0250N05L12R10	2.5	1	5	2.5	60	6	J306
VCPSRBD0250N05L20R10	2.5	1	5	2.5	60	6	J306
VCPSRBD0250N08R10	2.5	1	8	2.5	50	6	J303
NEW VFRPSRBD0250R100N080	2.5	1	8	2.5	50	6	J284
VCPSRBD0250N15R10	2.5	1	15	2.5	50	6	J303
MPXLRBD0300R010N080	3	0.1	8	3	60	6	J262
VCPSRBD0300N10R01	3	0.1	10	3	60	6	J303
NEW VFRPSRBD0300R010N100	3	0.1	10	3	60	6	J284
MPXLRBD0300R010N120	3	0.1	12	3	60	6	J262
VCPSRBD0300N15R01	3	0.1	15	3	60	6	J303
NEW VFRPSRBD0300R010N150	3	0.1	15	3	60	6	J284
MPXLRBD0300R010N180	3	0.1	18	3	70	6	J262
VCPSRBD0300N20R01	3	0.1	20	3	60	6	J303
MPXLRBD0300R010N240	3	0.1	24	3	70	6	J262
MPXLRBD0300R010N300	3	0.1	30	3	70	6	J262
MPXLRBD0300R010N360	3	0.1	36	3	90	6	J262
MS2MRBD0300R010	3	0.1	—	6	50	6	J245
MPMHVRBD0300R010	3	0.1	—	7.5	45	6	J257
MS4MRBD0300R010	3	0.1	—	8	45	6	J267
VCPSRBD0300N10R02	3	0.2	10	3	60	6	J303
NEW VFRPSRBD0300R020N100	3	0.2	10	3	60	6	J284
MPXLRBD0300R020N120	3	0.2	12	3	60	6	J262
VCPSRBD0300N15R02	3	0.2	15	3	60	6	J303
NEW VFRPSRBD0300R020N150	3	0.2	15	3	60	6	J284
MPXLRBD0300R020N180	3	0.2	18	3	60	6	J262
VCPSRBD0300N20R02	3	0.2	20	3	60	6	J303
NEW VFRPSRBD0300R020N200	3	0.2	20	3	60	6	J284
CRN2XLRBD0300R020N20	3	0.2	20	3	65	6	J249
MPXLRBD0300R020N240	3	0.2	24	3	70	6	J262
MPXLRBD0300R020N300	3	0.2	30	3	70	6	J262
MPXLRBD0300R020N360	3	0.2	36	3	90	6	J262
MS2MRBD0300R020	3	0.2	—	6	50	6	J245
MPMHVRBD0300R020	3	0.2	—	7.5	45	6	J257

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MS4MRBD0300R020	3	0.2	—	8	45	6	J267
VQMHVRBD0300R020	3	0.2	—	8	45	6	J270
VFSDRBD0300R030	3	0.3	9	3	45	6	J318
VCPSRBD0300N10R03	3	0.3	10	3	60	6	J303
NEW VFRPSRBD0300R030N100	3	0.3	10	3	60	6	J284
MPXLRBD0300R030N120	3	0.3	12	3	60	6	J262
VCPSRBD0300N15R03	3	0.3	15	3	60	6	J303
NEW VFRPSRBD0300R030N150	3	0.3	15	3	60	6	J284
MPXLRBD0300R030N180	3	0.3	18	3	60	6	J262
VCPSRBD0300N20R03	3	0.3	20	3	60	6	J303
NEW VFRPSRBD0300R030N200	3	0.3	20	3	60	6	J284
CRN2XLRBD0300R030N20	3	0.3	20	3	65	6	J249
MPXLRBD0300R030N240	3	0.3	24	3	70	6	J262
MPXLRBD0300R030N300	3	0.3	30	3	70	6	J262
VCPSRBD0300N30R03	3	0.3	30	3	70	6	J303
MPXLRBD0300R030N360	3	0.3	36	3	90	6	J262
VFMDRBD0300R030	3	0.3	—	10	60	6	J320
MS2MRBD0300R030	3	0.3	—	6	50	6	J245
NEW VQN4MVRBD0300R030	3	0.3	—	7	45	6	J277
MPMHVRBD0300R030	3	0.3	—	7.5	45	6	J257
MS4MRBD0300R030	3	0.3	—	8	45	6	J267
VQMHVRBD0300R030	3	0.3	—	8	45	6	J270
VC4JRBD0300R0030	3	0.3	—	12	50	6	J308
VCPSRBD0300N06L15R05	3	0.5	6	3	60	6	J306
VCPSRBD0300N06L20R05	3	0.5	6	3	60	6	J306
NEW VQHVRBD0300R05N100	3	0.5	10	3	55	6	J279
VCPSRBD0300N10R05	3	0.5	10	3	60	6	J303
VFHVRBD0300R05N010	3	0.5	10	3	60	6	J290
NEW VFRPSRBD0300R050N100	3	0.5	10	3	60	6	J284
MPXLRBD0300R050N120	3	0.5	12	3	60	6	J262
VCPSRBD0300N15R05	3	0.5	15	3	60	6	J303
VFHVRBD0300R05N015	3	0.5	15	3	60	6	J290
NEW VFRPSRBD0300R050N150	3	0.5	15	3	60	6	J284
MPXLRBD0300R050N180	3	0.5	18	3	60	6	J262
NEW VQHVRBD0300R05N180	3	0.5	18	3	60	6	J279
VCPSRBD0300N20R05	3	0.5	20	3	60	6	J303
NEW VFRPSRBD0300R050N200	3	0.5	20	3	60	6	J284
CRN2XLRBD0300R050N20	3	0.5	20	3	65	6	J249
VFHVRBD0300R05N020	3	0.5	20	3	80	6	J290
MPXLRBD0300R050N240	3	0.5	24	3	70	6	J262
MPXLRBD0300R050N300	3	0.5	30	3	70	6	J262
VCPSRBD0300N30R05	3	0.5	30	3	70	6	J303
VFHVRBD0300R05N030	3	0.5	30	3	80	6	J290
MPXLRBD0300R050N360	3	0.5	36	3	90	6	J262
MS2MRBD0300R050	3	0.5	—	6	50	6	J245
NEW VQN4MVRBD0300R050	3	0.5	—	7	45	6	J277
MPMHVRBD0300R050	3	0.5	—	7.5	45	6	J257
MS4MRBD0300R050	3	0.5	—	8	45	6	J267
VQMHVRBD0300R050	3	0.5	—	8	45	6	J270
VFHVRBD030R08N020T09	3	0.8	6	3	80	6	J296
VFHVRBD030R08N025T09	3	0.8	6	3	80	6	J296
VFHVRBD030R08N030T09	3	0.8	6	3	80	6	J296
VFHVRBD030R08N040T09	3	0.8	6	3	90	6	J297
VFHVRBD030R08N050T09	3	0.8	6	3	90	6	J297
VFHVRBD030R08N060T09	3	0.8	6	3	100	6	J297
VFHVRBD0300R08N010	3	0.8	10	3	60	6	J290
VFHVRBD0300R08N015	3	0.8	15	3	60	6	J290
VFHVRBD0300R08N020	3	0.8	20	3	80	6	J290
VFHVRBD0300R08N030	3	0.8	30	3	80	6	J290
VFHVRBD0300R08N040	3	0.8	40	3	90	6	J290
VFHVRBD0300R08N050	3	0.8	50	3	90	6	J290
VCPSRBD0300N06L15R10	3	1	6	3	60	6	J306
VCPSRBD0300N06L20R10	3	1	6	3	60	6	J306
VCPSRBD0300N10R10	3	1	10	3	60	6	J303
NEW VFRPSRBD0300R100N100	3	1	10	3	60	6	J284
VCPSRBD0300N15R10	3	1	15	3	60	6	J303
NEW VFRPSRBD0300R100N150	3	1	15	3	60	6	J284
VCPSRBD0300N20R10	3	1	20	3	60	6	J303
NEW VFRPSRBD0300R100N200	3	1	20	3	60	6	J284
MS2MRBD0300R100	3	1	—	6	50	6	J245
MS4MRBD0300R100	3	1	—	8	45	6	J267
VCPSRBD0400N12R01	4	0.1	12	4	60	6	J304
NEW VFRPSRBD0400R010N120	4	0.1	12	4	60	6	J284
MPXLRBD0400R010N160	4	0.1	16	4	70	6	J262
VCPSRBD0400N20R01	4	0.1	20	4	60	6	J304
NEW VFRPSRBD0400R010N200	4	0.1	20	4	60	6	J284
MPXLRBD0400R010N240	4	0.1	24	4	70	6	J262
MPXLRBD0400R010N320	4	0.1	32	4	70	6	J262
MPXLRBD0400R010N480	4	0.1	48	4	90	6	J262
MS2MRBD0400R010	4	0.1	—	8	50	6	J245
MPMHVRBD0400R010	4	0.1	—	10	45	6	J257
MS4MRBD0400R010	4	0.1	—	11	45	6	J267
VCPSRBD0400N12R02	4	0.2	12	4	60	6	J304
NEW VFRPSRBD0400R020N120	4	0.2	12	4	60	6	J284
MPXLRBD0400R020N160	4	0.2	16	4	70	6	J262
VCPSRBD0400N20R02	4	0.2	20	4	60	6	J304
NEW VFRPSRBD0400R020N200	4	0.2	20	4	60	6	J284
CRN2XLRBD0400R020N20	4	0.2	20	4	65	6	J249
MPXLRBD0400R020N240	4	0.2	24	4	70	6	J262
MPXLRBD0400R020N320	4	0.2	32	4	70	6	J262
MPXLRBD0400R020N480	4	0.2	48	4	90	6	J262
MS2MRBD0400R020	4	0.2	—	8	50	6	J245
MPMHVRBD0400R020	4	0.2	—	10	45	6	J257
MS4MRBD0400R020	4	0.2	—	11	45	6	J267
VQMHVRBD0400R020	4	0.2	—	11	45	6	J270
VFSDRBD0400R030	4	0.3	12	4	45	6	J318
VCPSRBD0400N12R03	4	0.3	12	4	60	6	J304
NEW VFRPSRBD0400R030N120	4	0.3	12	4	60	6	J284
MPXLRBD0400R030N160	4	0.3	16	4	70	6	J262
VCPSRBD0400N20R03	4	0.3	20	4	60	6	J304

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

SELECTION CHART BY BLADE DIAMETER

CARBIDE/RADIUS

Order Number	DC	RE	LU	APMX	LF	DCON	Page
NEW VFRPSRBD0400R030N200	4	0.3	20	4	60	6	J284
CRN2XLRBD0400R030N20	4	0.3	20	4	65	6	J249
MPXLRBD0400R030N240	4	0.3	24	4	70	6	J263
VCPSRBD0400N30R03	4	0.3	30	4	70	6	J304
NEW VFRPSRBD0400R030N300	4	0.3	30	4	70	6	J284
MPXLRBD0400R030N320	4	0.3	32	4	70	6	J263
MPXLRBD0400R030N480	4	0.3	48	4	90	6	J263
VFMDRBD0400R030	4	0.3	—	12	60	6	J320
MS2MRBD0400R030	4	0.3	—	8	50	6	J245
MPMHVRBD0400R030	4	0.3	—	10	45	6	J257
NEW VQN4MVRBD0400R030	4	0.3	—	10	45	6	J277
MS4MRBD0400R030	4	0.3	—	11	45	6	J267
VQMHVRBD0400R030	4	0.3	—	11	45	6	J270
VC4JRBD0400R0030	4	0.3	—	15	50	6	J308
VCPSRBD0400N12R05	4	0.5	12	4	60	6	J304
VFHVRBD0400R05N012	4	0.5	12	4	60	6	J290
NEW VFRPSRBD0400R050N120	4	0.5	12	4	60	6	J284
MPXLRBD0400R050N160	4	0.5	16	4	70	6	J263
VCPSRBD0400N20R05	4	0.5	20	4	60	6	J304
NEW VFRPSRBD0400R050N200	4	0.5	20	4	60	6	J284
CRN2XLRBD0400R050N20	4	0.5	20	4	65	6	J249
VFHVRBD0400R05N020	4	0.5	20	4	80	6	J290
MPXLRBD0400R050N240	4	0.5	24	4	70	6	J263
VCPSRBD0400N30R05	4	0.5	30	4	70	6	J304
NEW VFRPSRBD0400R050N300	4	0.5	30	4	70	6	J284
VFHVRBD0400R05N030	4	0.5	30	4	80	6	J290
MPXLRBD0400R050N320	4	0.5	32	4	70	6	J263
MPXLRBD0400R050N480	4	0.5	48	4	90	6	J263
VFHVRBD0400R05N048	4	0.5	48	4	90	6	J291
MS2MRBD0400R050	4	0.5	—	8	50	6	J245
MPMHVRBD0400R050	4	0.5	—	10	45	6	J257
NEW VQN4MVRBD0400R050	4	0.5	—	10	45	6	J277
MS4MRBD0400R050	4	0.5	—	11	45	6	J267
VQMHVRBD0400R050	4	0.5	—	11	45	6	J270
VC4JRBD0400R0050	4	0.5	—	15	50	6	J308
VFHVRBD040R10N025T04	4	1	7	4	80	6	J297
VFHVRBD040R10N030T04	4	1	7	4	80	6	J297
VFHVRBD040R10N035T04	4	1	7	4	80	6	J297
VFHVRBD040R10N040T04	4	1	7	4	80	6	J297
VFHVRBD040R10N025T09	4	1	7	4	90	6	J297
VFHVRBD040R10N030T09	4	1	7	4	90	6	J297
VFHVRBD040R10N045T04	4	1	7	4	90	6	J297
VFHVRBD040R10N050T04	4	1	7	4	90	6	J297
VFHVRBD040R10N040T09	4	1	7	4	100	6	J297
VFHVRBD040R10N050T09	4	1	7	4	100	6	J297
VFHVRBD040R10N060T09	4	1	7	4	100	6	J297
VCPSRBD0400N08L20R10	4	1	8	4	60	6	J306
VCPSRBD0400N08L30R10	4	1	8	4	70	6	J306
NEW VQHVRBD0400R10N120	4	1	12	4	55	6	J279
VCPSRBD0400N12R10	4	1	12	4	60	6	J304

Order Number	DC	RE	LU	APMX	LF	DCON	Page
VFHVRBD0400R10N012	4	1	12	4	60	6	J291
NEW VFRPSRBD0400R100N120	4	1	12	4	60	6	J284
VCPSRBD0400N20R10	4	1	20	4	60	6	J304
NEW VFRPSRBD0400R100N200	4	1	20	4	60	6	J284
NEW VQHVRBD0400R10N200	4	1	20	4	60	6	J279
VFHVRBD0400R10N020	4	1	20	4	80	6	J291
VCPSRBD0400N30R10	4	1	30	4	70	6	J304
NEW VFRPSRBD0400R100N300	4	1	30	4	70	6	J284
VFHVRBD0400R10N030	4	1	30	4	80	6	J291
MS2MRBD0400R100	4	1	—	8	50	6	J245
MPMHVRBD0400R100	4	1	—	10	45	6	J257
MS4MRBD0400R100	4	1	—	11	45	6	J267
MS2MRBD0500R010	5	0.1	—	10	50	6	J245
MPMHVRBD0500R010	5	0.1	—	12.5	50	6	J257
MS4MRBD0500R010	5	0.1	—	13	50	6	J267
MS2MRBD0500R020	5	0.2	—	10	50	6	J245
MPMHVRBD0500R020	5	0.2	—	12.5	50	6	J257
MS4MRBD0500R020	5	0.2	—	13	50	6	J267
VQMHVRBD0500R020	5	0.2	—	13	50	6	J270
VFSDRBD0500R030	5	0.3	15	5	50	6	J318
VFMDRBD0500R030	5	0.3	—	15	60	6	J320
MS2MRBD0500R030	5	0.3	—	10	50	6	J245
MPMHVRBD0500R030	5	0.3	—	12.5	50	6	J257
MS4MRBD0500R030	5	0.3	—	13	50	6	J267
VQMHVRBD0500R030	5	0.3	—	13	50	6	J270
VC4JRBD0500R0030	5	0.3	—	20	60	6	J308
VCPSRBD0500N08L40R05	5	0.5	8	5	90	8	J306
VCPSRBD0500N08L60R05	5	0.5	8	5	110	8	J306
VCPSRBD0500N15R05	5	0.5	15	5	60	6	J304
NEW VFRPSRBD0500R050N150	5	0.5	15	5	60	6	J284
VCPSRBD0500N30R05	5	0.5	30	5	70	6	J304
MS2MRBD0500R050	5	0.5	—	10	50	6	J245
NEW VQN4MVRBD0500R050	5	0.5	—	12	50	6	J277
MPMHVRBD0500R050	5	0.5	—	12.5	50	6	J257
MS4MRBD0500R050	5	0.5	—	13	50	6	J267
VQMHVRBD0500R050	5	0.5	—	13	50	6	J270
VC4JRBD0500R0050	5	0.5	—	20	60	6	J308
VCPSRBD0500N08L40R10	5	1	8	5	90	8	J306
VCPSRBD0500N08L60R10	5	1	8	5	110	8	J306
VCPSRBD0500N15R10	5	1	15	5	60	6	J304
NEW VFRPSRBD0500R100N150	5	1	15	5	60	6	J284
VCPSRBD0500N30R10	5	1	30	5	70	6	J304
MS2MRBD0500R100	5	1	—	10	50	6	J245
MPMHVRBD0500R100	5	1	—	12.5	50	6	J257
MS4MRBD0500R100	5	1	—	13	50	6	J267
VQMHVRBD0500R100	5	1	—	13	50	6	J270
VCPSRBD0600N18R01	6	0.1	18	6	70	6	J304
NEW VFRPSRBD0600R010N180	6	0.1	18	9	70	6	J284
MPXLRBD0600R010N240	6	0.1	24	6	70	6	J263
MPXLRBD0600R010N480	6	0.1	48	6	100	6	J263

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MS2MRBD0600R010	6	0.1	—	12	50	6	J245
MS4MRBD0600R010	6	0.1	—	13	50	6	J267
MPMHVRBD0600R010	6	0.1	—	15	60	6	J257
VCPSRBD0600N18R02	6	0.2	18	6	70	6	J304
NEW VFRPSRBD0600R020N180	6	0.2	18	9	70	6	J284
MPXLRBD0600R020N240	6	0.2	24	6	70	6	J263
CRN2XLRBD0600R020N30	6	0.2	30	6	70	6	J249
MPXLRBD0600R020N480	6	0.2	48	6	100	6	J263
MS2MRBD0600R020	6	0.2	—	12	50	6	J245
CRN2MRBD0600R020	6	0.2	—	13	50	6	J248
MS4MRBD0600R020	6	0.2	—	13	50	6	J267
MPMHVRBD0600R020	6	0.2	—	15	60	6	J257
VFSDRBD0600R030	6	0.3	18	6	50	6	J318
VCPSRBD0600N18R03	6	0.3	18	6	70	6	J304
NEW VFRPSRBD0600R030N180	6	0.3	18	9	70	6	J284
MPXLRBD0600R030N240	6	0.3	24	6	70	6	J263
CRN2XLRBD0600R030N30	6	0.3	30	6	70	6	J249
MPXLRBD0600R030N480	6	0.3	48	6	100	6	J263
VFMDRBD0600R030	6	0.3	—	15	60	6	J320
MS2MRBD0600R030	6	0.3	—	12	50	6	J245
MS4MRBD0600R030	6	0.3	—	13	50	6	J267
VQMHVRBD0600R030	6	0.3	—	13	50	6	J270
VQMHVRBFD0600R030	6	0.3	—	13	50	6	J275
MPMHVRBD0600R030	6	0.3	—	15	60	6	J257
VC4JRBD0600R0030	6	0.3	—	20	60	6	J308
VFSDRBD0600R050	6	0.5	18	6	50	6	J318
VCPSRBD0600N18R05	6	0.5	18	6	70	6	J304
VFHVRBD0600R05N018	6	0.5	18	9	60	6	J291
NEW VFRPSRBD0600R050N180	6	0.5	18	9	70	6	J284
MPXLRBD0600R050N240	6	0.5	24	6	70	6	J263
CRN2XLRBD0600R050N30	6	0.5	30	6	70	6	J249
VFHVRBD0600R05N030	6	0.5	30	9	80	6	J291
VCPSRBD0600N41R05	6	0.5	41	6	90	6	J304
MPXLRBD0600R050N480	6	0.5	48	6	100	6	J263
VFMDRBD0600R050	6	0.5	—	15	60	6	J320
MS2MRBD0600R050	6	0.5	—	12	50	6	J245
CRN2MRBD0600R050	6	0.5	—	13	50	6	J248
MS4MRBD0600R050	6	0.5	—	13	50	6	J267
VF6MHVRBD0600R050	6	0.5	—	13	50	6	J316
VQMHVRBD0600R050	6	0.5	—	13	50	6	J270
VQMHVRBFD0600R050	6	0.5	—	13	50	6	J275
NEW VQN4MVRBD0600R050	6	0.5	—	13	50	6	J277
MPMHVRBD0600R050	6	0.5	—	15	60	6	J257
VC4JRBD0600R0050	6	0.5	—	20	60	6	J308
VFSDRBD0600R100	6	1	18	6	50	6	J318
VCPSRBD0600N18R10	6	1	18	6	70	6	J304
VFHVRBD0600R10N018	6	1	18	9	60	6	J291
NEW VFRPSRBD0600R100N180	6	1	18	9	70	6	J284
CRN2XLRBD0600R100N30	6	1	30	6	70	6	J249
VFHVRBD0600R10N030	6	1	30	9	80	6	J291

Order Number	DC	RE	LU	APMX	LF	DCON	Page
VCPSRBD0600N50R10	6	1	50	6	90	6	J304
VFHVRBD0600R10N054	6	1	54	9	90	6	J291
VFMDRBD0600R100	6	1	—	15	60	6	J320
MS2MRBD0600R100	6	1	—	12	50	6	J246
MS4MRBD0600R100	6	1	—	13	50	6	J267
VF6MHVRBD0600R100	6	1	—	13	50	6	J316
VQMHVRBD0600R100	6	1	—	13	50	6	J270
VQMHVRBFD0600R100	6	1	—	13	50	6	J275
NEW VQN4MVRBD0600R100	6	1	—	13	50	6	J277
MPMHVRBD0600R100	6	1	—	15	60	6	J257
VC4JRBD0600R0100	6	1	—	20	60	6	J308
VFHVRBD060R15N040T09	6	1.5	12	9	110	8	J297
VFHVRBD060R15N050T09	6	1.5	12	9	110	8	J297
VFHVRBD060R15N060T09	6	1.5	12	9	110	8	J297
VFHVRBD060R15N070T09	6	1.5	12	9	110	8	J297
VFHVRBD0600R15N018	6	1.5	18	9	60	6	J291
VFHVRBD0600R15N030	6	1.5	30	9	80	6	J291
VFHVRBD0600R15N042	6	1.5	42	9	90	6	J291
VFHVRBD0600R15N054	6	1.5	54	9	90	6	J291
MS2MRBD0600R150	6	1.5	—	12	50	6	J246
MS4MRBD0600R150	6	1.5	—	13	50	6	J267
VCPSRBD0600N08L40R20	6	2	8	6	70	8	J306
VCPSRBD0600N08L60R20	6	2	8	6	100	8	J306
VCPSRBD0600N18R20	6	2	18	6	70	6	J304
VFHVRBD0600R20N018	6	2	18	9	60	6	J291
NEW VFRPSRBD0600R200N180	6	2	18	9	70	6	J284
VFHVRBD0600R20N030	6	2	30	9	80	6	J291
MS2MRBD0600R200	6	2	—	12	50	6	J246
MS4MRBD0600R200	6	2	—	13	50	6	J267
VFHVRBD0700R15	7	1.5	—	11	80	6	J291
VCPSRBD0800N24R01	8	0.1	24	8	90	8	J304
VCPSRBD0800N24R02	8	0.2	24	8	90	8	J304
NEW VFRPSRBD0800R020N240	8	0.2	24	12	90	8	J284
MS2MRBD0800R020	8	0.2	—	16	60	8	J246
MS4MRBD0800R020	8	0.2	—	19	60	8	J267
MPMHVRBD0800R020	8	0.2	—	20	70	8	J257
VFSDRBD0800R030	8	0.3	24	8	60	8	J318
VCPSRBD0800N24R03	8	0.3	24	8	90	8	J304
NEW VFRPSRBD0800R030N240	8	0.3	24	12	90	8	J284
VFMDRBD0800R030	8	0.3	—	20	75	8	J320
MS2MRBD0800R030	8	0.3	—	16	60	8	J246
MS4MRBD0800R030	8	0.3	—	19	60	8	J267
VQMHVRBD0800R030	8	0.3	—	19	60	8	J270
MPMHVRBD0800R030	8	0.3	—	20	70	8	J257
VC4JRBD0800R0030	8	0.3	—	25	70	8	J308
VFSDRBD0800R050	8	0.5	24	8	60	8	J318
VCPSRBD0800N24R05	8	0.5	24	8	90	8	J304
VFHVRBD0800R05N024	8	0.5	24	12	60	8	J291
NEW VFRPSRBD0800R050N240	8	0.5	24	12	90	8	J284
VFHVRBD0800R05N040	8	0.5	40	12	100	8	J291

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

SELECTION CHART BY BLADE DIAMETER

CARBIDE/RADIUS

Order Number	DC	RE	LU	APMX	LF	DCON	Page
VFMDRBD0800R050	8	0.5	—	20	75	8	J320
MS2MRBD0800R050	8	0.5	—	16	60	8	J246
CRN2MRBD0800R050	8	0.5	—	19	60	8	J248
MS4MRBD0800R050	8	0.5	—	19	60	8	J267
VF6MHVRBD0800R050	8	0.5	—	19	60	8	J316
VQMHVRBD0800R050	8	0.5	—	19	60	8	J270
VQMHVRBFD0800R050	8	0.5	—	19	60	8	J275
NEW VQN6MVRBD0800R050	8	0.5	—	19	60	8	J277
MPMHVRBD0800R050	8	0.5	—	20	70	8	J257
VC4JRBD0800R0050	8	0.5	—	25	70	8	J308
VFSDRBD0800R100	8	1	24	8	60	8	J318
VCPSRBD0800N24R10	8	1	24	8	90	8	J304
VFHVRBD0800R10N024	8	1	24	12	60	8	J291
NEW VFRPSRBD0800R100N240	8	1	24	12	90	8	J285
VFHVRBD0800R10N040	8	1	40	12	100	8	J291
VCPSRBD0800N50R10	8	1	50	8	90	8	J304
VFMDRBD0800R100	8	1	—	20	75	8	J320
MS2MRBD0800R100	8	1	—	16	60	8	J246
CRN2MRBD0800R100	8	1	—	19	60	8	J248
MS4MRBD0800R100	8	1	—	19	60	8	J267
VF6MHVRBD0800R100	8	1	—	19	60	8	J316
VQMHVRBD0800R100	8	1	—	19	60	8	J270
VQMHVRBFD0800R100	8	1	—	19	60	8	J275
NEW VQN6MVRBD0800R100	8	1	—	19	60	8	J277
MPMHVRBD0800R100	8	1	—	20	70	8	J257
VC4JRBD0800R0100	8	1	—	25	70	8	J308
MS2MRBD0800R150	8	1.5	—	16	60	8	J246
MS4MRBD0800R150	8	1.5	—	19	60	8	J267
VQMHVRBD0800R150	8	1.5	—	19	60	8	J270
MPMHVRBD0800R150	8	1.5	—	20	70	8	J257
VC4JRBD0800R0150	8	1.5	—	25	70	8	J308
VCPSRBD0800N10L53R20	8	2	10	8	90	10	J306
VCPSRBD0800N10L70R20	8	2	10	8	130	12	J306
VFHVRBD080R20N060T09	8	2	15	12	150	10	J297
VFHVRBD080R20N080T09	8	2	15	12	150	10	J297
VCPSRBD0800N24R20	8	2	24	8	90	8	J304
VFHVRBD0800R20N024	8	2	24	12	60	8	J291
NEW VFRPSRBD0800R200N240	8	2	24	12	90	8	J285
VFHVRBD0800R20N040	8	2	40	12	100	8	J291
VFHVRBD0800R20N056	8	2	56	12	120	8	J291
VFHVRBD0800R20N072	8	2	72	12	120	8	J291
MS2MRBD0800R200	8	2	—	16	60	8	J246
MS4MRBD0800R200	8	2	—	19	60	8	J267
MPMHVRBD0800R200	8	2	—	20	70	8	J257
VC4JRBD0800R0200	8	2	—	25	70	8	J308
MS2MRBD0800R250	8	2.5	—	16	60	8	J246
MS4MRBD0800R250	8	2.5	—	19	60	8	J267
MPMHVRBD0800R250	8	2.5	—	20	70	8	J257
VCPSRBD0800N24R30	8	3	24	8	90	8	J304
VCPSRBD0800N50R30	8	3	50	8	90	8	J304

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MS2MRBD0800R300	8	3	—	16	60	8	J246
MS4MRBD0800R300	8	3	—	19	60	8	J267
MPMHVRBD0800R300	8	3	—	20	70	8	J258
VFHVRBD0900R20	9	2	—	13.5	100	8	J291
MS2MRBD1000R020	10	0.2	—	20	70	10	J246
MS4MRBD1000R020	10	0.2	—	22	70	10	J267
MPMHVRBD1000R020	10	0.2	—	25	80	10	J258
VCPSRBD1000N30R03	10	0.3	30	10	100	10	J304
NEW VFRPSRBD1000R030N300	10	0.3	30	15	100	10	J285
VFMDRBD1000R030	10	0.3	—	25	80	10	J320
MS2MRBD1000R030	10	0.3	—	20	70	10	J246
MS4MRBD1000R030	10	0.3	—	22	70	10	J267
VQMHVRBD1000R030	10	0.3	—	22	70	10	J270
VQMHVRBFD1000R030	10	0.3	—	22	70	10	J275
MPMHVRBD1000R030	10	0.3	—	25	80	10	J258
MPMHVRBD1000R030S08	10	0.3	—	25	100	8	J258
VC4JRBD1000R0030	10	0.3	—	30	90	10	J308
VFSDRBD1000R050	10	0.5	30	10	70	10	J318
VCPSRBD1000N30R05	10	0.5	30	10	100	10	J304
VFHVRBD1000R05N030	10	0.5	30	15	70	10	J291
NEW VFRPSRBD1000R050N300	10	0.5	30	15	100	10	J285
VFHVRBD1000R05N050	10	0.5	50	15	110	10	J291
VQ6MHVRBCHD1000R050	10	0.5	—	22	70	10	J314
VFMDRBD1000R050	10	0.5	—	25	80	10	J320
MS2MRBD1000R050	10	0.5	—	20	70	10	J246
CRN2MRBD1000R050	10	0.5	—	22	70	10	J248
MS4MRBD1000R050	10	0.5	—	22	70	10	J267
VF6MHVRBD1000R050	10	0.5	—	22	70	10	J316
VQMHVRBD1000R050	10	0.5	—	22	70	10	J270
VQMHVRBFD1000R050	10	0.5	—	22	70	10	J275
NEW VQN6MVRBD1000R050	10	0.5	—	22	70	10	J277
MPMHVRBD1000R050	10	0.5	—	25	80	10	J258
MPMHVRBD1000R050S08	10	0.5	—	25	100	8	J258
VC4JRBD1000R0050	10	0.5	—	30	90	10	J308
VFSDRBD1000R100	10	1	30	10	70	10	J318
VCPSRBD1000N30R10	10	1	30	10	100	10	J304
VFHVRBD1000R10N030	10	1	30	15	70	10	J291
NEW VFRPSRBD1000R100N300	10	1	30	15	100	10	J285
VCPSRBD1000N50R10	10	1	50	10	100	10	J304
VFHVRBD1000R10N050	10	1	50	15	110	10	J291
VQ6MHVRBCHD1000R100	10	1	—	22	70	10	J314
VFMDRBD1000R100	10	1	—	25	80	10	J320
MS2MRBD1000R100	10	1	—	20	70	10	J246
CRN2MRBD1000R100	10	1	—	22	70	10	J248
MS4MRBD1000R100	10	1	—	22	70	10	J267
VF6MHVRBD1000R100	10	1	—	22	70	10	J316
VQMHVRBD1000R100	10	1	—	22	70	10	J270
VQMHVRBFD1000R100	10	1	—	22	70	10	J275
NEW VQN6MVRBD1000R100	10	1	—	22	70	10	J277
MPMHVRBD1000R100	10	1	—	25	80	10	J258

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MPMHVRBD1000R100S08	10	1	—	25	100	8	J258
VC4JRBD1000R0100	10	1	—	30	90	10	J308
MS2MRBD1000R150	10	1.5	—	20	70	10	J246
MS4MRBD1000R150	10	1.5	—	22	70	10	J268
VQMHVRBD1000R150	10	1.5	—	22	70	10	J270
MPMHVRBD1000R150	10	1.5	—	25	80	10	J258
VC4JRBD1000R0150	10	1.5	—	30	90	10	J308
VFHVRBD100R20N080T09	10	2	18	15	130	16	J297
VFHVRBD100R20N120T09	10	2	18	15	180	16	J297
VCPSRBD1000N30R20	10	2	30	10	100	10	J304
VFHVRBD1000R20N030	10	2	30	15	70	10	J291
NEW VFRPSRBD1000R200N300	10	2	30	15	100	10	J285
VFHVRBD1000R20N050	10	2	50	15	110	10	J291
VFHVRBD1000R20N070	10	2	70	15	150	10	J291
VFHVRBD1000R20N090	10	2	90	15	150	10	J291
MS2MRBD1000R200	10	2	—	20	70	10	J246
MS4MRBD1000R200	10	2	—	22	70	10	J268
VQMHVRBD1000R200	10	2	—	22	70	10	J270
VQMHVRBFD1000R200	10	2	—	22	70	10	J275
MPMHVRBD1000R200	10	2	—	25	80	10	J258
MPMHVRBD1000R200S08	10	2	—	25	100	8	J258
VC4JRBD1000R0200	10	2	—	30	90	10	J308
MS2MRBD1000R250	10	2.5	—	20	70	10	J246
MS4MRBD1000R250	10	2.5	—	22	70	10	J268
MPMHVRBD1000R250	10	2.5	—	25	80	10	J258
VCPSRBD1000N12L55R30	10	3	12	10	100	12	J306
VCPSRBD1000N12L70R30	10	3	12	10	130	12	J306
VCPSRBD1000N30R30	10	3	30	10	100	10	J304
NEW VFRPSRBD1000R300N300	10	3	30	15	100	10	J285
VCPSRBD1000N50R30	10	3	50	10	100	10	J304
MS2MRBD1000R300	10	3	—	20	70	10	J246
MS4MRBD1000R300	10	3	—	22	70	10	J268
MPMHVRBD1000R300	10	3	—	25	80	10	J258
VCPSRBD1000N30R40	10	4	30	10	100	10	J304
VFHVRBD1100R20	11	2	—	16.5	110	10	J291
MS2MRBD1200R020	12	0.2	—	24	75	12	J246
MS4MRBD1200R020	12	0.2	—	26	75	12	J268
VCPSRBD1200N36R03	12	0.3	36	12	110	12	J304
MS2MRBD1200R030	12	0.3	—	24	75	12	J246
MS4MRBD1200R030	12	0.3	—	26	75	12	J268
MPMHVRBD1200R030	12	0.3	—	30	100	12	J258
MPMHVRBD1200R030S10	12	0.3	—	30	110	10	J258
VFSDRBD1200R050	12	0.5	36	12	75	12	J318
VCPSRBD1200N36R05	12	0.5	36	12	110	12	J304
VFHVRBD1200R05N036	12	0.5	36	18	80	12	J291
NEW VFRPSRBD1200R050N360	12	0.5	36	18	110	12	J285
VFHVRBD1200R05N060	12	0.5	60	18	120	12	J291
VQ6MHVRBCHD1200R050	12	0.5	—	26	75	12	J314
VFMDRBD1200R050	12	0.5	—	30	100	12	J320
MS2MRBD1200R050	12	0.5	—	24	75	12	J246

Order Number	DC	RE	LU	APMX	LF	DCON	Page
CRN2MRBD1200R050	12	0.5	—	26	75	12	J248
MS4MRBD1200R050	12	0.5	—	26	75	12	J268
VF6MHVRBD1200R050	12	0.5	—	26	75	12	J316
VQMHVRBD1200R050	12	0.5	—	26	75	12	J270
NEW VQN6MVRBD1200R050	12	0.5	—	26	75	12	J277
VC4JRBD1200R0050	12	0.5	—	30	90	12	J308
MPMHVRBD1200R050	12	0.5	—	30	100	12	J258
MPMHVRBD1200R050S10	12	0.5	—	30	110	10	J258
C3SARBD1200N0300R100	12	1	30	15	75	12	J253
VFSDRBD1200R100	12	1	36	12	75	12	J318
VCPSRBD1200N36R10	12	1	36	12	110	12	J304
NEW A3SARB120R100N36C	12	1	36	18	80	12	J251
NEW DLC3SARB120R100N36C	12	1	36	18	80	12	J255
VFHVRBD1200R10N036	12	1	36	18	80	12	J291
NEW VFRPSRBD1200R100N360	12	1	36	18	110	12	J285
C3SARBD1200N0400R100	12	1	40	15	125	12	J253
VFHVRBD1200R10N060	12	1	60	18	120	12	J291
VQ6MHVRBCHD1200R100	12	1	—	26	75	12	J314
VFMDRBD1200R100	12	1	—	30	100	12	J320
MS2MRBD1200R100	12	1	—	24	75	12	J246
CRN2MRBD1200R100	12	1	—	26	75	12	J248
MS4MRBD1200R100	12	1	—	26	75	12	J268
VF6MHVRBD1200R100	12	1	—	26	75	12	J316
VQMHVRBD1200R100	12	1	—	26	75	12	J270
VQMHVRBFD1200R100	12	1	—	26	75	12	J275
NEW VQN6MVRBD1200R100	12	1	—	26	75	12	J277
VC4JRBD1200R0100	12	1	—	30	90	12	J308
MPMHVRBD1200R100	12	1	—	30	100	12	J258
MPMHVRBD1200R100S10	12	1	—	30	110	10	J258
MS2MRBD1200R150	12	1.5	—	24	75	12	J246
MS4MRBD1200R150	12	1.5	—	26	75	12	J268
VQMHVRBD1200R150	12	1.5	—	26	75	12	J270
VC4JRBD1200R0150	12	1.5	—	30	90	12	J308
MPMHVRBD1200R150	12	1.5	—	30	100	12	J258
VFHVRBD120R20N080T09	12	2	28	18	130	16	J297
VFHVRBD120R20N120T09	12	2	28	18	180	16	J297
VCPSRBD1200N36R20	12	2	36	12	110	12	J304
NEW A3SARB120R200N36C	12	2	36	18	80	12	J251
NEW DLC3SARB120R200N36C	12	2	36	18	80	12	J255
VFHVRBD1200R20N036	12	2	36	18	80	12	J291
NEW VFRPSRBD1200R200N360	12	2	36	18	110	12	J285
VFHVRBD1200R20N060	12	2	60	18	120	12	J291
VFHVRBD1200R20N084	12	2	84	18	160	12	J291
VFHVRBD1200R20N108	12	2	108	18	160	12	J291
MS2MRBD1200R200	12	2	—	24	75	12	J246
MS4MRBD1200R200	12	2	—	26	75	12	J268
VQMHVRBD1200R200	12	2	—	26	75	12	J270
VQMHVRBFD1200R200	12	2	—	26	75	12	J275
VC4JRBD1200R0200	12	2	—	30	90	12	J308
MPMHVRBD1200R200	12	2	—	30	100	12	J258

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

SELECTION CHART BY BLADE DIAMETER

CARBIDE/RADIUS

Order Number	DC	RE	LU	APMX	LF	DCON	Page
MPMHVRBD1200R200S10	12	2	—	30	110	10	J258
MS2MRBD1200R250	12	2.5	—	24	75	12	J246
MS4MRBD1200R250	12	2.5	—	26	75	12	J268
VQMHVRBD1200R250	12	2.5	—	26	75	12	J270
VCPSRBD1200N24L70R30	12	3	24	12	130	16	J306
VCPSRBD1200N36R30	12	3	36	12	110	12	J304
NEW A3SARB120R300N36C	12	3	36	18	80	12	J251
NEW DLC3SARB120R300N36C	12	3	36	18	80	12	J255
VFHVRBD1200R30N036	12	3	36	18	80	12	J291
NEW VFRPSRBD1200R300N360	12	3	36	18	110	12	J285
VFHVRBD1200R30N060	12	3	60	18	120	12	J291
MS2MRBD1200R300	12	3	—	24	75	12	J246
MS4MRBD1200R300	12	3	—	26	75	12	J268
VQMHVRBD1200R300	12	3	—	26	75	12	J270
VQMHVRBFD1200R300	12	3	—	26	75	12	J275
MPMHVRBD1200R300	12	3	—	30	100	12	J258
MPMHVRBD1200R300S10	12	3	—	30	110	10	J258
C3SARBD1200N0300R320	12	3.2	30	15	75	12	J253
C3SARBD1200N0400R320	12	3.2	40	15	125	12	J253
VCPSRBD1200N36R40	12	4	36	12	110	12	J304
VCPSRBD1200N36R50	12	5	36	12	110	12	J304
VFHVRBD1300R30	13	3	—	19.5	120	12	J291
MPMHVRBD1600R030	16	0.3	—	40	110	16	J258
VFHVRBD1600R05N042	16	0.5	42	24	100	16	J291
MS4MRBD1600R050	16	0.5	—	32	90	16	J268
MPMHVRBD1600R050	16	0.5	—	40	110	16	J258
VC4JRBD1600R0050	16	0.5	—	50	110	16	J308
C3SARBD1600N0450R100	16	1	45	15	125	16	J253
NEW VQT5MVRB160R100N48C	16	1	48	34	120	16	J312
C3SARBD1600N0700R100	16	1	70	15	150	16	J253
VQ6MHVRBCHD1600R100	16	1	—	32	90	16	J314
VFMHVRBCHD1600R100	16	1	—	35	90	16	J288
VFMDRBD1600R100	16	1	—	40	110	16	J320
MS4MRBD1600R100	16	1	—	32	90	16	J268
VF6MHVRBD1600R100	16	1	—	32	90	16	J316
VF8MHVRBCHD1600R100	16	1	—	32	90	16	J322
VQMHVRBD1600R100	16	1	—	35	90	16	J270
VQMHVRBFD1600R100	16	1	—	35	90	16	J275
MPMHVRBD1600R100	16	1	—	40	110	16	J258
VC4JRBD1600R0100	16	1	—	50	110	16	J308
VFMDRBD1600R150	16	1.5	—	40	110	16	J320
MS4MRBD1600R150	16	1.5	—	32	90	16	J268
VQMHVRBD1600R150	16	1.5	—	35	90	16	J270
VC4JRBD1600R0150	16	1.5	—	50	110	16	J308
VFHVRBD1600R20N042	16	2	42	24	100	16	J291
NEW A3SARB160R200N48C	16	2	48	24	90	16	J251
NEW DLC3SARB160R200N48C	16	2	48	24	90	16	J255
MS4MRBD1600R200	16	2	—	32	90	16	J268
VF6MHVRBD1600R200	16	2	—	32	90	16	J316
VQMHVRBD1600R200	16	2	—	35	90	16	J271

Order Number	DC	RE	LU	APMX	LF	DCON	Page
VQMHVRBFD1600R200	16	2	—	35	90	16	J275
MPMHVRBD1600R200	16	2	—	40	110	16	J258
VC4JRBD1600R0200	16	2	—	50	110	16	J308
MS4MRBD1600R250	16	2.5	—	32	90	16	J268
VQMHVRBD1600R250	16	2.5	—	35	90	16	J271
VFHVRBD1600R30N042	16	3	42	24	100	16	J291
NEW A3SARB160R300N48C	16	3	48	24	90	16	J251
NEW DLC3SARB160R300N48C	16	3	48	24	90	16	J255
NEW VQT5MVRB160R300N48C	16	3	48	34	120	16	J312
VFHVRBD1600R30N080	16	3	80	24	140	16	J291
VFHVRBD1600R30N120	16	3	120	24	175	16	J291
VQ6MHVRBCHD1600R300	16	3	—	32	90	16	J314
VFMHVRBCHD1600R300	16	3	—	35	90	16	J288
MS4MRBD1600R300	16	3	—	32	90	16	J268
VF8MHVRBCHD1600R300	16	3	—	32	90	16	J322
VQMHVRBD1600R300	16	3	—	35	90	16	J271
MPMHVRBD1600R300	16	3	—	40	110	16	J258
C3SARBD1600N0450R320	16	3.2	45	15	125	16	J253
C3SARBD1600N0700R320	16	3.2	70	15	150	16	J253
NEW A3SARB160R400N48C	16	4	48	24	90	16	J251
NEW DLC3SARB160R400N48C	16	4	48	24	90	16	J255
NEW VQT5MVRB160R400N48C	16	4	48	34	120	16	J312
VQ6MHVRBCHD1600R400	16	4	—	32	90	16	J314
VQMHVRBD1600R400	16	4	—	35	90	16	J271
VQMHVRBD1600R500	16	5	—	35	90	16	J271
MPMHVRBD1600R500	16	5	—	40	110	16	J258
VFMDRBD1800R100	18	1	—	40	120	16	J320
C3SARBD1800R100	18	1	—	18	150	16	J253
VFMDRBD1800R150	18	1.5	—	40	120	16	J320
C3SARBD1800R320	18	3.2	—	18	150	16	J253
MPMHVRBD2000R030	20	0.3	—	50	125	20	J258
MS4MRBD2000R050	20	0.5	—	38	100	20	J268
MPMHVRBD2000R050	20	0.5	—	50	125	20	J258
VC4JRBD2000R0050	20	0.5	—	55	110	20	J308
C3SARBD2000N0600R100	20	1	60	20	125	20	J253
NEW VQT5MVRB200R100N60C	20	1	60	44	135	20	J312
C3SARBD2000N0850R100	20	1	85	20	150	20	J253
VQ6MHVRBCHD2000R100	20	1	—	38	100	20	J314
VFMHVRBCHD2000R100	20	1	—	45	110	20	J288
VFMDRBD2000R100	20	1	—	45	125	20	J320
MS4MRBD2000R100	20	1	—	38	100	20	J268
VF6MHVRBD2000R100	20	1	—	38	100	20	J316
VF8MHVRBCHD2000R100	20	1	—	38	100	20	J322
VQMHVRBD2000R100	20	1	—	45	110	20	J271
MPMHVRBD2000R100	20	1	—	50	125	20	J258
VC4JRBD2000R0100	20	1	—	55	110	20	J308
VFMDRBD2000R150	20	1.5	—	45	125	20	J320
MS4MRBD2000R150	20	1.5	—	38	100	20	J268
VQMHVRBD2000R150	20	1.5	—	45	110	20	J271
VC4JRBD2000R0150	20	1.5	—	55	110	20	J308

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

	Order Number	DC	RE	LU	APMX	LF	DCON	Page
NEW	A3SARB200R200N55C	20	2	55	30	100	20	J251
NEW	DLC3SARB200R200N55C	20	2	55	30	100	20	J255
	VFMDRBD2000R200	20	2	—	45	125	20	J320
	MS4MRBD2000R200	20	2	—	38	100	20	J268
	VF6MHVRBD2000R200	20	2	—	38	100	20	J316
	VQMHVRBD2000R200	20	2	—	45	110	20	J271
	MPMHVRBD2000R200	20	2	—	50	125	20	J258
	VC4JRBD2000R0200	20	2	—	55	110	20	J308
	MS4MRBD2000R250	20	2.5	—	38	100	20	J268
	VQMHVRBD2000R250	20	2.5	—	45	110	20	J271
NEW	A3SARB200R300N55C	20	3	55	30	100	20	J251
NEW	DLC3SARB200R300N55C	20	3	55	30	100	20	J255
NEW	VQT5MVRB200R300N60C	20	3	60	44	135	20	J312
	VQ6MHVRBCHD2000R300	20	3	—	38	100	20	J314
	VFMHVRBCHD2000R300	20	3	—	45	110	20	J288
	MS4MRBD2000R300	20	3	—	38	100	20	J268
	VF8MHVRBCHD2000R300	20	3	—	38	100	20	J322
	VQMHVRBD2000R300	20	3	—	45	110	20	J271
	MPMHVRBD2000R300	20	3	—	50	125	20	J258
	C3SARBD2000N0600R320	20	3.2	60	20	125	20	J253
	C3SARBD2000N0850R320	20	3.2	85	20	150	20	J253
NEW	A3SARB200R400N55C	20	4	55	30	100	20	J251
NEW	DLC3SARB200R400N55C	20	4	55	30	100	20	J255
	C3SARBD2000N0600R400	20	4	60	20	125	20	J253
NEW	VQT5MVRB200R400N60C	20	4	60	44	135	20	J312
	C3SARBD2000N0850R400	20	4	85	20	150	20	J253
	VQ6MHVRBCHD2000R400	20	4	—	38	100	20	J314
	VQMHVRBD2000R400	20	4	—	45	110	20	J271
	VQMHVRBD2000R500	20	5	—	45	110	20	J271
	MPMHVRBD2000R500	20	5	—	50	125	20	J258
NEW	VQT5MVRB200R600N60C	20	6	60	44	135	20	J312
	VQMHVRBD2000R635	20	6.35	—	45	110	20	J271
NEW	VQT5MVRB250R100N75C	25	1	75	54	155	25	J312
NEW	A3SARB250R200N55C	25	2	55	37.5	100	25	J251
NEW	DLC3SARB250R200N55C	25	2	55	37.5	100	25	J255
NEW	A3SARB250R300N55C	25	3	55	37.5	100	25	J251
NEW	DLC3SARB250R300N55C	25	3	55	37.5	100	25	J255
NEW	VQT5MVRB250R300N75C	25	3	75	54	155	25	J312
	C3SARBD2500N0650R320	25	3.2	65	20	125	25	J253
	C3SARBD2500N0900R320	25	3.2	90	20	150	25	J253
NEW	A3SARB250R400N55C	25	4	55	37.5	100	25	J251
NEW	DLC3SARB250R400N55C	25	4	55	37.5	100	25	J255
	C3SARBD2500N0650R400	25	4	65	20	125	25	J253
NEW	VQT5MVRB250R400N75C	25	4	75	54	155	25	J312
	C3SARBD2500N0900R400	25	4	90	20	150	25	J253
NEW	A3SARB250R500N55C	25	5	55	37.5	100	25	J251
NEW	DLC3SARB250R500N55C	25	5	55	37.5	100	25	J255
	C3SARBD2500N0650R500	25	5	65	20	125	25	J253
	C3SARBD2500N0900R500	25	5	90	20	150	25	J253
NEW	VQT5MVRB250R600N75C	25	6	75	54	155	25	J312

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

SELECTION CHART BY BLADE DIAMETER

CARBIDE/OTHER

Duplex Corner Radius End Mill

Order Number	DC	RE1	LU	APMX	LF	DCON	Page
NEW VQFDRBD0300N080	3	0.64	8	0.18	50	6	J281
VFFDRBD0300	3	0.64	10	0.18	60	6	J300
NEW VQFDRBD0300N120	3	0.64	12	0.18	55	6	J281
NEW VQFDRBD0400N120	4	0.71	12	0.25	55	6	J281
VFFDRBD0400	4	0.71	12	0.25	60	6	J300
NEW VQFDRBD0400N160	4	0.71	16	0.25	60	6	J281
NEW VQFDRBD0600N180	6	0.92	18	0.36	60	6	J281
VFFDRBD0600	6	0.92	18	0.36	80	6	J300
VFFDRBD0800	8	1.16	24	0.44	90	8	J300
VFFDRBD1000	10	1.47	30	0.57	100	10	J300
VFFDRBD1200	12	1.77	36	0.7	110	12	J300

DC = Cutting diameter RE1 = Approx. R LU = Usable length
APMX = Depth of cut maximum LF = Functional length
DCON = Connection diameter

Chamfer End Mill

Order Number	DC	DCN	LU	APMX	LF	DCON	Page
VC2CD0200	2	0.3	6	0.85	50	6	J348
VC2CD0400	4	0.3	12	1.85	50	6	J348
VC2CD0600	6	0.3	—	2.85	50	6	J348
VC2CD0800	8	0.4	—	3.8	60	8	J348
VC2CD1000	10	0.5	—	4.75	70	10	J348
VC2CD1200	12	0.5	—	5.75	75	12	J348

DC = Cutting diameter DCN = Cutting diameter minimum
LU = Usable length APMX = Depth of cut maximum LF = Functional length
DCON = Connection diameter

Barrel End Mill

Order Number	DC	RE1	RE2	APMX	LF	DCON	Page
VQT6URR020R075S08	8	2	75	21	90	8	J333
VQT6URR020R085S10	10	2	85	26	100	10	J333
VQT6URR030R075S10	10	3	75	22	100	10	J333
VQT6URR040R100S12	12	4	100	25	110	12	J333

DC = Cutting diameter RE1 = Nose radius RE2 = Tangential form radius
LU = Usable length APMX = Depth of cut maximum LF = Functional length
DCON = Connection diameter

CERAMICS/CBN

Ceramic End Mill

Order Number	DC	RE	LU	APMX	LF	DCON	Page
CE4SRBD0600R050	6	0.5	12	4.5	50	6	J310
CE6SRBD0600R050	6	0.5	12	4.5	50	6	J310
CE4SRBD0800R100	8	1	16	6	60	8	J310
CE6SRBD0800R100	8	1	16	6	60	8	J310
CE4SRBD1000R100	10	1	20	7.5	65	10	J310
CE6SRBD1000R100	10	1	20	7.5	65	10	J310
CE4SRBD1200R150	12	1.5	24	9	70	12	J310
CE6SRBD1200R150	12	1.5	24	9	70	12	J310

CBN End Mill

Order Number	Grade	DC	LU	APMX	LF	DCON	Page
GBE06S0640	MB730	6	8	3.5	40	6	J349
GBE08S0845	MB730	8	13	6	45	8	J349
GBE10S1050	MB730	10	13	6	50	10	J349
GBE12S1255	MB730	12	13	6	55	12	J349

DC = Cutting diameter RE = Corner radius LU = Usable length APMX = Depth of cut maximum LF = Functional length DCON = Usable length

HSS/SQUARE

Order Number	DC	APMX	LF	DCON	Page
2SSD0050	0.5	0.8	50	6	J356
2SSD0100	1	2	50	6	J356
2MSD0100	1	3	50	6	J358
2LSD0100	1	6	50	6	J360
2SSD0150	1.5	3.5	50	6	J356
2MSD0150	1.5	4.5	50	6	J358
2LSD0150	1.5	7.5	50	6	J360
2SSD0200	2	5	50	6	J356
2MSD0200	2	6	50	6	J358
2LSD0200	2	10	55	6	J360
2SSD0250	2.5	6	50	6	J356
2MSD0250	2.5	7.5	50	6	J358
4MCD0250	2.5	10	50	6	J366
2LSD0250	2.5	15	55	6	J360
2MKND0300	3	5	50	6	J362
2MKNND0300	3	5	50	6	J362
2MKPD0300	3	5	50	6	J362
2SSD0300	3	8	50	6	J356
S2SDAD0300	3	8	50	6	J363
VA2SSD0300	3	8	50	6	J352
2MSD0300	3	10	50	6	J358
4MCD0300	3	10	50	6	J366
VA2MSD0300	3	10	50	6	J354
VA4MCD0300	3	10	50	6	J364
1MAD0300	3	10	60	8	J350
2LSD0300	3	15	55	6	J360
4LCD0300	3	15	55	6	J368
2SSD0350	3.5	8	60	8	J356
2MSD0350	3.5	12	50	6	J358
2LSD0350	3.5	15	55	6	J360
2MKND0400	4	6	60	8	J362
2MKNND0400	4	6	60	8	J362
2MKPD0400	4	6	60	8	J362
2SSD0400	4	8	60	8	J356
S2SDAD0400	4	8	60	8	J363
VA2SSD0400	4	8	60	8	J352
2MSD0400	4	12	50	6	J358
1MAD0400	4	12	60	8	J350
4MCD0400	4	12	60	8	J366
VA2MSD0400	4	12	60	8	J354
VA4MCD0400	4	12	60	8	J364
1LAD0400	4	18	70	8	J351
2LSD0400	4	20	55	6	J360
4LCD0400	4	20	55	8	J368
2SSD0450	4.5	10	60	8	J356
2MSD0450	4.5	15	55	6	J358
4MCD0450	4.5	15	60	8	J366
2LSD0450	4.5	20	55	6	J360
2MKND0500	5	8	60	8	J362
2MKNND0500	5	8	60	8	J362
2MKPD0500	5	8	60	8	J362
2SSD0500	5	10	60	8	J356
S2SDAD0500	5	10	60	8	J363
VA2SSD0500	5	10	60	8	J352
VASFPRD0500	5	10	80	6	J370
2MSD0500	5	15	55	6	J358
MRD0500	5	15	60	6	J376
VAMRD0500	5	15	60	6	J374
4MCD0500	5	15	60	8	J366
VA2MSD0500	5	15	60	8	J354
VA4MCD0500	5	15	60	8	J364
1MAD0500	5	15	65	8	J350
VAMFPRD0500	5	15	80	6	J372
1LAD0500	5	20	70	8	J351
2LSD0500	5	25	60	6	J360
4LCD0500	5	25	60	8	J368
2SSD0550	5.5	12	60	8	J356
2MSD0550	5.5	15	55	6	J358
2LSD0550	5.5	25	60	6	J360
2MKND0600	6	8	60	8	J362
2MKNND0600	6	8	60	8	J362
2MKPD0600	6	8	60	8	J362
2SSD0600	6	12	60	8	J356
S2SDAD0600	6	12	60	8	J363
VA2SSD0600	6	12	60	8	J352
VASFPRD0600	6	12	80	6	J370
2MSD0600	6	15	55	6	J358
MRD0600	6	15	60	6	J376
VAMRD0600	6	15	60	6	J374
4MCD0600	6	15	60	8	J366
VA2MSD0600	6	15	60	8	J354
VA4MCD0600	6	15	60	8	J364
1MAD0600	6	15	65	8	J350
VAMFPRD0600	6	17	80	6	J372
1LAD0600	6	20	70	8	J351
2LSD0600	6	25	60	6	J360
4LCD0600	6	25	60	8	J368
2SSD0650	6.5	15	65	10	J356
2MSD0650	6.5	20	65	8	J358
4MCD0650	6.5	20	65	10	J366
2MKND0700	7	10	65	10	J362
2MKNND0700	7	10	65	10	J362
2MKPD0700	7	10	65	10	J362
2SSD0700	7	15	65	10	J356
VA2SSD0700	7	15	65	10	J352
VASFPRD0700	7	17	80	8	J370
2MSD0700	7	20	65	8	J358
4MCD0700	7	20	65	10	J366
VA2MSD0700	7	20	65	10	J354
VA4MCD0700	7	20	65	10	J364

DC = Cutting diameter APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

SELECTION CHART BY BLADE DIAMETER

HSS/SQUARE

Order Number	DC	APMX	LF	DCON	Page
MRD0700	7	20	70	8	J376
VAMRD0700	7	20	70	8	J374
VAMFPRD0700	7	22	80	8	J372
2LSD0700	7	35	75	8	J360
4LCD0700	7	35	75	10	J368
2SSD0750	7.5	15	65	10	J356
2MSD0750	7.5	20	65	8	J358
2MKND0800	8	10	65	10	J362
2MKNND0800	8	10	65	10	J362
2MKPD0800	8	10	65	10	J362
2SSD0800	8	15	65	10	J356
S2SDAD0800	8	15	65	10	J363
VA2SSD0800	8	15	65	10	J352
VASFPRD0800	8	17	85	8	J370
2MSD0800	8	20	65	8	J358
4MCD0800	8	20	65	10	J366
VA2MSD0800	8	20	65	10	J354
VA4MCD0800	8	20	65	10	J364
MRD0800	8	20	70	8	J376
VAMRD0800	8	20	70	8	J374
1MAD0800	8	20	75	8	J350
VAMFPRD0800	8	28	85	8	J372
1LAD0800	8	30	80	8	J351
2LSD0800	8	35	75	8	J360
4LCD0800	8	35	75	10	J368
2SSD0850	8.5	20	75	10	J356
2MSD0850	8.5	25	75	10	J358
2SSD0900	9	20	75	10	J356
VA2SSD0900	9	20	75	10	J352
VASFPRD0900	9	22	100	10	J370
2MSD0900	9	25	75	10	J358
4MCD0900	9	25	75	10	J366
VA2MSD0900	9	25	75	10	J354
VA4MCD0900	9	25	75	10	J364
MRD0900	9	25	80	10	J376
VAMRD0900	9	25	80	10	J374
VAMFPRD0900	9	28	95	10	J372
2LSD0900	9	45	90	10	J360
2SSD0950S10	9.5	20	75	10	J356
2MSD0950	9.5	25	75	10	J358
2MKND1000	10	15	75	12	J362
2MKNND1000	10	15	75	12	J362
2MKPD1000	10	15	75	12	J362
2SSD1000S10	10	20	75	10	J356
S2SDAD1000	10	20	75	10	J363
2SSD1000S12	10	20	75	12	J356
VA2SSD1000	10	20	75	12	J352
VASFPRD1000	10	22	100	10	J370
2MSD1000	10	25	75	10	J358
4MCD1000	10	25	75	10	J366

Order Number	DC	APMX	LF	DCON	Page
VA2MSD1000	10	25	75	10	J354
VA4MCD1000	10	25	75	10	J364
MRD1000	10	25	80	10	J376
VAMRD1000	10	25	80	10	J374
VAMFPRD1000	10	34	100	10	J372
1LAD1000	10	35	90	10	J351
2LSD1000	10	45	90	10	J360
4LCD1000	10	45	90	10	J368
2SSD1100	11	22	85	12	J356
VA2SSD1100	11	22	85	12	J352
2MSD1100	11	30	85	12	J358
4MCD1100	11	30	85	12	J366
VA2MSD1100	11	30	85	12	J354
VA4MCD1100	11	30	85	12	J364
MRD1100	11	30	110	12	J376
VAMRD1100	11	30	110	12	J374
2LSD1100	11	55	105	12	J360
2MKND1200	12	18	75	12	J362
2MKNND1200	12	18	75	12	J362
2MKPD1200	12	18	75	12	J362
2SSD1200	12	22	85	12	J356
VA2SSD1200	12	22	85	12	J352
VASFPRD1200	12	27	110	12	J370
2MSD1200	12	30	85	12	J358
4MCD1200	12	30	85	12	J366
VA2MSD1200	12	30	85	12	J354
VA4MCD1200	12	30	85	12	J364
MRD1200	12	30	110	12	J376
VAMRD1200	12	30	110	12	J374
VAMFPRD1200	12	40	110	12	J372
1LAD1200	12	45	100	12	J351
2LSD1200	12	55	105	12	J360
4LCD1200	12	55	105	12	J368
2SSD1300	13	26	90	12	J356
2MSD1300	13	35	90	12	J358
4MCD1300	13	35	90	12	J366
VA2MSD1300	13	35	90	12	J354
VA4MCD1300	13	35	90	12	J364
MRD1300	13	35	115	12	J376
VAMRD1300	13	35	115	12	J374
2LSD1300	13	55	105	12	J360
2SSD1400	14	26	90	16	J356
VA2SSD1400	14	26	95	16	J352
VASFPRD1400	14	27	110	12	J370
2MSD1400	14	35	95	16	J358
4MCD1400	14	35	95	16	J366
VA2MSD1400	14	35	95	16	J354
VA4MCD1400	14	35	95	16	J364
MRD1400	14	35	135	16	J376
VAMRD1400	14	35	135	16	J374

DC = Cutting diameter APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

Order Number	DC	APMX	LF	DCON	Page
VAMFPRD1400	14	40	110	12	J372
2LSD1400	14	55	110	16	J360
VASFPRD1500	15	27	125	16	J370
2SSD1500	15	30	100	16	J356
2MSD1500	15	40	100	16	J358
4MCD1500	15	40	100	16	J366
VA2MSD1500	15	40	100	16	J354
VA4MCD1500	15	40	100	16	J364
VAMFPRD1500	15	40	120	16	J372
MRD1500	15	40	140	16	J376
VAMRD1500	15	40	140	16	J374
2LSD1500	15	65	120	16	J360
2SSD1600	16	32	100	16	J356
VA2SSD1600	16	32	100	16	J352
VASFPRD1600	16	33	125	16	J370
2MSD1600	16	40	100	16	J358
4MCD1600	16	40	100	16	J366
VA2MSD1600	16	40	100	16	J354
VA4MCD1600	16	40	100	16	J364
MRD1600	16	40	140	16	J376
VAMRD1600	16	40	140	16	J374
VAMFPRD1600	16	48	125	16	J372
2LSD1600	16	65	120	16	J360
4LCD1600	16	65	120	16	J368
2MSD1700	17	40	100	16	J358
VA2MSD1700	17	40	100	16	J354
VA4MCD1700	17	40	100	16	J364
VAMRD1700	17	40	140	16	J374
VASFPRD1800	18	33	125	16	J370
2MSD1800	18	40	100	16	J358
4MCD1800	18	40	100	16	J366
VA2MSD1800	18	40	100	16	J354
VA4MCD1800	18	40	100	16	J364
MRD1800	18	40	140	16	J376
VAMRD1800	18	40	140	16	J374
VAMFPRD1800	18	48	125	16	J372
2LSD1800	18	65	120	16	J360
2MSD1900	19	45	115	20	J358
VAMRD1900	19	45	145	20	J374
2SSD2000	20	38	115	20	J356
VA2SSD2000	20	38	120	20	J352
VASFPRD2000	20	38	145	20	J370
2MSD2000	20	45	115	20	J358
4MCD2000	20	45	115	20	J366
VA4MCD2000	20	45	115	20	J364
VA2MSD2000	20	45	120	20	J354
MRD2000	20	45	145	20	J376
VAMRD2000	20	45	145	20	J374
VAMFPRD2000	20	57	145	20	J372
2LSD2000	20	75	140	20	J360
4LCD2000	20	75	140	20	J368
2MSD2100	21	45	115	20	J358
VASFPRD2200	22	38	145	20	J370
2MSD2200	22	45	115	20	J358
4MCD2200	22	45	115	20	J366
VA4MCD2200	22	45	115	20	J364
VA2MSD2200	22	45	120	20	J354
MRD2200	22	45	145	20	J376
VAMRD2200	22	45	145	20	J374
VAMFPRD2200	22	57	145	20	J372
2MSD2300	23	50	120	25	J358
2MSD2400	24	50	120	25	J358
VASFPRD2500	25	43	150	25	J370
2MSD2500	25	50	120	25	J358
4MCD2500	25	50	120	25	J366
VA4MCD2500	25	50	120	25	J364
MRD2500	25	50	150	25	J376
VAMRD2500	25	50	150	25	J374
VAMFPRD2500	25	68	150	25	J372
4LCD2500	25	90	160	25	J368
2MSD2600	26	50	120	25	J359
4LCD2600	26	90	160	25	J368
2MSD2800	28	55	125	25	J359
VASFPRD3000	30	48	165	25	J370
2MSD3000	30	55	125	25	J359
4MCD3000	30	55	125	25	J366
MRD3000S25	30	55	165	25	J376
VAMRD3000	30	55	165	25	J374
MRD3000S32	30	55	165	32	J376
VAMFPRD3000	30	68	165	25	J372
4LCD3000	30	90	160	25	J368
2MSD3200	32	60	145	32	J359
VAMRD3200	32	60	175	32	J374

DC = Cutting diameter APMX = Depth of cut maximum LF = Functional length DCON = Connection diameter

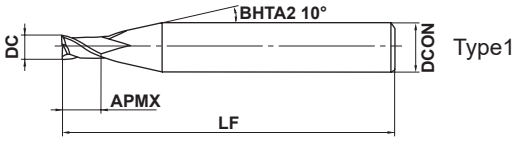
MS2SS

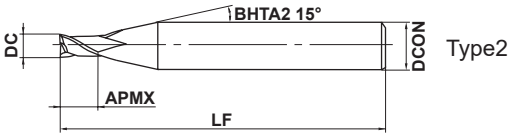
End mill, Short cut length, 2 flute

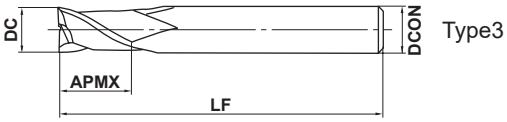


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	









DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2SSD0010	0.1	0.15	40	4	2	●	1
MS2SSD0020	0.2	0.3	40	4	2	●	2
MS2SSD0030	0.3	0.45	40	4	2	●	2
MS2SSD0040	0.4	0.6	40	4	2	●	2
MS2SSD0050	0.5	0.75	40	4	2	●	2
MS2SSD0060	0.6	0.9	40	4	2	●	2
MS2SSD0070	0.7	1.1	40	4	2	●	2
MS2SSD0080	0.8	1.2	40	4	2	●	2
MS2SSD0090	0.9	1.4	40	4	2	●	2
MS2SSD0100	1	1.5	40	4	2	●	2
MS2SSD0120	1.2	1.8	40	4	2	●	2
MS2SSD0150	1.5	2.3	40	4	2	●	2
MS2SSD0180	1.8	2.7	40	4	2	●	2
MS2SSD0200	2	3	40	4	2	●	2
MS2SSD0250	2.5	3.8	40	4	2	●	2
MS2SSD0300	3	4.5	45	6	2	●	2
MS2SSD0400	4	6	50	6	2	●	2
MS2SSD0500	5	7.5	50	6	2	●	2
MS2SSD0600	6	9	50	6	2	●	3
MS2SSD0700	7	10.5	60	8	2	●	2
MS2SSD0800	8	12	60	8	2	●	3
MS2SSD0900	9	13.5	70	10	2	●	2
MS2SSD1000	10	15	70	10	2	●	3
MS2SSD1100	11	16.5	75	12	2	●	2
MS2SSD1200	12	18	75	12	2	●	3

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

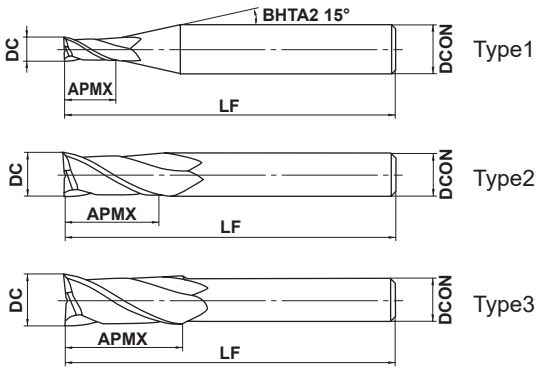
MS2MS

End mill, Medium cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●2 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0020	0.2	0.4	40	4	2	●	1
MS2MSD0030	0.3	0.6	40	4	2	●	1
MS2MSD0040	0.4	0.8	40	4	2	●	1
MS2MSD0050	0.5	1	40	4	2	●	1
MS2MSD0060	0.6	1.2	40	4	2	●	1
MS2MSD0070	0.7	1.4	40	4	2	●	1
MS2MSD0080	0.8	1.6	40	4	2	●	1
MS2MSD0090	0.9	1.8	40	4	2	●	1
MS2MSD0100	1	2	40	4	2	●	1
MS2MSD0110	1.1	2.2	40	4	2	●	1
MS2MSD0120	1.2	2.4	40	4	2	●	1
MS2MSD0130	1.3	2.6	40	4	2	●	1
MS2MSD0140	1.4	2.8	40	4	2	●	1
MS2MSD0150	1.5	3	40	4	2	●	1
MS2MSD0160	1.6	3.2	40	4	2	●	1
MS2MSD0170	1.7	3.4	40	4	2	●	1
MS2MSD0180	1.8	3.6	40	4	2	●	1
MS2MSD0190	1.9	3.8	40	4	2	●	1
MS2MSD0200	2	4	40	4	2	●	1
MS2MSD0210	2.1	4.2	40	4	2	●	1
MS2MSD0220	2.2	4.4	40	4	2	●	1
MS2MSD0230	2.3	4.6	40	4	2	●	1
MS2MSD0240	2.4	4.8	40	4	2	●	1
MS2MSD0250	2.5	5	40	4	2	●	1
MS2MSD0260	2.6	5.2	40	4	2	●	1
MS2MSD0270	2.7	5.4	40	4	2	●	1
MS2MSD0280	2.8	5.6	40	4	2	●	1
MS2MSD0290	2.9	5.8	40	4	2	●	1
MS2MSD0300	3	6	45	6	2	●	1
MS2MSD0310	3.1	6.2	45	6	2	●	1
MS2MSD0320	3.2	6.4	45	6	2	●	1
MS2MSD0330	3.3	6.6	45	6	2	●	1
MS2MSD0340	3.4	6.8	45	6	2	●	1
MS2MSD0350	3.5	7	45	6	2	●	1

MS2MS

End mill, Medium cut length, 2 flute

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0360	3.6	7.2	45	6	2	●	1
MS2MSD0370	3.7	7.4	45	6	2	●	1
MS2MSD0380	3.8	7.6	45	6	2	●	1
MS2MSD0390	3.9	7.8	45	6	2	●	1
MS2MSD0400	4	8	50	6	2	●	1
MS2MSD0410	4.1	8.2	50	6	2	●	1
MS2MSD0420	4.2	8.4	50	6	2	●	1
MS2MSD0430	4.3	8.6	50	6	2	●	1
MS2MSD0440	4.4	8.8	50	6	2	●	1
MS2MSD0450	4.5	9	50	6	2	●	1
MS2MSD0460	4.6	9.2	50	6	2	●	1
MS2MSD0470	4.7	9.4	50	6	2	●	1
MS2MSD0480	4.8	9.6	50	6	2	●	1
MS2MSD0490	4.9	9.8	50	6	2	●	1
MS2MSD0500	5	10	50	6	2	●	1
MS2MSD0510	5.1	10.2	50	6	2	●	1
MS2MSD0520	5.2	10.4	50	6	2	●	1
MS2MSD0530	5.3	10.6	50	6	2	●	1
MS2MSD0540	5.4	10.8	50	6	2	●	1
MS2MSD0550	5.5	11	50	6	2	●	1
MS2MSD0560	5.6	11.2	50	6	2	●	1
MS2MSD0570	5.7	11.4	50	6	2	●	1
MS2MSD0580	5.8	11.6	50	6	2	●	1
MS2MSD0590	5.9	11.8	50	6	2	●	1
MS2MSD0600	6	12	50	6	2	●	2
MS2MSD0650	6.5	13	60	8	2	●	1
MS2MSD0700	7	14	60	8	2	●	1
MS2MSD0750	7.5	15	60	8	2	●	1
MS2MSD0800	8	16	60	8	2	●	2
MS2MSD0850	8.5	17	70	10	2	●	1
MS2MSD0900	9	18	70	10	2	●	1
MS2MSD0950	9.5	19	70	10	2	●	1
MS2MSD1000	10	20	70	10	2	●	2
MS2MSD1100	11	22	75	12	2	●	1
MS2MSD1200	12	24	75	12	2	●	2
MS2MSD1600	16	32	90	16	2	●	2
MS2MSD1800	18	36	90	16	2	●	3
MS2MSD2000	20	40	100	20	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

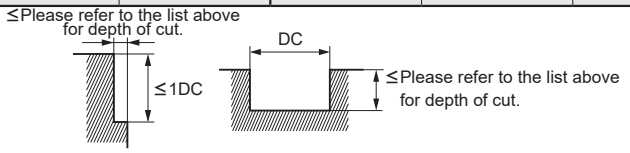
MS2SS
End mill, Short cut length, 2 flute

MS2MS
End mill, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21			Hardened steel (45－55HRC) AISI H13		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
0.1	40000	40	0.001	40000	40	0.001
0.2	40000	100	0.002	40000	100	0.002
0.3	40000	200	0.005	40000	200	0.005
0.4	40000	600	0.01	40000	600	0.01
0.5	40000	1000	0.015	40000	960	0.015
0.6	40000	1200	0.02	40000	1200	0.02
0.7	40000	1400	0.02	40000	1400	0.02
0.8	40000	1600	0.03	40000	1600	0.03
0.9	40000	1800	0.04	40000	1600	0.04
1	40000	2000	0.06	32000	1600	0.06
1.5	40000	3000	0.12	32000	1900	0.08
2	30000	3000	0.18	24000	1900	0.10
2.5	24000	2600	0.25	19000	1600	0.13
3	20000	2300	0.30	16000	1400	0.15
4	15000	2000	0.40	12000	1200	0.20
5	12000	1600	0.50	9000	900	0.25
6	10000	1400	0.60	7000	700	0.30
8	8000	1000	0.80	5600	550	0.40
10	6400	900	1.00	4500	500	0.50
12	5400	820	1.00	3800	450	0.50
16	2400	380	3.00	1200	100	0.80
20	1900	320	4.00	1000	80	1.00

Depth of cut



DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When slotting with end mills with ϕ3 or larger, reduce the revolution to 50－70% and the feed rate to 40－60%.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

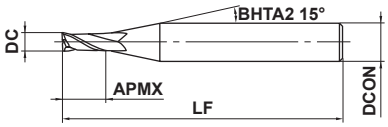
MS2MD

End mill, Medium cut length, 2 flute

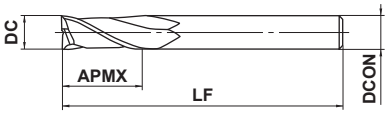


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○		





Type1



Type2

1≤DC≤12				
0 - 0.020				

4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● Strong edge type, 2 flute end mill with high resistance to corner fracturing.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MDD0100	1	2.5	40	4	2	●	1
MS2MDD0150	1.5	3.8	40	4	2	●	1
MS2MDD0200	2	5	40	4	2	●	1
MS2MDD0250	2.5	6.3	40	4	2	●	1
MS2MDD0300	3	7.5	50	6	2	●	1
MS2MDD0400	4	10	50	6	2	●	1
MS2MDD0500	5	12.5	50	6	2	●	1
MS2MDD0600	6	15	50	6	2	●	2
MS2MDD0800	8	20	60	8	2	●	2
MS2MDD1000	10	25	70	10	2	●	2
MS2MDD1200	12	30	90	12	2	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

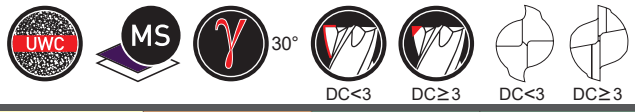
RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21			Hardened steel (45－55HRC) AISI H13		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	2000	0.06	32000	1600	0.06
1.5	40000	3000	0.12	32000	1900	0.08
2	30000	3000	0.18	24000	1900	0.10
2.5	24000	2600	0.25	19000	1600	0.13
3	20000	2300	0.30	16000	1400	0.15
4	15000	2000	0.40	12000	1200	0.20
5	12000	1600	0.50	9000	900	0.25
6	10000	1400	0.60	7000	700	0.30
8	8000	1000	0.80	5600	550	0.40
10	6400	900	1.00	4500	500	0.50
12	5400	820	1.00	3800	450	0.50
Depth of cut	≤Please refer to the list above for depth of cut. ≤1DC DC ≤Please refer to the list above for depth of cut. DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

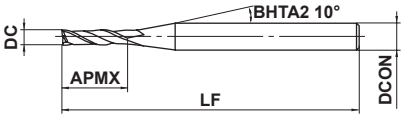
MS2JS

End mill, Semi long cut length, 2 flute

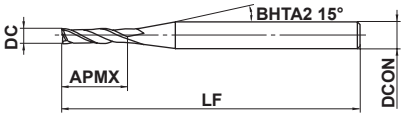


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	

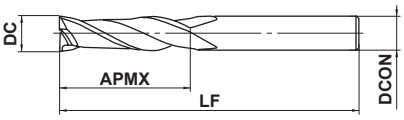




Type1



Type2



Type3

DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2JSD0010	0.1	0.3	40	4	2	●	1
MS2JSD0020	0.2	0.6	40	4	2	●	2
MS2JSD0030	0.3	0.9	40	4	2	●	2
MS2JSD0040	0.4	1.2	40	4	2	●	2
MS2JSD0050	0.5	1.5	40	4	2	●	2
MS2JSD0060	0.6	1.8	40	4	2	●	2
MS2JSD0070	0.7	2.1	40	4	2	●	2
MS2JSD0080	0.8	2.4	40	4	2	●	2
MS2JSD0090	0.9	2.7	40	4	2	●	2
MS2JSD0100	1	3	40	4	2	●	2
MS2JSD0120	1.2	3.6	40	4	2	●	2
MS2JSD0150	1.5	4.5	40	4	2	●	2
MS2JSD0180	1.8	5.4	40	4	2	●	2
MS2JSD0200	2	6	40	4	2	●	2
MS2JSD0250	2.5	7.5	40	4	2	●	2
MS2JSD0300	3	9	45	6	2	●	2
MS2JSD0400	4	12	50	6	2	●	2
MS2JSD0500	5	15	50	6	2	●	2
MS2JSD0600	6	18	50	6	2	●	3
MS2JSD0800	8	24	70	8	2	●	3
MS2JSD1000	10	30	90	10	2	●	3
MS2JSD1200	12	36	90	12	2	●	3

● : Inventory maintained in Japan.

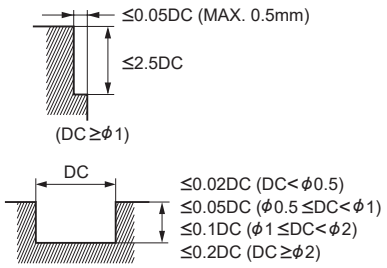
Click here for product NEWS ▶

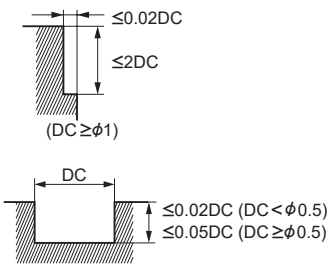
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
0.1	40000	— (40)	40000	— (40)	40000	— (35)	40000	— (25)
0.2	40000	— (45)	40000	— (45)	40000	— (35)	32000	— (25)
0.3	40000	— (55)	32000	— (45)	27000	— (35)	21000	— (25)
0.4	32000	— (60)	24000	— (45)	20000	— (35)	16000	— (25)
0.5	25000	— (60)	19000	— (45)	16000	— (35)	13000	— (25)
0.6	21000	— (60)	16000	— (45)	13000	— (35)	11000	— (25)
0.7	18000	— (60)	14000	— (45)	11000	— (35)	9100	— (25)
0.8	16000	— (60)	12000	— (45)	9900	— (35)	8000	— (25)
0.9	14000	— (60)	11000	— (45)	8800	— (35)	7100	— (25)
1	13000	60 (60)	9500	45 (45)	8000	35 (35)	6400	25 (25)
1.5	8500	60 (60)	6400	45 (45)	5300	35 (35)	4200	25 (25)
2	6400	60 (60)	4800	45 (45)	4000	35 (35)	3200	25 (25)
2.5	5100	60 (60)	3800	45 (45)	3200	40 (40)	2500	25 (25)
3	4200	65 (60)	3400	55 (45)	2600	40 (40)	2100	25 (25)
4	3400	80 (60)	2700	65 (45)	2100 (1600)	50 (30)	1700	35 (25)
5	2900	100 (60)	2300	80 (45)	1800 (1350)	60 (30)	1500	40 (25)
6	2500	120 (60)	2000	100 (50)	1500 (1100)	75 (30)	1300	50 (25)
8	1900	130 (60)	1500	100 (50)	1200 (900)	80 (30)	1000	50 (25)
10	1600	130 (60)	1300	100 (50)	950 (710)	75 (30)	800	50 (25)
12	1300	120 (60)	1100	100 (50)	800 (600)	75 (30)	670	50 (25)

Depth of cut





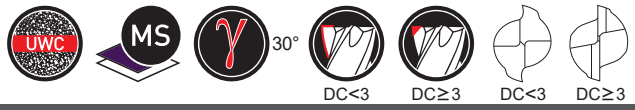
( ) : Indicates standard revolution and feed rate for slotting.

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

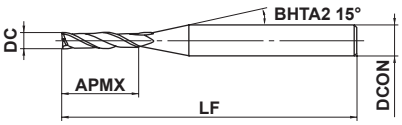
MS2LS

End mill, Long cut length, 2 flute

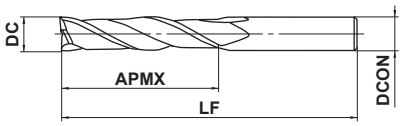


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

0.2≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2LSD0020	0.2	0.8	40	4	2	●	1
MS2LSD0030	0.3	1.2	40	4	2	●	1
MS2LSD0040	0.4	1.6	40	4	2	●	1
MS2LSD0050	0.5	2	40	4	2	●	1
MS2LSD0060	0.6	2.4	40	4	2	●	1
MS2LSD0070	0.7	2.8	40	4	2	●	1
MS2LSD0080	0.8	3.2	40	4	2	●	1
MS2LSD0090	0.9	3.6	40	4	2	●	1
MS2LSD0100	1	4	40	4	2	●	1
MS2LSD0150	1.5	6	40	4	2	●	1
MS2LSD0200	2	8	40	4	2	●	1
MS2LSD0250	2.5	10	50	4	2	●	1
MS2LSD0300	3	12	50	6	2	●	1
MS2LSD0400	4	16	50	6	2	●	1
MS2LSD0500	5	20	60	6	2	●	1
MS2LSD0600	6	24	60	6	2	●	2
MS2LSD0800	8	32	70	8	2	●	2
MS2LSD1000	10	40	90	10	2	●	2
MS2LSD1200	12	48	110	12	2	●	2

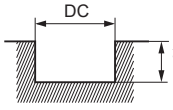
● : Inventory maintained in Japan.

Click here for product NEWS ▶

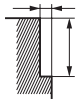
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
0.2	40000	400	0.001	30000	250	0.001
0.3	40000	600	0.005	35000	420	0.005
0.4	40000	700	0.007	30000	420	0.007
0.5	40000	800	0.01	24000	380	0.01
0.6	33000	800	0.015	21000	480	0.01
0.7	28000	800	0.015	18000	480	0.015
0.8	25000	800	0.02	16000	480	0.02
0.9	22000	800	0.03	15000	500	0.03
1	20000	800	0.04	13000	500	0.04
1.5	13000	800	0.10	9000	500	0.10
2	10000	800	0.15	6700	500	0.15
2.5	9000	800	0.20	6000	500	0.20
3	8000	800	0.20	5200	460	0.20
4	6000	600	0.20	4000	340	0.20
5	4800	480	0.30	3200	280	0.20
6	4000	400	0.30	2600	210	0.20
8	3000	300	0.30	2000	170	0.30
10	2400	240	0.30	1600	140	0.30
12	2000	200	0.30	1300	110	0.30
Depth of cut	 ≤Please refer to the list above for depth of cut. DC:Dia.					

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
3	3500	370	0.05	2600	250	0.03
4	2800	370	0.06	2100	200	0.03
5	2200	330	0.06	1700	160	0.03
6	1800	300	0.06	1500	140	0.03
8	1600	270	0.08	1100	140	0.04
10	1400	240	0.10	900	140	0.05
12	1200	200	0.10	750	120	0.06
Depth of cut	≤Please refer to the list above for depth of cut.  DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

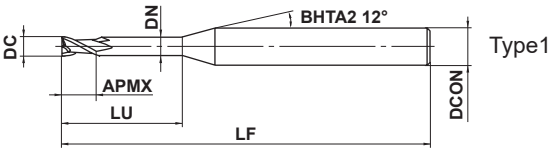
MS2XL

End mill, Short cut length, 2 flute, Long neck

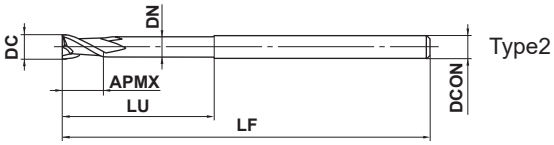


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

DC<0.5	DC≥0.5			
0 - 0.010	0 - 0.020			
4≤DCON≤6				
0 - 0.008				

●2 flute long neck end mill.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0020N005	0.2	0.3	0.5	0.17	45	4	2	●	1
MS2XLD0020N010	0.2	0.3	1	0.17	45	4	2	●	1
MS2XLD0020N015	0.2	0.3	1.5	0.17	45	4	2	●	1
MS2XLD0030N010	0.3	0.4	1	0.27	45	4	2	●	1
MS2XLD0030N020	0.3	0.4	2	0.27	45	4	2	●	1
MS2XLD0030N030	0.3	0.4	3	0.27	45	4	2	●	1
MS2XLD0030N060	0.3	0.4	6	0.27	45	4	2	●	1
MS2XLD0030N090	0.3	0.4	9	0.27	45	4	2	●	1
MS2XLD0040N020	0.4	0.6	2	0.36	45	4	2	●	1
MS2XLD0040N030	0.4	0.6	3	0.36	45	4	2	●	1
MS2XLD0040N040	0.4	0.6	4	0.36	45	4	2	●	1
MS2XLD0040N080	0.4	0.6	8	0.36	45	4	2	●	1
MS2XLD0040N120	0.4	0.6	12	0.36	45	4	2	●	1
MS2XLD0050N020	0.5	0.7	2	0.46	45	4	2	●	1
MS2XLD0050N040	0.5	0.7	4	0.46	45	4	2	●	1
MS2XLD0050N060	0.5	0.7	6	0.46	45	4	2	●	1
MS2XLD0050N080	0.5	0.7	8	0.46	50	4	2	●	1
MS2XLD0050N100	0.5	0.7	10	0.46	50	4	2	●	1
MS2XLD0050N150	0.5	0.7	15	0.46	50	4	2	●	1
MS2XLD0060N020	0.6	0.9	2	0.56	45	4	2	●	1
MS2XLD0060N040	0.6	0.9	4	0.56	45	4	2	●	1
MS2XLD0060N060	0.6	0.9	6	0.56	45	4	2	●	1
MS2XLD0060N080	0.6	0.9	8	0.56	50	4	2	●	1
MS2XLD0060N100	0.6	0.9	10	0.56	50	4	2	●	1
MS2XLD0060N120	0.6	0.9	12	0.56	50	4	2	●	1
MS2XLD0060N180	0.6	0.9	18	0.56	50	4	2	●	1
MS2XLD0070N020	0.7	1	2	0.66	45	4	2	●	1
MS2XLD0070N040	0.7	1	4	0.66	45	4	2	●	1
MS2XLD0070N060	0.7	1	6	0.66	45	4	2	●	1
MS2XLD0070N080	0.7	1	8	0.66	50	4	2	●	1
MS2XLD0070N100	0.7	1	10	0.66	50	4	2	●	1
MS2XLD0080N040	0.8	1.2	4	0.76	45	4	2	●	1
MS2XLD0080N060	0.8	1.2	6	0.76	45	4	2	●	1
MS2XLD0080N080	0.8	1.2	8	0.76	50	4	2	●	1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0080N100	0.8	1.2	10	0.76	50	4	2	●	1
MS2XLD0080N120	0.8	1.2	12	0.76	50	4	2	●	1
MS2XLD0080N160	0.8	1.2	16	0.76	50	4	2	●	1
MS2XLD0080N240	0.8	1.2	24	0.76	60	4	2	●	1
MS2XLD0090N060	0.9	1.4	6	0.86	45	4	2	●	1
MS2XLD0090N080	0.9	1.4	8	0.86	50	4	2	●	1
MS2XLD0090N100	0.9	1.4	10	0.86	50	4	2	●	1
MS2XLD0090N150	0.9	1.4	15	0.86	60	4	2	●	1
MS2XLD0100N040	1	1.5	4	0.94	50	4	2	●	1
MS2XLD0100N060	1	1.5	6	0.94	50	4	2	●	1
MS2XLD0100N080	1	1.5	8	0.94	50	4	2	●	1
MS2XLD0100N100	1	1.5	10	0.94	50	4	2	●	1
MS2XLD0100N120	1	1.5	12	0.94	50	4	2	●	1
MS2XLD0100N160	1	1.5	16	0.94	60	4	2	●	1
MS2XLD0100N200	1	1.5	20	0.94	60	4	2	●	1
MS2XLD0100N250	1	1.5	25	0.94	70	4	2	●	1
MS2XLD0100N300	1	1.5	30	0.94	70	4	2	●	1
MS2XLD0120N060	1.2	1.8	6	1.14	50	4	2	●	1
MS2XLD0120N080	1.2	1.8	8	1.14	50	4	2	●	1
MS2XLD0120N100	1.2	1.8	10	1.14	50	4	2	●	1
MS2XLD0120N120	1.2	1.8	12	1.14	50	4	2	●	1
MS2XLD0120N160	1.2	1.8	16	1.14	60	4	2	●	1
MS2XLD0120N200	1.2	1.8	20	1.14	60	4	2	●	1
MS2XLD0150N060	1.5	2.3	6	1.44	50	4	2	●	1
MS2XLD0150N080	1.5	2.3	8	1.44	50	4	2	●	1
MS2XLD0150N100	1.5	2.3	10	1.44	50	4	2	●	1
MS2XLD0150N120	1.5	2.3	12	1.44	50	4	2	●	1
MS2XLD0150N140	1.5	2.3	14	1.44	60	4	2	●	1
MS2XLD0150N160	1.5	2.3	16	1.44	60	4	2	●	1
MS2XLD0150N180	1.5	2.3	18	1.44	60	4	2	●	1
MS2XLD0150N200	1.5	2.3	20	1.44	60	4	2	●	1
MS2XLD0150N250	1.5	2.3	25	1.44	70	4	2	●	1
MS2XLD0150N300	1.5	2.3	30	1.44	70	4	2	●	1
MS2XLD0150N380	1.5	2.3	38	1.44	80	4	2	●	1
MS2XLD0150N450	1.5	2.3	45	1.44	80	4	2	●	1
MS2XLD0200N060	2	3	6	1.9	50	4	2	●	1
MS2XLD0200N080	2	3	8	1.9	50	4	2	●	1
MS2XLD0200N100	2	3	10	1.9	50	4	2	●	1
MS2XLD0200N120	2	3	12	1.9	50	4	2	●	1
MS2XLD0200N140	2	3	14	1.9	60	4	2	●	1
MS2XLD0200N160	2	3	16	1.9	60	4	2	●	1
MS2XLD0200N180	2	3	18	1.9	60	4	2	●	1
MS2XLD0200N200	2	3	20	1.9	60	4	2	●	1
MS2XLD0200N250	2	3	25	1.9	70	4	2	●	1
MS2XLD0200N300	2	3	30	1.9	70	4	2	●	1
MS2XLD0200N350	2	3	35	1.9	80	4	2	●	1
MS2XLD0200N400	2	3	40	1.9	90	4	2	●	1
MS2XLD0200N500	2	3	50	1.9	100	4	2	●	1
MS2XLD0200N600	2	3	60	1.9	110	4	2	●	1
MS2XLD0250N080	2.5	3.7	8	2.4	50	4	2	●	1
MS2XLD0250N120	2.5	3.7	12	2.4	50	4	2	●	1
MS2XLD0250N160	2.5	3.7	16	2.4	60	4	2	●	1

MS2XL

End mill, Short cut length, 2 flute, Long neck

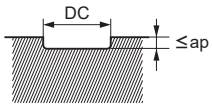
(mm)

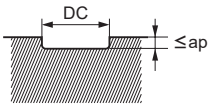
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0250N200	2.5	3.7	20	2.4	60	4	2	●	1
MS2XLD0250N250	2.5	3.7	25	2.4	70	4	2	●	1
MS2XLD0250N300	2.5	3.7	30	2.4	70	4	2	●	1
MS2XLD0250N400	2.5	3.7	40	2.4	90	4	2	●	1
MS2XLD0250N500	2.5	3.7	50	2.4	100	4	2	●	1
MS2XLD0300N080	3	4.5	8	2.8	50	6	2	●	1
MS2XLD0300N120	3	4.5	12	2.8	50	6	2	●	1
MS2XLD0300N160	3	4.5	16	2.8	60	6	2	●	1
MS2XLD0300N200	3	4.5	20	2.8	60	6	2	●	1
MS2XLD0300N250	3	4.5	25	2.8	70	6	2	●	1
MS2XLD0300N300	3	4.5	30	2.8	70	6	2	●	1
MS2XLD0300N400	3	4.5	40	2.8	90	6	2	●	1
MS2XLD0300N500	3	4.5	50	2.8	100	6	2	●	1
MS2XLD0400N120	4	6	12	3.8	50	6	2	●	1
MS2XLD0400N160	4	6	16	3.8	60	6	2	●	1
MS2XLD0400N200	4	6	20	3.8	60	6	2	●	1
MS2XLD0400N250	4	6	25	3.8	70	6	2	●	1
MS2XLD0400N300	4	6	30	3.8	70	6	2	●	1
MS2XLD0400N350	4	6	35	3.8	80	6	2	●	1
MS2XLD0400N400	4	6	40	3.8	90	6	2	●	1
MS2XLD0400N450	4	6	45	3.8	90	6	2	●	1
MS2XLD0400N500	4	6	50	3.8	100	6	2	●	1
MS2XLD0400N600	4	6	60	3.8	110	6	2	●	1
MS2XLD0500N160	5	7.5	16	4.8	60	6	2	●	1
MS2XLD0500N250	5	7.5	25	4.8	70	6	2	●	1
MS2XLD0500N350	5	7.5	35	4.8	80	6	2	●	1
MS2XLD0500N500	5	7.5	50	4.8	110	6	2	●	1
MS2XLD0500N600	5	7.5	60	4.8	120	6	2	●	1
MS2XLD0600N200	6	9	20	5.8	80	6	2	●	2
MS2XLD0600N300	6	9	30	5.8	90	6	2	●	2
MS2XLD0600N400	6	9	40	5.8	100	6	2	●	2
MS2XLD0600N500	6	9	50	5.8	110	6	2	●	2
MS2XLD0600N600	6	9	60	5.8	120	6	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.2	**0.5**	40000	600	0.004
	1	40000	400	0.001
0.3	**1**	40000	650	0.007
	3	40000	500	0.002
	9	22000	150	0.001
0.4	**2**	40000	800	0.007
	4	40000	800	0.003
	12	17000	150	0.001
0.5	**2**	40000	950	0.01
	6	40000	700	0.003
	10	25000	400	0.002
	15	14000	150	0.001
0.6	**2**	40000	950	0.01
	6	40000	800	0.005
	10	25000	450	0.003
	18	12000	150	0.001
0.7	**2**	40000	1000	0.02
	6	40000	900	0.01
	8	30000	700	0.005
	10	11000	300	0.005
0.8	**4**	40000	1200	0.02
	8	40000	1000	0.01
	12	25000	400	0.003
	24	10000	150	0.001
0.9	**6**	40000	1300	0.02
	10	35000	1000	0.01
	15	9000	400	0.003
1	**6**	40000	1600	0.04
	8	40000	1600	0.03
	12	30000	1000	0.02
	20	15000	400	0.005
	30	8000	150	0.001
1.2	**6**	40000	1900	0.06
	8	40000	1900	0.04
	12	25000	1000	0.03
	20	6500	150	0.01
Depth of cut		 DC:Dia.		

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1.5	**6**	40000	2400	0.10
	10	30000	1800	0.05
	20	15000	600	0.02
	30	7500	300	0.005
	45	5000	150	0.001
1.6	**6**	40000	2400	0.12
	10	30000	1800	0.07
	16	20000	1000	0.04
2	**6**	40000	2400	0.18
	10	30000	1800	0.10
	16	20000	1000	0.06
	30	8000	500	0.04
	40	6000	250	0.01
	60	4200	150	0.003
2.5	**8**	25000	2500	0.20
	16	18000	1700	0.10
	20	12000	1000	0.08
	40	8000	400	0.03
	50	4000	150	0.015
3	**8**	20000	2000	0.30
	16	15000	1400	0.15
	20	10000	800	0.10
	40	5000	250	0.02
	50	3700	150	0.010
4	**12**	15000	3000	0.30
	20	11000	2200	0.22
	30	6400	1200	0.12
	40	4500	400	0.05
	50	2800	150	0.018
	60	1800	60	0.005
5	**16**	12000	2500	0.35
	35	5100	750	0.15
	60	2200	150	0.02
6	**20**	10000	2000	0.40
	40	4200	800	0.20
	60	1900	150	0.10
Depth of cut		 DC:Dia.		

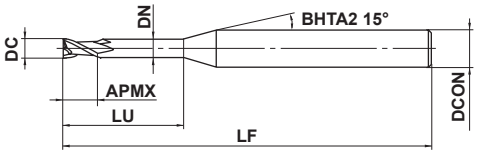
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS2XL6

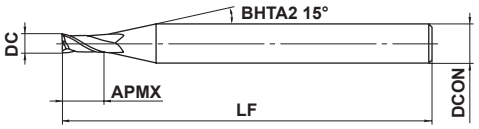
End mill, Short cut length, 2 flute, 6mm shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

0.3≤DC≤2.5				
0 - 0.020				
DCON=6				
0 - 0.008				

●2 flute long neck end mill.
●ϕ6 shank type.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0030N008	0.3	0.8	—	—	50	6	2	●	2
MS2XL6D0030N015	0.3	0.5	1.5	0.27	50	6	2	●	1
MS2XL6D0040N010	0.4	0.6	1	0.36	50	6	2	●	1
MS2XL6D0040N020	0.4	0.6	2	0.36	50	6	2	●	1
MS2XL6D0050N013	0.5	0.8	1.3	0.46	50	6	2	●	1
MS2XL6D0050N025	0.5	0.8	2.5	0.46	50	6	2	●	1
MS2XL6D0060N015	0.6	0.9	1.5	0.56	50	6	2	●	1
MS2XL6D0060N030	0.6	0.9	3	0.56	50	6	2	●	1
MS2XL6D0070N018	0.7	1.1	1.8	0.66	50	6	2	●	1
MS2XL6D0070N035	0.7	1.1	3.5	0.66	50	6	2	●	1
MS2XL6D0080N020	0.8	1.2	2	0.76	50	6	2	●	1
MS2XL6D0080N040	0.8	1.2	4	0.76	50	6	2	●	1
MS2XL6D0090N023	0.9	1.4	2.3	0.86	50	6	2	●	1
MS2XL6D0090N045	0.9	1.4	4.5	0.86	50	6	2	●	1
MS2XL6D0100N025	1	1.5	2.5	0.94	50	6	2	●	1
MS2XL6D0100N050	1	1.5	5	0.94	50	6	2	●	1
MS2XL6D0110N028	1.1	1.7	2.8	1.04	50	6	2	●	1
MS2XL6D0110N055	1.1	1.7	5.5	1.04	50	6	2	●	1
MS2XL6D0120N030	1.2	1.8	3	1.14	50	6	2	●	1
MS2XL6D0120N060	1.2	1.8	6	1.14	50	6	2	●	1
MS2XL6D0130N033	1.3	2	3.3	1.24	50	6	2	●	1
MS2XL6D0130N065	1.3	2	6.5	1.24	50	6	2	●	1
MS2XL6D0140N035	1.4	2.1	3.5	1.34	50	6	2	●	1
MS2XL6D0140N070	1.4	2.1	7	1.34	50	6	2	●	1
MS2XL6D0150N038	1.5	2.3	3.8	1.44	50	6	2	●	1
MS2XL6D0150N075	1.5	2.3	7.5	1.44	50	6	2	●	1
MS2XL6D0160N040	1.6	2.4	4	1.54	50	6	2	●	1
MS2XL6D0160N080	1.6	2.4	8	1.54	50	6	2	●	1
MS2XL6D0170N043	1.7	2.6	4.3	1.64	50	6	2	●	1
MS2XL6D0170N085	1.7	2.6	8.5	1.64	50	6	2	●	1
MS2XL6D0180N045	1.8	2.7	4.5	1.74	50	6	2	●	1
MS2XL6D0180N090	1.8	2.7	9	1.74	50	6	2	●	1
MS2XL6D0190N048	1.9	2.9	4.8	1.84	50	6	2	●	1
MS2XL6D0190N095	1.9	2.9	9.5	1.84	50	6	2	●	1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

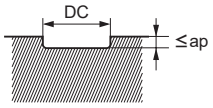
(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0200N050	2	3	5	1.90	50	6	2	●	1
MS2XL6D0200N100	2	3	10	1.90	50	6	2	●	1
MS2XL6D0210N053	2.1	3.2	5.3	2.00	50	6	2	●	1
MS2XL6D0210N105	2.1	3.2	10.5	2.00	60	6	2	●	1
MS2XL6D0220N055	2.2	3.3	5.5	2.10	50	6	2	●	1
MS2XL6D0220N110	2.2	3.3	11	2.10	60	6	2	●	1
MS2XL6D0230N058	2.3	3.5	5.8	2.20	50	6	2	●	1
MS2XL6D0230N115	2.3	3.5	11.5	2.20	60	6	2	●	1
MS2XL6D0240N060	2.4	3.6	6	2.30	50	6	2	●	1
MS2XL6D0240N120	2.4	3.6	12	2.30	60	6	2	●	1
MS2XL6D0250N063	2.5	3.8	6.3	2.40	50	6	2	●	1
MS2XL6D0250N125	2.5	3.8	12.5	2.40	60	6	2	●	1

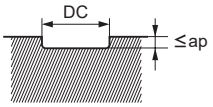
MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.3	—	40000	500−1000	0.01	30000	300−800	0.01
	1.5			0.007			0.007
0.4	**1**	40000	500−1000	0.015	30000	300−800	0.015
	2			0.01			0.01
0.5	**1.3**	40000	500−1000	0.02	30000	300−800	0.02
	2.5			0.013			0.013
0.6	**1.5**	33000	500−1000	0.03	25000	300−800	0.03
	3			0.018			0.018
0.7	**1.8**	29000	500−1000	0.04	22000	300−800	0.04
	3.5			0.025			0.025
0.8	**2**	25000	500−1000	0.06	20000	300−800	0.06
	4			0.03			0.03
0.9	**2.3**	22000	500−1000	0.08	18000	300−800	0.08
	4.5			0.05			0.05
1	**2.5**	20000	500−1000	0.1	16000	300−800	0.1
	5			0.07			0.07
1.1	**2.8**	18000	500−1000	0.12	14000	300−800	0.12
	5.5			0.08			0.08
1.2	**3**	16000	500−1000	0.12	13000	300−800	0.12
	6			0.08			0.08
1.3	**3.3**	15000	500−1000	0.12	12000	300−800	0.12
	6.5			0.08			0.08
1.4	**3.5**	14000	500−1000	0.12	11000	300−800	0.12
	7			0.08			0.08
1.5	**3.8**	13000	500−1000	0.15	10000	300−800	0.15
	7.5			0.1			0.1
Depth of cut		 DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1.6	**4**	12000	500−1000	0.15	10000	300−800	0.15
	8			0.1			0.1
1.7	**4.3**	12000	500−1000	0.17	9500	300−800	0.17
	8.5			0.12			0.12
1.8	**4.5**	11000	500−1000	0.17	9000	300−800	0.17
	9			0.12			0.12
1.9	**4.8**	10000	500−1000	0.17	9000	300−800	0.17
	9.5			0.12			0.12
2	**5**	10000	500−1000	0.2	9000	300−800	0.2
	10			0.15			0.15
2.1	**5.3**	9800	500−1000	0.2	9000	300−800	0.2
	10.5			0.15			0.15
2.2	**5.5**	9600	500−1000	0.2	9000	300−800	0.2
	11			0.15			0.15
2.3	**5.8**	9400	500−1000	0.2	8800	300−800	0.2
	11.5			0.15			0.15
2.4	**6**	9200	500−1000	0.25	8700	300−800	0.25
	12			0.2			0.2
2.5	**6.3**	9000	500−1000	0.25	8500	300−800	0.25
	12.5			0.2			0.2
Depth of cut		 DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

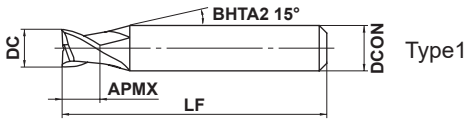
MP2ES NEW

End mill, For small automatic lathes, 2 flute

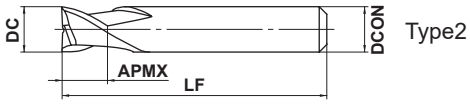


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

3≤DC≤10				
- 0.010 - 0.030				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

●2 flute end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2ESD0300S04	3	4.5	50	4	2	●	1
MP2ESD0400S04	4	6	50	4	2	●	2
MP2ESD0500S06	5	7.5	50	6	2	●	1
MP2ESD0600S06	6	9	50	6	2	●	2
MP2ESD0700S07	7	10.5	50	7	2	●	2
MP2ESD0800S08	8	12	50	8	2	●	2
MP2ESD1000S10	10	15	50	10	2	●	2

● : Inventory maintained in Japan.

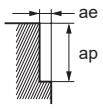
Click here for product NEWS ▶

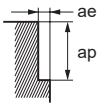
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side Milling

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	10000	600	3	0.6	7000	400	3	0.6	6000	300	3	0.6
4	7500	600	4	0.6	5200	400	4	0.6	4500	300	4	0.6
5	6000	600	5	0.6	4200	400	5	0.6	3600	300	5	0.6
6	5000	600	6	0.6	3500	400	6	0.6	3000	300	6	0.6
7	4500	560	7	0.6	3200	360	7	0.6	2700	280	7	0.6
8	4000	520	8	0.6	2800	350	8	0.6	2400	260	8	0.6
10	3200	450	10	0.6	2200	300	10	0.6	1900	230	10	0.6
Depth of cut												

Workpiece Material	Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	5000	120	3	0.2	13000	780	3	0.6
4	4000	120	4	0.2	9500	760	4	0.6
5	3200	120	5	0.2	7600	760	5	0.6
6	2700	120	6	0.2	6400	770	6	0.6
7	2300	110	7	0.2	5500	680	7	0.6
8	2000	110	8	0.2	4800	620	8	0.6
10	1600	100	10	0.2	3800	530	10	0.6
Depth of cut								

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

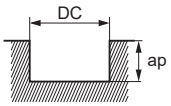
MP2ES

End mill, For small automatic lathes, 2 flute

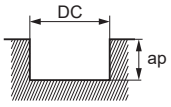
RECOMMENDED CUTTING CONDITIONS

■Slotting

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	10000	600	0.6	7000	400	0.6	6000	300	0.6
4	7500	600	0.6	5200	400	0.6	4500	300	0.6
5	6000	600	0.6	4200	400	0.6	3600	300	0.6
6	5000	600	0.6	3500	400	0.6	3000	300	0.6
7	4500	560	0.6	3200	360	0.6	2700	280	0.6
8	4000	520	0.6	2800	350	0.6	2400	260	0.6
10	3200	450	0.6	2200	300	0.6	1900	230	0.6
Depth of cut									

DC:Dia.

Workpiece Material	Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	5000	120	0.2	13000	780	0.6
4	4000	120	0.2	9500	760	0.6
5	3200	120	0.2	7600	760	0.6
6	2700	120	0.2	6400	770	0.6
7	2300	110	0.2	5500	680	0.6
8	2000	110	0.2	4800	620	0.6
10	1600	100	0.2	3800	530	0.6
Depth of cut						

DC:Dia.

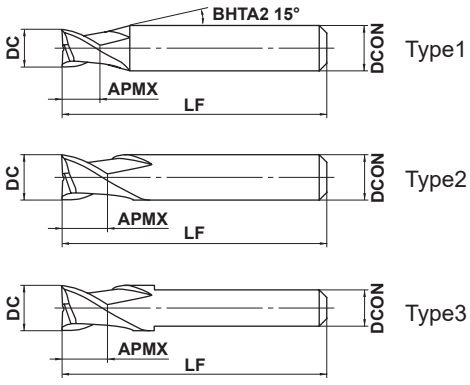
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS2ES

End mill, 2 flute, For small automatic lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

●2 flute end mill.

Overall length 35mm (mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L35S04	3	3	35	4	2	●	1
MS2ESD0350L35S04	3.5	3.5	35	4	2	●	1
MS2ESD0400L35S04	4	4	35	4	2	●	2
MS2ESD0500L35S05	5	5	35	5	2	●	2
MS2ESD0500L35S06	5	5	35	6	2	●	1
MS2ESD0600L35S05	6	6	35	5	2	●	3
MS2ESD0600L35S06	6	6	35	6	2	●	2
MS2ESD0700L35S07	7	6	35	7	2	●	2
MS2ESD0800L35S07	8	6	35	7	2	●	3
MS2ESD0800L35S08	8	6	35	8	2	●	2
MS2ESD1000L35S07	10	6	35	7	2	●	3
MS2ESD1000L35S10	10	6	35	10	2	●	2
MS2ESD1200L35S10	12	6	35	10	2	●	3

Overall length 45mm (mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L45S04	3	3	45	4	2	●	1
MS2ESD0350L45S04	3.5	3.5	45	4	2	●	1
MS2ESD0400L45S04	4	4	45	4	2	●	2
MS2ESD0500L45S06	5	5	45	6	2	●	1
MS2ESD0600L45S06	6	6	45	6	2	●	2
MS2ESD0700L45S07	7	7	45	7	2	●	2
MS2ESD0800L45S07	8	8	45	7	2	●	3
MS2ESD0800L45S08	8	8	45	8	2	●	2
MS2ESD1000L45S07	10	10	45	7	2	●	3
MS2ESD1000L45S10	10	10	45	10	2	●	2
MS2ESD1200L45S10	12	12	45	10	2	●	3

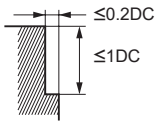
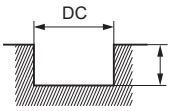
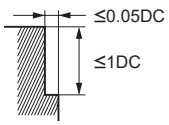
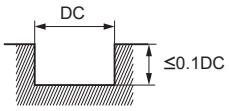
● : Inventory maintained in Japan.

Click here for product NEWS ▶

MS2ES

End mill, 2 flute, For small automatic lathes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	10000	600	7000	400	6000	300	5000	120
4	7500	600	5200	400	4500	300	4000	120
5	6000	600	4200	400	3600	300	3200	120
6	5000	600	3500	400	3000	300	2700	120
7	4500	560	3000	360	2700	280	2300	110
8	4000	520	2800	350	2400	260	2000	110
10	3200	450	2200	300	1900	230	1600	100
12	2700	410	1900	270	1600	210	1300	100
Depth of cut								

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

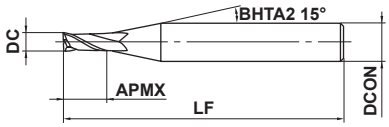
VF2MD

End mill, Medium cut length, 2 flute, For hardened materials

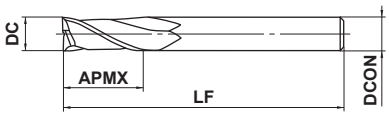


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

0.5≤DC≤6					
0 - 0.020					
4≤DCON≤6					
0 - 0.008					

●2 flute end mill suitable for high-speed machining of hardened steel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF2MDD0050	0.5	1.3	40	4	2	●	1
VF2MDD0100	1	2.5	40	4	2	●	1
VF2MDD0150	1.5	3.8	40	4	2	●	1
VF2MDD0200	2	5	40	4	2	●	1
VF2MDD0250	2.5	6.3	40	4	2	●	1
VF2MDD0300	3	7.5	50	6	2	●	1
VF2MDD0400	4	10	50	6	2	●	1
VF2MDD0500	5	12.5	50	6	2	●	1
VF2MDD0600	6	15	50	6	2	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶



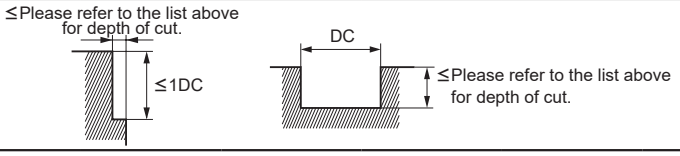
VF2MD

End mill, Medium cut length, 2 flute, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45－55HRC) AISI H13			Hardened steel (55－62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
0.5	40000	1000	0.015	40000	960	0.015	30000	600	0.01
1	40000	2000	0.06	32000	1600	0.06	16000	550	0.05
1.5	40000	3000	0.12	32000	1900	0.08	10600	500	0.08
2	30000	3000	0.18	24000	1900	0.10	8100	400	0.1
2.5	24000	2600	0.25	19000	1600	0.13	6400	350	0.13
3	20000	2300	0.30	16000	1400	0.15	5400	300	0.15
4	15000	2000	0.40	12000	1200	0.20	4000	240	0.2
5	12000	1600	0.50	9000	900	0.25	3200	190	0.2
6	10000	1400	0.60	7000	700	0.30	2700	160	0.2

Depth of cut



DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

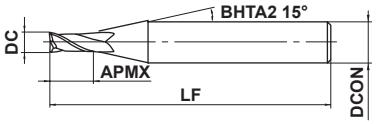
VF2MV

End mill, Medium cut length, 2 flute, Irregular helix flutes

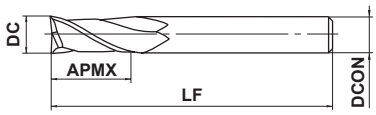


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

0.5≤DC≤6					
0 - 0.020					
4≤DCON≤6					
0 - 0.008					

●An irregular helix 2 flute square end mill suitable for high-speed machining of hardened steel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF2MVD0050	0.5	1.3	40	4	2	●	1
VF2MVD0100	1	2.5	40	4	2	●	1
VF2MVD0150	1.5	3.8	40	4	2	●	1
VF2MVD0200	2	5	40	4	2	●	1
VF2MVD0250	2.5	6.3	40	4	2	●	1
VF2MVD0300	3	7.5	50	6	2	●	1
VF2MVD0400	4	10	50	6	2	●	1
VF2MVD0500	5	12.5	50	6	2	●	1
VF2MVD0600	6	15	50	6	2	●	2

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

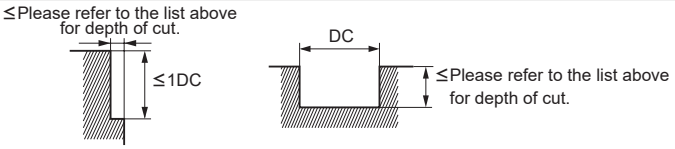
VF2MV

End mill, Medium cut length, 2 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45－55HRC) AISI H13			Hardened steel (55－62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae (mm)
0.5	40000	1000	0.015	40000	960	0.015	30000	600	0.01
1	40000	2000	0.06	32000	1600	0.06	16000	550	0.05
1.5	40000	3000	0.12	32000	1900	0.08	10600	500	0.08
2	30000	3000	0.18	24000	1900	0.10	8100	400	0.1
2.5	24000	2600	0.25	19000	1600	0.13	6400	350	0.13
3	20000	2300	0.30	16000	1400	0.15	5400	300	0.15
4	15000	2000	0.40	12000	1200	0.20	4000	240	0.2
5	12000	1600	0.50	9000	900	0.25	3200	190	0.2
6	10000	1400	0.60	7000	700	0.30	2700	160	0.2

Depth of cut



DC:Dia.

Note 1) When slotting, reduce the revolutions by 50－70% and the feed rate by 40－60%.
Note 2) For austenitic stainless steels, titanium and heat-resistant alloys, the VFMHV is recommended.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

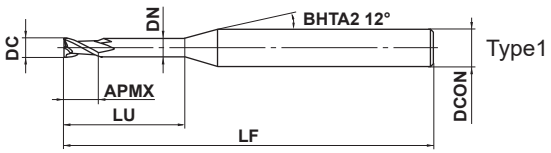
VF2XL

End mill, 2 flute, Long neck



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	◎	◎				





0.2≤DC≤3					
0 - 0.020					
4≤DCON≤6					
0 - 0.008					

●2 flute long neck end mill for high-speed machining of hardened steels.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2XLD0020N006	0.2	0.3	0.6	0.17	45	4	2	●	1
VF2XLD0030N010	0.3	0.5	1	0.27	45	4	2	●	1
VF2XLD0040N010	0.4	0.6	1	0.36	45	4	2	●	1
VF2XLD0040N020	0.4	0.6	2	0.36	45	4	2	●	1
VF2XLD0050N020	0.5	0.8	2	0.46	45	4	2	●	1
VF2XLD0050N040	0.5	0.8	4	0.46	45	4	2	●	1
VF2XLD0060N020	0.6	0.9	2	0.56	45	4	2	●	1
VF2XLD0060N040	0.6	0.9	4	0.56	45	4	2	●	1
VF2XLD0080N040	0.8	1.2	4	0.76	45	4	2	●	1
VF2XLD0080N060	0.8	1.2	6	0.76	45	4	2	●	1
VF2XLD0100N040	1	1.5	4	0.94	50	4	2	●	1
VF2XLD0100N060	1	1.5	6	0.94	50	4	2	●	1
VF2XLD0100N080	1	1.5	8	0.94	50	4	2	●	1
VF2XLD0100N120	1	1.5	12	0.94	50	4	2	●	1
VF2XLD0150N060	1.5	2.3	6	1.44	50	4	2	●	1
VF2XLD0150N080	1.5	2.3	8	1.44	50	4	2	●	1
VF2XLD0150N100	1.5	2.3	10	1.44	50	4	2	●	1
VF2XLD0150N120	1.5	2.3	12	1.44	50	4	2	●	1
VF2XLD0150N160	1.5	2.3	16	1.44	60	4	2	●	1
VF2XLD0200N060	2	3	6	1.9	50	4	2	●	1
VF2XLD0200N100	2	3	10	1.9	50	4	2	●	1
VF2XLD0200N120	2	3	12	1.9	50	4	2	●	1
VF2XLD0200N160	2	3	16	1.9	60	4	2	●	1
VF2XLD0200N200	2	3	20	1.9	60	4	2	●	1
VF2XLD0300N120	3	4.5	12	2.9	50	6	2	●	1
VF2XLD0300N200	3	4.5	20	2.9	60	6	2	●	1

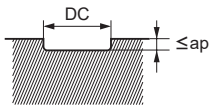
● : Inventory maintained in Japan.

Click here for product NEWS ▶

VF2XL

End mill, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.2	**0.6**	40000	400	0.004	40000	360	0.004
0.3	**1**	40000	500	0.006	40000	450	0.004
0.4	**1**	40000	800	0.008	36000	500	0.006
	2	40000	500	0.007	30000	350	0.005
0.5	**2**	40000	800	0.01	30000	600	0.009
	4	36000	600	0.008	27000	450	0.007
0.6	**2**	40000	1000	0.015	30000	700	0.012
	4	36000	800	0.01	27000	500	0.01
0.8	**4**	36000	1200	0.03	27000	900	0.02
	6	30000	900	0.02	22000	650	0.015
1	**4**	32000	1600	0.05	24000	1100	0.04
	6	32000	1400	0.04	24000	1000	0.03
	8	28000	1000	0.03	21000	750	0.02
	12	24000	500	0.02	18000	370	0.01
1.5	**6**	22000	1200	0.08	16000	900	0.06
	8	22000	1100	0.07	16000	800	0.05
	10	22000	1000	0.06	16000	750	0.04
	12	20000	800	0.05	15000	600	0.03
	16	18000	500	0.03	13000	350	0.02
2	**6**	16000	1000	0.15	12000	750	0.15
	10	16000	800	0.1	12000	600	0.08
	12	16000	800	0.08	12000	600	0.06
	16	15000	600	0.06	11000	450	0.05
	20	14000	500	0.05	10000	350	0.04
3	**12**	11000	800	0.2	8200	600	0.15
	20	11000	500	0.1	8200	350	0.1
Depth of cut		 DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

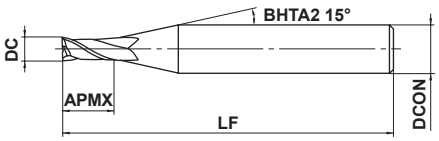
CRN2MS

End mill, Medium cut length, 2 flute, For copper electrodes

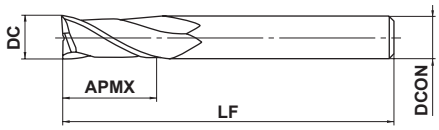


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1



Type2

0.2≤DC≤12				
0 -0.02				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

●2 flute end mill with CRN coating for copper electrode machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
CRN2MSD0020S04	0.2	0.4	40	4	2	●	1
CRN2MSD0030S04	0.3	0.6	40	4	2	●	1
CRN2MSD0040S04	0.4	0.8	40	4	2	●	1
CRN2MSD0050S04	0.5	1	40	4	2	●	1
CRN2MSD0060S04	0.6	1.2	40	4	2	●	1
CRN2MSD0070S04	0.7	1.4	40	4	2	●	1
CRN2MSD0080S04	0.8	1.6	40	4	2	●	1
CRN2MSD0100S04	1	2.5	40	4	2	●	1
CRN2MSD0100S06	1	2.5	45	6	2	●	1
CRN2MSD0150S04	1.5	4	40	4	2	●	1
CRN2MSD0150S06	1.5	4	45	6	2	●	1
CRN2MSD0170S04	1.7	4	40	4	2	●	1
CRN2MSD0200S06	2	6	45	6	2	●	1
CRN2MSD0250S06	2.5	8	45	6	2	●	1
CRN2MSD0300S06	3	8	45	6	2	●	1
CRN2MSD0400S06	4	11	45	6	2	●	1
CRN2MSD0500S06	5	13	50	6	2	●	1
CRN2MSD0600S06	6	13	50	6	2	●	2
CRN2MSD0800S08	8	19	60	8	2	●	2
CRN2MSD1000S10	10	22	70	10	2	●	2
CRN2MSD1200S12	12	26	75	12	2	●	2

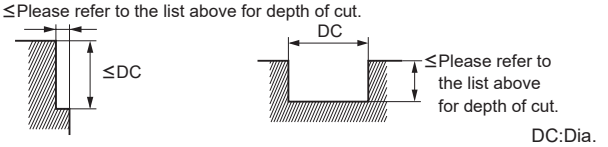
● : Inventory maintained in Japan.

CRN2MS

End mill, Medium cut length, 2 flute, For copper electrodes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Copper, Copper alloys		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
0.2	40000	600	0.01
0.3	40000	600	0.01
0.4	40000	800	0.01
0.5	40000	960	0.015
0.6	40000	1200	0.02
0.7	40000	1400	0.02
0.8	40000	1600	0.03
1	40000	2000	0.06
1.5	40000	3000	0.12
2	30000	3000	0.18
2.5	24000	2600	0.25
3	20000	2300	0.30
4	15000	2000	0.40
5	12000	1600	0.50
6	10000	1400	0.60
8	8000	1000	0.80
10	6400	900	1.00
12	5400	820	1.00
Depth of cut	≤Please refer to the list above for depth of cut.		



DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) When drilling, please set the feed rate at 1/3 or below of the table value.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

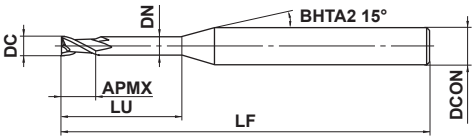
CRN2XL

End mill, Medium cut length, 2 flute, Long neck, For copper electrodes

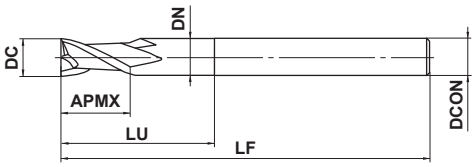


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1



Type2

0.3≤DC≤6					
0 - 0.02					
4≤DCON≤6					
0 - 0.008					

●2 flute long neck end mill with CRN coating for copper electrode machining.

(mm)

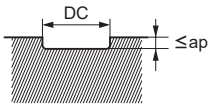
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CRN2XLD0030N010S04	0.3	0.5	1	0.27	50	4	2	●	1
CRN2XLD0030N030S04	0.3	0.5	3	0.27	50	4	2	●	1
CRN2XLD0040N020S04	0.4	0.6	2	0.36	50	4	2	●	1
CRN2XLD0050N020S04	0.5	0.8	2	0.46	50	4	2	●	1
CRN2XLD0050N040S04	0.5	0.8	4	0.46	50	4	2	●	1
CRN2XLD0050N060S04	0.5	0.8	6	0.46	50	4	2	●	1
CRN2XLD0080N040S04	0.8	1.2	4	0.76	50	4	2	●	1
CRN2XLD0100N060S04	1	1.5	6	0.94	50	4	2	●	1
CRN2XLD0100N060S06	1	1.5	6	0.94	50	6	2	●	1
CRN2XLD0100N080S04	1	1.5	8	0.94	50	4	2	●	1
CRN2XLD0100N100S04	1	1.5	10	0.94	50	4	2	●	1
CRN2XLD0100N120S04	1	1.5	12	0.94	50	4	2	●	1
CRN2XLD0150N060S04	1.5	2.3	6	1.44	50	4	2	●	1
CRN2XLD0150N080S04	1.5	2.3	8	1.44	50	4	2	●	1
CRN2XLD0150N100S04	1.5	2.3	10	1.44	50	4	2	●	1
CRN2XLD0150N120S04	1.5	2.3	12	1.44	50	4	2	●	1
CRN2XLD0200N060S06	2	3.0	6	1.90	50	6	2	●	1
CRN2XLD0200N080S06	2	3.0	8	1.90	50	6	2	●	1
CRN2XLD0200N100S06	2	3.0	10	1.90	50	6	2	●	1
CRN2XLD0200N120S06	2	3.0	12	1.90	50	6	2	●	1
CRN2XLD0200N200S06	2	3.0	20	1.90	60	6	2	●	1
CRN2XLD0250N200S06	2.5	3.8	20	2.40	65	6	2	●	1
CRN2XLD0300N200S06	3	4.5	20	2.90	65	6	2	●	1
CRN2XLD0400N200S06	4	6.0	20	3.90	65	6	2	●	1
CRN2XLD0500N250S06	5	7.5	25	4.90	70	6	2	●	1
CRN2XLD0600N300S06	6	9.0	30	5.85	70	6	2	●	2

● : Inventory maintained in Japan.

CRN2XL

End mill, Medium cut length, 2 flute, Long neck, For copper electrodes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Copper, Copper alloys		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.3	**1**	40000	800	0.007
	3	40000	600	0.002
0.4	**2**	40000	950	0.007
0.5	**2**	40000	950	0.01
	4	40000	800	0.005
	6	40000	700	0.002
0.8	**4**	40000	1200	0.02
1	**6**	40000	2000	0.04
	8	40000	2000	0.03
	10	30000	1200	0.02
	12	30000	1000	0.015
1.5	**6**	40000	2400	0.10
	8	40000	2200	0.09
	10	40000	2000	0.08
	12	30000	1800	0.05
2	**6**	40000	2400	0.18
	8	40000	2200	0.15
	10	40000	2000	0.12
	12	30000	1500	0.10
	20	15000	600	0.03
2.5	**20**	20000	1000	0.08
3	**20**	20000	2000	0.12
4	**20**	15000	2000	0.30
5	**25**	12000	1500	0.35
6	**30**	10000	1200	0.40
Depth of cut		 DC:Dia.		

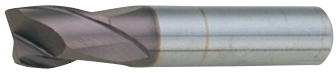
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

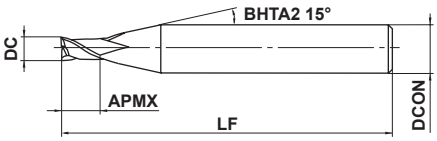
SED2KMG

End mill, Medium cut length, 2 flute, - Tolerance

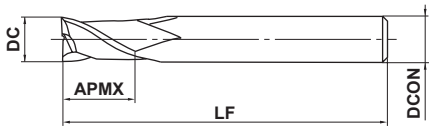


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			○			





Type1



Type2

2≤DC≤16				
0 - 0.02				
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute end mill for key way slotting with minus tolerance cutting diameter.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
SED2020KMG	2	3	45	4	2	●	1
SED2030KMG	3	5	45	6	2	●	1
SED2040KMG	4	6	45	6	2	●	1
SED2050KMG	5	8	50	6	2	●	1
SED2060KMG	6	9	50	6	2	●	2
SED2070KMG	7	10	60	8	2	●	1
SED2080KMG	8	12	60	8	2	●	2
SED2100KMG	10	15	65	10	2	●	2
SED2120KMG	12	15	65	12	2	●	2
SED2140KMG	14	15	70	16	2	●	1
SED2150KMG	15	15	70	16	2	●	1
SED2160KMG	16	15	70	16	2	●	2

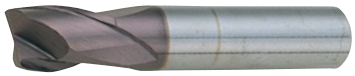
● : Inventory maintained in Japan.

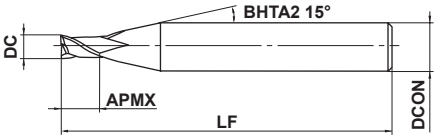
SED2KPG

End mill, Medium cut length, 2 flute, + Tolerance

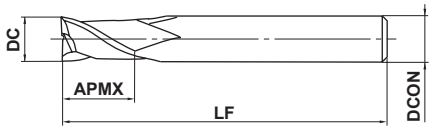


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			○			





Type1



Type2

2≤DC≤16				
0 + 0.02				
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

●2 flute end mill for key way slotting with plus tolerance cutting diameter.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
SED2020KPG	2	3	45	4	2	●	1
SED2030KPG	3	5	45	6	2	●	1
SED2040KPG	4	6	45	6	2	●	1
SED2050KPG	5	8	50	6	2	●	1
SED2060KPG	6	9	50	6	2	●	2
SED2070KPG	7	10	60	8	2	●	1
SED2080KPG	8	12	60	8	2	●	2
SED2100KPG	10	15	65	10	2	●	2
SED2120KPG	12	15	65	12	2	●	2
SED2140KPG	14	15	70	16	2	●	1
SED2150KPG	15	15	70	16	2	●	1
SED2160KPG	16	15	70	16	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

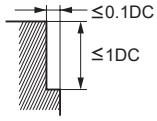
SED2KMG
End mill, Short cut length, 2 flute, For key ways

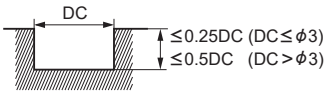
SED2KPG
End mill, Short cut length, 2 flute, For key ways

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Alloy steel (180−280HB) AISI 1045, AISI P20		Carbon steel, Alloy steel (280−380HB) AISI 1045, AISI P20		Pre-hardened steel (35−45HRC)		Stainless steel (270HB≥) AISI 420		Cast iron (Tensile Strength 350MPa≥) AISI No 35 B	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
2	13000	260 (260)	10300	200 (200)	8800	110 (110)	9800	170 (170)	21500	830 (830)
3	8500	340 (340)	6900	200 (200)	6400	110 (110)	6400	170 (170)	14300	850 (850)
4	6500	380 (380)	5200	250 (200)	4400	140 (110)	4800	200 (160)	10700	860 (860)
5	5100	400 (400)	4100	290 (230)	3500	140 (110)	3800	190 (150)	8600	850 (850)
6	4300	410 (410)	3400	290 (230)	2900	150 (120)	3200	180 (140)	7200	870 (870)
8	3200	410 (410)	2600	250 (200)	2200	140 (110)	2400	150 (120)	5400	880 (880)
10	2600	400 (400)	2070	240 (190)	1800	140 (110)	1900	140 (110)	4300	860 (860)
12	2200	360 (360)	1700	210 (170)	1500	130 (100)	1600	130 (105)	3600	860 (860)
14	1900	340 (340)	1500	200 (160)	1250	130 (100)	1400	130 (100)	3100	860 (860)
16	1600	320 (320)	1300	200 (160)	1100	130 (100)	1200	120 (95)	2700	870 (870)

Depth of cut





DC:Dia.

( ) : Indicates standard feed rate for slotting.

Note 1) The cutting conditions above are a guide only to milling within the standard depth of cut.
Note 2) Ductile cast iron milling has the same cutting conditions as carbon steel and alloy steel. (180−280HB)
Note 3) When drilling, please set the feed rate at 1/3 or below of the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

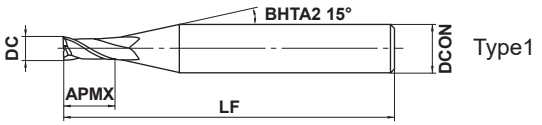
C2MA

End mill, Medium cut length, 2 flute, For aluminium alloy

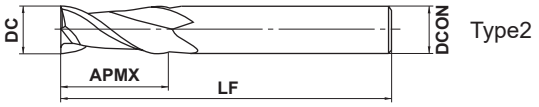


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎

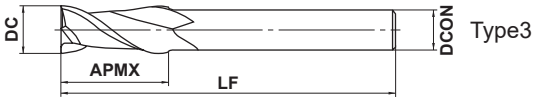




Type1



Type2



Type3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●2 flute uncoated end mill designed especially for aluminium alloys.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
C2MAD0100	1	2.5	40	4	2	●	1
C2MAD0150	1.5	4	40	4	2	●	1
C2MAD0200	2	6	40	4	2	●	1
C2MAD0250	2.5	8	40	4	2	●	1
C2MAD0300	3	8	45	6	2	●	1
C2MAD0400	4	11	45	6	2	●	1
C2MAD0500	5	13	50	6	2	●	1
C2MAD0600	6	13	50	6	2	●	2
C2MAD0800	8	19	60	8	2	●	2
C2MAD1000	10	22	70	10	2	●	2
C2MAD1200	12	26	75	12	2	●	2
C2MAD1400	14	26	75	12	2	●	3
C2MAD1500	15	30	80	16	2	●	1
C2MAD1600	16	32	90	16	2	●	2
C2MAD1800	18	32	90	16	2	●	3
C2MAD2000	20	38	100	20	2	●	2

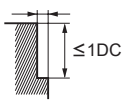
● : Inventory maintained in Japan.

Click here for product NEWS ▶

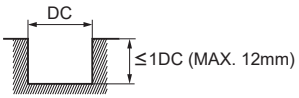
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	40000	600	40000	460
2	40000	1100	38000	850
3	32000	1400	25000	950
4	24000	1500	19000	1000
5	19000	1600	15000	1000
6	16000	1900	13000	1100
8	12000	1900	9500	1200
10	9500	1900	7600	1200
12	8000	1900	6400	1200
16	6000	1900	4800	1200
20	4800	1500	3800	1000
Depth of cut	≤0.2DC (DC < ϕ3) ≤0.5DC (DC ≥ ϕ3)  DC:Dia.			

■ Slotting

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	40000	460	40000	350
2	38000	850	32000	550
3	25000	950	21000	600
4	19000	1000	16000	650
5	15000	1000	13000	700
6	13000	1100	11000	750
8	9500	1200	8000	800
10	7600	1200	6400	800
12	6400	1200	5300	800
16	4800	1000	4000	720
20	3800	970	3200	660
Depth of cut	 DC:Dia.			

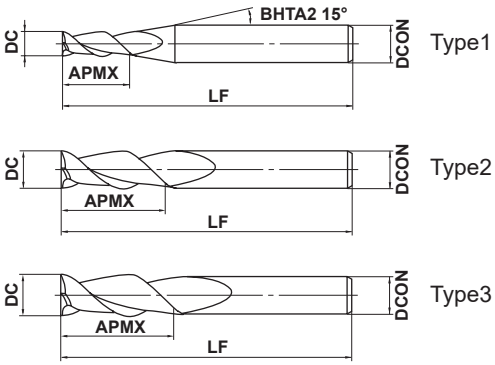
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) Climb cutting is recommended for side milling.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

C2MHA

End mill, Medium cut length, 2 flute, For aluminium alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● High efficiency machining for aluminium alloys.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
C2MHAD0300	3	9	60	6	2	●	1
C2MHAD0400	4	12	60	6	2	●	1
C2MHAD0500	5	15	60	6	2	●	1
C2MHAD0600	6	18	60	6	2	●	2
C2MHAD0800	8	20	75	8	2	●	2
C2MHAD1000	10	25	75	10	2	●	2
C2MHAD1200	12	25	75	12	2	●	2
C2MHAD1400	14	32	75	12	2	●	3
C2MHAD1600	16	32	100	16	2	●	2
C2MHAD2000	20	38	125	20	2	●	2
C2MHAD2500	25	38	125	25	2	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
3	40000	2400
4	36000	2600
5	30000	4000
6	27000	4000
8	20000	4000
10	16000	4500
12	13000	4500
16	10000	4500
20	8000	4300
25	6000	3600
Depth of cut	≤0.2DC, ≤1.5DC, DC:Dia.	

■ Slotting

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
3	40000	1500
4	36000	1800
5	30000	2800
6	27000	2800
8	20000	2800
10	16000	3200
12	13000	3200
16	10000	3200
20	8000	3000
25	6000	2500
Depth of cut	DC, ≤1DC (MAX. 20mm), DC:Dia.	

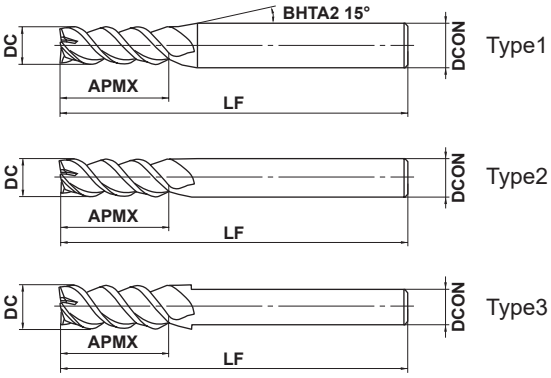
Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) If tool clamping is poor, the tool can be pulled out of the holder. Ensure that the tool is sufficiently clamped.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MSMHZD

Slotting, Medium cut length, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●A single end mill for both plunging and slotting.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHZDD0100	1	2	45	4	3	●	1
MSMHZDD0150	1.5	3	45	4	3	●	1
MSMHZDD0200	2	4	50	6	3	●	1
MSMHZDD0250	2.5	5	50	6	3	●	1
MSMHZDD0300	3	6	50	6	3	●	1
MSMHZDD0350	3.5	8	50	6	3	●	1
MSMHZDD0400	4	8	50	6	3	●	1
MSMHZDD0450	4.5	10	50	6	3	●	1
MSMHZDD0500	5	10	50	6	3	●	1
MSMHZDD0550	5.5	13	50	6	3	●	1
MSMHZDD0600	6	13	60	6	3	●	2
MSMHZDD0650	6.5	16	60	8	3	●	1
MSMHZDD0700	7	16	60	8	3	●	1
MSMHZDD0750	7.5	16	60	8	3	●	1
MSMHZDD0800	8	19	70	8	3	●	2
MSMHZDD0850	8.5	19	70	10	3	●	1
MSMHZDD0900	9	19	70	10	3	●	1
MSMHZDD0950	9.5	19	70	10	3	●	1
MSMHZDD1000	10	22	80	10	3	●	2
MSMHZDD1100	11	22	80	12	3	●	1
MSMHZDD1200	12	26	90	12	3	●	2
MSMHZDD1300	13	26	90	12	3	●	3
MSMHZDD1400	14	26	90	12	3	●	3
MSMHZDD1500	15	26	110	16	3	●	1
MSMHZDD1600	16	30	110	16	3	●	2
MSMHZDD2000	20	32	140	20	3	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	19000	600	13000	310	10000	200	9500	65
1.5	14000	600	9000	310	7500	210	6400	75
2	11000	600	7200	310	6000	210	4800	75
3	8500	770	5300	380	4400	220	3200	100
4	7200	850	4400	480	3700	250	2400	130
6	5300	940	3200	490	2700	270	1600	130
8	4000	1010	2400	560	2000	280	1200	120
10	3200	1000	1900	480	1600	300	950	110
12	2700	950	1600	440	1300	300	800	90
16	2000	720	1200	350	1000	260	600	70
20	1600	600	1000	290	800	240	480	60
Depth of cut	≤0.2DC (DC>ϕ3) ≤0.1DC (DC≤ϕ3) ≤1.5DC						0.05DC 1.5DC	

DC:Dia.

■ Plunging

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	13000	80	10000	50	6000	10
1.5	12000	120	8000	80	6000	20
2	11000	200	7200	140	6000	30
3	8500	250	5300	180	4200	50
4	7200	300	4400	210	3300	60
6	5300	300	3200	210	2200	70
8	4000	320	2400	220	1600	80
10	3200	340	1900	240	1300	70
12	2700	320	1600	220	1100	70
16	2000	250	1200	180	800	55
20	1600	200	1000	140	640	55
Depth of cut	≤1DC (DC≥ϕ2) ≤0.5DC (DC<ϕ2)			≤0.5DC (DC≥ϕ2) ≤0.2DC (DC<ϕ2)		

DC:Dia.

■ Slotting

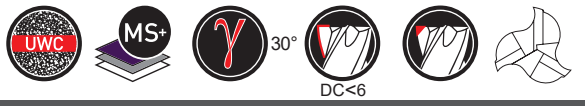
Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	13000	130	10000	80	6000	30	5700	25
1.5	12000	250	8000	150	6000	60	3800	30
2	11000	500	7200	260	6000	130	2800	35
3	8500	640	5300	320	4200	130	1900	50
4	7200	650	4400	370	3300	140	1400	70
6	5300	720	3200	380	2200	140	950	70
8	4000	780	2400	430	1600	140	720	60
10	3200	770	1900	370	1300	150	570	50
12	2700	730	1600	340	1100	150	480	40
16	2000	600	1200	290	800	130	360	30
20	1600	500	1000	240	640	120	290	25
Depth of cut	DC ≤1DC (DC≥ϕ2) ≤0.5DC (DC<ϕ2)		DC ≤0.5DC (DC≥ϕ2) ≤0.2DC (DC<ϕ2)				DC 0.2DC	

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

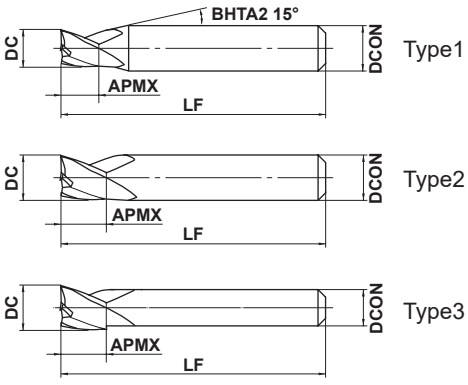
MP3ES NEW

End mill, For small automatic lathes, 3 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





3≤DC≤12				
- 0.010 - 0.030				
4≤DCON≤6	7≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

●3 flute end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP3ESD0300S04	3	4.5	50	4	3	●	1
MP3ESD0400S04	4	6	50	4	3	●	2
MP3ESD0500S06	5	7.5	50	6	3	●	1
MP3ESD0600S06	6	9	50	6	3	●	2
MP3ESD0700S07	7	10.5	50	7	3	●	2
MP3ESD0800S08	8	12	50	8	3	●	2
MP3ESD0900S10	9	13.5	50	10	3	●	1
MP3ESD1000S10	10	15	50	10	3	●	2
MP3ESD1200S10	12	15	50	10	3	●	3
MP3ESD1200S12	12	15	50	12	3	●	2

● : Inventory maintained in Japan.

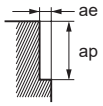
Click here for product NEWS ▶

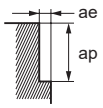
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side Milling

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	10000	720	3	0.6	7000	480	3	0.6	6000	360	3	0.6
4	7500	720	4	0.6	5200	480	4	0.6	4500	360	4	0.6
5	6000	720	5	0.6	4200	480	5	0.6	3600	360	5	0.6
6	5000	720	6	0.6	3500	480	6	0.6	3000	360	6	0.6
7	4500	670	7	0.6	3200	440	7	0.6	2700	340	7	0.6
8	4000	620	8	0.6	2800	420	8	0.6	2400	310	8	0.6
9	3500	580	9	0.6	2500	380	9	0.6	2100	290	9	0.6
10	3200	540	10	0.6	2200	360	10	0.6	1900	280	10	0.6
12	2700	490	12	0.6	1900	320	12	0.6	1600	250	12	0.6
Depth of cut												

Workpiece Material	Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	5000	140	3	0.2	13000	940	3	0.6
4	4000	140	4	0.2	9500	910	4	0.6
5	3200	140	5	0.2	7600	910	5	0.6
6	2700	140	6	0.2	6400	920	6	0.6
7	2300	130	7	0.2	5500	820	7	0.6
8	2000	130	8	0.2	4800	740	8	0.6
9	1800	130	9	0.2	4200	700	9	0.6
10	1600	120	10	0.2	3800	640	10	0.6
12	1300	120	12	0.2	3200	580	12	0.6
Depth of cut								

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MP3ES

End mill, For small automatic lathes, 3 flute

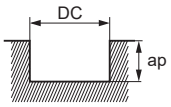
RECOMMENDED CUTTING CONDITIONS

■Slotting

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	10000	720	0.6	7000	480	0.6	6000	360	0.6
4	7500	720	0.6	5200	480	0.6	4500	360	0.6
5	6000	720	0.6	4200	480	0.6	3600	360	0.6
6	5000	720	0.6	3500	480	0.6	3000	360	0.6
7	4500	670	0.6	3200	440	0.6	2700	340	0.6
8	4000	620	0.6	2800	420	0.6	2400	310	0.6
9	3500	580	0.6	2500	380	0.6	2100	290	0.6
10	3200	540	0.6	2200	360	0.6	1900	280	0.6
12	2700	490	0.6	1900	320	0.6	1600	250	0.6

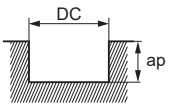
Depth of cut



DC:Dia.

Workpiece Material	Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	5000	140	0.2	13000	940	0.6
4	4000	140	0.2	9500	910	0.6
5	3200	140	0.2	7600	910	0.6
6	2700	140	0.2	6400	920	0.6
7	2300	130	0.2	5500	820	0.6
8	2000	130	0.2	4800	740	0.6
9	1800	130	0.2	4200	700	0.6
10	1600	120	0.2	3800	640	0.6
12	1300	120	0.2	3200	580	0.6

Depth of cut



DC:Dia.

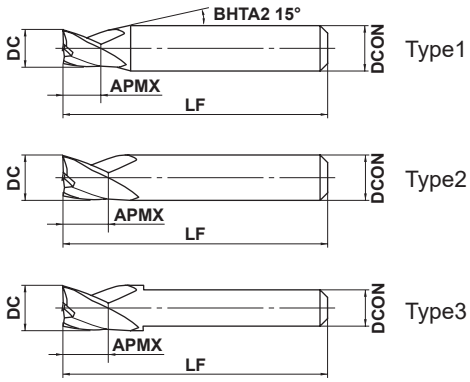
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS3ES

End mill, 3 flute, For small automatic lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

●3 flute end mill.

Overall length 35mm

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L35S04	3	3	35	4	3	●	1
MS3ESD0350L35S04	3.5	3.5	35	4	3	●	1
MS3ESD0400L35S04	4	4	35	4	3	●	2
MS3ESD0500L35S05	5	5	35	5	3	●	2
MS3ESD0500L35S06	5	5	35	6	3	●	1
MS3ESD0600L35S05	6	6	35	5	3	●	3
MS3ESD0600L35S06	6	6	35	6	3	●	2
MS3ESD0700L35S07	7	6	35	7	3	●	2
MS3ESD0800L35S07	8	6	35	7	3	●	3
MS3ESD0800L35S08	8	6	35	8	3	●	2
MS3ESD1000L35S07	10	6	35	7	3	●	3
MS3ESD1000L35S10	10	6	35	10	3	●	2
MS3ESD1200L35S10	12	6	35	10	3	●	3

Overall length 45mm

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L45S04	3	3	45	4	3	●	1
MS3ESD0350L45S04	3.5	3.5	45	4	3	●	1
MS3ESD0400L45S04	4	4	45	4	3	●	2
MS3ESD0500L45S06	5	5	45	6	3	●	1
MS3ESD0600L45S06	6	6	45	6	3	●	2
MS3ESD0700L45S07	7	7	45	7	3	●	2
MS3ESD0800L45S07	8	8	45	7	3	●	3
MS3ESD0800L45S08	8	8	45	8	3	●	2
MS3ESD1000L45S07	10	10	45	7	3	●	3
MS3ESD1000L45S10	10	10	45	10	3	●	2
MS3ESD1200L45S10	12	12	45	10	3	●	3

● : Inventory maintained in Japan.

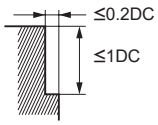
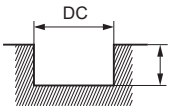
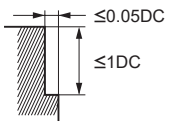
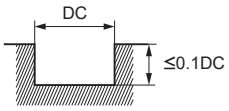
Click here for product NEWS ▶

ISO13399 ➤ J002

MS3ES

End mill, 3 flute, For small automatic lathes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	10000	600	7000	400	6000	300	5000	120
4	7500	600	5200	400	4500	300	4000	120
5	6000	600	4200	400	3600	300	3200	120
6	5000	600	3500	400	3000	300	2700	120
7	4500	560	3000	360	2700	280	2300	110
8	4000	520	2800	350	2400	260	2000	110
10	3200	450	2200	300	1900	230	1600	100
12	2700	410	1900	270	1600	210	1300	100
Depth of cut								

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

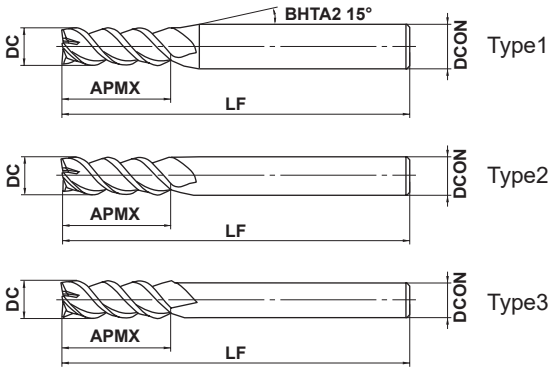
VQMHZV

End mill, Medium cutting length, 3 flute for drilling and slotting



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- A single end mill for both plunging and slotting.
- Irregular helical geometry controls the vibration.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0100	1	2	45	4	3	●	1
VQMHZVD0110	1.1	2.2	45	4	3	●	1
VQMHZVD0120	1.2	2.4	45	4	3	●	1
VQMHZVD0130	1.3	2.6	45	4	3	●	1
VQMHZVD0140	1.4	2.8	45	4	3	●	1
VQMHZVD0150	1.5	3	45	4	3	●	1
VQMHZVD0160	1.6	3.2	45	4	3	●	1
VQMHZVD0170	1.7	3.4	45	4	3	●	1
VQMHZVD0180	1.8	3.6	45	4	3	●	1
VQMHZVD0190	1.9	3.8	45	4	3	●	1
VQMHZVD0200	2	4	50	6	3	●	1
VQMHZVD0210	2.1	4.2	50	6	3	●	1
VQMHZVD0220	2.2	4.4	50	6	3	●	1
VQMHZVD0230	2.3	4.6	50	6	3	●	1
VQMHZVD0240	2.4	4.8	50	6	3	●	1
VQMHZVD0250	2.5	5	50	6	3	●	1
VQMHZVD0260	2.6	5.2	50	6	3	●	1
VQMHZVD0270	2.7	5.4	50	6	3	●	1
VQMHZVD0280	2.8	5.6	50	6	3	●	1
VQMHZVD0290	2.9	5.8	50	6	3	●	1
VQMHZVD0300	3	6	50	6	3	●	1
VQMHZVD0310	3.1	7	50	6	3	●	1
VQMHZVD0320	3.2	7	50	6	3	●	1
VQMHZVD0330	3.3	7	50	6	3	●	1
VQMHZVD0340	3.4	7	50	6	3	●	1
VQMHZVD0350	3.5	8	50	6	3	●	1
VQMHZVD0360	3.6	8	50	6	3	●	1
VQMHZVD0370	3.7	8	50	6	3	●	1
VQMHZVD0380	3.8	8	50	6	3	●	1
VQMHZVD0390	3.9	8	50	6	3	●	1
VQMHZVD0400	4	8	50	6	3	●	1
VQMHZVD0450	4.5	10	50	6	3	●	1

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : Inventory maintained in Japan.

Click here for product NEWS ▶

VQMHZV

End mill, Medium cutting length, 3 flute for drilling and slotting

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0500	5	10	50	6	3	●	1
VQMHZVD0550	5.5	13	50	6	3	●	1
VQMHZVD0600	6	13	60	6	3	●	2
VQMHZVD0650	6.5	16	60	8	3	●	1
VQMHZVD0700	7	16	60	8	3	●	1
VQMHZVD0750	7.5	16	60	8	3	●	1
VQMHZVD0800	8	19	70	8	3	●	2
VQMHZVD0850	8.5	19	70	10	3	●	1
VQMHZVD0900	9	19	70	10	3	●	1
VQMHZVD0950	9.5	19	70	10	3	●	1
VQMHZVD1000	10	22	80	10	3	●	2
VQMHZVD1100	11	22	80	12	3	●	1
VQMHZVD1200	12	26	90	12	3	●	2
VQMHZVD1300	13	26	90	12	3	●	3
VQMHZVD1400	14	26	90	12	3	●	3
VQMHZVD1500	15	26	110	16	3	●	1
VQMHZVD1600	16	30	110	16	3	●	2
VQMHZVD2000	20	32	140	20	3	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

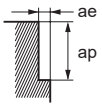
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

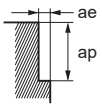
■ Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	720	1.5	0.2	80	25000	530	1.5	0.2	60	19000	430	1.5	0.2	50	16000	340	1.5	0.1
1.5	130	28000	1300	2.25	0.3	100	21000	630	2.25	0.3	85	18000	540	2.25	0.3	65	14000	420	2.25	0.15
2	150	24000	1800	3	0.6	120	19000	860	3	0.6	100	16000	620	3	0.6	75	12000	540	3	0.4
3	150	16000	1900	4.5	0.9	120	13000	940	4.5	0.9	100	11000	660	4.5	0.9	75	8000	580	4.5	0.6
4	150	12000	2000	6	1.2	120	9500	940	6	1.2	100	8000	670	6	1.2	75	6000	590	6	0.8
5	150	9500	1900	7.5	1.5	120	7600	960	7.5	1.5	100	6400	670	7.5	1.5	75	4800	600	7.5	1
6	150	8000	1900	9	1.8	120	6400	960	9	1.8	100	5300	830	9	1.8	75	4000	600	9	1.2
8	150	6000	1900	12	2.4	120	4800	1000	12	2.4	100	4000	900	12	2.4	75	3000	630	12	1.6
10	150	4800	1700	15	3	120	3800	910	15	3	100	3200	960	15	3	75	2400	580	15	2
12	150	4000	1400	18	3.6	120	3200	860	18	3.6	100	2700	890	18	3.6	75	2000	540	18	2.4
16	150	3000	1200	24	4.8	120	2400	720	24	4.8	100	2000	720	24	4.8	75	1500	450	24	3.2
20	150	2400	970	30	6	120	1900	570	30	6	100	1600	580	30	6	75	1200	360	30	4
Depth of cut																				

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	480	1.5	0.2	80	25000	350	1.5	0.2	60	19000	280	1.5	0.2	50	16000	220	1.5	0.1
1.5	120	25000	740	2.25	0.3	100	21000	420	2.25	0.3	80	17000	340	2.25	0.3	65	14000	280	2.25	0.15
2	120	19000	940	3	0.6	100	16000	480	3	0.6	80	13000	340	3	0.6	70	11000	330	3	0.4
3	120	13000	1000	4.5	0.9	100	11000	520	4.5	0.9	80	8500	340	4.5	0.9	70	7400	350	4.5	0.6
4	120	9500	1000	6	1.2	100	8000	520	6	1.2	80	6400	350	6	1.2	70	5600	370	6	0.8
5	120	7600	980	7.5	1.5	100	6400	530	7.5	1.5	80	5100	350	7.5	1.5	70	4500	370	7.5	1
6	120	6400	1000	9	1.8	100	5300	540	9	1.8	80	4200	400	9	1.8	70	3700	370	9	1.2
8	120	4800	1000	12	2.4	100	4000	550	12	2.4	80	3200	430	12	2.4	70	2800	390	12	1.6
10	120	3800	900	15	3	100	3200	510	15	3	80	2500	450	15	3	70	2200	350	15	2
12	120	3200	760	18	3.6	100	2700	480	18	3.6	80	2100	420	18	3.6	70	1900	340	18	2.4
16	120	2400	640	24	4.8	100	2000	400	24	4.8	80	1600	340	24	4.8	70	1400	280	24	3.2
20	120	1900	510	30	6	100	1600	320	30	6	80	1300	270	30	6	70	1100	220	30	4
Depth of cut																				

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

VQMHZV

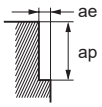
End mill, Medium cutting length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

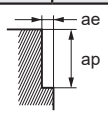
■Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency cutting conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	860	1.5	0.2	40	13000	160	1.5	0.05
1.5	150	32000	1400	2.25	0.3	40	8500	170	2.25	0.08
2	180	29000	2200	3	0.6	40	6400	170	3	0.2
3	180	19000	2300	4.5	0.9	40	4200	180	4.5	0.3
4	180	14000	2300	6	1.2	40	3200	180	6	0.4
5	180	11000	2300	7.5	1.5	40	2500	180	7.5	0.5
6	180	9500	2300	9	1.8	40	2100	190	9	0.6
8	180	7200	2300	12	2.4	40	1600	190	12	0.8
10	180	5700	2100	15	3	40	1300	220	15	1
12	180	4800	1700	18	3.6	40	1100	210	18	1.2
16	180	3600	1500	24	4.8	40	800	150	24	1.6
20	180	2900	1200	30	6	40	640	120	30	2
Depth of cut										

General-purpose conditions

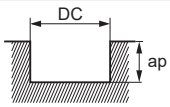
Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	560	1.5	0.2	30	9500	75	1.5	0.05
1.5	140	30000	890	2.25	0.3	30	6400	82	2.25	0.07
2	140	22000	1100	3	0.6	30	4800	86	3	0.2
3	140	15000	1200	4.5	0.9	30	3200	89	4.5	0.3
4	140	11000	1200	6	1.2	30	2400	90	6	0.4
5	140	8900	1200	7.5	1.5	30	1900	90	7.5	0.5
6	140	7400	1200	9	1.8	30	1600	95	9	0.6
8	140	5600	1200	12	2.4	30	1200	95	12	0.8
10	140	4500	1100	15	3	30	950	110	15	1
12	140	3700	880	18	3.6	30	800	100	18	1.2
16	140	2800	750	24	4.8	30	600	76	24	1.6
20	140	2200	590	30	6	30	480	61	30	2
Depth of cut										

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

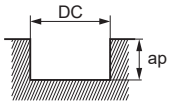
■Slotting

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	100	32000	380	0.5	80	25000	150	0.5	60	19000	100	0.5	45	14000	80	0.3	120	38000	460	0.5	30	9500	60	0.2
1.5	130	28000	590	0.75	100	21000	250	0.75	85	18000	220	0.75	60	12000	140	0.4	150	32000	670	0.75	30	6400	80	0.3
2	150	24000	940	2	120	19000	460	2	100	16000	480	2	60	9500	230	1	180	29000	1100	2	30	4800	100	0.6
3	150	16000	1100	3	120	13000	550	3	100	11000	500	3	60	6400	270	1.5	180	19000	1300	3	30	3200	120	0.9
4	150	12000	1400	4	120	9500	680	4	100	8000	530	4	60	4800	350	2	180	14000	1700	4	30	2400	130	1.2
5	150	9500	1400	5	120	7600	680	5	100	6400	540	5	60	3800	350	2.5	180	11000	1700	5	30	1900	130	1.5
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8
20	150	2400	650	12	120	1900	400	12	100	1600	380	12	60	950	200	10	180	2900	780	12	30	480	90	6
Depth of cut	 DC:Dia.																							

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	100	32000	250	0.5	80	25000	99	0.5	60	19000	80	0.5	45	14000	60	0.3	120	38000	300	0.5	25	8000	30	0.2
1.5	100	21000	290	0.75	80	17000	130	0.75	60	13000	100	0.75	50	11000	87	0.4	120	25000	350	0.75	25	5300	40	0.3
2	100	16000	410	2	80	13000	210	2	60	9500	190	2	50	8000	130	1	120	19000	490	2	25	4000	55	0.6
3	100	11000	500	3	80	8500	240	3	60	6400	190	3	50	5300	150	1.5	120	13000	590	3	25	2700	64	0.9
4	100	8000	630	4	80	6400	300	4	60	4800	210	4	50	4000	190	2	120	9500	750	4	25	2000	70	1.2
5	100	6400	630	5	80	5100	300	5	60	3800	210	5	50	3200	190	2.5	120	7600	750	5	25	1600	71	1.5
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8
20	100	1600	290	12	80	1300	180	12	60	950	150	12	50	800	110	10	120	1900	340	12	25	400	50	6
Depth of cut	 DC:Dia.																							

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

VQMHZV

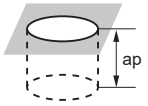
End mill, Medium cutting length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

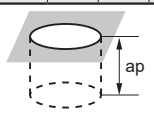
■Plunging

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH					Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.1	50	16000	100	0.5	0.1	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.1
1.5	85	18000	270	0.75	0.3	60	13000	120	0.75	0.3	60	13000	80	0.75	0.1	35	7400	40	0.75	0.1	100	21000	320	0.75	0.3
2	100	16000	480	2	0.5	70	11000	200	2	0.4	60	9500	90	1	0.15	40	6400	60	1	0.1	120	19000	570	2	0.5
3	100	11000	660	3	1	70	7400	270	3	0.6	60	6400	100	1.5	0.2	40	4200	60	1.5	0.2	120	13000	780	3	1.0
4	100	8000	800	4	2	70	5600	340	4	0.8	60	4800	100	2	0.4	40	3200	60	2	0.4	120	9500	950	4	2
5	100	6400	960	5	2.5	70	4500	410	5	1	60	3800	100	2.5	0.5	40	2500	60	2.5	0.5	120	7600	1100	5	2.5
6	100	5300	950	6	3	70	3700	440	6	1.2	60	3200	100	3	0.6	40	2100	60	3	0.6	120	6400	1200	6	3
8	100	4000	720	8	4	70	2800	340	8	1.6	60	2400	70	4	0.6	40	1600	50	4	0.6	120	4800	860	8	4
10	100	3200	580	10	5	70	2200	260	10	2.5	60	1900	60	5	0.6	40	1300	40	5	0.6	120	3800	680	10	5
12	100	2700	490	12	5	70	1900	230	12	3	60	1600	50	6	0.6	40	1100	30	6	0.6	120	3200	580	12	5
16	100	2000	360	16	5	70	1400	170	16	4	60	1200	40	8	0.6	40	800	20	8	0.6	120	2400	430	16	5
20	100	1600	290	20	5	70	1100	130	20	5	60	950	30	10	0.6	40	640	20	10	0.6	120	1900	340	20	5
Depth of cut																									

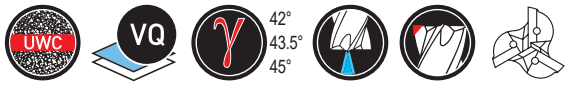
General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH					Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.05	50	16000	100	0.5	0.05	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.05
1.5	85	18000	270	0.75	0.15	60	13000	120	0.75	0.1	60	13000	80	0.75	0.05	35	7400	40	0.75	0.05	100	21000	320	0.75	0.15
2	100	16000	480	2	0.25	70	11000	200	2	0.2	60	9500	90	1	0.05	40	6400	60	1	0.05	120	19000	570	2	0.25
3	100	11000	660	3	0.3	70	7400	270	3	0.3	60	6400	100	1.5	0.1	40	4200	60	1.5	0.1	120	13000	780	3	0.3
4	100	8000	800	4	0.4	70	5600	340	4	0.4	60	4800	100	2	0.2	40	3200	60	2	0.2	120	9500	950	4	0.4
5	100	6400	960	5	0.5	70	4500	410	5	0.5	60	3800	100	2.5	0.25	40	2500	60	2.5	0.25	120	7600	1100	5	0.5
6	100	5300	950	6	0.6	70	3700	440	6	0.6	60	3200	100	3	0.3	40	2100	60	3	0.3	120	6400	1200	6	0.6
8	100	4000	720	8	0.7	70	2800	340	8	0.7	60	2400	70	4	0.3	40	1600	50	4	0.3	120	4800	860	8	0.7
10	100	3200	580	10	0.75	70	2200	260	10	0.75	60	1900	60	5	0.3	40	1300	40	5	0.3	120	3800	680	10	0.75
12	100	2700	490	12	0.75	70	1900	230	12	0.75	60	1600	50	6	0.3	40	1100	30	6	0.3	120	3200	580	12	0.75
16	100	2000	360	16	0.75	70	1400	170	16	0.75	60	1200	40	8	0.3	40	800	20	8	0.3	120	2400	430	16	0.75
20	100	1600	290	20	0.75	70	1100	130	20	0.75	60	950	30	10	0.3	40	640	20	10	0.3	120	1900	340	20	0.75
Depth of cut																									

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

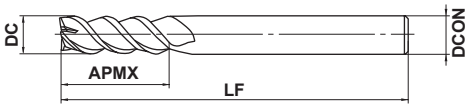
VQMHZVOH

End mill, Medium cutting length, 3 flute for drilling and slotting with internal through coolant holes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





Type1

DC≤12	DC=16			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

- A single end mill for both plunging and slotting.
- Excellent peformance in slotting and pocketing with oil supply from the end cutting edge.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVOHD0600	6	13	60	6	3	●	1
VQMHZVOHD0800	8	19	70	8	3	●	1
VQMHZVOHD1000	10	22	80	10	3	●	1
VQMHZVOHD1200	12	26	90	12	3	●	1
VQMHZVOHD1600	16	30	110	16	3	●	1

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

VQMHZVOH

End mill, Medium cutting length, 3 flute for drilling and slotting with internal through coolant holes

RECOMMENDED CUTTING CONDITIONS

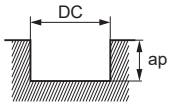
■ Slotting

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8

Depth of cut

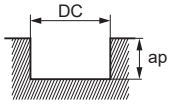


DC:Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min-1)	Feed rate (mm/min)	Depth of cut ap (mm)
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8

Depth of cut



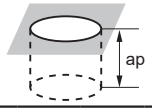
DC:Dia.

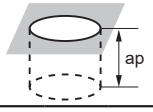
Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

Plunging

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	3	70	3700	440	9	1.2	60	3200	100	6	0.6	40	2100	60	6	0.6
8	100	4000	720	12	4	70	2800	340	12	1.6	60	2400	70	8	0.6	40	1600	50	8	0.6
10	100	3200	580	15	5	70	2200	260	15	2.5	60	1900	60	10	0.6	40	1300	40	10	0.6
12	100	2700	490	18	5	70	1900	230	18	3	60	1600	50	12	0.6	40	1100	30	12	0.6
16	100	2000	360	24	5	70	1400	170	24	4	60	1200	40	16	0.6	40	800	20	16	0.6
Depth of cut																				

Workpiece Material	Copper, Copper alloy				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	120	6400	1200	9	3
8	120	4800	860	12	4
10	120	3800	680	15	5
12	120	3200	580	18	5
16	120	2400	430	24	5
Depth of cut					

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VQMHZVOH

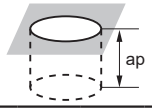
End mill, Medium cutting length, 3 flute for drilling and slotting with internal through coolant holes

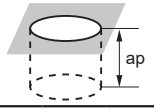
RECOMMENDED CUTTING CONDITIONS

■ Plunging

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	0.6	70	3700	440	9	0.6	60	3200	100	6	0.3	40	2100	60	6	0.3
8	100	4000	720	12	0.7	70	2800	340	12	0.7	60	2400	70	8	0.3	40	1600	50	8	0.3
10	100	3200	580	15	0.75	70	2200	260	15	0.75	60	1900	60	10	0.3	40	1300	40	10	0.3
12	100	2700	490	18	0.75	70	1900	230	18	0.75	60	1600	50	12	0.3	40	1100	30	12	0.3
16	100	2000	360	24	0.75	70	1400	170	24	0.75	60	1200	40	16	0.3	40	800	20	16	0.3
Depth of cut																				

Workpiece Material	Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Step (mm)
6	120	6400	1200	9	0.6
8	120	4800	860	12	0.7
10	120	3800	680	15	0.75
12	120	3200	580	18	0.75
16	120	2400	430	24	0.75
Depth of cut					

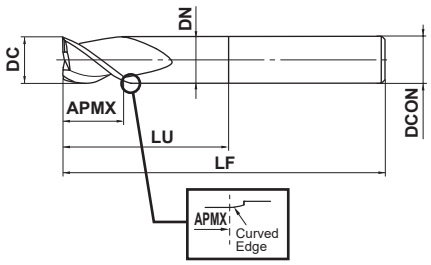
Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

A3SA NEW

End mill, Short cut length, 3 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

●Stability and reliability even when slotting, ramping and plunging.
●The cross sectional geometry of the flutes is perfect for efficient chip discharge.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
A3SA120N36C	12	18	36	11.4	80	12	3	●
A3SA160N48C	16	24	48	15.4	90	16	3	●
A3SA200N55C	20	30	55	18	100	20	3	●
A3SA250N55C	25	37.5	55	23	100	25	3	●

● : Inventory maintained in Japan.

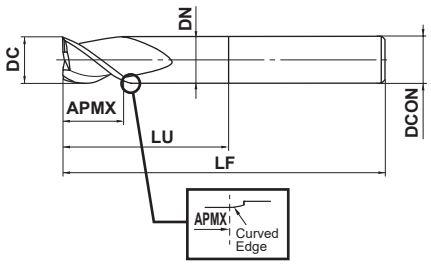
Click here for product NEWS ▶

DLC3SA NEW

End mill, Short cut length, 3 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

●Stability and reliability even when slotting, ramping and plunging.
●The cross sectional geometry of the flutes is perfect for efficient chip discharge.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
DLC3SA120N36C	12	18	36	11.4	80	12	3	●
DLC3SA160N48C	16	24	48	15.4	90	16	3	●
DLC3SA200N55C	20	30	55	18	100	20	3	●
DLC3SA250N55C	25	37.5	55	23	100	25	3	●

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

A3SA NEW

End mill, Short cut length, 3 flute, with multiple internal through coolant holes

DLC3SA NEW

End mill, Short cut length, 3 flute, with multiple internal through coolant holes

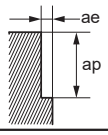
RECOMMENDED CUTTING CONDITIONS

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

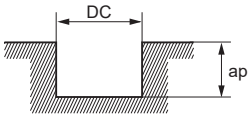
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ae(mm)	Depth of Cut ap(mm)
12	1240	33000	15000	6	12
16	1660	33000	20000	8	16
20	2070	33000	26000	10	20
25	2590	33000	32000	12.5	25
Depth of Cut					

■Slot Milling

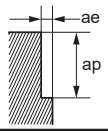
(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	1240	33000	15000	6
16	1660	33000	20000	8
20	2070	33000	26000	10
25	2590	33000	32000	12.5
Depth of Cut	 DC:Cutting Dia.			

General-purpose conditions

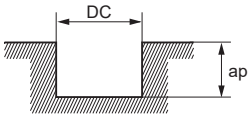
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ae(mm)	Depth of Cut ap(mm)
12	600	16000	7200	6	12
16	600	12000	7200	8	16
20	600	9500	7400	10	20
25	600	7600	7300	12.5	25
Depth of Cut					

■Slot Milling

(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	600	16000	7200	6
16	600	12000	7200	8
20	600	9500	7400	10
25	600	7600	7300	12.5
Depth of Cut	 DC:Cutting Dia.			

Note 1) It is recommended to use a water-soluble coolant. It is also possible to use an air blower (external/internal) for DLC coating.
Note 2) Down cut is recommended for side cutting.
Note 3) This table shows the cutting conditions with an overhang length of less than 4D. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) When ramping, consider the chip discharge and use a feed rate 50% lower than the slotting conditions above and also use a ramping angle of 5º or less.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

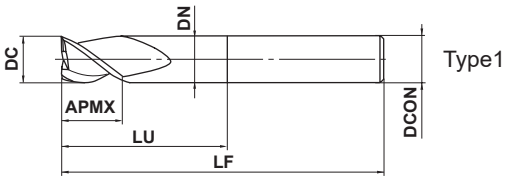
C3SA

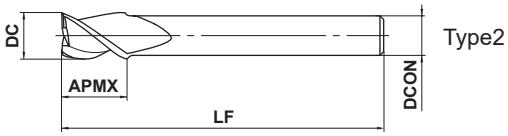
End mill, Short cut length, 3 flute, For aluminium alloy



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎







DC≤12	DC>12			
0 - 0.020	0 - 0.030			
8≤DCON≤10	12≤DCON≤16	20≤DCON≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

● High efficiency machining for aluminium alloys.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type	Center cutting edge
C3SAD1000A100S08	10	12	—	—	100	8	3	▲	2	○
C3SAD1000N300	10	12	30	9.4	75	10	3	▲	1	—
C3SAD1000N350	10	12	35	9.4	100	10	3	▲	1	—
C3SAD1200A150S10	12	15	—	—	150	10	3	▲	2	○
C3SAD1200N300	12	15	30	11.4	75	12	3	▲	1	—
C3SAD1200N350	12	15	35	11.4	100	12	3	▲	1	—
C3SAD1200N400	12	15	40	11.4	125	12	3	▲	1	—
C3SAD1600A200S14	16	15	—	—	200	14	3	▲	2	○
C3SAD1600N300	16	15	30	15.4	75	16	3	▲	1	—
C3SAD1600N400	16	15	40	15.4	100	16	3	▲	1	—
C3SAD1600N450	16	15	45	15.4	125	16	3	▲	1	—
C3SAD1700A150S16	17	18	—	—	150	16	3	▲	2	○
C3SAD1800A200S16	18	18	—	—	200	16	3	▲	2	○
C3SAD2000A200S18	20	20	—	—	200	18	3	▲	2	○
C3SAD2000N400	20	20	40	18	100	20	3	▲	1	—
C3SAD2000N600	20	20	60	18	125	20	3	▲	1	—
C3SAD2000N850	20	20	85	18	150	20	3	▲	1	—
C3SAD2500N500	25	20	50	23	100	25	3	▲	1	—
C3SAD2500N650	25	20	65	23	125	25	3	▲	1	—
C3SAD2500N900	25	20	90	23	150	25	3	▲	1	—
C3SAD2600A200S25	26	20	—	—	200	25	3	▲	2	○

▲ : Product scheduled to be discontinued at the end of March 2023
A3SA (J113) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
12	13000	5400
16	10000	5400
18	9000	5000
20	8000	5000
25	6000	4500
Depth of cut	≤0.3DC, ≤0.8DC, DC:Dia.	

■ Slotting

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
12	13000	3200
16	10000	3200
18	9000	3000
20	8000	3000
25	6000	2800
Depth of cut	DC, ≤0.5DC, DC:Dia.	

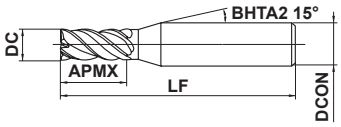
Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) This table shows the cutting condition with less than 4D overhang length. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MPMHV

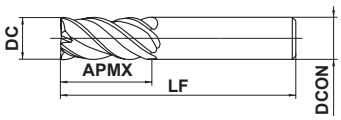
End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		◎	○	○	





Type1



Type2

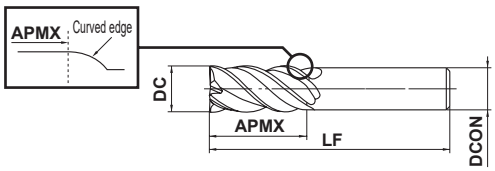
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=4	DCON=6	DCON=8		
0 - 0.005	0 - 0.005	0 - 0.006		
DCON=6(DC=8)	DCON=8(DC=10)	DCON=10	12≤DCON≤16	DCON=20
0 - 0.008	0 - 0.009	0 - 0.009	0 - 0.011	0 - 0.013

●flute irregular helix end mill for reduced vibration when machining stainless steels and carbon steels.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MPMHVD0100	1	2.5	45	4	4	●	1
MPMHVD0150	1.5	3.8	45	4	4	●	1
MPMHVD0200	2	5	45	4	4	●	1
MPMHVD0250	2.5	6.3	45	4	4	●	1
MPMHVD0300	3	7.5	45	6	4	●	1
MPMHVD0400	4	10	45	6	4	●	1
MPMHVD0500	5	12.5	50	6	4	●	1
MPMHVD0600	6	15	60	6	4	●	2
MPMHVD0700	7	17.5	70	8	4	●	2
MPMHVD0800	8	20	70	8	4	●	2
MPMHVD1000	10	25	80	10	4	●	2
MPMHVD1200	12	30	100	12	4	●	2
MPMHVD1600	16	40	110	16	4	●	2
MPMHVD2000	20	50	125	20	4	●	2





Type3

■Slim Shank

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MPMHVD0700S06	7	17.5	80	6	4	●	3
MPMHVD0800S06	8	20	90	6	4	●	3
MPMHVD0900S08	9	22.5	90	8	4	●	3
MPMHVD1000S08	10	25	100	8	4	●	3
MPMHVD1100S10	11	28	100	10	4	●	3
MPMHVD1200S10	12	30	110	10	4	●	3
MPMHVD1300S12	13	32	110	12	4	●	3
MPMHVD1400S12	14	35	130	12	4	●	3
MPMHVD1800S16	18	45	150	16	4	●	3
MPMHVD2200S20	22	55	160	20	4	●	3

● : Inventory maintained in Japan.

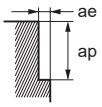
Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■Side milling

*Please refer to page J120 for cutting conditions of slim shank.

Workpiece Material	Carbon steel, Alloy steel (180−280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450				Carbon steel, Alloy steel (280−350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT				Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened steel (45−55HRC) AISI H13, AISI L6			
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	38000	910	1.7	0.2	31000	500	1.7	0.2	25000	500	1.7	0.2	18000	290	1.7	0.05
1.5	27000	970	2.5	0.3	22000	530	2.5	0.3	18000	500	2.5	0.3	13000	310	2.5	0.08
2	21000	1500	3.5	0.4	17000	820	3.5	0.4	14000	640	3.5	0.4	10000	320	3.5	0.1
2.5	18000	1700	4.2	0.5	15000	900	4.2	0.5	12000	820	4.2	0.5	8500	360	4.2	0.13
3	16000	1800	5	0.6	13000	940	5	0.6	11000	880	5	0.6	7400	380	5	0.15
4	12000	1700	7	0.8	9500	950	7	0.8	8000	900	7	0.8	5600	400	7	0.2
5	9500	1800	8.5	1	7600	1100	8.5	1	6400	900	8.5	1	4500	430	8.5	0.25
6	8000	2100	10	1.2	6400	1300	10	1.2	5300	1100	10	1.2	3700	440	10	0.3
7	6800	2000	12	1.4	5500	1400	12	1.4	4500	1200	12	1.4	3200	450	12	0.35
8	6000	2000	13.5	1.6	4800	1400	13.5	1.6	4000	1200	13.5	1.6	2800	450	13.5	0.4
10	4800	2100	17	2	3800	1500	17	2	3200	1100	17	2	2200	440	17	0.5
12	4000	1900	20.5	2.4	3200	1400	20.5	2.4	2700	1100	20.5	2.4	1900	380	20.5	0.6
16	3000	1400	27.2	3.2	2400	1100	27.2	3.2	2000	840	27.2	3.2	1400	340	27.2	0.8
20	2400	1200	34	4	1900	840	34	4	1600	670	34	4	1100	260	34	1
Depth of cut																

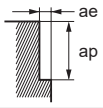
Note 1) Wet cutting mode is recommended for cutting stainless steels and titanium alloys, and air blow is recommended for carbon steels.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MPMHV

End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■ Side milling (Slim Shank)

Workpiece Material	Carbon steel, Alloy steel (180－280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450				Carbon steel, Alloy steel (280－350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT				Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened steel (45－55HRC) AISI H13, AISI L6			
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
7	4100	1200	12	0.7	3300	860	12	0.7	2700	700	12	0.7	1900	270	12	0.35
8	3600	1200	13.5	0.8	2900	870	13.5	0.8	2400	720	13.5	0.8	1700	270	13.5	0.4
9	3200	1200	15	0.9	2500	900	15	0.9	2100	660	15	0.9	1500	270	15	0.45
10	2900	1300	17	1	2300	920	17	1	1900	670	17	1	1300	260	17	0.5
11	2600	1200	18.5	1.1	2100	880	18.5	1.1	1700	520	18.5	1.1	1200	190	18.5	0.55
12	2400	1200	20.5	1.2	1900	840	20.5	1.2	1600	650	20.5	1.2	1100	220	20.5	0.6
13	2200	1100	22	1.3	1800	790	22	1.3	1500	490	22	1.3	1000	160	22	0.65
14	2000	960	24	1.4	1600	700	24	1.4	1400	460	24	1.4	950	150	24	0.7
18	1600	770	31	1.8	1300	570	31	1.8	1100	360	31	1.8	740	120	31	0.9
22	1300	620	37.5	2.2	1000	440	37.5	2.2	870	280	37.5	2.2	610	98	37.5	1.2
Depth of cut																

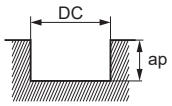
Note 1) Wet cutting mode is recommended for cutting stainless steels and titanium alloys, and air blow is recommended for carbon steels.

Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Slotting

Workpiece Material	Carbon steel, Alloy steel (180−280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450			Carbon steel, Alloy steel (280−350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT			Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Hardened steel (45−55HRC) AISI H13, AISI L6		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	31000	620	0.5	24000	380	0.5	20000	320	0.5	9500	110	0.2
1.5	22000	630	0.8	17000	410	0.8	14000	340	0.8	6400	130	0.3
2	17000	650	2	14000	450	2	11000	350	2	4800	130	0.4
2.5	15000	830	2.5	12000	580	2.5	9700	470	2.5	3800	130	0.5
3	13000	940	3	10000	660	3	8500	510	3	3200	140	0.6
4	9500	820	4	7600	600	4	6400	460	4	2400	150	0.8
5	7600	910	5	6100	670	5	5100	510	5	1900	170	1
6	6400	860	6	5100	630	6	4200	470	6	1600	190	1.2
7	5500	960	7	4400	710	7	3600	530	7	1400	190	1.4
8	4800	1000	8	3800	750	8	3200	580	8	1200	190	1.6
10	3800	910	10	3100	680	10	2500	500	10	950	150	2
12	3200	920	12	2500	660	12	2100	500	12	800	160	2.4
16	2400	690	16	1900	500	16	1600	380	16	600	120	3.2
20	1900	550	20	1500	400	20	1300	310	20	480	96	4

Depth of cut



DC:Dia.

Note 3) Slim shank type is not recommended for grooving.

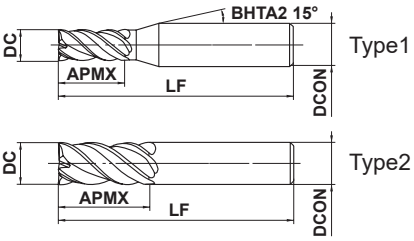
MPJHV

End mill, Semi long cut length, 4 flute, Irregular helix flutes

APMX=DCx3.3 APMX=DCx4

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		◎	○	○	





DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=4	DCON=6	DCON=8		
0 - 0.005	0 - 0.005	0 - 0.006		
DCON=10	DCON=12	DCON=16	DCON=20	
0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

- Irregular helix flutes end mill for reduced vibration when machining stainless steels and carbon steels.
- Semi long flute length suitable for vertical wall finishing.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MPJHVD0100AP04	1	4	45	4	4	●	1
MPJHVD0150AP06	1.5	6	45	4	4	●	1
MPJHVD0200AP06	2	6.5	60	6	4	●	1
MPJHVD0200AP08	2	8	60	6	4	●	1
MPJHVD0250AP10	2.5	10	60	6	4	●	1
MPJHVD0300AP10	3	10	60	6	4	●	1
MPJHVD0300AP12	3	12	60	6	4	●	1
MPJHVD0400AP13	4	13	60	6	4	●	1
MPJHVD0400AP16	4	16	60	6	4	●	1
MPJHVD0500AP17	5	17	60	6	4	●	1
MPJHVD0500AP20	5	20	60	6	4	●	1
MPJHVD0600AP20	6	20	60	6	4	●	2
MPJHVD0600AP24	6	24	60	6	4	●	2
MPJHVD0800AP26	8	26	80	8	4	●	2
MPJHVD0800AP32	8	32	80	8	4	●	2
MPJHVD1000AP33	10	33	100	10	4	●	2
MPJHVD1000AP40	10	40	100	10	4	●	2
MPJHVD1200AP40	12	40	110	12	4	●	2
MPJHVD1200AP48	12	48	110	12	4	●	2
MPJHVD1600AP53	16	53	125	16	4	●	2
MPJHVD1600AP64	16	64	125	16	4	●	2
MPJHVD2000AP66	20	66	140	20	4	●	2
MPJHVD2000AP80	20	80	140	20	4	●	2

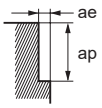
● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material		Carbon steel, Alloy steel (180－280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450				Carbon steel, Alloy steel (280－350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT				Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened steel (45－55HRC) AISI H13, AISI L6			
Dia. **DC** (mm)	Length of cut **APMX** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	**4**	19000	300	3	0.03	15000	240	3	0.03	13000	210	3	0.03	13000	160	3	0.02
1.5	**6**	16000	320	4.5	0.05	13000	260	4.5	0.05	11000	220	4.5	0.05	8500	170	4.5	0.03
2	**6.5**	15000	500	5	0.1	12000	380	5	0.1	10000	320	5	0.1	7700	220	5	0.06
	8	14000	470	6	0.06	11000	350	6	0.06	9500	300	6	0.06	7300	200	6	0.04
2.5	**10**	13000	660	7.5	0.08	11000	520	7.5	0.08	8900	390	7.5	0.08	6300	250	7.5	0.05
3	**10**	13000	890	7.4	0.15	10000	620	7.4	0.15	8400	470	7.4	0.15	5900	300	7.4	0.09
	12	12000	820	9	0.09	9500	590	9	0.09	8000	450	9	0.09	5600	280	9	0.06
4	**13**	9400	940	9.9	0.2	7500	650	9.9	0.2	6300	530	9.9	0.2	4700	320	9.9	0.12
	16	9000	900	12	0.12	7200	620	12	0.12	6000	500	12	0.12	4500	310	12	0.08
5	**17**	7500	990	12.4	0.25	6000	680	12.4	0.25	5000	560	12.4	0.25	3800	350	12.4	0.15
	20	7200	950	15	0.15	5700	650	15	0.15	4800	540	15	0.15	3600	330	15	0.1
6	**20**	6300	1100	14.9	0.3	5000	760	14.9	0.3	4200	640	14.9	0.3	3200	350	14.9	0.18
	24	6000	1000	18	0.18	4800	730	18	0.18	4000	610	18	0.18	3000	330	18	0.12
8	**26**	4700	1100	19.8	0.4	3800	800	19.8	0.4	3100	620	19.8	0.4	2400	360	19.8	0.24
	32	4500	1000	24	0.24	3600	760	24	0.24	3000	600	24	0.24	2300	350	24	0.16
10	**33**	3800	1000	24.8	0.5	3000	760	24.8	0.5	2500	590	24.8	0.5	1900	330	24.8	0.3
	40	3600	970	30	0.3	2900	730	30	0.3	2400	570	30	0.3	1800	310	30	0.2
12	**40**	3100	1000	29.7	0.6	2500	720	29.7	0.6	2100	550	29.7	0.6	1600	300	29.7	0.36
	48	3000	970	36	0.36	2400	690	36	0.36	2000	520	36	0.36	1500	280	36	0.24
16	**53**	2400	780	27.2	0.48	1900	550	39.6	0.8	1600	420	39.6	0.8	1200	240	39.6	0.48
	64	2200	710	48	0.48	1800	520	48	0.48	1500	390	48	0.48	1100	220	48	0.32
20	**66**	1900	620	34	0.6	1500	430	49.5	1	1300	340	49.5	1	950	190	49.5	0.6
	80	1800	580	60	0.6	1400	400	60	0.6	1200	310	60	0.6	900	180	60	0.4
Depth of cut																	

Note 1) Wet cutting mode is recommended for cutting stainless steels and titanium alloys, and air blow is recommended for carbon steels.

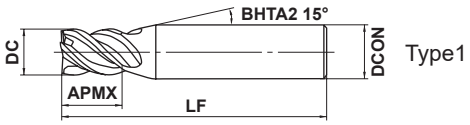
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MSSHD

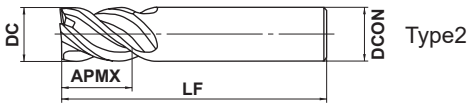
High power, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	

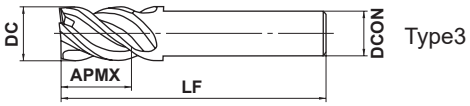




Type1



Type2



Type3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

●4 flute high power end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSSHDD0300	3	4.5	45	6	4	●	1
MSSHDD0350	3.5	5.3	45	6	4	●	1
MSSHDD0400	4	6	45	6	4	●	1
MSSHDD0450	4.5	6.8	45	6	4	●	1
MSSHDD0500	5	7.5	50	6	4	●	1
MSSHDD0550	5.5	8.3	50	6	4	●	1
MSSHDD0600	6	9	50	6	4	●	2
MSSHDD0650	6.5	9.8	60	8	4	●	1
MSSHDD0700	7	10.5	60	8	4	●	1
MSSHDD0750	7.5	11.3	60	8	4	●	1
MSSHDD0800	8	12	60	8	4	●	2
MSSHDD0850	8.5	12.8	70	10	4	●	1
MSSHDD0900	9	13.5	70	10	4	●	1
MSSHDD0950	9.5	14.3	70	10	4	●	1
MSSHDD1000	10	15	70	10	4	●	2
MSSHDD1100	11	16.5	75	12	4	●	1
MSSHDD1200	12	18	75	12	4	●	2
MSSHDD1300	13	19.5	75	12	4	●	3
MSSHDD1400	14	21	90	16	4	●	1
MSSHDD1500	15	22.5	90	16	4	●	1
MSSHDD1600	16	24	90	16	4	●	2
MSSHDD1700	17	25.5	100	16	4	●	3
MSSHDD1800	18	27	100	16	4	●	3
MSSHDD1900	19	28.5	110	20	4	●	1
MSSHDD2000	20	30	110	20	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

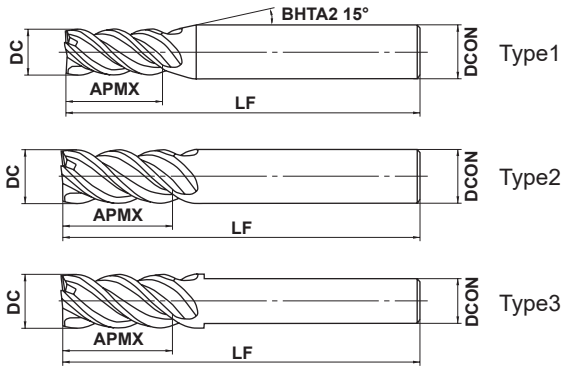
ISO13399 ➤ J002

MSMHD

High power, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute high power end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0200	2	4	45	4	4	●	1
MSMHDD0210	2.1	5	45	4	4	●	1
MSMHDD0220	2.2	5	45	4	4	●	1
MSMHDD0230	2.3	5	45	4	4	●	1
MSMHDD0240	2.4	5	45	4	4	●	1
MSMHDD0250	2.5	5	45	4	4	●	1
MSMHDD0260	2.6	6	45	4	4	●	1
MSMHDD0270	2.7	6	45	4	4	●	1
MSMHDD0280	2.8	6	45	4	4	●	1
MSMHDD0290	2.9	6	45	4	4	●	1
MSMHDD0300	3	8	45	6	4	●	1
MSMHDD0310	3.1	8	45	6	4	●	1
MSMHDD0320	3.2	8	45	6	4	●	1
MSMHDD0330	3.3	8	45	6	4	●	1
MSMHDD0340	3.4	8	45	6	4	●	1
MSMHDD0350	3.5	8	45	6	4	●	1
MSMHDD0360	3.6	11	45	6	4	●	1
MSMHDD0370	3.7	11	45	6	4	●	1
MSMHDD0380	3.8	11	45	6	4	●	1
MSMHDD0390	3.9	11	45	6	4	●	1
MSMHDD0400	4	11	45	6	4	●	1
MSMHDD0410	4.1	12	45	6	4	●	1
MSMHDD0420	4.2	12	45	6	4	●	1
MSMHDD0430	4.3	12	45	6	4	●	1
MSMHDD0440	4.4	12	45	6	4	●	1
MSMHDD0450	4.5	12	45	6	4	●	1
MSMHDD0460	4.6	13	50	6	4	●	1
MSMHDD0470	4.7	13	50	6	4	●	1
MSMHDD0480	4.8	13	50	6	4	●	1
MSMHDD0490	4.9	13	50	6	4	●	1
MSMHDD0500	5	13	50	6	4	●	1
MSMHDD0510	5.1	13	50	6	4	●	1
MSMHDD0520	5.2	13	50	6	4	●	1
MSMHDD0530	5.3	13	50	6	4	●	1

MSMHD

High power, Medium cut length, 4 flute

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0540	5.4	13	50	6	4	●	1
MSMHDD0550	5.5	13	50	6	4	●	1
MSMHDD0560	5.6	13	50	6	4	●	1
MSMHDD0570	5.7	13	50	6	4	●	1
MSMHDD0580	5.8	13	50	6	4	●	1
MSMHDD0590	5.9	13	50	6	4	●	1
MSMHDD0600	6	13	50	6	4	●	2
MSMHDD0650	6.5	16	60	8	4	●	1
MSMHDD0700	7	19	60	8	4	●	1
MSMHDD0750	7.5	19	60	8	4	●	1
MSMHDD0800	8	19	60	8	4	●	2
MSMHDD0850	8.5	19	70	10	4	●	1
MSMHDD0900	9	22	70	10	4	●	1
MSMHDD0950	9.5	22	70	10	4	●	1
MSMHDD1000	10	22	70	10	4	●	2
MSMHDD1100	11	26	75	12	4	●	1
MSMHDD1200S10	12	26	75	10	4	●	3
MSMHDD1200	12	26	75	12	4	●	2
MSMHDD1300	13	26	75	12	4	●	3
MSMHDD1400	14	30	90	16	4	●	1
MSMHDD1500	15	35	90	16	4	●	1
MSMHDD1600	16	35	90	16	4	●	2
MSMHDD1700	17	35	100	16	4	●	3
MSMHDD1800	18	40	100	16	4	●	3
MSMHDD1900	19	40	110	20	4	●	1
MSMHDD2000	20	45	110	20	4	●	2
MSMHDD2200	22	50	125	20	4	●	3
MSMHDD2500	25	55	125	25	4	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

MSSHD
High power, Short cut length, 4 flute

MSMHD
High power, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13		Heat resistant alloys Inconel718	
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
2	15000	550	10000	340	10000	320	6400	160	4800	100
3	11000	800	7400	500	7400	480	4800	250	4000	170
4	8000	900	5600	540	5600	520	3600	270	3200	240
5	6400	1000	4500	600	4500	580	2900	300	2600	240
6	5800	1100	3700	640	3700	600	2400	320	2100	230
8	4400	1100	2800	660	2800	600	1800	330	1600	220
10	3500	1000	2200	640	2200	560	1400	320	1300	200
12	2900	1000	1900	640	1900	530	1200	320	1100	170
16	2200	800	1400	500	1400	450	900	250	800	130
20	1800	750	1100	460	1100	440	720	230	640	100
25	1400	600	900	400	900	380	570	200	510	80
Depth of cut	≤0.2DC, ≤1.5DC				≤0.1DC, ≤1.5DC		≤0.05DC, ≤1.5DC			

DC:Dia.

■ Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13		Heat resistant alloys Inconel718	
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
2	12000	400	7000	200	7000	100	4200	80	2300	40
3	9000	600	5300	300	5300	150	3200	130	1900	70
4	7200	720	4000	360	4000	180	2400	140	1400	95
5	5800	720	3200	360	3200	180	1900	150	1100	95
6	5000	800	2700	400	2700	200	1600	160	950	95
8	3700	800	2000	400	2000	200	1200	170	720	90
10	3000	720	1600	360	1600	180	960	160	570	80
12	2500	720	1300	360	1300	180	800	160	480	70
16	2000	600	1000	280	1000	150	600	130	360	50
20	1600	540	800	250	800	130	480	120	290	40
25	1300	480	640	220	640	120	380	100	230	35
Depth of cut	DC, ≤1DC (MAX. 12mm)				DC, ≤0.5DC		DC, ≤0.2DC			

DC:Dia.

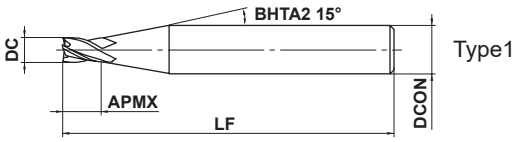
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS4SC

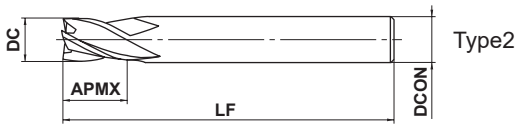
End mill, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4SCD0100	1	1.5	40	4	4	●	1
MS4SCD0150	1.5	2.3	40	4	4	●	1
MS4SCD0200	2	3	40	4	4	●	1
MS4SCD0250	2.5	3.8	40	4	4	●	1
MS4SCD0300	3	4.5	50	6	4	●	1
MS4SCD0400	4	6	50	6	4	●	1
MS4SCD0500	5	7.5	50	6	4	●	1
MS4SCD0600	6	9	50	6	4	●	2
MS4SCD0800	8	12	60	8	4	●	2
MS4SCD1000	10	15	70	10	4	●	2
MS4SCD1200	12	18	75	12	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21			Hardened steel (45－55HRC) AISI H13		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	3000	0.06	32000	2400	0.06
1.5	40000	4500	0.12	32000	3600	0.08
2	30000	4500	0.18	24000	3600	0.10
2.5	24000	3900	0.25	19000	3000	0.13
3	20000	3500	0.30	16000	2700	0.15
4	15000	3000	0.40	12000	2400	0.20
5	12000	2400	0.50	9000	1800	0.25
6	10000	2100	0.60	7000	1500	0.30
8	8000	1500	0.80	5600	1100	0.40
10	6400	1400	1.00	4500	950	0.50
12	5400	1200	1.00	3800	860	0.50
Depth of cut	≤Please refer to the list above for depth of cut. ≤1DC DC ≤Please refer to the list above for depth of cut. DC:Dia.					

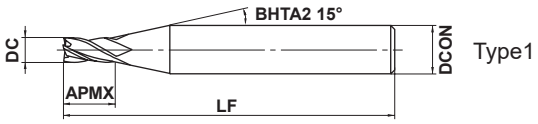
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When slotting with end mills with ϕ3 or larger, reduce the revolution to 50－70% and the feed rate to 40－60%.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS4MC

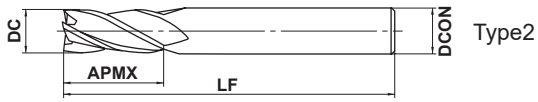
End mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	

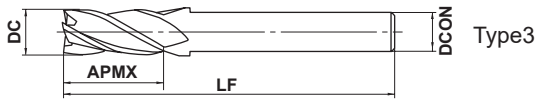




Type1



Type2



Type3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MCD0100	1	2.5	40	4	4	●	1
MS4MCD0150	1.5	3.8	40	4	4	●	1
MS4MCD0200	2	5	40	4	4	●	1
MS4MCD0250	2.5	6.3	40	4	4	●	1
MS4MCD0300	3	7.5	50	6	4	●	1
MS4MCD0350	3.5	9	50	6	4	●	1
MS4MCD0400	4	10	50	6	4	●	1
MS4MCD0450	4.5	11.5	50	6	4	●	1
MS4MCD0500	5	12.5	50	6	4	●	1
MS4MCD0550	5.5	14	50	6	4	●	1
MS4MCD0600	6	15	50	6	4	●	2
MS4MCD0650	6.5	16.5	60	8	4	●	1
MS4MCD0700	7	17.5	60	8	4	●	1
MS4MCD0750	7.5	19	60	8	4	●	1
MS4MCD0800	8	20	60	8	4	●	2
MS4MCD0850	8.5	21.5	70	10	4	●	1
MS4MCD0900	9	22.5	70	10	4	●	1
MS4MCD0950	9.5	24	70	10	4	●	1
MS4MCD1000	10	25	70	10	4	●	2
MS4MCD1100	11	27.5	75	12	4	●	1
MS4MCD1200	12	30	90	12	4	●	2
MS4MCD1400	14	35	90	12	4	●	3
MS4MCD1600	16	40	100	16	4	●	2
MS4MCD1800	18	45	100	16	4	●	3
MS4MCD2000	20	50	110	20	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

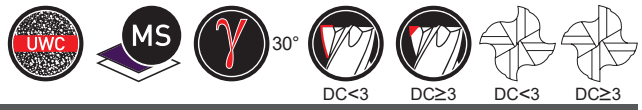
RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21			Hardened steel (45—55HRC) AISI H13		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	3000	0.06	32000	2400	0.06
1.5	40000	4500	0.12	32000	3600	0.08
2	30000	4500	0.18	24000	3600	0.10
2.5	24000	3900	0.25	19000	3000	0.13
3	20000	3500	0.30	16000	2700	0.15
4	15000	3000	0.40	12000	2400	0.20
5	12000	2400	0.50	9000	1800	0.25
6	10000	2100	0.60	7000	1500	0.30
8	8000	1500	0.80	5600	1100	0.40
10	6400	1400	1.00	4500	950	0.50
12	5400	1200	1.00	3800	860	0.50
16	2400	550	3.00	1200	120	0.80
20	1900	480	4.00	1000	100	1.00
Depth of cut	≤Please refer to the list above for depth of cut. ≤1DC DC ≤Please refer to the list above for depth of cut. DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When slotting with end mills with ϕ3 or larger, reduce the revolution to 50—70% and the feed rate to 40—60%.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

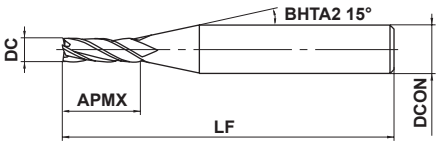
MS4JC

End mill, Semi long cut length, 4 flute

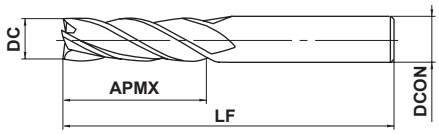


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

1≤DC≤12				
0 - 0.020				

4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill for general use.

(mm)

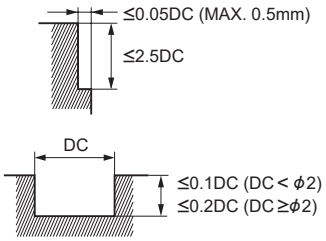
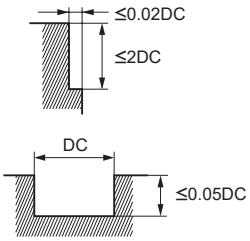
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4JCD0100	1	4	40	4	4	●	1
MS4JCD0150	1.5	6	40	4	4	●	1
MS4JCD0200	2	8	40	4	4	●	1
MS4JCD0250	2.5	10	50	4	4	●	1
MS4JCD0300	3	12	50	6	4	●	1
MS4JCD0400	4	16	50	6	4	●	1
MS4JCD0500	5	20	60	6	4	●	1
MS4JCD0600	6	24	60	6	4	●	2
MS4JCD0800	8	32	70	8	4	●	2
MS4JCD1000	10	40	90	10	4	●	2
MS4JCD1200	12	48	110	12	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	11100	85	9500	65	8000	50	6400	35
1.5	7400	85	6400	90	5300	50	4200	35
2	5600	85	4800	90	4000	50	3200	35
2.5	4500	85	3800	90	3200	55	2500	35
3	3700	90	3400	90	2600	60	2100	35
4	3000	110	2700	90	2100	70	1700	50
5	2600	140	2300	110	1800	85	1500	55
6	2300	170	2000	140	1500	110	1300	70
8	1700	180	1500	140	1200	110	1000	70
10	1400	180	1300	140	950	110	800	70
12	1200	170	1100	140	800	110	670	70
Depth of cut								

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

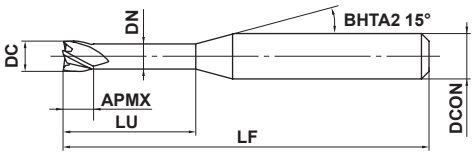
MS4XL

End mill, Short cut length, 4 flute, Long neck

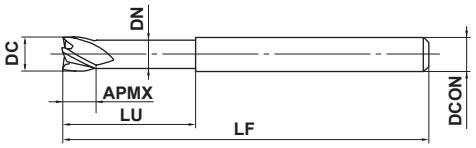


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

1≤DC≤10				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10			
0 - 0.008	0 - 0.009			

h6

●4 flute long neck end mill.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0100N040	1	1	4	0.94	50	4	4	●	1
MS4XLD0100N060	1	1	6	0.94	50	4	4	●	1
MS4XLD0100N080	1	1	8	0.94	50	4	4	●	1
MS4XLD0100N100	1	1	10	0.94	50	4	4	●	1
MS4XLD0100N120	1	1	12	0.94	50	4	4	●	1
MS4XLD0100N160	1	1	16	0.94	60	4	4	●	1
MS4XLD0110N060	1.1	1.1	6	1.04	50	4	4	●	1
MS4XLD0110N100	1.1	1.1	10	1.04	50	4	4	●	1
MS4XLD0110N160	1.1	1.1	16	1.04	60	4	4	●	1
MS4XLD0120N060	1.2	1.2	6	1.14	50	4	4	●	1
MS4XLD0120N080	1.2	1.2	8	1.14	50	4	4	●	1
MS4XLD0120N100	1.2	1.2	10	1.14	50	4	4	●	1
MS4XLD0120N120	1.2	1.2	12	1.14	50	4	4	●	1
MS4XLD0120N160	1.2	1.2	16	1.14	60	4	4	●	1
MS4XLD0130N060	1.3	1.3	6	1.24	50	4	4	●	1
MS4XLD0130N120	1.3	1.3	12	1.24	50	4	4	●	1
MS4XLD0130N180	1.3	1.3	18	1.24	60	4	4	●	1
MS4XLD0140N060	1.4	1.4	6	1.34	50	4	4	●	1
MS4XLD0140N080	1.4	1.4	8	1.34	50	4	4	●	1
MS4XLD0140N100	1.4	1.4	10	1.34	50	4	4	●	1
MS4XLD0140N120	1.4	1.4	12	1.34	50	4	4	●	1
MS4XLD0140N140	1.4	1.4	14	1.34	60	4	4	●	1
MS4XLD0140N160	1.4	1.4	16	1.34	60	4	4	●	1
MS4XLD0140N220	1.4	1.4	22	1.34	60	4	4	●	1
MS4XLD0150N060	1.5	1.5	6	1.44	50	4	4	●	1
MS4XLD0150N080	1.5	1.5	8	1.44	50	4	4	●	1
MS4XLD0150N100	1.5	1.5	10	1.44	50	4	4	●	1
MS4XLD0150N120	1.5	1.5	12	1.44	50	4	4	●	1
MS4XLD0150N140	1.5	1.5	14	1.44	60	4	4	●	1
MS4XLD0150N160	1.5	1.5	16	1.44	60	4	4	●	1
MS4XLD0150N180	1.5	1.5	18	1.44	60	4	4	●	1
MS4XLD0150N200	1.5	1.5	20	1.44	60	4	4	●	1
MS4XLD0160N060	1.6	1.6	6	1.54	50	4	4	●	1
MS4XLD0160N080	1.6	1.6	8	1.54	50	4	4	●	1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0160N100	1.6	1.6	10	1.54	50	4	4	●	1
MS4XLD0160N120	1.6	1.6	12	1.54	50	4	4	●	1
MS4XLD0160N140	1.6	1.6	14	1.54	60	4	4	●	1
MS4XLD0160N160	1.6	1.6	16	1.54	60	4	4	●	1
MS4XLD0160N180	1.6	1.6	18	1.54	60	4	4	●	1
MS4XLD0160N200	1.6	1.6	20	1.54	60	4	4	●	1
MS4XLD0160N260	1.6	1.6	26	1.54	70	4	4	●	1
MS4XLD0170N060	1.7	1.7	6	1.64	50	4	4	●	1
MS4XLD0170N140	1.7	1.7	14	1.64	60	4	4	●	1
MS4XLD0170N240	1.7	1.7	24	1.64	70	4	4	●	1
MS4XLD0180N060	1.8	1.8	6	1.74	50	4	4	●	1
MS4XLD0180N080	1.8	1.8	8	1.74	50	4	4	●	1
MS4XLD0180N100	1.8	1.8	10	1.74	50	4	4	●	1
MS4XLD0180N120	1.8	1.8	12	1.74	50	4	4	●	1
MS4XLD0180N140	1.8	1.8	14	1.74	60	4	4	●	1
MS4XLD0180N160	1.8	1.8	16	1.74	60	4	4	●	1
MS4XLD0180N180	1.8	1.8	18	1.74	60	4	4	●	1
MS4XLD0180N200	1.8	1.8	20	1.74	60	4	4	●	1
MS4XLD0180N250	1.8	1.8	25	1.74	70	4	4	●	1
MS4XLD0190N060	1.9	1.9	6	1.84	50	4	4	●	1
MS4XLD0190N160	1.9	1.9	16	1.84	60	4	4	●	1
MS4XLD0190N280	1.9	1.9	28	1.84	70	4	4	●	1
MS4XLD0200N060	2	2	6	1.9	50	4	4	●	1
MS4XLD0200N080	2	2	8	1.9	50	4	4	●	1
MS4XLD0200N100	2	2	10	1.9	50	4	4	●	1
MS4XLD0200N120	2	2	12	1.9	50	4	4	●	1
MS4XLD0200N140	2	2	14	1.9	60	4	4	●	1
MS4XLD0200N160	2	2	16	1.9	60	4	4	●	1
MS4XLD0200N180	2	2	18	1.9	60	4	4	●	1
MS4XLD0200N200	2	2	20	1.9	60	4	4	●	1
MS4XLD0200N250	2	2	25	1.9	70	4	4	●	1
MS4XLD0200N300	2	2	30	1.9	70	4	4	●	1
MS4XLD0250N080	2.5	2.5	8	2.4	50	4	4	●	1
MS4XLD0250N120	2.5	2.5	12	2.4	50	4	4	●	1
MS4XLD0250N160	2.5	2.5	16	2.4	60	4	4	●	1
MS4XLD0250N200	2.5	2.5	20	2.4	60	4	4	●	1
MS4XLD0250N250	2.5	2.5	25	2.4	70	4	4	●	1
MS4XLD0300N080	3	3	8	2.9	50	6	4	●	1
MS4XLD0300N120	3	3	12	2.9	50	6	4	●	1
MS4XLD0300N160	3	3	16	2.9	60	6	4	●	1
MS4XLD0300N200	3	3	20	2.9	60	6	4	●	1
MS4XLD0300N250	3	3	25	2.9	70	6	4	●	1
MS4XLD0300N300	3	3	30	2.9	70	6	4	●	1
MS4XLD0350N150	3.5	3.5	15	3.4	60	6	4	●	1
MS4XLD0350N250	3.5	3.5	25	3.4	70	6	4	●	1
MS4XLD0350N350	3.5	3.5	35	3.4	80	6	4	●	1
MS4XLD0400N120	4	4	12	3.9	50	6	4	●	1
MS4XLD0400N160	4	4	16	3.9	60	6	4	●	1
MS4XLD0400N200	4	4	20	3.9	60	6	4	●	1
MS4XLD0400N250	4	4	25	3.9	70	6	4	●	1
MS4XLD0400N300	4	4	30	3.9	70	6	4	●	1
MS4XLD0400N350	4	4	35	3.9	80	6	4	●	1

MS4XL

End mill, Short cut length, 4 flute, Long neck

(mm)

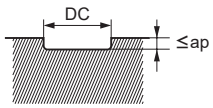
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0400N400	4	4	40	3.9	90	6	4	●	1
MS4XLD0400N450	4	4	45	3.9	90	6	4	●	1
MS4XLD0400N500	4	4	50	3.9	100	6	4	●	1
MS4XLD0500N160	5	5	16	4.9	60	6	4	●	1
MS4XLD0500N250	5	5	25	4.9	70	6	4	●	1
MS4XLD0500N350	5	5	35	4.9	80	6	4	●	1
MS4XLD0500N500	5	5	50	4.9	110	6	4	●	1
MS4XLD0600N200	6	6	20	5.85	80	6	4	●	2
MS4XLD0600N300	6	6	30	5.85	90	6	4	●	2
MS4XLD0600N400	6	6	40	5.85	100	6	4	●	2
MS4XLD0600N500	6	6	50	5.85	110	6	4	●	2
MS4XLD0800N300	8	8	30	7.85	90	8	4	●	2
MS4XLD0800N500	8	8	50	7.85	110	8	4	●	2
MS4XLD0800N700	8	8	70	7.85	130	8	4	●	2
MS4XLD1000N400	10	10	40	9.7	100	10	4	●	2
MS4XLD1000N600	10	10	60	9.7	120	10	4	●	2
MS4XLD1000N800	10	10	80	9.7	140	10	4	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	**4**	40000	3000	0.04
	8	36000	2400	0.03
	12	20000	1000	0.02
	16	10000	500	0.005
1.2	**6**	40000	3000	0.05
	10	36000	2400	0.04
	12	20000	1200	0.03
	16	12000	600	0.01
1.5	**6**	40000	3200	0.06
	12	32000	2400	0.05
	16	16000	1100	0.03
	20	10000	600	0.01
1.8	**6**	40000	3600	0.08
	12	32000	2800	0.06
	20	12000	1000	0.02
	25	7000	600	0.01
2	**6**	40000	4000	0.1
	12	32000	3200	0.07
	16	24000	2400	0.05
	20	12000	1200	0.03
	30	5000	500	0.01
2.5	**8**	32000	4000	0.2
	25	9000	1100	0.04
	50	2500	300	0.005
3	**8**	25000	3600	0.4
	16	18000	2500	0.2
	25	12000	1700	0.1
	30	7000	800	0.05

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21		
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
3.5	**15**	20000	3000	0.6
	25	11000	1600	0.15
	35	5500	800	0.06
4	**12**	18000	3000	1
	20	12000	2000	0.5
	30	8000	1300	0.2
	40	4200	700	0.08
	50	2400	400	0.03
5	**16**	14000	2700	1
	25	9500	1800	0.5
	35	6400	1200	0.2
	50	3200	600	0.05
6	**20**	11000	2200	1.2
	30	8000	1600	0.6
	40	5400	1100	0.25
	50	3200	640	0.15
8	**30**	8000	1600	1.6
	50	4000	800	0.5
	70	2000	400	0.2
10	**40**	6400	1300	2
	60	3200	640	0.6
	80	1600	320	0.3
Depth of cut				

DC:Dia.
ap:Depth of Cut in the Axial Direction

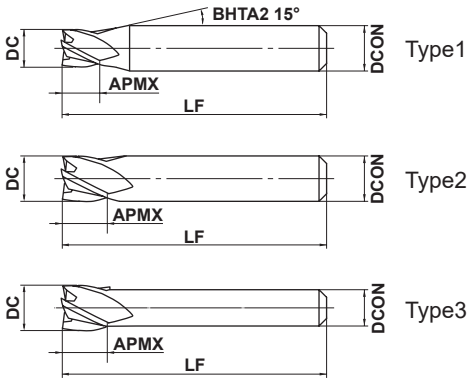
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MP4EC NEW

End mill, For small automatic lathes, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





3≤DC≤12	DC=14			
- 0.010 - 0.030	0.010 - 0.040			
4≤DCON≤6	**7≤DCON≤10**	**DCON=12**		
0 - 0.008	0 - 0.009	0 - 0.011		

h6

●4 flute end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP4ECD0300S04	3	4.5	50	4	4	●	1
MP4ECD0350S04	3.5	5	50	4	4	●	1
MP4ECD0400S04	4	6	50	4	4	●	2
MP4ECD0500S06	5	7.5	50	6	4	●	1
MP4ECD0600S06	6	9	50	6	4	●	2
MP4ECD0700S07	7	10.5	50	7	4	●	2
MP4ECD0800S07	8	12	50	7	4	●	3
MP4ECD0800S08	8	12	50	8	4	●	2
MP4ECD0900S10	9	13.5	50	10	4	●	1
MP4ECD1000S07	10	15	50	7	4	●	3
MP4ECD1000S10	10	15	50	10	4	●	2
MP4ECD1200S10	12	15	50	10	4	●	3
MP4ECD1200S12	12	15	50	12	4	●	2
MP4ECD1400S10	14	15	50	10	4	●	3

● : Inventory maintained in Japan.

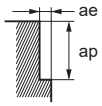
Click here for product NEWS ▶

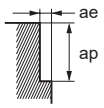
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side Milling

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	10000	900	3	0.6	7000	600	3	0.6	6000	450	3	0.6
3.5	8500	900	3.5	0.6	6000	600	3.5	0.6	5100	450	3.5	0.6
4	7500	900	4	0.6	5200	600	4	0.6	4500	450	4	0.6
5	6000	900	5	0.6	4200	600	5	0.6	3600	450	5	0.6
6	5000	900	6	0.6	3500	600	6	0.6	3000	450	6	0.6
7	4500	840	7	0.6	3200	540	7	0.6	2700	420	7	0.6
8	4000	780	8	0.6	2800	520	8	0.6	2400	390	8	0.6
9	3500	720	9	0.6	2500	480	9	0.6	2100	360	9	0.6
10	3200	680	10	0.6	2200	450	10	0.6	1900	340	10	0.6
12	2700	620	12	0.6	1900	410	12	0.6	1600	310	12	0.6
14	2300	550	14	0.6	1600	350	14	0.6	1400	280	14	0.6
Depth of cut												

Workpiece Material	Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	5000	180	3	0.2	13000	1200	3	0.6
3.5	4500	180	3.5	0.2	11000	1200	3.5	0.6
4	4000	180	4	0.2	9500	1100	4	0.6
5	3200	180	5	0.2	7600	1100	5	0.6
6	2700	180	6	0.2	6400	1100	6	0.6
7	2300	160	7	0.2	5500	1000	7	0.6
8	2000	160	8	0.2	4800	940	8	0.6
9	1800	150	9	0.2	4200	860	9	0.6
10	1600	140	10	0.2	3800	810	10	0.6
12	1300	120	12	0.2	3200	730	12	0.6
14	1200	120	14	0.2	2700	650	14	0.6
Depth of cut								

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MP4EC

End mill, For small automatic lathes, 4 flute

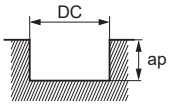
RECOMMENDED CUTTING CONDITIONS

■Slotting

(mm)

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	10000	900	0.6	7000	600	0.6	6000	450	0.6
3.5	8500	900	0.6	6000	600	0.6	5100	450	0.6
4	7500	900	0.6	5200	600	0.6	4500	450	0.6
5	6000	900	0.6	4200	600	0.6	3600	450	0.6
6	5000	900	0.6	3500	600	0.6	3000	450	0.6
7	4500	840	0.6	3200	540	0.6	2700	420	0.6
8	4000	780	0.6	2800	520	0.6	2400	390	0.6
9	3500	720	0.6	2500	480	0.6	2100	360	0.6
10	3200	680	0.6	2200	450	0.6	1900	340	0.6
12	2700	620	0.6	1900	410	0.6	1600	310	0.6
14	2300	550	0.6	1600	350	0.6	1400	280	0.6

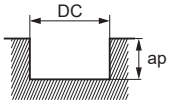
Depth of cut



DC:Dia.

Workpiece Material	Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**
3	5000	180	0.2	13000	1200	0.6
3.5	4500	180	0.2	11000	1200	0.6
4	4000	180	0.2	9500	1100	0.6
5	3200	180	0.2	7600	1100	0.6
6	2700	180	0.2	6400	1100	0.6
7	2300	160	0.2	5500	1000	0.6
8	2000	160	0.2	4800	940	0.6
9	1800	150	0.2	4200	860	0.6
10	1600	140	0.2	3800	810	0.6
12	1300	120	0.2	3200	730	0.6
14	1200	120	0.2	2700	650	0.6

Depth of cut



DC:Dia.

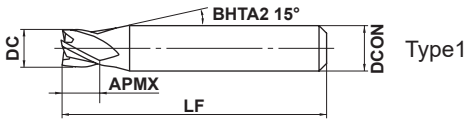
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MS4EC

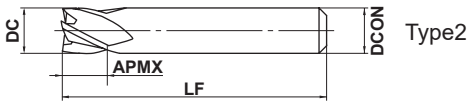
End mill, 4 flute, For small automatic lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	

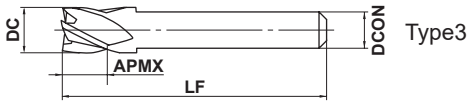




Type1



Type2



Type3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

●4 flute end mill.

Overall length 35mm (mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L35S04	3	3	35	4	4	●	1
MS4ECD0350L35S04	3.5	3.5	35	4	4	●	1
MS4ECD0400L35S04	4	4	35	4	4	●	2
MS4ECD0500L35S05	5	5	35	5	4	●	2
MS4ECD0500L35S06	5	5	35	6	4	●	1
MS4ECD0600L35S05	6	6	35	5	4	●	3
MS4ECD0600L35S06	6	6	35	6	4	●	2
MS4ECD0700L35S07	7	6	35	7	4	●	2
MS4ECD0800L35S07	8	6	35	7	4	●	3
MS4ECD0800L35S08	8	6	35	8	4	●	2
MS4ECD1000L35S07	10	6	35	7	4	●	3
MS4ECD1000L35S10	10	6	35	10	4	●	2
MS4ECD1200L35S10	12	6	35	10	4	●	3

Overall length 45mm (mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L45S04	3	3	45	4	4	●	1
MS4ECD0350L45S04	3.5	3.5	45	4	4	●	1
MS4ECD0400L45S04	4	4	45	4	4	●	2
MS4ECD0500L45S06	5	5	45	6	4	●	1
MS4ECD0600L45S06	6	6	45	6	4	●	2
MS4ECD0700L45S07	7	7	45	7	4	●	2
MS4ECD0800L45S07	8	8	45	7	4	●	3
MS4ECD0800L45S08	8	8	45	8	4	●	2
MS4ECD1000L45S07	10	10	45	7	4	●	3
MS4ECD1000L45S10	10	10	45	10	4	●	2
MS4ECD1200L45S10	12	12	45	10	4	●	3
MS4ECD1400L45S10	14	14	45	10	4	●	3

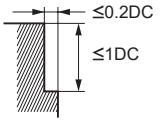
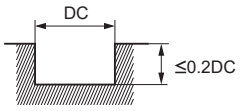
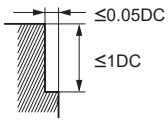
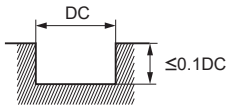
● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

MS4EC

End mill, 4 flute, For small automatic lathes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	10000	900	7000	600	6000	450	5000	180
4	7500	900	5200	600	4500	450	4000	180
5	6000	900	4200	600	3600	450	3200	180
6	5000	900	3500	600	3000	450	2700	180
7	4500	840	3000	540	2700	420	2300	160
8	4000	780	2800	520	2400	390	2000	160
10	3200	680	2200	450	1900	340	1600	140
12	2700	620	1900	410	1600	310	1300	120
14	2300	550	1600	350	1400	280	1200	120
Depth of cut	 				 			

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

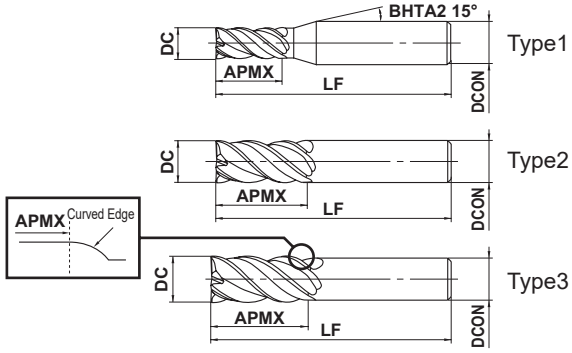
VQMHV

End mill, Medium cutting length, 4 flute, Irregular helix flutes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVD0100	1	2	45	4	4	●	1
VQMHVD0150	1.5	3	45	4	4	●	1
VQMHVD0200	2	4	45	4	4	●	1
VQMHVD0250	2.5	5	45	4	4	●	1
VQMHVD0300	3	8	45	6	4	●	1
VQMHVD0350	3.5	8	45	6	4	●	1
VQMHVD0400	4	11	45	6	4	●	1
VQMHVD0500	5	13	50	6	4	●	1
VQMHVD0600	6	13	50	6	4	●	2
VQMHVD0700	7	19	60	8	4	●	1
VQMHVD0800	8	19	60	8	4	●	2
VQMHVD0900	9	22	70	10	4	●	1
VQMHVD0900S08	9	22	75	8	4	●	3
VQMHVD1000	10	22	70	10	4	●	2
VQMHVD1000S08	10	22	100	8	4	●	3
VQMHVD1100	11	26	75	12	4	●	1
VQMHVD1100S10	11	26	100	10	4	●	3
VQMHVD1200	12	26	75	12	4	●	2
VQMHVD1200S10	12	26	110	10	4	●	3
VQMHVD1300	13	26	75	12	4	●	3
VQMHVD1300S12	13	26	110	12	4	●	3
VQMHVD1400	14	30	90	16	4	●	1
VQMHVD1400S12	14	32	130	12	4	●	3
VQMHVD1600	16	35	90	16	4	●	2
VQMHVD1800	18	40	100	16	4	●	3
VQMHVD1800S16	18	42	150	16	4	●	3
VQMHVD2000	20	45	110	20	4	●	2
VQMHVD2500	25	55	125	25	4	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : Inventory maintained in Japan.

Click here for product NEWS ▶

VQMHV

End mill, Medium length of cut, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

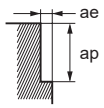
■ Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1800	1.5	0.3	120	38000	910	1.5	0.3	80	25000	500	1.5	0.2	75	24000	580	1.5	0.2
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
25	150	1900	1100	37.5	7.5	120	1500	600	37.5	7.5	100	1300	620	37.5	7.5	75	950	380	37.5	5

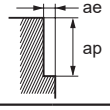
Depth of cut



General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	1000	1.5	0.3	100	32000	560	1.5	0.3	80	25000	400	0.75	0.1	70	22000	390	1.5	0.2
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
25	120	1500	390	37.5	7.5	100	1300	340	37.5	7.5	80	1000	210	24	4.8	70	890	230	37.5	5

Depth of cut

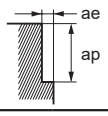


Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

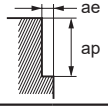
■ Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1800	1.5	0.3	40	13000	210	1.5	0.1
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
25	180	2300	1300	37.5	7.5	40	510	130	37.5	2.5
Depth of cut										

General-purpose conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1300	1.5	0.3	30	9600	92	1.5	0.1
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
25	140	1800	670	37.5	7.5	30	380	64	37.5	2.5
Depth of cut										

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHV

End mill, Medium length of cut, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

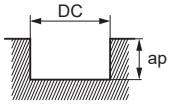
■ Slotting

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6
25	150	1900	760	12	120	1500	420	12	100	1300	420	12	60	760	210	12	180	2300	920	12	30	380	100	7.5

Depth of cut

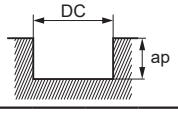


DC:Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	100	32000	500	1	80	25000	250	1	80	25000	300	1	50	16000	150	0.5	120	38000	590	1	25	8000	67	0.3
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6
25	100	1300	340	12	80	1000	180	12	60	760	160	12	50	640	120	12	120	1500	400	12	25	320	50	7.5

Depth of cut



DC:Dia.

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

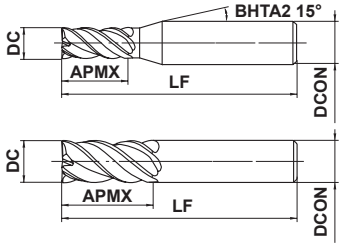
VQJHV

End mill, Semi long cut length, 4 flute, Irregular helix flutes

38° 40° DC≤6 | 37.5° 40° DC>6

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJHVD0100	1	4	45	4	4	●	1
VQJHVD0150	1.5	6	45	4	4	●	1
VQJHVD0200	2	8	60	6	4	●	1
VQJHVD0250	2.5	10	60	6	4	●	1
VQJHVD0300	3	12	60	6	4	●	1
VQJHVD0350	3.5	14	60	6	4	●	1
VQJHVD0400	4	16	60	6	4	●	1
VQJHVD0450	4.5	18	60	6	4	●	1
VQJHVD0500	5	20	60	6	4	●	1
VQJHVD0600	6	24	60	6	4	●	2
VQJHVD0700	7	25	80	8	4	●	1
VQJHVD0800	8	28	80	8	4	●	2
VQJHVD0900	9	32	90	10	4	●	1
VQJHVD1000	10	35	90	10	4	●	2
VQJHVD1200	12	40	100	12	4	●	2
VQJHVD1600	16	55	125	16	4	●	2
VQJHVD2000	20	70	140	20	4	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : **Inventory maintained in Japan.**

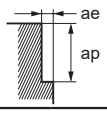
Click here for product NEWS ▶

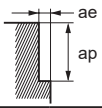
VQJHV

End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 306, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy SUS630, SUS631, 15-5PH, 17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	530	2.5	0.1	100	32000	410	2.5	0.1	80	25000	300	2.5	0.05	75	24000	290	2.5	0.05
2	130	21000	700	5	0.2	100	16000	510	5	0.2	80	13000	390	5	0.1	75	12000	360	5	0.1
3	130	14000	960	7.5	0.3	100	11000	680	7.5	0.3	80	8500	490	7.5	0.15	75	8000	460	7.5	0.15
4	130	10000	1000	10	0.4	100	8000	690	10	0.4	80	6400	540	10	0.2	75	6000	510	10	0.2
5	130	8300	1100	12.5	0.5	100	6400	730	12.5	0.5	80	5100	570	12.5	0.25	75	4800	540	12.5	0.25
6	130	6900	1200	15	0.6	100	5300	810	15	0.6	80	4200	630	15	0.3	75	4000	600	15	0.3
8	130	5200	1200	20	0.8	100	4000	840	20	0.8	80	3200	640	20	0.4	75	3000	600	20	0.4
10	130	4100	1100	25	1	100	3200	810	25	1	80	2500	590	25	0.5	75	2400	570	25	0.5
12	130	3400	1100	30	1.2	100	2700	780	30	1.2	80	2100	550	30	0.6	75	2000	520	30	0.6
16	130	2600	920	40	1.6	100	2000	640	40	1.6	80	1600	450	40	0.8	75	1500	420	40	0.8
20	130	2100	820	50	2	100	1600	570	50	2	80	1300	420	50	1	75	1200	390	50	1
Depth of cut																				

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	530	2.5	0.1	40	13000	73	2.5	0.02
2	160	25000	830	5	0.2	40	6400	90	5	0.04
3	160	17000	1200	7.5	0.3	40	4200	130	7.5	0.06
4	160	13000	1300	10	0.4	40	3200	190	10	0.08
5	160	10000	1300	12.5	0.5	40	2500	180	12.5	0.1
6	160	8500	1500	15	0.6	40	2100	180	15	0.12
8	160	6400	1500	20	0.8	40	1600	170	20	0.16
10	160	5100	1300	25	1	40	1300	170	25	0.2
12	160	4200	1300	30	1.2	40	1100	140	30	0.24
16	160	3200	1100	40	1.6	40	800	110	40	0.32
20	160	2500	970	50	2	40	640	80	50	0.4
Depth of cut										

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

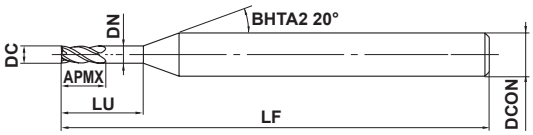
VQXL

End mill, Short cut length, 3—4 flute, Long neck



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





Type1

DC≤1	
0 - 0.010	
DCON=4	
0 - 0.005	

● The use of SMART MIRACLE Coating improves chip discharge dramatically.

● Multi-cutters at a small diameter of ϕ1 is realized.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQXLD0020N006	0.2	0.3	0.6	0.18	40	4	3	●	1
VQXLD0030N009	0.3	0.5	0.9	0.28	40	4	3	●	1
VQXLD0030N015	0.3	0.5	1.5	0.28	40	4	3	●	1
VQXLD0040N010	0.4	0.6	1	0.37	40	4	4	●	1
VQXLD0040N018	0.4	0.6	1.8	0.37	40	4	4	●	1
VQXLD0050N015	0.5	0.7	1.5	0.47	40	4	4	●	1
VQXLD0050N025	0.5	0.7	2.5	0.47	40	4	4	●	1
VQXLD0050N030	0.5	0.7	3	0.47	40	4	4	●	1
VQXLD0060N030	0.6	0.9	3	0.57	40	4	4	●	1
VQXLD0070N035	0.7	1	3.5	0.67	40	4	4	●	1
VQXLD0080N024	0.8	1.2	2.4	0.77	40	4	4	●	1
VQXLD0080N030	0.8	1.2	3	0.77	40	4	4	●	1
VQXLD0080N040	0.8	1.2	4	0.77	40	4	4	●	1
VQXLD0100N050	1	1.5	5	0.96	40	4	4	●	1

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

Torque chart

Order Number	ISO 10664 Torque type
VQXLD0020N006	T4
VQXLD0030N009	T6
VQXLD0030N015	
VQXLD0040N010	T8
VQXLD0040N018	
VQXLD0050N015	T15
VQXLD0050N025	
VQXLD0050N030	
VQXLD0080N024	TS25
VQXLD0080N040	
VQXLD0100N050	T40

● : Inventory maintained in Japan.

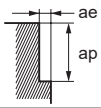
Click here for product NEWS ▶

VQXL

End mill, Short cut length, 3—4 flute, Long neck

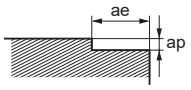
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 316, AISI 304LN, AISI 316LN, Ti-6Al-4V					Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420				
Dia. **DC** (mm)	Neck Length **LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.6**	25	40000	360	0.03	0.01	20	32000	290	0.03	0.01
0.3	**0.9**	40	40000	480	0.045	0.015	20	21000	250	0.045	0.015
0.3	**1.5**	40	40000	360	0.045	0.015	20	21000	190	0.045	0.015
0.4	**1**	50	40000	800	0.06	0.02	20	16000	320	0.06	0.02
0.4	**1.8**	50	40000	560	0.06	0.02	20	16000	220	0.06	0.025
0.5	**1.5**	60	38000	910	0.075	0.025	20	13000	310	0.075	0.025
0.5	**2.5**	60	38000	610	0.075	0.025	20	13000	210	0.075	0.025
0.5	**3**	60	38000	550	0.075	0.025	20	13000	180	0.075	0.025
0.6	**3**	60	32000	640	0.09	0.03	20	10500	210	0.09	0.03
0.7	**3.5**	60	27000	650	0.11	0.035	20	9100	200	0.11	0.035
0.8	**2.4**	60	24000	960	0.12	0.04	20	8000	260	0.12	0.04
0.8	**3**	60	24000	860	0.12	0.04	20	8000	230	0.12	0.04
0.8	**4**	60	24000	670	0.12	0.04	20	8000	190	0.12	0.04
1	**5**	60	20000	800	0.15	0.05	20	6500	210	0.15	0.05
Depth of cut											

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

■Bottom face milling

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 316, AISI 304LN, AISI 316LN, Ti-6Al-4V					Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420				
Dia. **DC** (mm)	Neck Length **LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.6**	25	40000	360	0.015	≤0.2	20	32000	290	0.015	≤0.1
0.3	**0.9**	40	40000	480	0.025	≤0.3	20	21000	250	0.025	≤0.15
0.3	**1.5**	40	40000	360	0.02	≤0.3	20	21000	190	0.02	≤0.15
0.4	**1**	50	40000	800	0.03	≤0.4	20	16000	320	0.03	≤0.2
0.4	**1.8**	50	40000	560	0.02	≤0.4	20	16000	220	0.02	≤0.2
0.5	**1.5**	60	38000	910	0.04	≤0.5	20	13000	310	0.04	≤0.25
0.5	**2.5**	60	38000	610	0.03	≤0.5	20	13000	210	0.03	≤0.25
0.5	**3**	60	38000	550	0.03	≤0.5	20	13000	180	0.03	≤0.25
0.6	**3**	60	32000	640	0.035	≤0.6	20	10500	210	0.035	≤0.3
0.7	**3.5**	60	27000	640	0.035	≤0.7	20	9100	190	0.035	≤0.35
0.8	**2.4**	60	24000	960	0.06	≤0.8	20	8000	260	0.06	≤0.4
0.8	**3**	60	24000	840	0.05	≤0.8	20	8000	230	0.05	≤0.4
0.8	**4**	60	24000	670	0.04	≤0.8	20	8000	190	0.04	≤0.4
1	**5**	60	20000	800	0.05	≤1	20	6500	210	0.05	≤0.5
Depth of cut											

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQXL

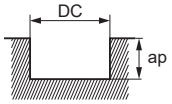
End mill, Short cut length, 3—4 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

■Slotting

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steels, Titanium alloys Cobaly chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 306, AISI 304LN, AISI 316LN, Ti-6Al-4V				Heat resistant alloys, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420			
Dia. **DC** (mm)	Neck Length **LU** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.2	**0.6**	20	30000	270	0.03	15	24000	220	0.03
0.3	**0.9**	30	30000	360	0.045	14	15000	180	0.045
0.3	**1.5**	30	30000	270	0.045	14	15000	140	0.045
0.4	**1**	40	30000	600	0.06	15	12000	240	0.06
0.4	**1.8**	40	30000	420	0.06	15	12000	170	0.06
0.5	**1.5**	45	28000	670	0.075	15	9500	230	0.075
0.5	**2.5**	45	28000	450	0.075	15	9500	150	0.075
0.5	**3**	45	28000	390	0.075	15	9500	130	0.075
0.6	**3**	45	24000	480	0.09	15	7800	160	0.09
0.7	**3.5**	45	20000	480	0.11	15	6800	140	0.11
0.8	**2.4**	45	18000	720	0.12	15	6000	190	0.12
0.8	**3**	45	18000	650	0.12	15	6000	170	0.12
0.8	**4**	45	18000	500	0.12	15	6000	140	0.12
1	**5**	45	15000	600	0.15	15	4800	150	0.15

Depth of cut



DC:Dia.

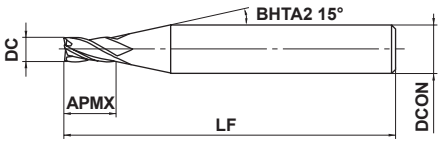
Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) When the depth of cut is small, the feed rate can be increased.

VF4MD

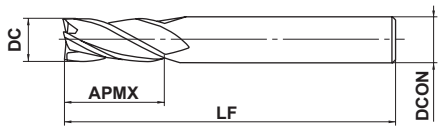
End mill, Medium cut length, 4 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute end mill suitable for high-speed machining of hardened steel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MDD0100	1	2.5	40	4	4	●	1
VF4MDD0150	1.5	3.8	40	4	4	●	1
VF4MDD0200	2	5	40	4	4	●	1
VF4MDD0250	2.5	6.3	40	4	4	●	1
VF4MDD0300	3	7.5	50	6	4	●	1
VF4MDD0400	4	10	50	6	4	●	1
VF4MDD0500	5	12.5	50	6	4	●	1
VF4MDD0600	6	15	50	6	4	●	2
VF4MDD0800	8	20	60	8	4	●	2
VF4MDD1000	10	25	70	10	4	●	2
VF4MDD1200	12	30	90	12	4	●	2
VF4MDD1600	16	40	100	16	4	●	2
VF4MDD2000	20	50	110	20	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

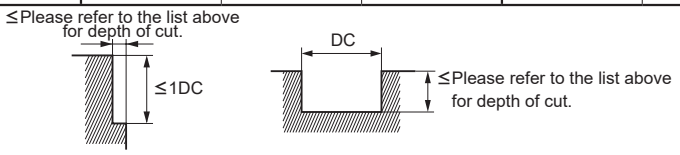
VF4MD

End mill, Medium cut length, 4 flute, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45－55HRC) AISI H13			Hardened steel (55－62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	3000	0.06	32000	2400	0.06	16000	710	0.05
1.5	40000	4500	0.12	32000	3600	0.08	10600	650	0.08
2	30000	4500	0.18	24000	3600	0.10	8100	520	0.10
2.5	24000	3900	0.25	19000	3000	0.13	6400	450	0.13
3	20000	3500	0.30	16000	2700	0.15	5400	390	0.15
4	15000	3000	0.40	12000	2400	0.20	4000	450	0.20
5	12000	2400	0.50	9000	1800	0.25	3200	380	0.20
6	10000	2100	0.60	7000	1400	0.30	2700	320	0.20
8	8000	1500	0.80	5600	1100	0.40	2000	240	0.20
10	6400	1400	1.00	4500	950	0.50	1600	210	0.30
12	5400	1200	1.00	3800	860	0.50	1300	160	0.30
16	2400	550	3.00	1200	280	0.80	1000	130	0.30
20	1900	480	4.00	1000	240	1.00	800	100	0.30

Depth of cut



DC:Dia.

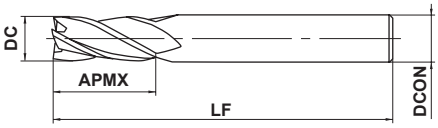
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VF4MV

End mill, Medium cut length, 4 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●An irregular helix 4 flute square end mill suitable for high-speed machining of hardened steel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MVD0600	6	15	50	6	4	●	1
VF4MVD0800	8	20	60	8	4	●	1
VF4MVD1000	10	25	70	10	4	●	1
VF4MVD1200	12	30	90	12	4	●	1
VF4MVD1600	16	40	100	16	4	●	1
VF4MVD2000	20	50	110	20	4	●	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
6	10000	2100	0.60	7000	1400	0.30	2700	320	0.20
8	8000	1500	0.80	5600	1100	0.40	2000	240	0.20
10	6400	1400	1.00	4500	950	0.50	1600	210	0.30
12	5400	1200	1.00	3800	860	0.50	1300	160	0.30
16	2400	550	3.00	1200	280	0.80	1000	130	0.30
20	1900	480	4.00	1000	240	1.00	800	100	0.30
Depth of cut	≤Please refer to the list above for depth of cut. ≤1DC DC ≤Please refer to the list above for depth of cut. DC:Dia.								

Note 1) When slotting, reduce the revolutions by 50−70% and the feed rate by 40−60%.
Note 2) For austenitic stainless steels, titanium and heat-resistant alloys, the VFMHV is recommended.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

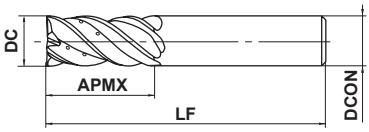
VFMHVCH

End mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





Type1

16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVCHD1600	16	35	90	16	4	▲	1
VFMHVCHD2000	20	45	110	20	4	▲	1

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	1140	2000	560	800	110
20	2400	860	1600	510	600	100
Depth of cut	≤0.1DC, 0.5DC−1.5DC				≤0.05DC, 0.5DC−1.5DC	

DC:Dia.

■ Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2400	670	1400	380	1400	170
20	1900	610	1100	350	1100	130
Depth of cut	DC, 0.5DC−1.5DC					

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low.
In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Click here for product NEWS ▶

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

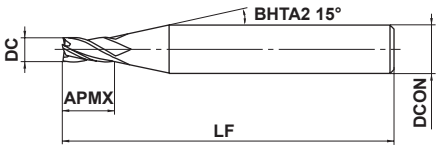
VCMDSC

End mill, Medium cut length, 4—6 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1

0.5≤DC≤3					
0 - 0.020					
DCON=6					
0 - 0.008					

● Recommended for shape nose cutting hardened steels.

(mm)

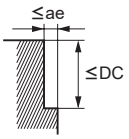
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCMDSCD0050	0.5	1	45	6	4	●	1
VCMDSCD0100	1	2.5	45	6	4	●	1
VCMDSCD0150	1.5	4	45	6	4	●	1
VCMDSCD0200	2	6	45	6	4	●	1
VCMDSCD0250	2.5	8	45	6	4	●	1
VCMDSCD0300	3	8	45	6	6	●	1

VCMDSC

End mill, Medium cut length, 4—6 flute

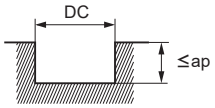
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Hardened steel (45—55HRC) AISI H13			Hardened steel (55—62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae (mm)
0.5	40000	2000	0.03	30000	600	0.02
1	40000	3000	0.05	20000	900	0.03
1.5	40000	5000	0.08	18000	1100	0.05
2	40000	5600	0.10	16000	1300	0.06
3	34000	5600	0.15	13000	1600	0.09
Depth of cut	 DC:Dia.					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

■Slotting

Workpiece Material	Hardened steel (45—55HRC) AISI H13			Hardened steel (55—62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
0.5	20000	200	0.05	15000	90	0.03
1	15000	300	0.1	11000	110	0.05
1.5	10000	280	0.15	7500	150	0.07
2	8000	320	0.2	6000	190	0.1
3	5000	200	0.3	3800	120	0.15
Depth of cut	 DC:Dia.					

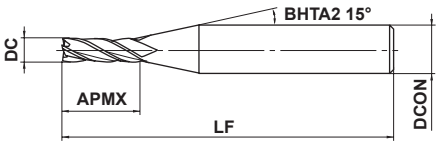
Note 1) Air blow or oil mist is recommended for good chip evacuation.

CRN4JC

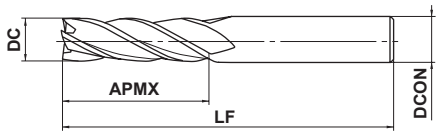
End mill, Semi long cut length, 4 flute, For copper electrodes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1



Type2

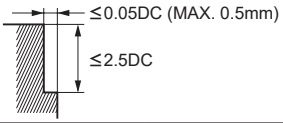
3≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill with CRN coating for copper electrode machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
CRN4JCD0300	3	12	50	6	4	●	1
CRN4JCD0400	4	15	50	6	4	●	1
CRN4JCD0600	6	20	60	6	4	●	2
CRN4JCD0800	8	25	70	8	4	●	2
CRN4JCD1000	10	30	90	10	4	●	2
CRN4JCD1200	12	30	90	12	4	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Copper, Copper alloys	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
3	10600	280
4	8000	330
6	5300	420
8	4000	460
10	3200	460
12	2700	460
Depth of cut		

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) When drilling, please set the feed rate at 1/3 or below of the table value.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

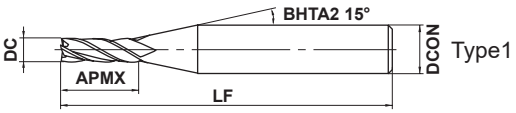
● : **Inventory maintained in Japan.**

DF4JC

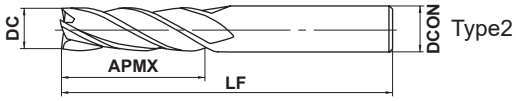
End mill, Semi long cut length, 4 flute, For graphite

Aluminium Alloy	Copper Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1



Type2

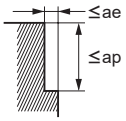
3≤DC≤12				
0 -0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

●4 flute end mill with original diamond coating for graphite machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DF4JCD0300	3	12	60	6	4	●	1
DF4JCD0400	4	16	60	6	4	●	1
DF4JCD0600	6	24	60	6	4	●	2
DF4JCD0800	8	28	70	8	4	●	2
DF4JCD1000	10	35	90	10	4	●	2
DF4JCD1200	12	36	110	12	4	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Graphite				Copper, Copper alloys			
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)
3	22000	2500	6	0.15	10600	280	6	0.15
4	18000	2900	8	0.2	8000	330	8	0.2
6	14000	3200	12	0.3	6400	380	12	0.3
8	10500	2900	16	0.4	4000	420	16	0.4
10	8700	2600	20	0.5	3200	460	20	0.5
12	7200	2200	24	0.6	2700	460	24	0.6
Depth of cut	 DC:Dia.							

Note 1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
Note 2) Use a milling machine dedicated for graphite.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

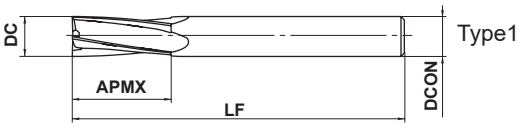
ISO13399 ➤ J002

DFC4JC

End mill, Semi long cut length, 4 flute

CFRP





6≤DC≤12				
0 - 0.03				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill with original CVD diamond coating for CFRP machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFC4JCD0600	6	20	70	6	4	●	1
DFC4JCD0800	8	30	80	8	4	●	1
DFC4JCD1000	10	30	90	10	4	●	1
DFC4JCD1200	12	30	100	12	4	●	1

Note 1) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	CFRP	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
6	11000	950
8	8000	780
10	6400	700
12	5300	650

Note 1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece. Please use the above table as a guideline.
Note 2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
Note 3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
Note 4) Please take precautions against dust.

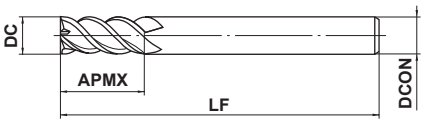
SEG4SA

End mill, Medium cut length, 4 flute, Irregular spiral helix angle, For aluminium alloy



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						○	◎





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

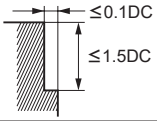
●4 flute end mill with irregular helix angle for aluminium alloy.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
SEG4060SA	6	14	50	6	4	●	1
SEG4080SA	8	19	60	8	4	●	1
SEG4100SA	10	24	70	10	4	●	1
SEG4120SA	12	29	75	12	4	●	1
SEG4160SA	16	38	90	16	4	●	1
SEG4200SA	20	48	110	20	4	●	1
SEG4250SA	25	59	125	25	4	●	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Aluminium alloy Plastics		Pure copper	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
6	9600	1700	4800	840
8	7200	1800	3600	900
10	5800	1800	2900	910
12	4800	2000	2400	980
16	3600	2000	1800	980
20	2900	2400	1400	1100
25	2300	2400	1100	1100
Depth of cut				

Note 1) The cutting conditions above are a guide only to milling within the standard depth of cut.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : **Inventory maintained in Japan.**

ISO13399 ➤ J002

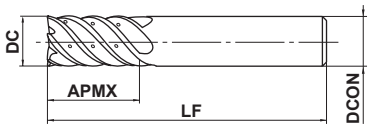
VQ6MHVCH

End mill, Medium cut length, 6 flute, Irregular helix flutes, With multiple internal through coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎	○	

CoolStar
END MILLS





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=10	DCON=12	DCON=16	DCON=20	
0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQ6MHVCHD1000	10	22	70	10	6	●	1
VQ6MHVCHD1200	12	26	75	12	6	●	1
VQ6MHVCHD1600	16	32	90	16	6	●	1
VQ6MHVCHD2000	20	38	100	20	6	●	1

RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic Stainless Steel (≤200HB), Titanium Alloy AISI 304, AISI 316, Ti-6Al-4V		Copper, Copper alloy		Heat Resistant Alloys Inconel 718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	—	—	4800	2000	—	—	1300	260
12	—	—	4000	2000	—	—	1100	230
16	4000	2200	3000	1600	2400	1400	800	180
20	3200	1900	2400	1400	1900	1100	640	150
Depth of Cut			≤0.12DC 0.5DC—1.5DC				≤0.05DC 0.5DC—1.5DC	

DC:Dia.

■ Trochoid Milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic Stainless Steel (≤200HB), Titanium Alloy AISI 304, AISI 316, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	—	—	4800	1400
12	—	—	4000	1200
16	4000	1600	3000	1100
20	3200	1400	2400	900
Depth of Cut	1.5DC≤ ≤0.12DC		0.5DC—1.5DC	

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.

Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low.
In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

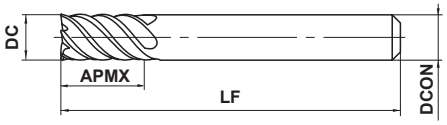
Click here for product NEWS ▶

VF6MHV

End mill, Medium cut length, 6 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Newly developed irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining. Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVD0600	6	13	50	6	6	●	1
VF6MHVD0800	8	19	60	8	6	●	1
VF6MHVD1000	10	22	70	10	6	●	1
VF6MHVD1200	12	26	75	12	6	●	1
VF6MHVD1600	16	32	90	16	6	●	1
VF6MHVD2000	20	38	100	20	6	●	1

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
6	10600	2900	8000	2000	2100	320
8	8000	2900	6000	2000	1600	300
10	6400	2700	4800	2000	1300	260
12	5300	2700	4000	2000	1100	230
16	4000	2200	3000	1600	800	180
20	3200	1900	2400	1400	640	150
Depth of cut	≤0.1DC ≤1.5DC				≤0.05DC ≤1.5DC	

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

ISO13399 ➤ J002

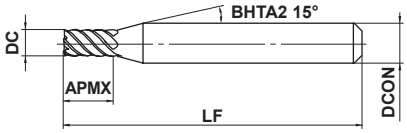
VFSD

End mill, Short cut length, For hardened materials

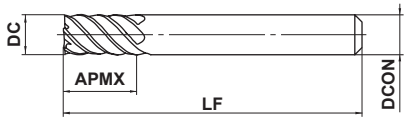


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

1≤DC≤12				
0 - 0.02				

DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●End mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSDD0100	1	2	45	6	4	●	1
VFSDD0150	1.5	3	45	6	4	●	1
VFSDD0200	2	4	45	6	4	●	1
VFSDD0250	2.5	5	45	6	4	●	1
VFSDD0300	3	6	45	6	6	●	1
VFSDD0350	3.5	7	45	6	6	●	1
VFSDD0400	4	8	45	6	6	●	1
VFSDD0500	5	10	50	6	6	●	1
VFSDD0600	6	12	50	6	6	●	2
VFSDD0800	8	16	60	8	6	●	2
VFSDD1000	10	20	70	10	6	●	2
VFSDD1200	12	24	75	12	6	●	2

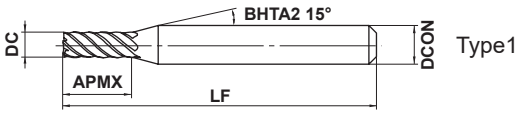
VFMD

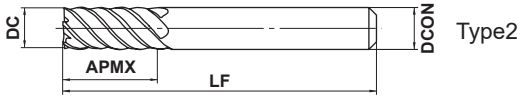
End mill, Medium cut length, For hardened materials

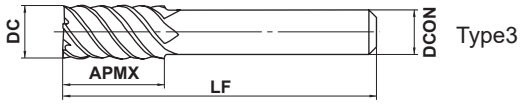


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				











DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	



●End mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDD0100	1	3.5	60	6	4	●	1
VFMDD0150	1.5	5	60	6	4	●	1
VFMDD0200	2	7	60	6	4	●	1
VFMDD0250	2.5	8	60	6	4	●	1
VFMDD0300	3	10	60	6	6	●	1
VFMDD0400	4	12	60	6	6	●	1
VFMDD0500	5	15	60	6	6	●	1
VFMDD0600	6	15	60	6	6	●	2
VFMDD0800	8	20	75	8	6	●	2
VFMDD1000	10	25	80	10	6	●	2
VFMDD1200	12	30	100	12	6	●	2
VFMDD1400	14	35	105	12	6	●	3
VFMDD1500	15	40	110	16	6	●	1
VFMDD1600	16	40	110	16	6	●	2
VFMDD1800	18	40	120	16	6	●	3
VFMDD2000	20	45	125	20	6	●	2
VFMDD2200	22	45	135	20	6	●	3
VFMDD2500	25	60	160	25	6	●	2

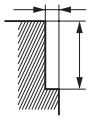
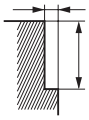
● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

VFSD
End mill, Short cut length, For hardened materials

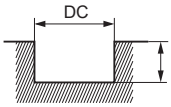
VFMD
End mill, Medium cut length, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2			Hardened steel (62−70HRC) AISI W1, AISI M2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	1200	0.05	40000	800	0.03	32000	500	0.02
2	40000	2000	0.1	24000	1000	0.05	16000	600	0.05
3	32000	3800	0.2	16000	1900	0.1	11000	1200	0.05
4	24000	4400	0.2	12000	2200	0.1	8000	1300	0.05
6	16000	5800	0.3	8000	2900	0.2	5300	1800	0.1
8	12000	5800	0.4	6000	2900	0.2	4000	1800	0.1
10	9600	5800	0.5	4800	2900	0.3	3200	1800	0.2
12	8000	4800	0.6	4000	2400	0.3	2700	1500	0.2
16	6000	3600	0.8	3000	1800	0.5	2000	1100	0.3
20	4800	2900	1.0	2400	1400	0.5	1600	880	0.3
25	3800	2300	1.0	1900	1100	0.5	1300	720	0.3
Depth of cut	 ≤Please refer to the list above for depth of cut. ≤1.5DC			 ≤Please refer to the list above for depth of cut. ≤1.0DC					

DC:Dia.

■Slot milling with small diameter tools

Workpiece Material	Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	15000	300	0.1	9500	110	0.05
2	8000	320	0.2	4800	190	0.1
Depth of cut	 DC ≤Please refer to the list above for depth of cut.					

DC:Dia.

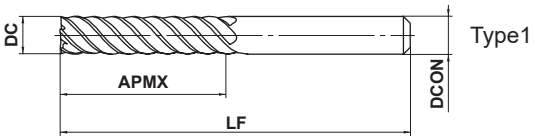
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VCLD

End mill, Long cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1

DC≤12	DC>12			
0 -0.020	0 -0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

● Ideal for tool steel and hardened materials machining

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCLDD0600	6	26	70	6	6	●	1
VCLDD0800	8	36	90	8	6	●	1
VCLDD1000	10	46	100	10	6	●	1
VCLDD1200	12	56	110	12	6	●	1
VCLDD1600	16	66	130	16	6	●	1
VCLDD2000	20	76	140	20	6	●	1
VCLDD2500	25	92	180	25	6	●	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Hardened steel (45—55HRC) AISI H13		Hardened steel (55—62HRC) AISI D2		Hardened steel (62—70HRC) AISI W1, AISI M2	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
6	2100	450	1600	330	1300	240	1100	190
8	1600	430	1200	310	1000	230	800	170
10	1300	420	960	290	800	220	640	150
12	1100	380	800	260	660	200	530	140
16	800	310	600	220	500	160	400	120
20	640	270	480	190	400	140	320	110
25	510	230	380	160	320	120	260	90
Depth of cut	≤0.01DC, 3DC—4DC				≤0.005DC, 3DC—4DC			

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.

ISO13399 ➤ J002

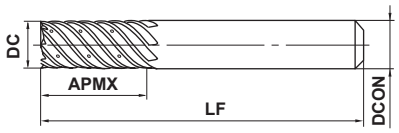
VF8MHVCH

End mill, Medium cut length, Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





Type1

16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

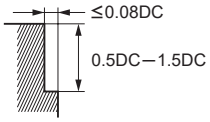
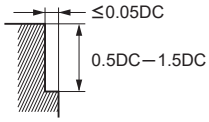
● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVCHD1600	16	32	90	16	8	▲	1
VF8MHVCHD2000	20	38	100	20	8	▲	1

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	4000	2400	3000	2100	800	240
20	3200	1900	2400	1900	640	200
Depth of cut						

DC:Dia.

■ Trochoidal slotting

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	4000	1900	3000	1400
20	3200	1500	2400	1200
Depth of cut				

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low.
In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

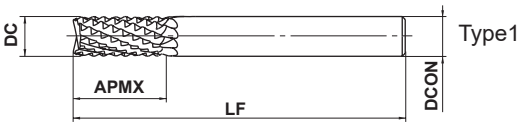
DFCJRT

Diamond coating endmill with cross-nick

CFRP

◎





Type1

h6	DCON=6	8≤DCON≤10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

● Cross-nick type end mill with original CVD diamond coating for CFRP machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFCJRTD0600	6	20	70	6	10	●	1
DFCJRTD0800	8	30	80	8	10	●	1
DFCJRTD1000	10	30	90	10	12	●	1
DFCJRTD1200	12	30	100	12	12	●	1

Note 1) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	CFRP	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
6	11000	1200
8	8000	1000
10	6400	900
12	5300	850

Note 1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece. Please use the above table as a guideline.
Note 2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
Note 3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
Note 4) Please take precautions against dust.

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

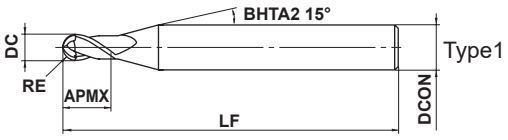
ISO13399 ➤ J002

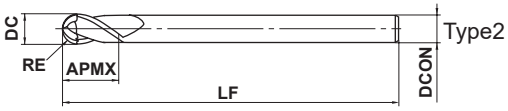
MP2SSB

Ball nose, Short cut length, 2 flute, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	







0.1≤RE≤6				
±0.005				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

●2-flute ball nose end mills with short cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

(mm)

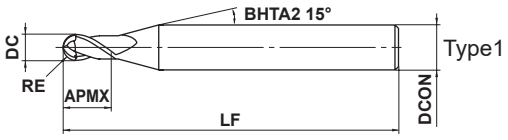
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2SSBR0010	0.1	0.2	0.2	40	4	2	●	1
MP2SSBR0020	0.2	0.4	0.4	40	4	2	●	1
MP2SSBR0030	0.3	0.6	0.6	40	4	2	●	1
MP2SSBR0040	0.4	0.8	0.8	40	4	2	●	1
MP2SSBR0050	0.5	1	1	40	4	2	●	1
MP2SSBR0050S06	0.5	1	1	40	6	2	●	1
MP2SSBR0075	0.75	1.5	1.5	40	4	2	●	1
MP2SSBR0075S06	0.75	1.5	1.5	40	6	2	●	1
MP2SSBR0100	1	2	2	45	6	2	●	1
MP2SSBR0150	1.5	3	3	45	6	2	●	1
MP2SSBR0200	2	4	4	45	6	2	●	1
MP2SSBR0250	2.5	5	5	50	6	2	●	1
MP2SSBR0300	3	6	6	50	6	2	●	2
MP2SSBR0400	4	8	8	60	8	2	●	2
MP2SSBR0500	5	10	10	70	10	2	●	2
MP2SSBR0600	6	12	12	75	12	2	●	2

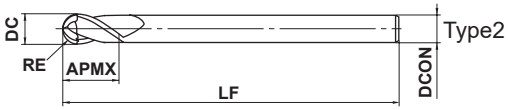
MP2SB

Ball nose, Short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	







0.1≤RE≤6				
±0.005				

4≤DCON≤6	8≤DCON≤10	DCON=12		
h5	0 - 0.005	0 - 0.006	0 - 0.008		

●2-flute ball nose end mills with short cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

(mm)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2SBR0010	0.1	0.2	0.3	45	4	2	●	1
MP2SBR0015	0.15	0.3	0.5	45	4	2	●	1
MP2SBR0020	0.2	0.4	0.6	45	4	2	●	1
MP2SBR0020S06	0.2	0.4	0.6	50	6	2	●	1
MP2SBR0025	0.25	0.5	0.8	45	4	2	●	1
MP2SBR0030	0.3	0.6	0.9	45	4	2	●	1
MP2SBR0030S06	0.3	0.6	0.9	50	6	2	●	1
MP2SBR0035	0.35	0.7	1.1	45	4	2	●	1
MP2SBR0040	0.4	0.8	1.2	45	4	2	●	1
MP2SBR0040S06	0.4	0.8	1.2	50	6	2	●	1
MP2SBR0045	0.45	0.9	1.4	45	4	2	●	1
MP2SBR0050	0.5	1	1.5	45	4	2	●	1
MP2SBR0050S06	0.5	1	1.5	50	6	2	●	1
MP2SBR0060	0.6	1.2	1.8	45	4	2	●	1
MP2SBR0070	0.7	1.4	2.1	45	4	2	●	1
MP2SBR0075	0.75	1.5	2.3	45	4	2	●	1
MP2SBR0075S06	0.75	1.5	2.3	50	6	2	●	1
MP2SBR0080	0.8	1.6	2.4	45	4	2	●	1
MP2SBR0090	0.9	1.8	2.7	45	4	2	●	1
MP2SBR0100	1	2	3	50	4	2	●	1
MP2SBR0100S06	1	2	3	50	6	2	●	1
MP2SBR0125	1.25	2.5	3.8	50	4	2	●	1
MP2SBR0150	1.5	3	4.5	70	6	2	●	1
MP2SBR0200	2	4	6	70	6	2	●	1
MP2SBR0250	2.5	5	7.5	80	6	2	●	1
MP2SBR0300	3	6	9	80	6	2	●	2
MP2SBR0400	4	8	12	90	8	2	●	2
MP2SBR0500	5	10	15	100	10	2	●	2
MP2SBR0600	6	12	18	110	12	2	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

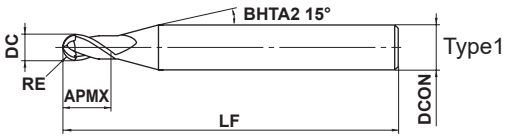
ISO13399 ➤ J002

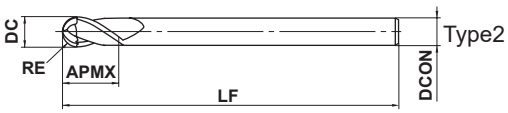
MP2MB

Ball nose, Medium cutting length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	







0.25≤RE≤6				
±0.005				

4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

●2-flute ball nose end mills with medium cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

(mm)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2MBR0025	0.25	0.5	1	45	4	2	●	1
MP2MBR0030	0.3	0.6	1.2	45	4	2	●	1
MP2MBR0040	0.4	0.8	1.6	45	4	2	●	1
MP2MBR0050	0.5	1	2.5	45	4	2	●	1
MP2MBR0060	0.6	1.2	2.5	45	4	2	●	1
MP2MBR0070	0.7	1.4	3	45	4	2	●	1
MP2MBR0075	0.75	1.5	4	45	4	2	●	1
MP2MBR0080	0.8	1.6	4	45	4	2	●	1
MP2MBR0090	0.9	1.8	5	45	4	2	●	1
MP2MBR0100	1	2	6	50	4	2	●	1
MP2MBR0125	1.25	2.5	6	50	4	2	●	1
MP2MBR0150	1.5	3	8	70	6	2	●	1
MP2MBR0150S03	1.5	3	8	70	3	2	●	2
MP2MBR0175	1.75	3.5	8	70	6	2	●	1
MP2MBR0200	2	4	8	70	6	2	●	1
MP2MBR0200S04	2	4	8	70	4	2	●	2
MP2MBR0250	2.5	5	12	80	6	2	●	1
MP2MBR0300	3	6	12	80	6	2	●	2
MP2MBR0400	4	8	14	90	8	2	●	2
MP2MBR0500	5	10	18	100	10	2	●	2
MP2MBR0600	6	12	22	110	12	2	●	2

SOLID END MILLS

Ball nose, Short cut length, 2 flute, Short shank **MP2SSB**

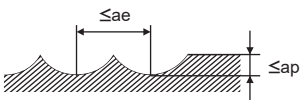
Ball nose, Short cut length, 2 flute **MP2SB** Ball nose, Medium cutting length, 2 flute **MP2MB**

RECOMMENDED CUTTING CONDITIONS

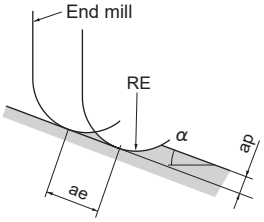
Workpiece Material	Mild Steel,Carbon steel, Alloy steel, Pre-hardened steel, Hardened steel (−45HRC) AISI 1050, AISI P21, AISI H13						Austenitic Stainless Steel (≤200HB), Titanium Alloy AISI 304, AISI 316, Ti-6Al-4V					
R **RE** (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R0.1	40000	300	40000	250	0.003	0.02	40000	300	40000	250	0.003	0.02
R0.15	40000	500	40000	350	0.007	0.03	40000	500	40000	350	0.007	0.03
R0.2	40000	1600	40000	1200	0.02	0.04	40000	1300	40000	1000	0.015	0.04
R0.25	40000	2400	40000	1400	0.025	0.05	40000	1900	40000	1200	0.02	0.05
R0.3	40000	3200	40000	1600	0.03	0.06	40000	2400	40000	1400	0.025	0.06
R0.4	40000	4800	40000	2400	0.05	0.08	40000	2400	40000	1900	0.04	0.08
R0.5	40000	5600	40000	3200	0.06	0.1	40000	3200	38000	2400	0.05	0.1
R0.75	40000	6500	40000	4000	0.09	0.15	40000	3200	25000	1600	0.08	0.15
R1	40000	6500	39000	4700	0.11	0.2	32000	3200	19000	1500	0.11	0.2
R1.25	40000	7000	33000	4500	0.12	0.25	25000	2500	15000	1200	0.12	0.25
R1.5	40000	7500	27000	4300	0.13	0.3	21000	2100	13000	1100	0.13	0.3
R2	32000	7500	20000	3600	0.15	0.4	16000	1900	9500	900	0.15	0.4
R2.5	25000	6000	16000	2900	0.2	0.5	13000	1600	7600	750	0.2	0.5
R3	21000	5800	13000	2600	0.25	0.6	11000	1500	6400	700	0.25	0.6
R4	16000	4500	10000	2000	0.3	0.8	8000	1400	4800	670	0.3	0.8
R5	13000	3600	8000	1700	0.5	1.0	6400	1300	3800	620	0.5	1.0
R6	9000	2500	6000	1300	0.5	1.2	5300	1300	3200	620	0.5	1.2

Workpiece Material	Hardened steel (45−55HRC) AISI 420, AISI H13						Copper, Copper alloys					
R **RE** (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R0.1	40000	300	40000	250	0.003	0.02	40000	300	40000	250	0.003	0.02
R0.15	40000	500	40000	350	0.007	0.03	40000	500	40000	350	0.007	0.03
R0.2	40000	1300	40000	950	0.015	0.04	40000	1300	40000	950	0.015	0.04
R0.25	40000	1900	40000	1100	0.02	0.05	40000	1900	40000	1100	0.02	0.05
R0.3	40000	2500	40000	1300	0.025	0.06	40000	2500	40000	1300	0.025	0.06
R0.4	40000	4000	40000	1900	0.04	0.08	40000	4000	40000	1900	0.04	0.08
R0.5	40000	5600	40000	3000	0.05	0.1	40000	5600	40000	3000	0.05	0.1
R0.75	40000	6500	32000	3200	0.08	0.15	40000	6500	32000	3200	0.08	0.15
R1	40000	6500	31000	3500	0.11	0.2	40000	6500	31000	3500	0.11	0.2
R1.25	36000	6500	26000	3500	0.12	0.25	36000	6500	26000	3500	0.12	0.25
R1.5	32000	6000	22000	3400	0.13	0.3	32000	6000	22000	3400	0.13	0.3
R2	25000	6000	16000	2700	0.15	0.4	25000	6000	16000	2700	0.15	0.6
R2.5	20000	5400	13000	2300	0.2	0.5	20000	5400	13000	2300	0.2	0.75
R3	17000	4700	10000	2000	0.25	0.6	17000	4700	10000	2000	0.25	0.9
R4	13000	3600	8000	1500	0.3	0.8	13000	3600	8000	1500	0.3	1.6
R5	10000	2900	6400	1200	0.5	1.0	10000	2900	6400	1200	0.5	2.0
R6	7200	2000	4800	1000	0.5	1.2	8500	2300	5300	1100	0.5	2.4

Depth of cut



Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) Standard cutting conditions of austenitic stainless steel and titanium alloy, please reduce to 60% revolution and 45% feedrate. (Hardened steel (45−55HRC) table above)



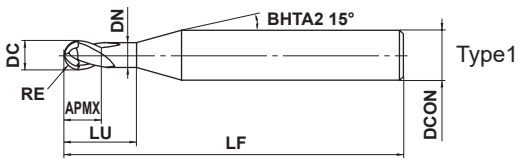
ae:Pick feed

MP2SDB

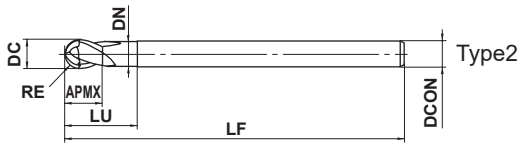
Ball nose, Short cut length, 2 flute, High strength

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	◎					





Type1



Type2

0.5≤RE≤6				
±0.01				
4≤DCON≤6	DCON=8			
0 - 0.005	0 - 0.006			
DCON=10	DCON=12			
0 - 0.009	0 - 0.011			

● Excellent chipping resistance with a strong S curve cutting edge.
Ideal for semi-finish machining of forging dies.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MP2SDBR0050	0.5	1	1	2	0.96	45	4	2	●	1
MP2SDBR0075S06	0.75	1.5	1.5	3	1.44	50	6	2	●	1
MP2SDBR0100	1	2	2	4	1.90	50	4	2	●	1
MP2SDBR0100S06	1	2	2	4	1.90	60	6	2	●	1
MP2SDBR0150	1.5	3	3	6	2.90	70	6	2	●	1
MP2SDBR0200	2	4	4	8	3.90	60	4	2	●	2
MP2SDBR0200S06	2	4	4	8	3.90	70	6	2	●	1
MP2SDBR0250	2.5	5	5	10	4.90	80	6	2	●	1
MP2SDBR0300	3	6	12	18	5.85	80	6	2	●	2
MP2SDBR0300A120	3	6	12	18	5.85	120	6	2	●	2
MP2SDBR0400	4	8	14	24	7.85	90	8	2	●	2
MP2SDBR0400A130	4	8	14	24	7.85	130	8	2	●	2
MP2SDBR0500	5	10	18	30	9.70	100	10	2	●	2
MP2SDBR0500A140	5	10	18	30	9.70	140	10	2	●	2
MP2SDBR0600	6	12	22	36	11.70	110	12	2	●	2
MP2SDBR0600A140	6	12	22	36	11.70	140	12	2	●	2

Note 1) MS plus end mills series MP2SB and MP2MB are recommended for finish surface processing.

● : Inventory maintained in Japan.

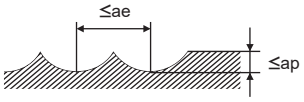
Click here for product NEWS ▶

MP2SDB

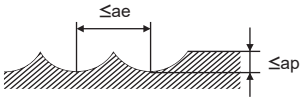
Ball nose, Short cut length, 2 flute, High strength

RECOMMENDED CUTTING CONDITIONS

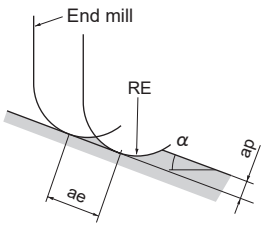
■Overhang below 5D (D:Dia.)

Workpiece Material	Carbon steel, Alloy steel, Tool steel, Alloy tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21						Hardened steel (45－55HRC) AISI H13, AISI L6					
R **RE** (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 0.5	40000	3900	36000	2100	0.1	0.25	40000	4300	36000	2200	0.1	0.25
R 0.75	40000	4200	36000	2600	0.15	0.35	40000	4700	36000	2700	0.15	0.35
R 1	40000	4500	36000	3100	0.2	0.5	40000	5000	36000	3300	0.2	0.5
R 1.5	37000	5300	24000	2700	0.3	0.75	37000	5800	24000	2800	0.3	0.75
R 2X4	24000	3200	15000	2000	0.25	0.7	19000	2800	13000	1600	0.25	0.7
R 2	30000	4900	19000	2500	0.4	1	28000	5000	19000	2400	0.4	1
R 2.5	25000	4500	16000	2300	0.5	1.3	22000	4200	16000	2200	0.5	1.25
R 3	22000	4300	14000	2200	0.6	1.8	18000	3800	12000	1800	0.6	1.5
R 4	19000	3900	12000	2000	0.8	2.4	15000	3200	9500	1600	0.8	2
R 5	15000	3300	9500	1800	1	3	11000	2500	7000	1400	1	2.5
R 6	12000	2550	8000	1600	1.2	3.6	9000	2000	6000	1300	1.2	3
Depth of cut												

■Overhang below 7D (D:Dia.)

Workpiece Material	Carbon steel, Alloy steel, Tool steel, Alloy tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21						Hardened steel (45－55HRC) AISI H13, AISI L6					
R **RE** (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 3	10000	1500	6900	1000	0.2	1	8000	1400	5300	770	0.2	0.8
R 4	8000	1400	5600	900	0.3	1.5	6400	1300	4000	650	0.3	1.2
R 5	6000	1200	4100	740	0.4	2	4800	1100	3200	580	0.4	1.6
R 6	5000	1000	3400	600	0.45	2.4	4000	900	2700	490	0.45	2
Depth of cut												

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.



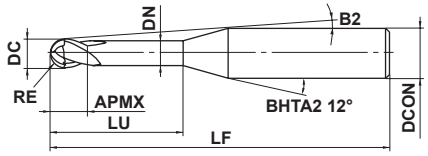
ae:Pick feed

MP2XLB

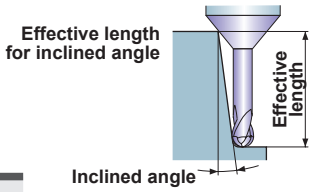
Ball nose, Short cut length, 2 flute, Long neck

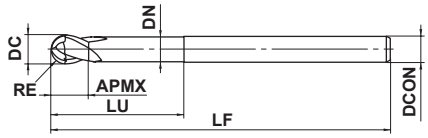
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	





Type1





Type2

0.05≤RE≤3			
±0.005			
4≤DCON≤6			
0 - 0.005			

●2-flute long neck ball nose end mills. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MP2XLBR0005N003	0.05	0.1	0.08	0.3	0.085	11.6°	50	4	2	●	1	0.3	0.3	0.4	0.4
MP2XLBR0005N005	0.05	0.1	0.08	0.5	0.085	11.4°	50	4	2	●	1	0.5	0.5	0.6	0.7
MP2XLBR0010N005	0.1	0.2	0.15	0.5	0.18	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.7
MP2XLBR0010N008	0.1	0.2	0.15	0.75	0.18	11.2°	50	4	2	●	1	0.8	0.8	0.9	1.0
MP2XLBR0010N010	0.1	0.2	0.15	1	0.18	10.9°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0010N013	0.1	0.2	0.15	1.25	0.18	10.6°	50	4	2	●	1	1.3	1.4	1.5	1.7
MP2XLBR0010N015	0.1	0.2	0.15	1.5	0.18	10.4°	50	4	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0010N018	0.1	0.2	0.15	1.75	0.18	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
MP2XLBR0010N020	0.1	0.2	0.15	2	0.18	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0010N025	0.1	0.2	0.15	2.5	0.18	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0015N005	0.15	0.3	0.24	0.5	0.28	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.6
MP2XLBR0015N008	0.15	0.3	0.24	0.75	0.28	11.2°	50	4	2	●	1	0.8	0.8	0.9	1.0
MP2XLBR0015N010	0.15	0.3	0.24	1	0.28	10.9°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0015N010S06	0.15	0.3	0.24	1	0.28	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0015N013	0.15	0.3	0.24	1.25	0.28	10.7°	50	4	2	●	1	1.3	1.4	1.5	1.6
MP2XLBR0015N013S06	0.15	0.3	0.24	1.25	0.28	11.1°	50	6	2	●	1	1.3	1.4	1.5	1.6
MP2XLBR0015N015	0.15	0.3	0.24	1.5	0.28	10.4°	50	4	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0015N015S06	0.15	0.3	0.24	1.5	0.28	10.9°	50	6	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0015N018	0.15	0.3	0.24	1.75	0.28	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
MP2XLBR0015N020	0.15	0.3	0.24	2	0.28	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0015N025	0.15	0.3	0.24	2.5	0.28	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0015N030	0.15	0.3	0.24	3	0.28	9.1°	50	4	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0015N035	0.15	0.3	0.24	3.5	0.28	8.7°	50	4	2	●	1	3.7	3.8	4.2	4.6
MP2XLBR0015N040	0.15	0.3	0.24	4	0.28	8.4°	50	4	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0020N005	0.2	0.4	0.3	0.5	0.37	11.6°	50	4	2	●	1	0.5	0.5	0.5	0.6
MP2XLBR0020N008	0.2	0.4	0.3	0.75	0.37	11.3°	50	4	2	●	1	0.7	0.8	0.9	0.9
MP2XLBR0020N010	0.2	0.4	0.3	1	0.37	11°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0020N010S06	0.2	0.4	0.3	1	0.37	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0020N015	0.2	0.4	0.3	1.5	0.37	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0020N020	0.2	0.4	0.3	2	0.37	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
MP2XLBR0020N020S06	0.2	0.4	0.3	2	0.37	10.6°	50	6	2	●	1	2.1	2.2	2.3	2.6
MP2XLBR0020N025	0.2	0.4	0.3	2.5	0.37	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.3

● : Inventory maintained in Japan.

Click here for product NEWS ▶

MP2XLB

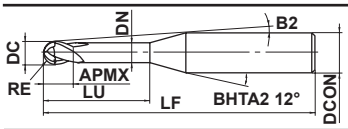
Ball nose, Short cut length, 2 flute, Long neck

(mm)

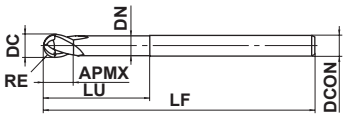
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MP2XLBR0020N030	0.2	0.4	0.3	3	0.37	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0020N035	0.2	0.4	0.3	3.5	0.37	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.6
MP2XLBR0020N040	0.2	0.4	0.3	4	0.37	8.4°	50	4	2	●	1	4.2	4.3	4.7	5.2
MP2XLBR0020N045	0.2	0.4	0.3	4.5	0.37	8°	50	4	2	●	1	4.7	4.9	5.3	5.9
MP2XLBR0020N050	0.2	0.4	0.3	5	0.37	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.6
MP2XLBR0020N055	0.2	0.4	0.3	5.5	0.37	7.5°	50	4	2	●	1	5.7	6.0	6.5	7.2
MP2XLBR0020N060	0.2	0.4	0.3	6	0.37	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
MP2XLBR0025N010	0.25	0.5	0.37	1	0.47	11°	50	4	2	●	1	1.0	1.0	1.1	1.2
MP2XLBR0025N015	0.25	0.5	0.37	1.5	0.47	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0025N015S06	0.25	0.5	0.37	1.5	0.47	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0025N020	0.25	0.5	0.37	2	0.47	9.9°	50	4	2	●	1	2.1	2.1	2.3	2.6
MP2XLBR0025N020S06	0.25	0.5	0.37	2	0.47	10.6°	50	6	2	●	1	2.1	2.1	2.3	2.6
MP2XLBR0025N025	0.25	0.5	0.37	2.5	0.47	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
MP2XLBR0025N025S06	0.25	0.5	0.37	2.5	0.47	10.3°	50	6	2	●	1	2.6	2.7	2.9	3.2
MP2XLBR0025N030	0.25	0.5	0.37	3	0.47	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0025N030S06	0.25	0.5	0.37	3	0.47	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0025N035	0.25	0.5	0.37	3.5	0.47	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.6
MP2XLBR0025N040	0.25	0.5	0.37	4	0.47	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
MP2XLBR0025N045	0.25	0.5	0.37	4.5	0.47	8°	50	4	2	●	1	4.7	4.9	5.3	5.9
MP2XLBR0025N050	0.25	0.5	0.37	5	0.47	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.6
MP2XLBR0025N055	0.25	0.5	0.37	5.5	0.47	7.4°	50	4	2	●	1	5.7	6.0	6.5	7.2
MP2XLBR0025N060	0.25	0.5	0.37	6	0.47	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
MP2XLBR0025N070	0.25	0.5	0.37	7	0.47	6.7°	50	4	2	●	1	7.3	7.6	8.3	9.2
MP2XLBR0025N080	0.25	0.5	0.37	8	0.47	6.3°	50	4	2	●	1	8.3	8.7	9.5	10.5
MP2XLBR0025N090	0.25	0.5	0.37	9	0.47	5.9°	50	4	2	●	1	9.4	9.8	10.7	11.9
MP2XLBR0025N100	0.25	0.5	0.37	10	0.47	5.6°	50	4	2	●	1	10.4	10.9	11.9	13.2
MP2XLBR0030N015	0.3	0.6	0.45	1.5	0.57	10.4°	50	4	2	●	1	1.5	1.6	1.8	2.0
MP2XLBR0030N015S06	0.3	0.6	0.45	1.5	0.57	11°	50	6	2	●	1	1.5	1.6	1.8	2.0
MP2XLBR0030N020	0.3	0.6	0.45	2	0.57	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0030N020S06	0.3	0.6	0.45	2	0.57	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0030N025	0.3	0.6	0.45	2.5	0.57	9.4°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0030N030	0.3	0.6	0.45	3	0.57	9°	50	4	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0030N030S06	0.3	0.6	0.45	3	0.57	9.9°	50	6	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0030N035	0.3	0.6	0.45	3.5	0.57	8.6°	50	4	2	●	1	3.7	3.8	4.2	4.6
MP2XLBR0030N040	0.3	0.6	0.45	4	0.57	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0030N040S06	0.3	0.6	0.45	4	0.57	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0030N045	0.3	0.6	0.45	4.5	0.57	7.9°	50	4	2	●	1	4.7	4.9	5.4	5.9
MP2XLBR0030N050	0.3	0.6	0.45	5	0.57	7.6°	50	4	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0030N050S06	0.3	0.6	0.45	5	0.57	8.8°	50	6	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0030N055	0.3	0.6	0.45	5.5	0.57	7.3°	50	4	2	●	1	5.8	6.0	6.6	7.3
MP2XLBR0030N060	0.3	0.6	0.45	6	0.57	7.1°	50	4	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0030N060S06	0.3	0.6	0.45	6	0.57	8.3°	50	6	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0030N065	0.3	0.6	0.45	6.5	0.57	6.8°	50	4	2	●	1	6.8	7.1	7.8	8.6
MP2XLBR0030N070	0.3	0.6	0.45	7	0.57	6.6°	50	4	2	●	1	7.3	7.6	8.4	9.3
MP2XLBR0030N080	0.3	0.6	0.45	8	0.57	6.2°	50	4	2	●	1	8.4	8.7	9.6	10.6
MP2XLBR0030N080S06	0.3	0.6	0.45	8	0.57	7.6°	50	6	2	●	1	8.4	8.7	9.6	10.6
MP2XLBR0030N085	0.3	0.6	0.45	8.5	0.57	6°	50	4	2	●	1	8.9	9.3	10.2	11.3
MP2XLBR0030N090	0.3	0.6	0.45	9	0.57	5.8°	50	4	2	●	1	9.4	9.8	10.8	11.9
MP2XLBR0030N095	0.3	0.6	0.45	9.5	0.57	5.7°	50	4	2	●	1	9.9	10.4	11.4	12.6
MP2XLBR0030N100	0.3	0.6	0.45	10	0.57	5.5°	50	4	2	●	1	10.5	10.9	12.0	13.2

● : Inventory maintained in Japan.

ISO13399 ➤ J002



Type1



Type2

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MP2XLBR0030N110	0.3	0.6	0.45	11	0.57	5.2°	50	4	2	●	1	11.5	12.0	13.2	14.6
MP2XLBR0030N120	0.3	0.6	0.45	12	0.57	5°	50	4	2	●	1	12.5	13.1	14.4	15.9
MP2XLBR0040N020	0.4	0.8	0.6	2	0.77	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0040N020S06	0.4	0.8	0.6	2	0.77	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0040N024S06	0.4	0.8	0.6	2.4	0.77	10.3°	50	6	2	●	1	2.5	2.6	2.8	3.1
MP2XLBR0040N030	0.4	0.8	0.6	3	0.77	8.9°	50	4	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0040N030S06	0.4	0.8	0.6	3	0.77	9.9°	50	6	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0040N040	0.4	0.8	0.6	4	0.77	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0040N040S06	0.4	0.8	0.6	4	0.77	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0040N050	0.4	0.8	0.6	5	0.77	7.5°	50	4	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0040N060	0.4	0.8	0.6	6	0.77	6.9°	50	4	2	●	1	6.3	6.5	7.2	7.9
MP2XLBR0040N070	0.4	0.8	0.6	7	0.77	6.5°	50	4	2	●	1	7.3	7.6	8.4	9.2
MP2XLBR0040N080	0.4	0.8	0.6	8	0.77	6°	50	4	2	●	1	8.4	8.7	9.5	10.6
MP2XLBR0040N090	0.4	0.8	0.6	9	0.77	5.7°	50	4	2	●	1	9.4	9.8	10.7	11.9
MP2XLBR0040N100	0.4	0.8	0.6	10	0.77	5.4°	50	4	2	●	1	10.5	10.9	11.9	13.2
MP2XLBR0040N120	0.4	0.8	0.6	12	0.77	4.8°	50	4	2	●	1	12.5	13.1	14.3	15.9
MP2XLBR0050N030	0.5	1	0.75	3	0.96	8.7°	50	4	2	●	1	3.2	3.4	3.7	4.1
MP2XLBR0050N030S06	0.5	1	0.75	3	0.96	9.8°	50	6	2	●	1	3.2	3.4	3.7	4.1
MP2XLBR0050N040	0.5	1	0.75	4	0.96	7.9°	50	4	2	●	1	4.3	4.5	4.9	5.4
MP2XLBR0050N040S06	0.5	1	0.75	4	0.96	9.2°	50	6	2	●	1	4.3	4.5	4.9	5.4
MP2XLBR0050N050	0.5	1	0.75	5	0.96	7.3°	50	4	2	●	1	5.3	5.6	6.1	6.7
MP2XLBR0050N050S06	0.5	1	0.75	5	0.96	8.6°	50	6	2	●	1	5.3	5.6	6.1	6.7
MP2XLBR0050N060	0.5	1	0.75	6	0.96	6.7°	50	4	2	●	1	6.4	6.7	7.3	8.1
MP2XLBR0050N060S06	0.5	1	0.75	6	0.96	8.2°	50	6	2	●	1	6.4	6.7	7.3	8.1
MP2XLBR0050N070	0.5	1	0.75	7	0.96	6.2°	50	4	2	●	1	7.4	7.8	8.5	9.4
MP2XLBR0050N080	0.5	1	0.75	8	0.96	5.8°	50	4	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0050N080S06	0.5	1	0.75	8	0.96	7.3°	50	6	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0050N090	0.5	1	0.75	9	0.96	5.5°	50	4	2	●	1	9.5	10.0	10.9	12.0
MP2XLBR0050N100	0.5	1	0.75	10	0.96	5.1°	50	4	2	●	1	10.6	11.1	12.1	13.4
MP2XLBR0050N100S06	0.5	1	0.75	10	0.96	6.7°	60	6	2	●	1	10.6	11.1	12.1	13.4
MP2XLBR0050N120	0.5	1	0.75	12	0.96	4.6°	50	4	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0050N120S06	0.5	1	0.75	12	0.96	6.1°	60	6	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0050N140	0.5	1	0.75	14	0.96	4.2°	55	4	2	●	1	14.8	15.4	16.9	18.7
MP2XLBR0050N160	0.5	1	0.75	16	0.96	3.8°	55	4	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0050N160S06	0.5	1	0.75	16	0.96	5.2°	65	6	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0050N180	0.5	1	0.75	18	0.96	3.5°	55	4	2	●	1	18.9	19.8	21.7	24.0
MP2XLBR0050N200	0.5	1	0.75	20	0.96	3.3°	55	4	2	●	1	21.0	22.0	24.1	26.6
MP2XLBR0050N200S06	0.5	1	0.75	20	0.96	4.6°	65	6	2	●	1	21.0	22.0	24.1	26.6
MP2XLBR0060N060	0.6	1.2	0.9	6	1.16	6.6°	50	4	2	●	1	6.4	6.7	7.3	8.0
MP2XLBR0060N060S06	0.6	1.2	0.9	6	1.16	8.1°	55	6	2	●	1	6.4	6.7	7.3	8.0
MP2XLBR0060N080	0.6	1.2	0.9	8	1.16	5.7°	50	4	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0060N080S06	0.6	1.2	0.9	8	1.16	7.3°	55	6	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0060N100	0.6	1.2	0.9	10	1.16	5°	50	4	2	●	1	10.6	11.0	12.1	13.3
MP2XLBR0060N100S06	0.6	1.2	0.9	10	1.16	6.6°	55	6	2	●	1	10.6	11.0	12.1	13.3
MP2XLBR0060N120	0.6	1.2	0.9	12	1.16	4.4°	50	4	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0060N120S06	0.6	1.2	0.9	12	1.16	6°	65	6	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0060N140	0.6	1.2	0.9	14	1.16	4°	55	4	2	●	1	14.8	15.4	16.9	18.7
MP2XLBR0060N160	0.6	1.2	0.9	16	1.16	3.7°	55	4	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0060N160S06	0.6	1.2	0.9	16	1.16	5.1°	65	6	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0060N180	0.6	1.2	0.9	18	1.16	3.4°	60	4	2	●	1	18.9	19.8	21.7	24.0

MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

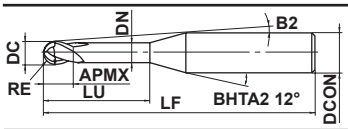
(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MP2XLBR0060N200	0.6	1.2	0.9	20	1.16	3.1°	60	4	2	●	1	21.0	21.9	24.0	26.6
MP2XLBR0060N240	0.6	1.2	0.9	24	1.16	2.7°	60	4	2	●	1	25.2	26.3	28.8	*
MP2XLBR0070N080	0.7	1.4	1.05	8	1.34	5.5°	50	4	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0070N120	0.7	1.4	1.05	12	1.34	4.3°	50	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0070N160	0.7	1.4	1.05	16	1.34	3.5°	50	4	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N030	0.75	1.5	1.1	3	1.44	8.6°	50	4	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0075N040	0.75	1.5	1.1	4	1.44	7.7°	50	4	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0075N060	0.75	1.5	1.1	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0075N060S06	0.75	1.5	1.1	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0075N080	0.75	1.5	1.1	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0075N080S06	0.75	1.5	1.1	8	1.44	7.2°	60	6	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0075N100	0.75	1.5	1.1	10	1.44	4.7°	50	4	2	●	1	10.5	11.0	12.0	13.2
MP2XLBR0075N100S06	0.75	1.5	1.1	10	1.44	6.5°	60	6	2	●	1	10.5	11.0	12.0	13.2
MP2XLBR0075N120	0.75	1.5	1.1	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0075N120S06	0.75	1.5	1.1	12	1.44	5.9°	60	6	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0075N140	0.75	1.5	1.1	14	1.44	3.8°	55	4	2	●	1	14.7	15.3	16.8	18.5
MP2XLBR0075N160	0.75	1.5	1.1	16	1.44	3.4°	55	4	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N160S06	0.75	1.5	1.1	16	1.44	5°	60	6	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N180	0.75	1.5	1.1	18	1.44	3.1°	60	4	2	●	1	18.9	19.7	21.6	23.8
MP2XLBR0075N200	0.75	1.5	1.1	20	1.44	2.9°	60	4	2	●	1	21.0	21.9	23.9	*
MP2XLBR0075N220	0.75	1.5	1.1	22	1.44	2.7°	60	4	2	●	1	23.0	24.0	26.3	*
MP2XLBR0080N080	0.8	1.6	1.2	8	1.54	5.3°	55	4	2	●	1	8.4	8.8	9.6	10.5
MP2XLBR0080N120	0.8	1.6	1.2	12	1.54	4.1°	55	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0080N160	0.8	1.6	1.2	16	1.54	3.3°	55	4	2	●	1	16.8	17.5	19.1	21.2
MP2XLBR0080N200	0.8	1.6	1.2	20	1.54	2.8°	55	4	2	●	1	21.0	21.9	23.9	*
MP2XLBR0090N080	0.9	1.8	1.4	8	1.74	5.1°	55	4	2	●	1	8.4	8.8	9.6	10.5
MP2XLBR0090N120	0.9	1.8	1.4	12	1.74	3.9°	55	4	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0090N160	0.9	1.8	1.4	16	1.74	3.1°	55	4	2	●	1	16.8	17.5	19.1	21.1
MP2XLBR0090N200	0.9	1.8	1.4	20	1.74	2.6°	55	4	2	●	1	20.9	21.8	23.9	*
MP2XLBR0100N040	1	2	1.5	4	1.94	7.2°	50	4	2	●	1	4.2	4.4	4.7	5.2
MP2XLBR0100N040S06	1	2	1.5	4	1.94	9°	50	6	2	●	1	4.2	4.4	4.7	5.2
MP2XLBR0100N060	1	2	1.5	6	1.94	5.8°	50	4	2	●	1	6.3	6.6	7.1	7.8
MP2XLBR0100N060S06	1	2	1.5	6	1.94	7.8°	50	6	2	●	1	6.3	6.6	7.1	7.8
MP2XLBR0100N080	1	2	1.5	8	1.94	4.8°	50	4	2	●	1	8.4	8.8	9.5	10.5
MP2XLBR0100N080S06	1	2	1.5	8	1.94	6.9°	50	6	2	●	1	8.4	8.8	9.5	10.5
MP2XLBR0100N100	1	2	1.5	10	1.94	4.2°	50	4	2	●	1	10.5	10.9	11.9	13.1
MP2XLBR0100N100S06	1	2	1.5	10	1.94	6.2°	50	6	2	●	1	10.5	10.9	11.9	13.1
MP2XLBR0100N120	1	2	1.5	12	1.94	3.6°	50	4	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0100N120S06	1	2	1.5	12	1.94	5.6°	60	6	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0100N140	1	2	1.5	14	1.94	3.2°	55	4	2	●	1	14.7	15.3	16.7	18.4
MP2XLBR0100N140S06	1	2	1.5	14	1.94	5.1°	60	6	2	●	1	14.7	15.3	16.7	18.4
MP2XLBR0100N160	1	2	1.5	16	1.94	2.9°	55	4	2	●	1	16.8	17.5	19.1	*
MP2XLBR0100N160S06	1	2	1.5	16	1.94	4.7°	65	6	2	●	1	16.8	17.5	19.1	21.1
MP2XLBR0100N180	1	2	1.5	18	1.94	2.7°	55	4	2	●	1	18.9	19.7	21.5	*
MP2XLBR0100N180S06	1	2	1.5	18	1.94	4.3°	65	6	2	●	1	18.9	19.7	21.5	23.8
MP2XLBR0100N200	1	2	1.5	20	1.94	2.4°	65	4	2	●	1	20.9	21.8	23.9	*
MP2XLBR0100N200S06	1	2	1.5	20	1.94	4°	65	6	2	●	1	20.9	21.8	23.9	26.4
MP2XLBR0100N220	1	2	1.5	22	1.94	2.3°	65	4	2	●	1	23.0	24.0	26.3	*
MP2XLBR0100N250	1	2	1.5	25	1.94	2°	65	4	2	●	1	26.2	27.3	*	*
MP2XLBR0100N250S06	1	2	1.5	25	1.94	3.5°	90	6	2	●	1	26.2	27.3	29.9	33

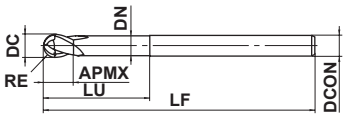
* No interference

● : Inventory maintained in Japan.

ISO13399 ➤ J002



Type1



Type2

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MP2XLBR0100N300	1	2	1.5	30	1.94	1.7°	80	4	2	●	1	31.4	32.7	*	*
MP2XLBR0100N300S06	1	2	1.5	30	1.94	3°	90	6	2	●	1	31.4	32.7	35.9	*
MP2XLBR0100N350	1	2	1.5	35	1.94	1.5°	80	4	2	●	1	36.6	38.2	*	*
MP2XLBR0100N350S06	1	2	1.5	35	1.94	2.7°	90	6	2	●	1	36.6	38.2	41.8	*
MP2XLBR0100N400	1	2	1.5	40	1.94	1.4°	80	4	2	●	1	41.8	43.6	*	*
MP2XLBR0100N400S06	1	2	1.5	40	1.94	2.4°	90	6	2	●	1	41.8	43.6	47.8	*
MP2XLBR0125N100	1.25	2.5	1.9	10	2.4	3.5°	55	4	2	●	1	10.4	10.8	11.8	12.9
MP2XLBR0125N150	1.25	2.5	1.9	15	2.4	2.5°	55	4	2	●	1	15.6	16.3	17.8	*
MP2XLBR0125N200	1.25	2.5	1.9	20	2.4	2°	55	4	2	●	1	20.8	21.7	*	*
MP2XLBR0125N250	1.25	2.5	1.9	25	2.4	1.6°	70	4	2	●	1	26.1	27.2	*	*
MP2XLBR0125N300	1.25	2.5	1.9	30	2.4	1.4°	70	4	2	●	1	31.3	32.6	*	*
MP2XLBR0125N350	1.25	2.5	1.9	35	2.4	1.2°	70	4	2	●	1	36.5	38.1	*	*
MP2XLBR0150N060S03	1.5	3	2.3	6	2.9	—	60	3	2	●	2	*	*	*	*
MP2XLBR0150N080	1.5	3	2.3	8	2.9	6.3°	60	6	2	●	1	8.3	8.6	9.3	10.2
MP2XLBR0150N100	1.5	3	2.3	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
MP2XLBR0150N120	1.5	3	2.3	12	2.9	4.9°	60	6	2	●	1	12.5	13.0	14.1	15.5
MP2XLBR0150N140	1.5	3	2.3	14	2.9	4.4°	60	6	2	●	1	14.6	15.2	16.5	18.2
MP2XLBR0150N160	1.5	3	2.3	16	2.9	4°	70	6	2	●	1	16.7	17.3	18.9	20.8
MP2XLBR0150N200	1.5	3	2.3	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
MP2XLBR0150N250	1.5	3	2.3	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	*
MP2XLBR0150N300	1.5	3	2.3	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	*
MP2XLBR0150N350	1.5	3	2.3	35	2.9	2.2°	90	6	2	●	1	36.5	38.0	41.7	*
MP2XLBR0150N400	1.5	3	2.3	40	2.9	1.9°	90	6	2	●	1	41.7	43.5	*	*
MP2XLBR0175N150	1.75	3.5	2.6	15	3.4	3.8°	65	6	2	●	1	15.6	16.2	17.7	19.4
MP2XLBR0175N250	1.75	3.5	2.6	25	3.4	2.5°	65	6	2	●	1	26.0	27.1	29.6	*
MP2XLBR0175N350	1.75	3.5	2.6	35	3.4	1.9°	90	6	2	●	1	36.5	38.0	*	*
MP2XLBR0175N450	1.75	3.5	2.6	45	3.4	1.5°	90	6	2	●	1	46.9	48.9	*	*
MP2XLBR0200N080S04	2	4	3	8	3.9	—	65	4	2	●	2	*	*	*	*
MP2XLBR0200N100	2	4	3	10	3.9	4.5°	65	6	2	●	1	10.4	10.8	11.6	12.7
MP2XLBR0200N120	2	4	3	12	3.9	3.9°	65	6	2	●	1	12.5	12.9	14.0	15.4
MP2XLBR0200N140	2	4	3	14	3.9	3.4°	65	6	2	●	1	14.6	15.1	16.4	18.0
MP2XLBR0200N160	2	4	3	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7
MP2XLBR0200N200	2	4	3	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
MP2XLBR0200N250	2	4	3	25	3.9	2.1°	70	6	2	●	1	26.0	27.1	29.6	*
MP2XLBR0200N300	2	4	3	30	3.9	1.8°	80	6	2	●	1	31.2	32.6	*	*
MP2XLBR0200N350	2	4	3	35	3.9	1.6°	80	6	2	●	1	36.5	38.0	*	*
MP2XLBR0200N400	2	4	3	40	3.9	1.4°	90	6	2	●	1	41.7	43.5	*	*
MP2XLBR0200N450	2	4	3	45	3.9	1.2°	90	6	2	●	1	46.9	48.9	*	*
MP2XLBR0200N500	2	4	3	50	3.9	1.1°	100	6	2	●	1	52.1	54.3	*	*
MP2XLBR0250N150	2.5	5	3.8	15	4.9	2°	70	6	2	●	1	15.6	16.2	*	*
MP2XLBR0250N200	2.5	5	3.8	20	4.9	1.5°	70	6	2	●	1	20.8	21.6	*	*
MP2XLBR0250N250	2.5	5	3.8	25	4.9	1.2°	70	6	2	●	1	26.0	27.1	*	*
MP2XLBR0250N300	2.5	5	3.8	30	4.9	1°	80	6	2	●	1	31.2	*	*	*
MP2XLBR0250N350	2.5	5	3.8	35	4.9	0.9°	80	6	2	●	1	36.4	*	*	*
MP2XLBR0250N400	2.5	5	3.8	40	4.9	0.8°	90	6	2	●	1	41.7	*	*	*
MP2XLBR0300N200	3	6	6	20	5.85	—	70	6	2	●	2	*	*	*	*
MP2XLBR0300N250	3	6	6	25	5.85	—	70	6	2	●	2	*	*	*	*
MP2XLBR0300N300	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*
MP2XLBR0300N400	3	6	6	40	5.85	—	90	6	2	●	2	*	*	*	*
MP2XLBR0300N500	3	6	6	50	5.85	—	100	6	2	●	2	*	*	*	*

* No interference

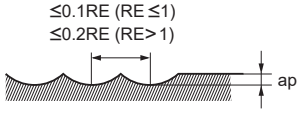
MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel,Alloy steel,Alloy Tool Steel, Pre-hardened steel, Precipitation hardeningstainless steel AISI 1055, AISI P21, ASTM 630			Hardened steel (45—55HRC)			Copper, Copper alloys		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R0.05	**0.3**	50000	200	0.002	50000	200	0.002	50000	200	0.004
	0.5	50000	200	0.001	50000	200	0.002	50000	200	0.002
R0.1	**0.5**	50000	400	0.003	50000	320	0.003	50000	320	0.006
	1	50000	400	0.002	50000	320	0.002	50000	320	0.004
	1.5	40000	300	0.001	40000	240	0.001	40000	240	0.002
	2	40000	200	0.001	40000	160	0.001	40000	160	0.002
	2.5	40000	100	0.001	40000	80	0.001	40000	80	0.002
R0.15	**1**	50000	600	0.007	50000	480	0.007	50000	480	0.014
	1.5	50000	600	0.005	50000	480	0.005	50000	480	0.01
	2	50000	600	0.003	50000	480	0.003	50000	480	0.006
	2.5	40000	400	0.003	40000	320	0.003	40000	320	0.006
	3	40000	300	0.002	40000	240	0.002	40000	240	0.004
	3.5	30000	250	0.002	30000	200	0.002	30000	200	0.004
	4	30000	200	0.002	30000	160	0.002	30000	160	0.004
R0.2	**1**	50000	1800	0.015	50000	1400	0.015	50000	1400	0.03
	2	50000	1300	0.01	50000	1000	0.01	50000	1000	0.02
	3	50000	900	0.005	50000	700	0.005	50000	700	0.01
	4	40000	600	0.004	40000	480	0.004	40000	480	0.008
	5	40000	400	0.003	40000	320	0.003	40000	320	0.006
	6	30000	200	0.002	30000	160	0.002	30000	160	0.004
R0.25	**2**	50000	2500	0.02	50000	2000	0.02	50000	2000	0.04
	3	50000	1500	0.015	50000	1200	0.015	50000	1200	0.03
	4	45000	1200	0.01	45000	950	0.01	45000	950	0.02
	5	45000	900	0.007	45000	700	0.007	45000	700	0.014
	6	36000	600	0.006	36000	480	0.006	36000	480	0.012
	7	32000	400	0.005	32000	320	0.005	32000	320	0.01
	8	32000	300	0.003	32000	240	0.003	32000	240	0.006
	10	26000	200	0.002	26000	160	0.002	26000	160	0.004
R0.3	**2**	50000	3500	0.03	50000	2800	0.03	50000	2800	0.06
	3	50000	3500	0.03	50000	2800	0.03	50000	2800	0.06
	4	44000	2500	0.02	44000	2000	0.02	44000	2000	0.04
	5	37000	1200	0.01	37000	950	0.01	37000	950	0.02
	6	37000	1000	0.008	37000	800	0.008	37000	800	0.016
	7	35000	750	0.008	35000	600	0.008	35000	600	0.016
	8	35000	600	0.006	35000	480	0.006	35000	480	0.012
	9	30000	500	0.004	30000	400	0.004	30000	400	0.008
	10	30000	500	0.003	30000	400	0.003	30000	400	0.006
	11	22000	300	0.002	22000	240	0.002	22000	240	0.004
	12	22000	200	0.002	22000	160	0.002	22000	160	0.004

Depth ofcut

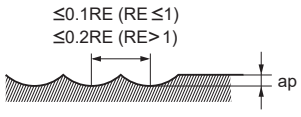


RE:Radius

Note 1) When the inclination angle of machined surface is large, or machining with large cutting load such as corner area, reduce the revolution and feed rate.
Note 2) The use of oil mist is recommended when machining with small diameter.
Note 3) The revolution and feed rate can increase for the small depth of cut.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 5) For hardened steel over 55HRC, use VF2XLB.
Note 6) Standard cutting conditions of austenitic stainless steel and titanium alloy, please reduce to 60% revolution and 45% feed rate. (Hardened steel (45—55HRC) table above)

Workpiece Material		Carbon steel,Alloy steel,Alloy Tool Steel, Pre-hardened steel, Precipitation hardeningstainless steel AISI 1055, AISI P21, ASTM 630			Hardened steel (45—55HRC)			Copper, Copper alloys		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R0.4	**2**	50000	4400	0.04	50000	3500	0.04	50000	3500	0.08
	3	50000	4000	0.04	50000	3200	0.04	50000	3200	0.08
	4	50000	4000	0.02	50000	3200	0.02	50000	3200	0.04
	5	35000	2400	0.02	35000	1900	0.02	35000	1900	0.04
	6	35000	2400	0.02	35000	1900	0.02	35000	1900	0.04
	7	30000	1500	0.015	30000	1200	0.015	30000	1200	0.03
	8	30000	1500	0.01	30000	1200	0.01	30000	1200	0.02
	10	30000	700	0.008	30000	560	0.008	30000	560	0.016
	12	22000	500	0.006	22000	400	0.006	22000	400	0.012
R0.5	**3**	40000	4000	0.05	40000	3200	0.05	40000	3200	0.1
	4	40000	4000	0.05	40000	3200	0.05	40000	3200	0.1
	6	35000	3000	0.03	35000	2400	0.03	35000	2400	0.06
	8	30000	2000	0.02	30000	1600	0.02	30000	1600	0.04
	10	20000	1000	0.01	20000	800	0.01	20000	800	0.02
	12	20000	1000	0.01	20000	800	0.01	20000	800	0.02
	14	18000	600	0.008	18000	480	0.008	18000	480	0.016
	16	18000	500	0.008	18000	400	0.008	18000	400	0.016
	18	13000	300	0.005	13000	240	0.005	13000	240	0.01
	20	13000	250	0.005	13000	200	0.005	13000	200	0.01
R0.6	**6**	40000	4400	0.04	40000	3500	0.04	40000	3500	0.08
	8	40000	4000	0.04	40000	3200	0.04	40000	3200	0.08
	10	27000	1900	0.02	27000	1500	0.02	27000	1500	0.04
	12	16000	1400	0.02	16000	1100	0.02	16000	1100	0.04
	18	15000	700	0.008	15000	560	0.008	15000	560	0.016
	24	11000	300	0.006	11000	240	0.006	11000	240	0.012
R0.7	**8**	40000	4000	0.05	40000	3200	0.05	40000	2560	0.1
	12	26000	2000	0.04	26000	1600	0.04	26000	1280	0.08
	16	17000	1400	0.03	17000	1120	0.03	17000	896	0.06
R0.75	**6**	40000	6000	0.07	36000	4300	0.07	36000	4300	0.14
	8	40000	6000	0.07	36000	4300	0.07	36000	4300	0.14
	10	40000	5000	0.06	36000	3600	0.06	36000	3600	0.12
	12	32000	3400	0.04	29000	2400	0.04	29000	2400	0.08
	16	15000	1400	0.03	15000	1100	0.03	15000	1100	0.06
	20	12000	900	0.02	12000	720	0.02	12000	720	0.04
	22	9000	400	0.01	9000	320	0.01	9000	320	0.02
R0.8	**8**	40000	6000	0.08	32000	3800	0.08	32000	3800	0.16
	12	36000	4500	0.06	29000	2800	0.06	29000	2800	0.12
	16	14000	1400	0.04	14000	1100	0.04	14000	1100	0.08
	20	12000	1000	0.03	12000	800	0.03	12000	800	0.06
R0.9	**8**	40000	6600	0.09	32000	4200	0.09	32000	4200	0.18
	12	40000	5000	0.07	32000	3200	0.07	32000	3200	0.14
	16	28000	2800	0.04	22000	1800	0.04	22000	1800	0.08
	20	10000	800	0.03	10000	640	0.03	10000	640	0.06

Depth ofcut



RE:Radius

Note 1) When the inclination angle of machined surface is large, or machining with large cutting load such as corner area, reduce the revolution and feed rate.
Note 2) The use of oil mist is recommended when machining with small diameter.
Note 3) The revolution and feed rate can increase for the small depth of cut.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 5) For hardened steel over 55HRC, use VF2XLB.
Note 6) Standard cutting conditions of austenitic stainless steel and titanium alloy, please reduce to 60% revolution and 45% feed rate. (Hardened steel (45—55HRC) table above)

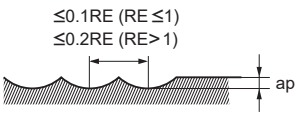
MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel,Alloy steel,Alloy Tool Steel, Pre-hardened steel, Precipitation hardeningstainless steel AISI 1055, AISI P21, ASTM 630			Hardened steel (45—55HRC)			Copper, Copper alloys		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R1	**4**	40000	8000	0.1	32000	5000	0.1	32000	5000	0.2
	6	40000	8000	0.1	32000	5000	0.1	32000	5000	0.2
	8	40000	6000	0.1	32000	3800	0.1	32000	3800	0.2
	10	40000	5000	0.08	32000	3200	0.08	32000	3200	0.16
	12	40000	5000	0.08	32000	3200	0.08	32000	3200	0.16
	16	32000	3500	0.05	26000	2200	0.05	26000	2200	0.1
	20	10000	1000	0.04	10000	800	0.04	10000	800	0.08
	25	10000	1000	0.04	10000	800	0.04	10000	800	0.08
	30	10000	800	0.02	10000	640	0.02	10000	640	0.04
	35	10000	600	0.02	10000	480	0.02	10000	480	0.04
	40	8000	400	0.01	8000	320	0.01	8000	320	0.02
R1.25	**10**	36000	6000	0.12	29000	3800	0.12	29000	3800	0.24
	15	32000	4500	0.1	26000	2900	0.1	26000	2900	0.2
	20	26000	3200	0.07	21000	2000	0.07	21000	2000	0.14
	25	12000	1400	0.06	8000	720	0.06	8000	720	0.12
	30	8000	900	0.04	8000	700	0.04	8000	700	0.08
	35	8000	800	0.02	8000	640	0.02	8000	510	0.04
R1.5	**6**	32000	7000	0.15	26000	4500	0.15	22000	3800	0.3
	10	32000	7000	0.15	26000	4500	0.15	22000	3800	0.3
	16	32000	5000	0.1	26000	3200	0.1	22000	2700	0.2
	20	27000	3800	0.1	22000	2400	0.1	22000	2400	0.2
	25	21000	2700	0.08	17000	1700	0.08	17000	1700	0.16
	30	10000	700	0.08	6000	560	0.08	6000	560	0.16
	35	6000	700	0.06	6000	560	0.06	6000	560	0.12
	40	6000	600	0.04	6000	480	0.04	6000	480	0.08
R1.75	**15**	27500	4400	0.13	22000	2800	0.13	18000	2300	0.26
	25	23000	3600	0.1	18000	2200	0.1	18000	2200	0.2
	35	10000	1400	0.08	10000	1100	0.08	10000	1100	0.16
	45	7500	900	0.04	7500	720	0.04	7500	720	0.08
R2	**10**	24000	6000	0.2	19000	3800	0.2	16000	3200	0.4
	20	24000	3800	0.15	19000	2400	0.15	16000	2000	0.3
	30	20000	3000	0.1	16000	1900	0.1	16000	1900	0.2
	40	12000	1700	0.1	12000	1400	0.1	12000	1400	0.2
	50	8000	1000	0.05	8000	800	0.05	8000	800	0.1
R2.5	**20**	22000	6000	0.2	18000	3800	0.2	13000	2800	0.4
	25	22000	4400	0.2	18000	2800	0.2	13000	2000	0.4
	30	22000	3800	0.15	18000	2400	0.15	13000	1700	0.3
	40	22000	3600	0.1	18000	2300	0.1	13000	1600	0.2
R3	**20**	20000	6000	0.2	16000	3800	0.2	11000	2600	0.4
	30	20000	6000	0.2	16000	3800	0.2	11000	2600	0.4
	40	20000	4500	0.15	16000	2800	0.15	11000	2000	0.3
	50	20000	3000	0.15	16000	1900	0.15	11000	1300	0.3

Depth ofcut



RE:Radius

Note 1) When the inclination angle of machined surface is large, or machining with large cutting load such as corner area, reduce the revolution and feed rate.
Note 2) The use of oil mist is recommended when machining with small diameter.
Note 3) The revolution and feed rate can increase for the small depth of cut.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 5) For hardened steel over 55HRC, use VF2XLB.
Note 6) Standard cutting conditions of austenitic stainless steel and titanium alloy, please reduce to 60% revolution and 45% feed rate. (Hardened steel (45—55HRC) table above)

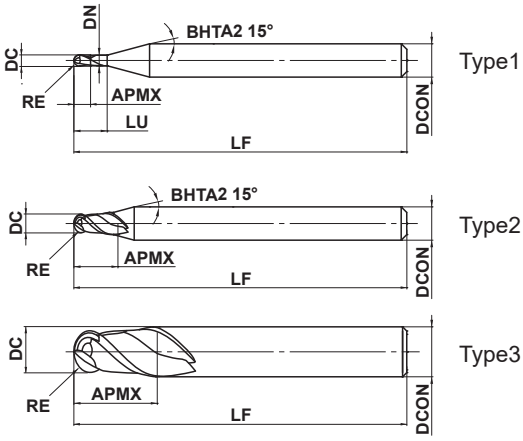
VQN2MB NEW

Ball nose, Medium cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		





RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

h5

●(Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
●The R cutting edge rake angle and ball nose geometry have been optimised to improve strength.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN2MBR0050	0.5	1	1	4	0.94	60	6	2	●	1
VQN2MBR0100	1.0	2	2	6	1.9	60	6	2	●	1
VQN2MBR0150	1.5	3	3	8	2.9	60	6	2	●	1
VQN2MBR0200	2.0	4	8	–	–	60	6	2	●	2
VQN2MBR0250	2.5	5	12	–	–	60	6	2	●	2
VQN2MBR0300	3.0	6	12	–	–	60	6	2	●	3
VQN2MBR0400	4.0	8	14	–	–	70	8	2	●	3
VQN2MBR0500	5.0	10	18	–	–	80	10	2	●	3
VQN2MBR0600	6.0	12	22	–	–	80	12	2	●	3

● : Inventory maintained in Japan.

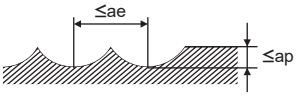
Click here for product NEWS ▶

VQN2MB

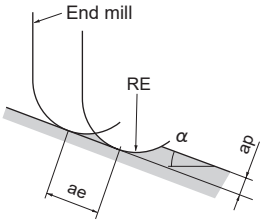
Ball nose, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material	Nickel-Based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.					
R **RE**	$\alpha \leq 15°$		$\alpha > 15°$		Depth of cut ap	Depth of cut ae
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
0.5	12700	640	12700	760	0.1	0.25
1.0	6300	320	6300	380	0.2	0.50
1.5	4200	250	4200	250	0.3	0.75
2.0	3100	190	3100	220	0.4	1.00
2.5	2500	180	2500	200	0.5	1.25
3.0	2100	170	2100	210	0.6	1.50
4.0	1500	130	1500	160	0.8	2.00
5.0	1200	130	1200	140	1.0	2.50
6.0	1000	110	1000	120	1.2	3.00
Depth of cut						

Note 1) The use of water-soluble coolant is effective for heat resistant super alloys.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) α is the inclination angle of the machined surface.



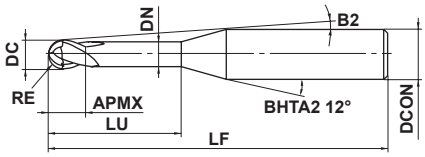
ae:Pick Feed

VQ2XLB NEW

Ball nose, Short cut length, 2 flute, Long neck

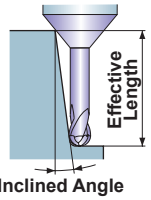
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminium Alloy
					◎	◎	





Type1

Effective Length for Inclined Angle



0.05≤RE≤1.5			
±0.005			
4≤DCON≤6			
0 -0.005			

- Fracture resistance is improved by adopting a new S-shape, reinforced cutting edge geometry.
- SMART MIRACLE coating provides better wear resistance when machining difficult-to-cut materials.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type
VQ2XLBR0050N080	0.5	1	0.75	8	0.94	6.4°	50	4	2	●	1
VQ2XLBR0050N100	0.5	1	0.75	10	0.94	5.6°	50	4	2	●	1
VQ2XLBR0050N080S06	0.5	1	0.75	8	0.94	8.3°	50	6	2	●	1
VQ2XLBR0050N100S06	0.5	1	0.75	10	0.94	7.5°	55	6	2	●	1
VQ2XLBR0050N120S06	0.5	1	0.75	12	0.94	6.8°	55	6	2	●	1
VQ2XLBR0075N100S06	0.75	1.5	1.1	10	1.44	7.2°	55	6	2	●	1
VQ2XLBR0075N120S06	0.75	1.5	1.1	12	1.44	6.5°	55	6	2	●	1
VQ2XLBR0100N100	1.0	2	1.5	10	1.9	4.5°	50	4	2	●	1
VQ2XLBR0100N100S06	1.0	2	1.5	10	1.9	6.9°	55	6	2	●	1
VQ2XLBR0100N120	1.0	2	1.5	12	1.9	3.9°	50	4	2	●	1
VQ2XLBR0100N120S06	1.0	2	1.5	12	1.9	6.1°	55	6	2	●	1
VQ2XLBR0150N120	1.5	3	2.3	12	2.9	5.3°	55	6	2	●	1
VQ2XLBR0150N140	1.5	3	2.3	14	2.9	4.7°	60	6	2	●	1
VQ2XLBR0150N160	1.5	3	2.3	16	2.9	4.3°	60	6	2	●	1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

VQ2XLB

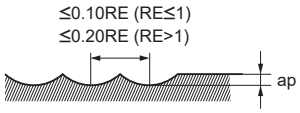
Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material		Titanium Alloys Ti-6Al-4V ELI, ASTM F136, etc.					Cobalt Chromium Alloys ASTM F75:Casting, F1537:Wrought Bar, F799:Forgings, etc.				
RE	**LU**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**
0.5	**8**	32000	100	2500	0.05	0.1	25000	80	2000	0.05	0.1
0.5	**10**	24000	75	1500	0.05	0.1	19000	60	1500	0.05	0.1
0.5	**12**	24000	75	1500	0.03	0.1	19000	60	1500	0.03	0.1
0.75	**10**	21000	100	2100	0.13	0.3	17000	80	1700	0.08	0.1
0.75	**12**	16000	75	1500	0.13	0.3	13000	60	1200	0.08	0.1
1	**10**	16000	100	1800	0.20	0.5	13000	80	1500	0.2	0.5
1	**12**	16000	100	1800	0.20	0.5	13000	80	1500	0.2	0.5
1.5	**12**	10000	100	1600	0.30	0.8	8500	80	1300	0.3	0.8
1.5	**14**	10000	100	1600	0.30	0.8	8500	80	1300	0.3	0.8
1.5	**16**	10000	100	1600	0.30	0.8	8500	80	1300	0.3	0.8

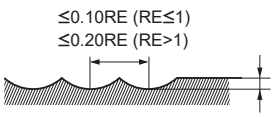
Depth of Cut



RE : Radius

Workpiece Material		Pure Titanium Ti etc.				
RE	**LU**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**
0.5	**8**	27000	80	1600	0.08	0.1
0.5	**10**	19000	60	1200	0.08	0.1
0.5	**12**	19000	60	1200	0.04	0.1
0.75	**10**	25000	120	2000	0.13	0.2
0.75	**12**	21000	100	1600	0.13	0.2
1	**10**	32000	200	2500	0.32	0.8
1	**12**	29000	180	1700	0.32	0.8
1.5	**12**	21000	200	1600	0.48	1.2
1.5	**14**	21000	200	1600	0.48	1.2
1.5	**16**	21000	200	1600	0.48	1.2

Depth of Cut



RE : Radius

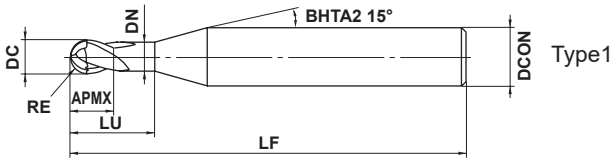
Note 1) The SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is shallow, the revolution and the feed rate can be increased.

VFR2SSB

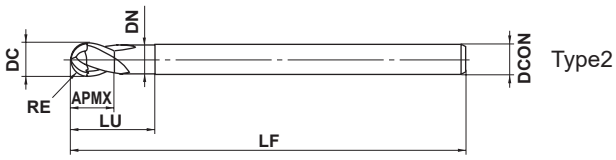
Ball nose, Short cut length, 2 flute, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

RE≤6				
±0.005				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

● Optimization of the cutting edge curve, helix angle, and rake angle have improved the edge strength at all areas of the ball blades.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SSBR0050S04	0.5	1	1	2	0.94	40	4	2	●	1
VFR2SSBR0050	0.5	1	1	2	0.94	40	6	2	●	1
VFR2SSBR0075S04	0.75	1.5	1.5	3	1.44	40	4	2	●	1
VFR2SSBR0075	0.75	1.5	1.5	3	1.44	40	6	2	●	1
VFR2SSBR0100	1	2	2	4	1.9	45	6	2	●	1
VFR2SSBR0150	1.5	3	3	6	2.9	45	6	2	●	1
VFR2SSBR0200	2	4	4	8	3.9	45	6	2	●	1
VFR2SSBR0250	2.5	5	5	10	4.9	50	6	2	●	1
VFR2SSBR0300	3	6	6	12	5.85	50	6	2	●	2
VFR2SSBR0400	4	8	8	14	7.85	60	8	2	●	2
VFR2SSBR0500	5	10	10	18	9.7	70	10	2	●	2
VFR2SSBR0600	6	12	12	22	11.7	75	12	2	●	2

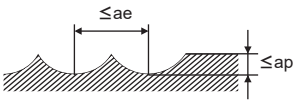
● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

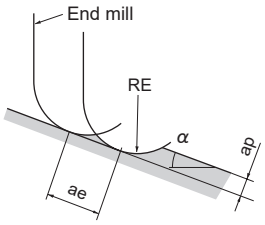
VFR2SSB

Ball nose, Short cut length, 2 flute, Short shank

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45－55HRC) AISI H13						Hardened steel (55－62HRC) AISI D2						Hardened steel (62－70HRC) AISI W1, AISI M2					
R RE (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 0.5	40000	8000	40000	3200	0.06	0.10	40000	5600	40000	2400	0.05	0.10	40000	3600	32000	1300	0.04	0.10
R 0.75	40000	9600	40000	4000	0.09	0.15	40000	7200	32000	2500	0.075	0.15	32000	4500	21000	1200	0.05	0.15
R 1	40000	9600	39000	4700	0.11	0.20	40000	8000	24000	2400	0.1	0.20	24000	3800	16000	1000	0.07	0.20
R 1.25	40000	10400	32000	4500	0.12	0.25	37000	8100	19000	2300	0.11	0.25	19000	3400	13000	1000	0.08	0.25
R 1.5	40000	12000	27000	4300	0.13	0.30	32000	7700	16000	2200	0.12	0.30	16000	3200	11000	880	0.09	0.30
R 2	32000	10880	20000	3600	0.15	0.40	24000	6200	12000	1900	0.13	0.40	12000	2400	8000	800	0.1	0.40
R 2.5	25000	9000	16000	2900	0.20	0.50	19000	5300	9600	1700	0.15	0.50	9600	2100	6000	600	0.1	0.50
R 3	21000	8400	13000	2600	0.25	0.60	16000	4800	8000	1600	0.2	0.60	8000	1700	5000	600	0.11	0.60
R 4	16000	6400	10000	2000	0.30	0.80	12000	3600	6000	1200	0.2	0.80	6000	1400	4000	480	0.11	0.80
R 5	13000	5200	8000	1700	0.50	1.00	10000	3200	4800	960	0.2	1.00	4800	1100	3000	420	0.12	1.00
R 6	9000	3600	6000	1300	0.50	1.20	7000	2200	3600	720	0.3	1.20	3600	860	2200	310	0.12	1.20
Depth of cut																		

Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Please reduce the feed rate when the surface finish is important.
Note 3) α is the inclination angle of the machined surface.



ae:Pick Feed

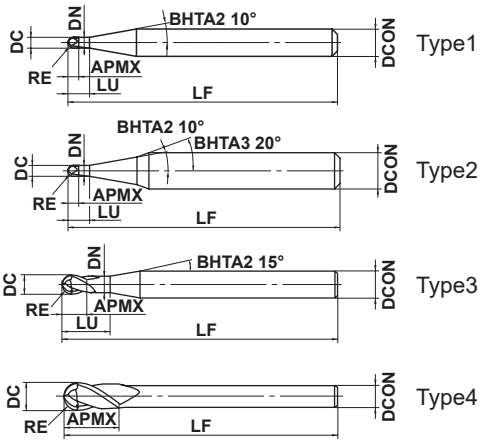
VFR2SB

Ball nose, Short cut length, 2 flute

UWC | VFR | 0° RE<0.3 | 20° RE≥0.3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





RE≤6	RE>6			
±0.005	±0.010			
DCON=3	4≤DCON≤6	8≤DCON≤10	DCON=12	DCON=20
0 - 0.004	0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

h5

● Optimization of the cutting edge curve, helix angle, and rake angle have improved the edge strength at all areas of the ball blades.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SBR0010	0.1	0.2	0.2	0.4	0.17	45	4	2	●	1
VFR2SBR0010S06	0.1	0.2	0.2	0.4	0.17	50	6	2	●	2
VFR2SBR0015	0.15	0.3	0.3	0.6	0.27	45	4	2	●	1
VFR2SBR0015S06	0.15	0.3	0.3	0.6	0.27	50	6	2	●	2
VFR2SBR0020	0.2	0.4	0.4	0.8	0.36	45	4	2	●	1
VFR2SBR0020S06	0.2	0.4	0.4	0.8	0.36	50	6	2	●	2
VFR2SBR0030	0.3	0.6	0.6	1.2	0.56	45	4	2	●	3
VFR2SBR0030S06	0.3	0.6	0.6	1.2	0.56	50	6	2	●	3
VFR2SBR0040	0.4	0.8	0.8	1.6	0.76	45	4	2	●	3
VFR2SBR0040S06	0.4	0.8	0.8	1.6	0.76	50	6	2	●	3
VFR2SBR0050	0.5	1	1	2	0.94	45	4	2	●	3
VFR2SBR0050S06	0.5	1	1	2	0.94	50	6	2	●	3
VFR2SBR0060	0.6	1.2	1.2	2.4	1.14	45	4	2	●	3
VFR2SBR0060S06	0.6	1.2	1.2	2.4	1.14	50	6	2	●	3
VFR2SBR0070	0.7	1.4	1.4	2.8	1.34	45	4	2	●	3
VFR2SBR0070S06	0.7	1.4	1.4	2.8	1.34	50	6	2	●	3
VFR2SBR0075	0.75	1.5	1.5	3	1.44	45	4	2	●	3
VFR2SBR0075S06	0.75	1.5	1.5	3	1.44	50	6	2	●	3
VFR2SBR0080	0.8	1.6	1.6	3.2	1.54	45	4	2	●	3
VFR2SBR0080S06	0.8	1.6	1.6	3.2	1.54	50	6	2	●	3
VFR2SBR0090	0.9	1.8	1.8	3.6	1.74	45	4	2	●	3
VFR2SBR0090S06	0.9	1.8	1.8	3.6	1.74	50	6	2	●	3
VFR2SBR0100	1	2	2	4	1.9	50	4	2	●	3
VFR2SBR0100S06	1	2	2	4	1.9	60	6	2	●	3
VFR2SBR0125S06	1.25	2.5	2.5	5	2.4	60	6	2	●	3
VFR2SBR0150	1.5	3	3	6	2.9	70	6	2	●	3
VFR2SBR0150S03	1.5	3	3	—	—	60	3	2	●	4
VFR2SBR0200	2	4	4	8	3.9	70	6	2	●	3
VFR2SBR0200S04	2	4	4	—	—	60	4	2	●	4
VFR2SBR0250	2.5	5	5	10	4.9	80	6	2	●	3
VFR2SBR0300	3	6	12	—	—	80	6	2	●	4
VFR2SBR0400	4	8	14	—	—	90	8	2	●	4
VFR2SBR0500	5	10	18	—	—	100	10	2	●	4
VFR2SBR0600	6	12	22	—	—	110	12	2	●	4
VFR2SBR0800	8	16	30	—	—	140	16	2	●	4
VFR2SBR1000	10	20	38	—	—	160	20	2	●	4

● : Inventory maintained in Japan.

Click here for product NEWS ▶

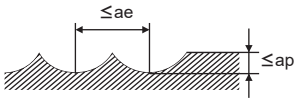
VFR2SB

Ball nose, Short cut length, 2 flute

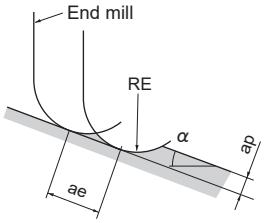
RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45－55HRC) AISI H13						Hardened steel (55－62HRC) AISI D2						Hardened steel (62－70HRC) AISI W1, AISI M2					
R RE (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°		α>15°		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 0.1	40000	320	40000	240	0.003	0.02	40000	320	40000	160	0.003	0.02	40000	320	40000	160	0.002	0.02
R 0.15	40000	640	40000	560	0.01	0.03	40000	640	40000	400	0.007	0.03	40000	640	40000	400	0.005	0.03
R 0.2	40000	1600	40000	1200	0.02	0.04	40000	1400	40000	1000	0.015	0.04	40000	1200	40000	1000	0.01	0.04
R 0.3	40000	3200	40000	1600	0.03	0.06	40000	2800	40000	1200	0.025	0.06	40000	2000	40000	1200	0.02	0.06
R 0.4	40000	6400	40000	2400	0.05	0.08	40000	4000	40000	1600	0.04	0.08	40000	2800	40000	1600	0.03	0.08
R 0.5	40000	8000	40000	3200	0.06	0.10	40000	5600	40000	2400	0.05	0.10	40000	3600	32000	1300	0.04	0.10
R 0.75	40000	9600	40000	4000	0.09	0.15	40000	7200	32000	2500	0.075	0.15	32000	4500	21000	1200	0.05	0.15
R 1	40000	9600	39000	4700	0.11	0.20	40000	8000	24000	2400	0.1	0.20	24000	3800	16000	1000	0.07	0.20
R 1.25	40000	10400	32000	4500	0.12	0.25	37000	8100	19000	2300	0.11	0.25	19000	3400	13000	1000	0.08	0.25
R 1.5	40000	12000	27000	4300	0.13	0.30	32000	7700	16000	2200	0.12	0.30	16000	3200	11000	880	0.09	0.30
R 2	32000	10880	20000	3600	0.15	0.40	24000	6200	12000	1900	0.13	0.40	12000	2400	8000	800	0.1	0.40
R 2.5	25000	9000	16000	2900	0.20	0.50	19000	5300	9600	1700	0.15	0.50	9600	2100	6000	600	0.1	0.50
R 3	21000	8400	13000	2600	0.25	0.60	16000	4800	8000	1600	0.2	0.60	8000	1700	5000	600	0.11	0.60
R 4	16000	6400	10000	2000	0.30	0.80	12000	3600	6000	1200	0.2	0.80	6000	1400	4000	480	0.11	0.80
R 5	13000	5200	8000	1700	0.50	1.00	10000	3200	4800	960	0.2	1.00	4800	1100	3000	420	0.12	1.00
R 6	9000	3600	6000	1300	0.50	1.20	7000	2200	3600	720	0.3	1.20	3600	860	2200	310	0.12	1.20
R 8	6000	2400	4000	1000	0.50	1.60	5000	1600	2500	500	0.3	1.60	2500	650	1500	240	0.15	1.60
R10	4500	1800	3000	780	0.50	2.00	4000	1300	1800	360	0.3	2.00	1800	470	1000	160	0.15	2.00

Depth of cut



Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Please reduce the feed rate when the surface finish is important.
Note 3) α is the inclination angle of the machined surface.



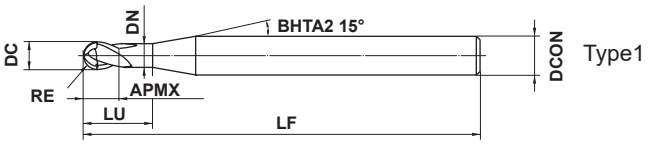
ae:Pick Feed

VFR2SBF

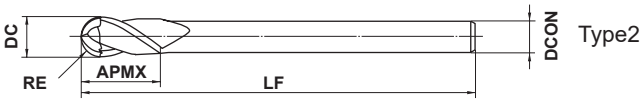
Ball nose, Short cut length, 2 flute, For Mirror finish cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

RE≤3				
±0.010				
4≤DCON≤6				
0 - 0.005				

●New ball geometry for mirror finish cutting.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SBFR0050	0.5	1	1	2	0.94	45	4	2	●	1
VFR2SBFR0075	0.75	1.5	1.5	3	1.44	45	4	2	●	1
VFR2SBFR0100	1	2	2	4	1.9	60	6	2	●	1
VFR2SBFR0125	1.25	2.5	2.5	5	2.4	60	6	2	●	1
VFR2SBFR0150	1.5	3	3	6	2.9	70	6	2	●	1
VFR2SBFR0200	2	4	4	8	3.9	70	6	2	●	1
VFR2SBFR0250	2.5	5	5	10	4.9	80	6	2	●	1
VFR2SBFR0300	3	6	12	—	—	80	6	2	●	2

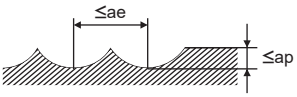
● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

VFR2SBF

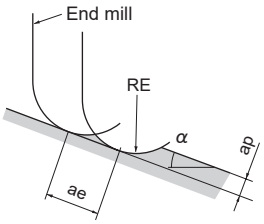
Ball nose, Short cut length, 2 flute, For Mirror finish cutting

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon Steel, Alloy Steel (180—280HB) Alloy steel (≤350HB), Pre-hardened steel (35— 45HRC) Hardened steel (45— 52HRC), Hardened steel (55— 62HRC) AISI 1045, AISI 4140, SKD, SKT, AISI P21, AISI P20, AISI H13, L6, AISI D2						Hardened steel (62—70HRC) AISI W1, AISI M2					
R **RE** (mm)	$\alpha \leq 15°$		$\alpha > 15°$		Depth of cut ap (mm)	Depth of cut ae (mm)	$\alpha \leq 15°$		$\alpha > 15°$		Depth of cut ap (mm)	Depth of cut ae (mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)			Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 0.5	40000	800	40000	800	0.007	0.007	40000	560	40000	560	0.005	0.005
R 0.75	40000	800	40000	800	0.009	0.009	40000	560	40000	560	0.007	0.007
R 1.0	35000	1050	35000	1050	0.011	0.011	35000	700	35000	700	0.009	0.009
R 1.25	35000	1050	35000	1050	0.013	0.013	35000	700	35000	700	0.011	0.011
R 1.5	35000	1050	35000	1050	0.015	0.015	35000	700	35000	700	0.013	0.013
R 2.0	25000	1000	25000	1000	0.017	0.017	25000	750	25000	750	0.015	0.015
R 2.5	25000	1000	25000	1000	0.020	0.020	25000	750	25000	750	0.015	0.015
R 3.0	25000	1000	25000	1000	0.020	0.020	25000	750	25000	750	0.015	0.015
Depth of cut												

Note 1) The tools are recommended for use only in finish machining.
Note 2) Air blowing or oil mist is recommended as coolants.
Note 3) Note the following points when using the tools.
- Avoid using equipment abruptly without proper preparation. After sufficiently energizing equipment, ensure that there will be no changes to the depth of cut such as due to elongation of the main axis during machining.
- If the tools are used immediately after rough machining of a surface, large uneven areas (cusp heights) will cause deflection of the tools and waviness of the machined surface. Therefore, it is recommended to add a medium finish machining process which uses the same value of ae as indicated in the table above.

Note 4) α is the inclination angle of the machined surface.



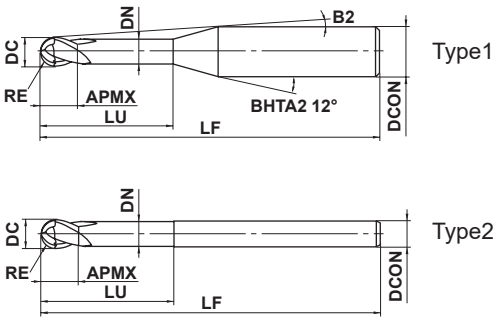
ae:Pick Feed

VFR2XLB NEW

Ball nose, Long neck, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





RE<0.3	0.3≤RE≤3			
±0.005	±0.005			
4≤DCON≤6				
0 - 0.005				

● Precise machining of vertical walls is possible due to a back taper and a strong, seamless ball nose cutting edge geometry.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFR2XLBR0010N005	0.1	0.2	0.15	0.5	0.18	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.7
VFR2XLBR0010N010	0.1	0.2	0.15	1	0.18	10.9°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0015N010	0.15	0.3	0.24	1	0.28	10.9°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0015N015	0.15	0.3	0.24	1.5	0.28	10.4°	50	4	2	●	1	1.6	1.6	1.8	2
VFR2XLBR0015N020	0.15	0.3	0.24	2	0.28	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0020N010	0.2	0.4	0.3	1	0.37	11°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0020N015	0.2	0.4	0.3	1.5	0.37	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VFR2XLBR0020N020	0.2	0.4	0.3	2	0.37	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
VFR2XLBR0020N025	0.2	0.4	0.3	2.5	0.37	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.3
VFR2XLBR0020N030	0.2	0.4	0.3	3	0.37	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VFR2XLBR0020N040	0.2	0.4	0.3	4	0.37	8.4°	50	4	2	●	1	4.2	4.3	4.7	5.2
VFR2XLBR0025N015	0.25	0.5	0.37	1.5	0.47	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VFR2XLBR0025N020	0.25	0.5	0.37	2	0.47	9.9°	50	4	2	●	1	2.1	2.1	2.3	2.6
VFR2XLBR0025N025	0.25	0.5	0.37	2.5	0.47	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VFR2XLBR0025N030	0.25	0.5	0.37	3	0.47	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VFR2XLBR0025N040	0.25	0.5	0.37	4	0.47	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
VFR2XLBR0030N020	0.3	0.6	0.45	2	0.57	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0030N020S06	0.3	0.6	0.45	2	0.57	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0030N030	0.3	0.6	0.45	3	0.57	9°	50	4	2	●	1	3.1	3.3	3.6	4
VFR2XLBR0030N030S06	0.3	0.6	0.45	3	0.57	9.9°	50	6	2	●	1	3.1	3.3	3.6	4
VFR2XLBR0030N040	0.3	0.6	0.45	4	0.57	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.3
VFR2XLBR0030N050	0.3	0.6	0.45	5	0.57	7.6°	50	4	2	●	1	5.2	5.5	6	6.6
VFR2XLBR0030N060	0.3	0.6	0.45	6	0.57	7.1°	50	4	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0040N030	0.4	0.8	0.6	3	0.77	8.9°	50	4	2	●	1	3.1	3.3	3.6	3.9
VFR2XLBR0040N040	0.4	0.8	0.6	4	0.77	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.2
VFR2XLBR0040N060	0.4	0.8	0.6	6	0.77	6.9°	50	4	2	●	1	6.3	6.5	7.2	7.9
VFR2XLBR0040N080	0.4	0.8	0.6	8	0.77	6°	50	4	2	●	1	8.4	8.7	9.5	10.6
VFR2XLBR0050N030	0.5	1	0.75	3	0.96	8.7°	50	4	2	●	1	3.2	3.4	3.7	4.1
VFR2XLBR0050N030S06	0.5	1	0.75	3	0.96	9.8°	50	6	2	●	1	3.2	3.4	3.7	4.1
VFR2XLBR0050N040	0.5	1	0.75	4	0.96	7.9°	50	4	2	●	1	4.3	4.5	4.9	5.4
VFR2XLBR0050N040S06	0.5	1	0.75	4	0.96	9.2°	50	6	2	●	1	4.3	4.5	4.9	5.4
VFR2XLBR0050N060	0.5	1	0.75	6	0.96	6.7°	50	4	2	●	1	6.3	6.5	7.2	7.9

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

VFR2XLB

Ball nose, Long neck, 2 flute

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFR2XLBR0050N060S06	0.5	1	0.75	6	0.96	8.2°	50	6	2	●	1	6.3	6.5	7.2	7.9
VFR2XLBR0050N080	0.5	1	0.75	8	0.96	5.8°	50	4	2	●	1	8.5	8.9	9.7	10.7
VFR2XLBR0050N100	0.5	1	0.75	10	0.96	5.1°	50	4	2	●	1	10.6	11.1	12.1	13.4
VFR2XLBR0050N120	0.5	1	0.75	12	0.96	4.6°	50	4	2	●	1	12.7	13.2	14.5	16
VFR2XLBR0075N060	0.75	1.5	1.1	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0075N060S06	0.75	1.5	1.1	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0075N080	0.75	1.5	1.1	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
VFR2XLBR0075N080S06	0.75	1.5	1.1	8	1.44	7.2°	50	6	2	●	1	8.4	8.8	9.6	10.6
VFR2XLBR0075N100	0.75	1.5	1.1	10	1.44	4.7°	50	4	2	●	1	10.5	11	12	13.2
VFR2XLBR0075N120	0.75	1.5	1.1	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
VFR2XLBR0075N140	0.75	1.5	1.1	14	1.44	3.8°	50	4	2	●	1	14.7	15.3	16.8	18.5
VFR2XLBR0075N160	0.75	1.5	1.1	16	1.44	3.4°	60	4	2	●	1	16.8	17.5	19.2	21.2
VFR2XLBR0100N060	1	2	1.5	6	1.94	5.8°	50	4	2	●	1	6.3	6.6	7.1	7.8
VFR2XLBR0100N060S06	1	2	1.5	6	1.94	7.8°	50	6	2	●	1	6.3	6.6	7.1	7.8
VFR2XLBR0100N080	1	2	1.5	8	1.94	4.8°	50	4	2	●	1	8.4	8.8	9.5	10.5
VFR2XLBR0100N080S06	1	2	1.5	8	1.94	6.9°	50	6	2	●	1	8.4	8.8	9.5	10.5
VFR2XLBR0100N100	1	2	1.5	10	1.94	4.2°	50	4	2	●	1	10.5	10.9	11.9	13.1
VFR2XLBR0100N100S06	1	2	1.5	10	1.94	6.2°	50	6	2	●	1	10.5	10.9	11.9	13.1
VFR2XLBR0100N120	1	2	1.5	12	1.94	3.6°	50	4	2	●	1	12.6	13.1	14.3	15.8
VFR2XLBR0100N120S06	1	2	1.5	12	1.94	5.6°	50	6	2	●	1	12.6	13.1	14.3	15.8
VFR2XLBR0100N160	1	2	1.5	16	1.94	2.9°	60	4	2	●	1	16.8	17.5	19.1	*
VFR2XLBR0100N160S06	1	2	1.5	16	1.94	4.7°	60	6	2	●	1	16.8	17.5	19.1	21.1
VFR2XLBR0100N200	1	2	1.5	20	1.94	2.4°	60	4	2	●	1	20.9	21.8	23.9	*
VFR2XLBR0100N200S06	1	2	1.5	20	1.94	4°	60	6	2	●	1	20.9	21.8	23.9	26.4
VFR2XLBR0125N100	1.25	2.5	1.9	10	2.4	3.5°	60	4	2	●	1	10.4	10.8	11.8	12.9
VFR2XLBR0125N150	1.25	2.5	1.9	15	2.4	2.5°	60	4	2	●	1	15.6	16.3	17.8	*
VFR2XLBR0150N100	1.5	3	2.3	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
VFR2XLBR0150N120	1.5	3	2.3	12	2.9	4.9°	60	6	2	●	1	12.5	13	14.1	15.5
VFR2XLBR0150N160	1.5	3	2.3	16	2.9	4°	70	6	2	●	1	16.7	17.3	18.9	20.8
VFR2XLBR0150N200	1.5	3	2.3	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
VFR2XLBR0150N250	1.5	3	2.3	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	*
VFR2XLBR0150N300	1.5	3	2.3	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	*
VFR2XLBR0200N100	2	4	3	10	3.9	4.5°	70	6	2	●	1	10.4	10.8	11.6	12.7
VFR2XLBR0200N120	2	4	3	12	3.9	3.9°	70	6	2	●	1	12.5	12.9	14	15.4
VFR2XLBR0200N160	2	4	3	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7
VFR2XLBR0200N200	2	4	3	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
VFR2XLBR0200N250	2	4	3	25	3.9	2.1°	70	6	2	●	1	26	27.1	29.6	*
VFR2XLBR0200N300	2	4	3	30	3.9	1.8°	70	6	2	●	1	31.2	32.6	*	*
VFR2XLBR0250N200	2.5	5	3.8	20	4.9	1.5°	70	6	2	●	1	20.8	21.6	*	*
VFR2XLBR0250N250	2.5	5	3.8	25	4.9	1.2°	70	6	2	●	1	26	27.1	*	*
VFR2XLBR0300N180	3	6	6	18	5.85	—	80	6	2	●	2	*	*	*	*
VFR2XLBR0300N300	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*

* No interference

● : Inventory maintained in Japan.

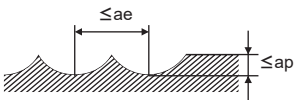
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material		Hardened Steels (45—55HRC)				Hardened Steels (55—70HRC)			
R **RE**	Neck length **LU**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
0.1	**0.5**	40000	300	0.003	0.01	40000	300	0.002	0.01
0.1	**1**	40000	300	0.002	0.01	40000	300	0.002	0.01
0.15	**1**	40000	500	0.007	0.015	40000	500	0.005	0.015
0.15	**1.5**	40000	500	0.005	0.015	40000	500	0.003	0.015
0.15	**2**	40000	500	0.003	0.015	40000	500	0.002	0.015
0.2	**1**	40000	1400	0.015	0.02	40000	1400	0.01	0.02
0.2	**1.5**	40000	1000	0.01	0.02	40000	1000	0.006	0.02
0.2	**2**	40000	1000	0.01	0.02	40000	1000	0.006	0.02
0.2	**2.5**	40000	700	0.005	0.02	40000	700	0.003	0.02
0.2	**3**	40000	700	0.005	0.02	40000	700	0.003	0.02
0.2	**4**	40000	600	0.004	0.02	40000	500	0.003	0.02
0.25	**1.5**	40000	2000	0.02	0.025	40000	2000	0.015	0.025
0.25	**2**	40000	2000	0.02	0.025	40000	2000	0.015	0.025
0.25	**2.5**	40000	1500	0.015	0.025	40000	1500	0.01	0.025
0.25	**3**	40000	1200	0.015	0.025	40000	1200	0.01	0.025
0.25	**4**	36000	900	0.1	0.025	36000	900	0.007	0.025
0.3	**2**	40000	2800	0.03	0.03	40000	2800	0.02	0.03
0.3	**3**	40000	2800	0.03	0.03	40000	2800	0.02	0.03
0.3	**4**	35000	2000	0.02	0.03	35000	2000	0.015	0.03
0.3	**5**	30000	1000	0.01	0.03	30000	1000	0.007	0.03
0.3	**6**	30000	800	0.008	0.03	30000	800	0.005	0.03
0.4	**3**	40000	3000	0.04	0.04	40000	3000	0.03	0.04
0.4	**4**	40000	3000	0.02	0.04	40000	3000	0.015	0.04
0.4	**6**	30000	1600	0.02	0.04	30000	1600	0.01	0.04
0.4	**8**	25000	1000	0.01	0.04	25000	1000	0.007	0.04
0.5	**3**	40000	4000	0.05	0.05	40000	4000	0.04	0.05
0.5	**4**	40000	4000	0.05	0.05	40000	4000	0.04	0.05
0.5	**6**	35000	2000	0.03	0.05	35000	2000	0.02	0.05
0.5	**8**	30000	1600	0.02	0.05	30000	1600	0.01	0.05
0.5	**10**	20000	1000	0.01	0.05	20000	1000	0.01	0.05
0.5	**12**	20000	1000	0.01	0.05	20000	800	0.008	0.05
0.75	**6**	40000	5000	0.07	0.075	40000	4000	0.06	0.075
0.75	**8**	40000	5000	0.07	0.075	40000	3500	0.06	0.075
0.75	**10**	40000	4500	0.06	0.075	40000	2400	0.06	0.075
0.75	**12**	32000	3400	0.04	0.075	32000	2000	0.04	0.075
0.75	**14**	16000	1500	0.04	0.075	16000	1200	0.03	0.075
0.75	**16**	13000	1200	0.03	0.075	13000	1200	0.02	0.075
1	**6**	40000	6000	0.1	0.1	40000	3400	0.1	0.1
1	**8**	40000	5000	0.1	0.1	40000	3000	0.1	0.1
1	**10**	40000	5000	0.08	0.1	40000	3000	0.07	0.1
1	**12**	40000	5000	0.08	0.1	40000	2600	0.05	0.1
1	**16**	32000	3500	0.05	0.1	32000	1700	0.03	0.1
1	**20**	10000	1000	0.04	0.1	10000	1000	0.03	0.1
1.25	**10**	36000	5000	0.12	0.25	36000	2600	0.11	0.25
1.25	**15**	36000	4600	0.08	0.25	36000	2000	0.075	0.25

Depth of Cut



Note 1) When the inclination angle of a machined surface is large, or when machining with a large cutting load such as the corner area, reduce the revolution and feed rate.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

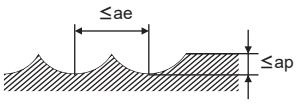
VFR2XLB

Ball nose, Long neck, 2 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened Steels (45－55HRC)				Hardened Steels (55－70HRC)			
R **RE**	Neck length **LU**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
1.5	**10**	32000	5100	0.15	0.3	32000	2200	0.15	0.3
1.5	**12**	32000	5100	0.13	0.3	32000	2200	0.13	0.3
1.5	**16**	32000	4500	0.1	0.3	32000	1800	0.1	0.3
1.5	**20**	27000	3800	0.1	0.3	27000	1600	0.06	0.3
1.5	**25**	21000	2700	0.08	0.3	21000	1200	0.06	0.3
1.5	**30**	9000	1000	0.08	0.3	9000	700	0.05	0.3
2	**10**	24000	4800	0.2	0.4	24000	2200	0.2	0.4
2	**12**	24000	4800	0.2	0.4	24000	2200	0.2	0.4
2	**16**	24000	3800	0.15	0.4	24000	1500	0.15	0.4
2	**20**	24000	3800	0.15	0.4	24000	1500	0.15	0.4
2	**25**	24000	3800	0.15	0.4	24000	1100	0.1	0.4
2	**30**	24000	3000	0.1	0.4	24000	1100	0.08	0.4
2.5	**20**	19000	3400	0.2	0.5	19000	1400	0.2	0.5
2.5	**25**	19000	3400	0.2	0.5	19000	1400	0.2	0.5
3	**18**	16000	3500	0.25	0.6	16000	1000	0.2	0.6
3	**30**	16000	3500	0.2	0.6	16000	1000	0.2	0.6

Depth of Cut



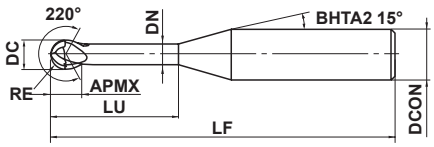
Note 1) When the inclination angle of a machined surface is large, or when machining with a large cutting load such as the corner area, reduce the revolution and feed rate.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VF2WB

Wide ball nose, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○	○		◎	◎		





Type1

1≤RE≤3					
±0.01					
DCON=6					
0 - 0.008					

● Ball nose end mill suitable for machining of undercut geometries and complex geometries using a 5-axis machine.

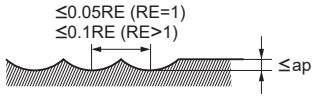
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2WBR0100N060	1	2	1.3	6	1.6	60	6	2	●	1
VF2WBR0150N080	1.5	3	2	8	2.4	60	6	2	●	1
VF2WBR0200N100	2	4	2.6	10	3.2	60	6	2	●	1
VF2WBR0300N120	3	6	4	12	4.8	80	6	2	●	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Hardened steel (45−55HRC) AISI H13		
R **RE** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R1	40000	5000	0.07	40000	5000	0.06	32000	2500	0.05	32000	3000	0.03
R1.5	32000	5000	0.12	32000	5000	0.11	26000	2500	0.10	26000	3000	0.07
R2	24000	3800	0.15	24000	3800	0.13	20000	2000	0.12	20000	2800	0.10
R3	16000	2800	0.20	16000	2800	0.18	13000	1500	0.15	13000	2100	0.12

Depth of cut



RE:Radius

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.

● : **Inventory maintained in Japan.**

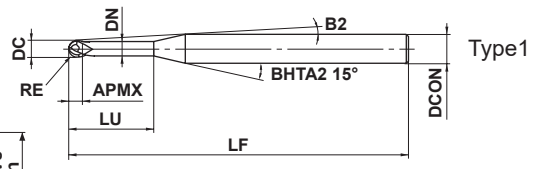
Click here for product NEWS ▶

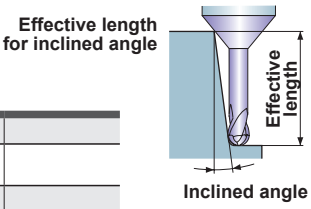
VF2XLBS

IMPACT MIRACLE, Ball nose, 2 flute, Long neck, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	◎	◎				







0.2≤RE≤1	±0.007
0.4≤DC≤2	0 / - 0.02
DCON=4	0 / - 0.008

●2 flute long neck ball nose end mill for high-speed machining of hardened steel.
●Short shank type suitable for use with a shrink fit holder.

(mm)

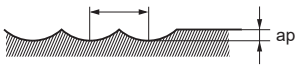
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBSR0020N010	0.2	0.4	0.32	1	0.36	13.4°	40	4	2	▲	1	1.0	1.0	1.1	1.2
VF2XLBSR0020N020	0.2	0.4	0.32	2	0.36	11.9°	40	4	2	▲	1	2.0	2.1	2.3	2.5
VF2XLBSR0020N030	0.2	0.4	0.32	3	0.36	10.7°	40	4	2	▲	1	3.1	3.2	3.4	3.7
VF2XLBSR0020N040	0.2	0.4	0.32	4	0.36	9.7°	40	4	2	▲	1	4.1	4.3	4.6	4.9
VF2XLBSR0025N040	0.25	0.5	0.4	4	0.46	9.6°	40	4	2	▲	1	4.1	4.3	4.6	4.9
VF2XLBSR0025N060	0.25	0.5	0.4	6	0.46	8.1°	40	4	2	▲	1	6.2	6.4	6.9	7.4
VF2XLBSR0030N020	0.3	0.6	0.48	2	0.56	11.8°	40	4	2	▲	1	2.1	2.2	2.3	2.5
VF2XLBSR0030N030	0.3	0.6	0.48	3	0.56	10.5°	40	4	2	▲	1	3.1	3.3	3.5	3.8
VF2XLBSR0030N040	0.3	0.6	0.48	4	0.56	9.5°	40	4	2	▲	1	4.2	4.3	4.6	5.0
VF2XLBSR0030N060	0.3	0.6	0.48	6	0.56	8.0°	40	4	2	▲	1	6.3	6.5	6.9	7.5
VF2XLBSR0040N040	0.4	0.8	0.64	4	0.76	9.4°	40	4	2	▲	1	4.2	4.3	4.6	5.0
VF2XLBSR0040N060	0.4	0.8	0.64	6	0.76	7.8°	40	4	2	▲	1	6.3	6.5	6.9	7.5
VF2XLBSR0050N030	0.5	1	0.8	3	0.94	10.1°	40	4	2	▲	1	3.2	3.3	3.6	3.9
VF2XLBSR0050N040	0.5	1	0.8	4	0.94	9.1°	40	4	2	▲	1	4.2	4.4	4.8	5.2
VF2XLBSR0050N060	0.5	1	0.8	6	0.94	7.5°	40	4	2	▲	1	6.3	6.6	7.1	7.7
VF2XLBSR0050N080	0.5	1	0.8	8	0.94	6.4°	40	4	2	▲	1	8.4	8.8	9.4	10.2
VF2XLBSR0100N060	1	2	1.6	6	1.9	6.4°	40	4	2	▲	1	6.2	6.5	6.9	7.4
VF2XLBSR0100N080	1	2	1.6	8	1.9	5.3°	40	4	2	▲	1	8.3	8.7	9.2	9.9
VF2XLBSR0100N100	1	2	1.6	10	1.9	4.5°	40	4	2	▲	1	10.4	10.8	11.5	12.4

▲ : Inventory maintained in Japan. To be replaced by new products.
VFR2XLB (J195) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R 0.2	**1**	40000	1400	0.015	40000	1400	0.01
	2	40000	1000	0.01	40000	1000	0.006
	3	40000	700	0.005	40000	700	0.003
	4	40000	600	0.004	40000	500	0.003
R 0.25	**4**	36000	900	0.01	36000	900	0.007
	6	36000	600	0.006	36000	500	0.004
R 0.3	**2**	40000	2800	0.03	40000	2800	0.02
	3	40000	2800	0.03	40000	2800	0.02
	4	35000	2000	0.02	35000	2000	0.015
	6	30000	800	0.008	30000	800	0.005
R 0.4	**4**	40000	3000	0.02	40000	3000	0.015
	6	30000	1600	0.02	30000	1600	0.01
R 0.5	**3**	40000	4000	0.05	40000	4000	0.04
	4	40000	4000	0.05	40000	4000	0.04
	6	35000	2000	0.03	35000	2000	0.02
	8	30000	1600	0.02	30000	1600	0.01
R 1	**6**	40000	6000	0.1	24000	3400	0.1
	8	40000	5000	0.1	24000	3000	0.1
	10	40000	5000	0.08	24000	3000	0.07
Depth of cut		≤0.1RE (RE≤1) ≤0.2RE (RE>1)  RE:Radius					

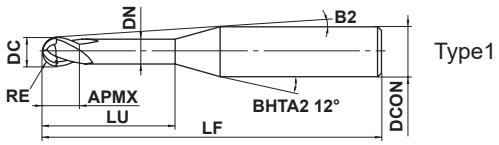
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VF2XLB

IMPACT MIRACLE, Ball nose, 2 flute, Long neck

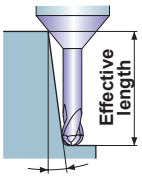
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	◎	◎				





Type1

Effective length for inclined angle





Type2

RE≤1	RE>1			
±0.007	±0.010			
0.2≤DC≤6				
0 - 0.02				
4≤DCON≤6				
0 - 0.008				

●2 flute long neck ball nose end mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0010N005S04	0.1	0.2	0.16	0.5	0.17	11.5°	50	4	2	▲	1	0.5	0.5	0.6	0.6
VF2XLBR0010N005S06	0.1	0.2	0.16	0.5	0.17	11.7°	50	6	2	▲	1	0.5	0.5	0.6	0.6
VF2XLBR0010N008S04	0.1	0.2	0.16	0.75	0.17	11.2°	50	4	2	▲	1	0.7	0.8	0.9	1.0
VF2XLBR0010N010S04	0.1	0.2	0.16	1	0.17	10.9°	50	4	2	▲	1	1.0	1.1	1.2	1.3
VF2XLBR0010N010S06	0.1	0.2	0.16	1	0.17	11.3°	50	6	2	▲	1	1.0	1.1	1.2	1.3
VF2XLBR0010N013S04	0.1	0.2	0.16	1.25	0.17	10.7°	50	4	2	▲	1	1.3	1.3	1.5	1.6
VF2XLBR0010N015S04	0.1	0.2	0.16	1.5	0.17	10.4°	50	4	2	▲	1	1.5	1.6	1.8	2.0
VF2XLBR0010N015S06	0.1	0.2	0.16	1.5	0.17	10.9°	50	6	2	▲	1	1.5	1.6	1.8	2.0
VF2XLBR0010N018S04	0.1	0.2	0.16	1.75	0.17	10.2°	50	4	2	▲	1	1.8	1.9	2.1	2.3
VF2XLBR0010N020S04	0.1	0.2	0.16	2	0.17	10°	50	4	2	▲	1	2.1	2.2	2.4	2.6
VF2XLBR0010N025S04	0.1	0.2	0.16	2.5	0.17	9.5°	50	4	2	▲	1	2.6	2.7	3.0	3.3
VF2XLBR0015N010S04	0.15	0.3	0.24	1	0.27	11°	50	4	2	▲	1	1.0	1.1	1.2	1.3
VF2XLBR0015N010S06	0.15	0.3	0.24	1	0.27	11.3°	50	6	2	▲	1	1.0	1.1	1.2	1.3
VF2XLBR0015N013S04	0.15	0.3	0.24	1.25	0.27	10.7°	50	4	2	▲	1	1.3	1.3	1.5	1.6
VF2XLBR0015N015S04	0.15	0.3	0.24	1.5	0.27	10.4°	50	4	2	▲	1	1.5	1.6	1.8	1.9
VF2XLBR0015N015S06	0.15	0.3	0.24	1.5	0.27	10.9°	50	6	2	▲	1	1.5	1.6	1.8	1.9
VF2XLBR0015N018S04	0.15	0.3	0.24	1.75	0.27	10.2°	50	4	2	▲	1	1.8	1.9	2.1	2.3
VF2XLBR0015N020S04	0.15	0.3	0.24	2	0.27	9.9°	50	4	2	▲	1	2.1	2.2	2.4	2.6
VF2XLBR0015N020S06	0.15	0.3	0.24	2	0.27	10.6°	50	6	2	▲	1	2.1	2.2	2.4	2.6
VF2XLBR0015N025S04	0.15	0.3	0.24	2.5	0.27	9.5°	50	4	2	▲	1	2.6	2.7	3.0	3.3
VF2XLBR0015N030S04	0.15	0.3	0.24	3	0.27	9.1°	50	4	2	▲	1	3.1	3.2	3.6	3.9
VF2XLBR0015N040S04	0.15	0.3	0.24	4	0.27	8.4°	50	4	2	▲	1	4.2	4.3	4.8	5.3
VF2XLBR0020N010S04	0.2	0.4	0.32	1	0.36	11°	50	4	2	▲	1	1.0	1.0	1.1	1.2
VF2XLBR0020N010S06	0.2	0.4	0.32	1	0.36	11.3°	50	6	2	▲	1	1.0	1.0	1.1	1.2
VF2XLBR0020N015S04	0.2	0.4	0.32	1.5	0.36	10.4°	50	4	2	▲	1	1.5	1.6	1.7	1.9
VF2XLBR0020N015S06	0.2	0.4	0.32	1.5	0.36	11°	50	6	2	▲	1	1.5	1.6	1.7	1.9
VF2XLBR0020N020S04	0.2	0.4	0.32	2	0.36	10°	50	4	2	▲	1	2.0	2.1	2.3	2.6
VF2XLBR0020N020S06	0.2	0.4	0.32	2	0.36	10.6°	50	6	2	▲	1	2.0	2.1	2.3	2.6
VF2XLBR0020N025S04	0.2	0.4	0.32	2.5	0.36	9.5°	50	4	2	▲	1	2.6	2.7	2.9	3.2
VF2XLBR0020N025S06	0.2	0.4	0.32	2.5	0.36	10.3°	50	6	2	▲	1	2.6	2.7	2.9	3.2
VF2XLBR0020N030S04	0.2	0.4	0.32	3	0.36	9.1°	50	4	2	▲	1	3.1	3.2	3.5	3.9
VF2XLBR0020N030S06	0.2	0.4	0.32	3	0.36	10°	50	6	2	▲	1	3.1	3.2	3.5	3.9
VF2XLBR0020N040S04	0.2	0.4	0.32	4	0.36	8.4°	50	4	2	▲	1	4.1	4.3	4.7	5.2
VF2XLBR0020N050S04	0.2	0.4	0.32	5	0.36	7.8°	50	4	2	▲	1	5.2	5.4	5.9	6.6

▲ : Inventory maintained in Japan. To be replaced by new products.
VFR2XLB (J195) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0025N015S04	0.25	0.5	0.4	1.5	0.46	10.5°	50	4	2	▲	1	1.5	1.6	1.7	1.9
VF2XLBR0025N015S06	0.25	0.5	0.4	1.5	0.46	11°	50	6	2	▲	1	1.5	1.6	1.7	1.9
VF2XLBR0025N020S04	0.25	0.5	0.4	2	0.46	10°	50	4	2	▲	1	2.0	2.1	2.3	2.6
VF2XLBR0025N020S06	0.25	0.5	0.4	2	0.46	10.6°	50	6	2	▲	1	2.0	2.1	2.3	2.6
VF2XLBR0025N025S04	0.25	0.5	0.4	2.5	0.46	9.5°	50	4	2	▲	1	2.6	2.7	2.9	3.2
VF2XLBR0025N030S04	0.25	0.5	0.4	3	0.46	9.1°	50	4	2	▲	1	3.1	3.2	3.5	3.9
VF2XLBR0025N030S06	0.25	0.5	0.4	3	0.46	10°	50	6	2	▲	1	3.1	3.2	3.5	3.9
VF2XLBR0025N035S04	0.25	0.5	0.4	3.5	0.46	8.7°	50	4	2	▲	1	3.6	3.8	4.1	4.5
VF2XLBR0025N040S04	0.25	0.5	0.4	4	0.46	8.3°	50	4	2	▲	1	4.1	4.3	4.7	5.2
VF2XLBR0025N040S06	0.25	0.5	0.4	4	0.46	9.4°	50	6	2	▲	1	4.1	4.3	4.7	5.2
VF2XLBR0025N050S04	0.25	0.5	0.4	5	0.46	7.7°	50	4	2	▲	1	5.2	5.4	5.9	6.5
VF2XLBR0025N050S06	0.25	0.5	0.4	5	0.46	8.9°	50	6	2	▲	1	5.2	5.4	5.9	6.5
VF2XLBR0025N060S04	0.25	0.5	0.4	6	0.46	7.2°	50	4	2	▲	1	6.2	6.5	7.1	7.9
VF2XLBR0025N060S06	0.25	0.5	0.4	6	0.46	8.4°	60	6	2	▲	1	6.2	6.5	7.1	7.9
VF2XLBR0030N020S04	0.3	0.6	0.48	2	0.56	9.9°	50	4	2	▲	1	2.1	2.2	2.4	2.6
VF2XLBR0030N020S06	0.3	0.6	0.48	2	0.56	10.6°	50	6	2	▲	1	2.1	2.2	2.4	2.6
VF2XLBR0030N025S04	0.3	0.6	0.48	2.5	0.56	9.4°	50	4	2	▲	1	2.6	2.7	3.0	3.3
VF2XLBR0030N030S04	0.3	0.6	0.48	3	0.56	9°	50	4	2	▲	1	3.1	3.3	3.6	3.9
VF2XLBR0030N030S06	0.3	0.6	0.48	3	0.56	9.9°	50	6	2	▲	1	3.1	3.3	3.6	3.9
VF2XLBR0030N035S04	0.3	0.6	0.48	3.5	0.56	8.6°	50	4	2	▲	1	3.6	3.8	4.2	4.6
VF2XLBR0030N040S04	0.3	0.6	0.48	4	0.56	8.3°	50	4	2	▲	1	4.2	4.4	4.8	5.2
VF2XLBR0030N040S06	0.3	0.6	0.48	4	0.56	9.3°	50	6	2	▲	1	4.2	4.4	4.8	5.2
VF2XLBR0030N050S04	0.3	0.6	0.48	5	0.56	7.6°	50	4	2	▲	1	5.2	5.4	6.0	6.6
VF2XLBR0030N050S06	0.3	0.6	0.48	5	0.56	8.8°	50	6	2	▲	1	5.2	5.4	6.0	6.6
VF2XLBR0030N060S04	0.3	0.6	0.48	6	0.56	7.1°	50	4	2	▲	1	6.3	6.5	7.1	7.9
VF2XLBR0030N060S06	0.3	0.6	0.48	6	0.56	8.4°	50	6	2	▲	1	6.3	6.5	7.1	7.9
VF2XLBR0030N070S04	0.3	0.6	0.48	7	0.56	6.6°	50	4	2	▲	1	7.3	7.6	8.3	9.2
VF2XLBR0030N080S04	0.3	0.6	0.48	8	0.56	6.2°	50	4	2	▲	1	8.3	8.7	9.5	10.6
VF2XLBR0030N080S06	0.3	0.6	0.48	8	0.56	7.6°	60	6	2	▲	1	8.3	8.7	9.5	10.6
VF2XLBR0040N020S04	0.4	0.8	0.64	2	0.76	9.9°	50	4	2	▲	1	2.1	2.2	2.3	2.6
VF2XLBR0040N020S06	0.4	0.8	0.64	2	0.76	10.6°	50	6	2	▲	1	2.1	2.2	2.3	2.6
VF2XLBR0040N030S04	0.4	0.8	0.64	3	0.76	8.9°	50	4	2	▲	1	3.1	3.3	3.5	3.9
VF2XLBR0040N030S06	0.4	0.8	0.64	3	0.76	9.9°	50	6	2	▲	1	3.1	3.3	3.5	3.9
VF2XLBR0040N040S04	0.4	0.8	0.64	4	0.76	8.2°	50	4	2	▲	1	4.2	4.3	4.7	5.2
VF2XLBR0040N040S06	0.4	0.8	0.64	4	0.76	9.3°	50	6	2	▲	1	4.2	4.3	4.7	5.2
VF2XLBR0040N050S04	0.4	0.8	0.64	5	0.76	7.5°	50	4	2	▲	1	5.2	5.4	5.9	6.5
VF2XLBR0040N060S04	0.4	0.8	0.64	6	0.76	7°	50	4	2	▲	1	6.3	6.5	7.1	7.9
VF2XLBR0040N060S06	0.4	0.8	0.64	6	0.76	8.3°	50	6	2	▲	1	6.3	6.5	7.1	7.9
VF2XLBR0040N070S04	0.4	0.8	0.64	7	0.76	6.5°	50	4	2	▲	1	7.3	7.6	8.3	9.2
VF2XLBR0040N080S04	0.4	0.8	0.64	8	0.76	6.1°	50	4	2	▲	1	8.3	8.7	9.5	10.5
VF2XLBR0040N080S06	0.4	0.8	0.64	8	0.76	7.5°	50	6	2	▲	1	8.3	8.7	9.5	10.5
VF2XLBR0040N100S04	0.4	0.8	0.64	10	0.76	5.4°	50	4	2	▲	1	10.4	10.9	11.9	13.2
VF2XLBR0040N100S06	0.4	0.8	0.64	10	0.76	6.8°	60	6	2	▲	1	10.4	10.9	11.9	13.2
VF2XLBR0050N030S04	0.5	1	0.8	3	0.94	8.8°	50	4	2	▲	1	3.2	3.3	3.6	4.0
VF2XLBR0050N030S06	0.5	1	0.8	3	0.94	9.8°	50	6	2	▲	1	3.2	3.3	3.6	4.0
VF2XLBR0050N040S04	0.5	1	0.8	4	0.94	8°	50	4	2	▲	1	4.2	4.4	4.8	5.3
VF2XLBR0050N040S06	0.5	1	0.8	4	0.94	9.2°	50	6	2	▲	1	4.2	4.4	4.8	5.3
VF2XLBR0050N050S04	0.5	1	0.8	5	0.94	7.3°	50	4	2	▲	1	5.3	5.5	6.0	6.7
VF2XLBR0050N050S06	0.5	1	0.8	5	0.94	8.7°	50	6	2	▲	1	5.3	5.5	6.0	6.7
VF2XLBR0050N060S04	0.5	1	0.8	6	0.94	6.8°	50	4	2	▲	1	6.3	6.6	7.2	8.0
VF2XLBR0050N060S06	0.5	1	0.8	6	0.94	8.2°	50	6	2	▲	1	6.3	6.6	7.2	8.0
VF2XLBR0050N070S04	0.5	1	0.8	7	0.94	6.3°	50	4	2	▲	1	7.4	7.7	8.4	9.3

VF2XLB

IMPACT MIRACLE, Ball nose, 2 flute, Long neck

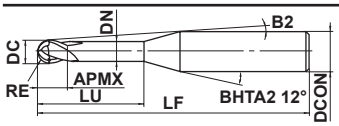
(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0050N080S04	0.5	1	0.8	8	0.94	5.9°	50	4	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0050N080S06	0.5	1	0.8	8	0.94	7.4°	50	6	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0050N090S04	0.5	1	0.8	9	0.94	5.5°	50	4	2	▲	1	9.5	9.9	10.8	12.0
VF2XLBR0050N100S04	0.5	1	0.8	10	0.94	5.2°	50	4	2	▲	1	10.5	11.0	12.0	13.3
VF2XLBR0050N100S06	0.5	1	0.8	10	0.94	6.7°	50	6	2	▲	1	10.5	11.0	12.0	13.3
VF2XLBR0050N120S04	0.5	1	0.8	12	0.94	4.6°	50	4	2	▲	1	12.6	13.2	14.4	15.9
VF2XLBR0050N120S06	0.5	1	0.8	12	0.94	6.1°	60	6	2	▲	1	12.6	13.2	14.4	15.9
VF2XLBR0050N140S04	0.5	1	0.8	14	0.94	4.2°	60	4	2	▲	1	14.7	15.3	16.8	18.6
VF2XLBR0050N160S04	0.5	1	0.8	16	0.94	3.8°	60	4	2	▲	1	16.8	17.5	19.2	21.3
VF2XLBR0050N160S06	0.5	1	0.8	16	0.94	5.3°	70	6	2	▲	1	16.8	17.5	19.2	21.3
VF2XLBR0050N180S04	0.5	1	0.8	18	0.94	3.5°	60	4	2	▲	1	18.9	19.7	21.6	23.9
VF2XLBR0050N200S04	0.5	1	0.8	20	0.94	3.3°	60	4	2	▲	1	21.0	21.9	24.0	26.6
VF2XLBR0050N200S06	0.5	1	0.8	20	0.94	4.6°	70	6	2	▲	1	21.0	21.9	24.0	26.6
VF2XLBR0060N060S04	0.6	1.2	0.96	6	1.14	6.6°	50	4	2	▲	1	6.3	6.6	7.2	8.0
VF2XLBR0060N060S06	0.6	1.2	0.96	6	1.14	8.1°	50	6	2	▲	1	6.3	6.6	7.2	8.0
VF2XLBR0060N080S04	0.6	1.2	0.96	8	1.14	5.7°	50	4	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0060N080S06	0.6	1.2	0.96	8	1.14	7.3°	50	6	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0060N100S04	0.6	1.2	0.96	10	1.14	5°	50	4	2	▲	1	10.5	11.0	12.0	13.3
VF2XLBR0060N100S06	0.6	1.2	0.96	10	1.14	6.6°	50	6	2	▲	1	10.5	11.0	12.0	13.3
VF2XLBR0060N120S04	0.6	1.2	0.96	12	1.14	4.5°	50	4	2	▲	1	12.6	13.2	14.4	15.9
VF2XLBR0060N120S06	0.6	1.2	0.96	12	1.14	6°	50	6	2	▲	1	12.6	13.2	14.4	15.9
VF2XLBR0060N140S04	0.6	1.2	0.96	14	1.14	4°	60	4	2	▲	1	14.7	15.3	16.8	18.6
VF2XLBR0060N160S04	0.6	1.2	0.96	16	1.14	3.7°	60	4	2	▲	1	16.8	17.5	19.2	21.2
VF2XLBR0060N160S06	0.6	1.2	0.96	16	1.14	5.2°	70	6	2	▲	1	16.8	17.5	19.2	21.2
VF2XLBR0070N080S04	0.7	1.4	1.12	8	1.34	5.5°	50	4	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0070N120S04	0.7	1.4	1.12	12	1.34	4.3°	50	4	2	▲	1	12.6	13.1	14.4	15.9
VF2XLBR0070N160S04	0.7	1.4	1.12	16	1.34	3.5°	60	4	2	▲	1	16.8	17.5	19.2	21.2
VF2XLBR0075N060S04	0.75	1.5	1.2	6	1.44	6.3°	50	4	2	▲	1	6.3	6.6	7.2	7.9
VF2XLBR0075N060S06	0.75	1.5	1.2	6	1.44	8°	50	6	2	▲	1	6.3	6.6	7.2	7.9
VF2XLBR0075N080S04	0.75	1.5	1.2	8	1.44	5.4°	50	4	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0075N080S06	0.75	1.5	1.2	8	1.44	7.2°	50	6	2	▲	1	8.4	8.8	9.6	10.6
VF2XLBR0075N100S04	0.75	1.5	1.2	10	1.44	4.7°	50	4	2	▲	1	10.5	11.0	12.0	13.2
VF2XLBR0075N100S06	0.75	1.5	1.2	10	1.44	6.5°	50	6	2	▲	1	10.5	11.0	12.0	13.2
VF2XLBR0075N120S04	0.75	1.5	1.2	12	1.44	4.2°	50	4	2	▲	1	12.6	13.1	14.4	15.9
VF2XLBR0075N120S06	0.75	1.5	1.2	12	1.44	5.9°	50	6	2	▲	1	12.6	13.1	14.4	15.9
VF2XLBR0075N140S04	0.75	1.5	1.2	14	1.44	3.8°	50	4	2	▲	1	14.7	15.3	16.8	18.5
VF2XLBR0075N140S06	0.75	1.5	1.2	14	1.44	5.4°	50	6	2	▲	1	14.7	15.3	16.8	18.5
VF2XLBR0075N160S04	0.75	1.5	1.2	16	1.44	3.4°	60	4	2	▲	1	16.8	17.5	19.2	21.2
VF2XLBR0075N160S06	0.75	1.5	1.2	16	1.44	5°	60	6	2	▲	1	16.8	17.5	19.2	21.2
VF2XLBR0075N180S04	0.75	1.5	1.2	18	1.44	3.1°	60	4	2	▲	1	18.9	19.7	21.6	23.8
VF2XLBR0075N200S04	0.75	1.5	1.2	20	1.44	2.9°	60	4	2	▲	1	21.0	21.9	23.9	*
VF2XLBR0075N200S06	0.75	1.5	1.2	20	1.44	4.3°	70	6	2	▲	1	21.0	21.9	23.9	26.5
VF2XLBR0080N080S04	0.8	1.6	1.28	8	1.54	5.3°	50	4	2	▲	1	8.4	8.8	9.6	10.5
VF2XLBR0080N120S04	0.8	1.6	1.28	12	1.54	4.1°	50	4	2	▲	1	12.6	13.1	14.4	15.9
VF2XLBR0080N160S04	0.8	1.6	1.28	16	1.54	3.3°	60	4	2	▲	1	16.8	17.5	19.1	21.2
VF2XLBR0080N200S04	0.8	1.6	1.28	20	1.54	2.8°	60	4	2	▲	1	21.0	21.9	23.9	*
VF2XLBR0090N080S04	0.9	1.8	1.44	8	1.74	5.1°	50	4	2	▲	1	8.4	8.8	9.6	10.5
VF2XLBR0090N120S04	0.9	1.8	1.44	12	1.74	3.9°	50	4	2	▲	1	12.6	13.1	14.3	15.8
VF2XLBR0090N160S04	0.9	1.8	1.44	16	1.74	3.1°	60	4	2	▲	1	16.8	17.5	19.1	21.1
VF2XLBR0090N200S04	0.9	1.8	1.44	20	1.74	2.6°	60	4	2	▲	1	20.9	21.8	23.9	*
VF2XLBR0100N060S04	1	2	1.6	6	1.9	5.8°	50	4	2	▲	1	6.2	6.5	7.0	7.7
VF2XLBR0100N060S06	1	2	1.6	6	1.9	7.9°	50	6	2	▲	1	6.2	6.5	7.0	7.7

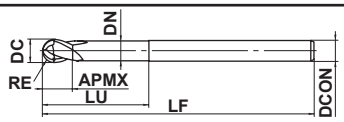
* No interference

▲ : Inventory maintained in Japan. To be replaced by new products.
VFR2XLB (J195) is alternative product.

ISO13399 ➤ J002



Type1



Type2

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0100N080S04	1	2	1.6	8	1.9	4.9°	50	4	2	▲	1	8.3	8.7	9.4	10.4
VF2XLBR0100N080S06	1	2	1.6	8	1.9	6.9°	50	6	2	▲	1	8.3	8.7	9.4	10.4
VF2XLBR0100N100S04	1	2	1.6	10	1.9	4.2°	50	4	2	▲	1	10.4	10.9	11.8	13.0
VF2XLBR0100N100S06	1	2	1.6	10	1.9	6.2°	50	6	2	▲	1	10.4	10.9	11.8	13.0
VF2XLBR0100N120S04	1	2	1.6	12	1.9	3.7°	50	4	2	▲	1	12.5	13.0	14.2	15.7
VF2XLBR0100N120S06	1	2	1.6	12	1.9	5.6°	50	6	2	▲	1	12.5	13.0	14.2	15.7
VF2XLBR0100N140S04	1	2	1.6	14	1.9	3.3°	50	4	2	▲	1	14.6	15.2	16.6	18.3
VF2XLBR0100N140S06	1	2	1.6	14	1.9	5.1°	50	6	2	▲	1	14.6	15.2	16.6	18.3
VF2XLBR0100N160S04	1	2	1.6	16	1.9	2.9°	60	4	2	▲	1	16.7	17.4	19.0	*
VF2XLBR0100N160S06	1	2	1.6	16	1.9	4.7°	60	6	2	▲	1	16.7	17.4	19.0	21.0
VF2XLBR0100N180S04	1	2	1.6	18	1.9	2.7°	60	4	2	▲	1	18.8	19.6	21.4	*
VF2XLBR0100N180S06	1	2	1.6	18	1.9	4.4°	60	6	2	▲	1	18.8	19.6	21.4	23.6
VF2XLBR0100N200S04	1	2	1.6	20	1.9	2.5°	60	4	2	▲	1	20.9	21.8	23.8	*
VF2XLBR0100N200S06	1	2	1.6	20	1.9	4.1°	60	6	2	▲	1	20.9	21.8	23.8	26.3
VF2XLBR0100N220S04	1	2	1.6	22	1.9	2.3°	60	4	2	▲	1	22.9	23.9	26.2	*
VF2XLBR0100N250S04	1	2	1.6	25	1.9	2°	70	4	2	▲	1	26.1	27.2	*	*
VF2XLBR0100N250S06	1	2	1.6	25	1.9	3.5°	70	6	2	▲	1	26.1	27.2	29.8	32.9
VF2XLBR0100N300S04	1	2	1.6	30	1.9	1.7°	70	4	2	▲	1	31.3	32.6	*	*
VF2XLBR0100N300S06	1	2	1.6	30	1.9	3°	80	6	2	▲	1	31.3	32.6	35.8	*
VF2XLBR0100N350S04	1	2	1.6	35	1.9	1.5°	80	4	2	▲	1	36.5	38.1	*	*
VF2XLBR0125N100S06	1.25	2.5	2	10	2.4	5.9°	60	6	2	▲	1	10.4	10.8	11.8	12.9
VF2XLBR0125N150S06	1.25	2.5	2	15	2.4	4.6°	60	6	2	▲	1	15.6	16.3	17.8	19.6
VF2XLBR0125N200S06	1.25	2.5	2	20	2.4	3.7°	70	6	2	▲	1	20.8	21.7	23.8	26.2
VF2XLBR0125N250S06	1.25	2.5	2	25	2.4	3.2°	70	6	2	▲	1	26.1	27.2	29.7	32.9
VF2XLBR0125N300S06	1.25	2.5	2	30	2.4	2.8°	80	6	2	▲	1	31.3	32.6	35.7	*
VF2XLBR0125N350S06	1.25	2.5	2	35	2.4	2.4°	80	6	2	▲	1	36.5	38.1	41.7	*
VF2XLBR0150N080S06	1.5	3	2.4	8	2.9	6.3°	60	6	2	▲	1	8.3	8.6	9.3	10.2
VF2XLBR0150N100S06	1.5	3	2.4	10	2.9	5.5°	60	6	2	▲	1	10.4	10.8	11.7	12.9
VF2XLBR0150N120S06	1.5	3	2.4	12	2.9	4.9°	60	6	2	▲	1	12.5	13.0	14.1	15.5
VF2XLBR0150N140S06	1.5	3	2.4	14	2.9	4.4°	60	6	2	▲	1	14.6	15.2	16.5	18.2
VF2XLBR0150N160S06	1.5	3	2.4	16	2.9	4°	60	6	2	▲	1	16.7	17.3	18.9	20.8
VF2XLBR0150N200S06	1.5	3	2.4	20	2.9	3.4°	70	6	2	▲	1	20.8	21.7	23.7	26.1
VF2XLBR0150N250S06	1.5	3	2.4	25	2.9	2.8°	70	6	2	▲	1	26.1	27.2	29.7	*
VF2XLBR0150N300S06	1.5	3	2.4	30	2.9	2.5°	70	6	2	▲	1	31.3	32.6	35.7	*
VF2XLBR0150N350S06	1.5	3	2.4	35	2.9	2.2°	80	6	2	▲	1	36.5	38.0	41.7	*
VF2XLBR0150N400S06	1.5	3	2.4	40	2.9	1.9°	90	6	2	▲	1	41.7	43.5	*	*
VF2XLBR0175N160S06	1.75	3.5	2.8	16	3.4	3.6°	60	6	2	▲	1	16.7	17.3	18.9	20.8
VF2XLBR0175N200S06	1.75	3.5	2.8	20	3.4	3°	70	6	2	▲	1	20.8	21.7	23.7	*
VF2XLBR0175N250S06	1.75	3.5	2.8	25	3.4	2.5°	70	6	2	▲	1	26.0	27.1	29.6	*
VF2XLBR0175N300S06	1.75	3.5	2.8	30	3.4	2.1°	80	6	2	▲	1	31.3	32.6	35.6	*
VF2XLBR0175N350S06	1.75	3.5	2.8	35	3.4	1.9°	80	6	2	▲	1	36.5	38.0	*	*
VF2XLBR0175N400S06	1.75	3.5	2.8	40	3.4	1.7°	90	6	2	▲	1	41.7	43.5	*	*
VF2XLBR0200N100S06	2	4	3.2	10	3.9	4.5°	70	6	2	▲	1	10.4	10.8	11.6	12.7
VF2XLBR0200N120S06	2	4	3.2	12	3.9	3.9°	70	6	2	▲	1	12.5	12.9	14.0	15.4
VF2XLBR0200N140S06	2	4	3.2	14	3.9	3.4°	70	6	2	▲	1	14.6	15.1	16.4	18.0
VF2XLBR0200N160S06	2	4	3.2	16	3.9	3.1°	70	6	2	▲	1	16.6	17.3	18.8	20.7
VF2XLBR0200N200S06	2	4	3.2	20	3.9	2.6°	70	6	2	▲	1	20.8	21.7	23.6	*
VF2XLBR0200N250S06	2	4	3.2	25	3.9	2.1°	70	6	2	▲	1	26.0	27.1	29.6	*
VF2XLBR0200N300S06	2	4	3.2	30	3.9	1.8°	70	6	2	▲	1	31.2	32.6	*	*
VF2XLBR0200N350S06	2	4	3.2	35	3.9	1.6°	80	6	2	▲	1	36.5	38.0	*	*
VF2XLBR0200N400S06	2	4	3.2	40	3.9	1.4°	90	6	2	▲	1	41.7	43.5	*	*
VF2XLBR0200N450S06	2	4	3.2	45	3.9	1.2°	90	6	2	▲	1	46.9	48.9	*	*

* No interference

VF2XLB

IMPACT MIRACLE, Ball nose, 2 flute, Long neck

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0200N500S06	2	4	3.2	50	3.9	1.1°	100	6	2	▲	1	52.1	54.3	*	*
VF2XLBR0250N200S06	2.5	5	4	20	4.9	1.5°	70	6	2	▲	1	20.8	21.6	*	*
VF2XLBR0250N250S06	2.5	5	4	25	4.9	1.2°	70	6	2	▲	1	26.0	27.1	*	*
VF2XLBR0250N300S06	2.5	5	4	30	4.9	1°	80	6	2	▲	1	31.2	*	*	*
VF2XLBR0250N350S06	2.5	5	4	35	4.9	0.9°	80	6	2	▲	1	36.4	*	*	*
VF2XLBR0300N300S06	3	6	4.8	30	5.85	—	80	6	2	▲	2	*	*	*	*
VF2XLBR0300N400S06	3	6	4.8	40	5.85	—	90	6	2	▲	2	*	*	*	*
VF2XLBR0300N500S06	3	6	4.8	50	5.85	—	100	6	2	▲	2	*	*	*	*

* No interference

▲ : **Inventory maintained in Japan. To be replaced by new products.**
VFR2XLB (J195) is alternative product.

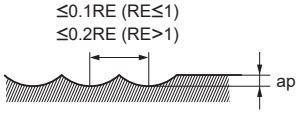
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45—55HRC) AISI H13			Hardened steel (55—62HRC) AISI D2		
R RE (mm)	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R 0.1	0.5	40000	300	0.003	40000	300	0.002
	1	40000	300	0.002	40000	300	0.002
	1.5	40000	300	0.001	40000	200	0.001
	2	40000	200	0.001	40000	100	0.001
	2.5	40000	100	0.001	40000	60	0.001
R 0.15	1	40000	500	0.007	40000	500	0.005
	1.5	40000	500	0.005	40000	500	0.003
	2	40000	500	0.003	40000	500	0.002
	2.5	40000	400	0.003	40000	400	0.002
	3	40000	300	0.002	40000	300	0.001
	4	30000	200	0.002	30000	200	0.001
R 0.2	1	40000	1400	0.015	40000	1400	0.01
	1.5	40000	1000	0.01	40000	1000	0.006
	2	40000	1000	0.01	40000	1000	0.006
	2.5	40000	700	0.005	40000	700	0.003
	3	40000	700	0.005	40000	700	0.003
	4	40000	600	0.004	40000	500	0.003
	5	40000	400	0.003	40000	300	0.002
R 0.25	1.5	40000	2000	0.02	40000	2000	0.015
	2	40000	2000	0.02	40000	2000	0.015
	3	40000	1200	0.015	40000	1200	0.01
	4	36000	900	0.01	36000	900	0.007
	5	36000	700	0.007	36000	600	0.005
	6	36000	600	0.006	36000	500	0.004
R 0.3	2	40000	2800	0.03	40000	2800	0.02
	3	40000	2800	0.03	40000	2800	0.02
	4	35000	2000	0.02	35000	2000	0.015
	5	30000	1000	0.01	30000	1000	0.007
	6	30000	800	0.008	30000	800	0.005
	7	30000	600	0.008	30000	600	0.005
	8	25000	400	0.006	25000	400	0.004
R 0.4	2	40000	3500	0.04	40000	3500	0.03
	3	40000	3000	0.04	40000	3000	0.03
	4	40000	3000	0.02	40000	3000	0.015
	6	30000	1600	0.02	30000	1600	0.01
	8	25000	1000	0.01	25000	1000	0.007
	10	25000	600	0.008	25000	600	0.005
R 0.5	3	40000	4000	0.05	40000	4000	0.04
	4	40000	4000	0.05	40000	4000	0.04
	5	40000	3000	0.03	40000	3000	0.02
	6	35000	2000	0.03	35000	2000	0.02
	8	30000	1600	0.02	30000	1600	0.01
	10	20000	1000	0.01	20000	1000	0.01
	12	20000	1000	0.01	18000	800	0.008
	14	18000	600	0.008	18000	480	0.008
	16	18000	500	0.008	18000	400	0.006
	18	13000	300	0.005	13000	240	0.004
	20	13000	250	0.005	13000	200	0.004
R 0.6	6	40000	4000	0.05	35000	3500	0.04
	8	40000	3000	0.05	27000	2000	0.04
	10	27000	1900	0.03	24000	1700	0.02
	12	16000	1100	0.02	16000	1000	0.01
	14	16000	850	0.01	16000	780	0.01
	16	15000	500	0.01	14000	400	0.006
R 0.7	8	40000	4500	0.06	28000	3200	0.05
	12	32000	3000	0.03	19000	1800	0.02
	16	15000	1000	0.02	14000	800	0.01
R 0.75	6	40000	5000	0.07	32000	4000	0.06
	8	40000	5000	0.07	28000	3500	0.06
	10	40000	4500	0.06	21000	2400	0.04
	12	32000	3400	0.04	19000	2000	0.03
	14	16000	1500	0.04	13000	1200	0.03
	16	13000	1200	0.03	13000	1200	0.02

Workpiece Material		Hardened steel (45—55HRC) AISI H13			Hardened steel (55—62HRC) AISI D2		
R RE (mm)	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R 0.75	18	13000	1100	0.02	10000	800	0.02
	20	12000	900	0.02	9000	700	0.01
R 0.8	8	40000	5000	0.08	26000	3200	0.07
	12	35000	3800	0.05	20000	2100	0.03
	16	13000	1200	0.04	12000	1100	0.02
	20	10000	750	0.02	8000	600	0.01
R 0.9	8	40000	5000	0.09	25000	3100	0.08
	12	36000	3800	0.06	18000	1900	0.04
	16	25000	2500	0.04	14000	1300	0.025
	20	10000	1000	0.03	8000	800	0.02
R 1	6	40000	6000	0.1	24000	3400	0.1
	8	40000	5000	0.1	24000	3000	0.1
	10	40000	5000	0.08	24000	3000	0.07
	12	40000	5000	0.08	24000	2600	0.05
	14	40000	5000	0.06	21000	2300	0.05
	16	32000	3500	0.05	16000	1700	0.03
	18	24000	2400	0.04	13000	1300	0.03
	20	10000	1000	0.04	10000	1000	0.03
	22	10000	1000	0.04	10000	1000	0.02
	25	10000	1000	0.04	8000	800	0.02
	30	10000	800	0.02	8000	800	0.015
	35	10000	500	0.02	8000	400	0.01
R 1.25	10	36000	5000	0.12	20000	2600	0.11
	15	36000	4600	0.08	18000	2000	0.075
	20	26000	3000	0.07	13000	1400	0.05
	25	10000	1100	0.06	8000	800	0.04
	30	8000	800	0.05	7000	700	0.03
	35	8000	500	0.03	5000	400	0.03
R 1.5	8	32000	6400	0.15	16000	3000	0.15
	10	32000	5100	0.15	16000	2200	0.15
	12	32000	5100	0.13	16000	2200	0.13
	14	32000	4500	0.13	16000	2200	0.1
	16	32000	4500	0.1	16000	1800	0.1
	20	27000	3800	0.1	14000	1600	0.06
	25	21000	2700	0.08	11000	1200	0.06
	30	9000	1000	0.08	7000	700	0.05
	35	6000	700	0.06	6000	600	0.04
	40	6000	600	0.04	5000	400	0.03
R 1.75	16	28000	4200	0.13	14000	1600	0.13
	20	26000	3800	0.13	13000	1600	0.11
	25	23000	3300	0.12	11000	1200	0.08
	30	13000	1900	0.09	9000	1000	0.07
	35	9000	1200	0.08	6000	600	0.06
	40	8500	1100	0.07	5500	500	0.04
R 2	10	24000	4800	0.2	12000	2200	0.2
	12	24000	4800	0.2	12000	2200	0.2
	14	24000	3800	0.15	12000	1500	0.15
	16	24000	3800	0.15	12000	1500	0.15
	20	24000	3800	0.15	12000	1500	0.15
	25	24000	3800	0.15	10000	1100	0.1
	30	20000	3000	0.1	10000	1100	0.08
	35	12000	1700	0.1	8000	900	0.08
	40	11000	1500	0.1	5000	500	0.06
	45	10000	1300	0.08	5000	500	0.05
	50	8000	1000	0.05	4000	400	0.04
R 2.5	20	19000	3400	0.2	10000	1400	0.2
	25	19000	3400	0.2	10000	1400	0.2
	30	19000	3200	0.15	8000	1000	0.15
	35	16000	2700	0.1	8000	900	0.1
R 3	30	16000	3500	0.2	8000	1000	0.2
	40	16000	3000	0.15	8000	800	0.15
	50	16000	2700	0.15	6000	500	0.15

Depth of cut



RE:Radius

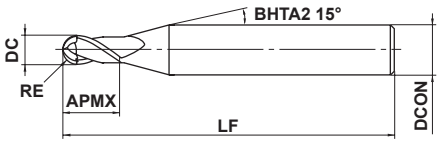
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

CRN2MB

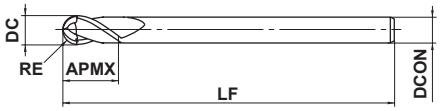
Ball nose, Medium cut length, 2 flute, For copper electrodes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1



Type2

0.2≤RE≤5				
±0.01				
0.4≤DC≤10				
0 - 0.02				
4≤DCON≤6	8≤DCON≤10			
0 - 0.008	0 - 0.009			

●2 flute ball nose end mill with CRN coating for copper electrode machining.

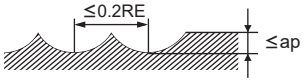
(mm)

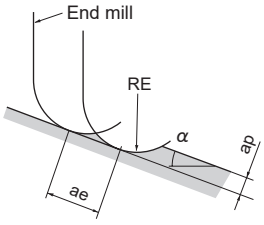
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
CRN2MBR0020S04	0.2	0.4	0.8	45	4	2	●	1
CRN2MBR0030S04	0.3	0.6	1.2	45	4	2	●	1
CRN2MBR0040S04	0.4	0.8	1.6	45	4	2	●	1
CRN2MBR0050S04	0.5	1	2.5	45	4	2	●	1
CRN2MBR0050S06	0.5	1	2.5	50	6	2	●	1
CRN2MBR0075S04	0.75	1.5	4	45	4	2	●	1
CRN2MBR0100S06	1	2	6	50	6	2	●	1
CRN2MBR0150S06	1.5	3	8	70	6	2	●	1
CRN2MBR0200S06	2	4	8	70	6	2	●	1
CRN2MBR0300S06	3	6	12	80	6	2	●	2
CRN2MBR0400S08	4	8	14	90	8	2	●	2
CRN2MBR0500S10	5	10	18	100	10	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Copper, Copper alloys				
R **RE** (mm)	$\alpha \leq 15°$		$\alpha > 15°$		Depth of cut ap(mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	
R0.2	40000	1600	40000	1200	0.02
R0.3	40000	3200	40000	1600	0.03
R0.4	40000	6400	40000	2400	0.05
R0.5	40000	8000	40000	3200	0.06
R0.75	40000	9600	40000	4000	0.09
R1	40000	9600	39000	4700	0.11
R1.25	40000	12000	30000	4500	0.12
R1.5	40000	12000	27000	4300	0.13
R2	32000	11000	20000	3600	0.15
R2.5	25000	9000	16000	2900	0.20
R3	21000	8400	13000	2600	0.25
R4	16000	6400	10000	2000	0.30
R5	13000	5200	8000	1700	0.50
Depth of cut	 RE:Radius				



ae:Pick Feed

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Water-soluble cutting fluid is recommended.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

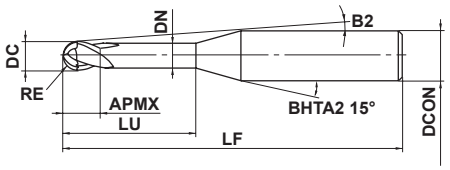
CRN2XLB

Ball nose, Medium cut length, 2 flute, Long neck, For copper electrodes

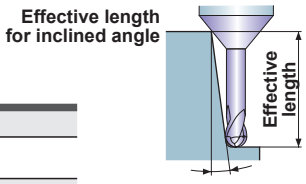
UWC CRN 30°

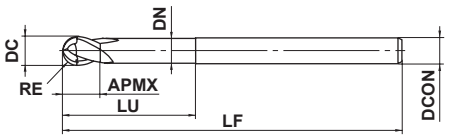
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1





Type2

0.15≤RE≤3			
±0.01			
0.3≤DC≤6			
0 - 0.02			
4≤DCON≤6			
h6 0 - 0.008			

●2 flute long neck ball nose end mill with CRN coating for copper electrode machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
CRN2XLBR0015N010S04	0.15	0.3	0.3	1	0.27	13.3°	50	4	2	●	1	1.0	1.1	1.2	1.3
CRN2XLBR0015N015S04	0.15	0.3	0.3	1.5	0.27	12.5°	50	4	2	●	1	1.5	1.6	1.7	1.9
CRN2XLBR0015N020S04	0.15	0.3	0.3	2	0.27	11.9°	50	4	2	●	1	2.1	2.2	2.3	2.5
CRN2XLBR0020N010S04	0.2	0.4	0.4	1	0.36	13.4°	50	4	2	●	1	1.0	1.0	1.1	1.2
CRN2XLBR0020N015S04	0.2	0.4	0.4	1.5	0.36	12.6°	50	4	2	●	1	1.5	1.6	1.7	1.8
CRN2XLBR0020N020S04	0.2	0.4	0.4	2	0.36	11.9°	50	4	2	●	1	2.0	2.1	2.3	2.5
CRN2XLBR0020N030S04	0.2	0.4	0.4	3	0.36	10.7°	50	4	2	●	1	3.1	3.2	3.4	3.7
CRN2XLBR0025N015S04	0.25	0.5	0.5	1.5	0.46	12.6°	50	4	2	●	1	1.5	1.6	1.7	1.8
CRN2XLBR0025N020S04	0.25	0.5	0.5	2	0.46	11.9°	50	4	2	●	1	2.0	2.1	2.3	2.4
CRN2XLBR0025N030S04	0.25	0.5	0.5	3	0.46	10.6°	50	4	2	●	1	3.1	3.2	3.4	3.7
CRN2XLBR0025N030S06	0.25	0.5	0.5	3	0.46	11.9°	50	6	2	●	1	3.1	3.2	3.4	3.7
CRN2XLBR0025N040S04	0.25	0.5	0.5	4	0.46	9.6°	50	4	2	●	1	4.1	4.3	4.6	4.9
CRN2XLBR0025N060S04	0.25	0.5	0.5	6	0.46	8.1°	50	4	2	●	1	6.2	6.4	6.9	7.4
CRN2XLBR0025N080S04	0.25	0.5	0.5	8	0.46	7°	50	4	2	●	1	8.3	8.5	9.2	9.9
CRN2XLBR0030N020S04	0.3	0.6	0.6	2	0.56	11.8°	50	4	2	●	1	2.1	2.2	2.3	2.5
CRN2XLBR0030N040S04	0.3	0.6	0.6	4	0.56	9.5°	50	4	2	●	1	4.2	4.3	4.6	5.0
CRN2XLBR0030N060S04	0.3	0.6	0.6	6	0.56	8°	50	4	2	●	1	6.3	6.5	6.9	7.5
CRN2XLBR0030N080S04	0.3	0.6	0.6	8	0.56	6.9°	50	4	2	●	1	8.3	8.6	9.2	10.0
CRN2XLBR0030N100S04	0.3	0.6	0.6	10	0.56	6°	50	4	2	●	1	10.4	10.8	11.5	12.5
CRN2XLBR0040N020S04	0.4	0.8	0.8	2	0.76	11.7°	50	4	2	●	1	2.1	2.2	2.3	2.5
CRN2XLBR0040N040S04	0.4	0.8	0.8	4	0.76	9.4°	50	4	2	●	1	4.2	4.3	4.6	5.0
CRN2XLBR0040N060S04	0.4	0.8	0.8	6	0.76	7.8°	50	4	2	●	1	6.3	6.5	6.9	7.5
CRN2XLBR0040N080S04	0.4	0.8	0.8	8	0.76	6.7°	50	4	2	●	1	8.3	8.6	9.2	10.0
CRN2XLBR0040N100S04	0.4	0.8	0.8	10	0.76	5.9°	50	4	2	●	1	10.4	10.8	11.5	12.4
CRN2XLBR0050N030S04	0.5	1	1	3	0.94	10.1°	50	4	2	●	1	3.2	3.3	3.6	3.9
CRN2XLBR0050N040S04	0.5	1	1	4	0.94	9.1°	50	4	2	●	1	4.2	4.4	4.8	5.2
CRN2XLBR0050N050S04	0.5	1	1	5	0.94	8.2°	50	4	2	●	1	5.3	5.5	6.0	6.4
CRN2XLBR0050N050S06	0.5	1	1	5	0.94	10.1°	50	6	2	●	1	5.3	5.5	6.0	6.4
CRN2XLBR0050N060S04	0.5	1	1	6	0.94	7.5°	50	4	2	●	1	6.3	6.6	7.1	7.7
CRN2XLBR0050N060S06	0.5	1	1	6	0.94	9.4°	50	6	2	●	1	6.3	6.6	7.1	7.7
CRN2XLBR0050N080S04	0.5	1	1	8	0.94	6.4°	50	4	2	●	1	8.4	8.8	9.4	10.2
CRN2XLBR0050N080S06	0.5	1	1	8	0.94	8.3°	50	6	2	●	1	8.4	8.8	9.4	10.2
CRN2XLBR0050N100S04	0.5	1	1	10	0.94	5.6°	50	4	2	●	1	10.5	10.9	11.7	12.6
CRN2XLBR0050N120S04	0.5	1	1	12	0.94	5°	50	4	2	●	1	12.6	13.1	14.0	15.1

● : Inventory maintained in Japan.

ISO13399 ➤ J002

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
CRN2XLBR0050N160S04	0.5	1	1	16	0.94	4.1°	55	4	2	●	1	16.8	17.4	18.6	20.1
CRN2XLBR0050N200S04	0.5	1	1	20	0.94	3.4°	55	4	2	●	1	20.9	21.6	23.2	25.1
CRN2XLBR0075N080S04	0.75	1.5	1.5	8	1.44	5.9°	50	4	2	●	1	8.4	8.8	9.4	10.1
CRN2XLBR0075N080S06	0.75	1.5	1.5	8	1.44	8.1°	50	6	2	●	1	8.4	8.8	9.4	10.1
CRN2XLBR0075N100S04	0.75	1.5	1.5	10	1.44	5.1°	50	4	2	●	1	10.5	10.9	11.7	12.6
CRN2XLBR0075N100S06	0.75	1.5	1.5	10	1.44	7.2°	50	6	2	●	1	10.5	10.9	11.7	12.6
CRN2XLBR0075N160S04	0.75	1.5	1.5	16	1.44	3.6°	55	4	2	●	1	16.8	17.3	18.6	20.0
CRN2XLBR0100N080S04	1	2	2	8	1.90	5.3°	50	4	2	●	1	8.3	8.7	9.2	9.9
CRN2XLBR0100N100S04	1	2	2	10	1.90	4.5°	50	4	2	●	1	10.4	10.8	11.5	12.4
CRN2XLBR0100N100S06	1	2	2	10	1.90	6.9°	50	6	2	●	1	10.4	10.8	11.5	12.4
CRN2XLBR0100N120S04	1	2	2	12	1.90	3.9°	50	4	2	●	1	12.5	12.9	13.8	14.9
CRN2XLBR0100N120S06	1	2	2	12	1.90	6.1°	50	6	2	●	1	12.5	12.9	13.8	14.9
CRN2XLBR0100N140S06	1	2	2	14	1.90	5.6°	55	6	2	●	1	14.6	15.1	16.1	17.4
CRN2XLBR0100N160S04	1	2	2	16	1.90	3.1°	55	4	2	●	1	16.7	17.2	18.4	19.9
CRN2XLBR0100N200S04	1	2	2	20	1.90	2.5°	60	4	2	●	1	20.8	21.5	23.0	*
CRN2XLBR0100N250S06	1	2	2	25	1.90	3.7°	65	6	2	●	1	26.0	26.8	28.8	31.0
CRN2XLBR0100N300S06	1	2	2	30	1.90	3.2°	70	6	2	●	1	31.1	32.2	34.5	37.3
CRN2XLBR0150N160S06	1.5	3	3	16	2.90	4.3°	60	6	2	●	1	16.6	17.2	18.4	19.7
CRN2XLBR0150N250S06	1.5	3	3	25	2.90	3°	70	6	2	●	1	26.0	26.8	28.7	*
CRN2XLBR0150N350S06	1.5	3	3	35	2.90	2.2°	80	6	2	●	1	36.3	37.5	40.2	*
CRN2XLBR0200N160S06	2	4	4	16	3.90	3.2°	70	6	2	●	1	16.6	17.1	18.3	19.6
CRN2XLBR0200N200S06	2	4	4	20	3.90	2.7°	70	6	2	●	1	20.8	21.4	22.9	*
CRN2XLBR0200N300S06	2	4	4	30	3.90	1.8°	70	6	2	●	1	31.1	32.1	*	*
CRN2XLBR0200N400S06	2	4	4	40	3.90	1.4°	90	6	2	●	1	41.4	42.8	*	*
CRN2XLBR0250N200S06	2.5	5	5	20	4.90	1.5°	70	6	2	●	1	20.7	21.4	*	*
CRN2XLBR0300N300S06	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*
CRN2XLBR0300N500S06	3	6	6	50	5.85	—	100	6	2	●	2	*	*	*	*

* No interference

CRN2XLB

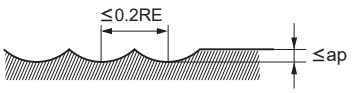
Ball nose, Medium cut length, 2 flute, Long neck, For copper electrodes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Copper, Copper alloys		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap(mm)
R0.15	**1**	40000	1200	0.007
	2	40000	800	0.003
R0.2	**1**	40000	2000	0.015
	2	40000	1300	0.01
	3	40000	800	0.005
R0.25	**2**	40000	2000	0.02
	4	40000	1200	0.01
	6	36000	600	0.006
	10	26000	200	0.002
R0.3	**2**	40000	3200	0.03
	6	40000	1200	0.008
	10	30000	500	0.003
R0.4	**4**	40000	4000	0.02
	6	40000	2500	0.02
	10	30000	700	0.008
R0.5	**4**	40000	6400	0.05
	6	40000	4800	0.03
	8	40000	3000	0.02
	10	33000	2000	0.01
	16	18000	500	0.008
	20	13000	250	0.005

Workpiece Material		Copper, Copper alloys		
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap(mm)
R0.75	**8**	40000	8000	0.07
	12	35000	4500	0.04
	16	20000	2000	0.03
	20	12000	900	0.02
R1	**8**	40000	9600	0.10
	10	40000	6400	0.08
	12	40000	6000	0.08
	16	30000	3000	0.05
	20	20000	2000	0.04
	30	10000	800	0.02
R1.5	**16**	40000	12000	0.10
	25	25000	6000	0.08
	35	6000	700	0.06
R2	**16**	32000	11000	0.15
	20	32000	9000	0.15
	30	20000	4500	0.10
	40	15000	3000	0.08
	50	8000	1000	0.05
R2.5	**20**	25000	9500	0.20
	30	20000	3300	0.15
R3	**30**	21000	8400	0.20
	50	20000	3000	0.15

Depth of cut



RE:Radius

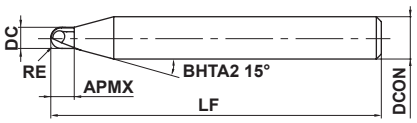
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

DC2SB

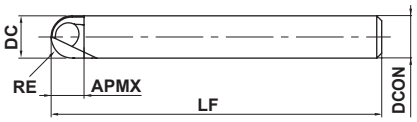
Ball nose, Short cut length, 2 flute, For hard brittle materials

Cemented carbide	Alumina Zirconia	Silicon carbide Silicon nitride	Quartz glass
◎	○	○	○





Type1



Type2

0.1≤RE≤3				
±0.01				
4≤DCON≤6				
0 -0.008				

●Suitable DC ball end mill for cemented carbide and other hard brittle materials processing.

(mm)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DC2SBR0010	0.1	0.2	0.12	50	4	2	●	1
DC2SBR0020	0.2	0.4	0.24	50	4	2	●	1
DC2SBR0030	0.3	0.6	0.42	50	4	2	●	1
DC2SBR0040	0.4	0.8	0.56	50	4	2	●	1
DC2SBR0050	0.5	1	0.7	50	4	2	●	1
DC2SBR0075	0.75	1.5	1	50	4	2	●	1
DC2SBR0100	1	2	1.4	50	4	2	●	1
DC2SBR0150	1.5	3	2.1	60	6	2	●	1
DC2SBR0200	2	4	2.8	60	6	2	●	1
DC2SBR0250	2.5	5	3.5	60	6	2	●	1
DC2SBR0300	3	6	4.2	60	6	2	●	2

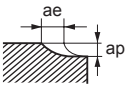
● : **Inventory maintained in Japan.**

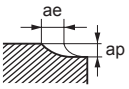
Click here for product NEWS ▶

DC2SB

Ball nose, Short cut length, 2 flute, For hard brittle materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Cemented carbide				Alumina Zirconia			
Dia. **DC** (mm)	R **RE** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.1**	30000	100	0.01	0.01	30000	100	0.01	0.01
0.4	**0.2**	30000	150	0.02	0.08	30000	150	0.02	0.08
0.6	**0.3**	30000	200	0.03	0.14	30000	200	0.03	0.14
0.8	**0.4**	30000	250	0.04	0.19	30000	250	0.04	0.19
1	**0.5**	30000	300	0.05	0.25	30000	300	0.05	0.25
1.5	**0.75**	30000	300	0.075	0.275	30000	300	0.075	0.275
2	**1**	30000	300	0.1	0.3	30000	300	0.1	0.3
3	**1.5**	27500	275	0.125	0.33	27500	275	0.125	0.33
4	**2**	24000	240	0.15	0.35	24000	240	0.15	0.35
5	**2.5**	22000	220	0.175	0.37	22000	220	0.175	0.37
6	**3**	20000	200	0.2	0.4	20000	200	0.2	0.4
Depth of cut									

Workpiece Material		Silicon carbide Silicon nitride				Quartz glass			
Dia. **DC** (mm)	R **RE** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.1**	30000	50	0.005	0.005	30000	150	0.015	0.015
0.4	**0.2**	30000	75	0.01	0.04	30000	225	0.03	0.12
0.6	**0.3**	30000	100	0.015	0.07	30000	300	0.045	0.21
0.8	**0.4**	30000	125	0.02	0.095	30000	375	0.06	0.285
1	**0.5**	30000	150	0.025	0.125	30000	450	0.075	0.375
1.5	**0.75**	30000	150	0.038	0.138	30000	450	0.113	0.413
2	**1**	30000	150	0.05	0.15	30000	450	0.15	0.45
3	**1.5**	27500	138	0.063	0.165	27500	413	0.188	0.495
4	**2**	24000	120	0.075	0.175	24000	360	0.225	0.525
5	**2.5**	22000	110	0.088	0.185	22000	330	0.263	0.555
6	**3**	20000	100	0.1	0.2	20000	300	0.3	0.6
Depth of cut									

Note 1) The cemented carbide in the above mentioned cutting conditions table is based on CIS standard VM-40(90HRA).

Note 2) Air blow or dry machining is recommended with cemented carbide machining.
*Note: Using coolants or oil mists may decrease tool longevity.

Note 3) The use of a water soluble cutting oil is recommended with the processing of hard brittle materials other than the cemented carbide mentioned in the above table. Be sure to refuel the oil and eliminate any chip discharge that adheres to the tool.

Note 4) Cutting conditions may need adjustments depending on the type of workpiece material.

Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

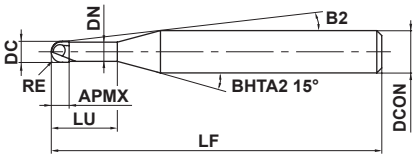
Note 6) Implementation of special counter measures is recommended since fine chip discharge may enter gaps in the processing machinery.

DC2XLB

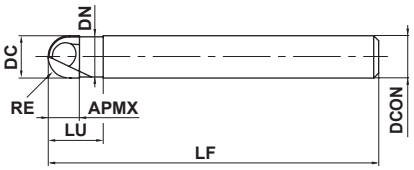
Ball nose, Short cut length, 2 flute, For hard brittle materials

Cemented carbide	Alumina Zirconia	Silicon carbide Silicon nitride	Quartz glass
◎	○	○	○





Type1



Type2

0.1≤RE≤3					
±0.01					
4≤DCON≤6					
0 -0.008					

● Suitable DC long neck ball end mill for cemented carbide and other hard brittle materials processing.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	B2	DCON	No. of Flutes	Stock	Type
DC2XLBR0010N005	0.1	0.2	0.12	0.5	0.18	50	11.5°	4	2	●	1
DC2XLBR0020N010	0.2	0.4	0.24	1	0.36	50	11°	4	2	●	1
DC2XLBR0030N015	0.3	0.6	0.36	1.5	0.56	50	10.4°	4	2	●	1
DC2XLBR0040N020	0.4	0.8	0.48	2	0.76	50	9.9°	4	2	●	1
DC2XLBR0050N025	0.5	1	0.6	2.5	0.96	50	9.2°	4	2	●	1
DC2XLBR0050N050	0.5	1	0.6	5	0.96	50	7.3°	4	2	●	1
DC2XLBR0075N038	0.75	1.5	0.9	3.8	1.44	50	7.8°	4	2	●	1
DC2XLBR0100N060	1	2	1.2	6	1.94	50	5.8°	4	2	●	1
DC2XLBR0100N100	1	2	1.2	10	1.94	50	4.2°	4	2	●	1
DC2XLBR0150N080	1.5	3	1.8	8	2.9	60	6.3°	6	2	●	1
DC2XLBR0200N100	2	4	2.4	10	3.9	60	4.5°	6	2	●	1
DC2XLBR0250N100	2.5	5	3	10	4.9	60	2.9°	6	2	●	1
DC2XLBR0300N100	3	6	3.6	10	5.85	60	—	6	2	●	2

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

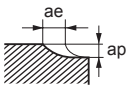
DC2XLB

Ball nose, Short cut length, 2 flute, For hard brittle materials

RECOMMENDED CUTTING CONDITIONS

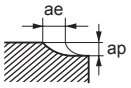
Workpiece Material			Cemented carbide				Alumina Zirconia			
Dia. **DC** (mm)	R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.1**	**0.5**	30000	30	0.005	0.01	30000	30	0.005	0.01
0.4	**0.2**	**1**	30000	100	0.015	0.08	30000	100	0.015	0.08
0.6	**0.3**	**1.5**	30000	200	0.03	0.14	30000	200	0.03	0.14
0.8	**0.4**	**2**	30000	250	0.04	0.19	30000	250	0.04	0.19
1	**0.5**	**2.5**	30000	300	0.05	0.25	30000	300	0.05	0.25
1	**0.5**	**5**	30000	300	0.05	0.25	30000	300	0.05	0.25
1.5	**0.75**	**3.8**	30000	300	0.075	0.275	30000	300	0.075	0.275
2	**1**	**6**	30000	300	0.1	0.3	30000	300	0.1	0.3
2	**1**	**10**	30000	300	0.1	0.3	30000	300	0.1	0.3
3	**1.5**	**8**	27500	275	0.125	0.33	27500	275	0.125	0.33
4	**2**	**10**	24000	240	0.15	0.35	24000	240	0.15	0.35
5	**2.5**	**10**	22000	220	0.175	0.37	22000	220	0.175	0.37
6	**3**	**10**	20000	200	0.2	0.4	20000	200	0.2	0.4

Depth of cut



Workpiece Material			Silicon carbide Silicon nitride				Quartz glass			
Dia. **DC** (mm)	R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.1**	**0.5**	30000	15	0.003	0.005	30000	45	0.008	0.015
0.4	**0.2**	**1**	30000	50	0.008	0.04	30000	150	0.023	0.12
0.6	**0.3**	**1.5**	30000	100	0.015	0.07	30000	300	0.045	0.21
0.8	**0.4**	**2**	30000	125	0.02	0.095	30000	375	0.06	0.285
1	**0.5**	**2.5**	30000	150	0.025	0.125	30000	450	0.075	0.375
1	**0.5**	**5**	30000	150	0.025	0.125	30000	450	0.075	0.375
1.5	**0.75**	**3.8**	30000	150	0.038	0.138	30000	450	0.113	0.413
2	**1**	**6**	30000	150	0.05	0.15	30000	450	0.15	0.45
2	**1**	**10**	30000	150	0.05	0.15	30000	450	0.15	0.45
3	**1.5**	**8**	27500	138	0.063	0.165	27500	413	0.188	0.495
4	**2**	**10**	24000	120	0.075	0.175	24000	360	0.225	0.525
5	**2.5**	**10**	22000	110	0.088	0.185	22000	330	0.263	0.555
6	**3**	**10**	20000	100	0.1	0.2	20000	300	0.3	0.6

Depth of cut



Note 1) The cemented carbide in the above mentioned cutting conditions table is based on CIS standard VM-40(90HRA).

Note 2) Air blow or dry machining is recommended with cemented carbide machining.
*Note: Using coolants or oil mists may decrease tool longevity.

Note 3) The use of a water soluble cutting oil is recommended with the processing of hard brittle materials other than the cemented carbide mentioned in the above table. Be sure to refuel the oil and eliminate any chip discharge that adheres to the tool.

Note 4) Cutting conditions may need adjustments depending on the type of workpiece material.

Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

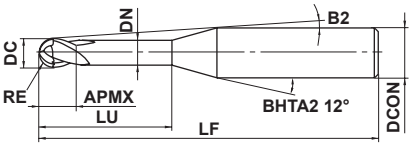
Note 6) Implementation of special counter measures is recommended since fine chip discharge may enter gaps in the processing machinery.

DF2XLB

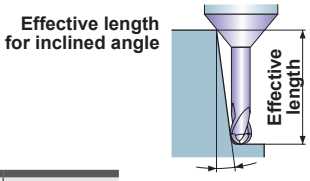
Ball nose, Medium cut length, 2 flute, Long neck, For graphite

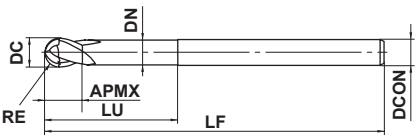
Aluminium Alloy	Copper Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○





Type1





Type2

0.15≤RE≤2					
±0.01					
DCON=4					
0 -0.008					

●2 flute long neck ball nose end mill with Mitsubishi's unique diamond coating for graphite machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
DF2XLBR0015N020	0.15	0.3	0.3	2	0.27	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
DF2XLBR0020N040	0.2	0.4	0.6	4	0.36	8.4°	60	4	2	●	1	4.1	4.3	4.7	5.2
DF2XLBR0020N080	0.2	0.4	0.6	8	0.36	6.4°	60	4	2	●	1	8.3	8.7	9.5	10.5
DF2XLBR0025N040	0.25	0.5	0.6	4	0.46	8.3°	60	4	2	●	1	4.1	4.3	4.7	5.2
DF2XLBR0025N080	0.25	0.5	0.6	8	0.46	6.3°	60	4	2	●	1	8.3	8.7	9.5	10.5
DF2XLBR0030N060	0.3	0.6	0.9	6	0.56	7.1°	60	4	2	●	1	6.3	6.5	7.1	7.9
DF2XLBR0030N100	0.3	0.6	0.9	10	0.56	5.5°	60	4	2	●	1	10.4	10.9	11.9	13.2
DF2XLBR0040N080	0.4	0.8	1.2	8	0.76	6.1°	60	4	2	●	1	8.3	8.7	9.5	10.5
DF2XLBR0050N040	0.5	1	1.5	4	0.94	8°	60	4	2	●	1	4.2	4.4	4.8	5.3
DF2XLBR0050N100	0.5	1	1.5	10	0.94	5.2°	60	4	2	●	1	10.5	11.0	12.0	13.3
DF2XLBR0050N120	0.5	1	1.5	12	0.94	4.6°	60	4	2	●	1	12.6	13.2	14.4	15.9
DF2XLBR0050N160	0.5	1	1.5	16	0.94	3.8°	80	4	2	●	1	16.8	17.5	19.2	21.3
DF2XLBR0050N200	0.5	1	1.5	20	0.94	3.3°	80	4	2	●	1	21.0	21.9	24.0	26.6
DF2XLBR0050N300	0.5	1	1.5	30	0.94	2.4°	80	4	2	●	1	31.4	32.8	36.0	*
DF2XLBR0075N160	0.75	1.5	2.3	16	1.44	3.4°	80	4	2	●	1	16.8	17.5	19.2	21.2
DF2XLBR0100N160	1	2	3	16	1.9	2.9°	80	4	2	●	1	16.7	17.4	19.0	*
DF2XLBR0100N200	1	2	3	20	1.9	2.5°	80	4	2	●	1	20.9	21.8	23.8	*
DF2XLBR0100N250	1	2	3	25	1.9	2°	80	4	2	●	1	26.1	27.2	*	*
DF2XLBR0100N400	1	2	3	40	1.9	1.4°	100	4	2	●	1	41.7	43.5	*	*
DF2XLBR0150N160	1.5	3	4.5	16	2.9	1.7°	80	4	2	●	1	16.7	17.3	*	*
DF2XLBR0150N250	1.5	3	4.5	25	2.9	1.2°	80	4	2	●	1	26.1	27.2	*	*
DF2XLBR0200N300	2	4	6	30	3.9	—	80	4	2	●	2	*	*	*	*
DF2XLBR0200N600	2	4	6	60	3.9	—	100	4	2	●	2	*	*	*	*

* No interference

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

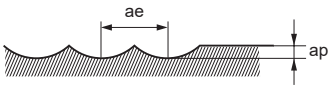
DF2XLB

Ball nose, Medium cut length, 2 flute, Long neck, For graphite

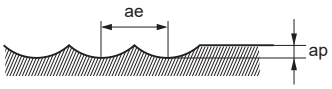
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Graphite				Copper, Copper alloys			
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R0.15	**2**	40000	1200	0.03	0.08	40000	800	0.003	0.03
	3	40000	1200	0.03	0.08	40000	600	0.002	0.03
R0.2	**1**	40000	1500	0.05	0.15	40000	2000	0.015	0.04
	2	40000	1500	0.05	0.12	40000	1300	0.01	0.04
	3	40000	1300	0.04	0.12	40000	800	0.005	0.04
	4	40000	1300	0.04	0.1	32000	600	0.004	0.04
	8	30000	800	0.03	0.1	—	—	—	—
	12	20000	450	0.03	0.08	—	—	—	—
R0.25	**4**	40000	1500	0.05	0.15	40000	800	0.01	0.05
	5	38000	1300	0.05	0.15	36000	700	0.008	0.05
	8	30000	1000	0.04	0.12	28000	500	0.002	0.05
R0.3	**2**	40000	1800	0.07	0.2	40000	1500	0.03	0.06
	4	40000	1500	0.06	0.18	40000	1200	0.02	0.06
	5	40000	1500	0.06	0.17	40000	1100	0.015	0.06
	6	40000	1500	0.06	0.15	40000	1000	0.008	0.06
	8	37000	1200	0.05	0.15	35000	800	0.005	0.06
	10	35000	1000	0.05	0.15	—	—	—	—
	16	22000	530	0.04	0.12	—	—	—	—
R0.4	**6**	40000	1700	0.08	0.2	40000	1500	0.02	0.08
	8	40000	1700	0.08	0.15	30000	1200	0.008	0.08
R0.5	**4**	40000	2500	0.12	0.3	40000	2000	0.05	0.1
	6	40000	2500	0.1	0.3	40000	2000	0.03	0.1
	8	40000	2000	0.1	0.25	40000	1800	0.02	0.1
	10	40000	2000	0.1	0.2	33000	1400	0.01	0.1
	12	40000	2000	0.1	0.2	30000	1000	0.007	0.1
	20	30000	1100	0.08	0.2	—	—	—	—
	30	20000	600	0.06	0.15	—	—	—	—
	40	15000	400	0.04	0.12	—	—	—	—

Depth of cut



Note 1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
Note 2) Use a milling machine dedicated for graphite.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material		Graphite				Copper, Copper alloys			
R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R0.75	**8**	40000	2800	0.15	0.45	40000	2400	0.07	0.15
	10	40000	2800	0.15	0.45	32000	1800	0.05	0.15
	16	35000	2000	0.15	0.3	20000	900	0.03	0.15
	30	27000	1000	0.1	0.3	—	—	—	—
	40	21000	700	0.08	0.25	—	—	—	—
R1	**8**	40000	3000	0.23	0.7	40000	3000	0.1	0.2
	10	40000	3000	0.2	0.6	40000	2800	0.08	0.2
	12	35000	2500	0.2	0.6	35000	2300	0.08	0.2
	16	30000	2000	0.2	0.5	30000	1800	0.05	0.2
	20	30000	2000	0.2	0.5	20000	1200	0.04	0.2
	25	25000	1500	0.18	0.45	20000	1000	0.03	0.2
	40	20000	1000	0.15	0.4	—	—	—	—
	60	15000	500	0.1	0.3	—	—	—	—
R1.5	**16**	28000	3000	0.3	0.9	28000	3000	0.3	0.3
	25	20000	2000	0.25	0.75	20000	2000	0.25	0.3
	40	16000	1500	0.2	0.6	16000	1500	0.2	0.3
	60	14000	1000	0.17	0.45	—	—	—	—
R2	**8**	24000	3800	0.5	1.5	24000	3800	0.5	0.4
	20	21000	3300	0.5	1.5	21000	3300	0.4	0.4
	30	15000	2000	0.4	1.2	15000	2000	0.3	0.4
	40	13000	1600	0.35	1.0	13000	1600	0.25	0.4
	60	12000	1400	0.3	0.9	12000	1400	0.2	0.4
Depth of cut									

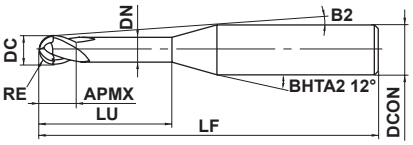
Note 1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
Note 2) Use a milling machine dedicated for graphite.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

DF2XLBF (For Finishing)

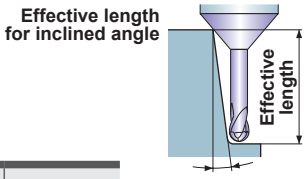
Ball nose, Medium cut length, 2 flute, Long neck, For graphite

Aluminium Alloy	Copper Alloy	Graphite	Zirconia (Before Sintering)	Rigid Composite Resin (Composite Resin)	Machineable Ceramics
○	◎	◎	◎	◎	○





Type1



0.3≤RE≤1	1.5≤RE			
±0.005	±0.01			
DCON=4				
0 - 0.008				

●DF long-neck ball end mills are ideal for finished surfaces of non-ferrous metals.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
DF2XLBFR0030N100	0.3	0.6	0.45	10	0.57	5.5°	50	4	2	●	1	10.4	10.9	11.9	13.2
DF2XLBFR0050N120	0.5	1	1.5	12	0.86	4.6°	50	4	2	●	1	12.6	13.2	14.4	15.9
DF2XLBFR0050N160	0.5	1	1.5	16	0.86	3.8°	50	4	2	●	1	16.8	17.5	19.2	21.3
DF2XLBFR0050N200	0.5	1	1.5	20	0.86	3.2°	50	4	2	●	1	21	21.9	24	26.6
DF2XLBFR0100N160	1	2	3	16	1.86	2.9°	50	4	2	●	1	16.7	17.4	19	*
DF2XLBFR0100N200	1	2	3	20	1.86	2.4°	50	4	2	●	1	20.9	21.8	23.9	*
DF2XLBFR0150N160	1.5	3	4.5	16	2.86	1.7°	50	4	2	●	1	16.7	17.3	18.9	20.8
DF2XLBFR0150N200	1.5	3	4.5	20	2.86	1.4°	50	4	2	●	1	20.8	21.7	23.7	26.1

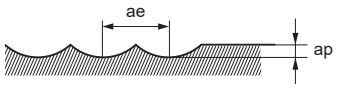
* No interference

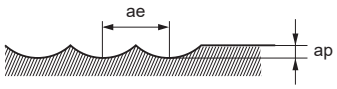
● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Graphite				Zirconia (Before Sintering)			
Dia. **DC** (mm)	R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.6	**R0.3**	**10**	35000	1000	0.05	0.015	26000	600	0.06	0.03
1	**R0.5**	**10**	40000	2000	0.10	0.200	26000	600	0.10	0.05
		16	35000	1500	0.09	0.200	26000	600	0.08	0.04
		20	30000	1100	0.08	0.200	26000	600	0.08	0.04
2	**R1**	**16**	30000	2000	0.20	0.500	18000	1400	0.06	0.80
		20	30000	2000	0.20	0.500	18000	1200	0.50	0.60
3	**R1.5**	**16**	28000	3000	0.30	0.900	15000	1600	0.90	0.90
		20	25000	2500	0.20	0.900	15000	1400	0.60	0.80
Depth of cut										

Workpiece Material			Copper, Copper alloys				Rigid Composite Resin (Composite Resin)			
Dia. **DC** (mm)	R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.6	**R0.3**	**10**	30000	600	0.005	0.040	28000	450	0.050	0.050
1	**R0.5**	**10**	33000	1400	0.010	0.100	25000	900	0.100	0.100
		16	25000	800	0.007	0.080	25000	700	0.080	0.080
		20	20000	500	0.005	0.050	25000	600	0.080	0.080
2	**R1**	**16**	30000	1800	0.050	0.200	25000	2100	0.800	0.800
		20	20000	1200	0.040	0.200	25000	1800	0.500	0.500
3	**R1.5**	**16**	28000	3000	0.300	0.300	25000	2400	1.000	1.000
		20	25000	2500	0.200	0.300	25000	2100	0.800	0.800
Depth of cut										

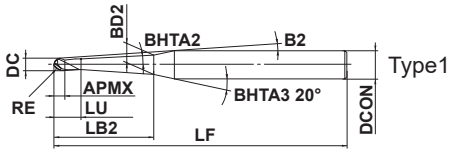
Note 1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate and depth of cut.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 3) When work on dry machining material that contain resin, be careful of tool breakage and mechanical problems (as there is a possibility of blockage caused by cutting chips).
Note 4) Use a milling machine dedicated for graphite.

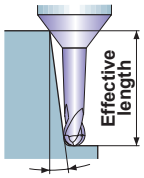
MP3XB

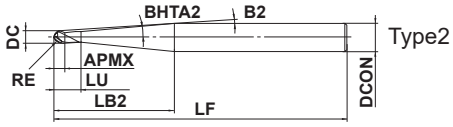
Ball nose, 3 flute, Taper neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	









RE≤3	RE≥4			
±0.005	±0.010			
DCON=6	DCON=8			
0 -0.005	0 -0.006			
DCON=10	DCON≥12			
0 -0.009	0 -0.011			

- Ideal for rough milling of long overhang applications and semi-finishing of forging dies (40-52 HRC).
- Rigid, high helix, 3 flute design enables large depths of cut and high feed rates for increased machining efficiency.

(mm)

Order Number	RE	DC	BHTA2	APMX	LU	LB2	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
MP3XBR0050N008T05	0.5	1	0.5°	0.8	2.3	8	9.3°	1.04	60	6	3	●	1	8.5	8.8	9.3	9.8
MP3XBR0050N012T05	0.5	1	0.5°	0.8	2.3	12	7.5°	1.1	60	6	3	●	1	12.6	13	13.6	14.4
MP3XBR0050N016T05	0.5	1	0.5°	0.8	2.3	16	6.3°	1.18	60	6	3	●	1	16.6	17.1	18	18.9
MP3XBR0050N020T05	0.5	1	0.5°	0.8	2.3	20	5.4°	1.24	60	6	3	●	1	20.6	21.2	22.3	23.5
MP3XBR0050N025T05	0.5	1	0.5°	0.8	2.3	25	4.6°	1.34	70	6	3	●	1	25.7	26.3	27.7	29.3
MP3XBR0050N030T05	0.5	1	0.5°	0.8	2.3	30	4°	1.42	70	6	3	●	1	30.7	31.5	33.1	35
MP3XBR0050N050T05	0.5	1	0.5°	0.8	2.3	50	2.6°	1.78	90	6	3	●	1	50.8	52.1	54.8	*
MP3XBR0050N010T10	0.5	1	1°	0.8	2.3	10	8.4°	1.2	60	6	3	●	1	—	10.6	11.2	11.8
MP3XBR0050N016T10	0.5	1	1°	0.8	2.3	16	6.4°	1.42	60	6	3	●	1	—	16.7	17.6	18.5
MP3XBR0050N020T10	0.5	1	1°	0.8	2.3	20	5.5°	1.56	60	6	3	●	1	—	20.7	21.8	23
MP3XBR0050N025T10	0.5	1	1°	0.8	2.3	25	4.7°	1.74	70	6	3	●	1	—	25.7	27.1	28.6
MP3XBR0050N030T10	0.5	1	1°	0.8	2.3	30	4.1°	1.9	70	6	3	●	1	—	30.8	32.4	34.2
MP3XBR0050N035T10	0.5	1	1°	0.8	2.3	35	3.6°	2.08	90	6	3	●	1	—	35.8	37.7	39.8
MP3XBR0050N050T10	0.5	1	1°	0.8	2.3	50	2.7°	2.6	90	6	3	●	1	—	50.9	53.6	*
MP3XBR0050N010T15	0.5	1	1.5°	0.8	2.3	10	8.5°	1.34	60	6	3	●	1	—	—	11	11.6
MP3XBR0050N016T15	0.5	1	1.5°	0.8	2.3	16	6.5°	1.66	60	6	3	●	1	—	—	17.2	18.1
MP3XBR0050N020T15	0.5	1	1.5°	0.8	2.3	20	5.6°	1.86	60	6	3	●	1	—	—	21.3	22.5
MP3XBR0050N023T15	0.5	1	1.5°	0.8	2.3	23	5°	2.02	70	6	3	●	1	—	—	24.4	25.7
MP3XBR0050N025T15	0.5	1	1.5°	0.8	2.3	25	4.7°	2.12	70	6	3	●	1	—	—	26.5	27.9
MP3XBR0050N010T30	0.5	1	3°	0.8	2.3	10	8.8°	1.74	60	6	3	●	1	—	—	—	10.8
MP3XBR0050N020T30	0.5	1	3°	0.8	2.3	20	5.9°	2.8	60	6	3	●	1	—	—	—	20.9
MP3XBR0050N030T30	0.5	1	3°	0.8	2.3	30	4.4°	3.84	70	6	3	●	1	—	—	—	31
MP3XBR0050N042T30	0.5	1	3°	0.8	2.3	42	3.4°	5.1	90	6	3	●	1	—	—	—	43
MP3XBR0050N025T50	0.5	1	5°	0.8	2.3	25	5.4°	4.92	60	6	3	●	1	—	—	—	—
MP3XBR0075N010T05	0.75	1.5	0.5°	1.2	2.7	10	7.8°	1.56	60	6	3	●	1	10.6	10.9	11.4	12
MP3XBR0075N016T05	0.75	1.5	0.5°	1.2	2.7	16	5.8°	1.68	60	6	3	●	1	16.6	17.1	17.9	18.9
MP3XBR0075N020T05	0.75	1.5	0.5°	1.2	2.7	20	5°	1.74	60	6	3	●	1	20.6	21.2	22.3	23.5
MP3XBR0075N030T05	0.75	1.5	0.5°	1.2	2.7	30	3.7°	1.92	80	6	3	●	1	30.7	31.5	33.1	35
MP3XBR0075N010T10	0.75	1.5	1°	1.2	2.7	10	7.9°	1.7	60	6	3	●	1	—	10.6	11.2	11.8
MP3XBR0075N016T10	0.75	1.5	1°	1.2	2.7	16	5.9°	1.9	60	6	3	●	1	—	16.7	17.6	18.5
MP3XBR0075N020T10	0.75	1.5	1°	1.2	2.7	20	5.1°	2.04	60	6	3	●	1	—	20.7	21.8	23
MP3XBR0075N030T10	0.75	1.5	1°	1.2	2.7	30	3.7°	2.4	80	6	3	●	1	—	30.8	32.4	34.2

* No interference

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	RE	DC	BHTA2	APMX	LU	LB2	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
MP3XBR0075N010T15	0.75	1.5	1.5°	1.2	2.7	10	8°	1.82	60	6	3	●	1	—	—	11	11.6
MP3XBR0075N016T15	0.75	1.5	1.5°	1.2	2.7	16	6°	2.14	60	6	3	●	1	—	—	17.2	18.1
MP3XBR0075N020T15	0.75	1.5	1.5°	1.2	2.7	20	5.1°	2.34	60	6	3	●	1	—	—	21.3	22.5
MP3XBR0075N025T15	0.75	1.5	1.5°	1.2	2.7	25	4.4°	2.6	80	6	3	●	1	—	—	26.5	27.9
MP3XBR0075N030T15	0.75	1.5	1.5°	1.2	2.7	30	3.8°	2.86	80	6	3	●	1	—	—	31.6	33.4
MP3XBR0075N046T30	0.75	1.5	3°	1.2	2.7	46	2.9°	—	80	6	3	●	2	—	—	—	*
MP3XBR0100N016T05	1	2	0.5°	1.6	3.6	16	5.2°	2.12	60	6	3	●	1	17	17.6	18.6	19.5
MP3XBR0100N020T05	1	2	0.5°	1.6	3.6	20	4.5°	2.18	60	6	3	●	1	21.1	21.8	22.9	24.1
MP3XBR0100N030T05	1	2	0.5°	1.6	3.6	30	3.3°	2.36	70	6	3	●	1	31.1	32.1	33.7	35.6
MP3XBR0100N035T05	1	2	0.5°	1.6	3.6	35	2.9°	2.44	80	6	3	●	1	36.2	37.2	39.2	*
MP3XBR0100N040T05	1	2	0.5°	1.6	3.6	40	2.6°	2.54	80	6	3	●	1	41.2	42.4	44.6	*
MP3XBR0100N016T10	1	2	1°	1.6	3.6	16	5.3°	2.34	60	6	3	●	1	—	17.1	18.2	19.1
MP3XBR0100N020T10	1	2	1°	1.6	3.6	20	4.5°	2.48	60	6	3	●	1	—	21.2	22.4	23.6
MP3XBR0100N025T10	1	2	1°	1.6	3.6	25	3.8°	2.64	70	6	3	●	1	—	26.2	27.7	29.2
MP3XBR0100N030T10	1	2	1°	1.6	3.6	30	3.3°	2.82	70	6	3	●	1	—	31.3	33	34.8
MP3XBR0100N035T10	1	2	1°	1.6	3.6	35	3°	3	80	6	3	●	1	—	36.3	38.3	40.4
MP3XBR0100N040T10	1	2	1°	1.6	3.6	40	2.7°	3.18	80	6	3	●	1	—	41.3	43.6	*
MP3XBR0100N050T10	1	2	1°	1.6	3.6	50	2.2°	3.52	110	6	3	●	1	—	51.4	54.2	*
MP3XBR0100N070T10	1	2	1°	1.6	3.6	70	1.7°	4.22	110	6	3	●	1	—	71.5	*	*
MP3XBR0100N016T15	1	2	1.5°	1.6	3.6	16	5.4°	2.54	60	6	3	●	1	—	—	22.8	18.7
MP3XBR0100N020T15	1	2	1.5°	1.6	3.6	20	4.6°	2.76	60	6	3	●	1	—	—	21.9	23.1
MP3XBR0100N025T15	1	2	1.5°	1.6	3.6	25	3.9°	3.02	70	6	3	●	1	—	—	27.1	28.5
MP3XBR0100N030T15	1	2	1.5°	1.6	3.6	30	3.4°	3.28	70	6	3	●	1	—	—	32.2	34
MP3XBR0100N035T15	1	2	1.5°	1.6	3.6	35	3°	3.54	80	6	3	●	1	—	—	37.4	39.4
MP3XBR0100N040T15	1	2	1.5°	1.6	3.6	40	2.7°	3.8	80	6	3	●	1	—	—	42.6	*
MP3XBR0100N020T30	1	2	3°	1.6	3.6	20	4.8°	3.62	60	6	3	●	1	—	—	—	20.5
MP3XBR0100N030T30	1	2	3°	1.6	3.6	30	3.6°	4.66	70	6	3	●	1	—	—	—	30.6
MP3XBR0100N042T30	1	2	3°	1.6	3.6	42	2.8°	—	80	6	3	●	2	—	—	—	*
MP3XBR0100N027T50	1	2	5°	1.6	3.6	27	4.3°	—	60	6	3	●	2	—	—	—	—
MP3XBR0150N010T05	1.5	3	0.5°	2.4	5.4	10	5.7°	2.98	60	6	3	●	1	11	11.4	12	12.6
MP3XBR0150N020T05	1.5	3	0.5°	2.4	5.4	20	3.5°	3.16	60	6	3	●	1	21.1	21.8	22.9	24.1
MP3XBR0150N030T05	1.5	3	0.5°	2.4	5.4	30	2.6°	3.32	70	6	3	●	1	31.2	32.1	33.7	*
MP3XBR0150N040T05	1.5	3	0.5°	2.4	5.4	40	2°	3.5	80	6	3	●	1	41.3	42.4	44.6	*
MP3XBR0150N050T05	1.5	3	0.5°	2.4	5.4	50	1.7°	3.68	90	6	3	●	1	51.3	52.7	*	*
MP3XBR0150N020T10	1.5	3	1°	2.4	5.4	20	3.6°	3.4	60	6	3	●	1	—	21.3	22.4	23.6
MP3XBR0150N030T10	1.5	3	1°	2.4	5.4	30	2.6°	3.76	70	6	3	●	1	—	31.3	33	*
MP3XBR0150N035T10	1.5	3	1°	2.4	5.4	35	2.3°	3.94	80	6	3	●	1	—	36.4	38.3	*
MP3XBR0150N040T10	1.5	3	1°	2.4	5.4	40	2.1°	4.1	80	6	3	●	1	—	41.4	43.6	*
MP3XBR0150N050T10	1.5	3	1°	2.4	5.4	50	1.7°	4.46	90	6	3	●	1	—	51.5	*	*
MP3XBR0150N060T10	1.5	3	1°	2.4	5.4	60	1.5°	4.8	110	6	3	●	1	—	61.5	*	*
MP3XBR0150N070T10	1.5	3	1°	2.4	5.4	70	1.3°	5.16	110	6	3	●	1	—	71.6	*	*
MP3XBR0150N020T15	1.5	3	1.5°	2.4	5.4	20	3.7°	3.66	60	6	3	●	1	—	—	22	23.2
MP3XBR0150N030T15	1.5	3	1.5°	2.4	5.4	30	2.7°	4.18	70	6	3	●	1	—	—	32.3	*
MP3XBR0150N035T15	1.5	3	1.5°	2.4	5.4	35	2.4°	4.46	70	6	3	●	1	—	—	37.5	*
MP3XBR0150N040T15	1.5	3	1.5°	2.4	5.4	40	2.1°	4.72	80	6	3	●	1	—	—	42.6	*
MP3XBR0150N045T15	1.5	3	1.5°	2.4	5.4	45	1.9°	4.98	80	6	3	●	1	—	—	*	*
MP3XBR0150N052T15	1.5	3	1.5°	2.4	5.4	52	1.7°	5.34	90	6	3	●	1	—	—	*	*
MP3XBR0150N064T15	1.5	3	1.5°	2.4	5.4	64	1.4°	—	110	6	3	●	2	—	—	*	*
MP3XBR0150N025T30	1.5	3	3°	2.4	5.4	25	3.3°	4.96	60	6	3	●	1	—	—	—	26.8
MP3XBR0150N034T30	1.5	3	3°	2.4	5.4	34	2.6°	—	70	6	3	●	2	—	—	—	*

* No interference

MP3XB

Ball nose, 3 flute, Taper neck

(mm)

Order Number	RE	DC	BHTA2	APMX	LU	LB2	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
MP3XBR0150N040T30	1.5	3	3°	2.4	5.4	40	3.4°	6.52	90	8	3	●	1	—	—	—	41.9
MP3XBR0150N054T30	1.5	3	3°	2.4	5.4	54	2.7°	—	90	8	3	●	2	—	—	—	*
MP3XBR0200N030T05	2	4	0.5°	3.2	6.2	30	1.8°	4.32	70	6	3	●	1	31.2	32.1	*	*
MP3XBR0200N040T05	2	4	0.5°	3.2	6.2	40	1.4°	4.48	80	6	3	●	1	41.3	42.4	*	*
MP3XBR0200N060T05	2	4	0.5°	3.2	6.2	60	1°	4.84	100	6	3	●	1	61.4	63	*	*
MP3XBR0200N020T10	2	4	1°	3.2	6.2	20	2.6°	4.38	70	6	3	●	1	—	21.3	22.4	*
MP3XBR0200N030T10	2	4	1°	3.2	6.2	30	1.8°	4.74	70	6	3	●	1	—	31.4	*	*
MP3XBR0200N035T10	2	4	1°	3.2	6.2	35	1.6°	4.9	70	6	3	●	1	—	36.4	*	*
MP3XBR0200N040T10	2	4	1°	3.2	6.2	40	1.5°	5.08	80	6	3	●	1	—	41.4	*	*
MP3XBR0200N045T10	2	4	1°	3.2	6.2	45	1.3°	5.26	80	6	3	●	1	—	46.5	*	*
MP3XBR0200N066T10	2	4	1°	3.2	6.2	66	1°	—	100	6	3	●	2	—	*	*	*
MP3XBR0200N050T15	2	4	1.5°	3.2	6.2	50	2.2°	6.2	90	8	3	●	1	—	—	53	*
MP3XBR0200N084T15	2	4	1.5°	3.2	6.2	84	1.5°	—	120	8	3	●	2	—	—	*	*
MP3XBR0200N030T30	2	4	3°	3.2	6.2	30	3.6°	6.4	90	8	3	●	1	—	—	—	31.9
MP3XBR0200N045T30	2	4	3°	3.2	6.2	45	2.6°	—	90	8	3	●	2	—	—	—	*
MP3XBR0250N038T10	2.5	5	1°	4	7	38	0.8°	—	80	6	3	●	2	—	*	*	*
MP3XBR0250N050T10	2.5	5	1°	4	7	50	1.7°	6.4	90	8	3	●	1	—	51.5	*	*
MP3XBR0250N065T10	2.5	5	1°	4	7	65	1.4°	6.92	110	8	3	●	1	—	66.6	*	*
MP3XBR0250N066T15	2.5	5	1.5°	4	7	66	1.4°	—	110	8	3	●	2	—	—	*	*
MP3XBR0250N036T30	2.5	5	3°	4	7	36	2.4°	—	90	8	3	●	2	—	—	—	*
MP3XBR0300N040T10	3	6	1°	9	12	40	1.4°	6.82	80	8	3	●	1	—	41.8	*	*
MP3XBR0300N050T10	3	6	1°	9	12	50	1.2°	7.18	90	8	3	●	1	—	51.8	*	*
MP3XBR0300N073T10	3	6	1°	9	12	73	0.9°	—	110	8	3	●	2	—	*	*	*
MP3XBR0300N090T10	3	6	1°	9	12	90	1.3°	8.58	140	10	3	●	1	—	92	*	*
MP3XBR0300N053T15	3	6	1.5°	9	12	53	1.2°	—	90	8	3	●	2	—	—	*	*
MP3XBR0300N032T30	3	6	3°	9	12	32	1.9°	—	80	8	3	●	2	—	—	—	*
MP3XBR0400N050T10	4	8	1°	12	15	50	1.2°	9.08	110	10	3	●	1	—	51.9	*	*
MP3XBR0400N065T10	4	8	1°	12	15	65	1°	9.6	130	10	3	●	1	—	67	*	*
MP3XBR0400N076T10	4	8	1°	12	15	76	0.8°	—	130	10	3	●	2	—	*	*	*
MP3XBR0400N090T10	4	8	1°	12	15	90	1.3°	10.46	150	12	3	●	1	—	92.1	*	*
MP3XBR0400N040T15	4	8	1.5°	12	15	40	1.5°	9.16	90	10	3	●	1	—	—	*	*
MP3XBR0400N056T15	4	8	1.5°	12	15	56	1.1°	—	110	10	3	●	2	—	—	*	*
MP3XBR0400N035T30	4	8	3°	12	15	35	1.7°	—	90	10	3	●	2	—	—	—	*
MP3XBR0500N060T10	5	10	1°	15	25	60	1°	10.92	120	12	3	●	1	—	62.6	*	*
MP3XBR0500N070T10	5	10	1°	15	25	70	0.9°	11.28	120	12	3	●	1	—	*	*	*
MP3XBR0500N100T10	5	10	1°	15	25	100	1.7°	12.32	160	16	3	●	1	—	102.8	*	*
MP3XBR0500N050T15	5	10	1.5°	15	25	50	1.2°	11	100	12	3	●	1	—	—	*	*
MP3XBR0500N068T15	5	10	1.5°	15	25	68	0.9°	—	120	12	3	●	2	—	—	*	*
MP3XBR0500N046T30	5	10	3°	15	25	46	1.3°	—	100	12	3	●	2	—	—	—	*
MP3XBR0600N070T10	6	12	1°	18	28	70	1.6°	13.16	130	16	3	●	1	—	72.7	*	*
MP3XBR0600N100T10	6	12	1°	18	28	100	1.2°	14.22	160	16	3	●	1	—	102.9	*	*
MP3XBR0600N080T15	6	12	1.5°	18	28	80	1.5°	14.42	130	16	3	●	1	—	—	*	*
MP3XBR0600N069T30	6	12	3°	18	28	69	1.8°	—	130	16	3	●	2	—	—	—	*

* No interference

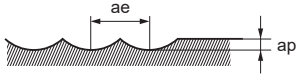
● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Carbon steel, Alloy steel (180—280HB) Alloy Tool Steel (≤350HB) Pre-hardened steel (35—45HRC) AISI 1045, AISI 4140, SKD, SKT, AISI 4140, AISI P21				Hardened steel (45—52HRC) AISI H13, AISI L6				Copper, Copper alloys			
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R0.5	**0.5°**	**8**	40000	1200	0.07	0.22	39000	1200	0.06	0.19	39000	1200	0.12	0.38
		12	40000	1200	0.06	0.19	39000	1200	0.05	0.16	39000	1200	0.1	0.32
		16	35000	1100	0.06	0.18	33000	900	0.04	0.14	33000	900	0.09	0.29
		20	32000	960	0.05	0.14	29000	800	0.04	0.11	29000	800	0.07	0.22
		25	28000	830	0.03	0.11	24000	600	0.02	0.07	24000	600	0.05	0.15
		30	24000	720	0.03	0.1	21000	450	0.02	0.06	21000	450	0.04	0.13
		50	10000	300	0.003	0.015	11000	150	0.003	0.015	11000	150	0.006	0.019
	1°	**10**	40000	1200	0.07	0.22	39000	1300	0.06	0.19	39000	1300	0.12	0.38
		16	35000	1100	0.06	0.18	33000	1000	0.05	0.14	33000	1000	0.09	0.29
		20	32000	960	0.05	0.14	29000	900	0.04	0.11	29000	900	0.07	0.22
		25	28000	830	0.04	0.11	24000	700	0.03	0.08	24000	700	0.05	0.16
		30	24000	720	0.03	0.1	21000	550	0.02	0.06	21000	550	0.04	0.13
		35	17000	500	0.03	0.08	13000	350	0.02	0.05	13000	350	0.03	0.1
		50	10000	300	0.003	0.015	11000	250	0.003	0.015	11000	250	0.006	0.019
	1.5°	**10**	40000	1200	0.07	0.22	39000	1400	0.06	0.19	39000	1400	0.12	0.38
		16	35000	1100	0.06	0.18	33000	1100	0.05	0.14	33000	1100	0.09	0.29
		20	32000	960	0.05	0.14	29000	1000	0.04	0.11	29000	1000	0.07	0.22
		23	27000	830	0.04	0.11	24000	800	0.03	0.08	24000	800	0.05	0.16
		25	27000	830	0.04	0.12	24000	800	0.03	0.09	24000	800	0.05	0.17
	3°	**10**	40000	1200	0.07	0.22	39000	1500	0.06	0.19	39000	1500	0.12	0.38
		20	32000	960	0.05	0.14	29000	1100	0.04	0.11	29000	1100	0.07	0.22
		30	22000	660	0.03	0.1	19000	700	0.02	0.06	19000	700	0.04	0.13
		42	13000	390	0.005	0.02	11000	390	0.005	0.02	11000	390	0.01	0.03
	5°	**25**	32000	960	0.04	0.11	29000	1000	0.03	0.08	29000	1000	0.05	0.16
R0.75	**0.5°**	**10**	30000	1800	0.11	0.34	28000	1500	0.1	0.3	28000	1500	0.19	0.61
		16	27000	1600	0.09	0.27	24000	1100	0.08	0.24	24000	1100	0.15	0.48
		20	26000	1500	0.08	0.24	24000	1100	0.07	0.21	24000	1100	0.13	0.42
		30	25000	1400	0.07	0.21	22000	1000	0.06	0.18	22000	1000	0.11	0.35
	1°	**10**	30000	1900	0.11	0.34	28000	1600	0.1	0.3	28000	1600	0.19	0.61
		16	26000	1600	0.09	0.27	24000	1200	0.08	0.24	24000	1200	0.15	0.48
		20	27000	1700	0.08	0.24	24000	1200	0.07	0.21	24000	1200	0.13	0.42
		30	25000	1500	0.07	0.21	22000	1100	0.06	0.18	22000	1100	0.11	0.35
	1.5°	**10**	30000	1900	0.11	0.34	28000	1700	0.1	0.3	28000	1700	0.19	0.61
		16	27500	1700	0.09	0.27	24000	1300	0.08	0.24	24000	1300	0.15	0.48
		20	26500	1700	0.08	0.24	24000	1300	0.07	0.21	24000	1300	0.13	0.42
		25	26000	1600	0.07	0.22	23000	1200	0.06	0.19	23000	1200	0.12	0.38
		30	25000	1500	0.07	0.21	22000	1100	0.06	0.18	22000	1100	0.11	0.35
	3°	**46**	15000	450	0.05	0.16	14000	800	0.04	0.13	14000	800	0.08	0.26

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

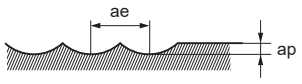
MP3XB

Ball nose, 3 flute, Taper neck

RECOMMENDED CUTTING CONDITIONS

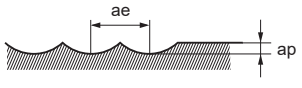
Workpiece Material			Carbon steel, Alloy steel (180—280HB) Alloy Tool Steel (≤350HB) Pre-hardened steel (35—45HRC) AISI 1045, AISI 4140, SKD, SKT, AISI 4140, AISI P21				Hardened steel (45—52HRC) AISI H13, AISI L6				Copper, Copper alloys			
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R1.0	0.5°	16	25000	1500	0.14	0.45	22000	1600	0.13	0.42	22000	1600	0.26	0.83
		20	23000	1400	0.1	0.3	20000	1400	0.09	0.27	20000	1400	0.17	0.54
		30	20000	1200	0.05	0.17	18000	1100	0.06	0.18	18000	1100	0.13	0.42
		35	19000	1100	0.05	0.15	17000	1000	0.05	0.16	17000	1000	0.12	0.38
		40	19000	1100	0.04	0.14	16000	900	0.05	0.14	16000	900	0.11	0.35
	1°	16	25000	2300	0.14	0.45	22000	1700	0.13	0.42	22000	1700	0.26	0.83
		20	23000	2100	0.1	0.3	20000	1500	0.09	0.27	20000	1500	0.17	0.54
		25	23000	1400	0.06	0.19	20000	1300	0.07	0.21	20000	1300	0.16	0.5
		30	20000	1200	0.05	0.17	18000	1200	0.06	0.18	18000	1200	0.13	0.42
		35	19000	1100	0.05	0.15	17000	1100	0.05	0.15	17000	1100	0.12	0.37
		40	19000	1100	0.04	0.14	16000	1000	0.05	0.14	16000	1000	0.11	0.35
		50	17000	900	0.03	0.09	15000	900	0.03	0.08	15000	900	0.06	0.19
		70	13000	700	0.02	0.06	11000	650	0.02	0.05	11000	650	0.04	0.12
	1.5°	16	25000	2300	0.14	0.45	22000	1800	0.13	0.42	22000	1800	0.26	0.83
		20	23000	2100	0.1	0.3	20000	1600	0.09	0.27	20000	1600	0.17	0.54
		25	23000	1600	0.06	0.19	20000	1400	0.07	0.21	20000	1400	0.16	0.5
		30	20000	1200	0.05	0.17	18000	1300	0.06	0.18	18000	1300	0.13	0.42
		35	19000	1100	0.05	0.15	16000	1100	0.05	0.16	17000	1100	0.12	0.38
		40	19000	1100	0.04	0.14	16000	1000	0.05	0.14	16000	1000	0.11	0.35
	3°	20	23000	2100	0.1	0.3	20000	1700	0.09	0.27	20000	1700	0.17	0.54
		30	18000	1600	0.08	0.26	16000	1300	0.07	0.22	16500	1300	0.14	0.45
		42	16000	1400	0.07	0.21	13000	1000	0.06	0.18	13000	1000	0.11	0.35
	5°	27	18000	2200	0.09	0.29	17000	1900	0.08	0.26	17000	1900	0.16	0.51
R1.5	0.5°	10	20000	2400	0.22	0.7	17000	1900	0.21	0.67	17000	1900	0.42	1.34
		20	17000	2000	0.2	0.64	15000	1600	0.19	0.61	15000	1600	0.38	1.22
		30	16000	1700	0.14	0.45	13000	1400	0.13	0.42	13000	1400	0.26	0.83
		40	16000	1400	0.08	0.24	12000	1200	0.09	0.27	12000	1200	0.2	0.65
		50	13000	1100	0.06	0.2	11000	1100	0.07	0.22	11000	1100	0.17	0.54
	1°	20	17000	2000	0.2	0.64	15000	1800	0.19	0.61	15000	1800	0.38	1.22
		30	17000	1900	0.14	0.45	13000	1500	0.13	0.42	13000	1500	0.26	0.83
		35	16000	1700	0.08	0.26	13000	1500	0.09	0.29	13000	1500	0.22	0.69
		40	16000	1500	0.08	0.24	13000	1300	0.09	0.27	13000	1300	0.2	0.65
		50	13000	1200	0.06	0.2	11000	1100	0.07	0.22	11000	1100	0.17	0.54
		60	13000	1100	0.06	0.19	11000	1000	0.07	0.21	11000	1000	0.16	0.5
		70	10000	800	0.05	0.17	9000	700	0.06	0.18	9000	700	0.13	0.42
	1.5°	20	17000	2000	0.2	0.64	15000	1900	0.19	0.61	15000	1900	0.38	1.22
		30	16000	1800	0.14	0.45	13000	1600	0.13	0.42	13000	1600	0.26	0.83
		35	15000	1700	0.08	0.26	12000	1400	0.09	0.29	12000	1400	0.22	0.69
		40	15000	1600	0.08	0.24	12000	1300	0.09	0.27	12000	1300	0.2	0.65
		45	13000	1400	0.07	0.22	11000	1300	0.08	0.24	11000	1300	0.18	0.58
		52	13000	1300	0.06	0.2	11000	1100	0.07	0.22	11000	1100	0.17	0.54
		64	10000	900	0.06	0.18	9000	900	0.06	0.19	9000	900	0.14	0.46
	3°	25	16000	2400	0.16	0.51	13000	1900	0.15	0.48	13000	1900	0.3	0.96
		34	14000	2100	0.13	0.4	11000	1600	0.12	0.37	11000	1600	0.23	0.74
		40	14000	1700	0.12	0.37	11000	1400	0.11	0.34	11000	1400	0.21	0.67
		54	12000	1400	0.1	0.3	10000	1200	0.09	0.27	10000	1200	0.17	0.54

Depth of cut



Workpiece Material			Carbon steel, Alloy steel (180—280HB) Alloy Tool Steel (≤350HB) Pre-hardened steel (35—45HRC) AISI 1045, AISI 4140, SKD, SKT, AISI 4140, AISI P21				Hardened steel (45—52HRC) AISI H13, AISI L6				Copper, Copper alloys			
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R2.0	**0.5°**	**30**	14000	2100	0.23	0.74	11000	1800	0.22	0.7	11000	1800	0.44	1.41
		40	12000	1800	0.19	0.61	10000	1600	0.18	0.58	10000	1600	0.36	1.15
		60	9000	1300	0.06	0.19	8500	1400	0.07	0.21	8500	1400	0.16	0.5
	1°	**20**	15000	2700	0.31	0.99	12000	2200	0.3	0.96	12000	2200	0.72	2.3
		30	14000	2100	0.23	0.74	11000	1800	0.22	0.7	11000	1800	0.53	1.69
		35	12000	1800	0.21	0.67	10000	1700	0.2	0.64	10000	1700	0.48	1.54
		40	12000	1700	0.19	0.61	10000	1600	0.18	0.58	10000	1600	0.43	1.38
		45	12000	1500	0.13	0.42	10000	1600	0.12	0.38	10000	1600	0.29	0.92
		66	9000	1100	0.08	0.24	8500	1300	0.07	0.21	8500	1300	0.16	0.5
	1.5°	**50**	12000	2200	0.11	0.35	10000	1700	0.1	0.32	10000	1700	0.24	0.77
		84	8000	1400	0.04	0.13	6500	900	0.03	0.1	6500	900	0.07	0.23
	3°	**30**	14000	2500	0.23	0.74	11000	2000	0.22	0.7	11000	2000	0.53	1.69
		45	11000	1900	0.16	0.51	9000	1600	0.15	0.48	9000	1600	0.36	1.15
R2.5	**1°**	**38**	10000	2200	0.28	0.9	8500	2000	0.27	0.86	8500	2000	0.65	2.07
		50	9000	1900	0.24	0.77	8000	1800	0.23	0.74	8000	1800	0.55	1.77
		65	8000	1600	0.16	0.51	6500	1400	0.15	0.48	6500	1400	0.36	1.15
	1.5°	**66**	8000	1600	0.16	0.51	6500	1500	0.15	0.48	6500	1500	0.36	1.15
	3°	**36**	10000	2700	0.31	0.99	8500	2300	0.3	0.96	8500	2300	0.72	2.3
R3.0	**1°**	**40**	8000	2200	0.28	0.9	7500	2100	0.27	0.86	7500	2100	0.65	2.07
		50	8000	2000	0.23	0.74	6500	1800	0.22	0.7	6500	1800	0.53	1.69
		73	7000	1700	0.15	0.48	6500	1700	0.14	0.45	6500	1700	0.34	1.07
		90	6500	1500	0.09	0.29	6000	1300	0.08	0.26	6000	1300	0.19	0.61
	1.5°	**53**	7000	2100	0.22	0.7	6500	1900	0.21	0.67	6500	1900	0.5	1.61
	3°	**32**	9000	2400	0.35	1.12	8000	2200	0.34	1.09	8000	2200	0.82	2.61
R4.0	**1°**	**50**	6000	2200	0.41	1.31	5500	2000	0.4	1.28	5500	2000	0.96	3.07
		65	6000	2000	0.36	1.15	5200	1700	0.35	1.12	5200	1700	0.84	2.69
		76	6000	1800	0.29	0.93	5000	1500	0.28	0.9	5000	1500	0.67	2.15
		90	5000	1400	0.19	0.61	4700	1200	0.18	0.58	4700	1200	0.43	1.38
	1.5°	**40**	6000	2300	0.46	1.47	5800	2200	0.45	1.44	5800	2200	1.08	3.46
		56	6000	2200	0.38	1.22	5500	2000	0.37	1.18	5500	2000	0.9	2.84
	3°	**35**	7000	2700	0.49	1.57	6000	2400	0.48	1.54	6000	2400	1.15	3.69
R5.0	**1°**	**60**	5500	2600	0.51	1.63	4500	2300	0.5	1.6	4500	2300	1.2	3.84
		70	5500	2600	0.46	1.47	4500	2200	0.45	1.44	4500	2200	1.08	3.46
		100	5000	2400	0.36	1.15	4000	1900	0.35	1.12	4000	1900	0.84	2.69
	1.5°	**50**	5000	2400	0.56	1.79	4600	2400	0.55	1.76	4600	2400	1.32	4.22
		68	5000	2400	0.49	1.57	4600	2300	0.48	1.54	4600	2300	1.15	3.69
	3°	**46**	5000	2400	0.69	2.21	4800	2500	0.68	2.18	4800	2500	1.63	5.22
R6.0	**1°**	**70**	4500	2600	0.81	2.59	4000	2100	0.8	2.56	4000	2100	1.92	6.14
		100	4000	2200	0.61	1.95	3500	1800	0.6	1.92	3500	1800	1.44	4.61
	1.5°	**80**	5000	2300	0.71	2.27	4000	2000	0.7	2.24	4000	2000	1.68	5.38
	3°	**69**	5000	2700	0.81	2.59	4000	2200	0.8	2.56	4000	2200	1.92	6.14

Depth of cut



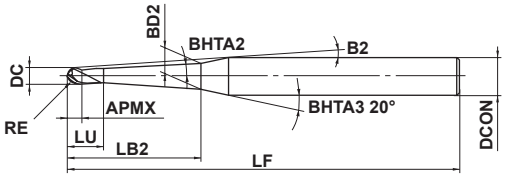
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

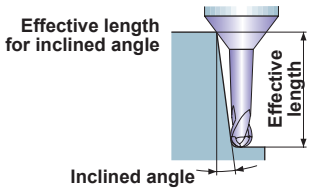
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	◎	◎				





Type1

0.4≤RE≤2.5				
±0.01				
0.8≤DC≤5				
0 - 0.02				
4≤DCON≤6	DCON=8			
0 - 0.008	0 - 0.009			



●3 flute ball end mill, high rigidity taper neck type.

(mm)

Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VF3XBR0040T0024L006	0.4	0.8	0.4°	0.5	6	1.5	8.9°	0.82	60	4	3	▲	1	6.3	6.6	6.9	7.3
VF3XBR0040T0024L008	0.4	0.8	0.4°	0.5	8	1.5	7.5°	0.85	60	4	3	▲	1	8.4	8.6	9.1	9.5
VF3XBR0040T0024L012	0.4	0.8	0.4°	0.5	12	1.5	5.7°	0.91	60	4	3	▲	1	12.4	12.7	13.4	14.1
VF3XBR0040T0054L008	0.4	0.8	0.9°	0.5	8	1.5	7.6°	0.96	60	4	3	▲	1	—	8.4	8.9	9.3
VF3XBR0040T0054L012	0.4	0.8	0.9°	0.5	12	1.5	5.8°	1.09	60	4	3	▲	1	—	12.4	13.1	13.8
VF3XBR0040T0054L016	0.4	0.8	0.9°	0.5	16	1.5	4.7°	1.22	60	4	3	▲	1	—	16.5	17.3	18.3
VF3XBR0050T0024L008	0.5	1	0.4°	0.8	8	2.3	9.6°	1.02	60	6	3	▲	1	8.5	8.8	9.3	9.8
VF3XBR0050T0024L010	0.5	1	0.4°	0.8	10	2.3	8.5°	1.05	60	6	3	▲	1	10.5	10.9	11.4	12.1
VF3XBR0050T0024L012	0.5	1	0.4°	0.8	12	2.3	7.6°	1.08	60	6	3	▲	1	12.6	13.0	13.6	14.4
VF3XBR0050T0024L016	0.5	1	0.4°	0.8	16	2.3	6.3°	1.13	70	6	3	▲	1	16.6	17.1	18.0	18.9
VF3XBR0050T0024L020	0.5	1	0.4°	0.8	20	2.3	5.4°	1.19	70	6	3	▲	1	20.6	21.2	22.3	23.5
VF3XBR0050T0024L025	0.5	1	0.4°	0.8	25	2.3	4.6°	1.26	70	6	3	▲	1	25.7	26.3	27.7	29.3
VF3XBR0050T0024L030	0.5	1	0.4°	0.8	30	2.3	4.0°	1.33	80	6	3	▲	1	30.7	31.5	33.1	35.0
VF3XBR0050T0024L035	0.5	1	0.4°	0.8	35	2.3	3.5°	1.40	80	6	3	▲	1	35.7	36.6	38.6	40.7
VF3XBR0050T0054L008	0.5	1	0.9°	0.8	8	2.3	9.7°	1.12	60	6	3	▲	1	—	8.6	9.1	9.6
VF3XBR0050T0054L012	0.5	1	0.9°	0.8	12	2.3	7.7°	1.24	60	6	3	▲	1	—	12.6	13.3	14.1
VF3XBR0050T0054L016	0.5	1	0.9°	0.8	16	2.3	6.4°	1.37	70	6	3	▲	1	—	16.7	17.6	18.5
VF3XBR0050T0054L020	0.5	1	0.9°	0.8	20	2.3	5.5°	1.50	70	6	3	▲	1	—	20.7	21.8	23.0
VF3XBR0050T0054L025	0.5	1	0.9°	0.8	25	2.3	4.7°	1.65	70	6	3	▲	1	—	25.7	27.1	28.6
VF3XBR0050T0054L030	0.5	1	0.9°	0.8	30	2.3	4.0°	1.81	80	6	3	▲	1	—	30.8	32.4	34.2
VF3XBR0050T0054L035	0.5	1	0.9°	0.8	35	2.3	3.6°	1.97	80	6	3	▲	1	—	35.8	37.7	39.8
VF3XBR0050T0054L040	0.5	1	0.9°	0.8	40	2.3	3.2°	2.12	80	6	3	▲	1	—	40.8	43.0	45.4
VF3XBR0050T0054L050	0.5	1	0.9°	0.8	50	2.3	2.7°	2.44	110	6	3	▲	1	—	50.9	53.6	*
VF3XBR0050T0054L060	0.5	1	0.9°	0.8	60	2.3	2.3°	2.75	110	6	3	▲	1	—	60.9	64.1	*
VF3XBR0050T0054L070	0.5	1	0.9°	0.8	70	2.3	2.0°	3.07	110	6	3	▲	1	—	71.0	74.7	*
VF3XBR0050T0130L012	0.5	1	1.5°	0.8	12	2.3	7.9°	1.45	60	6	3	▲	1	—	—	13.0	13.7
VF3XBR0050T0130L016	0.5	1	1.5°	0.8	16	2.3	6.5°	1.66	70	6	3	▲	1	—	—	17.1	18.0
VF3XBR0050T0130L020	0.5	1	1.5°	0.8	20	2.3	5.6°	1.87	70	6	3	▲	1	—	—	21.2	22.4
VF3XBR0050T0130L025	0.5	1	1.5°	0.8	25	2.3	4.8°	2.13	70	6	3	▲	1	—	—	26.3	27.8
VF3XBR0050T0130L030	0.5	1	1.5°	0.8	30	2.3	4.1°	2.39	80	6	3	▲	1	—	—	31.5	33.2
VF3XBR0050T0130L035	0.5	1	1.5°	0.8	35	2.3	3.7°	2.65	80	6	3	▲	1	—	—	36.6	38.6
VF3XBR0075T0024L010	0.75	1.5	0.4°	1.3	10	2.8	8.1°	1.54	60	6	3	▲	1	10.6	10.9	11.4	12.0
VF3XBR0075T0024L015	0.75	1.5	0.4°	1.3	15	2.8	6.2°	1.61	60	6	3	▲	1	15.6	16.0	16.9	17.8
VF3XBR0075T0024L020	0.75	1.5	0.4°	1.3	20	2.8	5.0°	1.68	70	6	3	▲	1	20.6	21.2	22.3	23.5

* No interference

▲ : Inventory maintained in Japan. To be replaced by new products.
MP3XB (J222) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
VF3XBR0075T0024L030	0.75	1.5	0.4°	1.3	30	2.8	3.7°	1.82	80	6	3	▲	1	30.7	31.5	33.1	35.0
VF3XBR0075T0054L015	0.75	1.5	0.9°	1.3	15	2.8	6.3°	1.82	60	6	3	▲	1	—	15.7	16.5	17.4
VF3XBR0075T0054L020	0.75	1.5	0.9°	1.3	20	2.8	5.1°	1.98	70	6	3	▲	1	—	20.7	21.8	23.0
VF3XBR0075T0054L030	0.75	1.5	0.9°	1.3	30	2.8	3.7°	2.29	80	6	3	▲	1	—	30.8	32.4	34.2
VF3XBR0075T0054L040	0.75	1.5	0.9°	1.3	40	2.8	3.0°	2.61	80	6	3	▲	1	—	40.8	43.0	45.3
VF3XBR0075T0130L015	0.75	1.5	1.5°	1.3	15	2.8	6.4°	2.08	60	6	3	▲	1	—	—	16.1	17.0
VF3XBR0075T0130L020	0.75	1.5	1.5°	1.3	20	2.8	5.2°	2.34	70	6	3	▲	1	—	—	21.2	22.4
VF3XBR0075T0130L030	0.75	1.5	1.5°	1.3	30	2.8	3.8°	2.86	80	6	3	▲	1	—	—	31.5	33.2
VF3XBR0100T0024L016	1	2	0.4°	1.6	16	3.6	5.5°	2.07	70	6	3	▲	1	16.7	17.1	18.0	19.0
VF3XBR0100T0024L020	1	2	0.4°	1.6	20	3.6	4.6°	2.13	70	6	3	▲	1	20.7	21.3	22.3	23.5
VF3XBR0100T0024L025	1	2	0.4°	1.6	25	3.6	3.9°	2.20	70	6	3	▲	1	25.8	26.4	27.8	29.3
VF3XBR0100T0024L030	1	2	0.4°	1.6	30	3.6	3.4°	2.27	80	6	3	▲	1	30.8	31.6	33.2	35.0
VF3XBR0100T0024L035	1	2	0.4°	1.6	35	3.6	2.9°	2.34	80	6	3	▲	1	35.8	36.7	38.6	*
VF3XBR0100T0024L040	1	2	0.4°	1.6	40	3.6	2.6°	2.41	80	6	3	▲	1	40.8	41.9	44.0	*
VF3XBR0100T0054L020	1	2	0.9°	1.6	20	3.6	4.7°	2.42	70	6	3	▲	1	—	20.8	21.9	23.0
VF3XBR0100T0054L025	1	2	0.9°	1.6	25	3.6	4.0°	2.57	70	6	3	▲	1	—	25.8	27.2	28.6
VF3XBR0100T0054L030	1	2	0.9°	1.6	30	3.6	3.4°	2.73	80	6	3	▲	1	—	30.9	32.5	34.2
VF3XBR0100T0054L035	1	2	0.9°	1.6	35	3.6	3.0°	2.89	80	6	3	▲	1	—	35.9	37.7	39.8
VF3XBR0100T0054L040	1	2	0.9°	1.6	40	3.6	2.7°	3.04	80	6	3	▲	1	—	40.9	43.0	*
VF3XBR0100T0054L050	1	2	0.9°	1.6	50	3.6	2.2°	3.36	110	6	3	▲	1	—	51.0	53.6	*
VF3XBR0100T0054L060	1	2	0.9°	1.6	60	3.6	1.9°	3.67	110	6	3	▲	1	—	61.0	*	*
VF3XBR0100T0054L070	1	2	0.9°	1.6	70	3.6	1.6°	3.99	110	6	3	▲	1	—	71.1	*	*
VF3XBR0100T0130L025	1	2	1.5°	1.6	25	3.6	4.1°	3.02	70	6	3	▲	1	—	—	26.4	27.9
VF3XBR0100T0130L030	1	2	1.5°	1.6	30	3.6	3.5°	3.28	80	6	3	▲	1	—	—	31.6	33.3
VF3XBR0100T0130L035	1	2	1.5°	1.6	35	3.6	3.1°	3.54	80	6	3	▲	1	—	—	36.7	38.7
VF3XBR0100T0130L040	1	2	1.5°	1.6	40	3.6	2.7°	3.81	80	6	3	▲	1	—	—	41.8	*
VF3XBR0125T0054L020	1.25	2.5	0.9°	2	20	4.5	4.3°	2.89	60	6	3	▲	1	—	20.8	21.9	23.1
VF3XBR0125T0054L030	1.25	2.5	0.9°	2	30	4.5	3.1°	3.20	80	6	3	▲	1	—	30.9	32.5	34.2
VF3XBR0125T0054L040	1.25	2.5	0.9°	2	40	4.5	2.4°	3.52	80	6	3	▲	1	—	40.9	43.1	*
VF3XBR0125T0130L020	1.25	2.5	1.5°	2	20	4.5	4.4°	3.21	60	6	3	▲	1	—	—	21.4	22.5
VF3XBR0125T0130L030	1.25	2.5	1.5°	2	30	4.5	3.1°	3.74	80	6	3	▲	1	—	—	31.6	33.3
VF3XBR0125T0130L040	1.25	2.5	1.5°	2	40	4.5	2.5°	4.26	80	6	3	▲	1	—	—	41.9	*
VF3XBR0150T0024L020	1.5	3	0.4°	2	20	5	3.8°	3.11	60	6	3	▲	1	20.7	21.3	22.3	23.5
VF3XBR0150T0024L025	1.5	3	0.4°	2	25	5	3.1°	3.18	80	6	3	▲	1	25.8	26.4	27.7	29.2
VF3XBR0150T0024L030	1.5	3	0.4°	2	30	5	2.7°	3.25	80	6	3	▲	1	30.8	31.6	33.2	*
VF3XBR0150T0024L040	1.5	3	0.4°	2	40	5	2.1°	3.39	80	6	3	▲	1	40.9	41.9	44.0	*
VF3XBR0150T0024L050	1.5	3	0.4°	2	50	5	1.7°	3.53	100	6	3	▲	1	50.9	52.2	*	*
VF3XBR0150T0054L020	1.5	3	0.9°	2	20	5	3.8°	3.37	60	6	3	▲	1	—	20.9	21.9	23.0
VF3XBR0150T0054L030	1.5	3	0.9°	2	30	5	2.7°	3.69	80	6	3	▲	1	—	30.9	32.5	*
VF3XBR0150T0054L040	1.5	3	0.9°	2	40	5	2.1°	4.00	80	6	3	▲	1	—	41.0	43.1	*
VF3XBR0150T0054L050	1.5	3	0.9°	2	50	5	1.7°	4.31	100	6	3	▲	1	—	51.0	*	*
VF3XBR0150T0054L060	1.5	3	0.9°	2	60	5	2.3°	4.63	110	8	3	▲	1	—	61.1	64.2	*
VF3XBR0150T0054L070	1.5	3	0.9°	2	70	5	2.0°	4.94	120	8	3	▲	1	—	71.1	74.8	*
VF3XBR0150T0130L040	1.5	3	1.5°	2	40	5	2.2°	4.73	80	6	3	▲	1	—	—	41.9	*
VF3XBR0150T0130L050	1.5	3	1.5°	2	50	5	2.8°	5.26	110	8	3	▲	1	—	—	52.2	*
VF3XBR0150T0130L060	1.5	3	1.5°	2	60	5	2.4°	5.78	110	8	3	▲	1	—	—	62.4	*
VF3XBR0150T0130L070	1.5	3	1.5°	2	70	5	2.1°	6.30	120	8	3	▲	1	—	—	72.7	*
VF3XBR0200T0054L030	2	4	0.9°	3	30	6	3.5°	4.65	90	8	3	▲	1	—	30.9	32.5	34.2
VF3XBR0200T0054L040	2	4	0.9°	3	40	6	2.7°	4.97	90	8	3	▲	1	—	41.0	43.0	*
VF3XBR0200T0054L050	2	4	0.9°	3	50	6	2.2°	5.28	110	8	3	▲	1	—	51.0	53.6	*
VF3XBR0200T0054L060	2	4	0.9°	3	60	6	1.9°	5.60	110	8	3	▲	1	—	61.1	*	*
VF3XBR0250T0054L035	2.5	5	0.9°	3.5	35	6.5	2.4°	5.80	90	8	3	▲	1	—	35.9	37.7	*

* No interference

VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

(mm)

Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
VF3XBR0250T0054L040	2.5	5	0.9°	3.5	40	6.5	2.2°	5.95	90	8	3	▲	1	—	41.0	43.0	*
VF3XBR0250T0054L050	2.5	5	0.9°	3.5	50	6.5	1.8°	6.27	110	8	3	▲	1	—	51.0	*	*
VF3XBR0250T0054L060	2.5	5	0.9°	3.5	60	6.5	1.5°	6.58	110	8	3	▲	1	—	61.1	*	*

* No interference

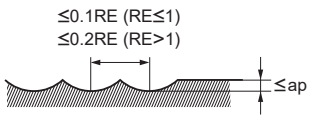
▲ : **Inventory maintained in Japan. To be replaced by new products.**
MP3XB (J222) is alternative product.

ISO13399 ➢ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R0.4	**0.4°**	**6**	34000	2700	0.03	31000	2200	0.025	24000	1700	0.02	19000	1400	0.015
		8	31000	2100	0.02	29000	1700	0.02	22000	1300	0.015	18000	1000	0.01
		12	28000	2000	0.015	26000	1600	0.01	20000	1200	0.01	16000	960	0.007
	0.9°	**8**	31000	2200	0.02	29000	1800	0.02	22000	1400	0.015	18000	1100	0.01
		12	28000	2100	0.015	26000	1700	0.01	20000	1300	0.01	16000	1000	0.007
		16	25000	1100	0.01	23000	910	0.01	18000	700	0.008	14000	560	0.006
R0.5	**0.4°**	**8**	27000	2700	0.04	25000	2200	0.04	19000	1700	0.03	15000	1400	0.02
		10	24000	2200	0.03	22000	1800	0.025	17000	1400	0.02	14000	1100	0.015
		12	24000	2200	0.03	22000	1800	0.025	17000	1400	0.02	14000	1100	0.015
		16	22000	2100	0.03	21000	1700	0.025	16000	1300	0.02	13000	1000	0.015
		20	20000	1400	0.015	18000	1200	0.01	14000	900	0.01	11000	720	0.007
		25	18000	1300	0.015	17000	1000	0.01	13000	800	0.009	10000	640	0.006
		30	15000	960	0.01	14000	780	0.01	11000	600	0.008	8800	480	0.006
		35	14000	800	0.008	13000	650	0.007	10000	500	0.006	8000	400	0.004
	0.9°	**8**	27000	2900	0.04	25000	2300	0.04	19000	1800	0.03	15000	1400	0.02
		12	24000	2400	0.03	22000	2000	0.025	17000	1500	0.02	14000	1200	0.015
		16	22000	2200	0.03	21000	1800	0.025	16000	1400	0.02	13000	1100	0.015
		20	20000	1600	0.015	18000	1300	0.01	14000	1000	0.01	11000	800	0.007
		25	18000	1400	0.015	17000	1200	0.01	13000	900	0.009	10000	720	0.006
		30	15000	1100	0.01	14000	910	0.009	11000	700	0.008	8800	560	0.006
		35	14000	960	0.008	13000	780	0.007	10000	600	0.006	8000	480	0.004
		40	11000	800	0.007	11000	650	0.006	8000	500	0.005	6400	400	0.003
		50	8400	610	0.006	7800	490	0.005	6000	380	0.004	4800	300	0.003
		60	7000	510	0.004	6500	400	0.004	5000	320	0.003	4000	260	0.002
		70	7000	480	0.003	6500	390	0.002	5000	300	0.002	4000	240	0.001
	1.5°	**12**	24000	2600	0.03	22000	2100	0.025	17000	1600	0.02	14000	1300	0.015
		16	22000	2400	0.03	21000	2000	0.025	16000	1500	0.02	13000	1200	0.015
		20	20000	1800	0.015	18000	1400	0.01	14000	1100	0.01	11000	880	0.007
		25	18000	1600	0.015	17000	1300	0.01	13000	1000	0.009	11000	800	0.006
		30	15000	1300	0.01	14000	1000	0.01	11000	800	0.008	8800	640	0.006
		35	14000	1100	0.008	13000	910	0.007	10000	700	0.006	8000	560	0.004

Depth of cut



RE:Radius

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

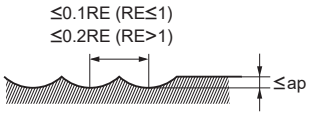
VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R0.75	**0.4°**	**10**	18000	2700	0.06	17000	2200	0.05	13000	1700	0.04	10000	1400	0.03
		15	17000	2200	0.04	16000	1800	0.04	12000	1400	0.03	9600	1100	0.02
		20	17000	2100	0.03	16000	1700	0.025	12000	1300	0.02	9600	1000	0.015
		30	14000	1600	0.015	13000	1300	0.01	10000	1000	0.01	8000	800	0.007
	0.9°	**15**	17000	2400	0.04	16000	2000	0.04	12000	1500	0.03	9600	1200	0.02
		20	17000	2200	0.03	16000	1800	0.025	12000	1400	0.02	9600	1100	0.015
		30	14000	1800	0.015	13000	1400	0.01	10000	1100	0.01	8000	880	0.007
		40	13000	1300	0.01	12000	1000	0.01	9000	800	0.008	7200	640	0.006
	1.5°	**15**	17000	2600	0.04	16000	2100	0.04	12000	1600	0.03	9600	1300	0.02
		20	17000	2400	0.03	16000	2000	0.025	12000	1500	0.02	9600	1200	0.015
		30	14000	2000	0.015	13000	1600	0.01	10000	1200	0.01	8000	960	0.007
R1	**0.4°**	**16**	15000	3200	0.07	14000	2600	0.06	11000	2000	0.05	8800	1600	0.03
		20	14000	2400	0.06	13000	2000	0.05	10000	1500	0.04	8000	1200	0.03
		25	14000	2100	0.04	13000	1700	0.04	10000	1300	0.03	8000	1000	0.02
		30	13000	1800	0.03	12000	1400	0.03	9000	1100	0.025	7200	880	0.02
		35	13000	1600	0.03	12000	1300	0.025	9000	1000	0.02	7200	800	0.015
		40	12000	1400	0.015	11000	1200	0.01	8500	900	0.01	6800	720	0.007
	0.9°	**20**	14000	2600	0.06	13000	2100	0.05	10000	1600	0.04	8000	1300	0.03
		25	14000	2200	0.05	13000	1800	0.04	10000	1400	0.03	8000	1100	0.025
		30	13000	1900	0.04	12000	1600	0.04	9000	1200	0.03	7200	960	0.02
		35	13000	1800	0.04	12000	1400	0.03	9000	1100	0.025	7200	880	0.02
		40	12000	1600	0.03	11000	1300	0.025	8500	1000	0.02	6800	800	0.015
		50	11000	1400	0.015	10000	1200	0.01	8000	900	0.01	6400	720	0.007
		60	9800	1100	0.007	9100	910	0.006	7000	700	0.005	5600	560	0.003
		70	8400	960	0.004	7800	780	0.004	6000	600	0.003	4800	480	0.002
	1.5°	**25**	14000	2400	0.05	13000	2000	0.04	10000	1500	0.03	8000	1200	0.025
		30	12600	2100	0.04	12000	1700	0.04	9000	1300	0.03	7200	1000	0.02
		35	13000	1900	0.04	12000	1600	0.03	9000	1200	0.025	7200	960	0.02
		40	12000	1800	0.03	11000	1400	0.025	8500	1100	0.02	6800	880	0.015

Depth of cut

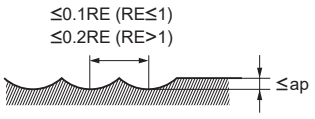


RE:Radius

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Hardened steel (45−55HRC) AISI H13			Hardened steel (55−62HRC) AISI D2		
R **RE** (mm)	Taper angle one side **BHTA2**	Neck length **LB2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R1.25	**0.9°**	**20**	13000	2900	0.06	12000	2300	0.05	9000	1800	0.04	7200	1400	0.03
		30	12000	2600	0.05	11000	2100	0.04	8500	1600	0.03	6800	1300	0.025
		40	11000	2200	0.04	9800	1800	0.04	7500	1400	0.03	6000	1100	0.02
	1.5°	**20**	13000	3000	0.06	12000	2500	0.05	9000	1900	0.04	7200	1500	0.03
		30	12000	2700	0.05	11050	2200	0.04	8500	1700	0.03	6800	1400	0.025
		40	11000	2400	0.04	9800	2000	0.04	7500	1500	0.03	6000	1200	0.02
R1.5	**0.4°**	**20**	12000	3700	0.13	11000	3000	0.1	8500	2300	0.09	6800	1800	0.06
		30	11000	2900	0.07	10000	2300	0.06	8000	1800	0.05	6400	1400	0.03
		40	11000	2400	0.06	10000	2000	0.05	8000	1500	0.04	6400	1200	0.03
		50	11000	2000	0.04	9800	1600	0.04	7500	1200	0.03	6000	960	0.02
	0.9°	**20**	12000	3800	0.13	11000	3100	0.1	8500	2400	0.09	6800	1900	0.06
		30	11000	3000	0.07	10000	2500	0.06	8000	1900	0.05	6400	1500	0.03
		40	11000	2600	0.06	10000	2100	0.05	8000	1600	0.04	6400	1300	0.03
		50	11000	2100	0.04	9800	1700	0.04	7500	1300	0.03	6000	1000	0.02
		60	9800	2000	0.03	9100	1600	0.025	7000	1200	0.02	5600	960	0.015
		70	9800	1800	0.015	9100	1400	0.01	7000	1100	0.01	5600	880	0.007
	1.5°	**50**	11000	2200	0.04	9800	1800	0.04	7500	1400	0.03	6000	1100	0.02
		60	9800	2100	0.03	9100	1700	0.025	7000	1300	0.02	5600	1000	0.015
		70	9800	2000	0.015	9100	1600	0.01	7000	1200	0.01	5600	960	0.007
R2	**0.9°**	**30**	10000	3200	0.3	9400	2600	0.25	7200	2000	0.2	5800	1600	0.15
		40	9500	2400	0.15	8800	2000	0.12	6800	1500	0.1	5400	1200	0.07
		50	9500	2100	0.1	8800	1700	0.1	6800	1300	0.08	5400	1000	0.06
		60	9000	1900	0.07	8300	1600	0.06	6400	1200	0.05	5100	960	0.03
R2.5	**0.9°**	**35**	8000	3500	0.3	7400	2900	0.25	5700	2200	0.2	4600	1800	0.15
		40	8000	3200	0.2	7400	2600	0.18	5700	2000	0.15	4600	1600	0.1
		60	7600	2400	0.15	7000	2000	0.12	5400	1500	0.1	4300	1200	0.07

Depth of cut



RE:Radius

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

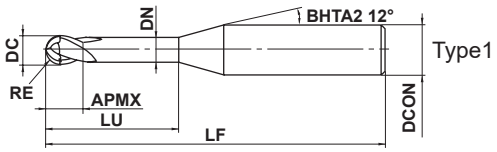
VQ4SVB

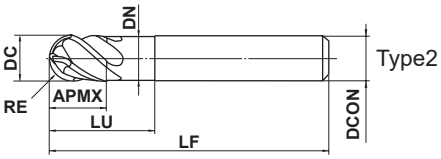
Ball nose, Short cut length, 4 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	







1≤RE≤6				
±0.01				
DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

- 4 flute ball nose end mill
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

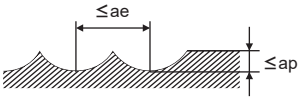
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQ4SVBR0100	1	2	3	5	1.9	50	6	4	●	1
VQ4SVBR0150	1.5	3	4.5	7.5	2.9	50	6	4	●	1
VQ4SVBR0200	2	4	6	10	3.9	50	6	4	●	1
VQ4SVBR0250	2.5	5	7.5	12.5	4.9	50	6	4	●	1
VQ4SVBR0300	3	6	9	15	5.85	50	6	4	●	2
VQ4SVBR0400	4	8	12	20	7.85	60	8	4	●	2
VQ4SVBR0500	5	10	15	25	9.7	70	10	4	●	2
VQ4SVBR0600	6	12	18	30	11.7	75	12	4	●	2

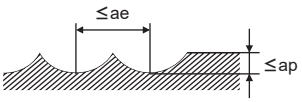
Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling(Slotting)

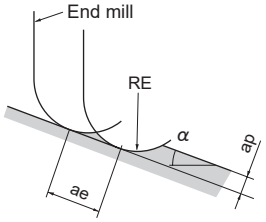
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Pre-hardened steel AISI 1045, AISI 4140, ASTM A36, AISI 1010, AISI P21, AISI P20, AISI 4340								Austenitic stainless steel, Titanium alloy, Precipitation hardeningstainless steel, Cobalt chromium alloy, Ferritic, Precipitation hardeningstainless steel AISI 304, AISI 316, Ti-6Al-4V, AISI 630, AISI 631, 15-5PH, 17-4PH, AISI 431, AISI 420							
R **RE** (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)
	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)			Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 1	250	40000	8000	200	32000	3800	0.17	0.5	230	36000	6500	150	24000	2900	0.17	0.5
R 1.5	300	32000	7700	200	21000	3200	0.25	0.75	230	24000	4800	150	16000	1900	0.25	0.75
R 2	300	24000	5800	200	16000	2800	0.33	1	230	18000	4000	150	12000	1700	0.33	1
R 2.5	300	19000	5300	200	12700	2600	0.42	1.25	230	14400	3500	150	9600	1500	0.42	1.25
R 3	300	16000	4800	200	10600	2100	0.5	1.5	230	12000	3200	150	8000	1400	0.5	1.5
R 4	300	12000	4300	200	8000	1900	0.8	2	230	9000	3200	150	6000	1400	0.8	2
R 5	300	9600	4100	200	6400	1800	1	2.5	230	7200	3000	150	4800	1300	1	2.5
R 6	300	8000	4000	200	5300	1800	1.2	3	230	6000	3000	150	4000	1300	1.2	3
Depth of cut																

RE:Radius

Workpiece Material	Copper, Copper alloy								Heat Resistant Alloy Inconel718							
R **RE** (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)
	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)			Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)		
R 1	250	40000	8000	240	38000	4500	0.17	0.5	60	9600	960	40	6400	510	0.08	0.2
R 1.5	360	38000	9100	240	25000	3800	0.25	0.7	60	6400	640	40	4200	340	0.13	0.3
R 2	360	29000	7000	240	19000	3300	0.33	1	60	4800	580	40	3200	260	0.17	0.4
R 2.5	360	23000	6400	240	15000	3100	0.42	1.2	60	3800	530	39	2500	250	0.21	0.5
R 3	360	19000	5700	240	13000	2600	0.5	1.5	60	3200	500	40	2100	210	0.25	0.6
R 4	360	14000	5000	240	9600	2300	0.8	2	60	2400	430	40	1600	190	0.4	0.8
R 5	360	12000	5100	240	7700	2200	1	2.5	63	2000	420	41	1300	180	0.5	1
R 6	360	9600	4800	240	6400	2200	1.2	3	64	1700	350	41	1100	150	0.6	1.2
Depth of cut																

RE:Radius

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 5) α is the inclination angle of the machined surface.



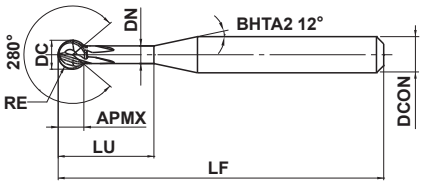
ae:Pick Feed

VQ4WB NEW

Multi-functional lollipop, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





0.5≤RE≤3					
±0.01					
4≤DCON≤6					
0 - 0.008					

●Multi-functional ball end mill with a lollipop shape for 5-axis machining. Optimal for back deburring undercutting, and inner curved surface machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
VQ4WBR0050N06E280	0.5	1.0	0.88	6	0.61	50	4	4	●
VQ4WBR0065N08E280	0.65	1.3	1.14	8	0.80	50	4	4	●
VQ4WBR0090N06E280	0.9	1.8	1.58	6	1.11	50	4	4	●
VQ4WBR0100N06E280	1.0	2.0	1.76	6	1.24	60	6	4	●
VQ4WBR0140N16E280	1.4	2.8	2.47	16	1.74	60	6	4	●
VQ4WBR0150N08E280	1.5	3.0	2.64	8	1.87	60	6	4	●
VQ4WBR0190N12E280	1.9	3.8	3.35	12	2.37	60	6	4	●
VQ4WBR0200N12E280	2.0	4.0	3.53	12	2.50	60	6	4	●
VQ4WBR0240N16E280	2.4	4.8	4.23	16	3.00	70	6	4	●
VQ4WBR0250N12E280	2.5	5.0	4.41	12	3.13	80	6	4	●
VQ4WBR0300N12E280	3.0	6.0	5.29	12	3.76	80	6	4	●

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.

<Special Orders>

For non standard products not shown above, please contact our sales department.

● : Inventory maintained in Japan.

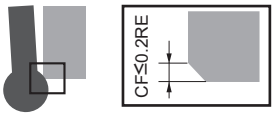
Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Chamfering (Debarring)

(mm)

Workpiece Material		Mild Steels, Carbon Steels, Alloy steel Pre-hardened Steels, Alloy tool steel (–45HRC), Copper Alloys SS400, S10C, S45C, SCM440, SNCM439 NAK, SKD etc.			Austenitic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chromium Alloys, Titanium Alloys SUS304, SUS316L, SUS420J, SUS630, SU631, Ti-6Al-4V, CCM etc.		
DC	**RE**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **Max. CF**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **Max. CF**
1.0	**0.5**	19000	300	0.10	14000	220	0.10
1.3	**0.65**	15000	420	0.13	11000	310	0.13
1.8	**0.9**	11000	570	0.18	8000	420	0.18
2.0	**1.0**	9500	610	0.20	7200	460	0.20
2.8	**1.4**	6800	760	0.28	5100	570	0.28
3.0	**1.5**	6400	770	0.30	4800	580	0.30
3.8	**1.9**	5000	840	0.38	3800	640	0.38
4.0	**2.0**	4800	880	0.40	3600	660	0.40
4.8	**2.4**	4000	960	0.48	3000	720	0.48
5.0	**2.5**	3800	970	0.50	2900	740	0.50
6.0	**3.0**	3200	1000	0.60	2400	770	0.60
Depth of Cut		 RE : Radius					

■ Internal Profile / Undercut

(mm)

Workpiece Material		Mild Steels, Carbon Steels, Alloy steel Pre-hardened Steels, Alloy tool steel (–45HRC), Copper Alloys SS400, S10C, S45C, SCM440, SNCM439 NAK, SKD etc.			Austenitic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chromium Alloys, Titanium Alloys SUS304, SUS316L, SUS420J, SUS630, SU631, Ti-6Al-4V, CCM etc.		
DC	**RE**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **ae**
2.0	**1.0**	9500	460	0.03	7200	290	0.03
3.0	**1.5**	6400	560	0.10	4800	350	0.10
4.0	**2.0**	4800	650	0.14	3600	390	0.14
5.0	**2.5**	3800	730	0.18	2900	440	0.18
6.0	**3.0**	3200	770	0.22	2400	460	0.22
Depth of Cut		 RE : Radius					

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work. When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) For sizes RE 0.5, 0.65, 0.9, 1.4, 1.9 and RE 2.4, which have long neck lengths, internal profile milling and round shape slotting are not recommended.

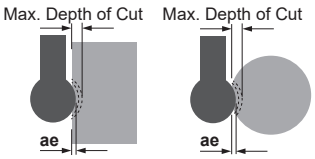
VQ4WB

Multi-functional lollipop, Short cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

■ Radiused Shape Slotting

(mm)

Workpiece Material		Mild Steels, Carbon Steels, Alloy steel Pre-hardened Steels, Alloy tool steel (–45HRC), Copper Alloys SS400, S10C, S45C, SCM440, SNCM439 NAK, SKD etc.				Austenitic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chromium Alloys, Titanium Alloys SUS304, SUS316L, SUS420J, SUS630, SU631, Ti-6Al-4V, CCM etc.			
DC	**RE**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **ae**	Depth of Cut **Max. ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (mm/min)	Depth of Cut **ae**	Depth of Cut **Max. ae**
2.0	**1.0**	9500	300	0.03	0.06	7200	140	0.03	0.06
3.0	**1.5**	6400	380	0.10	0.20	4800	190	0.10	0.20
4.0	**2.0**	4800	440	0.14	0.28	3600	230	0.14	0.28
5.0	**2.5**	3800	490	0.18	0.54	2900	260	0.18	0.54
6.0	**3.0**	3200	510	0.22	0.88	2400	270	0.22	0.88
Depth of Cut									

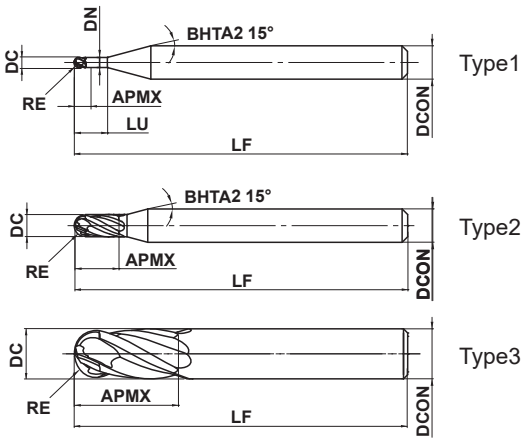
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work. When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) For sizes RE 0.5, 0.65, 0.9, 1.4, 1.9 and RE 2.4, which have long neck lengths, internal profile milling and round shape slotting are not recommended.
Note 5) The maximum allowed depth of cut (Max. ae) avoids interference between the workpiece and tool shank. It is recommended to machine up to the Max. ae in 2-4 passes.

VQN4MB NEW

Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		





RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

h5

●(Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
●The 2-flute end cutting edge provides excellent chip evacuation and is ideal for rough machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN4MBR0100	1.0	2	2	6	1.9	60	6	4	●	1
VQN4MBR0150	1.5	3	3	8	2.9	60	6	4	●	1
VQN4MBR0200	2.0	4	8	–	–	60	6	4	●	2
VQN4MBR0250	2.5	5	12	–	–	60	6	4	●	2
VQN4MBR0300	3.0	6	12	–	–	60	6	4	●	3
VQN4MBR0400	4.0	8	14	–	–	70	8	4	●	3
VQN4MBR0500	5.0	10	18	–	–	80	10	4	●	3
VQN4MBR0600	6.0	12	22	–	–	80	12	4	●	3

● : Inventory maintained in Japan.

Click here for product NEWS ▶

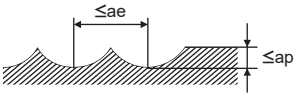
ISO13399 ➤ J002

VQN4MB

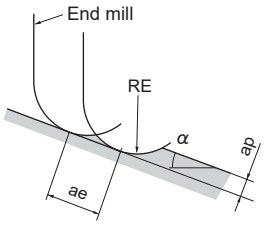
Ball nose, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material	Nickel-Based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.					
R **RE**	$\alpha \leq 15°$		$\alpha > 15°$		Depth of cut ap	Depth of cut ae
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		
1.0	6300	380	6300	510	0.2	0.50
1.5	4200	340	4200	420	0.3	0.75
2.0	3100	320	3100	380	0.4	1.00
2.5	2500	250	2500	310	0.5	1.25
3.0	2100	210	2100	250	0.6	1.50
4.0	1500	160	1500	190	0.8	2.00
5.0	1200	150	1200	200	1.0	2.50
6.0	1000	150	1000	170	1.2	3.00
Depth of cut						

Note 1) The use of water-soluble coolant is effective for heat resistant super alloys.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) α is the inclination angle of the machined surface.



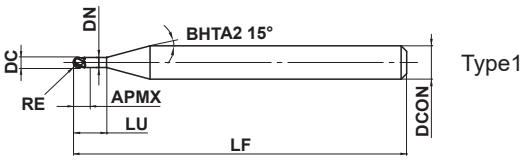
ae:Pick Feed

VQN4MBF NEW

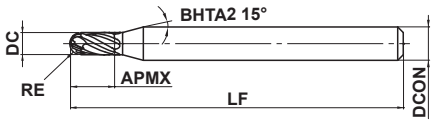
Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		

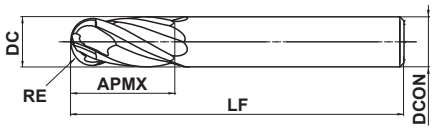




Type1



Type2



Type3

RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

●(Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
●The 4-flute end cutting edge is also ideal for 5-axis machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN4MBFR0100	1.0	2	2	6	1.9	60	6	4	●	1
VQN4MBFR0150	1.5	3	3	8	2.9	60	6	4	●	1
VQN4MBFR0200	2.0	4	8	–	–	60	6	4	●	2
VQN4MBFR0250	2.5	5	12	–	–	60	6	4	●	2
VQN4MBFR0300	3.0	6	12	–	–	60	6	4	●	3
VQN4MBFR0400	4.0	8	14	–	–	70	8	4	●	3
VQN4MBFR0500	5.0	10	18	–	–	80	10	4	●	3
VQN4MBFR0600	6.0	12	22	–	–	80	12	4	●	3

● : Inventory maintained in Japan.

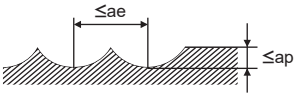
Click here for product NEWS ▶

VQN4MBF

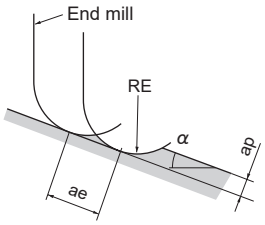
Ball nose, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material	Nickel-Based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.						
R **RE**	$\alpha \leq 15°$			$\alpha > 15°$			Depth of cut ap
	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ae	
1.0	6300	180	0.40	6300	310	0.50	0.2
1.5	4200	170	0.60	4200	340	0.75	0.3
2.0	3100	190	0.80	3100	320	1.00	0.4
2.5	2500	150	1.00	2500	250	1.25	0.5
3.0	2100	170	1.20	2100	250	1.50	0.6
4.0	1500	130	1.60	1500	190	2.00	0.8
5.0	1200	100	2.00	1200	200	2.50	1.0
6.0	1000	130	2.40	1000	170	3.00	1.2
Depth of cut							

Note 1) The use of water-soluble coolant is effective for heat resistant super alloys.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) α is the inclination angle of the machined surface.



ae:Pick Feed

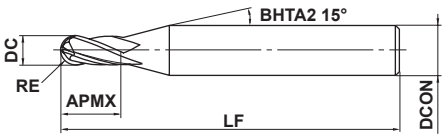
VF4MB

Ball nose, Medium cut length, 4 flute

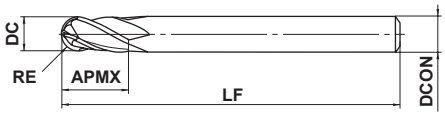


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

0.5≤RE≤6					
±0.01					
1≤DC≤12					
0 - 0.020					
DCON=6	8≤DCON≤10	DCON=12			
0 - 0.008	0 - 0.009	0 - 0.011			

●4 flute ball nose end mill for high-speed machining of hardened steel.

(mm)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MBR0050	0.5	1	2.5	50	6	4	●	1
VF4MBR0100	1	2	6	60	6	4	●	1
VF4MBR0150	1.5	3	8	70	6	4	●	1
VF4MBR0200	2	4	8	70	6	4	●	1
VF4MBR0250	2.5	5	12	80	6	4	●	1
VF4MBR0300	3	6	12	80	6	4	●	2
VF4MBR0400	4	8	14	90	8	4	●	2
VF4MBR0500	5	10	18	100	10	4	●	2
VF4MBR0600	6	12	22	110	12	4	●	2

● : Inventory maintained in Japan.

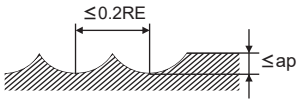
Click here for product NEWS ▶



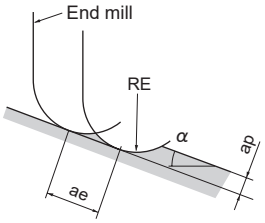
VF4MB

Ball nose, Medium cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45－55HRC) AISI H13					Hardened steel (55－62HRC) AISI D2					Hardened steel (62－70HRC) AISI W1, AISI M2				
R **RE** (mm)	α≤15°		α>15°		Depth of cut ap(mm)	α≤15°		α>15°		Depth of cut ap(mm)	α≤15°		α>15°		Depth of cut ap(mm)
	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)		Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	
R0.5	40000	8000	40000	3800	0.06	40000	5600	40000	3100	0.05	40000	4700	32000	1700	0.03
R1	40000	9600	40000	5600	0.11	40000	8000	28000	3100	0.10	24000	5000	16000	1200	0.06
R1.5	40000	12000	32000	5600	0.13	32000	7700	19000	2900	0.12	16000	4200	11000	1100	0.07
R2	32000	11000	24000	4700	0.15	24000	6200	14000	2500	0.13	12000	3100	8000	1000	0.08
R2.5	25000	9000	19000	3800	0.20	19000	5300	12000	2200	0.15	9600	2700	6000	780	0.08
R3	21000	8400	15000	3400	0.25	16000	4800	9600	2000	0.20	8000	2300	5000	780	0.09
R4	16000	6400	12000	2600	0.30	12000	3600	7200	1600	0.20	6000	1900	4000	620	0.09
R5	13000	5200	9600	2200	0.50	10000	3200	5800	1300	0.20	4800	1500	3000	550	0.10
R6	9000	3600	7200	1700	0.50	7000	2200	4300	940	0.30	3600	1100	2200	400	0.10
Depth of cut	 RE:Radius														

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.



ae:Pick Feed

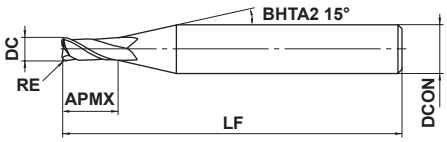
MS2MRB

Corner radius end mill, Medium cut length, 2 flute

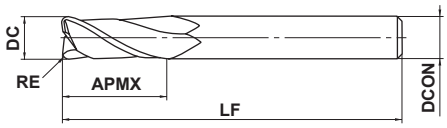


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

1≤DC≤12				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute corner radius end mill for general use.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0100R010	1	0.1	2	40	4	2	●	1
MS2MRBD0100R020	1	0.2	2	40	4	2	●	1
MS2MRBD0100R030	1	0.3	2	40	4	2	●	1
MS2MRBD0150R010	1.5	0.1	3	40	4	2	●	1
MS2MRBD0150R020	1.5	0.2	3	40	4	2	●	1
MS2MRBD0150R030	1.5	0.3	3	40	4	2	●	1
MS2MRBD0150R050	1.5	0.5	3	40	4	2	●	1
MS2MRBD0200R010	2	0.1	4	40	4	2	●	1
MS2MRBD0200R020	2	0.2	4	40	4	2	●	1
MS2MRBD0200R030	2	0.3	4	40	4	2	●	1
MS2MRBD0200R050	2	0.5	4	40	4	2	●	1
MS2MRBD0250R010	2.5	0.1	5	40	4	2	●	1
MS2MRBD0250R020	2.5	0.2	5	40	4	2	●	1
MS2MRBD0250R030	2.5	0.3	5	40	4	2	●	1
MS2MRBD0250R050	2.5	0.5	5	40	4	2	●	1
MS2MRBD0300R010	3	0.1	6	50	6	2	●	1
MS2MRBD0300R020	3	0.2	6	50	6	2	●	1
MS2MRBD0300R030	3	0.3	6	50	6	2	●	1
MS2MRBD0300R050	3	0.5	6	50	6	2	●	1
MS2MRBD0300R100	3	1	6	50	6	2	●	1
MS2MRBD0400R010	4	0.1	8	50	6	2	●	1
MS2MRBD0400R020	4	0.2	8	50	6	2	●	1
MS2MRBD0400R030	4	0.3	8	50	6	2	●	1
MS2MRBD0400R050	4	0.5	8	50	6	2	●	1
MS2MRBD0400R100	4	1	8	50	6	2	●	1
MS2MRBD0500R010	5	0.1	10	50	6	2	●	1
MS2MRBD0500R020	5	0.2	10	50	6	2	●	1
MS2MRBD0500R030	5	0.3	10	50	6	2	●	1
MS2MRBD0500R050	5	0.5	10	50	6	2	●	1
MS2MRBD0500R100	5	1	10	50	6	2	●	1
MS2MRBD0600R010	6	0.1	12	50	6	2	●	2
MS2MRBD0600R020	6	0.2	12	50	6	2	●	2
MS2MRBD0600R030	6	0.3	12	50	6	2	●	2
MS2MRBD0600R050	6	0.5	12	50	6	2	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

MS2MRB

Corner radius end mill, Medium cut length, 2 flute

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0600R100	6	1	12	50	6	2	●	2
MS2MRBD0600R150	6	1.5	12	50	6	2	●	2
MS2MRBD0600R200	6	2	12	50	6	2	●	2
MS2MRBD0800R020	8	0.2	16	60	8	2	●	2
MS2MRBD0800R030	8	0.3	16	60	8	2	●	2
MS2MRBD0800R050	8	0.5	16	60	8	2	●	2
MS2MRBD0800R100	8	1	16	60	8	2	●	2
MS2MRBD0800R150	8	1.5	16	60	8	2	●	2
MS2MRBD0800R200	8	2	16	60	8	2	●	2
MS2MRBD0800R250	8	2.5	16	60	8	2	●	2
MS2MRBD0800R300	8	3	16	60	8	2	●	2
MS2MRBD1000R020	10	0.2	20	70	10	2	●	2
MS2MRBD1000R030	10	0.3	20	70	10	2	●	2
MS2MRBD1000R050	10	0.5	20	70	10	2	●	2
MS2MRBD1000R100	10	1	20	70	10	2	●	2
MS2MRBD1000R150	10	1.5	20	70	10	2	●	2
MS2MRBD1000R200	10	2	20	70	10	2	●	2
MS2MRBD1000R250	10	2.5	20	70	10	2	●	2
MS2MRBD1000R300	10	3	20	70	10	2	●	2
MS2MRBD1200R020	12	0.2	24	75	12	2	●	2
MS2MRBD1200R030	12	0.3	24	75	12	2	●	2
MS2MRBD1200R050	12	0.5	24	75	12	2	●	2
MS2MRBD1200R100	12	1	24	75	12	2	●	2
MS2MRBD1200R150	12	1.5	24	75	12	2	●	2
MS2MRBD1200R200	12	2	24	75	12	2	●	2
MS2MRBD1200R250	12	2.5	24	75	12	2	●	2
MS2MRBD1200R300	12	3	24	75	12	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21			Hardened steel (45－55HRC) AISI H13		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
1	40000	2000	0.06	32000	1600	0.06
1.5	40000	3000	0.12	32000	1900	0.08
2	30000	3000	0.18	24000	1900	0.10
2.5	24000	2600	0.25	19000	1600	0.13
3	20000	2300	0.30	16000	1400	0.15
4	15000	2000	0.40	12000	1200	0.20
5	12000	1600	0.50	9000	900	0.25
6	10000	1400	0.60	7000	700	0.30
8	8000	1000	0.80	5600	550	0.40
10	6400	900	1.00	4500	500	0.50
12	5400	820	1.00	3800	450	0.50
Depth of cut	≤Please refer to the list above for depth of cut. ≤1DC			DC ≤Please refer to the list above for depth of cut.		

DC:Dia.

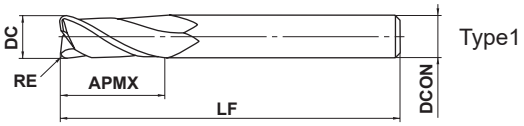
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) When slotting with end mills with ϕ3 or larger, reduce the revolution to 50－70% and the feed rate to 40－60%.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

CRN2MRB

Corner radius, Medium cut length, 2 flute, For copper electrodes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





Type1

6≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute corner radius end mill with CRN coating for copper electrode machining.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
CRN2MRBD0600R020	6	0.2	13	50	6	2	●	1
CRN2MRBD0600R050	6	0.5	13	50	6	2	●	1
CRN2MRBD0800R050	8	0.5	19	60	8	2	●	1
CRN2MRBD0800R100	8	1	19	60	8	2	●	1
CRN2MRBD1000R050	10	0.5	22	70	10	2	●	1
CRN2MRBD1000R100	10	1	22	70	10	2	●	1
CRN2MRBD1200R050	12	0.5	26	75	12	2	●	1
CRN2MRBD1200R100	12	1	26	75	12	2	●	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Copper, Copper alloys			
Dia. DC (mm)	Corner radius RE (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
6	R0.2, R0.5	10000	1400	6	0.6
8	R0.5	8000	1000	8	0.8
	R1	8000	1200	8	0.8
10	R0.5	6400	900	10	1.0
	R1	6400	1100	10	1.0
12	R0.5	5400	800	12	1.0
	R1	5400	1000	12	1.0
Depth of cut		≤ae, ≤ap DC:Dia.			

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : Inventory maintained in Japan.

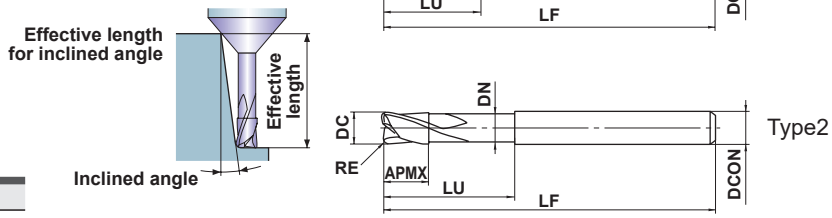
CRN2XLRB

Corner radius, Medium cut length, 2 flute, For copper electrodes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						◎	○





0.5≤DC≤6			
0 - 0.02			
4≤DCON≤6			
0 - 0.008			

●2 flute long neck corner radius end mill with CRN coating for copper electrode machining.

(mm)

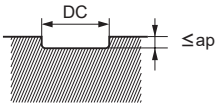
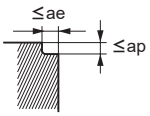
Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
CRN2XLRBD0050R005N04	0.5	0.05	0.5	4	0.46	9.5°	50	4	2	●	1	4.1	4.3	4.6	5
CRN2XLRBD0050R010N04	0.5	0.1	0.5	4	0.46	9.5°	50	4	2	●	1	4.1	4.3	4.6	5
CRN2XLRBD0100R010N08	1	0.1	1	8	0.94	6.3°	50	4	2	●	1	8.5	8.8	9.5	10.2
CRN2XLRBD0100R030N08	1	0.3	1	8	0.94	6.3°	50	4	2	●	1	8.5	8.8	9.5	10.2
CRN2XLRBD0100R030N12	1	0.3	1	12	0.94	4.9°	55	4	2	●	1	12.6	13.1	14.1	15.2
CRN2XLRBD0150R020N12	1.5	0.2	1.5	12	1.44	4.3°	55	4	2	●	1	12.6	13.1	14.1	15.2
CRN2XLRBD0150R030N12	1.5	0.3	1.5	12	1.44	4.3°	55	4	2	●	1	12.6	13.1	14.1	15.2
CRN2XLRBD0200R010N12	2	0.1	2	12	1.9	3.7°	55	4	2	●	1	12.5	13	14	15.1
CRN2XLRBD0200R020N12	2	0.2	2	12	1.9	3.7°	55	4	2	●	1	12.5	13	14	15.1
CRN2XLRBD0200R030N12	2	0.3	2	12	1.9	3.7°	55	4	2	●	1	12.5	13	13.9	15
CRN2XLRBD0200R050N12	2	0.5	2	12	1.9	3.8°	55	4	2	●	1	12.5	13	13.9	15
CRN2XLRBD0200R020N16	2	0.2	2	16	1.9	2.9°	55	4	2	●	1	16.7	17.3	18.6	*
CRN2XLRBD0200R030N16	2	0.3	2	16	1.9	3°	55	4	2	●	1	16.7	17.3	18.5	*
CRN2XLRBD0200R020N20	2	0.2	2	20	1.9	2.5°	60	4	2	●	1	20.8	21.5	23.2	*
CRN2XLRBD0300R020N20	3	0.2	3	20	2.9	3.4°	65	6	2	●	1	20.8	21.5	23.2	25
CRN2XLRBD0300R030N20	3	0.3	3	20	2.9	3.4°	65	6	2	●	1	20.8	21.5	23.1	25
CRN2XLRBD0300R050N20	3	0.5	3	20	2.9	3.4°	65	6	2	●	1	20.8	21.5	23.1	24.9
CRN2XLRBD0400R020N20	4	0.2	4	20	3.9	2.5°	65	6	2	●	1	20.8	21.5	23.2	*
CRN2XLRBD0400R030N20	4	0.3	4	20	3.9	2.5°	65	6	2	●	1	20.8	21.5	23.1	*
CRN2XLRBD0400R050N20	4	0.5	4	20	3.9	2.5°	65	6	2	●	1	20.8	21.5	23.1	*
CRN2XLRBD0600R020N30	6	0.2	6	30	5.85	—	70	6	2	●	2	*	*	*	*
CRN2XLRBD0600R030N30	6	0.3	6	30	5.85	—	70	6	2	●	2	*	*	*	*
CRN2XLRBD0600R050N30	6	0.5	6	30	5.85	—	70	6	2	●	2	*	*	*	*
CRN2XLRBD0600R100N30	6	1	6	30	5.85	—	70	6	2	●	2	*	*	*	*

* No interference

CRN2XLRB

Corner radius, Medium cut length, 2 flute, For copper electrodes

RECOMMENDED CUTTING CONDITIONS

			■Slotting			■Contour Cutting			
Workpiece Material			Copper, Copper alloys			Copper, Copper alloys			
Dia. **DC** (mm)	Corner radius **RE** (mm)	Neck length (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.5	**R0.05, R0.1**	**4**	40000	800	0.005	40000	1500	0.01	0.1
1	**R0.1, R0.3**	**8**	40000	2000	0.03	40000	3000	0.03	0.2
		12	30000	1200	0.02	30000	1800	0.02	0.2
1.5	**R0.2, R0.3**	**12**	30000	1500	0.05	40000	4500	0.04	0.3
2	**R0.1, R0.2 R0.3, R0.5**	**12**	30000	1500	0.1	40000	4500	0.08	0.4
		16	30000	1000	0.06	30000	3000	0.05	0.4
		20	20000	600	0.04	20000	2000	0.04	0.4
3	**R0.2, R0.3**	**20**	20000	2000	0.12	35000	6000	0.1	0.6
	R0.5	**20**	20000	2200	0.12	35000	8000	0.1	0.6
4	**R0.2, R0.3**	**20**	15000	2000	0.25	32000	5000	0.15	0.8
	R0.5	**20**	15000	2200	0.25	32000	7000	0.15	0.8
6	**R0.2, R0.3, R0.5**	**30**	10000	1200	0.4	20000	5000	0.25	1.2
	R1	**30**	10000	1500	0.4	20000	7000	0.25	1.2
Depth of cut			 DC:Dia.			 DC:Dia.			

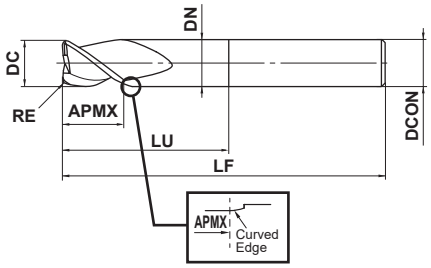
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Water-soluble cutting fluid is recommended.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

A3SARB NEW

Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

●Stability and reliability even when slotting, ramping and plunging.
●The cross sectional geometry of the flutes is perfect for efficient chip discharge.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
A3SARB120R100N36C	12	1	18	36	11.4	80	12	3	●
A3SARB120R200N36C	12	2	18	36	11.4	80	12	3	●
A3SARB120R300N36C	12	3	18	36	11.4	80	12	3	●
A3SARB160R200N48C	16	2	24	48	15.4	90	16	3	●
A3SARB160R300N48C	16	3	24	48	15.4	90	16	3	●
A3SARB160R400N48C	16	4	24	48	15.4	90	16	3	●
A3SARB200R200N55C	20	2	30	55	18	100	20	3	●
A3SARB200R300N55C	20	3	30	55	18	100	20	3	●
A3SARB200R400N55C	20	4	30	55	18	100	20	3	●
A3SARB250R200N55C	25	2	37.5	55	23	100	25	3	●
A3SARB250R300N55C	25	3	37.5	55	23	100	25	3	●
A3SARB250R400N55C	25	4	37.5	55	23	100	25	3	●
A3SARB250R500N55C	25	5	37.5	55	23	100	25	3	●

● : Inventory maintained in Japan.

Click here for product NEWS ▶

A3SARB

Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes

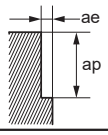
RECOMMENDED CUTTING CONDITIONS

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

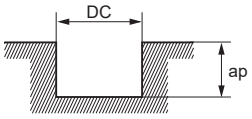
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ae(mm)	Depth of Cut ap(mm)
12	1240	33000	15000	6	12
16	1660	33000	20000	8	16
20	2070	33000	26000	10	20
25	2590	33000	32000	12.5	25
Depth of Cut					

■Slot Milling

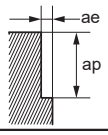
(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	1240	33000	15000	6
16	1660	33000	20000	8
20	2070	33000	26000	10
25	2590	33000	32000	12.5
Depth of Cut	 DC:Cutting Dia.			

General-purpose conditions

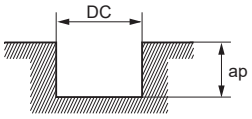
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ae(mm)	Depth of Cut ap(mm)
12	600	16000	7200	6	12
16	600	12000	7200	8	16
20	600	9500	7400	10	20
25	600	7600	7300	12.5	25
Depth of Cut					

■Slot Milling

(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	600	16000	7200	6
16	600	12000	7200	8
20	600	9500	7400	10
25	600	7600	7300	12.5
Depth of Cut	 DC:Cutting Dia.			

Note 1) It is recommended to use a water-soluble coolant. It is also possible to use an air blower (external/internal) for DLC coating.
Note 2) Down cut is recommended for side cutting.
Note 3) This table shows the cutting conditions with an overhang length of less than 4D. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) When ramping, consider the chip discharge and use a feed rate 50% lower than the slotting conditions above and also use a ramping angle of 5º or less.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

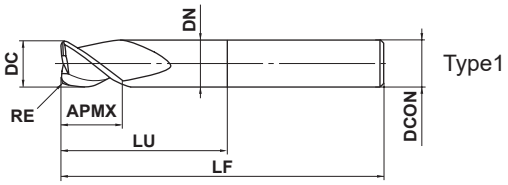
C3SARB

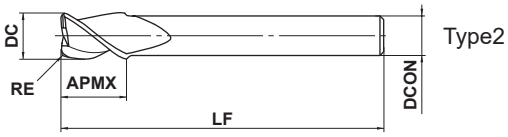
Corner radius, Short cut length, 3 flute, For aluminium alloy



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎







DC≤12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

●High efficiency machining for aluminium alloys.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
C3SARBD1200N0300R100	12	1	15	30	11.4	75	12	3	▲	1
C3SARBD1200N0300R320	12	3.2	15	30	11.4	75	12	3	▲	1
C3SARBD1200N0400R100	12	1	15	40	11.4	125	12	3	▲	1
C3SARBD1200N0400R320	12	3.2	15	40	11.4	125	12	3	▲	1
C3SARBD1600N0450R100	16	1	15	45	15.4	125	16	3	▲	1
C3SARBD1600N0450R320	16	3.2	15	45	15.4	125	16	3	▲	1
C3SARBD1600N0700R100	16	1	15	70	15.4	150	16	3	▲	1
C3SARBD1600N0700R320	16	3.2	15	70	15.4	150	16	3	▲	1
C3SARBD1800R100	18	1	18	—	—	150	16	3	▲	2
C3SARBD1800R320	18	3.2	18	—	—	150	16	3	▲	2
C3SARBD2000N0600R100	20	1	20	60	18.0	125	20	3	▲	1
C3SARBD2000N0600R320	20	3.2	20	60	18.0	125	20	3	▲	1
C3SARBD2000N0600R400	20	4	20	60	18.0	125	20	3	▲	1
C3SARBD2000N0850R100	20	1	20	85	18.0	150	20	3	▲	1
C3SARBD2000N0850R320	20	3.2	20	85	18.0	150	20	3	▲	1
C3SARBD2000N0850R400	20	4	20	85	18.0	150	20	3	▲	1
C3SARBD2500N0650R320	25	3.2	20	65	23.0	125	25	3	▲	1
C3SARBD2500N0650R400	25	4	20	65	23.0	125	25	3	▲	1
C3SARBD2500N0650R500	25	5	20	65	23.0	125	25	3	▲	1
C3SARBD2500N0900R320	25	3.2	20	90	23.0	150	25	3	▲	1
C3SARBD2500N0900R400	25	4	20	90	23.0	150	25	3	▲	1
C3SARBD2500N0900R500	25	5	20	90	23.0	150	25	3	▲	1

▲ : Product scheduled to be discontinued at the end of March 2023
A3SARB (J251) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

C3SARB

Corner radius, Short cut length, 3 flute, For aluminium alloy

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
12	13000	5400
16	10000	5400
18	9000	5000
20	8000	5000
25	6000	4500
Depth of cut	≤0.3DC, ≤0.8DC, DC:Dia.	

■ Slotting

Workpiece Material	Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
12	13000	3200
16	10000	3200
18	9000	3000
20	8000	3000
25	6000	2800
Depth of cut	DC, ≤0.5DC, DC:Dia.	

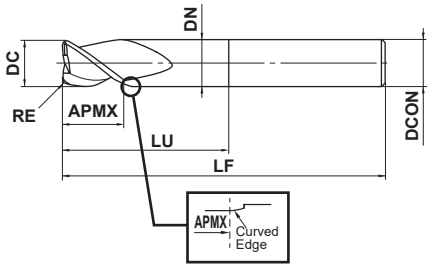
Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) This table shows the cutting condition with less than 4D overhang length. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

DLC3SARB NEW

Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

●Stability and reliability even when slotting, ramping and plunging.
●The cross sectional geometry of the flutes is perfect for efficient chip discharge.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
DLC3SARB120R100N36C	12	1	18	36	11.4	80	12	3	●
DLC3SARB120R200N36C	12	2	18	36	11.4	80	12	3	●
DLC3SARB120R300N36C	12	3	18	36	11.4	80	12	3	●
DLC3SARB160R200N48C	16	2	24	48	15.4	90	16	3	●
DLC3SARB160R300N48C	16	3	24	48	15.4	90	16	3	●
DLC3SARB160R400N48C	16	4	24	48	15.4	90	16	3	●
DLC3SARB200R200N55C	20	2	30	55	18	100	20	3	●
DLC3SARB200R300N55C	20	3	30	55	18	100	20	3	●
DLC3SARB200R400N55C	20	4	30	55	18	100	20	3	●
DLC3SARB250R200N55C	25	2	37.5	55	23	100	25	3	●
DLC3SARB250R300N55C	25	3	37.5	55	23	100	25	3	●
DLC3SARB250R400N55C	25	4	37.5	55	23	100	25	3	●
DLC3SARB250R500N55C	25	5	37.5	55	23	100	25	3	●

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

DLC3SARB

Corner radius end mill, Short cut length, 3 flute, with multiple internal through coolant holes

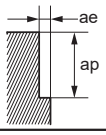
RECOMMENDED CUTTING CONDITIONS

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

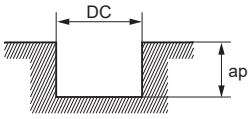
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ap(mm)	Depth of Cut ae(mm)
12	1240	33000	15000	6	12
16	1660	33000	20000	8	16
20	2070	33000	26000	10	20
25	2590	33000	32000	12.5	25
Depth of Cut					

■Slot Milling

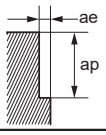
(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	1240	33000	15000	6
16	1660	33000	20000	8
20	2070	33000	26000	10
25	2590	33000	32000	12.5
Depth of Cut	 DC:Cutting Dia.			

General-purpose conditions

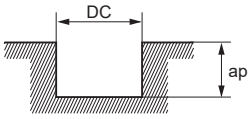
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of cut ap(mm)	Depth of Cut ae(mm)
12	600	16000	7200	6	12
16	600	12000	7200	8	16
20	600	9500	7400	10	20
25	600	7600	7300	12.5	25
Depth of Cut					

■Slot Milling

(mm)

Workpiece Material	Aluminium Alloys			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap(mm)
12	600	16000	7200	6
16	600	12000	7200	8
20	600	9500	7400	10
25	600	7600	7300	12.5
Depth of Cut	 DC:Cutting Dia.			

Note 1) It is recommended to use a water-soluble coolant. It is also possible to use an air blower (external/internal) for DLC coating.
Note 2) Down cut is recommended for side cutting.
Note 3) This table shows the cutting conditions with an overhang length of less than 4D. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) When ramping, consider the chip discharge and use a feed rate 50% lower than the slotting conditions above and also use a ramping angle of 5º or less.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

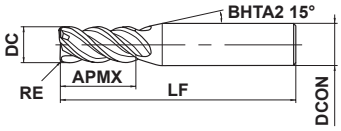
MPMHVRB

End mill, Medium cut length, 4 flute, Irregular helix flutes

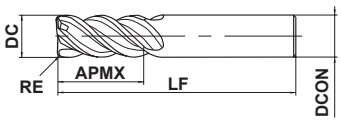
UWC MS+ 37° 40°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		◎	○	○	





Type1



Type2

0.1≤RE≤5				
±0.015				
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=4	DCON=6	DCON=8		
0 - 0.005	0 - 0.005	0 - 0.006		
DCON=8(DC=10)	DCON=10(DC=12)	DCON=10	12≤DCON≤16	DCON=20
0 - 0.009	0 - 0.009	0 - 0.009	0 - 0.011	0 - 0.013

● Irregular helix flutes end mill for reduced vibration when machining stainless steels and carbon steels.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MPMHVRBD0100R010	1	0.1	2.5	45	4	4	●	1
MPMHVRBD0100R020	1	0.2	2.5	45	4	4	●	1
MPMHVRBD0200R010	2	0.1	5	45	4	4	●	1
MPMHVRBD0200R020	2	0.2	5	45	4	4	●	1
MPMHVRBD0200R030	2	0.3	5	45	4	4	●	1
MPMHVRBD0200R050	2	0.5	5	45	4	4	●	1
MPMHVRBD0300R010	3	0.1	7.5	45	6	4	●	1
MPMHVRBD0300R020	3	0.2	7.5	45	6	4	●	1
MPMHVRBD0300R030	3	0.3	7.5	45	6	4	●	1
MPMHVRBD0300R050	3	0.5	7.5	45	6	4	●	1
MPMHVRBD0400R010	4	0.1	10	45	6	4	●	1
MPMHVRBD0400R020	4	0.2	10	45	6	4	●	1
MPMHVRBD0400R030	4	0.3	10	45	6	4	●	1
MPMHVRBD0400R050	4	0.5	10	45	6	4	●	1
MPMHVRBD0400R100	4	1	10	45	6	4	●	1
MPMHVRBD0500R010	5	0.1	12.5	50	6	4	●	1
MPMHVRBD0500R020	5	0.2	12.5	50	6	4	●	1
MPMHVRBD0500R030	5	0.3	12.5	50	6	4	●	1
MPMHVRBD0500R050	5	0.5	12.5	50	6	4	●	1
MPMHVRBD0500R100	5	1	12.5	50	6	4	●	1
MPMHVRBD0600R010	6	0.1	15	60	6	4	●	2
MPMHVRBD0600R020	6	0.2	15	60	6	4	●	2
MPMHVRBD0600R030	6	0.3	15	60	6	4	●	2
MPMHVRBD0600R050	6	0.5	15	60	6	4	●	2
MPMHVRBD0600R100	6	1	15	60	6	4	●	2
MPMHVRBD0800R020	8	0.2	20	70	8	4	●	2
MPMHVRBD0800R030	8	0.3	20	70	8	4	●	2
MPMHVRBD0800R050	8	0.5	20	70	8	4	●	2
MPMHVRBD0800R100	8	1	20	70	8	4	●	2
MPMHVRBD0800R150	8	1.5	20	70	8	4	●	2
MPMHVRBD0800R200	8	2	20	70	8	4	●	2
MPMHVRBD0800R250	8	2.5	20	70	8	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

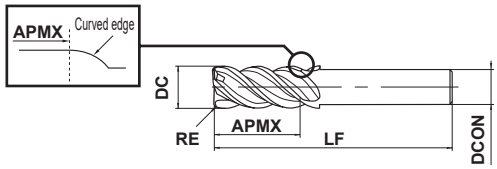
ISO13399 ➤ J002

MPMHVRB

End mill, Medium cut length, 4 flute, Irregular helix flutes

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MPMHVRBD0800R300	8	3	20	70	8	4	●	2
MPMHVRBD1000R020	10	0.2	25	80	10	4	●	2
MPMHVRBD1000R030	10	0.3	25	80	10	4	●	2
MPMHVRBD1000R050	10	0.5	25	80	10	4	●	2
MPMHVRBD1000R100	10	1	25	80	10	4	●	2
MPMHVRBD1000R150	10	1.5	25	80	10	4	●	2
MPMHVRBD1000R200	10	2	25	80	10	4	●	2
MPMHVRBD1000R250	10	2.5	25	80	10	4	●	2
MPMHVRBD1000R300	10	3	25	80	10	4	●	2
MPMHVRBD1200R030	12	0.3	30	100	12	4	●	2
MPMHVRBD1200R050	12	0.5	30	100	12	4	●	2
MPMHVRBD1200R100	12	1	30	100	12	4	●	2
MPMHVRBD1200R150	12	1.5	30	100	12	4	●	2
MPMHVRBD1200R200	12	2	30	100	12	4	●	2
MPMHVRBD1200R300	12	3	30	100	12	4	●	2
MPMHVRBD1600R030	16	0.3	40	110	16	4	●	2
MPMHVRBD1600R050	16	0.5	40	110	16	4	●	2
MPMHVRBD1600R100	16	1	40	110	16	4	●	2
MPMHVRBD1600R200	16	2	40	110	16	4	●	2
MPMHVRBD1600R300	16	3	40	110	16	4	●	2
MPMHVRBD1600R500	16	5	40	110	16	4	●	2
MPMHVRBD2000R030	20	0.3	50	125	20	4	●	2
MPMHVRBD2000R050	20	0.5	50	125	20	4	●	2
MPMHVRBD2000R100	20	1	50	125	20	4	●	2
MPMHVRBD2000R200	20	2	50	125	20	4	●	2
MPMHVRBD2000R300	20	3	50	125	20	4	●	2
MPMHVRBD2000R500	20	5	50	125	20	4	●	2



Type3

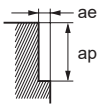
Slim Shank

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MPMHVRBD1000R030S08	10	0.3	25	100	8	4	●	3
MPMHVRBD1000R050S08	10	0.5	25	100	8	4	●	3
MPMHVRBD1000R100S08	10	1	25	100	8	4	●	3
MPMHVRBD1000R200S08	10	2	25	100	8	4	●	3
MPMHVRBD1200R030S10	12	0.3	30	110	10	4	●	3
MPMHVRBD1200R050S10	12	0.5	30	110	10	4	●	3
MPMHVRBD1200R100S10	12	1	30	110	10	4	●	3
MPMHVRBD1200R200S10	12	2	30	110	10	4	●	3
MPMHVRBD1200R300S10	12	3	30	110	10	4	●	3

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Alloy steel (180−280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450				Carbon steel, Alloy steel (280−350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT				Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened steel (45−55HRC) AISI H13, AISI L6			
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	38000	910	1.7	0.2	31000	500	1.7	0.2	25000	500	1.7	0.2	18000	290	1.7	0.05
2	21000	1500	3.5	0.4	17000	820	3.5	0.4	14000	640	3.5	0.4	10000	320	3.5	0.1
3	16000	1800	5	0.6	13000	940	5	0.6	11000	880	5	0.6	7400	380	5	0.15
4	12000	1700	7	0.8	9500	950	7	0.8	8000	900	7	0.8	5600	400	7	0.2
5	9500	1800	8.5	1	7600	1100	8.5	1	6400	900	8.5	1	4500	430	8.5	0.25
6	8000	2100	10	1.2	6400	1300	10	1.2	5300	1100	10	1.2	3700	440	10	0.3
8	6000	2000	13.5	1.6	4800	1400	13.5	1.6	4000	1200	13.5	1.6	2800	450	13.5	0.4
10	4800	2100	17	2	3800	1500	17	2	3200	1100	17	2	2200	440	17	0.5
12	4000	1900	20.5	2.4	3200	1400	20.5	2.4	2700	1100	20.5	2.4	1900	380	20.5	0.6
16	3000	1400	27.2	3.2	2400	1100	27.2	3.2	2000	840	27.2	3.2	1400	340	27.2	0.8
20	2400	1200	34	4	1900	840	34	4	1600	670	34	4	1100	260	34	1
Depth of cut																

Note 1) When using a slim shank with DC=10 or 12, reduce the cutting speed by 60%, the feed rate by 80%, and the depth of cut ae by 50% from the above conditions.
Note 2) Wet cutting mode is recommended for cutting stainless steels and titanium alloys, and air blow is recommended for carbon steels.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

MPMHVRB

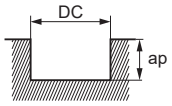
End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■ Slotting

Workpiece Material	Carbon steel, Alloy steel (180－280HB) Ductile cast iron AISI 1045, AISI 4140, FCD450			Carbon steel, Alloy steel (280－350HB) Pre-hardened steel, Alloy tool steel AISI 4340, AISI P21, AISI P20, SKD, SKT			Austenitic stainless steel (≤200HB) Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Hardened steel (45－55HRC) AISI H13, AISI L6		
Dia. **DC**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
1	31000	620	0.5	24000	380	0.5	20000	320	0.5	9500	110	0.2
2	17000	650	2	14000	450	2	11000	350	2	4800	130	0.4
3	13000	940	3	10000	660	3	8500	510	3	3200	140	0.6
4	9500	820	4	7600	600	4	6400	460	4	2400	150	0.8
5	7600	910	5	6100	670	5	5100	510	5	1900	170	1
6	6400	860	6	5100	630	6	4200	470	6	1600	190	1.2
8	4800	1000	8	3800	750	8	3200	580	8	1200	190	1.6
10	3800	910	10	3100	680	10	2500	500	10	950	150	2
12	3200	920	12	2500	660	12	2100	500	12	800	160	2.4
16	2400	690	16	1900	500	16	1600	380	16	600	120	3.2
20	1900	550	20	1500	400	20	1300	310	20	480	96	4

Depth of cut



DC:Dia.

Note 4) Slim shank type is not recommended for slotting.

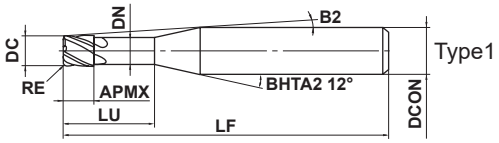
MPXLRB

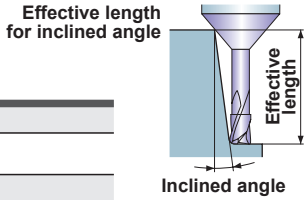
Corner radius, short cut length, long neck

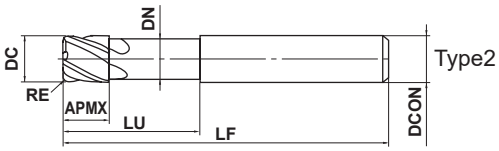


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		○	○	○	









0.05≤RE≤0.5					
±0.005					
0.2≤DC≤6					
0 - 0.01					
4≤DCON≤6					
0 - 0.005					

● Suitable for high precision and high efficient machining of die & mold.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MPXLRBD0020R005N005	0.2	0.05	0.2	0.5	0.18	11.4°	50	4	2	●	1	0.5	0.5	0.6	0.7
MPXLRBD0020R005N010	0.2	0.05	0.2	1	0.18	10.8°	50	4	2	●	1	1.0	1.1	1.2	1.3
MPXLRBD0030R005N010	0.3	0.05	0.3	1	0.28	10.8°	50	4	2	●	1	1.0	1.1	1.2	1.3
MPXLRBD0030R005N020	0.3	0.05	0.3	2	0.28	9.8°	50	4	2	●	1	2.1	2.2	2.4	2.7
MPXLRBD0040R005N020	0.4	0.05	0.4	2	0.37	9.8°	50	4	4	●	1	2.1	2.2	2.4	2.6
MPXLRBD0040R005N030	0.4	0.05	0.4	3	0.37	8.9°	50	4	4	●	1	3.1	3.3	3.6	4.0
MPXLRBD0040R005N040	0.4	0.05	0.4	4	0.37	8.2°	50	4	4	●	1	4.2	4.3	4.8	5.3
MPXLRBD0050R005N020	0.5	0.05	0.5	2	0.47	9.7°	50	4	4	●	1	2.1	2.2	2.4	2.6
MPXLRBD0050R005N030	0.5	0.05	0.5	3	0.47	8.9°	50	4	4	●	1	3.1	3.3	3.6	4.0
MPXLRBD0050R005N040	0.5	0.05	0.5	4	0.47	8.1°	50	4	4	●	1	4.2	4.3	4.8	5.3
MPXLRBD0050R005N050	0.5	0.05	0.5	5	0.47	7.5°	50	4	4	●	1	5.2	5.4	6.0	6.6
MPXLRBD0060R005N020	0.6	0.05	0.6	2	0.57	9.7°	50	4	4	●	1	2.1	2.2	2.4	2.6
MPXLRBD0060R005N040	0.6	0.05	0.6	4	0.57	8.1°	50	4	4	●	1	4.2	4.3	4.8	5.3
MPXLRBD0060R005N060	0.6	0.05	0.6	6	0.57	6.9°	50	4	4	●	1	6.2	6.5	7.2	7.9
MPXLRBD0080R005N040	0.8	0.05	0.8	4	0.77	7.9°	50	4	4	●	1	4.2	4.3	4.8	5.3
MPXLRBD0080R005N060	0.8	0.05	0.8	6	0.77	6.8°	50	4	4	●	1	6.2	6.5	7.2	7.9
MPXLRBD0100R005N030	1	0.05	1	3	0.96	8.3°	50	4	4	●	1	3.2	3.4	3.8	4.2
MPXLRBD0100R005N040	1	0.05	1	4	0.96	7.6°	50	4	4	●	1	4.3	4.5	5.0	5.6
MPXLRBD0100R005N050	1	0.05	1	5	0.96	7.0°	50	4	4	●	1	5.4	5.6	6.2	6.9
MPXLRBD0100R005N060	1	0.05	1	6	0.96	6.5°	50	4	4	●	1	6.4	6.7	7.4	8.2
MPXLRBD0100R005N080	1	0.05	1	8	0.96	5.6°	50	4	4	●	1	8.5	8.9	9.8	10.9
MPXLRBD0100R005N100	1	0.05	1	10	0.96	5.0°	50	4	4	●	1	10.6	11.1	12.2	13.5
MPXLRBD0100R005N120	1	0.05	1	12	0.96	4.5°	50	4	4	●	1	12.7	13.3	14.6	16.2
MPXLRBD0100R010N030	1	0.1	1	3	0.96	8.4°	50	4	4	●	1	3.2	3.4	3.8	4.2
MPXLRBD0100R010N040	1	0.1	1	4	0.96	7.6°	50	4	4	●	1	4.3	4.5	5.0	5.5
MPXLRBD0100R010N050	1	0.1	1	5	0.96	7.0°	50	4	4	●	1	5.3	5.6	6.2	6.9
MPXLRBD0100R010N060	1	0.1	1	6	0.96	6.5°	50	4	4	●	1	6.4	6.7	7.4	8.2
MPXLRBD0100R010N080	1	0.1	1	8	0.96	5.6°	50	4	4	●	1	8.5	8.9	9.8	10.8
MPXLRBD0100R010N100	1	0.1	1	10	0.96	5.0°	50	4	4	●	1	10.6	11.1	12.2	13.5
MPXLRBD0100R010N120	1	0.1	1	12	0.96	4.5°	50	4	4	●	1	12.7	13.3	14.6	16.2
MPXLRBD0120R010N100	1.2	0.1	1.2	10	1.16	4.8°	50	4	4	●	1	10.6	11.1	12.2	13.5
MPXLRBD0120R020N100	1.2	0.2	1.2	10	1.16	4.8°	50	4	4	●	1	10.6	11.1	12.2	13.5
MPXLRBD0150R010N060	1.5	0.1	1.5	6	1.44	6.0°	50	4	4	●	1	6.4	6.7	7.3	8.1
MPXLRBD0150R010N120	1.5	0.1	1.5	12	1.44	4.0°	50	4	4	●	1	12.6	13.2	14.5	16.1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

MPXLRB

Corner radius, short cut length, long neck

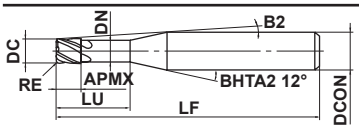
(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MPXLRBD0150R010N180	1.5	0.1	1.5	18	1.44	3.0°	60	4	4	●	1	18.9	19.7	21.7	24.0
MPXLRBD0150R020N060	1.5	0.2	1.5	6	1.44	6.0°	50	4	4	●	1	6.4	6.7	7.3	8.1
MPXLRBD0150R020N120	1.5	0.2	1.5	12	1.44	4.0°	50	4	4	●	1	12.6	13.2	14.5	16.0
MPXLRBD0150R020N180	1.5	0.2	1.5	18	1.44	3.0°	60	4	4	●	1	18.9	19.7	21.7	*
MPXLRBD0150R030N060	1.5	0.3	1.5	6	1.44	6.1°	50	4	4	●	1	6.3	6.6	7.3	8.0
MPXLRBD0150R030N120	1.5	0.3	1.5	12	1.44	4.0°	50	4	4	●	1	12.6	13.2	14.5	16.0
MPXLRBD0150R030N180	1.5	0.3	1.5	18	1.44	3.0°	60	4	4	●	1	18.9	19.7	21.6	*
MPXLRBD0200R010N080	2	0.1	2	8	1.94	4.5°	50	4	4	●	1	8.5	8.8	9.7	10.8
MPXLRBD0200R010N120	2	0.1	2	12	1.94	3.4°	50	4	4	●	1	12.6	13.2	14.5	16.1
MPXLRBD0200R010N160	2	0.1	2	16	1.94	2.8°	60	4	4	●	1	16.8	17.6	19.3	*
MPXLRBD0200R010N200	2	0.1	2	20	1.94	2.3°	60	4	4	●	1	21.0	21.9	24.1	*
MPXLRBD0200R010N240	2	0.1	2	24	1.94	2.0°	70	4	4	●	1	25.2	26.3	*	*
MPXLRBD0200R020N080	2	0.2	2	8	1.94	4.5°	50	4	4	●	1	8.5	8.8	9.7	10.7
MPXLRBD0200R020N120	2	0.2	2	12	1.94	3.4°	50	4	4	●	1	12.6	13.2	14.5	*
MPXLRBD0200R020N160	2	0.2	2	16	1.94	2.8°	60	4	4	●	1	16.8	17.6	19.3	*
MPXLRBD0200R020N200	2	0.2	2	20	1.94	2.3°	60	4	4	●	1	21.0	21.9	24.0	*
MPXLRBD0200R020N240	2	0.2	2	24	1.94	2.0°	70	4	4	●	1	25.1	26.3	*	*
MPXLRBD0200R030N080	2	0.3	2	8	1.94	4.5°	50	4	4	●	1	8.5	8.8	9.7	10.7
MPXLRBD0200R030N120	2	0.3	2	12	1.94	3.5°	50	4	4	●	1	12.6	13.2	14.5	16.0
MPXLRBD0200R030N160	2	0.3	2	16	1.94	2.8°	60	4	4	●	1	16.8	17.5	19.2	*
MPXLRBD0200R030N200	2	0.3	2	20	1.94	2.3°	60	4	4	●	1	21.0	21.9	24.0	*
MPXLRBD0200R030N240	2	0.3	2	24	1.94	2.0°	70	4	4	●	1	25.1	26.3	*	*
MPXLRBD0300R010N080	3	0.1	3	8	2.9	5.7°	60	6	4	●	1	8.4	8.8	9.6	10.7
MPXLRBD0300R010N120	3	0.1	3	12	2.9	4.5°	60	6	4	●	1	12.6	13.1	14.4	16.0
MPXLRBD0300R010N180	3	0.1	3	18	2.9	3.4°	70	6	4	●	1	18.8	19.7	21.6	23.9
MPXLRBD0300R010N240	3	0.1	3	24	2.9	2.8°	70	6	4	●	1	25.1	26.2	28.8	*
MPXLRBD0300R010N300	3	0.1	3	30	2.9	2.3°	70	6	4	●	1	31.3	32.7	35.9	*
MPXLRBD0300R010N360	3	0.1	3	36	2.9	2.0°	90	6	4	●	1	37.6	39.3	*	*
MPXLRBD0300R020N120	3	0.2	3	12	2.9	4.5°	60	6	4	●	1	12.6	13.1	14.4	15.9
MPXLRBD0300R020N180	3	0.2	3	18	2.9	3.4°	60	6	4	●	1	18.8	19.6	21.6	23.9
MPXLRBD0300R020N240	3	0.2	3	24	2.9	2.8°	70	6	4	●	1	25.1	26.2	28.7	*
MPXLRBD0300R020N300	3	0.2	3	30	2.9	2.3°	70	6	4	●	1	31.3	32.7	35.9	*
MPXLRBD0300R020N360	3	0.2	3	36	2.9	2.0°	90	6	4	●	1	37.6	39.3	43.1	*
MPXLRBD0300R030N120	3	0.3	3	12	2.9	4.5°	60	6	4	●	1	12.5	13.1	14.4	15.9
MPXLRBD0300R030N180	3	0.3	3	18	2.9	3.5°	60	6	4	●	1	18.8	19.6	21.5	23.9
MPXLRBD0300R030N240	3	0.3	3	24	2.9	2.8°	70	6	4	●	1	25.1	26.2	28.7	*
MPXLRBD0300R030N300	3	0.3	3	30	2.9	2.3°	70	6	4	●	1	31.3	32.7	35.9	*
MPXLRBD0300R030N360	3	0.3	3	36	2.9	2.0°	90	6	4	●	1	37.6	39.2	*	*
MPXLRBD0300R050N120	3	0.5	3	12	2.9	4.6°	60	6	4	●	1	12.5	13.1	14.3	15.8
MPXLRBD0300R050N180	3	0.5	3	18	2.9	3.5°	60	6	4	●	1	18.8	19.6	21.5	23.8
MPXLRBD0300R050N240	3	0.5	3	24	2.9	2.8°	70	6	4	●	1	25.1	26.2	28.7	*
MPXLRBD0300R050N300	3	0.5	3	30	2.9	2.3°	70	6	4	●	1	31.3	32.7	35.9	*
MPXLRBD0300R050N360	3	0.5	3	36	2.9	2.0°	90	6	4	●	1	37.6	39.2	*	*
MPXLRBD0400R010N160	4	0.1	4	16	3.9	2.8°	70	6	4	●	1	16.7	17.5	19.2	*
MPXLRBD0400R010N240	4	0.1	4	24	3.9	2.0°	70	6	4	●	1	25.1	26.2	*	*
MPXLRBD0400R010N320	4	0.1	4	32	3.9	1.6°	70	6	4	●	1	33.4	34.9	*	*
MPXLRBD0400R010N480	4	0.1	4	48	3.9	1.1°	90	6	4	●	1	50.1	52.3	*	*
MPXLRBD0400R020N160	4	0.2	4	16	3.9	2.8°	70	6	4	●	1	16.7	17.5	19.2	*
MPXLRBD0400R020N240	4	0.2	4	24	3.9	2.0°	70	6	4	●	1	25.1	26.2	*	*
MPXLRBD0400R020N320	4	0.2	4	32	3.9	1.6°	70	6	4	●	1	33.4	34.9	*	*
MPXLRBD0400R020N480	4	0.2	4	48	3.9	1.1°	90	6	4	●	1	50.1	52.3	*	*
MPXLRBD0400R030N160	4	0.3	4	16	3.9	2.8°	70	6	4	●	1	16.7	17.5	19.1	*

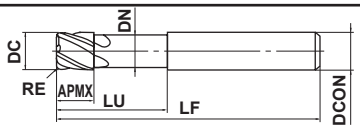
* No interference

● : Inventory maintained in Japan.

ISO13399 ➤ J002



Type1



Type2

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
MPXLRBD0400R030N240	4	0.3	4	24	3.9	2.0°	70	6	4	●	1	25.1	26.2	*	*
MPXLRBD0400R030N320	4	0.3	4	32	3.9	1.6°	70	6	4	●	1	33.4	34.9	*	*
MPXLRBD0400R030N480	4	0.3	4	48	3.9	1.1°	90	6	4	●	1	50.1	52.3	*	*
MPXLRBD0400R050N160	4	0.5	4	16	3.9	2.8°	70	6	4	●	1	16.7	17.4	19.1	*
MPXLRBD0400R050N240	4	0.5	4	24	3.9	2.0°	70	6	4	●	1	25.1	26.2	*	*
MPXLRBD0400R050N320	4	0.5	4	32	3.9	1.6°	70	6	4	●	1	33.4	34.9	*	*
MPXLRBD0400R050N480	4	0.5	4	48	3.9	1.1°	90	6	4	●	1	50.1	52.3	*	*
MPXLRBD0600R010N240	6	0.1	6	24	5.85	—	70	6	4	●	2	*	*	*	*
MPXLRBD0600R010N480	6	0.1	6	48	5.85	—	100	6	4	●	2	*	*	*	*
MPXLRBD0600R020N240	6	0.2	6	24	5.85	—	70	6	4	●	2	*	*	*	*
MPXLRBD0600R020N480	6	0.2	6	48	5.85	—	100	6	4	●	2	*	*	*	*
MPXLRBD0600R030N240	6	0.3	6	24	5.85	—	70	6	4	●	2	*	*	*	*
MPXLRBD0600R030N480	6	0.3	6	48	5.85	—	100	6	4	●	2	*	*	*	*
MPXLRBD0600R050N240	6	0.5	6	24	5.85	—	70	6	4	●	2	*	*	*	*
MPXLRBD0600R050N480	6	0.5	6	48	5.85	—	100	6	4	●	2	*	*	*	*

* No interference

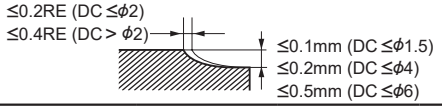
MPXLRB

Corner radius, short cut length, long neck

RECOMMENDED CUTTING CONDITIONS

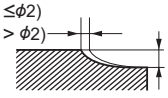
Workpiece Material		Carbon steel, Alloy steel (180—280HB) Pre-hardened steel, Alloy Tool Steel, Precipitation hardeningstainless steel (<450HB) AISI 1045, AISI 4140, AISI P21, AISI P20, SKD, SKT, AISI 431, AISI 420				Hardened steel (45—52HRC) AISI H13, AISI L6			
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.5**	30000	180	0.003	0.04	30000	150	0.003	0.04
	1	30000	120	0.003	0.04	30000	100	0.003	0.04
0.3	**1**	30000	210	0.003	0.08	30000	180	0.003	0.08
	2	30000	120	0.003	0.08	30000	100	0.003	0.08
0.4	**2**	31000	970	0.005	0.10	31000	810	0.005	0.10
	3	31000	790	0.004	0.10	31000	660	0.004	0.10
	4	31000	540	0.003	0.10	31000	450	0.003	0.10
0.5	**2**	31000	1500	0.006	0.12	31000	1300	0.006	0.12
	3	31000	1300	0.005	0.12	31000	1100	0.005	0.12
	4	31000	970	0.004	0.12	31000	810	0.004	0.12
	5	25000	790	0.004	0.12	25000	660	0.004	0.12
0.6	**2**	31000	2100	0.020	0.13	31000	1800	0.020	0.13
	4	25000	1300	0.015	0.13	25000	1100	0.015	0.13
	6	20000	790	0.008	0.13	20000	660	0.008	0.13
0.8	**4**	25000	3200	0.025	0.20	25000	2700	0.025	0.20
	6	20000	2100	0.020	0.20	20000	1800	0.020	0.20
1	**3**	24000	2400	0.045	0.30	20000	2000	0.045	0.30
	4	24000	1900	0.040	0.30	20000	1600	0.040	0.30
	5	24000	1800	0.035	0.25	20000	1500	0.035	0.25
	6	20000	1400	0.030	0.25	17000	1200	0.030	0.25
	8	20000	1000	0.020	0.20	17000	880	0.020	0.20
	10	15000	800	0.015	0.10	13000	670	0.015	0.10
	12	15000	370	0.010	0.01	13000	310	0.010	0.01
1.2	**10**	18000	1500	0.030	0.25	15000	1300	0.030	0.25
1.5	**6**	20000	2400	0.050	0.40	17000	2000	0.050	0.40
	12	15000	1400	0.040	0.30	13000	1200	0.040	0.30
	18	12000	670	0.010	0.15	10000	560	0.010	0.15
2	**8**	15000	2600	0.050	0.50	13000	2200	0.050	0.50
	12	15000	2100	0.045	0.50	13000	1800	0.045	0.50
	16	14000	1900	0.040	0.35	12000	1600	0.040	0.35
	20	14000	1100	0.015	0.25	12000	960	0.015	0.25
	24	9300	930	0.010	0.20	7800	780	0.010	0.20
3	**8**	12000	3300	0.100	0.80	10000	2800	0.100	0.80
	12	12000	3100	0.080	0.80	10000	2600	0.080	0.80
	18	11000	3100	0.070	0.70	9600	2600	0.070	0.70
	24	11000	2600	0.060	0.50	9300	2200	0.060	0.50
	30	9000	1300	0.030	0.40	7500	1100	0.030	0.40
	36	6200	910	0.010	0.30	5200	760	0.010	0.30
4	**16**	9000	3200	0.100	1.00	7500	2700	0.100	1.00
	24	7900	2500	0.085	0.80	6600	2100	0.085	0.80
	32	6900	1600	0.040	0.70	5800	1400	0.040	0.70
	48	4800	740	0.010	0.35	4000	620	0.010	0.35
6	**24**	5500	2700	0.120	1.50	4600	2263	0.120	1.50
	48	3800	1200	0.050	1.20	3200	1000	0.050	1.20

Depth of cut



DC:Dia.

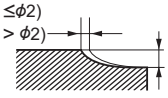
Note 1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material		Austenitic stainless steel (≤200HB) Titanium alloy (<450HB) AISI 304, AISI 306, Ti-6Al-4V			
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.5**	33000	170	0.003	0.04
	1	30000	110	0.003	0.04
0.3	**1**	30000	200	0.003	0.08
	2	30000	110	0.003	0.08
0.4	**2**	31000	930	0.005	0.10
	3	31000	750	0.004	0.10
	4	31000	510	0.003	0.10
0.5	**2**	31000	1400	0.006	0.12
	3	31000	1200	0.005	0.12
	4	31000	930	0.004	0.12
	5	25000	750	0.004	0.12
0.6	**2**	31000	2000	0.020	0.13
	4	25000	1200	0.015	0.13
	6	20000	750	0.008	0.13
0.8	**4**	25000	3100	0.025	0.20
	6	20000	2000	0.020	0.20
1	**3**	23000	2300	0.045	0.30
	4	23000	1800	0.040	0.30
	5	23000	1700	0.035	0.25
	6	19000	1300	0.030	0.25
	8	19000	1000	0.020	0.20
	10	14000	770	0.015	0.10
	12	14000	350	0.010	0.01
1.2	**10**	17000	1400	0.030	0.25
1.5	**6**	19000	2300	0.050	0.40
	12	14000	1300	0.040	0.30
	18	11000	640	0.010	0.15
2	**8**	14000	2500	0.050	0.50
	12	14000	2000	0.045	0.50
	16	13000	1800	0.040	0.35
	20	13000	1100	0.015	0.25
	24	8900	890	0.010	0.20
3	**8**	11000	3200	0.100	0.80
	12	11000	2900	0.080	0.80
	18	11000	2900	0.070	0.70
	24	10000	2500	0.060	0.50
	30	8600	1200	0.030	0.40
	36	5900	870	0.010	0.30
4	**16**	8600	3100	0.100	1.00
	24	7500	2400	0.085	0.80
	32	6600	1600	0.040	0.70
	48	4600	710	0.010	0.35
6	**24**	5200	2600	0.120	1.50
	48	3600	1100	0.050	1.20
Depth of cut		≤0.2RE (DC ≤ϕ2) ≤0.4RE (DC > ϕ2)  ≤0.1mm (DC ≤ϕ1.5) ≤0.2mm (DC ≤ϕ4) ≤0.5mm (DC ≤ϕ6)			DC:Dia.

MPXLRB

Corner radius, short cut length, long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Copper, Copper alloys			
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.5**	30000	150	0.003	0.08
	1	30000	100	0.003	0.08
0.3	**1**	30000	180	0.003	0.16
	2	30000	100	0.003	0.16
0.4	**2**	31000	810	0.005	0.20
	3	31000	660	0.004	0.20
	4	31000	450	0.003	0.20
0.5	**2**	31000	1300	0.006	0.24
	3	31000	1100	0.005	0.24
	4	31000	810	0.004	0.24
	5	25000	660	0.004	0.24
0.6	**2**	31000	1800	0.020	0.26
	4	25000	1100	0.015	0.26
	6	20000	660	0.008	0.26
0.8	**4**	25000	2700	0.025	0.40
	6	20000	1800	0.020	0.40
1	**3**	20000	2000	0.045	0.60
	4	20000	1600	0.040	0.60
	5	20000	1500	0.035	0.50
	6	17000	1200	0.030	0.50
	8	17000	880	0.020	0.40
	10	13000	670	0.015	0.20
	12	13000	310	0.010	0.02
1.2	**10**	15000	1300	0.030	0.50
1.5	**6**	14700	1700	0.050	0.80
	12	11000	1000	0.040	0.60
	18	8600	480	0.010	0.30
2	**8**	11000	1900	0.050	1.00
	12	11000	1500	0.045	1.00
	16	10000	1300	0.040	0.70
	20	10000	830	0.015	0.50
	24	6700	670	0.010	0.40
3	**8**	8600	2400	0.100	1.60
	12	8600	2200	0.080	1.60
	18	8300	2200	0.070	1.40
	24	8000	1900	0.060	1.00
	30	6500	950	0.030	0.80
	36	4500	660	0.010	0.60
4	**16**	6500	2300	0.100	2.00
	24	5700	1800	0.085	1.60
	32	5000	1200	0.040	1.40
	48	3400	530	0.010	0.70
6	**24**	4000	1900	0.120	3.00
	48	2700	870	0.050	2.40
Depth of cut		≤0.2RE (DC ≤ϕ2) ≤0.4RE (DC > ϕ2)  ≤0.1mm (DC ≤ϕ1.5) ≤0.2mm (DC ≤ϕ4) ≤0.5mm (DC ≤ϕ6)		DC:Dia.	

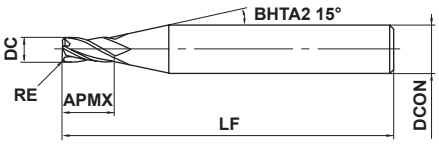
MS4MRB

Corner radius end mill, Medium cut length, 4 flute

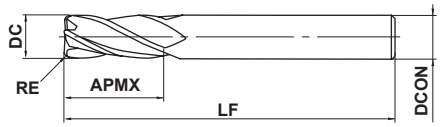


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		○	○	○	





Type1



Type2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute corner radius end mill for general use.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD0300R010	3	0.1	8	45	6	4	●	1
MS4MRBD0300R020	3	0.2	8	45	6	4	●	1
MS4MRBD0300R030	3	0.3	8	45	6	4	●	1
MS4MRBD0300R050	3	0.5	8	45	6	4	●	1
MS4MRBD0300R100	3	1	8	45	6	4	●	1
MS4MRBD0400R010	4	0.1	11	45	6	4	●	1
MS4MRBD0400R020	4	0.2	11	45	6	4	●	1
MS4MRBD0400R030	4	0.3	11	45	6	4	●	1
MS4MRBD0400R050	4	0.5	11	45	6	4	●	1
MS4MRBD0400R100	4	1	11	45	6	4	●	1
MS4MRBD0500R010	5	0.1	13	50	6	4	●	1
MS4MRBD0500R020	5	0.2	13	50	6	4	●	1
MS4MRBD0500R030	5	0.3	13	50	6	4	●	1
MS4MRBD0500R050	5	0.5	13	50	6	4	●	1
MS4MRBD0500R100	5	1	13	50	6	4	●	1
MS4MRBD0600R010	6	0.1	13	50	6	4	●	2
MS4MRBD0600R020	6	0.2	13	50	6	4	●	2
MS4MRBD0600R030	6	0.3	13	50	6	4	●	2
MS4MRBD0600R050	6	0.5	13	50	6	4	●	2
MS4MRBD0600R100	6	1	13	50	6	4	●	2
MS4MRBD0600R150	6	1.5	13	50	6	4	●	2
MS4MRBD0600R200	6	2	13	50	6	4	●	2
MS4MRBD0800R020	8	0.2	19	60	8	4	●	2
MS4MRBD0800R030	8	0.3	19	60	8	4	●	2
MS4MRBD0800R050	8	0.5	19	60	8	4	●	2
MS4MRBD0800R100	8	1	19	60	8	4	●	2
MS4MRBD0800R150	8	1.5	19	60	8	4	●	2
MS4MRBD0800R200	8	2	19	60	8	4	●	2
MS4MRBD0800R250	8	2.5	19	60	8	4	●	2
MS4MRBD0800R300	8	3	19	60	8	4	●	2
MS4MRBD1000R020	10	0.2	22	70	10	4	●	2
MS4MRBD1000R030	10	0.3	22	70	10	4	●	2
MS4MRBD1000R050	10	0.5	22	70	10	4	●	2
MS4MRBD1000R100	10	1	22	70	10	4	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

MS4MRB

Corner radius end mill, Medium cut length, 4 flute

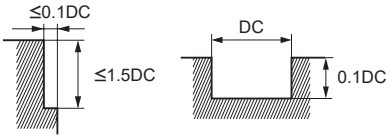
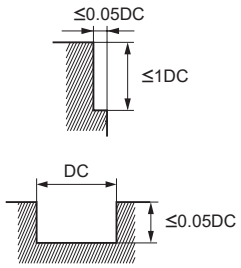
(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD1000R150	10	1.5	22	70	10	4	●	2
MS4MRBD1000R200	10	2	22	70	10	4	●	2
MS4MRBD1000R250	10	2.5	22	70	10	4	●	2
MS4MRBD1000R300	10	3	22	70	10	4	●	2
MS4MRBD1200R020	12	0.2	26	75	12	4	●	2
MS4MRBD1200R030	12	0.3	26	75	12	4	●	2
MS4MRBD1200R050	12	0.5	26	75	12	4	●	2
MS4MRBD1200R100	12	1	26	75	12	4	●	2
MS4MRBD1200R150	12	1.5	26	75	12	4	●	2
MS4MRBD1200R200	12	2	26	75	12	4	●	2
MS4MRBD1200R250	12	2.5	26	75	12	4	●	2
MS4MRBD1200R300	12	3	26	75	12	4	●	2
MS4MRBD1600R050	16	0.5	32	90	16	4	●	2
MS4MRBD1600R100	16	1	32	90	16	4	●	2
MS4MRBD1600R150	16	1.5	32	90	16	4	●	2
MS4MRBD1600R200	16	2	32	90	16	4	●	2
MS4MRBD1600R250	16	2.5	32	90	16	4	●	2
MS4MRBD1600R300	16	3	32	90	16	4	●	2
MS4MRBD2000R050	20	0.5	38	100	20	4	●	2
MS4MRBD2000R100	20	1	38	100	20	4	●	2
MS4MRBD2000R150	20	1.5	38	100	20	4	●	2
MS4MRBD2000R200	20	2	38	100	20	4	●	2
MS4MRBD2000R250	20	2.5	38	100	20	4	●	2
MS4MRBD2000R300	20	3	38	100	20	4	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	16000	1500	10000	800	7400	480	8000	240
4	12000	1800	8000	1000	5600	600	6000	240
5	9600	1800	6400	1000	4400	600	4800	240
6	8000	1800	5300	1000	3700	600	4000	240
8	6000	1600	4000	900	2800	560	3000	240
10	4800	1400	3200	800	2200	500	2400	240
12	4000	1200	2700	700	1800	430	2000	230
16	3000	960	2000	560	1400	360	1500	190
20	2400	800	1600	480	1100	300	1200	170
Depth of cut								

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

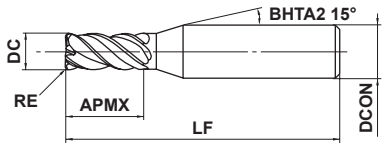
VQMHVRB

Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes

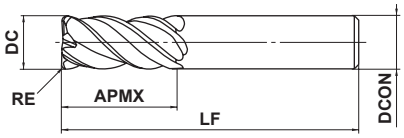


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





Type1



Type2

0.2≤RE≤6.35				
±0.015				
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD0200R020	2	0.2	4	45	4	4	●	1
VQMHVRBD0200R030	2	0.3	4	45	4	4	●	1
VQMHVRBD0300R020	3	0.2	8	45	6	4	●	1
VQMHVRBD0300R030	3	0.3	8	45	6	4	●	1
VQMHVRBD0300R050	3	0.5	8	45	6	4	●	1
VQMHVRBD0400R020	4	0.2	11	45	6	4	●	1
VQMHVRBD0400R030	4	0.3	11	45	6	4	●	1
VQMHVRBD0400R050	4	0.5	11	45	6	4	●	1
VQMHVRBD0500R020	5	0.2	13	50	6	4	●	1
VQMHVRBD0500R030	5	0.3	13	50	6	4	●	1
VQMHVRBD0500R050	5	0.5	13	50	6	4	●	1
VQMHVRBD0500R100	5	1	13	50	6	4	●	1
VQMHVRBD0600R030	6	0.3	13	50	6	4	●	2
VQMHVRBD0600R050	6	0.5	13	50	6	4	●	2
VQMHVRBD0600R100	6	1	13	50	6	4	●	2
VQMHVRBD0800R030	8	0.3	19	60	8	4	●	2
VQMHVRBD0800R050	8	0.5	19	60	8	4	●	2
VQMHVRBD0800R100	8	1	19	60	8	4	●	2
VQMHVRBD0800R150	8	1.5	19	60	8	4	●	2
VQMHVRBD1000R030	10	0.3	22	70	10	4	●	2
VQMHVRBD1000R050	10	0.5	22	70	10	4	●	2
VQMHVRBD1000R100	10	1	22	70	10	4	●	2
VQMHVRBD1000R150	10	1.5	22	70	10	4	●	2
VQMHVRBD1000R200	10	2	22	70	10	4	●	2
VQMHVRBD1200R050	12	0.5	26	75	12	4	●	2
VQMHVRBD1200R100	12	1	26	75	12	4	●	2
VQMHVRBD1200R150	12	1.5	26	75	12	4	●	2
VQMHVRBD1200R200	12	2	26	75	12	4	●	2
VQMHVRBD1200R250	12	2.5	26	75	12	4	●	2
VQMHVRBD1200R300	12	3	26	75	12	4	●	2
VQMHVRBD1600R100	16	1	35	90	16	4	●	2
VQMHVRBD1600R150	16	1.5	35	90	16	4	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD1600R200	16	2	35	90	16	4	●	2
VQMHVRBD1600R250	16	2.5	35	90	16	4	●	2
VQMHVRBD1600R300	16	3	35	90	16	4	●	2
VQMHVRBD1600R400	16	4	35	90	16	4	●	2
VQMHVRBD1600R500	16	5	35	90	16	4	●	2
VQMHVRBD2000R100	20	1	45	110	20	4	●	2
VQMHVRBD2000R150	20	1.5	45	110	20	4	●	2
VQMHVRBD2000R200	20	2	45	110	20	4	●	2
VQMHVRBD2000R250	20	2.5	45	110	20	4	●	2
VQMHVRBD2000R300	20	3	45	110	20	4	●	2
VQMHVRBD2000R400	20	4	45	110	20	4	●	2
VQMHVRBD2000R500	20	5	45	110	20	4	●	2
VQMHVRBD2000R635	20	6.35	45	110	20	4	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

VQMHVRB

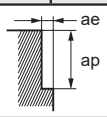
Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

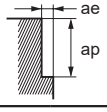
■ Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
Depth of cut																				

General-purpose conditions

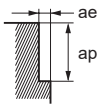
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
Depth of cut																				

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

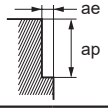
■Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
Depth of cut										

General-purpose conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
Depth of cut										

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHVRB

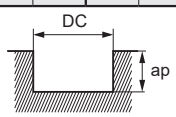
Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■Slotting

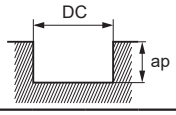
The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6
Depth of cut																								

DC:Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloys Inconel718			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6
Depth of cut																								

DC:Dia.

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

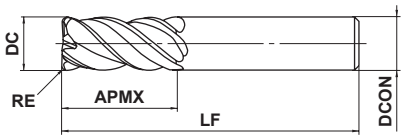
VQMHVRBF

Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes (for finishing)



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





Type1

0.3≤RE≤3				
±0.015				
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

- Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials.
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBFD0600R030	6	0.3	13	50	6	4	●	1
VQMHVRBFD0600R050	6	0.5	13	50	6	4	●	1
VQMHVRBFD0600R100	6	1	13	50	6	4	●	1
VQMHVRBFD0800R050	8	0.5	19	60	8	4	●	1
VQMHVRBFD0800R100	8	1	19	60	8	4	●	1
VQMHVRBFD1000R030	10	0.3	22	70	10	4	●	1
VQMHVRBFD1000R050	10	0.5	22	70	10	4	●	1
VQMHVRBFD1000R100	10	1	22	70	10	4	●	1
VQMHVRBFD1000R200	10	2	22	70	10	4	●	1
VQMHVRBFD1200R100	12	1	26	75	12	4	●	1
VQMHVRBFD1200R200	12	2	26	75	12	4	●	1
VQMHVRBFD1200R300	12	3	26	75	12	4	●	1
VQMHVRBFD1600R100	16	1	35	90	16	4	●	1
VQMHVRBFD1600R200	16	2	35	90	16	4	●	1

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : Inventory maintained in Japan.

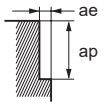
Click here for product NEWS ▶

VQMHVRBF

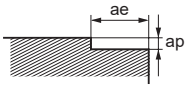
Corner radius end mill, Medium cutting length, 4 flute, Irregular helix flutes (for finishing)

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
6	150	8000	2600	9	0.3	120	6400	1300	9	0.3	75	4000	800	9	0.3	180	9500	3000	9	0.3	40	2100	250	9	0.18
8	150	6000	2500	12	0.4	120	4800	1300	12	0.4	75	3000	840	12	0.4	180	7200	3000	12	0.4	40	1600	260	12	0.24
10	150	4800	2300	15	0.5	120	3800	1200	15	0.5	75	2400	770	15	0.5	180	5700	2700	15	0.5	41	1300	290	15	0.3
12	150	4000	1900	18	0.6	120	3200	1200	18	0.6	75	2000	720	18	0.6	180	4800	2300	18	0.6	41	1100	280	18	0.36
16	150	3000	1600	24	0.8	120	2400	960	24	0.8	75	1500	600	24	0.8	180	3600	1900	24	0.8	40	800	200	24	0.48
Depth of cut																									

■Bottom face milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy					Heat resistant alloys Inconel718				
Dia. DC (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
6	110	5800	1400	0.3	4.8	90	4800	770	0.3	4.8	55	2900	460	0.3	4.8	130	6900	1700	0.3	4.8	30	1600	180	0.18	4.8
8	110	4400	1200	0.4	6.4	90	3600	720	0.4	6.4	55	2200	440	0.4	6.4	130	5200	1500	0.4	6.4	30	1200	190	0.24	6.4
10	110	3500	1100	0.5	8	90	2900	640	0.5	8	55	1800	400	0.5	8	130	4100	1300	0.5	8	30	950	210	0.3	8
12	110	2900	930	0.6	9.6	90	2400	580	0.6	9.6	55	1500	360	0.6	9.6	130	3400	1100	0.6	9.6	30	800	200	0.36	9.6
16	110	2200	790	0.8	12.8	90	1800	500	0.8	12.8	55	1100	310	0.8	12.8	130	2600	940	0.8	12.8	30	600	150	0.48	12.8
Depth of cut																									

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

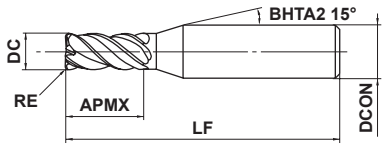
VQN4/6MVRB NEW

Corner Radius, Medium cut length, 4, 6 flute

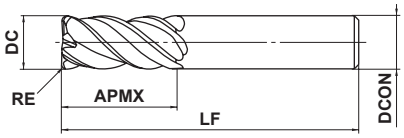
UWC | VQN | 33° 37° VQN4 | 34° 36° VQN6 | VQN4 | VQN6

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		





Type1



Type2

VQN4	VQN6			
±0.015	±0.02			
DC≤12				
0 - 0.02				
DCON=6	DCON=8,12	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.012		

● (Al, Ti, Ai) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.

● Optimized number of flutes for efficient and stable machining.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQN4MVRBD0300R030	3	0.3	7	45	6	4	●	1
VQN4MVRBD0300R050	3	0.5	7	45	6	4	●	1
VQN4MVRBD0400R030	4	0.3	10	45	6	4	●	1
VQN4MVRBD0400R050	4	0.5	10	45	6	4	●	1
VQN4MVRBD0500R050	5	0.5	12	50	6	4	●	1
VQN4MVRBD0600R050	6	0.5	13	50	6	4	●	2
VQN4MVRBD0600R100	6	1	13	50	6	4	●	2
VQN6MVRBD0800R050	8	0.5	19	60	8	6	●	2
VQN6MVRBD0800R100	8	1	19	60	8	6	●	2
VQN6MVRBD1000R050	10	0.5	22	70	10	6	●	2
VQN6MVRBD1000R100	10	1	22	70	10	6	●	2
VQN6MVRBD1200R050	12	0.5	26	75	12	6	●	2
VQN6MVRBD1200R100	12	1	26	75	12	6	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

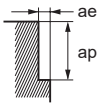
VQN4/6MVRB

Corner Radius, Medium cut length, 4, 6 flute

RECOMMENDED CUTTING CONDITIONS

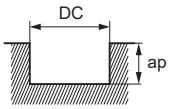
■ Side milling

(mm)

Workpiece Material		Nickel-Based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.			
DC	Number of Flutes	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Depth of cut ae
3	**4**	4200	340	4.5	0.3
4	**4**	3200	260	6	0.4
5	**4**	2500	300	7.5	0.5
6	**4**	2100	250	9	0.6
8	**6**	1600	290	12	0.8
10	**6**	1300	310	15	1
12	**6**	1100	260	18	1.2
Depth of cut					

■ Slot milling

(mm)

Workpiece Material		Nickel-Based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.		
DC	Number of Flutes	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap
3	**4**	3200	260	1.5
4	**4**	2400	190	2
5	**4**	1900	230	2.5
6	**4**	1600	190	3
8	**6**	1200	220	4
10	**6**	1000	180	5
12	**6**	800	140	6
Depth of cut				

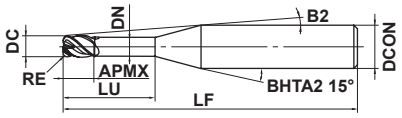
Note 1) The use of water-soluble coolant is effective for heat resistant super alloys.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 3) If the depth of cut is shallow, the revolution and feed rate can be increased.

VQHVRB NEW

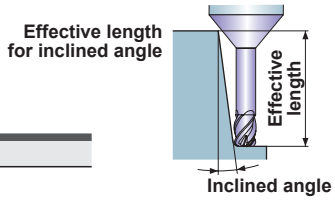
Corner radius, Short cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminium Alloy
					◎	○	





Type1



0.1≤RE≤1	±0.01
1≤DC≤4	0 -0.02
DCON=6	0 -0.005

● SMART MIRACLE corner radius end mill for high feed rates and efficient machining.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type
VQHVRBD0100R01N080	1	0.1	1	8	0.94	8.2°	50	6	4	●	1
VQHVRBD0100R01N120	1	0.1	1	12	0.94	6.7°	55	6	4	●	1
VQHVRBD0200R02N120	2	0.2	2	12	1.9	5.9°	55	6	4	●	1
VQHVRBD0200R02N160	2	0.2	2	16	1.9	4.9°	60	6	4	●	1
VQHVRBD0300R05N100	3	0.5	3	10	2.9	5.6°	55	6	4	●	1
VQHVRBD0300R05N180	3	0.5	3	18	2.9	3.7°	60	6	4	●	1
VQHVRBD0400R10N120	4	1.0	4	12	3.9	3.9°	55	6	4	●	1
VQHVRBD0400R10N200	4	1.0	4	20	3.9	2.5°	60	6	4	●	1

● : Inventory maintained in Japan.

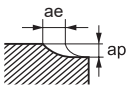
Click here for product NEWS ▶

VQHVRB

Corner radius, Short cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material		Titanium Alloys Ti-6Al-4V ELI etc.					Cobalt Chromium Alloys Precipitation Hardening Stainless Steels Co-Cr-Mo, SUS630, SUS631, 15-5PH, 17-4PH etc.				
DC	**LU**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**
1	**8**	2500	8	500	0.030	0.1	2500	8	500	0.030	0.1
1	**12**	2500	8	350	0.030	0.1	2500	8	350	0.030	0.1
2	**12**	4800	30	600	0.075	0.3	4800	30	600	0.075	0.3
2	**16**	4800	30	340	0.075	0.3	4800	30	350	0.075	0.3
3	**10**	8500	80	2400	0.190	1.3	6400	60	2200	0.170	1.3
3	**18**	8500	80	2000	0.190	1.3	6400	60	1600	0.170	1.3
4	**12**	6400	80	2000	0.250	1.7	4800	60	1800	0.220	1.7
4	**20**	6400	80	2000	0.250	1.7	4800	60	1800	0.220	1.7
Depth of Cut											

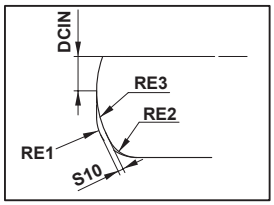
Note 1) The SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) If the depth of cut is shallow, the revolution and the feed rate can be increased.

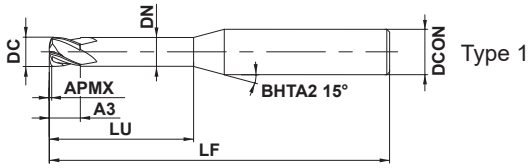
VQFDRB NEW

Duplex corner radius end mill for high-speed cutting

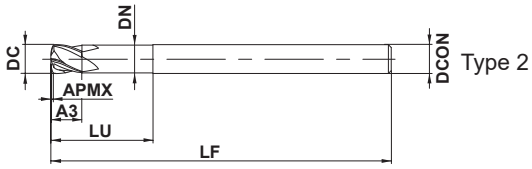
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminium Alloy
					◎	○	







Type 1



Type 2

1≤DC≤4	0 -0.020
DCON=6	0 -0.005

- Duplex corner radius type allows a more efficient, higher feed.
- High feed cutting realized through the use of multiple cuts.

(mm)

Order Number	DC	*1 RE1	APMX	*2 A3	LU	DN	LF	DCON	No. F	Multi-task radius part S10	DCIN	RE2	RE3	*3 RMPX	Stock	Type
VQFDRBD0300N080	3	0.64	0.18	3	8	2.8	50	6	4	0.08	0.75	0.5	2	2.1°	●	1
VQFDRBD0300N120	3	0.64	0.18	3	12	2.8	55	6	4	0.08	0.75	0.5	2	2.1°	●	1
VQFDRBD0400N120	4	0.71	0.25	4	12	3.8	55	6	4	0.13	1.0	0.5	3	1.9°	●	1
VQFDRBD0400N160	4	0.71	0.25	4	16	3.8	60	6	4	0.13	1.0	0.5	3	1.9°	●	1
VQFDRBD0600N180	6	0.92	0.36	6	18	5.6	60	6	4	0.21	1.5	0.6	5	1.7°	●	2

*1 RE1 : Approx. R
*2 A3 : Cutting Edge Effective Length
*3 RMPX : Max. Ramping Angle

● : Inventory maintained in Japan.

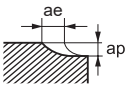
Click here for product NEWS ▶

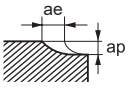
VQFDRB

Duplex corner radius end mill for high-speed cutting

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material	Titanium Alloys Ti-6Al-4V ELI etc.					Cobalt Chromium Alloys Precipitation Hardening Stainless Steels Co-Cr-Mo, SUS630, SUS631, 15-5PH, 17-4PH etc.				
DC	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**
3	8500	80	2100	0.2	1.3	6400	60	3000	0.2	1.3
4	6400	80	2200	0.2	1.7	4800	60	2700	0.2	1.7
6	4200	80	1400	0.3	2.0	3200	60	2100	0.3	2.6
Depth of Cut										

Workpiece Material	Heat Resistant Alloys Inconel 718 etc.				
DC	Revolution **n** (min^{-1})	Cutting Speed **vc** (m/min)	Feed Rate **vf** (mm/min)	Depth of cut **ap**	Width of cut **ae**
3	3200	30	770	0.2	0.6
4	2400	30	770	0.2	0.8
6	1600	30	520	0.3	1.3
Depth of Cut					

Note 1) The SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is shallow, the revolution and the feed rate can be increased.

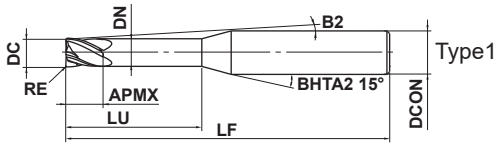
VFRPSRB NEW

Corner radius end mill, Short cut length, High precision, 4 flute

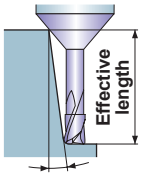
UWC VFR 30° DC≤1.0 DC≥1.5

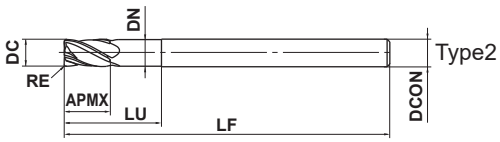
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Effective length for inclined angle





0.5≤DC≤6	6<DC≤12			
±0.005	±0.007			
0.5≤DC≤6	6<DC≤12			
0 - 0.01	0 - 0.15			
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

● Completely seamless curved R edge. DC≥1.5

● The wiper edge and strong back taper achieve high precision machining. 1.5≤DC≤5

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0050R005N020	0.5	0.05	0.5	2	0.47	12.6	50	6	4	●	1	2.1	2.2	2.3	2.5
VFRPSRBD0050R010N020	0.5	0.1	0.5	2	0.47	12.7	50	6	4	●	1	2.1	2.2	2.3	2.5
VFRPSRBD0060R005N020	0.6	0.05	0.6	2	0.57	12.5	50	6	4	●	1	2.1	2.2	2.4	2.6
VFRPSRBD0060R010N020	0.6	0.1	0.6	2	0.57	12.5	50	6	4	●	1	2.1	2.2	2.3	2.6
VFRPSRBD0060R010N040	0.6	0.1	0.6	4	0.57	10.8	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0060R020N020	0.6	0.2	0.6	2	0.57	12.6	50	6	4	●	1	2.1	2.2	2.2	2.6
VFRPSRBD0080R005N040	0.8	0.05	0.8	4	0.77	10.7	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R010N040	0.8	0.1	0.8	4	0.77	10.7	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R020N040	0.8	0.2	0.8	4	0.77	10.8	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R030N040	0.8	0.3	0.8	4	0.77	10.8	50	6	4	●	1	4.2	4.4	4.7	5
VFRPSRBD0100R005N040	1	0.05	1	4	0.96	10.4	50	6	4	●	1	4.3	4.5	4.9	5.4
VFRPSRBD0100R010N040	1	0.1	1	4	0.96	10.4	50	6	4	●	1	4.3	4.5	4.9	5.4
VFRPSRBD0100R010N060	1	0.1	1	6	0.96	9.1	50	6	4	●	1	6.4	6.7	7.3	7.9
VFRPSRBD0100R020N040	1	0.2	1	4	0.96	10.5	50	6	4	●	1	4.3	4.5	4.7	5.3
VFRPSRBD0100R020N060	1	0.2	1	6	0.96	9.2	50	6	4	●	1	6.4	6.7	7.3	7.8
VFRPSRBD0100R030N040	1	0.3	1	4	0.96	10.5	50	6	4	●	1	4.3	4.5	4.6	5.3
VFRPSRBD0100R040N040	1	0.4	1	4	0.96	10.6	50	6	4	●	1	4.3	4.5	4.5	5.3
VFRPSRBD0150R010N040	1.5	0.1	1.5	4	1.42	10.2	50	6	4	●	1	4.2	4.4	4.8	5.2
VFRPSRBD0150R010N060	1.5	0.1	1.5	6	1.42	8.8	50	6	4	●	1	6.3	6.6	7.1	7.7
VFRPSRBD0150R010N100	1.5	0.1	1.5	10	1.42	6.9	50	6	4	●	1	10.5	10.9	11.7	12.7
VFRPSRBD0150R020N040	1.5	0.2	1.5	4	1.42	10.2	50	6	4	●	1	4.2	4.4	4.6	5.2
VFRPSRBD0150R020N060	1.5	0.2	1.5	6	1.42	8.8	50	6	4	●	1	6.3	6.6	7.1	7.7
VFRPSRBD0150R020N100	1.5	0.2	1.5	10	1.42	7	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0150R030N040	1.5	0.3	1.5	4	1.42	10.3	50	6	4	●	1	4.2	4.4	4.5	5.2
VFRPSRBD0150R030N060	1.5	0.3	1.5	6	1.42	8.9	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0150R030N100	1.5	0.3	1.5	10	1.42	7	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0150R050N040	1.5	0.5	1.5	4	1.42	10.5	50	6	4	●	1	4.2	4.4	4.3	5.1
VFRPSRBD0150R050N060	1.5	0.5	1.5	6	1.42	9	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0150R050N100	1.5	0.5	1.5	10	1.42	7.1	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0200R010N060	2	0.1	2	6	1.9	8.4	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0200R010N100	2	0.1	2	10	1.9	6.5	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0200R010N150	2	0.1	2	15	1.9	5.1	50	6	4	●	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R020N060	2	0.2	2	6	1.9	8.4	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0200R020N100	2	0.2	2	10	1.9	6.5	50	6	4	●	1	10.5	10.9	11.7	12.6

● : Inventory maintained in Japan.

Click here for product NEWS ▶

VFRPSRB

Corner radius end mill, Short cut length, High precision, 4 flute

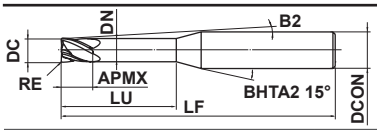
(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0200R020N150	2	0.2	2	15	1.9	5.1	50	6	4	●	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R030N060	2	0.3	2	6	1.9	8.5	50	6	4	●	1	6.3	6.6	7	7.6
VFRPSRBD0200R030N100	2	0.3	2	10	1.9	6.6	50	6	4	●	1	10.5	10.8	11.6	12.6
VFRPSRBD0200R030N150	2	0.3	2	15	1.9	5.1	50	6	4	●	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R030N200	2	0.3	2	20	1.9	4.2	60	6	4	●	1	20.8	21.5	23.1	25
VFRPSRBD0200R050N060	2	0.5	2	6	1.9	8.6	50	6	4	●	1	6.3	6.5	7	7.5
VFRPSRBD0200R050N100	2	0.5	2	10	1.9	6.6	50	6	4	●	1	10.5	10.8	11.6	12.5
VFRPSRBD0200R050N150	2	0.5	2	15	1.9	5.2	50	6	4	●	1	15.6	16.2	17.4	18.7
VFRPSRBD0200R050N200	2	0.5	2	20	1.9	4.2	60	6	4	●	1	20.8	21.5	23.1	24.9
VFRPSRBD0250R030N080	2.5	0.3	2.5	8	2.35	6.9	50	6	4	●	1	8.3	8.6	9.2	10
VFRPSRBD0250R030N150	2.5	0.3	2.5	15	2.35	4.7	50	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0250R050N080	2.5	0.5	2.5	8	2.35	7	50	6	4	●	1	8.3	8.6	9.2	9.9
VFRPSRBD0250R050N150	2.5	0.5	2.5	15	2.35	4.7	50	6	4	●	1	15.6	16.1	17.3	18.6
VFRPSRBD0250R100N080	2.5	1	2.5	8	2.35	7.3	50	6	4	●	1	8.3	8.6	9.1	9.8
VFRPSRBD0300R010N100	3	0.1	3	10	2.85	5.5	60	6	4	●	1	10.4	10.8	11.6	12.5
VFRPSRBD0300R010N150	3	0.1	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R020N100	3	0.2	3	10	2.85	5.5	60	6	4	●	1	10.4	10.8	11.6	12.5
VFRPSRBD0300R020N150	3	0.2	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R020N200	3	0.2	3	20	2.85	3.4	60	6	4	●	1	20.7	21.5	23.1	24.9
VFRPSRBD0300R030N100	3	0.3	3	10	2.85	5.6	60	6	4	●	1	10.4	10.8	11.5	12.5
VFRPSRBD0300R030N150	3	0.3	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R030N200	3	0.3	3	20	2.85	3.4	60	6	4	●	1	20.7	21.5	23	24.9
VFRPSRBD0300R050N100	3	0.5	3	10	2.85	5.6	60	6	4	●	1	10.4	10.7	11.5	12.4
VFRPSRBD0300R050N150	3	0.5	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.6
VFRPSRBD0300R050N200	3	0.5	3	20	2.85	3.4	60	6	4	●	1	20.7	21.4	23	24.8
VFRPSRBD0300R100N100	3	1	3	10	2.85	5.8	60	6	4	●	1	10.4	10.7	11.4	12.3
VFRPSRBD0300R100N150	3	1	3	15	2.85	4.3	60	6	4	●	1	15.5	16.1	17.2	18.5
VFRPSRBD0300R100N200	3	1	3	20	2.85	3.5	60	6	4	●	1	20.7	21.4	22.9	24.7
VFRPSRBD0400R010N120	4	0.1	4	12	3.85	3.6	60	6	4	●	1	12.5	12.9	13.9	15
VFRPSRBD0400R010N200	4	0.1	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23.1	*
VFRPSRBD0400R020N120	4	0.2	4	12	3.85	3.7	60	6	4	●	1	12.5	12.9	13.9	15
VFRPSRBD0400R020N200	4	0.2	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23.1	*
VFRPSRBD0400R030N120	4	0.3	4	12	3.85	3.7	60	6	4	●	1	12.5	12.9	13.8	15
VFRPSRBD0400R030N200	4	0.3	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23	*
VFRPSRBD0400R030N300	4	0.3	4	30	3.85	1.7	70	6	4	●	1	31.1	32.2	*	*
VFRPSRBD0400R050N120	4	0.5	4	12	3.85	3.7	60	6	4	●	1	12.5	12.9	13.8	14.9
VFRPSRBD0400R050N200	4	0.5	4	20	3.85	2.5	60	6	4	●	1	20.7	21.4	23	*
VFRPSRBD0400R050N300	4	0.5	4	30	3.85	1.7	70	6	4	●	1	31.1	32.1	*	*
VFRPSRBD0400R100N120	4	1	4	12	3.85	3.8	60	6	4	●	1	12.4	12.8	13.7	14.8
VFRPSRBD0400R100N200	4	1	4	20	3.85	2.5	60	6	4	●	1	20.7	21.4	22.9	*
VFRPSRBD0400R100N300	4	1	4	30	3.85	1.7	70	6	4	●	1	31.1	32.1	*	*
VFRPSRBD0500R050N150	5	0.5	5	15	4.85	1.7	60	6	4	●	1	15.6	16.1	*	*
VFRPSRBD0500R100N150	5	1	5	15	4.85	1.8	60	6	4	●	1	15.5	16.1	*	*
VFRPSRBD0600R010N180	6	0.1	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R020N180	6	0.2	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R030N180	6	0.3	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R050N180	6	0.5	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R100N180	6	1	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R200N180	6	2	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0800R020N240	8	0.2	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R030N240	8	0.3	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R050N240	8	0.5	12	24	7.85	—	90	8	4	●	2	*	*	*	*

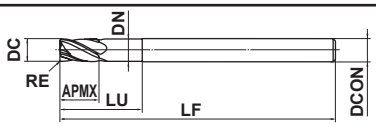
* No interference

● : Inventory maintained in Japan.

ISO13399 ➤ J002



Type1



Type2

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0800R100N240	8	1	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R200N240	8	2	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD1000R030N300	10	0.3	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R050N300	10	0.5	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R100N300	10	1	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R200N300	10	2	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R300N300	10	3	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1200R050N360	12	0.5	18	36	11.7	—	110	12	4	●	2	*	*	*	*
VFRPSRBD1200R100N360	12	1	18	36	11.7	—	110	12	4	●	2	*	*	*	*
VFRPSRBD1200R200N360	12	2	18	36	11.7	—	110	12	4	●	2	*	*	*	*
VFRPSRBD1200R300N360	12	3	18	36	11.7	—	110	12	4	●	2	*	*	*	*

* No interference

VFRPSRB

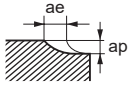
Corner radius end mill, Short cut length, High precision, 4 flute

RECOMMENDED CUTTING CONDITIONS

(mm)

Workpiece Material			Hardened Steels (45—55HRC)				Hardened Steels (55—65HRC)				Hardened Steels (65—70HRC)			
Dia. **DC**	Corner Radius **RE**	Usable Length **LU**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
0.5	**0.05**	**2**	25000	1000	0.005	0.1	19000	760	0.004	0.08	13000	510	0.003	0.08
0.5	**0.1**	**2**	25000	1000	0.008	0.1	19000	760	0.006	0.08	13000	510	0.005	0.08
0.6	**0.05**	**2**	21000	1000	0.005	0.1	16000	760	0.004	0.08	11000	510	0.003	0.08
0.6	**0.1**	**2**	21000	1000	0.008	0.1	16000	760	0.006	0.08	11000	510	0.005	0.08
0.6	**0.1**	**4**	18000	890	0.006	0.1	16000	760	0.005	0.08	11000	510	0.004	0.08
0.6	**0.2**	**2**	24000	1100	0.01	0.1	19000	890	0.008	0.08	16000	760	0.006	0.08
0.8	**0.05**	**4**	16000	760	0.015	0.12	12000	570	0.01	0.1	7900	380	0.01	0.1
0.8	**0.1**	**4**	16000	760	0.02	0.12	12000	570	0.015	0.1	7900	380	0.01	0.1
0.8	**0.2**	**4**	20000	950	0.03	0.12	16000	760	0.025	0.1	12000	570	0.02	0.1
0.8	**0.3**	**4**	20000	950	0.03	0.12	16000	760	0.025	0.1	12000	570	0.02	0.1
1	**0.05**	**4**	13000	1000	0.015	0.15	9500	760	0.01	0.12	6400	510	0.01	0.12
1	**0.1**	**4**	13000	1000	0.02	0.15	9500	760	0.015	0.12	6400	510	0.015	0.12
1	**0.1**	**6**	11000	890	0.015	0.12	6400	510	0.01	0.1	6400	510	0.01	0.1
1	**0.2**	**4**	16000	1300	0.03	0.15	9500	760	0.025	0.12	6400	510	0.02	0.12
1	**0.2**	**6**	13000	1000	0.02	0.12	6400	510	0.02	0.1	6400	510	0.015	0.1
1	**0.3**	**4**	16000	1300	0.03	0.15	9500	760	0.025	0.12	6400	510	0.02	0.12
1	**0.4**	**4**	16000	1300	0.04	0.15	9500	760	0.03	0.12	6400	510	0.025	0.12
1.5	**0.1**	**4**	14000	1700	0.025	0.23	11000	920	0.015	0.2	7200	570	0.01	0.2
1.5	**0.1**	**6**	11000	1400	0.025	0.18	9200	730	0.015	0.16	5700	460	0.01	0.16
1.5	**0.1**	**10**	11000	1400	0.025	0.18	9200	730	0.015	0.16	5700	460	0.01	0.16
1.5	**0.2**	**4**	14000	1700	0.05	0.23	11000	920	0.035	0.2	7200	570	0.025	0.2
1.5	**0.2**	**6**	11000	1400	0.05	0.18	9200	730	0.035	0.16	5700	460	0.025	0.16
1.5	**0.2**	**10**	11000	1400	0.05	0.18	9200	730	0.035	0.16	5700	460	0.025	0.16
1.5	**0.3**	**4**	16000	1900	0.075	0.23	13000	1000	0.05	0.2	8000	640	0.035	0.2
1.5	**0.3**	**6**	13000	1500	0.075	0.18	10000	810	0.05	0.16	6400	510	0.035	0.16
1.5	**0.3**	**10**	13000	1500	0.075	0.18	10000	810	0.05	0.16	6400	510	0.035	0.16
1.5	**0.5**	**4**	16000	1900	0.08	0.23	13000	1000	0.055	0.2	8000	640	0.04	0.2
1.5	**0.5**	**6**	13000	1500	0.08	0.18	10000	810	0.055	0.16	6400	510	0.04	0.16
1.5	**0.5**	**10**	13000	1500	0.08	0.18	10000	810	0.055	0.16	6400	510	0.04	0.16
2	**0.1**	**6**	11000	1700	0.025	0.3	8600	1000	0.02	0.28	5400	640	0.015	0.28
2	**0.1**	**10**	8600	1400	0.025	0.24	6900	830	0.02	0.22	4300	520	0.015	0.22
2	**0.1**	**15**	6400	1000	0.02	0.18	5200	620	0.015	0.17	3200	390	0.01	0.17
2	**0.2**	**6**	11000	1700	0.055	0.3	8600	1000	0.035	0.28	5400	640	0.025	0.28
2	**0.2**	**10**	8600	1400	0.055	0.24	6900	830	0.035	0.22	4300	520	0.025	0.22
2	**0.2**	**15**	6400	1000	0.04	0.18	5200	620	0.025	0.17	3200	390	0.02	0.16
2	**0.3**	**6**	12000	1900	0.08	0.3	6900	1100	0.055	0.28	6000	420	0.04	0.27
2	**0.3**	**10**	9500	1500	0.08	0.24	7600	920	0.055	0.22	4800	570	0.04	0.22
2	**0.3**	**15**	7200	1100	0.065	0.18	5700	690	0.045	0.17	3600	430	0.03	0.16
2	**0.3**	**20**	7200	1100	0.065	0.18	5700	690	0.045	0.17	3600	430	0.03	0.16
2	**0.5**	**6**	12000	1900	0.085	0.3	9500	1100	0.06	0.28	6000	720	0.04	0.27
2	**0.5**	**10**	9500	1500	0.085	0.24	7600	920	0.06	0.22	4800	570	0.04	0.22
2	**0.5**	**15**	7200	1100	0.07	0.18	5700	690	0.045	0.17	3600	430	0.035	0.16
2	**0.5**	**20**	7200	1100	0.07	0.18	5700	690	0.045	0.17	3600	430	0.035	0.16
2.5	**0.3**	**8**	9500	1900	0.08	0.38	7600	1400	0.055	0.35	4800	860	0.04	0.34
2.5	**0.3**	**15**	7600	1500	0.08	0.3	6100	1100	0.055	0.28	3800	690	0.04	0.27
2.5	**0.5**	**8**	9500	1900	0.09	0.38	7600	1400	0.06	0.35	4800	860	0.04	0.34
2.5	**0.5**	**15**	7600	1500	0.09	0.3	6100	1100	0.06	0.28	3800	690	0.04	0.27
2.5	**1**	**8**	9500	1900	0.15	0.33	7600	1400	0.09	0.31	4800	860	0.065	0.31

Depth of Cut



Note 1) The table above is a guide for when machining using the corner R cutting edge. When machining with the peripheral cutting edge, reduce the feed rate.

Note 2) If depth of cut is shallow, the revolution and feed rate can be increased.

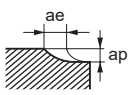
Note 3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of the workpiece.

Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

(mm)

Workpiece Material			Hardened Steels (45—55HRC)				Hardened Steels (55—65HRC)				Hardened Steels (65—70HRC)			
Dia. **DC**	Corner Radius **RE**	Usable Length **LU**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of Cut **ap**	Width of Cut **ae**
3	**0.1**	**10**	8100	1900	0.025	0.6	6500	1200	0.02	0.55	4100	730	0.015	0.55
3	**0.1**	**15**	6500	1600	0.025	0.48	5200	940	0.02	0.44	3200	580	0.015	0.44
3	**0.2**	**10**	8100	1900	0.055	0.6	6500	1200	0.04	0.55	4100	730	0.025	0.55
3	**0.2**	**15**	6500	1600	0.055	0.48	5200	940	0.04	0.44	3200	580	0.025	0.44
3	**0.2**	**20**	6500	1600	0.055	0.48	5200	940	0.04	0.44	3200	580	0.025	0.44
3	**0.3**	**10**	9000	2200	0.085	0.6	7200	1300	0.055	0.55	4500	810	0.04	0.55
3	**0.3**	**15**	7200	1700	0.085	0.48	5800	1000	0.055	0.44	3600	650	0.04	0.44
3	**0.3**	**20**	7200	1700	0.085	0.48	5800	1000	0.055	0.44	3600	650	0.04	0.44
3	**0.5**	**10**	9000	2200	0.09	0.6	7200	1300	0.06	0.55	4500	810	0.045	0.55
3	**0.5**	**15**	7200	1700	0.09	0.48	5800	1000	0.06	0.44	3600	650	0.045	0.44
3	**0.5**	**20**	7200	1700	0.09	0.48	5800	1000	0.06	0.44	3600	650	0.045	0.44
3	**1**	**10**	9000	2200	0.15	0.54	7200	1300	0.1	0.5	4500	810	0.07	0.5
3	**1**	**15**	7200	1700	0.15	0.43	5800	1000	0.1	0.4	3600	650	0.07	0.4
3	**1**	**20**	7200	2000	0.15	0.43	5800	1000	0.1	0.4	3600	650	0.07	0.4
4	**0.1**	**12**	6100	1700	0.25	0.8	4900	970	0.02	0.74	3000	610	0.015	0.73
4	**0.1**	**20**	4900	1400	0.25	0.6	3900	780	0.02	0.6	2400	490	0.015	0.58
4	**0.2**	**12**	6100	1700	0.055	0.8	4900	970	0.04	0.74	3000	610	0.025	0.73
4	**0.2**	**20**	4900	1400	0.055	0.6	3900	780	0.04	0.6	2400	490	0.025	0.58
4	**0.3**	**12**	6800	1900	0.085	0.8	5400	1100	0.055	0.75	3400	680	0.04	0.73
4	**0.3**	**20**	5400	1500	0.085	0.6	4300	870	0.055	0.6	2700	540	0.04	0.58
4	**0.3**	**30**	4100	1100	0.065	0.5	3200	650	0.045	0.45	2000	410	0.035	0.44
4	**0.5**	**12**	6800	1900	0.09	0.8	5400	1100	0.06	0.75	3400	680	0.045	0.74
4	**0.5**	**20**	5400	1500	0.09	0.65	4300	870	0.06	0.6	2700	540	0.045	0.58
4	**0.5**	**30**	4100	1100	0.075	0.5	4300	650	0.05	0.45	2000	410	0.035	0.44
4	**1**	**12**	6800	1900	0.15	0.7	5400	1100	0.1	0.66	3400	680	0.07	0.66
4	**1**	**20**	5400	1500	0.15	0.55	4300	870	0.1	0.53	2700	540	0.07	0.53
4	**1**	**30**	4100	1100	0.1	0.4	3200	650	0.075	0.4	2000	410	0.055	0.4
5	**0.5**	**15**	6400	1800	0.1	1.3	5100	1000	0.065	1.2	3200	640	0.045	1.1
5	**1**	**15**	6400	1800	0.15	1.1	5100	1000	0.1	1	3200	640	0.075	1
6	**0.1**	**18**	4800	1500	0.03	1.5	3800	920	0.02	1.4	2400	570	0.015	1.3
6	**0.2**	**18**	4800	1500	0.06	1.5	3800	920	0.04	1.4	2400	570	0.03	1.3
6	**0.3**	**18**	5300	1700	0.09	1.5	4200	1000	0.06	1.4	2700	640	0.045	1.3
6	**0.5**	**18**	5300	1700	0.1	1.5	4200	1000	0.065	1.4	2700	640	0.045	1.3
6	**1**	**18**	5300	1700	0.15	1.4	4200	1000	0.1	1.2	2700	640	0.075	1.2
6	**2**	**18**	5300	1700	0.3	1.3	4200	1000	0.2	1.1	2700	640	0.15	1.1
8	**0.2**	**24**	3600	1100	0.06	2	2900	690	0.04	1.8	1800	430	0.03	1.8
8	**0.3**	**24**	4000	1300	0.09	2	3200	760	0.06	1.8	2000	480	0.045	1.8
8	**0.5**	**24**	4000	1300	0.095	2	3200	760	0.065	1.8	2000	480	0.045	1.8
8	**1**	**24**	4000	1300	0.15	1.8	3200	760	0.1	1.7	2000	480	0.075	1.6
8	**2**	**24**	4000	1300	0.3	1.7	3200	760	0.2	1.6	2000	480	0.15	1.5
10	**0.3**	**30**	3200	1000	0.09	2.5	2500	610	0.06	2.3	1600	380	0.045	2.3
10	**0.5**	**30**	3200	1000	0.095	2.5	2500	610	0.065	2.3	1600	380	0.045	2.3
10	**1**	**30**	3200	1000	0.15	2.3	2500	610	0.1	2.1	1600	380	0.075	2
10	**2**	**30**	3200	1000	0.3	2.1	2500	610	0.2	2	1600	380	0.15	1.9
10	**3**	**30**	3200	1000	0.45	1.9	2500	610	0.3	1.7	1600	380	0.2	1.7
12	**0.5**	**36**	2700	950	0.1	3	2100	510	0.065	2.8	1300	320	0.05	2.7
12	**1**	**36**	2700	950	0.15	2.7	2100	510	0.1	2.5	1300	320	0.075	2.4
12	**2**	**36**	2700	950	0.3	2.6	2100	510	0.2	2.4	1300	320	0.15	2.3
12	**3**	**36**	2700	950	0.45	2.3	2100	510	0.3	2.1	1300	320	0.2	2

Depth of Cut



VFMHVRBCH

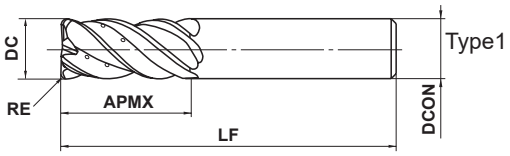
Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





1≤RE≤3					
±0.015					
16≤DC≤20					
0 - 0.03					
DCON=16	DCON=20				
0 - 0.011	0 - 0.013				

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

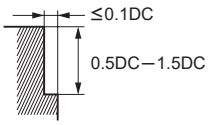
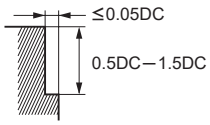
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVRBCHD1600R100	16	1	35	90	16	4	▲	1
VFMHVRBCHD1600R300	16	3	35	90	16	4	▲	1
VFMHVRBCHD2000R100	20	1	45	110	20	4	▲	1
VFMHVRBCHD2000R300	20	3	45	110	20	4	▲	1

▲ : Inventory maintained in Japan.
To be replaced by new products.

Click here for product NEWS ▶

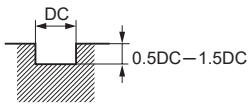
RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	1140	2000	560	800	110
20	2400	860	1600	510	600	100
Depth of cut						

DC:Dia.

■ Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2400	670	1400	380	1400	170
20	1900	610	1100	350	1100	130
Depth of cut						

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

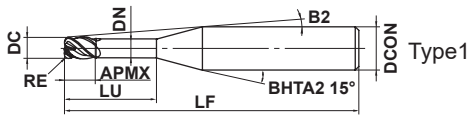
VFHVRB

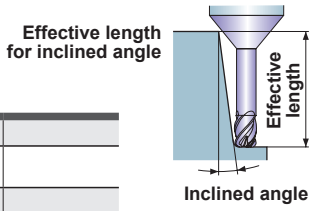
4 flute, Corner radius, Short cut length,Irregular helix flutes

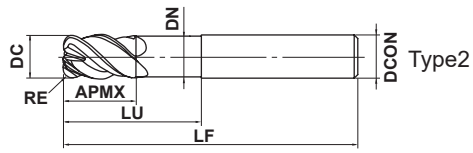
UWC VF 43° 45°

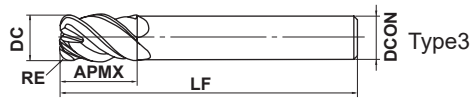
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎	○	○	○		













DC≤10	DC>10			
±0.007	±0.01			
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

● Impact Miracle corner radius end mill for high feed and efficient machining.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VFHVRBD0100R02N004	1	0.2	1	4	0.94	10.6°	60	6	4	●	1	4.2	4.5	4.7	5.3
VFHVRBD0100R02N006	1	0.2	1	6	0.94	9.2°	60	6	4	●	1	6.4	6.7	7.2	7.7
VFHVRBD0100R02N008	1	0.2	1	8	0.94	8.2°	60	6	4	●	1	8.5	8.8	9.5	10.2
VFHVRBD0100R02N010	1	0.2	1	10	0.94	7.4°	60	6	4	●	1	10.5	11	11.8	12.7
VFHVRBD0100R02N015	1	0.2	1	15	0.94	5.9°	60	6	4	●	1	15.8	16.3	17.5	18.9
VFHVRBD0100R02N020	1	0.2	1	20	0.94	4.9°	80	6	4	●	1	20.9	21.7	23.3	25.1
VFHVRBD0150R03N004	1.5	0.3	1.5	4	1.44	10.3°	60	6	4	●	1	4.2	4.5	4.6	5.2
VFHVRBD0150R03N006	1.5	0.3	1.5	6	1.44	8.9°	60	6	4	●	1	6.3	6.6	7.2	7.7
VFHVRBD0150R03N010	1.5	0.3	1.5	10	1.44	7°	60	6	4	●	1	10.5	10.9	11.8	12.7
VFHVRBD0150R03N015	1.5	0.3	1.5	15	1.44	5.5°	60	6	4	●	1	15.7	16.3	17.5	18.9
VFHVRBD0150R03N020	1.5	0.3	1.5	20	1.44	4.6°	80	6	4	●	1	20.9	21.6	23.3	25.1
VFHVRBD0150R03N025	1.5	0.3	1.5	25	1.44	3.9°	80	6	4	●	1	26.1	27	29	31.3
VFHVRBD0150R03N030	1.5	0.3	1.5	30	1.44	3.4°	80	6	4	●	1	31.3	32.3	34.7	37.5
VFHVRBD0200R05N006	2	0.5	2	6	1.9	8.7°	60	6	4	●	1	6.3	6.5	7	7.5
VFHVRBD0200R05N010	2	0.5	2	10	1.9	6.7°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRBD0200R05N015	2	0.5	2	15	1.9	5.2°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRBD0200R05N020	2	0.5	2	20	1.9	4.3°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0200R05N025	2	0.5	2	25	1.9	3.6°	80	6	4	●	1	26	26.9	28.9	31.2
VFHVRBD0200R05N030	2	0.5	2	30	1.9	3.1°	80	6	4	●	1	31.2	32.2	34.6	37.4
VFHVRBD0200R05N035	2	0.5	2	35	1.9	2.8°	90	6	4	●	1	36.3	37.6	40.4	*
VFHVRBD0200R05N040	2	0.5	2	40	1.9	2.5°	90	6	4	●	1	41.5	42.9	46.1	*
VFHVRBD0300R05N010	3	0.5	3	10	2.9	5.6°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRBD0300R05N015	3	0.5	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRBD0300R05N020	3	0.5	3	20	2.9	3.4°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0300R05N030	3	0.5	3	30	2.9	2.5°	80	6	4	●	1	31.2	32.2	34.6	*
VFHVRBD0300R08N010	3	0.8	3	10	2.9	5.7°	60	6	4	●	1	10.4	10.8	11.6	12.4
VFHVRBD0300R08N015	3	0.8	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.3	18.7
VFHVRBD0300R08N020	3	0.8	3	20	2.9	3.5°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0300R08N030	3	0.8	3	30	2.9	2.5°	80	6	4	●	1	31.1	32.2	34.6	*
VFHVRBD0300R08N040	3	0.8	3	40	2.9	2°	90	6	4	●	1	41.5	42.9	*	*
VFHVRBD0300R08N050	3	0.8	3	50	2.9	1.6°	90	6	4	●	1	51.8	53.6	*	*
VFHVRBD0400R05N012	4	0.5	4	12	3.9	3.8°	60	6	4	●	1	12.5	13	13.9	15
VFHVRBD0400R05N020	4	0.5	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23.1	*
VFHVRBD0400R05N030	4	0.5	4	30	3.9	1.8°	80	6	4	●	1	31.2	32.2	*	*

* No interference

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFHVRBD0400R05N048	4	0.5	4	48	3.9	1.2°	90	6	4	●	1	49.8	51.5	*	*
VFHVRBD0400R10N012	4	1	4	12	3.9	3.9°	60	6	4	●	1	12.5	12.9	13.8	14.9
VFHVRBD0400R10N020	4	1	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23	*
VFHVRBD0400R10N030	4	1	4	30	3.9	1.8°	80	6	4	●	1	31.1	32.2	*	*
VFHVRBD0600R05N018	6	0.5	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R05N030	6	0.5	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R10N018	6	1	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R10N030	6	1	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R10N054	6	1	9	54	5.85	—	90	6	4	●	2	*	*	*	*
VFHVRBD0600R15N018	6	1.5	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R15N030	6	1.5	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R15N042	6	1.5	9	42	5.85	—	90	6	4	●	2	*	*	*	*
VFHVRBD0600R15N054	6	1.5	9	54	5.85	—	90	6	4	●	2	*	*	*	*
VFHVRBD0600R20N018	6	2	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R20N030	6	2	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0700R15	7	1.5	11	—	—	—	80	6	4	●	3	*	*	*	*
VFHVRBD0800R05N024	8	0.5	12	24	7.85	—	60	8	4	●	2	*	*	*	*
VFHVRBD0800R05N040	8	0.5	12	40	7.85	—	100	8	4	●	2	*	*	*	*
VFHVRBD0800R10N024	8	1	12	24	7.85	—	60	8	4	●	2	*	*	*	*
VFHVRBD0800R10N040	8	1	12	40	7.85	—	100	8	4	●	2	*	*	*	*
VFHVRBD0800R20N024	8	2	12	24	7.85	—	60	8	4	●	2	*	*	*	*
VFHVRBD0800R20N040	8	2	12	40	7.85	—	100	8	4	●	2	*	*	*	*
VFHVRBD0800R20N056	8	2	12	56	7.85	—	120	8	4	●	2	*	*	*	*
VFHVRBD0800R20N072	8	2	12	72	7.85	—	120	8	4	●	2	*	*	*	*
VFHVRBD0900R20	9	2	13.5	—	—	—	100	8	4	●	3	*	*	*	*
VFHVRBD1000R05N030	10	0.5	15	30	9.7	—	70	10	4	●	2	*	*	*	*
VFHVRBD1000R05N050	10	0.5	15	50	9.7	—	110	10	4	●	2	*	*	*	*
VFHVRBD1000R10N030	10	1	15	30	9.7	—	70	10	4	●	2	*	*	*	*
VFHVRBD1000R10N050	10	1	15	50	9.7	—	110	10	4	●	2	*	*	*	*
VFHVRBD1000R20N030	10	2	15	30	9.7	—	70	10	4	●	2	*	*	*	*
VFHVRBD1000R20N050	10	2	15	50	9.7	—	110	10	4	●	2	*	*	*	*
VFHVRBD1000R20N070	10	2	15	70	9.7	—	150	10	4	●	2	*	*	*	*
VFHVRBD1000R20N090	10	2	15	90	9.7	—	150	10	4	●	2	*	*	*	*
VFHVRBD1100R20	11	2	16.5	—	—	—	110	10	4	●	3	*	*	*	*
VFHVRBD1200R05N036	12	0.5	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R05N060	12	0.5	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R10N036	12	1	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R10N060	12	1	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R20N036	12	2	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R20N060	12	2	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R20N084	12	2	18	84	11.7	—	160	12	4	●	2	*	*	*	*
VFHVRBD1200R20N108	12	2	18	108	11.7	—	160	12	4	●	2	*	*	*	*
VFHVRBD1200R30N036	12	3	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R30N060	12	3	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1300R30	13	3	19.5	—	—	—	120	12	4	●	3	*	*	*	*
VFHVRBD1600R05N042	16	0.5	24	42	15.5	—	100	16	4	●	2	*	*	*	*
VFHVRBD1600R20N042	16	2	24	42	15.5	—	100	16	4	●	2	*	*	*	*
VFHVRBD1600R30N042	16	3	24	42	15.5	—	100	16	4	●	2	*	*	*	*
VFHVRBD1600R30N080	16	3	24	80	15.5	—	140	16	4	●	2	*	*	*	*
VFHVRBD1600R30N120	16	3	24	120	15.5	—	175	16	4	●	2	*	*	*	*

* No interference

VFHVRB

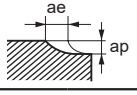
4 flute, Corner radius, Short cut length,Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

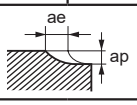
■High speed milling

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. DC (mm)	Corner R RE (mm)	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	0.2	4	40000	7200	0.04	0.45	33000	5100	0.03	0.45	27000	4100	0.025	0.45	20000	1800	0.013	0.45
1	0.2	6	40000	6500	0.03	0.45	33000	4600	0.022	0.45	27000	3700	0.018	0.45	20000	1600	0.01	0.45
1	0.2	8	32000	4500	0.022	0.45	27000	3200	0.018	0.45	21000	2600	0.012	0.45	16000	1100	0.008	0.45
1	0.2	10	24000	2700	0.015	0.45	20000	1900	0.01	0.45	16000	1500	0.008	0.45	12000	700	0.006	0.45
1	0.2	15	16000	1200	0.008	0.45	14000	700	0.005	0.45	12000	500	0.003	0.45	10000	400	0.003	0.45
1	0.2	20	14000	1000	0.005	0.45	12000	600	0.004	0.45	10000	400	0.002	0.45	9000	300	0.002	0.45
1.5	0.3	4	32000	10000	0.1	0.65	27000	7100	0.08	0.65	21000	5700	0.06	0.65	16000	2500	0.03	0.65
1.5	0.3	6	32000	7800	0.08	0.65	27000	5500	0.06	0.65	21000	4200	0.05	0.65	16000	2000	0.025	0.65
1.5	0.3	10	27000	5700	0.05	0.65	22000	4000	0.035	0.65	18000	3000	0.03	0.65	14000	1400	0.014	0.65
1.5	0.3	15	22000	3200	0.03	0.65	18000	2300	0.025	0.65	15000	1700	0.018	0.65	11000	1000	0.009	0.65
1.5	0.3	20	16000	1400	0.02	0.65	14000	1200	0.016	0.65	13000	1000	0.012	0.65	9000	700	0.007	0.65
1.5	0.3	25	13000	1000	0.015	0.65	11000	800	0.012	0.65	10000	700	0.009	0.65	7500	500	0.005	0.65
1.5	0.3	30	13000	900	0.01	0.65	11000	700	0.008	0.65	10000	600	0.006	0.65	7500	400	0.004	0.65
2	0.5	6	24000	10000	0.1	0.75	20000	7100	0.08	0.75	16000	5700	0.06	0.75	12000	2500	0.03	0.75
2	0.5	10	24000	10000	0.08	0.75	20000	7100	0.06	0.75	16000	5700	0.05	0.75	12000	2500	0.025	0.75
2	0.5	15	20000	7000	0.05	0.75	17000	5000	0.04	0.75	13000	3200	0.03	0.75	10000	1800	0.016	0.75
2	0.5	20	20000	3600	0.04	0.75	17000	2600	0.03	0.75	13000	1800	0.025	0.75	10000	900	0.012	0.75
2	0.5	25	16000	1800	0.03	0.75	14000	1400	0.025	0.75	12000	1100	0.02	0.75	9000	720	0.01	0.75
2	0.5	30	16000	1400	0.025	0.75	14000	1200	0.02	0.75	12000	900	0.016	0.75	9000	650	0.008	0.75
2	0.5	35	13000	1100	0.02	0.75	11000	800	0.018	0.75	10000	700	0.014	0.75	7000	500	0.007	0.75
2	0.5	40	13000	1000	0.02	0.75	11000	700	0.015	0.75	10000	600	0.012	0.75	7000	400	0.006	0.75
3	0.5	10	16000	11000	0.12	1.5	13000	7800	0.09	1.5	11000	6300	0.07	1.5	8000	2800	0.04	1.5
3	0.5	15	16000	9000	0.11	1.5	13000	6400	0.08	1.5	11000	5100	0.06	1.5	8000	2300	0.04	1.5
3	0.5	20	13000	7200	0.09	1.5	11000	5100	0.07	1.5	8700	4000	0.05	1.5	6500	1800	0.03	1.5
3	0.5	30	13000	5700	0.06	1.5	11000	4000	0.05	1.5	8700	3000	0.04	1.5	6500	1400	0.02	1.5
3	0.8	10	16000	11000	0.24	1	13000	7800	0.19	1	11000	6300	0.14	1	8000	2800	0.07	1
3	0.8	15	16000	9000	0.22	1	13000	6400	0.17	1	11000	5100	0.13	1	8000	2300	0.07	1
3	0.8	20	13000	7200	0.19	1	11000	5100	0.15	1	8700	4000	0.11	1	6500	1800	0.06	1
3	0.8	30	13000	5700	0.12	1	11000	4000	0.09	1	8700	3000	0.07	1	6500	1400	0.04	1
3	0.8	40	11000	3600	0.08	1	9100	2600	0.06	1	7400	2000	0.05	1	5500	1000	0.025	1
3	0.8	50	8000	2600	0.07	1	6600	1800	0.05	1	5800	1500	0.04	1	4600	800	0.02	1
4	0.5	12	8400	6000	0.15	2	7000	4300	0.12	2	5600	3400	0.09	2	4200	1500	0.05	2
4	0.5	20	8400	6000	0.14	2	7000	4300	0.11	2	5600	3400	0.08	2	4200	1500	0.04	2
4	0.5	30	6900	4900	0.12	2	5700	3500	0.09	2	4600	2800	0.07	2	3500	1200	0.03	2
4	0.5	48	5600	2000	0.07	2	4600	1400	0.05	2	3800	1100	0.04	2	2800	500	0.02	2
4	1	12	12000	12000	0.3	1.5	10000	8500	0.23	1.5	8000	6800	0.18	1.5	6000	3000	0.1	1.5
4	1	20	12000	12000	0.27	1.5	10000	8500	0.21	1.5	8000	6800	0.16	1.5	6000	3000	0.08	1.5
4	1	30	10000	9900	0.24	1.5	8300	7000	0.19	1.5	6700	5600	0.14	1.5	5000	2500	0.07	1.5
6	0.5	18	4000	3900	0.15	3.5	3300	2800	0.12	3.5	2700	2200	0.09	3.5	2000	1000	0.05	3.5
6	0.5	30	4000	3900	0.14	3.5	3300	2800	0.11	3.5	2700	2200	0.08	3.5	2000	1000	0.04	3.5
6	1	18	8000	13000	0.5	3	6600	9200	0.4	3	5400	7400	0.3	3	4000	3300	0.15	3
6	1	30	8000	13000	0.45	3	6600	9200	0.35	3	5400	7400	0.27	3	4000	3300	0.14	3
6	1	54	6600	11000	0.25	3	5500	7800	0.2	3	4400	6300	0.15	3	3300	2800	0.08	3
6	1.5	18	8000	13000	0.5	2	6600	9200	0.4	2	5400	7400	0.3	2	4000	3300	0.15	2
6	1.5	30	8000	13000	0.45	2	6600	9200	0.35	2	5400	7400	0.27	2	4000	3300	0.14	2
6	1.5	42	6600	11000	0.4	2	5500	7800	0.3	2	4400	6300	0.24	2	3300	2800	0.12	2
6	1.5	54	6600	11000	0.25	2	5500	7800	0.2	2	4400	6300	0.15	2	3300	2800	0.08	2
6	2	18	8000	13000	0.5	1.5	6600	9200	0.4	1.5	5400	7400	0.3	1.5	4000	3300	0.15	1.5
6	2	30	8000	13000	0.45	1.5	6600	9200	0.35	1.5	5400	7400	0.27	1.5	4000	3300	0.14	1.5

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. **DC** (mm)	Corner R **RE** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
7	**1.5**	**—**	6800	13000	0.5	3	5600	9200	0.4	3	4600	7400	0.3	3	3400	3300	0.15	3
8	**0.5**	**24**	3000	3900	0.18	5	2500	2800	0.14	5	2000	2200	0.11	5	1500	1000	0.05	5
8	**0.5**	**40**	3000	3900	0.16	5	2500	2800	0.12	5	2000	2200	0.1	5	1500	1000	0.05	5
8	**1**	**24**	4200	6500	0.3	4.5	3500	4600	0.23	4.5	2800	3700	0.18	4.5	2100	1600	0.09	4.5
8	**1**	**40**	4200	6500	0.27	4.5	3500	4600	0.21	4.5	2800	3700	0.16	4.5	2100	1600	0.08	4.5
8	**2**	**24**	6000	13000	0.6	3	5000	9200	0.46	3	4000	7400	0.36	3	3000	3300	0.18	3
8	**2**	**40**	6000	13000	0.54	3	5000	9200	0.42	3	4000	7400	0.32	3	3000	3300	0.16	3
8	**2**	**56**	5000	11000	0.48	3	4200	7800	0.37	3	3400	6300	0.3	3	2500	2800	0.14	3
8	**2**	**72**	5000	11000	0.3	3	4200	7800	0.23	3	3400	6300	0.2	3	2500	2800	0.09	3
9	**2**	**—**	5300	13000	0.6	3.5	4400	9200	0.46	3.5	3600	7400	0.36	3.5	2700	3300	0.18	3.5
10	**0.5**	**30**	2400	3900	0.18	6.5	2000	2800	0.14	6.5	1600	2200	0.11	6.5	1200	1000	0.05	6.5
10	**0.5**	**50**	2400	3900	0.16	6.5	2000	2800	0.12	6.5	1600	2200	0.1	6.5	1200	1000	0.05	6.5
10	**1**	**30**	3300	6500	0.3	6	2700	4600	0.23	6	2200	3700	0.18	6	1700	1600	0.09	6
10	**1**	**50**	3300	6500	0.27	6	2700	4600	0.21	6	2200	3700	0.16	6	1700	1600	0.08	6
10	**2**	**30**	4800	13000	0.6	4.5	4000	9200	0.46	4.5	3200	7400	0.36	4.5	2400	3300	0.18	4.5
10	**2**	**50**	4800	13000	0.54	4.5	4000	9200	0.42	4.5	3200	7400	0.32	4.5	2400	3300	0.16	4.5
10	**2**	**70**	4000	11000	0.48	4.5	3300	7800	0.37	4.5	2700	6300	0.3	4.5	2000	2800	0.14	4.5
10	**2**	**90**	4000	11000	0.48	4.5	3300	7800	0.37	4.5	2700	6300	0.3	4.5	2000	2800	0.14	4.5
11	**2**	**—**	4300	12000	0.6	5	3600	8500	0.46	5	2900	6800	0.36	5	2200	3000	0.18	5
12	**0.5**	**36**	2000	3600	0.27	8	1700	2600	0.21	8	1300	2100	0.14	8	1000	900	0.07	8
12	**0.5**	**60**	2000	3600	0.24	8	1700	2600	0.18	8	1300	2100	0.12	8	1000	900	0.06	8
12	**1**	**36**	2400	4800	0.36	7.5	2000	3400	0.28	7.5	1600	2700	0.18	7.5	1200	1200	0.09	7.5
12	**1**	**60**	2400	4800	0.32	7.5	2000	3400	0.25	7.5	1600	2700	0.16	7.5	1200	1200	0.08	7.5
12	**2**	**36**	4000	12000	0.9	6	3300	8500	0.7	6	2700	6800	0.45	6	2000	3000	0.23	6
12	**2**	**60**	4000	12000	0.8	6	3300	8500	0.6	6	2700	6800	0.4	6	2000	3000	0.2	6
12	**2**	**84**	3300	9900	0.7	6	2700	7000	0.55	6	2200	5600	0.36	6	1700	2500	0.18	6
12	**2**	**108**	3300	9900	0.45	6	2700	7000	0.35	6	2200	5600	0.23	6	1700	2500	0.11	6
12	**3**	**36**	4000	12000	0.9	4.5	3300	8500	0.7	4.5	2700	6800	0.45	4.5	2000	3000	0.23	4.5
12	**3**	**60**	4000	12000	0.8	4.5	3300	8500	0.6	4.5	2700	6800	0.4	4.5	2000	3000	0.2	4.5
13	**3**	**—**	3700	12000	0.9	5	3100	8500	0.7	5	2500	6800	0.45	5	1900	3000	0.23	5
16	**0.5**	**42**	1500	3000	0.27	11	1200	2100	0.21	11	1000	1700	0.12	11	750	750	0.05	11
16	**2**	**42**	2100	5000	0.45	9	1700	3600	0.35	9	1400	2900	0.2	9	1100	1300	0.08	9
16	**3**	**42**	3000	10000	0.9	7.5	2500	7100	0.7	7.5	2000	5700	0.4	7.5	1500	2500	0.15	7.5
16	**3**	**80**	3000	10000	0.8	7.5	2500	7100	0.6	7.5	2000	5700	0.37	7.5	1500	2500	0.14	7.5
16	**3**	**120**	2500	8300	0.7	7.5	2100	5900	0.55	7.5	1700	4700	0.32	7.5	1300	2100	0.12	7.5
Depth of cut																		

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

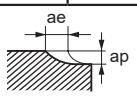
VFHVRB

4 flute, Corner radius, Short cut length,Irregular helix flutes

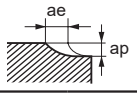
■High depth of cut conditions

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. DC (mm)	Corner R RE (mm)	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	**0.2**	**4**	24000	2200	0.08	0.45	20000	1500	0.07	0.45	16000	1200	0.05	0.45	12000	550	0.025	0.45
1	**0.2**	**6**	24000	2000	0.07	0.45	20000	1400	0.05	0.45	16000	1100	0.04	0.45	12000	500	0.02	0.45
1	**0.2**	**8**	19000	1400	0.05	0.45	16000	1000	0.04	0.45	13000	800	0.03	0.45	9500	350	0.016	0.45
1	**0.2**	**10**	14000	800	0.04	0.45	12000	600	0.03	0.45	9000	400	0.025	0.45	7000	200	0.012	0.45
1	**0.2**	**15**	16000	1200	0.008	0.45	14000	700	0.005	0.45	12000	500	0.003	0.45	10000	400	0.003	0.45
1	**0.2**	**20**	14000	1000	0.005	0.45	12000	600	0.004	0.45	10000	400	0.002	0.45	9000	300	0.002	0.45
1.5	**0.3**	**4**	19000	3000	0.2	0.65	16000	2100	0.16	0.65	13000	1700	0.12	0.65	9500	750	0.06	0.65
1.5	**0.3**	**6**	19000	2300	0.16	0.65	16000	1600	0.13	0.65	13000	1300	0.1	0.65	9500	580	0.05	0.65
1.5	**0.3**	**10**	16000	1700	0.1	0.65	13000	1200	0.07	0.65	11000	1000	0.05	0.65	8000	430	0.03	0.65
1.5	**0.3**	**15**	13000	1000	0.06	0.65	11000	700	0.05	0.65	9000	600	0.04	0.65	6500	250	0.018	0.65
1.5	**0.3**	**20**	16000	1400	0.02	0.65	14000	1200	0.016	0.65	13000	1000	0.012	0.65	9000	700	0.007	0.65
1.5	**0.3**	**25**	13000	1000	0.015	0.65	11000	800	0.012	0.65	10000	700	0.009	0.65	7500	500	0.005	0.65
1.5	**0.3**	**30**	13000	900	0.01	0.65	11000	700	0.008	0.65	10000	600	0.006	0.65	7500	400	0.004	0.65
2	**0.5**	**6**	14000	3000	0.2	0.75	12000	2100	0.16	0.75	9400	1700	0.12	0.75	7000	750	0.06	0.75
2	**0.5**	**10**	14000	3000	0.16	0.75	12000	2100	0.13	0.75	9400	1700	0.1	0.75	7000	750	0.05	0.75
2	**0.5**	**15**	12000	2100	0.1	0.75	10000	1500	0.08	0.75	8000	1200	0.06	0.75	6000	530	0.03	0.75
2	**0.5**	**20**	12000	1100	0.08	0.75	10000	800	0.06	0.75	8000	600	0.05	0.75	6000	280	0.025	0.75
2	**0.5**	**25**	16000	1800	0.03	0.75	14000	1400	0.025	0.75	12000	1100	0.02	0.75	9000	720	0.01	0.75
2	**0.5**	**30**	16000	1400	0.025	0.75	14000	1200	0.02	0.75	12000	900	0.016	0.75	9000	650	0.008	0.75
2	**0.5**	**35**	13000	1100	0.02	0.75	11000	800	0.018	0.75	10000	700	0.014	0.75	7000	500	0.007	0.75
2	**0.5**	**40**	13000	1000	0.02	0.75	11000	700	0.015	0.75	10000	600	0.012	0.75	7000	400	0.006	0.75
3	**0.5**	**10**	9600	3300	0.24	1.5	8000	2300	0.2	1.5	6400	1800	0.14	1.5	4800	830	0.07	1.5
3	**0.5**	**15**	9600	2700	0.22	1.5	8000	1900	0.17	1.5	6400	1500	0.13	1.5	4800	680	0.06	1.5
3	**0.5**	**20**	7800	2200	0.18	1.5	6500	1500	0.14	1.5	5200	1200	0.11	1.5	3900	550	0.05	1.5
3	**0.5**	**30**	7800	1700	0.12	1.5	6500	1200	0.1	1.5	5200	1000	0.07	1.5	3900	430	0.04	1.5
3	**0.8**	**10**	9600	3300	0.5	1	8000	2300	0.4	1	6400	1800	0.3	1	4800	830	0.14	1
3	**0.8**	**15**	9600	2700	0.5	1	8000	1900	0.35	1	6400	1500	0.25	1	4800	680	0.13	1
3	**0.8**	**20**	7800	2200	0.4	1	6500	1500	0.3	1	5200	1200	0.23	1	3900	550	0.11	1
3	**0.8**	**30**	7800	1700	0.24	1	6500	1200	0.2	1	5200	1000	0.14	1	3900	430	0.05	1
3	**0.8**	**40**	11000	3600	0.08	1	9100	2600	0.06	1	7400	2000	0.05	1	5500	1000	0.025	1
3	**0.8**	**50**	8000	2600	0.07	1	6600	1800	0.05	1	5800	1500	0.04	1	4600	800	0.02	1
4	**0.5**	**12**	5000	1800	0.3	2	4200	1300	0.24	2	3400	1000	0.18	2	2500	450	0.06	2
4	**0.5**	**20**	5000	1800	0.3	2	4200	1300	0.22	2	3400	1000	0.17	2	2500	450	0.06	2
4	**0.5**	**30**	4100	1500	0.24	2	3400	1100	0.19	2	2700	840	0.14	2	2100	380	0.05	2
4	**0.5**	**48**	5600	2000	0.07	2	4600	1400	0.05	2	3800	1100	0.04	2	2800	500	0.02	2
4	**1**	**12**	7200	3600	0.6	1.5	6000	2500	0.5	1.5	4800	2000	0.36	1.5	3600	900	0.12	1.5
4	**1**	**20**	7200	3600	0.6	1.5	6000	2500	0.4	1.5	4800	2000	0.32	1.5	3600	900	0.11	1.5
4	**1**	**30**	6000	3000	0.5	1.5	5000	2100	0.4	1.5	4000	1700	0.3	1.5	3000	750	0.1	1.5
6	**0.5**	**18**	2400	1200	0.3	3.5	2000	840	0.24	3.5	1600	670	0.18	3.5	1200	300	0.06	3.5
6	**0.5**	**30**	2400	1200	0.3	3.5	2000	840	0.22	3.5	1600	670	0.17	3.5	1200	300	0.06	3.5
6	**1**	**18**	4800	3900	1	3	4000	2700	0.8	3	3200	2200	0.6	3	2400	980	0.2	3
6	**1**	**30**	4800	3900	0.9	3	4000	2700	0.7	3	3200	2200	0.5	3	2400	980	0.18	3
6	**1**	**54**	4000	3300	0.5	3	3300	2300	0.4	3	2700	1800	0.3	3	2000	830	0.1	3
6	**1.5**	**18**	4800	3900	1	2	4000	2700	0.8	2	3200	2200	0.6	2	2400	980	0.2	2
6	**1.5**	**30**	4800	3900	0.9	2	4000	2700	0.7	2	3200	2200	0.5	2	2400	980	0.18	2
6	**1.5**	**42**	4000	3300	0.8	2	3300	2300	0.6	2	2700	1800	0.5	2	2000	830	0.16	2
6	**1.5**	**54**	4000	3300	0.5	2	3300	2300	0.4	2	2700	1800	0.3	2	2000	830	0.1	2
6	**2**	**18**	4800	3900	1	1.5	4000	2700	0.8	1.5	3200	2200	0.6	1.5	2400	980	0.2	1.5
6	**2**	**30**	4800	3900	0.9	1.5	4000	2700	0.7	1.5	3200	2200	0.5	1.5	2400	980	0.18	1.5

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. DC (mm)	Corner R RE (mm)	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
7	**1.5**	—	4100	3900	1	3	3400	2700	0.8	3	2700	2200	0.6	3	2100	980	0.2	3
8	**0.5**	**24**	1800	1200	0.35	5	1500	840	0.3	5	1200	670	0.2	5	900	300	0.07	5
8	**0.5**	**40**	1800	1200	0.3	5	1500	840	0.25	5	1200	670	0.2	5	900	300	0.06	5
8	**1**	**24**	2500	2000	0.6	4.5	2100	1400	0.5	4.5	1700	1100	0.4	4.5	1300	500	0.12	4.5
8	**1**	**40**	2500	2000	0.5	4.5	2100	1400	0.4	4.5	1700	1100	0.3	4.5	1300	500	0.11	4.5
8	**2**	**24**	3600	3900	1.2	3	3000	2700	1	3	2400	2200	0.7	3	1800	980	0.24	3
8	**2**	**40**	3600	3900	1.1	3	3000	2700	0.9	3	2400	2200	0.7	3	1800	980	0.22	3
8	**2**	**56**	3000	3300	1	3	2500	2300	0.8	3	2000	1800	0.6	3	1500	830	0.2	3
8	**2**	**72**	3000	3300	0.6	3	2500	2300	0.5	3	2000	1800	0.4	3	1500	830	0.12	3
9	**2**	—	3200	3900	1.2	3.5	2700	2700	1	3.5	2100	2200	0.7	3.5	1600	980	0.24	3.5
10	**0.5**	**30**	1400	1200	0.35	6.5	1200	840	0.3	6.5	940	670	0.2	6.5	700	300	0.07	6.5
10	**0.5**	**50**	1400	1200	0.3	6.5	1200	840	0.25	6.5	940	670	0.2	6.5	700	300	0.06	6.5
10	**1**	**30**	2000	2000	0.6	6	1700	1400	0.5	6	1300	1100	0.4	6	1000	500	0.12	6
10	**1**	**50**	2000	2000	0.5	6	1700	1400	0.4	6	1300	1100	0.3	6	1000	500	0.11	6
10	**2**	**30**	2900	3900	1.2	4.5	2400	2700	1	4.5	1900	2200	0.7	4.5	1500	980	0.24	4.5
10	**2**	**50**	2900	3900	1.1	4.5	2400	2700	0.9	4.5	1900	2200	0.7	4.5	1500	980	0.22	4.5
10	**2**	**70**	2400	3300	1	4.5	2000	2300	0.8	4.5	1600	1800	0.6	4.5	1200	830	0.2	4.5
10	**2**	**90**	2400	3300	1	4.5	2000	2300	0.8	4.5	1600	1800	0.6	4.5	1200	830	0.2	4.5
11	**2**	—	2600	3600	1.2	5	2200	2500	1	5	1700	2000	0.7	5	1300	900	0.24	5
12	**0.5**	**36**	1200	1100	0.5	8	1000	770	0.4	8	800	620	0.3	8	600	280	0.11	8
12	**0.5**	**60**	1200	1100	0.5	8	1000	770	0.4	8	800	620	0.3	8	600	280	0.1	8
12	**1**	**36**	1400	1400	0.7	7.5	1200	1000	0.6	7.5	940	780	0.4	7.5	700	350	0.14	7.5
12	**1**	**60**	1400	1400	0.6	7.5	1200	1000	0.5	7.5	940	780	0.4	7.5	700	350	0.13	7.5
12	**2**	**36**	2400	3600	1.8	6	2000	2500	1.4	6	1600	2000	1.1	6	1200	900	0.4	6
12	**2**	**60**	2400	3600	1.6	6	2000	2500	1.3	6	1600	2000	1	6	1200	900	0.3	6
12	**2**	**84**	2000	3000	1.4	6	1700	2100	1.1	6	1300	1700	0.8	6	1000	750	0.3	6
12	**2**	**108**	2000	3000	0.9	6	1700	2100	0.7	6	1300	1700	0.5	6	1000	750	0.2	6
12	**3**	**36**	2400	3600	1.8	4.5	2000	2500	1.4	4.5	1600	2000	1.1	4.5	1200	900	0.4	4.5
12	**3**	**60**	2400	3600	1.6	4.5	2000	2500	1.3	4.5	1600	2000	1	4.5	1200	900	0.3	4.5
13	**3**	—	2200	3600	1.8	5	1800	2500	1.4	5	1500	2000	1.1	5	1100	900	0.4	5
16	**0.5**	**42**	900	900	0.5	11	750	630	0.4	11	600	500	0.3	11	450	230	0.1	11
16	**2**	**42**	1300	1500	0.9	9	1100	1100	0.7	9	870	840	0.5	9	650	380	0.2	9
16	**3**	**42**	1800	3000	1.8	7.5	1500	2100	1.4	7.5	1200	1700	0.9	7.5	900	750	0.4	7.5
16	**3**	**80**	1800	3000	1.6	7.5	1500	2100	1.3	7.5	1200	1700	0.8	7.5	900	750	0.3	7.5
16	**3**	**120**	1500	2500	1.4	7.5	1200	1800	1.1	7.5	1000	1400	0.7	7.5	750	630	0.3	7.5
Depth of cut																		

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VFHVRB

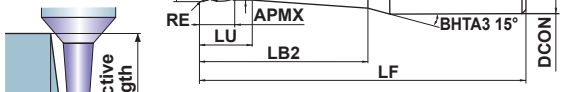
4 flute, Corner radius, Short cut length,Irregular helix flutes

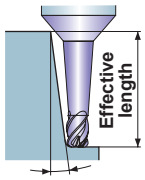


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎	○	○	○		

Taper neck type







DC≤10	DC>10			
±0.007	±0.01			
DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

● Impact Miracle corner radius end mill for high feed and efficient machining.

(mm)

Order Number	DC	RE	BHTA2	APMX	LU	LB2	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle 0.5°	1°	2°	3°
VFHVRBD010R02N006T09	1	0.2	0.9°	1	2.5	6	0.94	9.3°	60	6	4	●	—	6.6	7.1	7.6
VFHVRBD010R02N010T09	1	0.2	0.9°	1	2.5	10	0.94	7.5°	60	6	4	●	—	10.6	11.4	12.3
VFHVRBD010R02N015T09	1	0.2	0.9°	1	2.5	15	0.94	6.1°	60	6	4	●	—	15.6	16.8	18.1
VFHVRBD010R02N020T09	1	0.2	0.9°	1	2.5	20	0.94	5.1°	80	6	4	●	—	20.6	22.1	23.9
VFHVRBD010R02N025T09	1	0.2	0.9°	1	2.5	25	0.94	4.4°	80	6	4	●	—	25.6	27.5	29.7
VFHVRBD010R02N030T09	1	0.2	0.9°	1	2.5	30	0.94	3.8°	80	6	4	●	—	30.6	32.9	35.5
VFHVRBD010R02N035T09	1	0.2	0.9°	1	2.5	35	0.94	3.4°	90	6	4	●	—	35.6	38.3	41.3
VFHVRBD010R02N040T09	1	0.2	0.9°	1	2.5	40	0.94	3.1°	90	6	4	●	—	40.6	43.6	47.2
VFHVRBD010R02N045T09	1	0.2	0.9°	1	2.5	45	0.94	2.8°	90	6	4	●	—	45.6	49	*
VFHVRBD010R02N050T09	1	0.2	0.9°	1	2.5	50	0.94	2.6°	90	6	4	●	—	50.6	54.4	*
VFHVRBD015R03N010T09	1.5	0.3	0.9°	1.5	3	10	1.44	7.1°	60	6	4	●	—	10.6	11.4	12.3
VFHVRBD015R03N015T09	1.5	0.3	0.9°	1.5	3	15	1.44	5.7°	60	6	4	●	—	15.6	16.8	18.1
VFHVRBD015R03N020T09	1.5	0.3	0.9°	1.5	3	20	1.44	4.7°	80	6	4	●	—	20.6	22.2	23.9
VFHVRBD015R03N030T09	1.5	0.3	0.9°	1.5	3	30	1.44	3.5°	80	6	4	●	—	30.6	32.9	35.6
VFHVRBD015R03N040T09	1.5	0.3	0.9°	1.5	3	40	1.44	2.8°	90	6	4	●	—	40.6	43.7	*
VFHVRBD015R03N050T09	1.5	0.3	0.9°	1.5	3	50	1.44	2.4°	90	6	4	●	—	50.6	54.4	*
VFHVRBD020R05N015T04	2	0.5	0.4°	2	4	15	1.9	5.2°	60	6	4	●	15.6	16.2	17.4	18.7
VFHVRBD020R05N020T04	2	0.5	0.4°	2	4	20	1.9	4.3°	80	6	4	●	20.6	21.3	22.9	24.7
VFHVRBD020R05N025T04	2	0.5	0.4°	2	4	25	1.9	3.6°	80	6	4	●	25.6	26.5	28.5	30.8
VFHVRBD020R05N030T04	2	0.5	0.4°	2	4	30	1.9	3.2°	80	6	4	●	30.6	31.7	34	36.8
VFHVRBD020R05N035T04	2	0.5	0.4°	2	4	35	1.9	2.8°	80	6	4	●	35.6	36.9	39.6	*
VFHVRBD020R05N040T04	2	0.5	0.4°	2	4	40	1.9	2.5°	80	6	4	●	40.6	42	45.2	*
VFHVRBD020R05N020T09	2	0.5	0.9°	2	4	20	1.9	4.4°	80	6	4	●	—	20.8	22.3	24.1
VFHVRBD020R05N025T09	2	0.5	0.9°	2	4	25	1.9	3.7°	90	6	4	●	—	25.8	27.7	29.9
VFHVRBD020R05N030T09	2	0.5	0.9°	2	4	30	1.9	3.2°	90	6	4	●	—	30.8	33	35.7
VFHVRBD020R05N035T09	2	0.5	0.9°	2	4	35	1.9	2.9°	90	6	4	●	—	35.8	38.4	*
VFHVRBD020R05N040T09	2	0.5	0.9°	2	4	40	1.9	2.6°	90	6	4	●	—	40.8	43.8	*
VFHVRBD020R05N045T09	2	0.5	0.9°	2	4	45	1.9	2.3°	90	6	4	●	—	45.8	49.2	*
VFHVRBD020R05N050T09	2	0.5	0.9°	2	4	50	1.9	2.2°	100	6	4	●	—	50.8	54.5	*
VFHVRBD020R05N055T09	2	0.5	0.9°	2	4	55	1.9	2°	100	6	4	●	—	55.8	59.9	*
VFHVRBD020R05N060T09	2	0.5	0.9°	2	4	60	1.9	1.8°	100	6	4	●	—	60.8	*	*
VFHVRBD030R08N020T09	3	0.8	0.9°	3	6	20	2.9	3.6°	80	6	4	●	—	20.9	22.4	24.1
VFHVRBD030R08N025T09	3	0.8	0.9°	3	6	25	2.9	3°	80	6	4	●	—	25.9	27.8	30
VFHVRBD030R08N030T09	3	0.8	0.9°	3	6	30	2.9	2.6°	80	6	4	●	—	30.9	33.1	*

* No interference

● : Inventory maintained in Japan.

Click here for product NEWS ▶

(mm)

Order Number	DC	RE	BHTA2	APMX	LU	LB2	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle			
													0.5°	1°	2°	3°
VFHVRBD030R08N040T09	3	0.8	0.9°	3	6	40	2.9	2°	90	6	4	●	—	40.9	43.9	*
VFHVRBD030R08N050T09	3	0.8	0.9°	3	6	50	2.9	1.7°	90	6	4	●	—	50.9	*	*
VFHVRBD030R08N060T09	3	0.8	0.9°	3	6	60	2.9	1.4°	100	6	4	●	—	60.9	*	*
VFHVRBD040R10N025T04	4	1	0.4°	4	7	25	3.9	2.1°	80	6	4	●	25.7	26.6	28.5	*
VFHVRBD040R10N030T04	4	1	0.4°	4	7	30	3.9	1.8°	80	6	4	●	30.7	31.8	*	*
VFHVRBD040R10N035T04	4	1	0.4°	4	7	35	3.9	1.6°	80	6	4	●	35.7	36.9	*	*
VFHVRBD040R10N040T04	4	1	0.4°	4	7	40	3.9	1.4°	80	6	4	●	40.7	42.1	*	*
VFHVRBD040R10N045T04	4	1	0.4°	4	7	45	3.9	1.3°	90	6	4	●	45.7	47.3	*	*
VFHVRBD040R10N050T04	4	1	0.4°	4	7	50	3.9	1.2°	90	6	4	●	50.7	52.5	*	*
VFHVRBD040R10N025T09	4	1	0.9°	4	7	25	3.9	2.2°	90	6	4	●	—	25.9	27.8	*
VFHVRBD040R10N030T09	4	1	0.9°	4	7	30	3.9	1.9°	90	6	4	●	—	30.9	*	*
VFHVRBD040R10N040T09	4	1	0.9°	4	7	40	3.9	1.4°	100	6	4	●	—	40.9	*	*
VFHVRBD040R10N050T09	4	1	0.9°	4	7	50	3.9	1.2°	100	6	4	●	—	50.9	*	*
VFHVRBD040R10N060T09	4	1	0.9°	4	7	60	3.9	1°	100	6	4	●	—	60.9	*	*
VFHVRBD060R15N040T09	6	1.5	0.9°	9	12	40	5.85	1.4°	110	8	4	●	—	41.4	*	*
VFHVRBD060R15N050T09	6	1.5	0.9°	9	12	50	5.85	1.2°	110	8	4	●	—	51.4	*	*
VFHVRBD060R15N060T09	6	1.5	0.9°	9	12	60	5.85	1°	110	8	4	●	—	61.4	*	*
VFHVRBD060R15N070T09	6	1.5	0.9°	9	12	70	5.85	0.9°	110	8	4	●	—	*	*	*
VFHVRBD080R20N060T09	8	2	0.9°	12	15	60	7.85	1°	150	10	4	●	—	61.5	*	*
VFHVRBD080R20N080T09	8	2	0.9°	12	15	80	7.85	0.8°	150	10	4	●	—	*	*	*
VFHVRBD100R20N080T09	10	2	0.9°	15	18	80	9.7	2°	130	16	4	●	—	82	88	*
VFHVRBD100R20N120T09	10	2	0.9°	15	18	120	9.7	1.4°	180	16	4	●	—	122	*	*
VFHVRBD120R20N080T09	12	2	0.9°	18	28	80	11.7	1.4°	130	16	4	●	—	82.2	*	*
VFHVRBD120R20N120T09	12	2	0.9°	18	28	120	11.7	1°	180	16	4	●	—	122.2	*	*

* No interference

VFHVRB

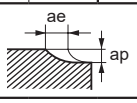
4 flute, Corner radius, Short cut length,Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

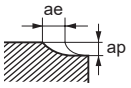
■High depth of cut conditions

Workpiece Material				Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. DC (mm)	Corner R RE (mm)	Taper angle one side BHTA	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	**0.2**	**0.9°**	**6**	40000	6500	0.03	0.45	33000	4600	0.022	0.45	27000	3700	0.018	0.45	20000	1600	0.01	0.45
1	**0.2**	**0.9°**	**10**	24000	2700	0.015	0.45	20000	1900	0.01	0.45	16000	1500	0.008	0.45	12000	700	0.006	0.45
1	**0.2**	**0.9°**	**15**	16000	1200	0.013	0.45	14000	700	0.008	0.45	12000	500	0.007	0.45	10000	400	0.003	0.45
1	**0.2**	**0.9°**	**20**	14000	1000	0.01	0.45	12000	600	0.006	0.45	10000	400	0.005	0.45	9000	300	0.002	0.45
1	**0.2**	**0.9°**	**25**	9500	610	0.008	0.45	8000	440	0.005	0.45	6000	320	0.004	0.45	4800	160	0.002	0.45
1	**0.2**	**0.9°**	**30**	4900	320	0.007	0.45	4100	220	0.004	0.45	3000	160	0.003	0.45	2500	80	0.002	0.45
1	**0.2**	**0.9°**	**35**	4000	260	0.006	0.45	3400	190	0.003	0.45	3000	160	0.003	0.45	2000	70	0.001	0.45
1	**0.2**	**0.9°**	**40**	3500	180	0.005	0.45	2900	130	0.003	0.45	2000	90	0.003	0.45	1700	50	0.001	0.45
1	**0.2**	**0.9°**	**45**	2900	150	0.004	0.45	2400	100	0.002	0.45	2000	90	0.002	0.45	1400	40	0.001	0.45
1	**0.2**	**0.9°**	**50**	2900	110	0.003	0.45	2400	80	0.002	0.45	2000	60	0.002	0.45	1400	30	0.001	0.45
1.5	**0.3**	**0.9°**	**10**	27000	5700	0.05	0.65	22000	4000	0.035	0.65	18000	3000	0.03	0.65	14000	1400	0.014	0.65
1.5	**0.3**	**0.9°**	**15**	22000	3200	0.03	0.65	18000	2300	0.025	0.65	15000	1700	0.018	0.65	11000	1000	0.009	0.65
1.5	**0.3**	**0.9°**	**20**	16000	1400	0.02	0.65	14000	1200	0.016	0.65	13000	1000	0.012	0.65	9000	700	0.007	0.65
1.5	**0.3**	**0.9°**	**30**	13000	900	0.01	0.65	11000	700	0.008	0.65	10000	600	0.006	0.65	7500	400	0.004	0.65
1.5	**0.3**	**0.9°**	**40**	4500	230	0.008	0.65	3700	160	0.007	0.65	3000	120	0.005	0.65	2300	70	0.003	0.65
1.5	**0.3**	**0.9°**	**50**	3700	190	0.007	0.65	3000	130	0.006	0.65	3000	120	0.004	0.65	1900	60	0.002	0.65
2	**0.5**	**0.4°**	**15**	20000	7000	0.05	0.75	17000	5000	0.04	0.75	13000	3200	0.03	0.75	10000	1800	0.016	0.75
2	**0.5**	**0.4°**	**20**	20000	3600	0.04	0.75	17000	2600	0.03	0.75	13000	1800	0.025	0.75	10000	900	0.012	0.75
2	**0.5**	**0.4°**	**25**	16000	1800	0.03	0.75	14000	1400	0.025	0.75	12000	1100	0.02	0.75	9000	720	0.01	0.75
2	**0.5**	**0.4°**	**30**	16000	1400	0.025	0.75	14000	1200	0.02	0.75	12000	900	0.016	0.75	9000	650	0.008	0.75
2	**0.5**	**0.4°**	**35**	13000	1100	0.02	0.75	11000	800	0.018	0.75	10000	700	0.014	0.75	7000	500	0.007	0.75
2	**0.5**	**0.4°**	**40**	13000	1000	0.02	0.75	11000	700	0.015	0.75	10000	600	0.012	0.75	7000	400	0.006	0.75
2	**0.5**	**0.9°**	**20**	20000	3600	0.04	0.75	17000	2600	0.03	0.75	13000	1800	0.025	0.75	10000	900	0.012	0.75
2	**0.5**	**0.9°**	**25**	16000	1800	0.03	0.75	14000	1400	0.025	0.75	12000	1100	0.02	0.75	9000	720	0.01	0.75
2	**0.5**	**0.9°**	**30**	16000	1400	0.025	0.75	14000	1200	0.02	0.75	12000	900	0.016	0.75	9000	650	0.008	0.75
2	**0.5**	**0.9°**	**35**	13000	1100	0.02	0.75	11000	800	0.018	0.75	10000	700	0.014	0.75	7000	500	0.007	0.75
2	**0.5**	**0.9°**	**40**	13000	1000	0.02	0.75	11000	700	0.015	0.75	10000	600	0.012	0.75	7000	400	0.006	0.75
2	**0.5**	**0.9°**	**45**	8000	500	0.016	0.75	6800	360	0.012	0.75	5200	250	0.01	0.75	4000	120	0.005	0.75
2	**0.5**	**0.9°**	**50**	8000	500	0.016	0.75	6800	360	0.012	0.75	5200	250	0.01	0.75	4000	120	0.005	0.75
2	**0.5**	**0.9°**	**55**	4100	230	0.012	0.75	3500	170	0.009	0.75	2700	120	0.008	0.75	2000	60	0.004	0.75
2	**0.5**	**0.9°**	**60**	4100	230	0.012	0.75	3500	170	0.009	0.75	2700	120	0.008	0.75	2000	60	0.004	0.75
3	**0.8**	**0.9°**	**20**	13000	7200	0.19	1	11000	5100	0.15	1	8700	4000	0.11	1	6500	1800	0.06	1
3	**0.8**	**0.9°**	**25**	13000	7200	0.19	1	11000	5100	0.15	1	8700	4000	0.11	1	6500	1800	0.06	1
3	**0.8**	**0.9°**	**30**	13000	5700	0.12	1	11000	4000	0.09	1	8700	3000	0.07	1	6500	1400	0.04	1
3	**0.8**	**0.9°**	**40**	11000	3600	0.08	1	9100	2600	0.06	1	7400	2000	0.05	1	5500	1000	0.025	1
3	**0.8**	**0.9°**	**50**	8000	2600	0.07	1	6600	1800	0.05	1	5800	1500	0.04	1	4600	800	0.02	1
3	**0.8**	**0.9°**	**60**	7800	2480	0.06	1	6600	1740	0.05	1	5000	1250	0.04	1	3900	610	0.02	1

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material				Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45−55HRC) AISI H13				Hardened steel (55−62HRC) AISI D2			
Dia. DC (mm)	Corner R RE (mm)	Taper angle one side BHTA2	Neck length LB2 (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
4	**1**	**0.4°**	**25**	10000	9900	0.24	1.5	8300	7000	0.19	1.5	6700	5600	0.14	1.5	5000	2500	0.07	1.5
4	**1**	**0.4°**	**30**	10000	9900	0.24	1.5	8300	7000	0.19	1.5	6700	5600	0.14	1.5	5000	2500	0.07	1.5
4	**1**	**0.4°**	**35**	10000	9900	0.15	1.5	8300	7000	0.12	1.5	6700	5600	0.09	1.5	5000	2500	0.04	1.5
4	**1**	**0.4°**	**40**	10000	9900	0.15	1.5	8300	7000	0.12	1.5	6700	5600	0.09	1.5	5000	2500	0.04	1.5
4	**1**	**0.4°**	**45**	10000	9900	0.15	1.5	8300	7000	0.12	1.5	6700	5600	0.09	1.5	5000	2500	0.04	1.5
4	**1**	**0.4°**	**50**	8100	6300	0.14	1.5	6700	4420	0.11	1.5	5400	3500	0.08	1.5	4000	1600	0.04	1.5
4	**1**	**0.9°**	**25**	10000	9900	0.24	1.5	8300	7000	0.19	1.5	6700	5600	0.14	1.5	5000	2500	0.07	1.5
4	**1**	**0.9°**	**30**	10000	9900	0.15	1.5	8300	7000	0.12	1.5	6700	5600	0.09	1.5	5000	2500	0.04	1.5
4	**1**	**0.9°**	**40**	10000	9900	0.15	1.5	8300	7000	0.12	1.5	6700	5600	0.09	1.5	5000	2500	0.04	1.5
4	**1**	**0.9°**	**50**	8100	6300	0.14	1.5	6700	4420	0.11	1.5	5400	3500	0.08	1.5	4000	1600	0.04	1.5
4	**1**	**0.9°**	**60**	8100	6300	0.11	1.5	6700	4420	0.08	1.5	5400	3500	0.06	1.5	4000	1600	0.03	1.5
6	**1.5**	**0.9°**	**40**	6600	11000	0.4	2	5500	7600	0.32	2	4500	6100	0.24	2	3300	2700	0.12	2
6	**1.5**	**0.9°**	**50**	6600	11000	0.4	2	5500	7600	0.32	2	4500	6100	0.24	2	3300	2700	0.12	2
6	**1.5**	**0.9°**	**60**	6600	11000	0.25	2	5500	7600	0.2	2	4500	6100	0.15	2	3300	2700	0.08	2
6	**1.5**	**0.9°**	**70**	5400	8700	0.23	2	4400	6200	0.18	2	3600	5000	0.14	2	2700	2200	0.07	2
8	**2**	**0.9°**	**60**	5000	11000	0.48	3	4200	7600	0.37	3	3300	6100	0.29	3	2500	2700	0.14	3
8	**2**	**0.9°**	**80**	5000	11000	0.3	3	4200	7600	0.23	3	3300	6100	0.18	3	2500	2700	0.09	3
10	**2**	**0.9°**	**80**	4000	11000	0.48	4.5	3300	7600	0.37	4.5	2700	6100	0.29	4.5	2000	2700	0.14	4.5
10	**2**	**0.9°**	**120**	3200	8700	0.27	4.5	2700	6200	0.21	4.5	2100	5000	0.16	4.5	1600	2200	0.08	4.5
12	**2**	**0.9°**	**80**	3300	10000	0.72	6	2700	7100	0.56	6	2200	5600	0.36	6	1700	2500	0.18	6
12	**2**	**0.9°**	**120**	3300	10000	0.45	6	2700	7100	0.35	6	2200	5600	0.23	6	1700	2500	0.12	6
Depth of cut																			

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

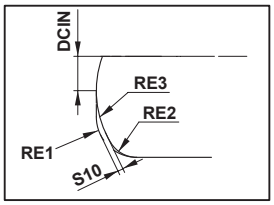
VFFDRB

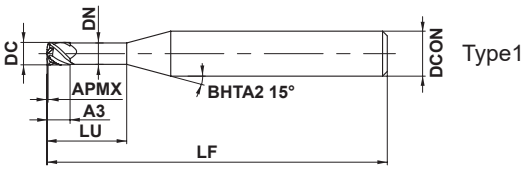
Multi-task corner radius end mill for impact miracle high speed cutting

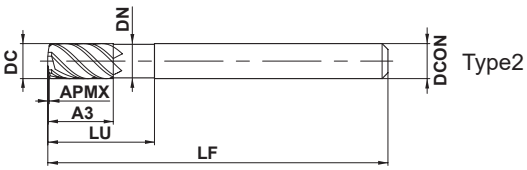


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				









DC≤12				
0 -0.020				
DCON=6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

- Multi-task corner radius type allows more efficient high feed.
- Adoption of multiple cuttings realized high feed cutting.

(mm)

Order Number	DC	*1 RE1	APMX	*2 A3	LU	DN	LF	DCON	No. of Flutes	Multi-task radius part				*3 RMPX	Stock	Type
										S10	DCIN	RE2	RE3			
VFFDRBD0300	3	0.64	0.18	3	10	2.8	60	6	4	0.08	0.75	0.5	2	2.1°	●	1
VFFDRBD0400	4	0.71	0.25	4	12	3.8	60	6	4	0.13	1	0.5	3	1.9°	●	1
VFFDRBD0600	6	0.92	0.36	9	18	5.6	80	6	4	0.21	1.5	0.6	5	1.7°	●	2
VFFDRBD0800	8	1.16	0.44	12	24	7.6	90	8	6	0.22	3.2	0.8	4.5	1.7°	●	2
VFFDRBD1000	10	1.47	0.57	15	30	9.4	100	10	6	0.28	4	1	5.5	1.7°	●	2
VFFDRBD1200	12	1.77	0.7	18	36	11.4	110	12	6	0.34	4.8	1.2	6.5	1.8°	●	2

*1 RE1 : Approx. R
*2 A3 : Cutting Edge Effective Length
*3 RMPX : Max. Ramping Angle

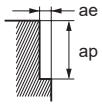
● : Inventory maintained in Japan.

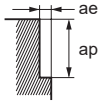
Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS FOR IMPACT MIRACLE END MILLS

■ Side milling

Workpiece Material	Carbon steel, Alloy steel (180—280HB), Alloy tool steel (≤350HB), Mild steel (≤180HB) AISI 1045, AISI 4140, ASTM A36, AISI 1010						Prehardened steel (35—45HRC) AISI P21, AISI P20, AISI 4340					
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
3	80	8500	0.07	2400	0.12	1.5	100	11000	0.07	3100	0.12	1.5
4	80	6400	0.1	2600	0.16	2	100	8000	0.1	3200	0.16	2
6	80	4200	0.17	2900	0.24	3	100	5300	0.17	3600	0.24	3
8	80	3200	0.17	3300	0.32	4.8	100	4000	0.17	4100	0.32	4.8
10	80	2500	0.2	3000	0.4	6	100	3200	0.2	3800	0.4	6
12	80	2100	0.22	2800	0.48	7.2	100	2700	0.22	3600	0.48	7.2
Depth of cut												

Workpiece Material	Hardened steel (40—55HRC), Ferritic and martensitic stainless steel (>200HB), Precipitation hardening stainless steel (<450HB), AISI H13, L6, AISI 431, AISI 420, 15-5PH, 17-4PH etc.						Hardened steel (55—62HRC) AISI D2 etc.					
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
3	80	8500	0.07	2400	0.12	1.5	40	4200	0.05	840	0.12	1.5
4	80	6400	0.1	2600	0.16	2	40	3200	0.07	960	0.16	2
6	80	4200	0.17	2900	0.24	3	40	2100	0.15	1300	0.24	3
8	80	3200	0.17	3300	0.32	4.8	40	1600	0.15	1400	0.32	4.8
10	80	2500	0.2	3000	0.4	6	40	1300	0.17	1300	0.4	6
12	80	2100	0.22	2800	0.48	7.2	40	1100	0.2	1300	0.48	7.2
Depth of cut												

Note 1) When ramping, it is recommended to reduce the feed rate by 50%. The recommended ramping angle is 1°.
Note 2) When the overhang is longer than 5D, reduce the spindle speed to about 70% and the feed rate by 50%.

DC:Dia.

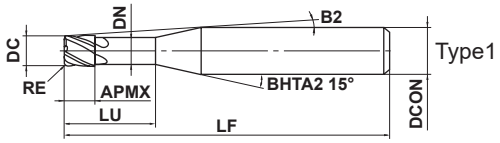
VCPSRB

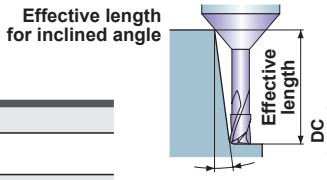
Corner radius end mill, Short cut length, 2—4 flute, High precision

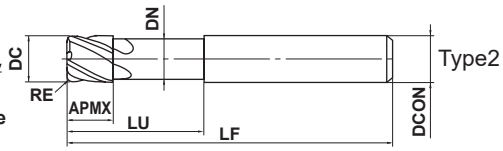
UWC VC 30° DC≤1.5 DC≥2

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	◎	◎	○				









0.05≤RE≤5				
±0.01				
0.6≤DC≤12				
0 - 0.01				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

●±0.01mm corner radius tolerance, 0—-0.01mm outer diameter tolerance.
End mill with corner radius for precise and efficient machining.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VCPSRBD0060N02R005	0.6	0.05	0.6	2	0.56	12.6°	50	6	2	▲	1	2.1	2.2	2.4	2.6
VCPSRBD0060N02R01	0.6	0.1	0.6	2	0.56	12.6°	50	6	2	▲	1	2.1	2.2	2.3	2.6
VCPSRBD0060N02R02	0.6	0.2	0.6	2	0.56	12.7°	50	6	2	▲	1	2.1	2.2	2.2	2.5
VCPSRBD0060N04R01	0.6	0.1	0.6	4	0.56	10.9°	50	6	2	▲	1	4.2	4.4	4.7	5.1
VCPSRBD0060N04R02	0.6	0.2	0.6	4	0.56	11°	50	6	2	▲	1	4.2	4.3	4.7	5
VCPSRBD0080N04R005	0.8	0.05	0.8	4	0.76	10.7°	50	6	2	▲	1	4.2	4.4	4.7	5.1
VCPSRBD0080N04R01	0.8	0.1	0.8	4	0.76	10.8°	50	6	2	▲	1	4.2	4.4	4.7	5.1
VCPSRBD0080N04R02	0.8	0.2	0.8	4	0.76	10.8°	50	6	2	▲	1	4.2	4.3	4.7	5
VCPSRBD0080N04R03	0.8	0.3	0.8	4	0.76	10.9°	50	6	2	▲	1	4.2	4.3	4.6	5
VCPSRBD0080N06R01	0.8	0.1	0.8	6	0.76	9.4°	50	6	2	▲	1	6.3	6.5	7	7.5
VCPSRBD0080N06R02	0.8	0.2	0.8	6	0.76	9.5°	50	6	2	▲	1	6.3	6.5	7	7.5
VCPSRBD0080N06R03	0.8	0.3	0.8	6	0.76	9.5°	50	6	2	▲	1	6.3	6.5	6.9	7.5
VCPSRBD0080N08R03	0.8	0.3	0.8	8	0.76	8.5°	50	6	2	▲	1	8.3	8.6	9.2	10
VCPSRBD0100N04R005	1	0.05	1	4	0.94	10.5°	50	6	2	▲	1	4.2	4.5	4.8	5.3
VCPSRBD0100N04R01	1	0.1	1	4	0.94	10.5°	50	6	2	▲	1	4.2	4.5	4.8	5.3
VCPSRBD0100N04R02	1	0.2	1	4	0.94	10.6°	50	6	2	▲	1	4.2	4.5	4.7	5.3
VCPSRBD0100N04R03	1	0.3	1	4	0.94	10.6°	50	6	2	▲	1	4.2	4.5	4.6	5.2
VCPSRBD0100N04R04	1	0.4	1	4	0.94	10.7°	50	6	2	▲	1	4.2	4.5	4.4	5.2
VCPSRBD0100N06R01	1	0.1	1	6	0.94	9.2°	50	6	2	▲	1	6.4	6.7	7.2	7.8
VCPSRBD0100N06R02	1	0.2	1	6	0.94	9.2°	50	6	2	▲	1	6.4	6.7	7.2	7.7
VCPSRBD0100N06R03	1	0.3	1	6	0.94	9.3°	50	6	2	▲	1	6.3	6.6	7.2	7.7
VCPSRBD0100N06R04	1	0.4	1	6	0.94	9.4°	50	6	2	▲	1	6.3	6.6	7.1	7.7
VCPSRBD0100N10R03	1	0.3	1	10	0.94	7.4°	50	6	2	▲	1	10.5	10.9	11.8	12.7
VCPSRBD0100N10R04	1	0.4	1	10	0.94	7.4°	50	6	2	▲	1	10.5	10.9	11.7	12.7
VCPSRBD0120N06R05	1.2	0.5	1.2	6	1.14	9.3°	50	6	2	▲	1	6.3	6.6	7.1	7.7
VCPSRBD0120N10R05	1.2	0.5	1.2	10	1.14	7.3°	50	6	2	▲	1	10.5	10.9	11.7	12.6
VCPSRBD0120N15R05	1.2	0.5	1.2	15	1.14	5.8°	50	6	2	▲	1	15.7	16.3	17.5	18.9
VCPSRBD0150N04R01	1.5	0.1	1.5	4	1.44	10.2°	50	6	2	▲	1	4.2	4.5	4.8	5.3
VCPSRBD0150N04R02	1.5	0.2	1.5	4	1.44	10.2°	50	6	2	▲	1	4.2	4.5	4.7	5.3
VCPSRBD0150N04R03	1.5	0.3	1.5	4	1.44	10.3°	50	6	2	▲	1	4.2	4.5	4.6	5.2
VCPSRBD0150N04R05	1.5	0.5	1.5	4	1.44	10.5°	50	6	2	▲	1	4.2	4.4	4.3	5.2
VCPSRBD0150N06R01	1.5	0.1	1.5	6	1.44	8.8°	50	6	2	▲	1	6.4	6.7	7.2	7.8
VCPSRBD0150N06R02	1.5	0.2	1.5	6	1.44	8.9°	50	6	2	▲	1	6.4	6.7	7.2	7.7
VCPSRBD0150N06R03	1.5	0.3	1.5	6	1.44	8.9°	50	6	2	▲	1	6.3	6.6	7.2	7.7

▲ : Inventory maintained in Japan. To be replaced by new products.
VFRPSRB (J283) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VCPSRBD0150N06R05	1.5	0.5	1.5	6	1.44	9°	50	6	2	▲	1	6.3	6.6	7.1	7.7
VCPSRBD0150N10R01	1.5	0.1	1.5	10	1.44	6.9°	50	6	2	▲	1	10.6	11	11.8	12.7
VCPSRBD0150N10R02	1.5	0.2	1.5	10	1.44	7°	50	6	2	▲	1	10.5	11	11.8	12.7
VCPSRBD0150N10R03	1.5	0.3	1.5	10	1.44	7°	50	6	2	▲	1	10.5	10.9	11.8	12.7
VCPSRBD0150N10R05	1.5	0.5	1.5	10	1.44	7.1°	50	6	2	▲	1	10.5	10.9	11.7	12.6
VCPSRBD0150N15R01	1.5	0.1	1.5	15	1.44	5.5°	50	6	2	▲	1	15.8	16.3	17.5	18.9
VCPSRBD0150N15R02	1.5	0.2	1.5	15	1.44	5.5°	50	6	2	▲	1	15.8	16.3	17.5	18.9
VCPSRBD0150N15R03	1.5	0.3	1.5	15	1.44	5.5°	50	6	2	▲	1	15.7	16.3	17.5	18.9
VCPSRBD0150N15R05	1.5	0.5	1.5	15	1.44	5.7°	50	6	2	▲	1	15.7	16.3	17.4	18.6
VCPSRBD0150N20R03	1.5	0.3	1.5	20	1.44	4.7°	60	6	2	▲	1	20.9	21.6	22.9	24.5
VCPSRBD0150N20R05	1.5	0.5	1.5	20	1.44	4.8°	60	6	2	▲	1	20.9	21.5	22.8	24.2
VCPSRBD0200N06R01	2	0.1	2	6	1.9	9.4°	50	6	4	▲	1	6.3	6.6	6.9	7.5
VCPSRBD0200N06R02	2	0.2	2	6	1.9	9.7°	50	6	4	▲	1	6.3	6.6	6.8	7.4
VCPSRBD0200N06R03	2	0.3	2	6	1.9	10°	50	6	4	▲	1	6.3	6.6	6.7	7.4
VCPSRBD0200N06R05	2	0.5	2	6	1.9	10.3°	50	6	4	▲	1	6.3	6.5	6.5	7.4
VCPSRBD0200N10R01	2	0.1	2	10	1.9	7.6°	50	6	4	▲	1	10.5	10.9	11.4	12
VCPSRBD0200N10R02	2	0.2	2	10	1.9	7.7°	50	6	4	▲	1	10.5	10.8	11.2	12
VCPSRBD0200N10R03	2	0.3	2	10	1.9	7.8°	50	6	4	▲	1	10.5	10.8	11.1	11.9
VCPSRBD0200N10R05	2	0.5	2	10	1.9	8°	50	6	4	▲	1	10.5	10.8	10.9	11.9
VCPSRBD0200N15R01	2	0.1	2	15	1.9	5.9°	50	6	4	▲	1	15.7	16.1	16.8	17.5
VCPSRBD0200N15R02	2	0.2	2	15	1.9	5.9°	50	6	4	▲	1	15.7	16.1	16.7	17.5
VCPSRBD0200N15R03	2	0.3	2	15	1.9	6°	50	6	4	▲	1	15.7	16.1	16.6	17.4
VCPSRBD0200N15R05	2	0.5	2	15	1.9	6.1°	50	6	4	▲	1	15.6	16.1	16.3	17.4
VCPSRBD0200N20R03	2	0.3	2	20	1.9	4.8°	60	6	4	▲	1	20.8	21.4	21.9	22.9
VCPSRBD0200N20R05	2	0.5	2	20	1.9	4.9°	60	6	4	▲	1	20.8	21.4	21.7	22.9
VCPSRBD0200N25R03	2	0.3	2	25	1.9	4°	60	6	4	▲	1	26	26.6	27.5	28.3
VCPSRBD0200N25R05	2	0.5	2	25	1.9	4°	60	6	4	▲	1	26	26.6	27	28.2
VCPSRBD0250N08R01	2.5	0.1	2.5	8	2.4	8.6°	50	6	4	▲	1	8.4	8.7	9.2	9.9
VCPSRBD0250N08R02	2.5	0.2	2.5	8	2.4	8.7°	50	6	4	▲	1	8.4	8.7	9	9.9
VCPSRBD0250N08R03	2.5	0.3	2.5	8	2.4	8.8°	50	6	4	▲	1	8.4	8.7	8.9	9.9
VCPSRBD0250N08R05	2.5	0.5	2.5	8	2.4	9°	50	6	4	▲	1	8.4	8.7	8.7	9.9
VCPSRBD0250N08R10	2.5	1	2.5	8	2.4	9.4°	50	6	4	▲	1	8.3	8.7	8.2	9.9
VCPSRBD0250N15R03	2.5	0.3	2.5	15	2.4	5.5°	50	6	4	▲	1	15.7	16.1	16.6	17.5
VCPSRBD0250N15R05	2.5	0.5	2.5	15	2.4	5.6°	50	6	4	▲	1	15.6	16.1	16.3	17.5
VCPSRBD0250N15R10	2.5	1	2.5	15	2.4	5.7°	50	6	4	▲	1	15.6	16.1	15.8	17.5
VCPSRBD0300N10R01	3	0.1	3	10	2.9	6.6°	60	6	4	▲	1	10.5	10.9	11.4	12.3
VCPSRBD0300N10R02	3	0.2	3	10	2.9	6.6°	60	6	4	▲	1	10.5	10.8	11.2	12.3
VCPSRBD0300N10R03	3	0.3	3	10	2.9	6.6°	60	6	4	▲	1	10.5	10.8	11.1	12.3
VCPSRBD0300N10R05	3	0.5	3	10	2.9	6.7°	60	6	4	▲	1	10.5	10.8	10.9	12.4
VCPSRBD0300N10R10	3	1	3	10	2.9	7°	60	6	4	▲	1	10.4	10.8	10.4	12.4
VCPSRBD0300N15R01	3	0.1	3	15	2.9	4.8°	60	6	4	▲	1	15.7	16.1	16.8	17.7
VCPSRBD0300N15R02	3	0.2	3	15	2.9	4.8°	60	6	4	▲	1	15.7	16.1	16.7	17.8
VCPSRBD0300N15R03	3	0.3	3	15	2.9	4.8°	60	6	4	▲	1	15.7	16.1	16.6	17.8
VCPSRBD0300N15R05	3	0.5	3	15	2.9	4.8°	60	6	4	▲	1	15.6	16.1	16.3	17.8
VCPSRBD0300N15R10	3	1	3	15	2.9	5°	60	6	4	▲	1	15.6	16.1	15.8	17.8
VCPSRBD0300N20R01	3	0.1	3	20	2.9	3.7°	60	6	4	▲	1	20.8	21.4	22.1	23.1
VCPSRBD0300N20R02	3	0.2	3	20	2.9	3.7°	60	6	4	▲	1	20.8	21.4	22	23.1
VCPSRBD0300N20R03	3	0.3	3	20	2.9	3.8°	60	6	4	▲	1	20.8	21.4	21.9	23.2
VCPSRBD0300N20R05	3	0.5	3	20	2.9	3.8°	60	6	4	▲	1	20.8	21.4	21.7	23.2
VCPSRBD0300N20R10	3	1	3	20	2.9	3.9°	60	6	4	▲	1	20.8	21.3	21.2	23.2
VCPSRBD0300N30R03	3	0.3	3	30	2.9	2.6°	70	6	4	▲	1	31.1	31.8	32.5	*
VCPSRBD0300N30R05	3	0.5	3	30	2.9	2.6°	70	6	4	▲	1	31.1	31.8	32.2	*

* No interference

VCPSRB

Corner radius end mill, Short cut length, 2—4 flute, High precision

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VCPSRBD0400N12R01	4	0.1	4	12	3.9	3.8°	60	6	4	▲	1	12.5	13	13.5	15.1
VCPSRBD0400N12R02	4	0.2	4	12	3.9	3.8°	60	6	4	▲	1	12.5	13	13.4	15.2
VCPSRBD0400N12R03	4	0.3	4	12	3.9	3.8°	60	6	4	▲	1	12.5	13	13.3	15.2
VCPSRBD0400N12R05	4	0.5	4	12	3.9	3.9°	60	6	4	▲	1	12.5	13	13.1	15.3
VCPSRBD0400N12R10	4	1	4	12	3.9	4°	60	6	4	▲	1	12.5	12.9	12.6	15.3
VCPSRBD0400N20R01	4	0.1	4	20	3.9	2.5°	60	6	4	▲	1	20.8	21.4	22.1	*
VCPSRBD0400N20R02	4	0.2	4	20	3.9	2.5°	60	6	4	▲	1	20.8	21.4	22	*
VCPSRBD0400N20R03	4	0.3	4	20	3.9	2.5°	60	6	4	▲	1	20.8	21.4	21.9	*
VCPSRBD0400N20R05	4	0.5	4	20	3.9	2.5°	60	6	4	▲	1	20.8	21.4	21.7	*
VCPSRBD0400N20R10	4	1	4	20	3.9	2.6°	60	6	4	▲	1	20.8	21.3	21.2	*
VCPSRBD0400N30R03	4	0.3	4	30	3.9	1.8°	70	6	4	▲	1	31.1	31.8	*	*
VCPSRBD0400N30R05	4	0.5	4	30	3.9	1.8°	70	6	4	▲	1	31.1	31.8	*	*
VCPSRBD0400N30R10	4	1	4	30	3.9	1.8°	70	6	4	▲	1	31.1	31.8	*	*
VCPSRBD0500N15R05	5	0.5	5	15	4.9	1.6°	60	6	4	▲	1	15.6	16.1	*	*
VCPSRBD0500N15R10	5	1	5	15	4.9	1.6°	60	6	4	▲	1	15.6	16.1	*	*
VCPSRBD0500N30R05	5	0.5	5	30	4.9	0.9°	70	6	4	▲	1	31.1	*	*	*
VCPSRBD0500N30R10	5	1	5	30	4.9	0.9°	70	6	4	▲	1	31.1	*	*	*
VCPSRBD0600N18R01	6	0.1	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N18R02	6	0.2	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N18R03	6	0.3	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N18R05	6	0.5	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N18R10	6	1	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N18R20	6	2	6	18	5.85	—	70	6	4	▲	2	*	*	*	*
VCPSRBD0600N41R05	6	0.5	6	41	5.85	—	90	6	4	▲	2	*	*	*	*
VCPSRBD0600N50R10	6	1	6	50	5.85	—	90	6	4	▲	2	*	*	*	*
VCPSRBD0800N24R01	8	0.1	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R02	8	0.2	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R03	8	0.3	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R05	8	0.5	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R10	8	1	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R20	8	2	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N24R30	8	3	8	24	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N50R10	8	1	8	50	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD0800N50R30	8	3	8	50	7.85	—	90	8	4	▲	2	*	*	*	*
VCPSRBD1000N30R03	10	0.3	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N30R05	10	0.5	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N30R10	10	1	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N30R20	10	2	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N30R30	10	3	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N30R40	10	4	10	30	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N50R10	10	1	10	50	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1000N50R30	10	3	10	50	9.7	—	100	10	4	▲	2	*	*	*	*
VCPSRBD1200N36R03	12	0.3	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R05	12	0.5	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R10	12	1	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R20	12	2	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R30	12	3	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R40	12	4	12	36	11.7	—	110	12	4	▲	2	*	*	*	*
VCPSRBD1200N36R50	12	5	12	36	11.7	—	110	12	4	▲	2	*	*	*	*

* No interference

▲ : Inventory maintained in Japan. To be replaced by new products.
VFRPSRB (J283) is alternative product.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Hardened steel (45－55HRC) AISI H13		Hardened steel (55－62HRC) AISI D2	
Dia. **DC** (mm)	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
0.6	**2**	48000	200－ 600	40000	160－ 500	22000	80－ 250
	4	48000	160－ 500	40000	100－ 300	22000	50－ 150
0.8	**4**	48000	240－ 750	32000	160－ 500	19000	80－ 250
	6	38000	190－ 600	26000	130－ 400	16000	70－ 200
	8	29000	150－ 450	19000	100－ 300	12000	50－ 150
1	**4**	48000	270－ 900	32000	180－ 600	19000	90－ 300
	6	38000	220－ 720	26000	150－ 480	16000	70－ 240
	10	29000	160－ 540	19000	110－ 360	12000	60－ 180
1.2	**6**	48000	300－ 900	32000	200－ 600	19000	100－ 300
	10	38000	240－ 720	26000	160－ 480	15000	80－ 240
	15	29000	180－ 540	19000	120－ 360	12000	60－ 180
1.5	**4**	41000	300－ 900	27000	200－ 600	16000	100－ 300
	6	32000	240－ 720	22000	160－ 480	13000	80－ 240
	10	24000	180－ 540	16000	120－ 360	10000	60－ 180
2	**6**	36000	600－2000	24000	400－1300	14000	200－ 650
	10	29000	480－1600	19000	320－1000	12000	160－ 520
	15	22000	360－1200	14000	240－ 780	9000	120－ 390
2.5	**8**	33000	750－2400	22000	500－1600	13000	250－ 800
	15	20000	450－1400	13000	300－ 960	8000	150－ 480
3	**10**	30000	900－3000	20000	600－2000	12000	300－1000
	15	24000	720－2400	16000	480－1600	10000	240－ 800
	20	18000	540－1800	12000	360－1200	7000	180－ 600
4	**12**	26000	1200－4500	17000	800－3000	10000	400－1500
	20	20000	960－2000	14000	640－2000	8000	320－2000
	30	15000	720－1000	10000	480－1000	6000	240－1000
5	**15**	20000	1200－4800	13000	780－3120	10000	520－2000
	30	12000	720－1900	8000	480－1600	7000	360－1120
6	**18**	20000	1600－7500	13000	1100－5000	8000	550－2500
	41	15000	900－2400	12000	720－1600	10000	600－1200
	50	10000	600－1200	8000	480－ 800	6000	360－ 530
8	**24**	15000	1900－7500	10000	1300－5000	6000	650－2500
	50	10000	1300－2400	8000	1000－2200	3000	320－ 600
10	**30**	12000	1600－7500	8000	1100－5000	5000	550－2500
	50	10000	1300－3200	7000	950－2200	2500	280－ 600
12	**36**	10000	1500－7500	7000	1000－5000	4000	500－2500
Depth of cut		≤0.2RE (DC≤ϕ2) ≤0.4RE (DC＞ϕ2) ≤0.1mm (DC≤ϕ1.5) ≤0.2mm (DC≤ϕ4) ≤0.5mm (DC≤ϕ6)		≤0.1RE (DC≤ϕ2) ≤0.2RE (DC＞ϕ2) ≤0.05mm (DC≤ϕ1.5) ≤0.1mm (DC≤ϕ4) ≤0.3mm (DC≤ϕ6)			

DC:Dia.

Note 1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VCPSRB

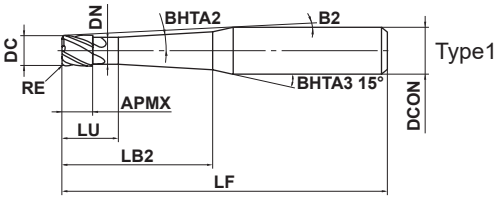
Corner radius end mill, Short cut length, 2—4 flute, High precision

UWC VC γ 30° DC≤1.5 DC≥2

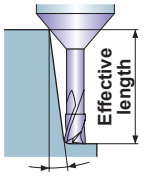
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	◎	◎	○				

Taper neck type





Type1



0.5≤RE≤3				
±0.01				
1.5≤DC≤12				
0 - 0.01				
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.005	0 - 0.006	0 - 0.008		

●±0.01mm corner radius tolerance, 0—-0.01mm outer diameter tolerance.
End mill with corner radius for precise and efficient machining.

(mm)

Order Number	DC	RE	BHTA2	APMX	LB2	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 1°	2°	3°
VCPSRBD0150N03L06R05	1.5	0.5	1.5°	1.5	6	3	1.44	9°	50	6	2	▲	1	—	7.1	7.7
VCPSRBD0150N03L10R05	1.5	0.5	1.5°	1.5	10	3	1.44	7.2°	50	6	2	▲	1	—	11.3	12.2
VCPSRBD0200N04L10R05	2	0.5	1.5°	2	10	4	1.9	6.7°	60	6	4	▲	1	—	11.5	12.4
VCPSRBD0200N04L15R05	2	0.5	1.5°	2	15	4	1.9	5.3°	60	6	4	▲	1	—	16.7	18
VCPSRBD0250N05L12R10	2.5	1	1.5°	2.5	12	5	2.4	5.6°	60	6	4	▲	1	—	14.2	15.3
VCPSRBD0250N05L20R10	2.5	1	1.5°	2.5	20	5	2.4	4°	60	6	4	▲	1	—	22.5	24.2
VCPSRBD0300N06L15R05	3	0.5	1.5°	3	15	6	2.9	4.4°	60	6	4	▲	1	—	16.9	18.2
VCPSRBD0300N06L15R10	3	1	1.5°	3	15	6	2.9	4.4°	60	6	4	▲	1	—	17.4	18.7
VCPSRBD0300N06L20R05	3	0.5	1.5°	3	20	6	2.9	3.6°	60	6	4	▲	1	—	22.1	23.8
VCPSRBD0300N06L20R10	3	1	1.5°	3	20	6	2.9	3.6°	60	6	4	▲	1	—	22.6	24.4
VCPSRBD0400N08L20R10	4	1	1.5°	4	20	8	3.9	2.6°	60	6	4	▲	1	—	22.8	*
VCPSRBD0400N08L30R10	4	1	1.5°	4	30	8	3.9	1.9°	70	6	4	▲	1	—	*	*
VCPSRBD0500N08L40R05	5	0.5	1°	5	40	8	4.9	2°	90	8	4	▲	1	41.2	*	*
VCPSRBD0500N08L40R10	5	1	1°	5	40	8	4.9	2°	90	8	4	▲	1	41.7	*	*
VCPSRBD0500N08L60R05	5	0.5	1°	5	60	8	4.9	1.4°	110	8	4	▲	1	61.2	*	*
VCPSRBD0500N08L60R10	5	1	1°	5	60	8	4.9	1.4°	110	8	4	▲	1	61.7	*	*
VCPSRBD0600N08L40R20	6	2	1°	6	40	8	5.85	1.4°	70	8	4	▲	1	42.8	*	*
VCPSRBD0600N08L60R20	6	2	1°	6	60	8	5.85	1°	100	8	4	▲	1	*	*	*
VCPSRBD0800N10L53R20	8	2	1°	8	53	10	7.85	1.1°	90	10	4	▲	1	55.9	*	*
VCPSRBD0800N10L70R20	8	2	1°	8	70	10	7.85	1.6°	130	12	4	▲	1	72.9	*	*
VCPSRBD1000N12L55R30	10	3	1°	10	55	12	9.7	1.1°	100	12	4	▲	1	59.4	*	*
VCPSRBD1000N12L70R30	10	3	1°	10	70	12	9.7	0.9°	130	12	4	▲	1	*	*	*
VCPSRBD1200N24L70R30	12	3	1°	12	70	24	11.7	1.6°	130	16	4	▲	1	75.2	*	*

* No interference

▲ : Inventory maintained in Japan. To be replaced by new products.
VFRPSRB (J283) is alternative product.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Hardened steel (45－55HRC) AISI H13		Hardened steel (55－62HRC) AISI D2	
Dia. **DC** (mm)	Taper angle one side **DHTA**	Neck length **LU_2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1.5	**1.5°**	**6**	36000	270－ 810	24000	180－ 540	15000	90－ 270
	1.5°	**10**	28000	210－ 630	19000	140－ 420	11000	70－ 210
2	**1.5°**	**10**	32000	540－1800	22000	360－1200	13000	180－ 590
	1.5°	**15**	25000	420－1400	17000	280－ 910	10000	140－ 460
2.5	**1.5°**	**12**	26000	600－1900	18000	400－1300	11000	200－ 640
	1.5°	**20**	20000	450－ 140	13000	300－ 960	8000	150－ 480
3	**1.5°**	**15**	27000	810－2700	18000	540－1800	11000	270－ 900
	1.5°	**20**	21000	630－2100	14000	420－1400	8000	210－ 700
4	**1.5°**	**20**	23000	1080－3000	15000	720－3000	9000	360－3000
	1.5°	**30**	18000	840－1500	12000	560－1500	7000	280－1500
5	**1°**	**40**	10000	520－1400	7000	420－ 840	5000	260－ 600
	1°	**60**	7000	360－ 840	5000	300－ 500	4000	210－ 400
6	**1°**	**40**	20000	1650－4500	13000	1100－3000	8000	550－1500
8	**1°**	**53**	15000	1950－4500	10000	1300－3000	6000	650－1500
10	**1°**	**55**	12000	1650－4500	8000	1100－3000	5000	550－1500
Depth of cut			≤0.2RE (DC≤ϕ2) ≤0.4RE (DC＞ϕ2) ≤0.1mm (DC≤ϕ1.5) ≤0.2mm (DC≤ϕ4) ≤0.5mm (DC≤ϕ6)		≤0.1RE (DC≤ϕ2) ≤0.2RE (DC＞ϕ2) ≤0.05mm (DC≤ϕ1.5) ≤0.1mm (DC≤ϕ4) ≤0.3mm (DC≤ϕ6)			

DC:Dia.

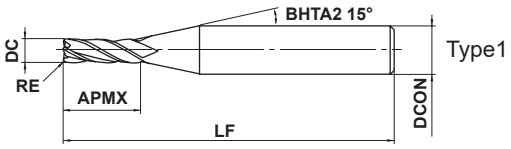
Note 1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

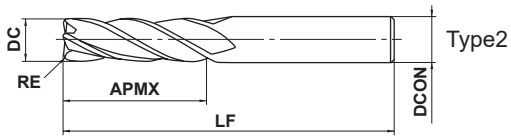
VC4JRB

Corner radius end mill, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	◎	○		○	○		







DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute corner radius end mill for general use.
●4 flute corner radius end mill for longer reach applications.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VC4JRBD0300R0030	3	0.3	12	50	6	4	●	1
VC4JRBD0400R0030	4	0.3	15	50	6	4	●	1
VC4JRBD0400R0050	4	0.5	15	50	6	4	●	1
VC4JRBD0500R0030	5	0.3	20	60	6	4	●	1
VC4JRBD0500R0050	5	0.5	20	60	6	4	●	1
VC4JRBD0600R0030	6	0.3	20	60	6	4	●	2
VC4JRBD0600R0050	6	0.5	20	60	6	4	●	2
VC4JRBD0600R0100	6	1	20	60	6	4	●	2
VC4JRBD0800R0030	8	0.3	25	70	8	4	●	2
VC4JRBD0800R0050	8	0.5	25	70	8	4	●	2
VC4JRBD0800R0100	8	1	25	70	8	4	●	2
VC4JRBD0800R0150	8	1.5	25	70	8	4	●	2
VC4JRBD0800R0200	8	2	25	70	8	4	●	2
VC4JRBD1000R0030	10	0.3	30	90	10	4	●	2
VC4JRBD1000R0050	10	0.5	30	90	10	4	●	2
VC4JRBD1000R0100	10	1	30	90	10	4	●	2
VC4JRBD1000R0150	10	1.5	30	90	10	4	●	2
VC4JRBD1000R0200	10	2	30	90	10	4	●	2
VC4JRBD1200R0050	12	0.5	30	90	12	4	●	2
VC4JRBD1200R0100	12	1	30	90	12	4	●	2
VC4JRBD1200R0150	12	1.5	30	90	12	4	●	2
VC4JRBD1200R0200	12	2	30	90	12	4	●	2
VC4JRBD1600R0050	16	0.5	50	110	16	4	●	2
VC4JRBD1600R0100	16	1	50	110	16	4	●	2
VC4JRBD1600R0150	16	1.5	50	110	16	4	●	2
VC4JRBD1600R0200	16	2	50	110	16	4	●	2
VC4JRBD2000R0050	20	0.5	55	110	20	4	●	2
VC4JRBD2000R0100	20	1	55	110	20	4	●	2
VC4JRBD2000R0150	20	1.5	55	110	20	4	●	2
VC4JRBD2000R0200	20	2	55	110	20	4	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	4200	110	3400	95	2600	70	2100	50
4	3400	140	2700	110	2100	85	1700	60
5	2900	170	2300	140	1800	100	1500	70
6	2500	200	2000	170	1500	130	1300	85
8	1900	220	1500	170	1200	150	1000	85
10	1600	220	1300	170	950	130	800	85
12	1300	170	1100	150	800	100	670	70
16	1000	140	820	110	600	80	500	50
20	800	110	650	85	480	70	400	40
Depth of cut	≤0.05DC (MAX. 0.5mm) ≤2.5DC DC ≤0.3DC (MAX. 3mm)						≤0.02DC (MAX. 0.3mm) ≤2DC DC ≤0.05DC (MAX. 0.5mm)	

DC:Dia.

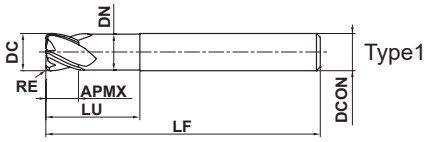
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) The above table shows cutting conditions for standard side milling. For slotting, please reduce the feed rate only to 50% of the table figure. Please set the revolution rate at 60% and the feed rate at 40% when slotting austenitic stainless steels.
Note 4) When drilling, please set the feed rate at 1/3 or below the values above.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

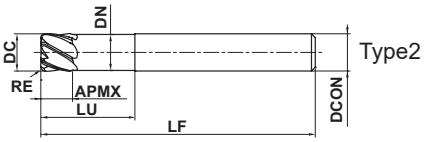
CE4SRB/CE6SRB

Corner radius end mill, short cut length, 4-6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		







DC≤12				
±0.02				
DC=6	DC=8,10	DC=12		
- 0.008 - 0.028	- 0.009 - 0.029	- 0.011 - 0.031		
DCON=6	DCON=8,10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● Ceramic corner radius end mill with high heat resistance.
● Capable of softening Ni based alloys by generating heat during machining

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CE4SRBD0600R050	6	0.5	4.5	12	5.85	50	6	4	●	1
CE4SRBD0800R100	8	1.0	6.0	16	7.85	60	8	4	●	1
CE4SRBD1000R100	10	1.0	7.5	20	9.70	65	10	4	●	1
CE4SRBD1200R150	12	1.5	9.0	24	11.70	70	12	4	●	1
CE6SRBD0600R050	6	0.5	4.5	12	5.85	50	6	6	●	2
CE6SRBD0800R100	8	1.0	6.0	16	7.85	60	8	6	●	2
CE6SRBD1000R100	10	1.0	7.5	20	9.70	65	10	6	●	2
CE6SRBD1200R150	12	1.5	9.0	24	11.70	70	12	6	●	2

Note 1) Never use ceramic end mills to cut titanium alloys.
Doing so will cause a risk of ignition and can be extremely dangerous.

● : Inventory maintained in Japan.

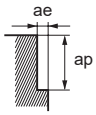
Click here for product NEWS ▶

ISO13399 ➤ J002

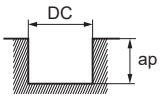
RECOMMENDED CUTTING CONDITIONS

CE4SRB

■ Side milling

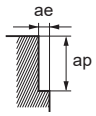
Workpiece Material	Heat resistant alloys Inconel718			
Dia. **DC** (mm)	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Depth of cut ap (mm)	Cutting Width ae (mm)
6	≥350	≤0.06	≤4.5	≤1.2
8	≥350	≤0.06	≤6.0	≤1.6
10	≥350	≤0.06	≤7.5	≤2.0
12	≥350	≤0.06	≤9.0	≤2.4
Depth of cut	 DC:Dia.			

■ Slotting

Workpiece Material	Heat resistant alloys Inconel718		
Dia. **DC** (mm)	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Depth of cut ap (mm)
6	≥350	≤0.03	≤1.0
8	≥350	≤0.03	≤1.5
10	≥350	≤0.03	≤2.0
12	≥350	≤0.03	≤2.5
Depth of cut	 DC:Dia.		

CE6SRB

■ Side milling

Workpiece Material	Heat resistant alloys Inconel718			
Dia. **DC** (mm)	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Depth of cut ap (mm)	Cutting Width ae (mm)
6	≥350	≤0.06	≤4.5	≤1.2
8	≥350	≤0.06	≤6.0	≤1.6
10	≥350	≤0.06	≤7.5	≤2.0
12	≥350	≤0.06	≤9.0	≤2.4
Depth of cut	 DC:Dia.			

Note 1) The outermost layer of the material may be affected by heat.
Ensure a minimum of 0.3mm final machining allowance remains.
Note 2) The recommended ramping angle is 1.5°. When ramping, set the feed rate to about 25% for side milling and about 50% for grooving.
Note 3) Gradually increase the depth of cut (Shoulder milling=ae and Slot milling=ap) starting from 0.05DC.

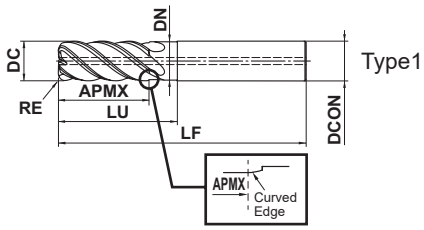
VQT5MVRB NEW

Corner radius, Medium cut length, 5 flute, Irregular helix flutes, With coolant hole

UWC | VQT | γ 40° 41.5° 43°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
					◎		





Type1

RE				
±0.02				
DC≤16	20≤DC≤25			
0 - 0.03	0 - 0.04			
DCON = 16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

● Flute geometry suitable for slot milling.
● The sharp corner R edges provide long tool life in machining of titanium alloys.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQT5MVRB160R100N48C	16	1	34	48	15.5	120	16	5	●	1
VQT5MVRB160R300N48C	16	3	34	48	15.5	120	16	5	●	1
VQT5MVRB160R400N48C	16	4	34	48	15.5	120	16	5	●	1
VQT5MVRB200R100N60C	20	1	44	60	19.5	135	20	5	●	1
VQT5MVRB200R300N60C	20	3	44	60	19.5	135	20	5	●	1
VQT5MVRB200R400N60C	20	4	44	60	19.5	135	20	5	●	1
VQT5MVRB200R600N60C	20	6	44	60	19.5	135	20	5	●	1
VQT5MVRB250R100N75C	25	1	54	75	24.5	155	25	5	●	1
VQT5MVRB250R300N75C	25	3	54	75	24.5	155	25	5	●	1
VQT5MVRB250R400N75C	25	4	54	75	24.5	155	25	5	●	1
VQT5MVRB250R600N75C	25	6	54	75	24.5	155	25	5	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.

● : Inventory maintained in Japan.

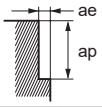
Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

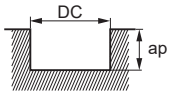
■Shoulder Milling

Overhang Length DC×1 (DC=Dia.) (mm)

Workpiece Material	Titanium Alloys Ti-6Al-4V etc.					
Dia. **DC**	Corner radius **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
16	1	80	1600	800	32	2.4
16	3	80	1600	800	32	2.4
16	4	80	1600	800	32	2.4
20	1	80	1300	650	40	3.0
20	3	80	1300	650	40	3.0
20	4	80	1300	650	40	3.0
20	6	80	1300	650	40	3.0
25	1	80	1000	500	50	3.8
25	3	80	1000	500	50	3.8
25	4	80	1000	500	50	3.8
25	6	80	1000	500	50	3.8
Depth of Cut						

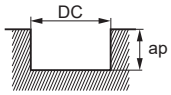
■Slot Milling

Depth of Cut DC×1 (mm)

Workpiece Material	Titanium Alloys Ti-6Al-4V etc.				
Dia. **DC**	Corner radius **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
16	1	60	1200	420	16
16	3	60	1200	420	16
16	4	60	1200	300	16
20	1	60	950	330	20
20	3	60	950	330	20
20	4	60	950	330	20
20	6	60	950	238	20
25	1	50	640	220	25
25	3	50	640	220	25
25	4	50	640	220	25
25	6	50	640	160	25
Depth of Cut					

DC:Dia.

Depth of Cut DC×2 (mm)

Workpiece Material	Titanium Alloys Ti-6Al-4V etc.				
Dia. **DC**	Corner radius **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
16	1	60	1200	240	32
16	3	60	1200	240	32
16	4	60	1200	180	32
20	1	60	950	190	40
20	3	60	950	190	40
20	4	60	950	190	40
20	6	60	950	143	40
25	1	50	640	130	50
25	3	50	640	130	50
25	4	50	640	130	50
25	6	50	640	96	50
Depth of Cut					

DC:Dia.

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 5) When machining a deep slot exceeding 1D, use a holder with a high gripping strength or an anti slippage mechanism.
Also, make sure that the clamping force and rigidity are sufficient before use.

VQ6MHVRBCH

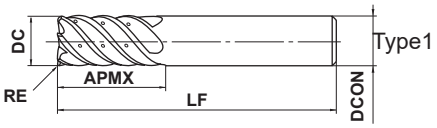
Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes, With multiple internal through coolant



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎	○	

CoolStar
END MILLS





0.5≤RE≤4				
±0.015				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=10	DCON=12	DCON=16	DCON=20	
0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQ6MHVRBCHD1000R050	10	0.5	22	70	10	6	●	1
VQ6MHVRBCHD1000R100	10	1	22	70	10	6	●	1
VQ6MHVRBCHD1200R050	12	0.5	26	75	12	6	●	1
VQ6MHVRBCHD1200R100	12	1	26	75	12	6	●	1
VQ6MHVRBCHD1600R100	16	1	32	90	16	6	●	1
VQ6MHVRBCHD1600R300	16	3	32	90	16	6	●	1
VQ6MHVRBCHD1600R400	16	4	32	90	16	6	●	1
VQ6MHVRBCHD2000R100	20	1	38	100	20	6	●	1
VQ6MHVRBCHD2000R300	20	3	38	100	20	6	●	1
VQ6MHVRBCHD2000R400	20	4	38	100	20	6	●	1

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic Stainless Steel (≤200HB), Titanium Alloy AISI 304, AISI 316, Ti-6Al-4V		Copper, Copper alloy		Heat Resistant Alloys Inconel 718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	—	—	4800	2000	—	—	1300	260
12	—	—	4000	2000	—	—	1100	230
16	4000	2200	3000	1600	2400	1400	800	180
20	3200	1900	2400	1400	1900	1100	640	150
Depth of Cut			≤0.12DC 0.5DC—1.5DC				≤0.05DC 0.5DC—1.5DC	

DC:Dia.

■ Trochoidal slotting

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel (≤200HB), Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	—	—	4800	1400
12	—	—	4000	1200
16	4000	1600	3000	1100
20	3200	1400	2400	900
Depth of cut	1.5DC≤ ≤0.12DC		0.5DC—1.5DC	

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

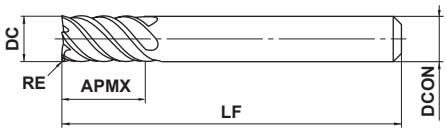
VF6MHVRB

Corner radius, Medium cut length, 6 flute, Irregular helix flutes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		





Type1

0.5≤RE≤2				
±0.015				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining.
● Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVRBD0600R050	6	0.5	13	50	6	6	●	1
VF6MHVRBD0600R100	6	1	13	50	6	6	●	1
VF6MHVRBD0800R050	8	0.5	19	60	8	6	●	1
VF6MHVRBD0800R100	8	1	19	60	8	6	●	1
VF6MHVRBD1000R050	10	0.5	22	70	10	6	●	1
VF6MHVRBD1000R100	10	1	22	70	10	6	●	1
VF6MHVRBD1200R050	12	0.5	26	75	12	6	●	1
VF6MHVRBD1200R100	12	1	26	75	12	6	●	1
VF6MHVRBD1600R100	16	1	32	90	16	6	●	1
VF6MHVRBD1600R200	16	2	32	90	16	6	●	1
VF6MHVRBD2000R100	20	1	38	100	20	6	●	1
VF6MHVRBD2000R200	20	2	38	100	20	6	●	1

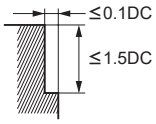
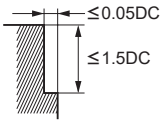
● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
6	10600	2900	8000	2000	2100	320
8	8000	2900	6000	2000	1600	300
10	6400	2700	4800	2000	1300	260
12	5300	2700	4000	2000	1100	230
16	4000	2200	3000	1600	800	180
20	3200	1900	2400	1400	640	150
Depth of cut						

DC:Dia.

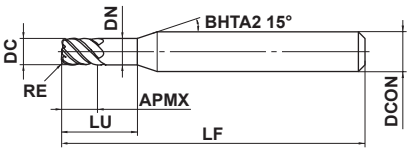
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VFSDRB

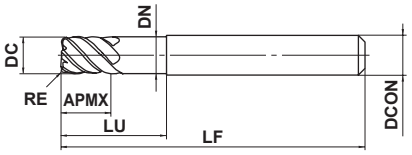
IMPACT MIRACLE Corner radius end mill, 6 flute (S)

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





Type1



Type2

3≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●6 flute end mill with Impact Miracle coating for high hardened materials.

(mm)

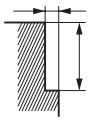
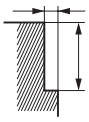
Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFSDRBD0300R030	3	0.3	3	9	2.9	45	6	6	●	1
VFSDRBD0400R030	4	0.3	4	12	3.9	45	6	6	●	1
VFSDRBD0500R030	5	0.3	5	15	4.9	50	6	6	●	1
VFSDRBD0600R030	6	0.3	6	18	5.85	50	6	6	●	2
VFSDRBD0600R050	6	0.5	6	18	5.85	50	6	6	●	2
VFSDRBD0600R100	6	1	6	18	5.85	50	6	6	●	2
VFSDRBD0800R030	8	0.3	8	24	7.85	60	8	6	●	2
VFSDRBD0800R050	8	0.5	8	24	7.85	60	8	6	●	2
VFSDRBD0800R100	8	1	8	24	7.85	60	8	6	●	2
VFSDRBD1000R050	10	0.5	10	30	9.7	70	10	6	●	2
VFSDRBD1000R100	10	1	10	30	9.7	70	10	6	●	2
VFSDRBD1200R050	12	0.5	12	36	11.7	75	12	6	●	2
VFSDRBD1200R100	12	1	12	36	11.7	75	12	6	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45－55HRC) AISI H13			Hardened steel (55－62HRC) AISI D2			Hardened steel (62－70HRC) AISI W1, AISI M2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
3	32000	3800	0.2	16000	1900	0.1	11000	1200	0.05
4	24000	4400	0.2	12000	2200	0.1	8000	1300	0.05
6	16000	5800	0.3	8000	2900	0.2	5300	1800	0.1
8	12000	5800	0.4	6000	2900	0.2	4000	1800	0.1
10	9600	5800	0.5	4800	2900	0.3	3200	1800	0.2
12	8000	4800	0.6	4000	2400	0.3	2700	1500	0.2
Depth of cut	 Please refer to the list above for depth of cut. ≤1.5DC			 Please refer to the list above for depth of cut. ≤1.0DC					

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

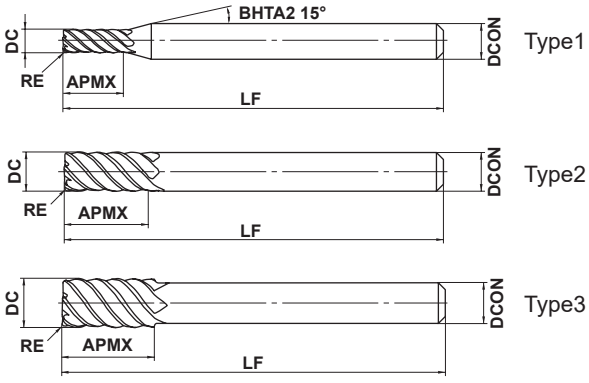
VFMDRB

Corner radius, Medium cut length, 6 flute, For hardened materials



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				





DC≤12	DC>12			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●6 flute corner radius end mill with Impact Miracle coating for high hardened materials.

(mm)

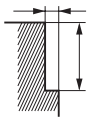
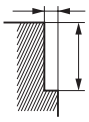
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDRBD0300R030	3	0.3	10	60	6	6	●	1
VFMDRBD0400R030	4	0.3	12	60	6	6	●	1
VFMDRBD0500R030	5	0.3	15	60	6	6	●	1
VFMDRBD0600R030	6	0.3	15	60	6	6	●	2
VFMDRBD0600R050	6	0.5	15	60	6	6	●	2
VFMDRBD0600R100	6	1	15	60	6	6	●	2
VFMDRBD0800R030	8	0.3	20	75	8	6	●	2
VFMDRBD0800R050	8	0.5	20	75	8	6	●	2
VFMDRBD0800R100	8	1	20	75	8	6	●	2
VFMDRBD1000R030	10	0.3	25	80	10	6	●	2
VFMDRBD1000R050	10	0.5	25	80	10	6	●	2
VFMDRBD1000R100	10	1	25	80	10	6	●	2
VFMDRBD1200R050	12	0.5	30	100	12	6	●	2
VFMDRBD1200R100	12	1	30	100	12	6	●	2
VFMDRBD1600R100	16	1	40	110	16	6	●	2
VFMDRBD1600R150	16	1.5	40	110	16	6	●	2
VFMDRBD1800R100	18	1	40	120	16	6	●	3
VFMDRBD1800R150	18	1.5	40	120	16	6	●	3
VFMDRBD2000R100	20	1	45	125	20	6	●	2
VFMDRBD2000R150	20	1.5	45	125	20	6	●	2
VFMDRBD2000R200	20	2	45	125	20	6	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45－55HRC) AISI H13			Hardened steel (55－62HRC) AISI D2			Hardened steel (62－70HRC) AISI W1, AISI M2		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut (mm)
3	32000	3800	0.2	16000	1900	0.1	11000	1200	0.05
4	24000	4400	0.2	12000	2200	0.1	8000	1300	0.05
6	16000	5800	0.3	8000	2900	0.2	5300	1800	0.1
8	12000	5800	0.4	6000	2900	0.2	4000	1800	0.1
10	9600	5800	0.5	4800	2900	0.3	3200	1800	0.2
12	8000	4800	0.6	4000	2400	0.3	2700	1500	0.2
16	6000	3600	0.8	3000	1800	0.5	2000	1100	0.3
20	4800	2900	1.0	2400	1400	0.5	1600	880	0.3
Depth of cut	 Please refer to the list above for depth of cut. ≤1.5DC			 Please refer to the list above for depth of cut. ≤1.0DC					

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

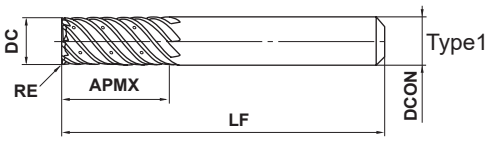
VF8MHVRBCH

Corner radius end mill, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





1≤RE≤3				
±0.015				
16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

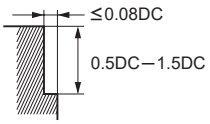
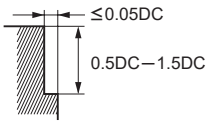
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVRBCHD1600R100	16	1	32	90	16	8	▲	1
VF8MHVRBCHD1600R300	16	3	32	90	16	8	▲	1
VF8MHVRBCHD2000R100	20	1	38	100	20	8	▲	1
VF8MHVRBCHD2000R300	20	3	38	100	20	8	▲	1

▲ : Inventory maintained in Japan.
To be replaced by new products.

Click here for product NEWS ▶

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	4000	2400	3000	2100	800	240
20	3200	1900	2400	1900	640	200
Depth of cut						

DC:Dia.

■ Trochoidal slotting

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	4000	1900	3000	1400
20	3200	1500	2400	1200
Depth of cut				

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

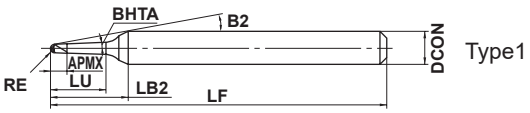
VC4STB

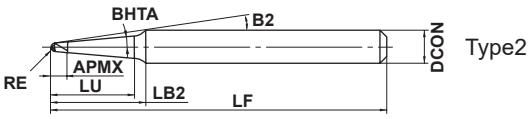
Ball nose taper end mill, Short cut length, 4 flute

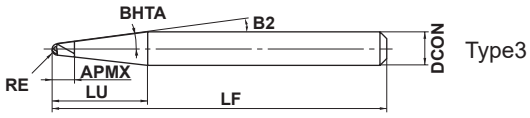


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	○	◎	◎				









*Relief Neck type.

0.3≤RE≤4				
±0.01				
DCON=6	8≤DCON≤10			
h6 0 - 0.008	h6 0 - 0.009			

●4 flute taper end mill with taper neck for maximum rigidity and high performance.

(mm)

Order Number	RE	BHTA	APMX	LU	LB2	B2	LF	DCON	No. of Flutes	Stock	Type
VC4STBR0030T0130N05	0.3	1.5°	1	5	9.0	17.2°	60	6	4	●	1
VC4STBR0030T0200N05	0.3	2°	1	5	9.0	17.2°	60	6	4	●	1
VC4STBR0030T0500N05	0.3	5°	1	5	8.8	17.6°	60	6	4	●	1
VC4STBR0030T1000N15	0.3	10°	1	15	—	10.4°	60	6	4	●	3
VC4STBR0040T0130N10	0.4	1.5°	2	10	14.0	10.8°	60	6	4	●	1
VC4STBR0040T0130N15	0.4	1.5°	2	15	19.0	8.0°	60	6	4	●	1
VC4STBR0040T0200N10	0.4	2°	2	10	14.0	10.8°	60	6	4	●	1
VC4STBR0040T0500N10	0.4	5°	2	10	13.5	11.2°	60	6	4	●	1
VC4STBR0040T0700N10	0.4	7°	7	10	12.2	12.4°	60	6	4	●	2
VC4STBR0040T1000N15	0.4	10°	3	15	—	10.1°	60	6	4	●	3
VC4STBR0050T0130N10	0.5	1.5°	2	10	14.0	10.5°	60	6	4	●	1
VC4STBR0050T0130N15	0.5	1.5°	2	15	19.0	7.7°	60	6	4	●	1
VC4STBR0050T0130N20	0.5	1.5°	2	20	24.0	6.1°	60	6	4	●	1
VC4STBR0050T0200N10	0.5	2°	2	10	14.0	10.5°	60	6	4	●	1
VC4STBR0050T0200N15	0.5	2°	2	15	18.9	7.8°	60	6	4	●	1
VC4STBR0050T0200N20	0.5	2°	3	20	24.0	6.1°	60	6	4	●	1
VC4STBR0050T0500N10	0.5	5°	3	10	13.6	10.8°	60	6	4	●	1
VC4STBR0050T0500N15	0.5	5°	3	15	17.2	8.5°	60	6	4	●	2
VC4STBR0050T0500N20	0.5	5°	3	20	21.8	6.7°	60	6	4	●	2
VC4STBR0050T0700N10	0.5	7°	7	10	12.1	12.2°	60	6	4	●	2
VC4STBR0050T0700N15	0.5	7°	7	15	16.6	8.9°	60	6	4	●	2
VC4STBR0050T0700N20	0.5	7°	7	20	—	7.3°	60	6	4	●	3
VC4STBR0050T1000N14	0.5	10°	3	14	—	10.5°	60	6	4	●	3
VC4STBR0075T0200N10	0.75	2°	3	10	14.0	9.6°	60	6	4	●	1
VC4STBR0075T0500N15	0.75	5°	3	15	17.0	7.9°	60	6	4	●	2
VC4STBR0100T0130N10	1	1.5°	4	10	13.5	9.1°	60	6	4	●	1
VC4STBR0100T0130N15	1	1.5°	4	15	18.5	6.5°	60	6	4	●	1
VC4STBR0100T0130N20	1	1.5°	4	20	23.5	5.1°	60	6	4	●	1
VC4STBR0100T0200N06	1	2°	4	6	8.7	14.4°	60	6	4	●	2
VC4STBR0100T0200N10	1	2°	4	10	13.8	8.9°	60	6	4	●	1
VC4STBR0100T0200N15	1	2°	4	15	17.5	6.9°	60	6	4	●	2
VC4STBR0100T0500N10	1	5°	4	10	12.2	10.1°	60	6	4	●	2
VC4STBR0100T0500N15	1	5°	4	15	16.8	7.2°	60	6	4	●	2
VC4STBR0100T0500N23	1	5°	4	23	—	5.2°	60	6	4	●	3

● : Inventory maintained in Japan.

ISO13399 ➤ J002

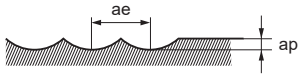
(mm)

Order Number	RE	BHTA	APMX	LU	LB2	B2	LF	DCON	No. of Flutes	Stock	Type
VC4STBR0100T0700N17	1	7°	7	17	—	7.1°	60	6	4	●	3
VC4STBR0100T1000N12	1	10°	4	12	—	10.3°	60	6	4	●	3
VC4STBR0125T0500N15	1.25	5°	4	15	16.5	6.6°	60	6	4	●	2
VC4STBR0150T0130N15	1.5	1.5°	4	15	17.3	5.4°	60	6	4	●	2
VC4STBR0150T0130N20	1.5	1.5°	4	20	22.2	4.2°	60	6	4	●	2
VC4STBR0150T0300N15	1.5	3°	4	15	16.9	5.6°	60	6	4	●	2
VC4STBR0150T0500N10	1.5	5°	4	10	11.7	8.3°	60	6	4	●	2
VC4STBR0150T0500N18	1.5	5°	4	18	—	5.2°	60	6	4	●	3
VC4STBR0175T0500N15	1.75	5°	4	15	—	5.4°	60	6	4	●	3
VC4STBR0200T0130N15	2	1.5°	5	15	16.8	3.9°	60	6	4	●	2
VC4STBR0200T0130N20	2	1.5°	5	20	21.6	3.0°	60	6	4	●	2
VC4STBR0200T0300N21	2	3°	4	21	—	3.1°	60	6	4	●	3
VC4STBR0200T0500N13	2	5°	4	13	—	5.2°	60	6	4	●	3
VC4STBR0200T0700N18	2	7°	7	18	—	7.1°	60	8	4	●	3
VC4STBR0300T0130N15	3	1.5°	6	15	16.8	4.2°	90	8	4	●	2
VC4STBR0300T0130N20	3	1.5°	6	20	21.7	3.1°	90	8	4	●	2
VC4STBR0300T0300N22	3	3°	6	22	—	3.1°	90	8	4	●	3
VC4STBR0400T0130N15	4	1.5°	8	15	16.9	4.4°	90	10	4	●	2
VC4STBR0400T0300N22	4	3°	8	22	—	3.2°	90	10	4	●	3

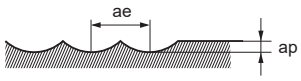
VC4STB

Ball nose taper end mill, Short cut length, 4 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45－55HRC) AISI H13				Hardened steel (55－62HRC) AISI D2			
R RE (mm)	Taper angle one side BHTA	Neck length LU (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R 0.3	1.5°	5	40000	1600	0.08	0.12	40000	1200	0.06	0.10	40000	700	0.04	0.06
	2°	5	40000	1600	0.08	0.12	40000	1200	0.06	0.10	40000	700	0.04	0.06
	5°	5	40000	1600	0.08	0.12	40000	1200	0.06	0.10	40000	700	0.04	0.06
	10°	15	40000	1600	0.05	0.08	40000	1200	0.04	0.06	40000	700	0.03	0.04
R 0.4	1.5°	10	40000	2000	0.07	0.11	40000	1500	0.06	0.08	30000	700	0.04	0.05
	1.5°	15	40000	2000	0.05	0.08	40000	1500	0.04	0.06	30000	800	0.03	0.04
	2°	10	40000	2000	0.07	0.11	40000	1500	0.06	0.08	30000	800	0.04	0.05
	5°	10	40000	2000	0.07	0.11	40000	1500	0.06	0.08	30000	800	0.04	0.05
	7°	10	40000	2000	0.07	0.11	40000	1500	0.06	0.08	30000	800	0.04	0.05
	10°	15	40000	2000	0.06	0.09	40000	1500	0.05	0.07	30000	800	0.03	0.05
R 0.5	1.5°	10	38000	2500	0.11	0.16	35000	1600	0.08	0.13	25000	800	0.05	0.08
	1.5°	15	38000	2500	0.09	0.14	35000	1600	0.07	0.11	25000	800	0.05	0.07
	1.5°	20	38000	2500	0.06	0.09	35000	1600	0.05	0.07	25000	800	0.03	0.05
	2°	10	38000	2500	0.11	0.16	35000	1600	0.08	0.13	25000	800	0.05	0.08
	2°	15	38000	2500	0.09	0.14	35000	1600	0.07	0.11	25000	800	0.05	0.07
	2°	20	38000	2500	0.06	0.09	35000	1600	0.05	0.07	25000	800	0.03	0.05
	5°	10	38000	2500	0.12	0.18	35000	1600	0.10	0.14	25000	800	0.06	0.09
	5°	15	38000	2500	0.09	0.14	35000	1600	0.07	0.11	25000	800	0.05	0.07
	5°	20	38000	2500	0.08	0.11	35000	1600	0.06	0.09	25000	800	0.04	0.06
	7°	10	38000	2500	0.12	0.18	35000	1600	0.10	0.14	25000	800	0.06	0.09
	7°	15	38000	2500	0.11	0.16	35000	1600	0.08	0.13	25000	800	0.05	0.08
	7°	20	38000	2500	0.08	0.11	35000	1600	0.06	0.09	25000	800	0.04	0.06
	10°	14	38000	2500	0.11	0.16	35000	1600	0.08	0.13	25000	800	0.05	0.08
R 0.75	2°	10	38000	2500	0.18	0.27	35000	1600	0.14	0.22	18000	800	0.09	0.14
	5°	15	38000	2500	0.16	0.24	35000	1600	0.13	0.19	18000	800	0.08	0.12
R 1	1.5°	10	35000	2800	0.18	0.27	30000	1800	0.14	0.22	15000	1000	0.09	0.14
	1.5°	15	35000	2800	0.16	0.24	30000	1800	0.13	0.19	15000	1000	0.08	0.12
	1.5°	20	35000	2800	0.14	0.21	30000	1800	0.11	0.17	15000	1000	0.07	0.11
	2°	6	35000	2800	0.20	0.30	30000	1800	0.16	0.24	15000	1000	0.10	0.15
	2°	10	35000	2800	0.18	0.27	30000	1800	0.14	0.22	15000	1000	0.09	0.14
	2°	15	35000	2800	0.16	0.24	30000	1800	0.13	0.19	15000	1000	0.08	0.12
	5°	10	35000	2800	0.18	0.27	30000	1800	0.14	0.22	15000	1000	0.09	0.14
	5°	15	35000	2800	0.18	0.27	30000	1800	0.14	0.22	15000	1000	0.09	0.14
	5°	23	35000	2800	0.14	0.21	30000	1800	0.11	0.17	15000	1000	0.07	0.11
	7°	17	35000	2800	0.16	0.24	30000	1800	0.13	0.19	15000	1000	0.08	0.12
	10°	12	35000	2800	0.18	0.27	30000	1800	0.14	0.22	15000	1000	0.09	0.14
R 1.25	5°	15	35000	2800	0.23	0.34	30000	1800	0.18	0.27	15000	1000	0.11	0.17
R 1.5	1.5°	15	32000	3000	0.23	0.34	27000	2000	0.18	0.27	16000	1200	0.11	0.17
	1.5°	20	32000	3000	0.23	0.34	27000	2000	0.18	0.27	16000	1200	0.11	0.17
	3°	15	32000	3000	0.23	0.34	27000	2000	0.18	0.27	16000	1200	0.11	0.17
	5°	10	32000	3000	0.25	0.38	27000	2000	0.20	0.30	16000	1200	0.13	0.19
	5°	18	32000	3000	0.23	0.34	27000	2000	0.18	0.27	16000	1200	0.11	0.17
R 1.75	5°	15	27500	3500	0.23	0.34	23000	2500	0.18	0.27	14000	1500	0.11	0.17
Depth of cut														

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Workpiece Material			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Hardened steel (45－55HRC) AISI H13				Hardened steel (55－62HRC) AISI D2			
R **RE** (mm)	Taper angle one side **BHTA**	Neck length **LU** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R 2	**1.5°**	**15**	24000	3500	0.23	0.34	20000	2500	0.18	0.27	12000	1500	0.11	0.17
	1.5°	**20**	24000	3500	0.23	0.34	20000	2500	0.18	0.27	12000	1500	0.11	0.17
	3°	**21**	24000	3500	0.23	0.34	20000	2500	0.18	0.27	12000	1500	0.11	0.17
	5°	**13**	24000	3500	0.25	0.38	20000	2500	0.20	0.30	12000	1500	0.13	0.19
	7°	**18**	24000	3500	0.23	0.34	20000	2500	0.18	0.27	12000	1500	0.11	0.17
R 3	**1.5°**	**15**	16000	3500	0.30	0.45	13500	2500	0.24	0.36	8000	1500	0.15	0.23
	1.5°	**20**	16000	3500	0.30	0.45	13500	2500	0.24	0.36	8000	1500	0.15	0.23
	3°	**22**	16000	3500	0.30	0.45	13500	2500	0.24	0.36	8000	1500	0.15	0.23
R 4	**1.5°**	**15**	12000	3500	0.30	0.45	10000	2500	0.24	0.36	6000	1500	0.15	0.23
	3°	**22**	12000	3500	0.30	0.45	10000	2500	0.24	0.36	6000	1500	0.15	0.23
Depth of cut														

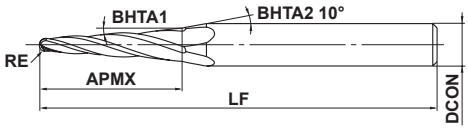
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

DLC4LATB NEW

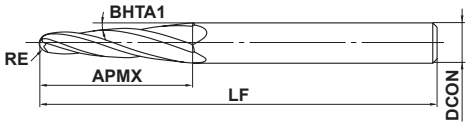
Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
h6 0 - 0.008	h6 0 - 0.009			

- The high rigidity design with improved breakage resistance achieves high efficiency machining of aluminum alloy impellers.
- High resistance to welding when there is an insufficient coolant supply or during high-speed cutting.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	No. of Flutes	Stock	Type
DLC4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
DLC4LATBR100T040AP20	1	4°	20	70	6	4	●	1
DLC4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
DLC4LATBR200T040AP30	2	4°	30	75	8	4	●	2

Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(ex.: RE sizes starting from a minimum of R0.3, half included taper angles) or coatings.

● : Inventory maintained in Japan.

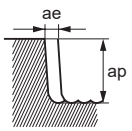
Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

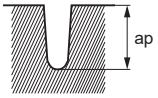
■Side Milling

(mm)

Workpiece Material	Aluminium Alloys			
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap	Depth of Cut ae
R0.5	20000	2000	15	0.75
R1	20000	4000	15	1.5
R1.5	20000	5200	15	2.25
R2	20000	5200	23	3
Depth of Cut				

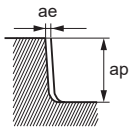
■Slotting

(mm)

Workpiece Material	Aluminium Alloys		
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap
R0.5	20000	600	10
R1	20000	2800	10
R1.5	20000	4000	10
R2	20000	4000	15
Depth of cut			

■Side Milling (Finishing)

(mm)

Workpiece Material	Aluminium Alloys			
R **RE**	Revolution (min^{-1})	Feed Rate (mm/min)	Depth of Cut ap	Depth of Cut ae
R0.5	20000	800	18	0.1
R1	20000	2000	18	0.2
R1.5	20000	2400	18	0.3
R2	20000	2400	27	0.3
Depth of Cut				

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

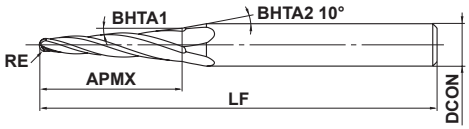
C4LATB

Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

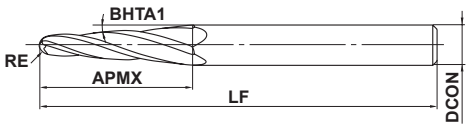


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
h6 0 - 0.008	0 - 0.009			

● High-efficiency roughing for aluminum impellers.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	No. of Flutes	Stock	Type
C4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
C4LATBR100T040AP20	1	4°	20	70	6	4	●	1
C4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
C4LATBR200T040AP30	2	4°	30	75	8	4	●	2

Note 1) Please inquire with us regarding non-standard special shapes
(ex.: RE sizes starting from a minimum of R0.3, half included taper angles) or coatings.

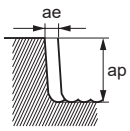
● : Inventory maintained in Japan.

Click here for product NEWS ▶

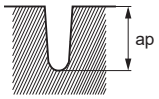
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

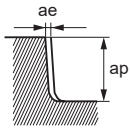
■Side milling

Workpiece Material	Aluminium alloy			
R **RE** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R0.5	20000	2000	15	0.75
R1	20000	4000	15	1.5
R1.5	20000	5200	15	2.25
R2	20000	5200	23	3
Depth of cut				

■Slotting

Workpiece Material	Aluminium alloy		
R **RE**	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
R0.5	20000	600	10
R1	20000	2800	10
R1.5	20000	4000	10
R2	20000	4000	15
Depth of cut			

■Side milling (Finishing)

Workpiece Material	Aluminium alloy			
R **RE** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
R0.5	20000	800	18	0.1
R1	20000	2000	18	0.2
R1.5	20000	2400	18	0.3
R2	20000	2400	27	0.3
Depth of cut				

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VQT6UR

Nose radius suitable for fillet milling, also tangential form radius fit composite blade surface machining.



Radial Accuracy

RE1 and RE2 ±0.010mm

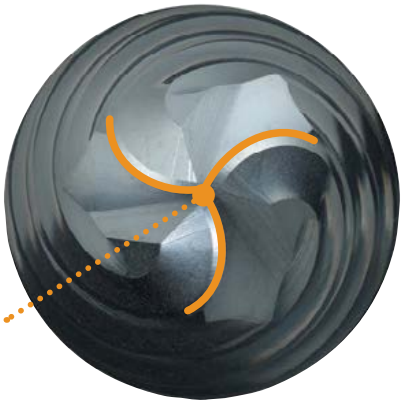
Optimum Cutting Edge Design

6-flute Peripheral Cutting Edge (Irregular pitch)

Multi cutting edge design achieve high efficiency machining.
Irregular pitch design prevents chattering.

3-flute End Cutting Edge

A wide flute improves chip evacuation.

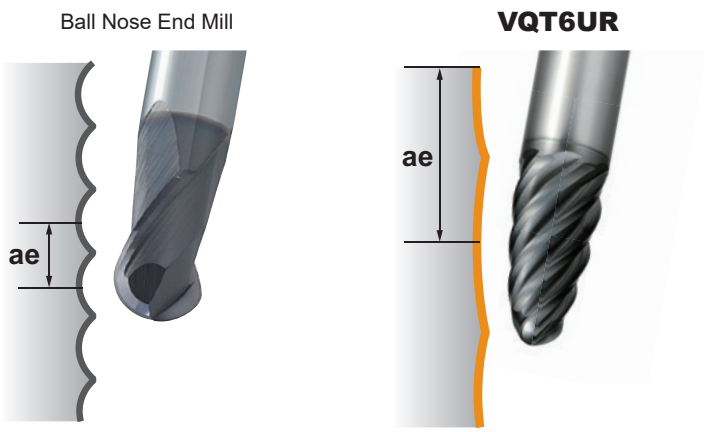


Ideal Shape

Compared with ball nose end mill, an tangential form radius is larger and cusp height is controllable. This design makes highly efficient machining with larger pick feed.



Nose and tangential form part has two different radius.



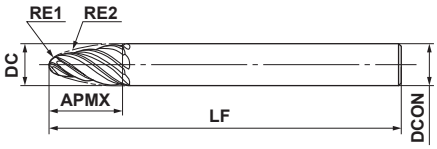
Shorter cutting distance contribute to longer tool life.

VQT6UR

Barrel, Medium cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
				○	◎		○





Type1

RE1≤4	RE2≤100			
±0.01	±0.01			

DCON≤10	DCON=12			
0 - 0.009	0 - 0.011			

● Nose and tangential form part has two different radius.

● Irregular pitch design prevents chattering and achieves high efficiency and high quality machining surface.

(mm)

Order Number	DC	RE1	RE2	APMX	LF	DCON	No. of Flutes	Stock	Type
VQT6URR020R075S08	8	2	75	21	90	8	6	●	1
VQT6URR020R085S10	10	2	85	26	100	10	6	●	1
VQT6URR030R075S10	10	3	75	22	100	10	6	●	1
VQT6URR040R100S12	12	4	100	25	110	12	6	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.

VQT6UR

Barrel, Medium cut length, 6 flute

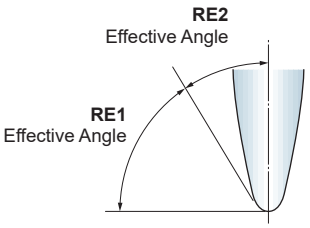
RECOMMENDED CUTTING CONDITIONS

■ Effective Angle

Please refer to the table below for the use of the nose radius (RE1) and tangential form radius (RE2).

(mm)

Order Number	Nose Radius		Tangential Form Radius	
	RE1	Effective Angle	**RE2**	Effective Angle
VQT6URR020R075S08	2	76.6°	75	13.4°
VQT6URR020R085S10	2	74.5°	85	15.5°
VQT6URR030R075S10	3	76.4°	75	13.6°
VQT6URR040R100S12	4	78.3°	100	11.7°



■ Side Milling with the Use of the Tangential Form Radius (RE2)

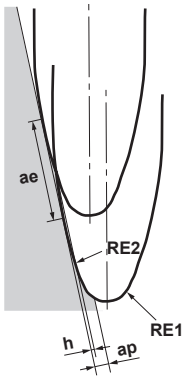
Workpiece Material		Mild Steels (≤180HB) Carbon Steels, Cast Irons (180−280HB)			Austenitic Stainless Steels (≤200HB) Titanium Alloys			Aluminum Alloys (Si<5%)		
DC (mm)	**RE2** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
8	**75**	8000	2400	0.05—0.3	3200	770	0.05—0.3	16000	4800	0.05—0.3
10	**85**	6400	1900	0.05—0.3	2500	600	0.05—0.3	13000	3900	0.05—0.3
10	**75**	6400	1900	0.05—0.3	2500	600	0.05—0.3	13000	3900	0.05—0.3
12	**100**	5300	1600	0.05—0.3	2100	500	0.05—0.3	11000	3300	0.05—0.3

■ Depth of Cut Calculation Table Based on Tangential Form Radius (RE2) and Cusp Height (h)

(mm)

Workpiece Material	**RE2**	Cusp Height **h**	0.0001	0.0003	0.0005	0.0008	0.001	0.003	0.005	0.008
VQT6URR020R075S08	75	Depth of Cut **ap**	0.245	0.424	0.548	0.693	0.775	1.342	1.732	2.191
VQT6URR030R075S10	75		0.245	0.424	0.548	0.693	0.775	1.342	1.732	2.191
VQT6URR020R085S10	85		0.261	0.452	0.583	0.738	0.825	1.428	1.844	2.332
VQT6URR040R100S12	100		0.283	0.49	0.632	0.8	0.894	1.549	2	2.53

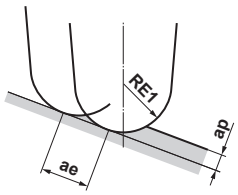
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) It is recommended to use this tool only for finish cutting.
Note 3) The tool contact part differs between the nose radius and tangential form radius depending on machining geometries and tilt angles. Select suitable cutting conditions according to tool contact parts.



■ Milling with the Use of the Nose Radius (RE1)

Workpiece Material		Mild Steels (≤180HB) Carbon Steels, Cast Irons (180−280HB)				Austenitic Stainless Steels (≤200HB) Titanium Alloys				Aluminum Alloys (Si<5%)			
DC (mm)	**RE1** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
8	**2**	16000	2400	0.4	1	6400	580	0.4	1	32000	4800	0.4	1
10	**2**	16000	2400	0.4	1	6400	580	0.4	1	32000	4800	0.4	1
10	**3**	11000	1700	0.6	1.5	4200	380	0.6	1.5	21000	3200	0.6	1.5
12	**4**	8000	1200	0.8	2	3200	290	0.8	2	16000	2400	0.8	2

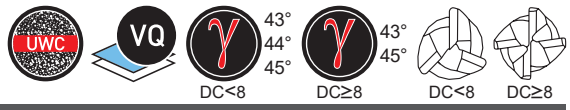
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) It is recommended to use this tool only for finish cutting.
Note 3) The tool contact part differs between the nose radius and tangential form radius depending on machining geometries and tilt angles. Select suitable cutting conditions according to tool contact parts.



ae:Pick Feed

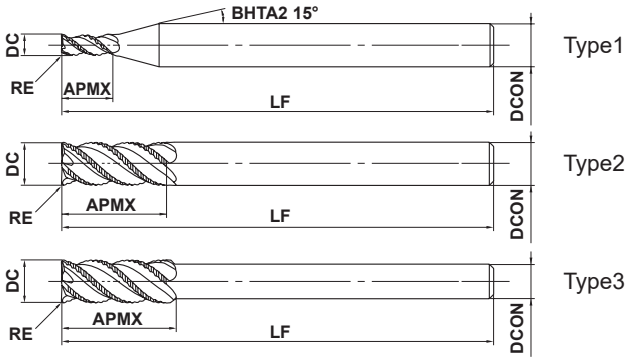
VQSVR

Roughing end mill, Short cut length, 3—4 flute, Irregular helix flutes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎			◎	◎	○	





h6	DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

- Achieving an excellent vibration resistance due to the adoption of irregular helix.
- Use of an asymmetric chip breaker improves fracture resistance substantially. (Compared to a conventional roughing end mill)

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQSVRD0300	3	0.2	6	60	6	3	●	1
VQSVRD0400	4	0.2	8	60	6	3	●	1
VQSVRD0500	5	0.3	10	60	6	3	●	1
VQSVRD0600	6	0.3	12	70	6	3	●	2
VQSVRD0700	7	0.3	17	80	8	3	●	1
VQSVRD0800	8	0.5	17	80	8	4	●	2
VQSVRD0900	9	0.5	22	90	10	4	●	1
VQSVRD1000	10	0.5	22	90	10	4	●	2
VQSVRD1000S08	10	0.5	22	90	8	4	●	3
VQSVRD1200	12	0.5	27	100	12	4	●	2
VQSVRD1200S10	12	0.5	27	100	10	4	●	3
VQSVRD1400	14	0.5	27	130	12	4	●	3
VQSVRD1600	16	0.5	33	125	16	4	●	2
VQSVRD1800	18	0.5	33	150	16	4	●	3
VQSVRD2000	20	0.5	38	140	20	4	●	2

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

● : Inventory maintained in Japan.

Click here for product NEWS ▶

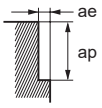
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

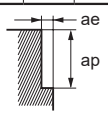
■ Side milling

The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	150	16000	960	4.5	1.5	120	13000	640	4.5	1.5	100	11000	450	4.5	1.5	75	8000	330	4.5	0.9	180	19000	1100	4.5	1.5
4	150	12000	960	6	2	120	9500	640	6	2	100	8000	430	6	2	75	6000	330	6	1.2	180	14000	1100	6	2
5	150	9500	960	7.5	2.5	120	7600	640	7.5	2.5	100	6400	440	7.5	2.5	75	4800	330	7.5	1.5	180	11000	1100	7.5	2.5
6	150	8000	960	9	3	120	6400	680	9	3	100	5300	480	9	3	75	4000	360	9	1.8	180	9500	1100	9	3
7	150	6800	950	10.5	3.5	120	5500	700	10.5	3.5	100	4500	500	10.5	3.5	75	3400	380	10.5	2.1	180	8200	1100	10.5	3.5
8	150	6000	1100	12	4	120	4800	800	12	4	100	4000	570	12	4	75	3000	430	12	2.4	180	7200	1300	12	4
9	150	5300	1100	13.5	4.5	120	4200	760	13.5	4.5	100	3500	570	13.5	4.5	75	2700	430	13.5	2.7	180	6400	1300	13.5	4.5
10	150	4800	1100	15	5	120	3800	760	15	5	100	3200	570	15	5	75	2400	430	15	3	180	5700	1200	15	5
12	150	4000	960	18	6	120	3200	700	18	6	100	2700	540	18	6	75	2000	400	18	3.6	180	4800	1200	18	6
14	150	3400	880	21	7	120	2700	650	21	7	100	2300	510	21	7	75	1700	380	21	4.2	180	4100	1100	21	7
16	150	3000	840	24	8	120	2400	620	24	8	100	2000	500	24	8	75	1500	380	24	4.8	180	3600	1000	24	8
18	150	2700	810	27	9	120	2100	590	27	9	100	1800	500	27	9	75	1300	360	27	5.4	180	3200	960	27	9
20	150	2400	760	30	10	120	1900	560	30	10	100	1600	500	30	10	75	1200	360	30	6	180	2900	920	30	10
Depth of cut																									

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 306, Ti-6Al-4V					Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	120	13000	610	4.5	1.5	100	11000	430	4.5	1.5	80	8500	280	4.5	1.5	70	7400	240	4.5	0.9	140	15000	700	4.5	1.5
4	120	9500	610	6	2	100	8000	430	6	2	80	6400	280	6	2	70	5600	240	6	1.2	140	11000	700	6	2
5	120	7600	610	7.5	2.5	100	6400	430	7.5	2.5	80	5100	280	7.5	2.5	70	4500	250	7.5	1.5	140	8900	720	7.5	2.5
6	120	6400	610	9	3	100	5300	450	9	3	80	4200	300	9	3	70	3700	270	9	1.8	140	7400	720	9	3
7	120	5500	620	10.5	3.5	100	4500	480	10.5	3.5	80	3600	320	10.5	3.5	70	3200	290	10.5	2.1	140	6400	720	10.5	3.5
8	120	4800	720	12	4	100	4000	570	12	4	80	3200	380	12	4	70	2800	340	12	2.4	140	5600	840	12	4
9	120	4200	670	13.5	4.5	100	3500	510	13.5	4.5	80	2800	360	13.5	4.5	70	2500	320	13.5	2.7	140	5000	800	13.5	4.5
10	120	3800	670	15	5	100	3200	510	15	5	80	2500	360	15	5	70	2200	310	15	3	140	4500	790	15	5
12	120	3200	610	18	6	100	2700	470	18	6	80	2100	340	18	6	70	1900	300	18	3.6	140	3700	710	18	6
14	120	2700	560	21	7	100	2300	440	21	7	80	1800	320	21	7	70	1600	280	21	4.2	140	3200	670	21	7
16	120	2400	540	24	8	100	2000	410	24	8	80	1600	320	24	8	70	1400	280	24	4.8	140	2800	630	24	8
18	120	2100	500	27	9	100	1800	400	27	9	80	1400	310	27	9	70	1200	270	27	5.4	140	2500	600	27	9
20	120	1900	480	30	10	100	1600	380	30	10	80	1300	310	30	10	70	1100	270	30	6	140	2200	560	30	10
Depth of cut																									

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQSVR

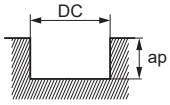
Roughing end mill, Short cut length, 3—4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■Slotting

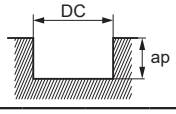
The rigidity of the machine or workpiece and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece or chip discharge is insufficient at general-purpose conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 306, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH				Copper, Copper alloy			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
3	120	13000	720	3	100	11000	440	3	80	8500	340	3	60	6400	250	1.5	150	16000	890	3
4	120	9500	720	4	100	8000	450	4	80	6400	340	4	60	4800	250	2	150	12000	900	4
5	120	7600	720	5	100	6400	460	5	80	5100	300	5	60	3800	230	2.5	150	9500	900	5
6	120	6400	720	6	100	5300	460	6	80	4200	310	6	60	3200	240	3	150	8000	900	6
7	120	5500	730	7	100	4500	470	7	80	3600	330	7	60	2700	250	3.5	150	6800	950	7
8	120	4800	840	8	100	4000	560	8	80	3200	400	8	60	2400	300	4	150	6000	1100	8
9	120	4200	810	9	100	3500	540	9	80	2800	350	9	60	2100	260	4.5	150	5300	1000	9
10	120	3800	800	10	100	3200	520	10	80	2500	340	10	60	1900	260	5	150	4800	1000	10
12	120	3200	750	12	100	2700	480	12	80	2100	340	12	60	1600	260	6	150	4000	940	12
14	120	2700	670	14	100	2300	420	14	80	1800	300	14	60	1400	240	7	150	3400	840	14
16	120	2400	620	16	100	2000	380	16	80	1600	290	16	60	1200	220	8	150	3000	780	16
18	120	2100	570	18	100	1800	380	18	80	1400	260	18	60	1100	210	9	150	2700	730	18
20	120	1900	540	20	100	1600	350	20	80	1300	260	20	60	950	190	10	150	2400	680	20
Depth of cut																				

DC:Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340				Austenitic, Ferritic and Martensitic stainless steels, Titanium alloys AISI 304, AISI 306, Ti-6Al-4V				Hardened stainless steels, Cobaly chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH				Copper, Copper alloy			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap (mm)
3	100	11000	490	3	80	8500	300	3	60	6400	200	3	50	5300	170	1.5	120	13000	580	3
4	100	8000	490	4	80	6400	310	4	60	4800	200	4	50	4000	170	2	120	9500	580	4
5	100	6400	490	5	80	5100	310	5	60	3800	200	5	50	3200	170	2.5	120	7600	580	5
6	100	5300	490	6	80	4200	310	6	60	3200	200	6	50	2700	170	3	120	6400	580	6
7	100	4500	500	7	80	3600	320	7	60	2700	200	7	50	2300	170	3.5	120	5500	620	7
8	100	4000	600	8	80	3200	380	8	60	2400	240	8	50	2000	200	4	120	4800	720	8
9	100	3500	540	9	80	2800	330	9	60	2100	210	9	50	1800	180	4.5	120	4200	650	9
10	100	3200	540	10	80	2500	330	10	60	1900	210	10	50	1600	180	5	120	3800	640	10
12	100	2700	510	12	80	2100	320	12	60	1600	210	12	50	1300	170	6	120	3200	600	12
14	100	2300	460	14	80	1800	300	14	60	1400	190	14	50	1100	150	7	120	2700	540	14
16	100	2000	410	16	80	1600	290	16	60	1200	170	16	50	990	140	8	120	2400	500	16
18	100	1800	390	18	80	1400	260	18	60	1100	170	18	50	880	130	9	120	2100	460	18
20	100	1600	360	20	80	1300	260	20	60	950	150	20	50	800	130	10	120	1900	430	20
Depth of cut																				

DC:Dia.

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloys and heat-resistant alloys etc. can be achieved with the use of emulsion.
Note 3) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.
Note 4) Finishing at a faster feedrate is possible when the depth of cut is small.

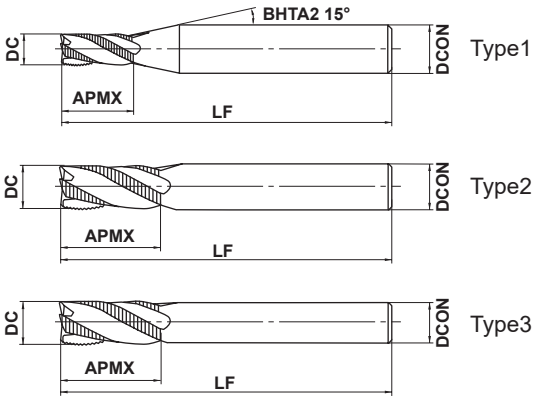
VFSFPR

Roughing end mill, Short cut length, 3—4 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		





h6	DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

● Impact Miracle roughing end mills for a wide range of workpiece materials from carbon and alloy steel through to difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRD0300	3	6	50	6	3	●	1
VFSFPRD0400	4	8	50	6	3	●	1
VFSFPRD0500	5	10	50	6	3	●	1
VFSFPRD0600	6	12	50	6	3	●	2
VFSFPRD0700	7	17	60	8	3	●	1
VFSFPRD0800	8	17	60	8	4	●	2
VFSFPRD0900	9	22	70	10	4	●	1
VFSFPRD1000	10	22	70	10	4	●	2
VFSFPRD1000S08	10	22	90	8	4	●	3
VFSFPRD1200	12	27	75	12	4	●	2
VFSFPRD1200S10	12	27	100	10	4	●	3
VFSFPRD1400	14	27	75	12	4	●	3
VFSFPRD1600	16	33	90	16	4	●	2
VFSFPRD1800	18	33	90	16	4	●	3
VFSFPRD2000	20	38	100	20	4	●	2

● : **Inventory maintained in Japan.**

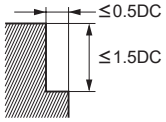
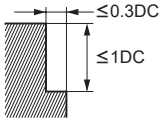
Click here for product NEWS ▶

VFSFPR

Roughing end mill, Short cut length, 3—4 flute

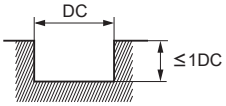
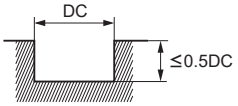
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45—55HRC) AISI H13		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	16000	960	13000	640	6400	260	5300	320	4200	70
4	12000	960	9500	640	4800	260	4000	320	3200	70
5	9500	960	7600	640	3800	260	3200	320	2500	70
6	8000	960	6400	680	3200	290	2700	340	2100	75
8	6000	1050	4800	760	2400	340	2000	400	1600	95
10	4800	1050	3800	760	1900	340	1600	400	1300	105
12	4000	960	3200	700	1600	320	1300	400	1100	110
16	3000	840	2400	620	1200	300	1000	360	800	110
20	2400	760	1900	560	1000	300	800	320	600	100
Depth of cut										

DC:Dia.

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45—55HRC) AISI H13		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	13000	720	11000	480	4800	190	3200	190	2100	25
4	9500	720	8000	480	3600	190	2400	190	1600	25
5	7600	720	6400	480	3200	190	1900	190	1300	25
6	6400	720	5300	480	2700	200	1600	200	1100	30
8	4800	800	4000	520	2000	220	1200	220	800	35
10	3800	800	3200	520	1600	220	1000	220	600	35
12	3200	750	2700	520	1300	210	800	210	500	40
16	2400	620	2000	450	1000	180	600	180	400	45
20	1900	540	1600	400	800	160	500	160	300	40
Depth of cut										

DC:Dia.

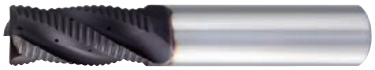
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

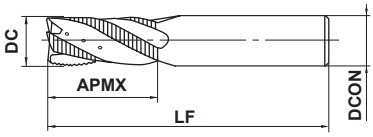
VFSFPRCH

Roughing end mill, Short cut length, 4 flute, with multiple internal through coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





Type1

DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

●Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRCHD1600	16	33	90	16	4	▲	1
VFSFPRCHD2000	20	38	100	20	4	▲	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	840	2400	620	1200	300	800	110
20	2400	760	1900	560	1000	300	600	100
Depth of cut	≤0.5DC 0.5DC−1.5DC						≤0.3DC 0.5DC−1.0DC	

DC:Dia.

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	2400	620	2000	450	800	100
20	1900	540	1600	400	600	80
Depth of cut	DC 0.5DC−1.0DC					

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

▲: Inventory maintained in Japan.
To be replaced by new products.

Click here for product NEWS ▶

ISO13399 ➤ J002

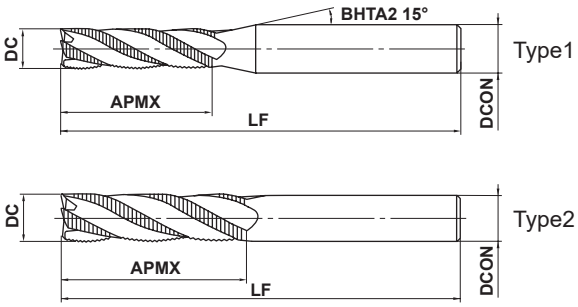
VFMFPR

Roughing end mill, Medium cut length, 4 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		





h6	DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

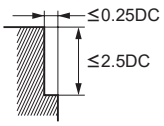
● Impact Miracle roughing end mills suitable for the machining of deep walled components.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMFPRD0500	5	15	60	6	4	●	1
VFMFPRD0600	6	17	60	6	4	●	2
VFMFPRD0700	7	22	75	8	4	●	1
VFMFPRD0800	8	28	75	8	4	●	2
VFMFPRD0900	9	28	100	10	4	●	1
VFMFPRD1000	10	34	100	10	4	●	2
VFMFPRD1200	12	40	110	12	4	●	2
VFMFPRD1600	16	48	125	16	4	●	2
VFMFPRD2000	20	57	140	20	4	●	2

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	3800	360	3200	290	2500	150	2500	150	1900	50
6	3200	360	2700	290	2100	160	2100	160	1600	60
8	2400	450	2000	360	1600	160	1600	160	1200	70
10	1900	450	1600	360	1300	180	1300	180	1000	75
12	1600	400	1300	320	1100	180	1100	180	800	80
16	1200	360	1000	290	800	160	800	160	600	80
20	1000	340	800	270	600	150	600	150	500	80
Depth of cut	 ≤0.25DC, ≤2.5DC									

DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Click here for product NEWS ▶

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.

ISO13399 ➤ J002

VF6SVRCH

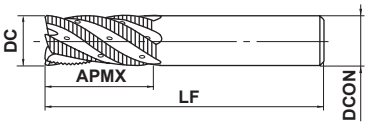
Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes

28.5°
30°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
○	○			◎	◎		

CoolStar
END MILLS





Type1

h6	DCON=16	DCON=20			
	0 - 0.011	0 - 0.013			

●Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6SVRCHD1600	16	33	90	16	6	▲	1
VF6SVRCHD2000	20	38	100	20	6	▲	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Heat resistant alloys Inconel718	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
16	3000	1500	2400	1200	800	160
20	2400	1200	2000	1000	640	140
Depth of cut	≤0.3DC 0.5DC—1.5DC				≤0.2DC 0.5DC—1.5DC	

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration damping end mills are more effective in suppressing chatter and vibration compared to general end mills, but these may still occur if the rigidity of the machine or the workpiece material is low. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

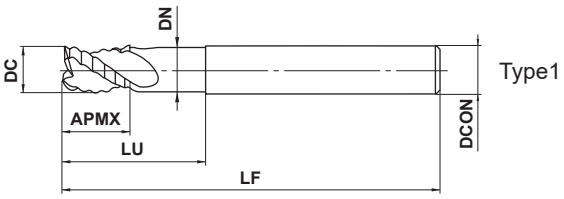
CSRA

Roughing end mill, Short cut length, 3 flute, For aluminium alloy

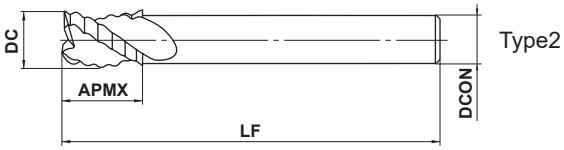
UWC γ 37.5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

h6

DCON=10	12≤DCON≤16	20≤DCON≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

●3 flute uncoated end mill for roughing aluminium alloy.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CSRAD1000	10	12	25	9.4	75	10	3	●	1
CSRAD1200	12	15	30	11.4	75	12	3	●	1
CSRAD1600	16	18	35	15.4	100	16	3	●	1
CSRAD1800	18	22	—	—	100	16	3	●	2
CSRAD2000	20	25	50	18.0	125	20	3	●	1
CSRAD2200	22	25	—	—	125	20	3	●	2
CSRAD2500	25	30	60	23.0	125	25	3	●	1

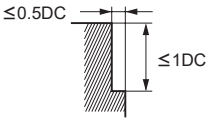
● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

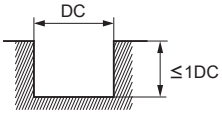
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	19000	8600	9500	3400
12	16000	8200	8000	3200
16	12000	7600	6000	3100
18	10500	7200	5300	2900
20	9500	7100	4800	2900
22	8500	6900	4300	2800
25	7500	6800	3800	2700
Depth of cut	 DC:Dia.			

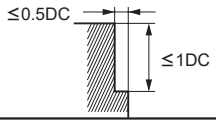
■ Slotting

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	19000	6800	9500	2700
12	16000	6500	8000	2600
16	12000	6100	6000	2400
18	10500	5800	5300	2400
20	9500	5700	4800	2300
22	8500	5500	4300	2200
25	7500	5400	3800	2200
Depth of cut	 DC:Dia.			

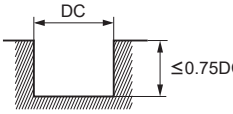
Note 1) Water-soluble cutting fluid is recommended.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Climb cutting is recommended for side milling.
Note 4) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

Using a high-speed and high-rigidity machining center

■ Side milling

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	30000	11000	19000	5400
12	30000	12000	16000	5300
16	24000	12000	12000	4900
18	21000	12000	10500	4700
20	19000	11000	9500	4600
22	17000	11000	8500	4300
25	15000	11000	7500	4300
Depth of cut	 DC:Dia.			

■ Slotting

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
10	30000	8600	19000	4300
12	30000	9900	16000	4300
16	24000	9700	12000	4000
18	21000	9500	10500	3800
20	19000	9100	9500	3700
22	17000	8700	8500	3400
25	15000	8600	7500	3400
Depth of cut	 DC:Dia.			

Note 1) Water-soluble cutting fluid is recommended.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Climb cutting is recommended for side milling.
Note 4) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

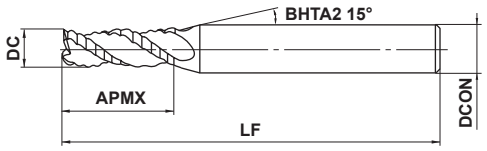
CMRA

Roughing end mill, Medium cut length, 3 flute, For aluminium alloy

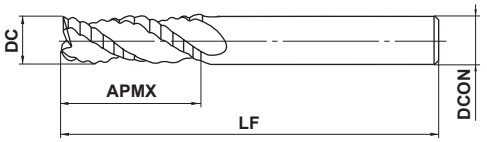
UWC γ 37.5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

h6

DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

●3 flute uncoated end mill for roughing aluminium alloy.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
CMRAD0300	3	8	50	6	3	●	1
CMRAD0400	4	11	50	6	3	●	1
CMRAD0500	5	13	50	6	3	●	1
CMRAD0600	6	13	50	6	3	●	2
CMRAD0800	8	19	60	8	3	●	2
CMRAD1000	10	22	75	10	3	●	2
CMRAD1200	12	26	75	12	3	●	2
CMRAD1600	16	32	100	16	3	●	2
CMRAD2000	20	38	125	20	3	●	2
CMRAD2500	25	45	125	25	3	●	2

● : Inventory maintained in Japan.

Click here for product NEWS ▶

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	40000	2700	25000	1100
4	36000	2700	20000	1100
5	30000	5400	16000	2200
6	27000	6100	13000	2300
8	20000	6000	10000	2400
10	16000	5800	8000	2300
12	13000	5300	6500	2100
16	10000	5100	5000	2000
20	8000	4800	4000	1900
25	6400	4600	3200	1800
Depth of cut	≤0.25DC, ≤1.5DC, DC:Dia.			

■ Slotting

Workpiece Material	Aluminium alloy		Aluminium alloy casting	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	30000	1800	16000	700
4	24000	2200	12000	900
5	19000	2300	10000	900
6	16000	2400	8000	1000
8	12000	2500	6000	1000
10	9500	2600	5000	1100
12	8000	2300	4000	900
16	6000	2100	3000	800
20	4800	2000	2400	800
25	3800	2000	1900	700
DCepth of cut	DC, ≤1DC, DC:Dia.			

Note 1) Water-soluble cutting fluid is recommended.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Climb cutting is recommended for side milling.
Note 4) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.
Note 5) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

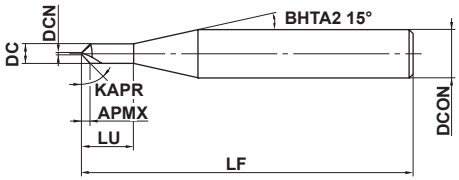
VC2C

Chamfer cutter, 2 flute

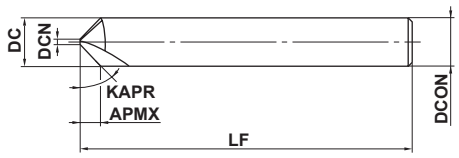


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	○		◎	◎	○	○





Type1



Type2



DCN				
±0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		



●Chamfering cutters for machining of hardened steel and difficult-to-cut materials.

(mm)

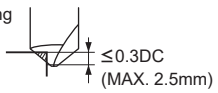
Order Number	DC	DCN	APMX	KAPR	LU	LF	DCON	No. of Flutes	Stock	Type
VC2CD0200	2	0.3	0.85	45°	6	50	6	2	●	1
VC2CD0400	4	0.3	1.85	45°	12	50	6	2	●	1
VC2CD0600	6	0.3	2.85	45°	—	50	6	2	●	2
VC2CD0800	8	0.4	3.8	45°	—	60	8	2	●	2
VC2CD1000	10	0.5	4.75	45°	—	70	10	2	●	2
VC2CD1200	12	0.5	5.75	45°	—	75	12	2	●	2

RECOMMENDED CUTTING CONDITIONS

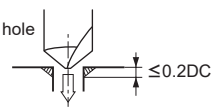
Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21		Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		Hardened steel (45−55HRC) AISI H13	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
2	16000	960	11000	590	9500	460	8000	320
4	8000	480	5600	300	4800	230	4000	160
6	5300	320	3700	200	3200	150	2700	110
8	4000	240	2800	150	2400	120	2000	80
10	3200	190	2200	120	1900	90	1600	60
12	2700	160	1900	100	1600	80	1300	50

Depth of cut

Chamfering



Chamfering of hole



DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

● : **Inventory maintained in Japan.**

Click here for product NEWS ▶

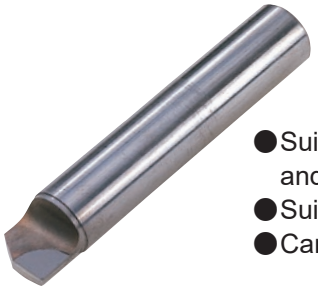


ISO13399 ➤ J002

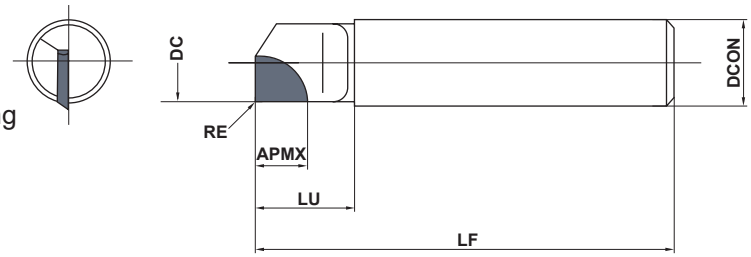
GBE

CBN end mill, Single flute

Light Alloy	Cast Iron	Carbon Steel • Alloy Steel	Stainless Steel	Hardened Steel
				◎



- Suitable for shoulder milling and die machining.
- Suitable for re-grinding.
- Carbide shank.



Right hand tool holder only.

Order Number	Number of Flutes	Stock	Dimensions (mm)					
		MB730	DC	RE	LF	DCON	LU	APMX
GBE06S0640	1	●	6	0.5	40	6	8	3.5
GBE08S0845	1	●	8	0.5	45	8	13	6
GBE10S1050	1	●	10	0.5	50	10	13	6
GBE12S1255	1	●	12	0.5	55	12	13	6

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
H	Hardened Steel	45–68HRC	**MB730**	140 (80–200)	0.08 (0.02–0.15)	≤0.5
	Hardened Steel	45–68HRC	**MB730**	100 (60–150)	0.06 (0.02–0.10)	≤0.5

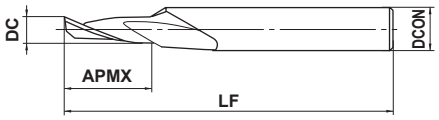
1MA

End mill, Medium cut length, 1 flute

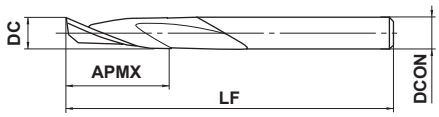


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

3≤DC≤8				
0 - 0.050				

●Single flute end mill for aluminium channel and wood working.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
1MAD0300	3	10	60	8	1	●	1
1MAD0400	4	12	60	8	1	●	1
1MAD0500	5	15	65	8	1	●	1
1MAD0600	6	15	65	8	1	●	1
1MAD0800	8	20	75	8	1	●	2

● : Inventory maintained in Japan.

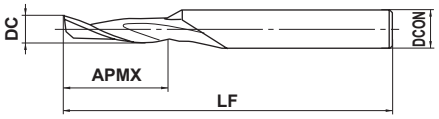
1LA

End mill, Long cut length, 1 flute

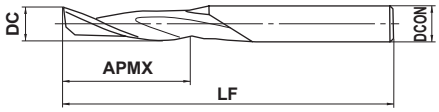


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎





Type1



Type2

4≤DC≤12				
0 - 0.050				

●Single flute end mill with longer cut length and overall length than standard for deeper machining.

(mm)

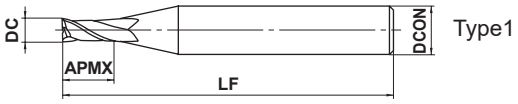
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
1LAD0400	4	18	70	8	1	●	1
1LAD0500	5	20	70	8	1	●	1
1LAD0600	6	20	70	8	1	●	1
1LAD0800	8	30	80	8	1	●	2
1LAD1000	10	35	90	10	1	●	2
1LAD1200	12	45	100	12	1	●	2

VA2SS

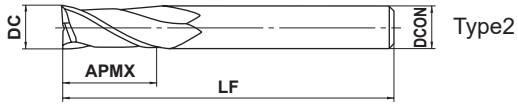
End mill, Short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		





Type1



Type2

3≤DC≤20				
0 - 0.030				

●2 flute end mill with high grade HSS substrate and Violet coating for general use.

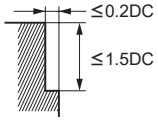
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VA2SSD0300	3	8	50	6	2	●	1
VA2SSD0400	4	8	60	8	2	●	1
VA2SSD0500	5	10	60	8	2	●	1
VA2SSD0600	6	12	60	8	2	●	1
VA2SSD0700	7	15	65	10	2	●	1
VA2SSD0800	8	15	65	10	2	●	1
VA2SSD0900	9	20	75	10	2	●	1
VA2SSD1000	10	20	75	12	2	●	1
VA2SSD1100	11	22	85	12	2	●	1
VA2SSD1200	12	22	85	12	2	●	2
VA2SSD1400	14	26	95	16	2	●	1
VA2SSD1600	16	32	100	16	2	●	2
VA2SSD2000	20	38	120	20	2	●	2

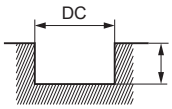
● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	5400	170	4000	125	2700	85	2200	65
4	4300	200	3200	150	2100	100	1800	75
5	3600	210	2700	160	1800	105	1500	80
6	3200	220	2400	165	1600	110	1300	85
8	2400	240	1800	180	1200	120	1000	90
10	1900	260	1400	190	950	130	800	100
12	1600	240	1200	180	800	120	660	90
16	1200	210	900	160	600	105	500	80
20	950	180	720	135	480	90	400	70
Depth of cut	 DC:Dia.							

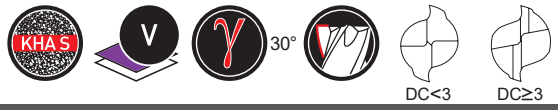
■ Slotting

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	3700	110	3000	95	2100	65	1600	50
4	3200	140	2800	130	1800	75	1400	60
5	2900	160	2400	145	1500	80	1200	60
6	2600	170	2100	150	1300	85	1000	70
8	2000	190	1600	160	1000	90	800	70
10	1600	210	1300	180	800	100	640	80
12	1300	190	1100	165	660	90	530	70
16	1000	170	800	140	500	80	400	65
20	720	130	640	120	400	70	320	55
Depth of cut	 DC:Dia.							

Note 1) Supply cutting fluid sufficiently during slotting. When dry cut, slotting decrease the revolution and feed rate by 20—30% proportionately.
Note 2) When drilling, please set the feed rate at 1/3 or below of the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

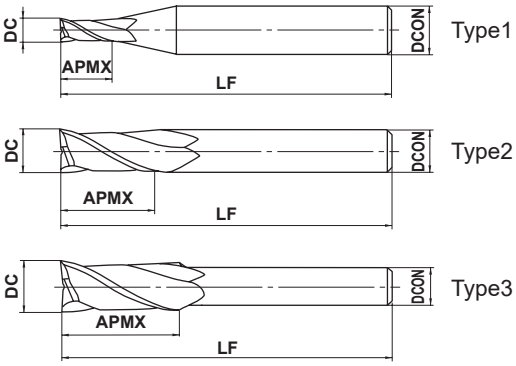
VA2MS

End mill, Medium cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		





DC≤20	DC>20			
0 - 0.030	0 - 0.040			

●2 flute end mill with high grade HSS substrate and Violet coating for general use.

(mm)

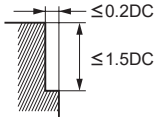
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VA2MSD0300	3	10	50	6	2	●	1
VA2MSD0400	4	12	60	8	2	●	1
VA2MSD0500	5	15	60	8	2	●	1
VA2MSD0600	6	15	60	8	2	●	1
VA2MSD0700	7	20	65	10	2	●	1
VA2MSD0800	8	20	65	10	2	●	1
VA2MSD0900	9	25	75	10	2	●	1
VA2MSD1000	10	25	75	10	2	●	2
VA2MSD1100	11	30	85	12	2	●	1
VA2MSD1200	12	30	85	12	2	●	2
VA2MSD1300	13	35	90	12	2	●	3
VA2MSD1400	14	35	95	16	2	●	1
VA2MSD1500	15	40	100	16	2	●	1
VA2MSD1600	16	40	100	16	2	●	2
VA2MSD1700	17	40	100	16	2	●	3
VA2MSD1800	18	40	100	16	2	●	3
VA2MSD2000	20	45	120	20	2	●	2
VA2MSD2200	22	45	120	20	2	●	3

● : Inventory maintained in Japan.

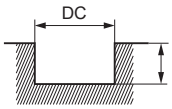
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	5400	170	4000	125	2700	85	2200	65
4	4300	200	3200	150	2100	100	1800	75
5	3600	210	2700	160	1800	105	1500	80
6	3200	220	2400	165	1600	110	1300	85
8	2400	240	1800	180	1200	120	1000	90
10	1900	260	1400	190	950	130	800	100
12	1600	240	1200	180	800	120	660	90
16	1200	210	900	160	600	105	500	80
20	950	180	720	135	480	90	400	70
Depth of cut	 DC:Dia.							

■ Slotting

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	3700	110	3000	95	2100	65	1600	50
4	3200	140	2800	130	1800	75	1400	60
5	2900	160	2400	145	1500	80	1200	60
6	2600	170	2100	150	1300	85	1000	70
8	2000	190	1600	160	1000	90	800	70
10	1600	210	1300	180	800	100	640	80
12	1300	190	1100	165	660	90	530	70
16	1000	170	800	140	500	80	400	65
20	720	130	640	120	400	70	320	55
Depth of cut	 DC:Dia.							

Note 1) Supply cutting fluid sufficiently during slotting. When dry cut, slotting decrease the revolution and feed rate by 20—30% proportionately.
Note 2) When drilling, please set the feed rate at 1/3 or below of the values above.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

SOLID END MILLS

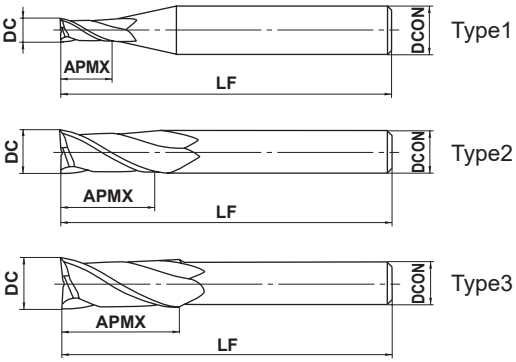
2SS

End mill, Short cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





DC≤3	DC>3			
0 - 0.020	0 - 0.030			

●2 flute HSS end mill with rigid design.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
2SSD0050	0.5	0.8	50	6	2	●	1
2SSD0100	1	2	50	6	2	●	1
2SSD0150	1.5	3.5	50	6	2	●	1
2SSD0200	2	5	50	6	2	●	1
2SSD0250	2.5	6	50	6	2	●	1
2SSD0300	3	8	50	6	2	●	1
2SSD0350	3.5	8	60	8	2	●	1
2SSD0400	4	8	60	8	2	●	1
2SSD0450	4.5	10	60	8	2	●	1
2SSD0500	5	10	60	8	2	●	1
2SSD0550	5.5	12	60	8	2	●	1
2SSD0600	6	12	60	8	2	●	1
2SSD0650	6.5	15	65	10	2	●	1
2SSD0700	7	15	65	10	2	●	1
2SSD0750	7.5	15	65	10	2	●	1
2SSD0800	8	15	65	10	2	●	1
2SSD0850	8.5	20	75	10	2	●	1
2SSD0900	9	20	75	10	2	●	1
2SSD0950S10	9.5	20	75	10	2	●	1
2SSD1000S10	10	20	75	10	2	●	2
2SSD1000S12	10	20	75	12	2	●	1
2SSD1100	11	22	85	12	2	●	1
2SSD1200	12	22	85	12	2	●	2
2SSD1300	13	26	90	12	2	●	3
2SSD1400	14	26	90	16	2	●	1
2SSD1500	15	30	100	16	2	●	1
2SSD1600	16	32	100	16	2	●	2
2SSD2000	20	38	115	20	2	●	2

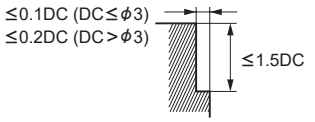
● : Inventory maintained in Japan.

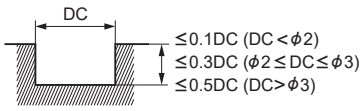
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural steel, Carbon steel AISI 1045, AISI 1050		Carbon steel, Alloy steel (20−30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30−35HRC) AISI H13		Austenitic stainless steel AISI 304, AISI 316		Cast iron AISI No 35 B		Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
0.5	8000	60 (50)	7000	40 (35)	4500	30 (25)	3500	25 (20)	7500	65 (55)	16000	120 (100)
1	5300	80 (65)	4200	50 (40)	3000	35 (30)	2400	27 (22)	4500	85 (70)	11000	170 (140)
2	3100	85 (70)	2600	60 (50)	1800	50 (40)	1400	30 (25)	2700	90 (75)	6800	190 (150)
3	2300	90 (75)	1800	65 (55)	1400	55 (45)	1100	35 (30)	2000	95 (80)	4800	240 (190)
4	1800	100 (85)	1400	70 (60)	1100	55 (45)	850	35 (30)	1600	110 (90)	3800	310 (250)
5	1600	110 (95)	1200	90 (75)	900	60 (50)	710	40 (35)	1300	120 (100)	3200	360 (290)
6	1400	120 (100)	1000	90 (75)	780	65 (55)	610	50 (40)	1100	130 (110)	2800	400 (320)
8	1100	130 (110)	800	95 (80)	580	65 (55)	470	50 (40)	850	140 (120)	2200	460 (370)
10	860	140 (120)	640	100 (80)	470	65 (55)	380	55 (45)	700	160 (130)	1800	440 (350)
12	720	130 (110)	530	95 (80)	390	60 (50)	310	50 (40)	580	140 (120)	1600	420 (340)
16	540	110 (95)	400	85 (70)	300	55 (45)	230	40 (35)	440	120 (100)	1200	350 (280)
20	430	100 (80)	320	70 (60)	240	45 (38)	190	35 (30)	350	100 (85)	960	300 (240)

Depth of cut





DC:Dia.

( ) : Indicates standard feed rate for slotting.

Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

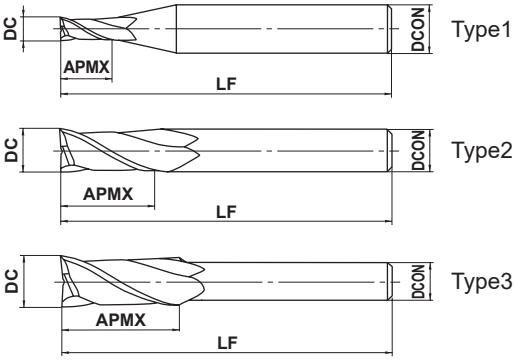
2MS

End mill, Medium cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





DC≤3	3<DC≤20	DC>20		
0 - 0.020	0 - 0.030	0 - 0.040		

●2 flute end mill with high grade HSS substrate for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
2MSD0100	1	3	50	6	2	●	1
2MSD0150	1.5	4.5	50	6	2	●	1
2MSD0200	2	6	50	6	2	●	1
2MSD0250	2.5	7.5	50	6	2	●	1
2MSD0300	3	10	50	6	2	●	1
2MSD0350	3.5	12	50	6	2	●	1
2MSD0400	4	12	50	6	2	●	1
2MSD0450	4.5	15	55	6	2	●	1
2MSD0500	5	15	55	6	2	●	1
2MSD0550	5.5	15	55	6	2	●	1
2MSD0600	6	15	55	6	2	●	2
2MSD0650	6.5	20	65	8	2	●	1
2MSD0700	7	20	65	8	2	●	1
2MSD0750	7.5	20	65	8	2	●	1
2MSD0800	8	20	65	8	2	●	2
2MSD0850	8.5	25	75	10	2	●	1
2MSD0900	9	25	75	10	2	●	1
2MSD0950	9.5	25	75	10	2	●	1
2MSD1000	10	25	75	10	2	●	2
2MSD1100	11	30	85	12	2	●	1
2MSD1200	12	30	85	12	2	●	2
2MSD1300	13	35	90	12	2	●	3
2MSD1400	14	35	95	16	2	●	1
2MSD1500	15	40	100	16	2	●	1
2MSD1600	16	40	100	16	2	●	2
2MSD1700	17	40	100	16	2	●	3
2MSD1800	18	40	100	16	2	●	3
2MSD1900	19	45	115	20	2	●	1
2MSD2000	20	45	115	20	2	●	2
2MSD2100	21	45	115	20	2	●	3
2MSD2200	22	45	115	20	2	●	3
2MSD2300	23	50	120	25	2	●	1
2MSD2400	24	50	120	25	2	●	1
2MSD2500	25	50	120	25	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
2MSD2600	26	50	120	25	2	●	3
2MSD2800	28	55	125	25	2	●	3
2MSD3000	30	55	125	25	2	●	3
2MSD3200	32	60	145	32	2	●	2

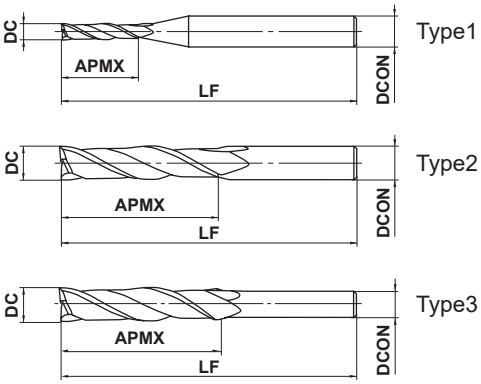
2LS

End mill, Long cut length, 2 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





DC≤3	3<DC≤20	DC>20		
0 - 0.020	0 - 0.030	0 - 0.040		

●2 flute end mill with high grade HSS substrate for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
2LSD0100	1	6	50	6	2	●	1
2LSD0150	1.5	7.5	50	6	2	●	1
2LSD0200	2	10	55	6	2	●	1
2LSD0250	2.5	15	55	6	2	●	1
2LSD0300	3	15	55	6	2	●	1
2LSD0350	3.5	15	55	6	2	●	1
2LSD0400	4	20	55	6	2	●	1
2LSD0450	4.5	20	55	6	2	●	1
2LSD0500	5	25	60	6	2	●	1
2LSD0550	5.5	25	60	6	2	●	1
2LSD0600	6	25	60	6	2	●	2
2LSD0700	7	35	75	8	2	●	1
2LSD0800	8	35	75	8	2	●	2
2LSD0900	9	45	90	10	2	●	1
2LSD1000	10	45	90	10	2	●	2
2LSD1100	11	55	105	12	2	●	1
2LSD1200	12	55	105	12	2	●	2
2LSD1300	13	55	105	12	2	●	3
2LSD1400	14	55	110	16	2	●	1
2LSD1500	15	65	120	16	2	●	1
2LSD1600	16	65	120	16	2	●	2
2LSD1800	18	65	120	16	2	●	3
2LSD2000	20	75	140	20	2	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

2MS
End mill, Medium cut length, 2 flute

2LS
End mill, Long cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS(2MS)

Workpiece Material	Structural steel, Carbon steel AISI 1045, AISI 1050		Carbon steel, Alloy steel (20−30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30−35HRC) AISI H13		Austenitic stainless steel AISI 304, AISI 316		Cast iron AISI No 35 B		Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	5300	65 (50)	4200	40 (30)	3000	30 (25)	2400	22 (18)	4500	70 (55)	11000	140 (110)
2	3100	70 (55)	2600	50 (40)	1800	40 (30)	1400	25 (20)	2700	75 (60)	6800	160 (130)
3	2300	75 (60)	1800	55 (45)	1400	45 (35)	1100	30 (25)	2000	80 (65)	4800	200 (160)
4	1800	85 (70)	1400	60 (50)	1100	45 (35)	850	30 (25)	1600	90 (70)	3800	260 (210)
5	1600	95 (75)	1200	75 (60)	900	50 (40)	710	35 (25)	1300	100 (80)	3200	300 (240)
6	1400	100 (80)	1000	75 (60)	780	55 (45)	610	40 (30)	1100	110 (90)	2800	330 (260)
8	1100	110 (90)	800	80 (65)	580	55 (45)	470	40 (30)	850	115 (90)	2200	380 (300)
10	860	120 (95)	640	85 (70)	470	55 (45)	380	45 (35)	700	130 (105)	1800	360 (290)
12	720	110 (90)	530	80 (65)	390	50 (40)	310	40 (30)	580	115 (90)	1600	350 (280)
16	540	95 (75)	400	75 (60)	300	45 (35)	230	35 (28)	440	100 (80)	1200	290 (230)
20	430	80 (65)	320	60 (50)	240	38 (30)	190	30 (25)	350	85 (70)	960	250 (200)

Depth of cut



DC:Dia.

( ) : Indicates standard feed rate for slotting.

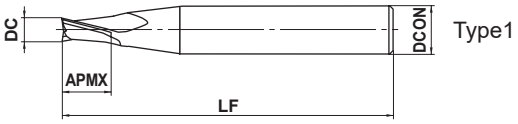
Note 1) Decrease the revolution by 20−30% and the feed rate by 40−50% for 2LS.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

2MK

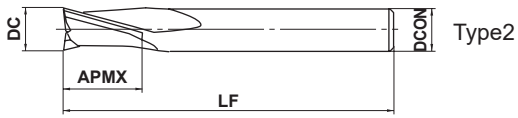
End mill, Short cut length, 2 flute, For key ways

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○			○





Type1



Type2

2MKP	2MKN	2MKNN		
+ 0.02 0	0 - 0.02	- 0.02 - 0.04		

●2 flute end mill for NN (JIS) standards and plus or minus tolerance diameters.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
2MKPD0300	3	5	50	6	2	●	1
2MKPD0400	4	6	60	8	2	●	1
2MKPD0500	5	8	60	8	2	●	1
2MKPD0600	6	8	60	8	2	●	1
2MKPD0700	7	10	65	10	2	●	1
2MKPD0800	8	10	65	10	2	●	1
2MKPD1000	10	15	75	12	2	●	1
2MKPD1200	12	18	75	12	2	●	2
2MKNND0300	3	5	50	6	2	●	1
2MKNND0400	4	6	60	8	2	●	1
2MKNND0500	5	8	60	8	2	●	1
2MKNND0600	6	8	60	8	2	●	1
2MKNND0700	7	10	65	10	2	●	1
2MKNND0800	8	10	65	10	2	●	1
2MKNND1000	10	15	75	12	2	●	1
2MKNND1200	12	18	75	12	2	●	2
2MKND0300	3	5	50	6	2	●	1
2MKND0400	4	6	60	8	2	●	1
2MKND0500	5	8	60	8	2	●	1
2MKND0600	6	8	60	8	2	●	1
2MKND0700	7	10	65	10	2	●	1
2MKND0800	8	10	65	10	2	●	1
2MKND1000	10	15	75	12	2	●	1
2MKND1200	12	18	75	12	2	●	2

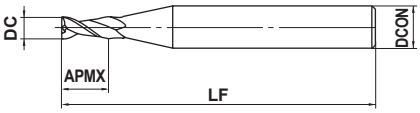
● : Inventory maintained in Japan.

S2SDA

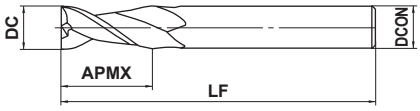
End mill, Short cut length, 2 flute, For aluminium alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
						○	◎





Type1



Type2

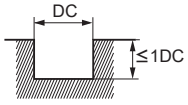
DC=3	DC>3			
0 - 0.020	0 - 0.030			

●2 flute end mill for aluminium alloy and soft materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
S2SDAD0300	3	8	50	6	2	●	1
S2SDAD0400	4	8	60	8	2	●	1
S2SDAD0500	5	10	60	8	2	●	1
S2SDAD0600	6	12	60	8	2	●	1
S2SDAD0800	8	15	65	10	2	●	1
S2SDAD1000	10	20	75	10	2	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Cast aluminium, Rolled aluminium, Magnesium alloy resin AC, ADC, A5052, A7075	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)
3	8200	410
4	6500	530
6	4800	680
8	3800	780
10	3200	750
Depth of cut	 DC:Dia.	

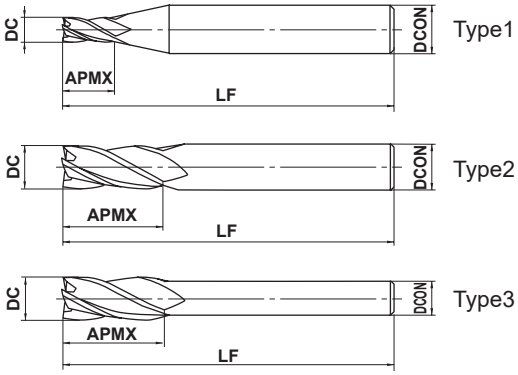
Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VA4MC

End mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		





DC≤20	DC>20			
0 +0.030	0 +0.040			

●4 flute end mill with high grade HSS substrate and Violet coating for general use.

(mm)

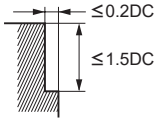
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VA4MCD0300	3	10	50	6	4	●	1
VA4MCD0400	4	12	60	8	4	●	1
VA4MCD0500	5	15	60	8	4	●	1
VA4MCD0600	6	15	60	8	4	●	1
VA4MCD0700	7	20	65	10	4	●	1
VA4MCD0800	8	20	65	10	4	●	1
VA4MCD0900	9	25	75	10	4	●	1
VA4MCD1000	10	25	75	10	4	●	2
VA4MCD1100	11	30	85	12	4	●	1
VA4MCD1200	12	30	85	12	4	●	2
VA4MCD1300	13	35	90	12	4	●	3
VA4MCD1400	14	35	95	16	4	●	1
VA4MCD1500	15	40	100	16	4	●	1
VA4MCD1600	16	40	100	16	4	●	2
VA4MCD1700	17	40	100	16	4	●	3
VA4MCD1800	18	40	100	16	4	●	3
VA4MCD2000	20	45	115	20	4	●	2
VA4MCD2200	22	45	115	20	4	●	3
VA4MCD2500	25	50	120	25	4	●	2

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20−30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30−35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35−40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	5400	270	4000	200	2700	140	2200	100
4	4300	320	3200	240	2100	160	1800	120
5	3600	340	2700	250	1800	170	1500	130
6	3200	350	2400	260	1600	180	1300	140
8	2400	380	1800	290	1200	190	1000	145
10	1900	420	1400	300	950	210	800	160
12	1600	380	1200	290	800	190	660	145
16	1200	340	900	260	600	170	500	130
20	950	290	720	220	480	140	400	110
25	760	240	570	180	380	120	320	100
Depth of cut	 DC:Dia.							

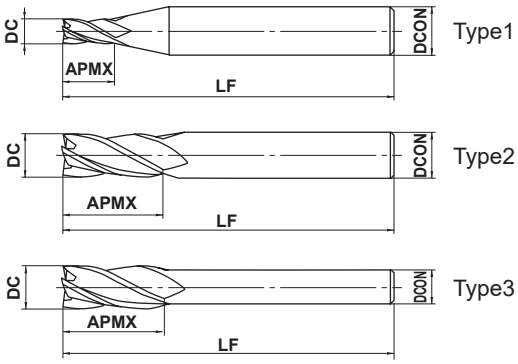
Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

4MC

End mill, Medium cut length, 4 flute, Center cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





DC≤20	DC>20			
0 + 0.020	0 + 0.030			

●4 flute end mill for general use.

(mm)

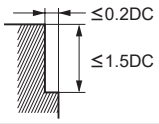
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
4MCD0250	2.5	10	50	6	4	●	1
4MCD0300	3	10	50	6	4	●	1
4MCD0400	4	12	60	8	4	●	1
4MCD0450	4.5	15	60	8	4	●	1
4MCD0500	5	15	60	8	4	●	1
4MCD0600	6	15	60	8	4	●	1
4MCD0650	6.5	20	65	10	4	●	1
4MCD0700	7	20	65	10	4	●	1
4MCD0800	8	20	65	10	4	●	1
4MCD0900	9	25	75	10	4	●	1
4MCD1000	10	25	75	10	4	●	2
4MCD1100	11	30	85	12	4	●	1
4MCD1200	12	30	85	12	4	●	2
4MCD1300	13	35	90	12	4	●	3
4MCD1400	14	35	95	16	4	●	1
4MCD1500	15	40	100	16	4	●	1
4MCD1600	16	40	100	16	4	●	2
4MCD1800	18	40	100	16	4	●	3
4MCD2000	20	45	115	20	4	●	2
4MCD2200	22	45	115	20	4	●	3
4MCD2500	25	50	120	25	4	●	2
4MCD3000	30	55	125	25	4	●	3

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Structural steel, Carbon steel AISI 1045, AISI 1050		Carbon steel, Alloy steel (20−30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30−35HRC) AISI H13		Austenitic stainless steel AISI 304, AISI 316		Cast iron AISI No 35 B		Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	2300	105	1800	80	1400	65	1100	45	2000	110	4800	280
4	1800	120	1400	85	1100	65	850	45	1600	125	3800	370
5	1600	135	1200	105	900	70	710	50	1300	140	3200	420
6	1400	140	1000	105	780	80	610	55	1100	155	2800	460
8	1100	155	800	110	580	80	470	55	850	160	2200	530
10	860	170	640	120	470	80	380	65	700	180	1800	500
12	720	155	530	110	390	70	310	55	580	160	1600	490
16	540	135	400	105	300	65	230	50	440	140	1200	410
20	430	110	320	85	240	55	190	45	350	120	960	350
25	350	100	250	70	190	45	150	35	285	105	760	310
30	290	90	210	65	160	40	120	30	240	100	640	280
Depth of cut	 DC:Dia.											

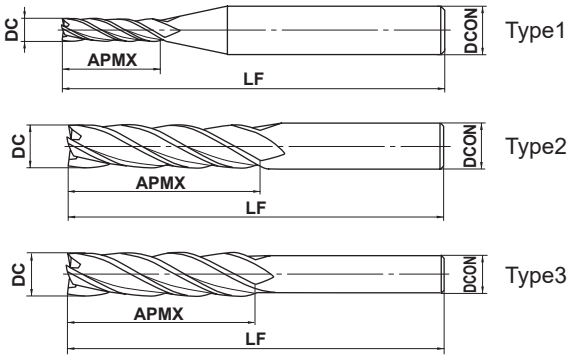
Note 1) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

4LC

End mill, Long cut length, 4 flute, Center cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





DC≤20	DC>20			
0 + 0.020	0 + 0.030			

●4 flute end mill with long flute for deep cutting applications.

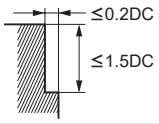
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
4LCD0300	3	15	55	6	4	●	1
4LCD0400	4	20	55	8	4	●	1
4LCD0500	5	25	60	8	4	●	1
4LCD0600	6	25	60	8	4	●	1
4LCD0700	7	35	75	10	4	●	1
4LCD0800	8	35	75	10	4	●	1
4LCD1000	10	45	90	10	4	●	2
4LCD1200	12	55	105	12	4	●	2
4LCD1600	16	65	120	16	4	●	2
4LCD2000	20	75	140	20	4	●	2
4LCD2500	25	90	160	25	4	●	2
4LCD2600	26	90	160	25	4	●	3
4LCD3000	30	90	160	25	4	●	3

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Structural steel, Carbon steel AISI 1045, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13		Austenitic stainless steel AISI 304, AISI 316		Cast iron AISI No 35 B		Aluminium alloy	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
3	2300	105	1800	80	1400	65	1100	45	2000	110	4800	280
4	1800	120	1400	85	1100	65	850	45	1600	125	3800	370
5	1600	135	1200	105	900	70	710	50	1300	140	3200	420
6	1400	140	1000	105	780	80	610	55	1100	155	2800	460
8	1100	155	800	110	580	80	470	55	850	160	2200	530
10	860	170	640	120	470	80	380	65	700	180	1800	500
12	720	155	530	110	390	70	310	55	580	160	1600	490
16	540	135	400	105	300	65	230	50	440	140	1200	410
20	430	110	320	85	240	55	190	45	350	120	960	350
25	350	100	250	70	190	45	150	35	285	105	760	310
30	290	90	210	65	160	40	120	30	240	100	640	280
Depth of cut	 DC:Dia.											

Note 1) Use the milling by reducing the revolution in the table shown above by 20—30% and the feedrate 40—50% to match the cutting type.
Note 2) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

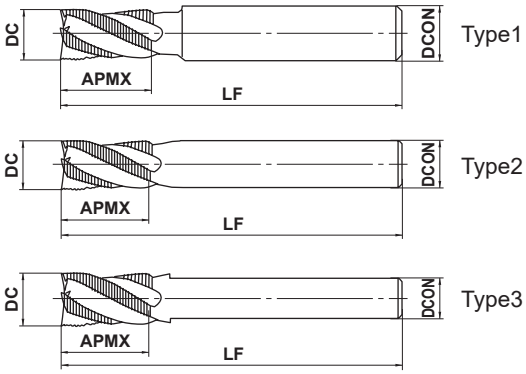
VASFPR

Roughing end mill, Short cut length, 4—6 flute, Fine pitch form



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	○		





●Roughing 4—6 flute end mill with high grade HSS substrate and Violet coating for general use.

(mm)

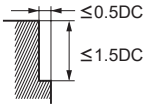
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VASFPRD0500	5	10	80	6	4	●	1
VASFPRD0600	6	12	80	6	4	●	2
VASFPRD0700	7	17	80	8	4	●	1
VASFPRD0800	8	17	85	8	4	●	2
VASFPRD0900	9	22	100	10	4	●	1
VASFPRD1000	10	22	100	10	4	●	2
VASFPRD1200	12	27	110	12	4	●	2
VASFPRD1400	14	27	110	12	4	●	3
VASFPRD1500	15	27	125	16	4	●	1
VASFPRD1600	16	33	125	16	4	●	2
VASFPRD1800	18	33	125	16	4	●	3
VASFPRD2000	20	38	145	20	4	●	2
VASFPRD2200	22	38	145	20	4	●	3
VASFPRD2500	25	43	150	25	5	●	2
VASFPRD3000	30	48	165	25	5	●	3

● : Inventory maintained in Japan.

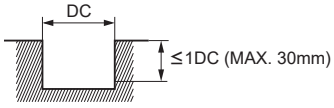
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	2800	140	2200	120	1500	80	1300	70
6	2600	180	2000	140	1400	90	1200	80
8	2200	230	1700	180	1200	130	990	100
10	1750	330	1350	250	950	160	800	130
12	1450	330	1100	260	800	180	660	140
16	1100	330	850	260	600	180	500	140
20	880	340	680	260	480	180	400	140
25	700	330	540	250	380	170	320	140
30	580	300	450	230	320	170	270	140
Depth of cut	 DC:Dia.							

■ Slotting

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	2100	100	1650	80	1150	50	960	35
6	2000	130	1550	100	1050	60	900	45
8	1600	160	1300	130	920	90	760	60
10	1300	220	1000	175	730	110	610	80
12	1050	230	850	190	610	130	500	85
16	800	230	640	190	460	130	380	85
20	640	230	510	180	370	130	300	85
25	510	200	410	160	290	110	240	80
30	420	190	320	140	210	90	180	75
Depth of cut	 DC:Dia.							

Note 1) Supply cutting fluid sufficiently during cutting. For dry-cutting, decrease the revolution and feed rate proportionately by 20—50%.
Note 2) For smaller depths and widths of cut, the revolution may be increased by 10—20% and the feed rate by 10—40%.
Note 3) When drilling, please set the feed rate at 1/3 or below of the values above.
Note 4) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

VAMFPR

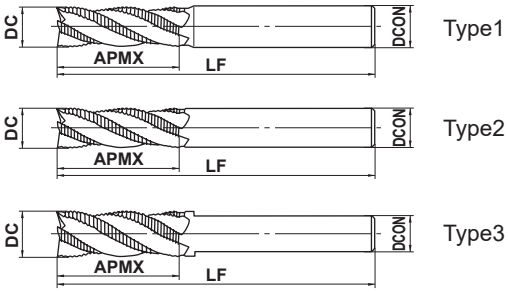
Roughing end mill, Medium cut length, 4—6 flute, Fine pitch form

30°

DC≤20 22≤DC≤28 DC≥30

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	○		





●4—6 flute end mill with medium cut length.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VAMFPRD0500	5	15	80	6	4	●	1
VAMFPRD0600	6	17	80	6	4	●	2
VAMFPRD0700	7	22	80	8	4	●	1
VAMFPRD0800	8	28	85	8	4	●	2
VAMFPRD0900	9	28	95	10	4	●	1
VAMFPRD1000	10	34	100	10	4	●	2
VAMFPRD1200	12	40	110	12	4	●	2
VAMFPRD1400	14	40	110	12	4	●	3
VAMFPRD1500	15	40	120	16	4	●	1
VAMFPRD1600	16	48	125	16	4	●	2
VAMFPRD1800	18	48	125	16	4	●	3
VAMFPRD2000	20	57	145	20	4	●	2
VAMFPRD2200	22	57	145	20	5	●	3
VAMFPRD2500	25	68	150	25	5	●	2
VAMFPRD3000	30	68	165	25	6	●	3

● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

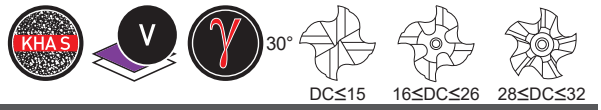
■Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	2600	90	2000	70	1400	50	1200	40
6	2500	100	1900	90	1300	50	1100	50
8	2000	170	1600	130	1100	90	930	80
10	1650	220	1300	170	900	100	750	90
12	1400	260	1000	210	750	140	620	120
16	1000	290	800	230	560	160	470	130
20	830	300	640	230	450	160	380	130
25	660	290	510	220	360	160	300	130
30	550	270	420	210	300	140	250	130
Depth of cut	≤0.25DC (MAX. 10mm) ≤2.5DC (DC≤ϕ25) ≤2DC (DC>ϕ25) DC:Dia.							

Note 1) Supply cutting fluid sufficiently during cutting. For dry-cutting, decrease the revolution and feed rate proportionately by 20—50%.
Note 2) When the diameter exceeds 30 and the metal removal is less than the quantity shown in the table, the revolution and feed rate may be increased proportionately by 10—40%.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

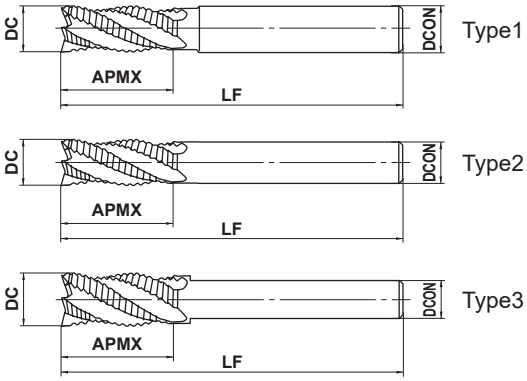
VAMR

Roughing end mill, Medium cut length, 4—6 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	○		





●Roughing 4—6 flute end mill with high grade HSS substrate and Violet coating for general use.

(mm)

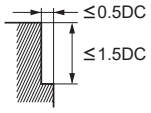
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VAMRD0500	5	15	60	6	4	●	1
VAMRD0600	6	15	60	6	4	●	2
VAMRD0700	7	20	70	8	4	●	1
VAMRD0800	8	20	70	8	4	●	2
VAMRD0900	9	25	80	10	4	●	1
VAMRD1000	10	25	80	10	4	●	2
VAMRD1100	11	30	110	12	4	●	1
VAMRD1200	12	30	110	12	4	●	2
VAMRD1300	13	35	115	12	4	●	3
VAMRD1400	14	35	135	16	4	●	1
VAMRD1500	15	40	140	16	4	●	1
VAMRD1600	16	40	140	16	4	●	2
VAMRD1700	17	40	140	16	4	●	3
VAMRD1800	18	40	140	16	4	●	3
VAMRD1900	19	45	145	20	4	●	1
VAMRD2000	20	45	145	20	4	●	2
VAMRD2200	22	45	145	20	4	●	3
VAMRD2500	25	50	150	25	4	●	2
VAMRD3000	30	55	165	25	5	●	3
VAMRD3200	32	60	175	32	5	●	2

● : Inventory maintained in Japan.

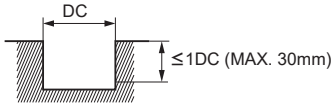
ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	2400	120	1800	90	1200	60	1000	50
6	2200	155	1700	120	1100	70	930	65
8	1800	200	1400	140	950	100	780	85
10	1500	250	1100	200	810	125	680	100
12	1250	270	960	220	680	160	560	120
16	930	270	720	220	510	160	430	120
20	750	290	580	220	410	160	340	120
25	600	270	460	210	320	140	270	120
30	490	250	380	200	270	140	230	120
Depth of cut	 DC:Dia.							

■ Slotting

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel, Alloy steel, Tool steel (35—40HRC) AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	1800	85	1350	60	920	40	740	25
6	1700	110	1300	85	830	45	700	35
8	1300	140	1050	100	730	70	600	50
10	1100	170	810	140	620	85	520	60
12	900	190	740	160	520	115	420	75
16	680	190	540	160	390	115	330	75
20	550	195	440	150	320	115	260	75
25	440	170	350	135	240	90	200	70
30	350	160	270	120	180	75	155	65
Depth of cut	 DC:Dia.							

Note 1) Supply cutting fluid sufficiently during cutting. For dry-cutting, decrease the revolution and feed rate proportionately by 20—50%.
Note 2) When the diameter exceeds 30 and the metal removal is less than the quantity shown in the table, the revolution and feed rate may be increased proportionately by 10—40%.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

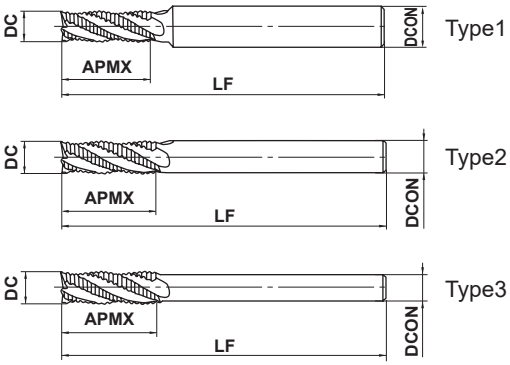
MR

Roughing end mill, Medium cut length, 4—6 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			○	○		○





●4—6 flute roughing end mill with full radius cutting edge profile for heavy cutting.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MRD0500	5	15	60	6	4	●	1
MRD0600	6	15	60	6	4	●	2
MRD0700	7	20	70	8	4	●	1
MRD0800	8	20	70	8	4	●	2
MRD0900	9	25	80	10	4	●	1
MRD1000	10	25	80	10	4	●	2
MRD1100	11	30	110	12	4	●	1
MRD1200	12	30	110	12	4	●	2
MRD1300	13	35	115	12	4	●	3
MRD1400	14	35	135	16	4	●	1
MRD1500	15	40	140	16	4	●	1
MRD1600	16	40	140	16	4	●	2
MRD1800	18	40	140	16	4	●	3
MRD2000	20	45	145	20	4	●	2
MRD2200	22	45	145	20	4	●	3
MRD2500	25	50	150	25	4	●	2
MRD3000S25	30	55	165	25	5	●	3
MRD3000S32	30	55	165	32	5	●	1

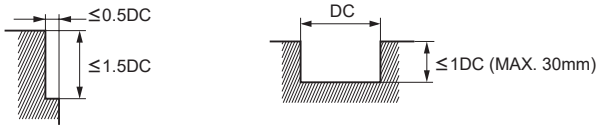
● : Inventory maintained in Japan.

ISO13399 ➤ J002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural steel, Cast iron, Carbon steel AISI 1045, AISI No 35 B, AISI 1050		Carbon steel, Alloy steel (20—30HRC) AISI 1055, AISI P20		Alloy steel, Tool steel, Pre-hardened steel (30—35HRC) AISI H13, AISI D2		Austenitic stainless steel AISI 304, AISI 316	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
5	1000 (750)	40 (30)	760 (570)	30 (25)	610 (460)	25 (20)	510 (380)	20 (15)
6	960 (720)	50 (40)	720 (540)	40 (30)	570 (430)	30 (25)	480 (360)	25 (20)
8	800 (600)	65 (50)	600 (450)	50 (40)	500 (380)	40 (30)	400 (300)	30 (25)
10	640 (480)	90 (70)	480 (360)	70 (55)	380 (290)	50 (40)	320 (240)	40 (30)
12	530 (400)	90 (70)	400 (300)	70 (55)	320 (240)	55 (40)	270 (200)	45 (35)
16	400 (300)	90 (70)	300 (230)	70 (55)	240 (180)	55 (40)	200 (150)	45 (35)
20	320 (240)	95 (70)	240 (180)	70 (55)	190 (140)	55 (40)	160 (120)	45 (35)
25	250 (190)	90 (70)	190 (140)	65 (50)	150 (110)	50 (40)	130 (100)	45 (35)
30	210 (160)	85 (65)	160 (120)	65 (50)	130 (100)	50 (40)	110 (85)	45 (35)

Depth of cut



DC:Dia.

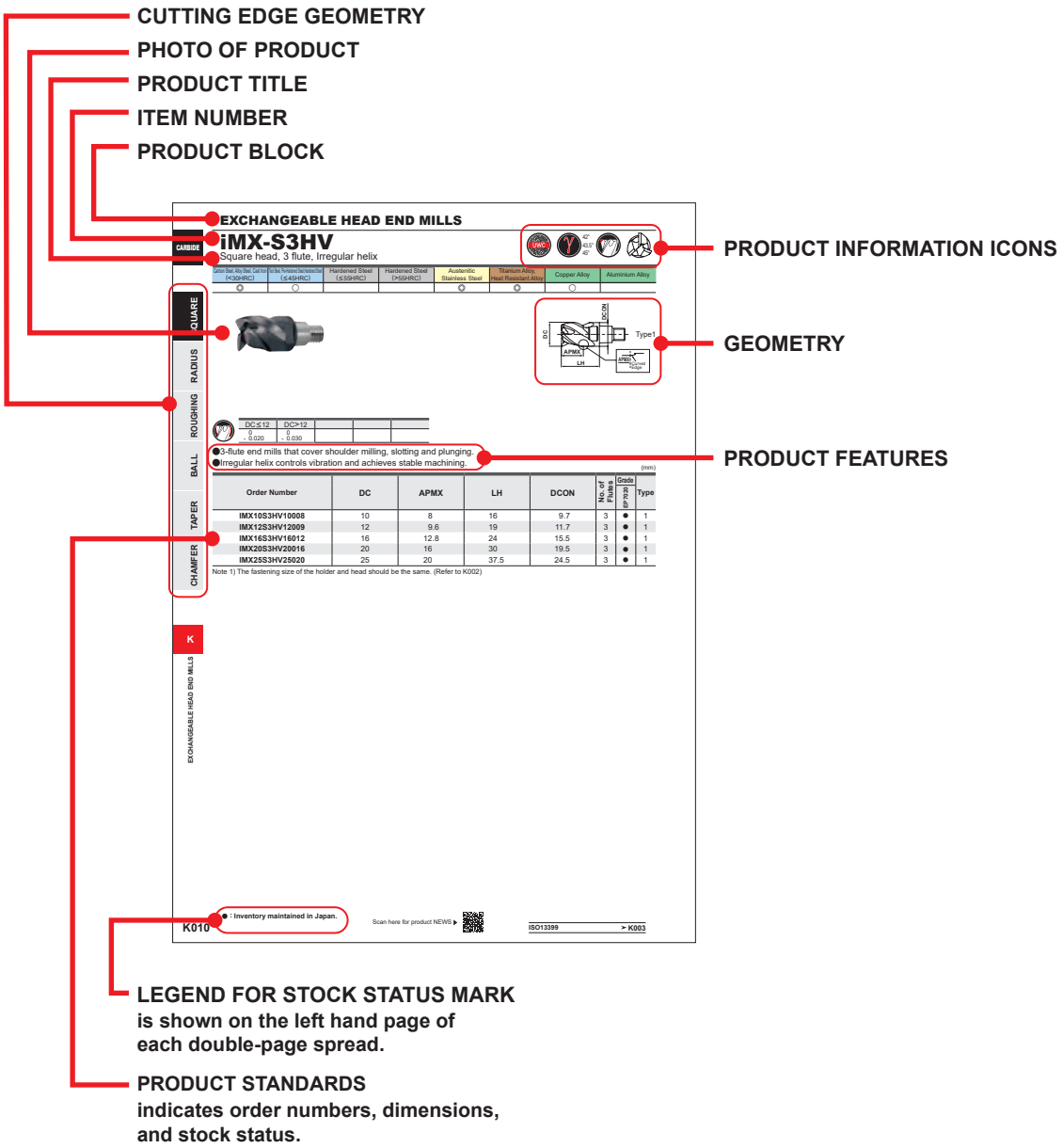
( ) : Indicates standard revolution and feed rate for slotting.

Note 1) Supply cutting fluid sufficiently during cutting.
Note 2) When the diameter exceeds 30 and the metal removal is less than the quantity shown in the table, the revolution and feed rate may be increased by 10—40%.
Note 3) If the machine or workpiece material is not rigid, vibration or abnormal noises may occur. In this case, please adjust the spindle speed, feed rate, and depth of cut according to the table above.

HOW TO READ THE STANDARD OF EXCHANGEABLE HEAD END MILLS

●How this section page is organised

①Organised according to cutting mode for milling. (Refer to END MILL LIST.)



●To Order:
Please specify ①order number.

MILLING TOOLS

EXCHANGEABLE HEAD END MILLS

IDENTIFICATION ····· K002
SYMBOL DESCRIPTIONS ····· K003
GUIDE FOR ISO13399 SYMBOLS ····· K003
PRODUCT INTRODUCTION ····· K004
CLASSIFICATION ····· K006
CORRECTION FACTOR BY OVERHANG LENGTH (SHOULDER MILLING) ··· K009

EXCHANGEABLE HEAD END MILLS STANDARDS

HEAD

SQUARE ····· K010
RADIUS ····· K024
TAPER RADIUS ····· K043
ROUGHING ····· K044
BALL ····· K048
CHAMFER ····· K060

HOLDER

CARBIDE ····· K064
STEEL ····· K065



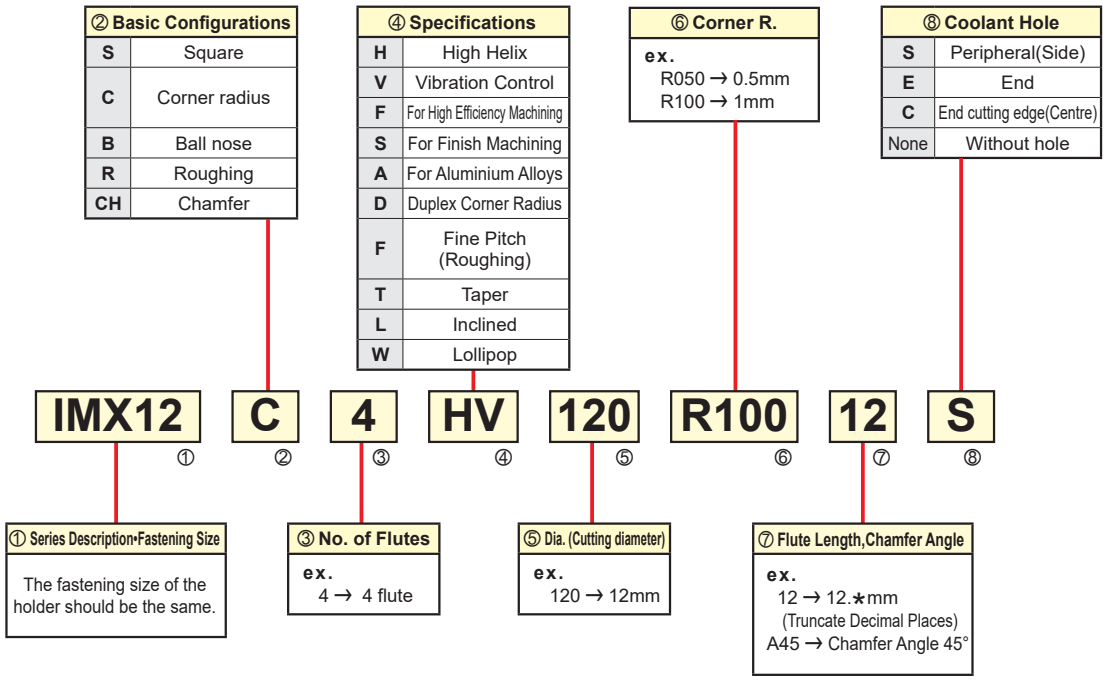
*Arranged by Alphabetical order

K048 **iMX-B2S**
K050 **iMX-B3FV**
K052 **iMX-B4HV**
K053 **iMX-B4HV-E**
K049 **iMX-B4S**
NEW K058 **iMX-B4WH-S**
K056 **iMX-B6HV**
K040 **iMX-C3A**
K036 **iMX-C4FD-C**
K038 **iMX-C4FV**
K024 **iMX-C4HV**
K026 **iMX-C4HV-S**
K034 **iMX-C6HV**
NEW K032 **iMX-C6HV-C**
K043 **iMX-C8T-C**
K034 **iMX-C10HV**
K043 **iMX-C10T-C**
K034 **iMX-C12HV**
K043 **iMX-C12T-C**
K043 **iMX-C15T-C**
K060 **iMX-CH3L**
K062 **iMX-CH6V**
K064 **iMX○○-○○○○○○○○L○○○C**
K065 **iMX○○-○○○○○○○○L○○○S**
K044 **iMX-R4F**
NEW K046 **iMX-RC4F-C**
K021 **iMX-S3A**
K010 **iMX-S3HV**
K014 **iMX-S4HV**
K015 **iMX-S4HV-S**

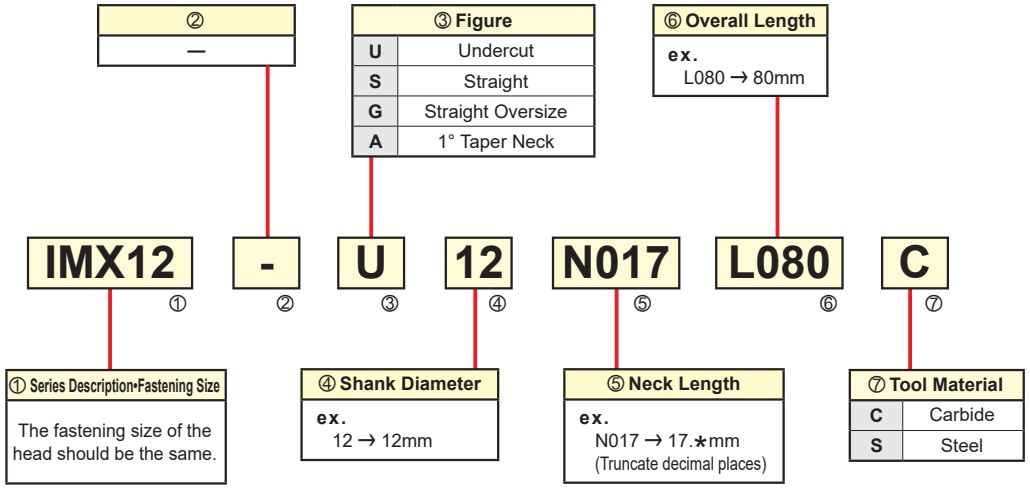
IDENTIFICATION

iMX End Mill Series

■HEAD



■HOLDER



■RUN-OUT ACCURACY AND HEAD EXCHANGE ACCURACY

(mm)

Dia. (Cutting diameter) DC	Run-out accuracy for the peripheral cutting edge *	Head exchange accuracy (Axial)
<ϕ25	0.015	±0.05
≥ϕ25	0.020	

∗ Use the carbide holder. (Except iMX-RC4F-C, iMX-R4F roughing head)

SYMBOL DESCRIPTIONS

Tool Material

Ultra Micro-grain Carbide
Ultra micro-grain carbide is used as the substrate material.

Angle, Coolant hole, Sharp corner edge and Gash land

Helix Angle
Indicates the helix angle of the end mill.

End Cutting Edge with Coolant Hole

Peripheral Cutting Edge with Coolant Hole

Gash Land
Indicates the end mill cutting edge has a gash land.

Tolerances

Outside Diameter Tolerance
Indicates diameter tolerance of end mill.

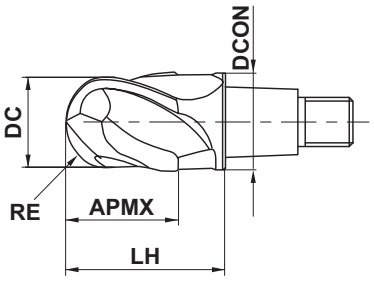
R Tolerance
Indicates the radial tolerance of a ball nose end mill.

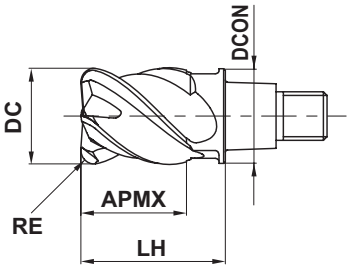
R Tolerance
Indicates the radial tolerance of an end mill with a corner radius.

Tolerance of Point Angle
Indicates the tolerance of the point angle.

Shank Diameter Tolerance
Indicates the shank diameter tolerance of end mill.

GUIDE FOR ISO13399 SYMBOLS



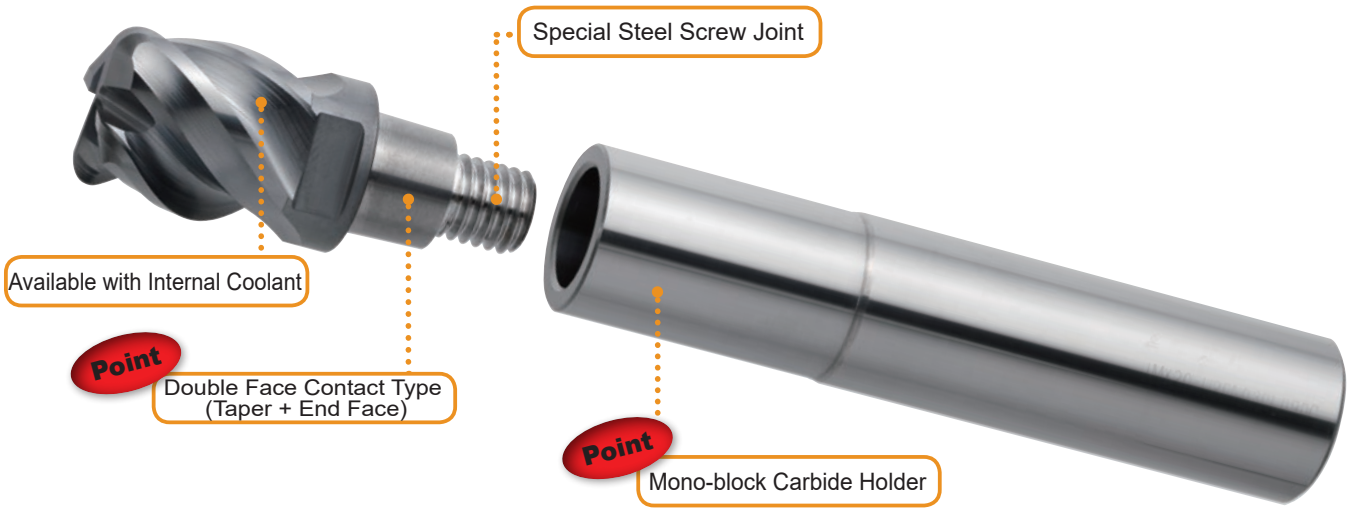


Symbol	Content
APMX	Depth of cut maximum
DC	Dia. (Cutting diameter)
DCON	Connection diameter
LH	Head length
RE	Corner radius

*There are exceptions other than those listed above. For more details, please refer to the technical data (page Q002).

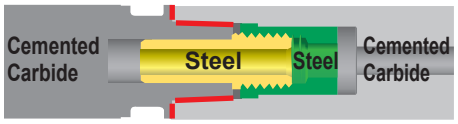
PRODUCT INTRODUCTION

Exchangeable Head End Mills iMX Series



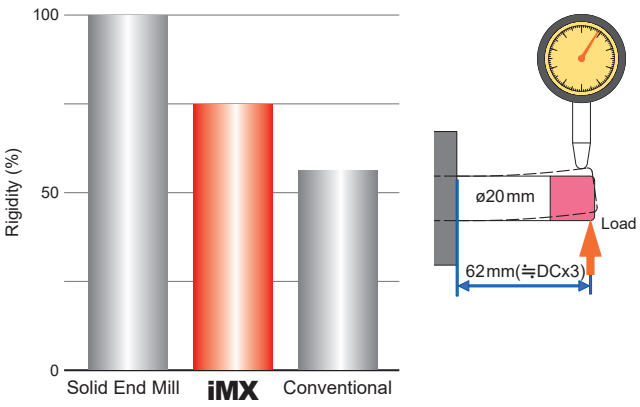
Fastening Mechanism

The iMX series is a revolutionary end mill system that enables efficiency, high accuracy and rigidity by combining the advantages of both solid carbide and indexable end mills.
Security and rigidity close to that of a solid type end mill because the contact faces are all carbide.
Excellent for reduced inventory over a variety of applications due to the exchangeable head.



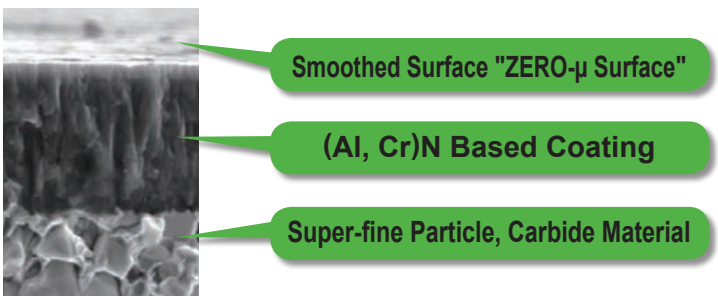
Comparison of Tool Rigidity

The double face contact of the carbide head and carbide holder gives an increase in rigidity of 30%.



Highly Versatile Grades

EP7020
Suitable for difficult-to-cut materials.

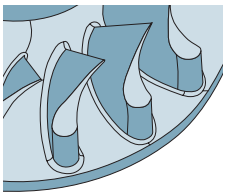
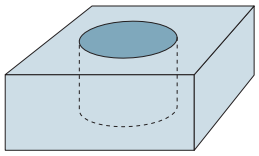
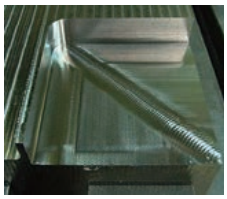


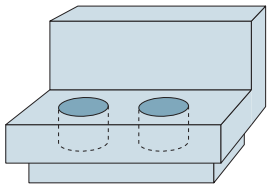
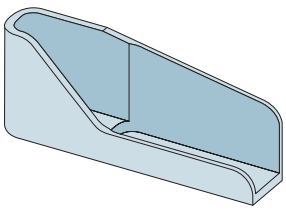
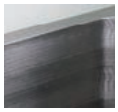
EP8100 Series
Suitable for milling of hardened steel.

EP6120
Suitable for high feed milling of steel.

ET2020 (Uncoated)
Suitable for milling of aluminium alloys.

Application Example

Holder		**IMX12-U12N041L100C**	**IMX20-U20N070L130C**	**IMX16-U16N024L080C**
Head		**IMX12B6HV12012**	**IMX20C4HV200R10021**	**IMX16C10HV160R10016**
Workpiece		AISI 1049 	Mild Steel 	Titanium Alloy (Ti-6Al4V) 
Component		Impeller for Torque Converter	Die Steel	Test Work
Intended Process		Finishing of Blade Faces	Hole Finishing	Shoulder Milling (Down(Climb) Cut)
Cutting Conditions	Cutting Speed **vc** (m/min)	200	100	151
	Feed per Tooth **fz** (mm/t)	0.08	0.05	0.08
	Width of Cut **ae** (mm)	Approx. 1.4	1	0.5
	Depth of Cut **ap** (mm)	Approx. 1.0	3	16
	Overhang Length (mm)	—	105	52
Cutting Mode		—	Air Blow	Wet Cutting (Emulsion)
Machine		5-axis MC (HSK A63)	Vertical MC	Vertical MC
Results		The tool reduced machining time by 30% and also produced a good surface finish.	The irregular helix flutes combined with the solid carbide holder gave better performance than conventional tools.	Machining without vibration was achieved even when the workpiece radius and tool radius were the same.

Holder		**IMX10-U10N034L090C**	**IMX20-S20L180C**
Head		**IMX10B4HV10010**	**IMX20C4HV220R10023**
Workpiece		Stainless Steel 	Titanium Alloy (Ti-6Al4V) 
Component		—	—
Intended Process		—	Deep Wall Machining
Cutting Conditions	Cutting Speed **vc** (m/min)	230	60
	Feed per Tooth **fz** (mm/t)	0.14	0.08
	Width of Cut **ae** (mm)	1.0	0.2
	Depth of Cut **ap** (mm)	1.4	15
	Overhang Length (mm)	—	142 (L/D=7)
Cutting Mode		Air Blow	Wet Cutting (Emulsion)
Machine		Vertical MC	Vertical MC
Results		Conventional products machined 8 pieces. iMX produced a good surface finish even after machining 70 pieces, giving 9 times the tool life.	The oversize type head achieved good surface finishes that reduced step differences in vertical wall surfaces.   **iMX** Conventional

The examples shown are actual applications and can differ from the recommended cutting conditions.

CLASSIFICATION

HEAD

(mm)

Type	Applications	No. of Flutes	Product Code	Features	Shape	Coolant	Dia. (Cutting diameter) DC	Head length APMX		Workpiece Material									Page
										P		H		M	S	N			
								Max. DC	APMX / DC	Carbon Steel	Tool Steel	-55HRC	55HRC-	Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy		
SQUARE																			
	For Difficult-to-cut Materials	3	iMX-S3HV	Vibration Control		External	10—25	20	0.8	◎	○			◎	◎	○			K010
		4	iMX-S4HV	Vibration Control			10—32	33	1	◎	○			◎	◎	○			K014
				Irregular helix, Long cutting edge			16, 20	40	2										K014
		4	iMX-S4HV-S	Vibration Control		Internal	10—25	25	1	◎	○			◎	◎	○			K015
	For Aluminium Alloys	3	iMX-S3A	Uncoated		External	10—28	23.4	0.8								◎		K021
RADIUS																			
	For Difficult-to-cut Materials	4	iMX-C4HV	Vibration Control		External	10—28	29	1	◎	○			◎	◎	○			K024
				Irregular helix, Long cutting edge			16, 20	40	2										K025
		4	iMX-C4HV-S	Vibration Control		Internal	10—25	25	1	◎	○			◎	◎	○			K026
		6	iMX-C6HV	Irregular helix, Multi-flute		External	10, 12	12	1	◎	○			◎	◎				K034
		6	NEW iMX-C6HV-C	Irregular helix, Multi-flute		Internal	10—25	25	1	◎	○			◎	◎				K032
		10	iMX-C10HV	Irregular helix, Multi-flute		External	16	16	1	◎	○			◎	◎				K034
		12	iMX-C12HV	Irregular helix, Multi-flute			20, 25	25	1	◎	○			◎	◎				
	For High Feed Machining	4	iMX-C4FD-C	Duplex Corner Radius		Internal	10—25	1.6	0.07	◎	◎	◎		◎	◎	○			K036
	For High Efficiency Machining	4	iMX-C4FV	Vibration Control		External	10—25	26	1	◎	◎	◎							K038
	For Aluminium Alloys	3	iMX-C3A	Uncoated			10—28	23.4	0.8								◎		K040
	For Blade	8	iMX-C8T-C	Taper head, Long cutting edge		Internal	8	7.12	0.8					◎	◎				K043
		10	iMX-C10T-C	Taper head, Long cutting edge			10	7.12	0.7					◎	◎				
		12	iMX-C12T-C	Taper head, Long cutting edge			15, 19	3.56	0.2					◎	◎				
		15	iMX-C15T-C	Taper head, Long cutting edge			15, 19	3.56	0.2					◎	◎				

(mm)

Type	Applications	No. of Flutes	Product Code	Features	Shape	Coolant	Dia. (Cutting diameter) DC	Head length APMX		Workpiece Material									Page
										P		H		M	S	N			
								Max. DC	APMX / DC	Carbon Steel	Tool Steel	-55HRC	55HRC-	Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy		
ROUGHING																			
	For Difficult-to-cut Materials	4	iMX-R4F	Square		External	10—25	26	1	◎	○			◎	◎	○			K044
	For Titanium Alloys	4	NEW iMX-RC4F-C	Corner radius		Internal	10—20	21	1	◎				◎	◎				K046
BALL																			
	For Hardened Steels	2	iMX-B2S	Finish		External	16, 20	20	1				◎						K048
		4	iMX-B4S	Finish			16, 20	20	1				◎						K049
	For High Efficiency Machining	3	iMX-B3FV	Vibration Control			10—20	16	0.8		◎	◎							K050
	For Difficult-to-cut Materials	4	iMX-B4HV	Vibration Control			10—25	26	1	◎	○			◎	◎	○			K052
		4	iMX-B4HV-E	Vibration Control		Internal	10—25	26	1	◎	○			◎	◎	○			K053
		6	iMX-B6HV	Vibration Control		External	10—25	26	1	◎	○			◎	◎				K056
LOLLIPOP																			
	For Difficult-to-cut Materials	4	NEW iMX-B4WH-S	5-axis machining		Internal	12—20	15	0.8	◎	○			◎	◎	○			K058
CHAMFER																			
	For Chamfer Materials	3	iMX-CH3L	Hole and Shape		External	10—20	9.2	0.5	◎	○	○		◎	◎				K060
		6	iMX-CH6V	Shape, Multi-flute			12—20	8.5	0.4	◎	○	○		◎	◎				K062

CLASSIFICATION

HOLDERS

Figure		Length	Taper angle one side	Tool material	Page
Undercut		Medium Semi-long Long	—	Carbide	K064
				Steel	K065
Straight	Straight 	Semi-long Long	—	Carbide	K064
	Straight Oversize 	Medium	—	Steel	K065
Taper neck		Long	1°	Carbide	K064

Correction factor by overhang length (Shoulder Milling)

Use by multiplying the recommended cutting condition by the correction factor by overhang length.
Refer to each recommended conditions for the long cutting, offset, and lollipop types.

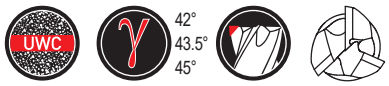
(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V			
L/D	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Width of Cut ae
2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	80%	90%	70%	80%	80%	90%	70%	80%	80%	90%	70%
5	60%	60%	80%	40%	60%	60%	80%	40%	60%	60%	80%	40%
6	50%	50%	70%	30%	50%	50%	70%	30%	50%	50%	70%	30%
7	40%	40%	70%	20%	40%	40%	70%	20%	30%	30%	60%	20%
8	40%	40%	60%	10%	40%	40%	60%	10%	30%	30%	50%	10%
9	30%	30%	60%	10%	30%	30%	60%	10%	20%	20%	50%	10%

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631				Heat resistant alloys Inconel718			
L/D	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Width of Cut ae
2	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	80%	90%	70%	80%	80%	90%	70%
5	60%	60%	80%	40%	60%	60%	80%	40%
6	50%	50%	70%	30%	50%	50%	70%	30%
7	30%	30%	60%	20%	30%	30%	60%	20%
8	30%	30%	50%	10%	30%	30%	50%	10%
9	20%	20%	50%	10%	20%	20%	50%	10%

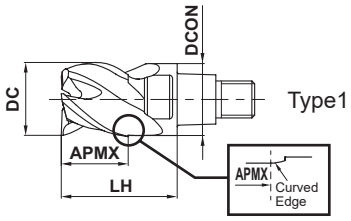
iMX-S3HV

Square head, 3 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			

●3-flute end mills that cover shoulder milling, slotting and plunging.
●Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S3HV10008	10	8	16	9.7	3	●	1
IMX12S3HV12009	12	9.6	19	11.7	3	●	1
IMX16S3HV16012	16	12.8	24	15.5	3	●	1
IMX20S3HV20016	20	16	30	19.5	3	●	1
IMX25S3HV25020	25	20	37.5	24.5	3	●	1

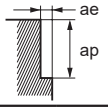
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

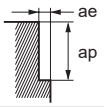
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	0.09	1300	8	2	120	3800	0.06	680	8	2	100	3200	0.075	720	8	2
12	150	4000	0.09	1100	9.6	2.4	120	3200	0.065	620	9.6	2.4	100	2700	0.08	650	9.6	2.4
16	150	3000	0.1	900	12.8	3.2	120	2400	0.075	540	12.8	3.2	100	2000	0.09	540	12.8	3.2
20	150	2400	0.1	720	16	4	120	1900	0.075	430	16	4	100	1600	0.09	430	16	4
25	150	1900	0.12	680	20	5	120	1500	0.075	340	20	5	100	1300	0.09	350	20	5
Depth of cut																		

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	75	2400	0.06	430	8	2	40	1300	0.04	160	8	1
12	75	2000	0.065	390	9.6	2.4	40	1100	0.045	150	9.6	1.2
16	75	1500	0.075	340	12.8	3.2	40	800	0.05	120	12.8	1.6
20	75	1200	0.075	270	16	4	40	640	0.05	96	16	2
25	75	950	0.075	210	20	5	40	510	0.05	77	20	2.5
Depth of cut												

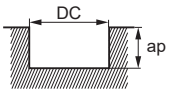
Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

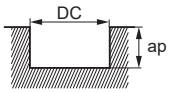
iMX-S3HV

Square head, 3 flute, Irregular helix

■Slot milling

(mm)

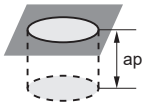
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	100	3200	0.04	380	5	80	2500	0.03	230	5	75	2400	0.03	200	5
12	100	2700	0.05	410	6	80	2100	0.04	250	6	75	2000	0.04	240	6
16	100	2000	0.07	420	8	80	1600	0.05	240	8	75	1500	0.06	270	8
20	100	1600	0.07	340	10	80	1300	0.05	200	10	75	1200	0.06	220	10
25	100	1300	0.08	310	12	80	1000	0.05	150	12	75	950	0.06	170	12
Depth of cut	 DC:Dia. (Cutting diameter)														

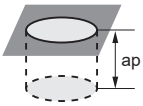
Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					Heat resistant alloys Inconel718				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	60	1900	0.025	140	5	30	950	0.02	57	2
12	60	1600	0.035	170	6	30	800	0.03	72	2.4
16	60	1200	0.05	180	8	30	600	0.05	90	3.2
20	60	950	0.05	140	10	30	480	0.05	72	4
25	60	760	0.05	110	12	30	380	0.05	57	5
Depth of cut	 DC:Dia. (Cutting diameter)									

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

■Plunging

(mm)

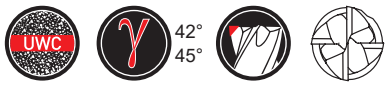
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2
10	100	3200	0.14	450	5	2.5	70	2200	0.09	200	5	2	60	1900	0.03	57	5	0.6
12	100	2700	0.14	380	6	2.5	70	1900	0.09	170	6	2	60	1600	0.03	48	6	0.6
16	100	2000	0.14	280	8	2.5	70	1400	0.09	130	8	2	60	1200	0.03	36	8	0.6
20	100	1600	0.14	220	10	2.5	70	1100	0.09	99	10	2	60	950	0.03	29	10	0.6
25	100	1300	0.14	180	12.5	2.5	70	890	0.09	80	12.5	2	60	760	0.03	23	12.5	0.6
Depth of cut																		

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2
10	40	1300	0.03	39	5	0.6
12	40	1100	0.03	33	6	0.6
16	40	800	0.03	24	8	0.6
20	40	640	0.03	19	10	0.6
25	40	510	0.03	15	12.5	0.6
Depth of cut						

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 3) If the depth of cut is shallow, the revolution and feed rate can be increased.

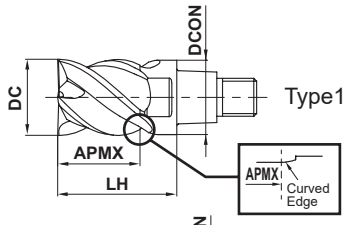
iMX-S4HV

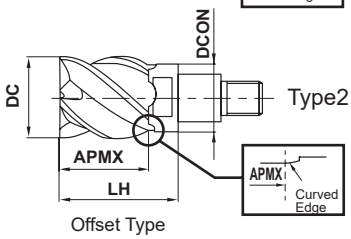
Square head, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	







Offset Type

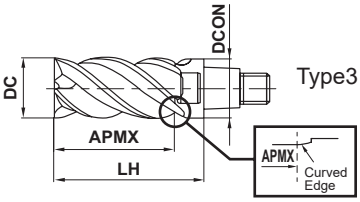
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010	10	10	16	9.7	4	●	1
IMX10S4HV12012	12	12.5	19	9.7	4	●	2
IMX12S4HV12012	12	12	19	11.7	4	●	1
IMX12S4HV14014	14	14.5	22.5	11.7	4	●	2
IMX16S4HV16016	16	16	24	15.5	4	●	1
IMX16S4HV18018	18	18.5	27	15.5	4	●	2
IMX20S4HV20020	20	20	30	19.5	4	●	1
IMX20S4HV22023	22	23	33	19.5	4	●	2
IMX25S4HV25025	25	25	37.5	24.5	4	●	1
IMX25S4HV28029	28	29	41.5	24.5	4	●	2
IMX25S4HV30031	30	31	43.5	24.5	4	●	2
IMX25S4HV32033	32	33	45.5	24.5	4	●	2





■ Long cutting edge type

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16S4HV16032	16	32	40	15.5	4	●	3
IMX20S4HV20040	20	40	50	19.5	4	●	3

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

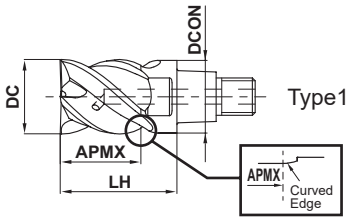
iMX-S4HV-S

Square head with coolant hole, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant holes for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010S	10	10	16	9.7	4	●	1
IMX12S4HV12012S	12	12	19	11.7	4	●	1
IMX16S4HV16016S	16	16	24	15.5	4	●	1
IMX20S4HV20020S	20	20	30	19.5	4	●	1
IMX25S4HV25025S	25	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

iMX-S4HV/iMX-S4HV-S

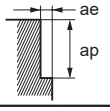
Square head, 4 flute, Irregular helix (With/Without coolant hole)

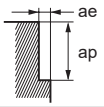
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

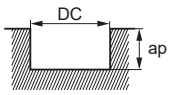
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	0.09	1700	10	2	120	3800	0.06	910	10	2	100	3200	0.075	960	10	2
12	150	4000	0.09	1400	12	2.4	120	3200	0.065	830	12	2.4	100	2700	0.08	860	12	2.4
16	150	3000	0.1	1200	16	3.2	120	2400	0.075	720	16	3.2	100	2000	0.09	720	16	3.2
20	150	2400	0.1	960	20	4	120	1900	0.075	570	20	4	100	1600	0.09	580	20	4
25	150	1900	0.12	910	25	5	120	1500	0.075	450	25	5	100	1300	0.09	470	25	5
Depth of cut																		

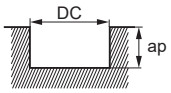
Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	75	2400	0.06	580	10	2	40	1300	0.04	210	10	1
12	75	2000	0.065	520	12	2.4	40	1100	0.045	200	12	1.2
16	75	1500	0.075	450	16	3.2	40	800	0.05	160	16	1.6
20	75	1200	0.075	360	20	4	40	640	0.05	130	20	2
25	75	950	0.075	290	25	5	40	510	0.05	100	25	2.5
Depth of cut												

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

■ Slot milling

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	100	3200	0.04	510	5	80	2500	0.03	300	5	75	2400	0.03	290	5
12	100	2700	0.05	540	6	80	2100	0.04	340	6	75	2000	0.04	320	6
16	100	2000	0.07	560	8	80	1600	0.05	320	8	75	1500	0.06	360	8
20	100	1600	0.07	450	10	80	1300	0.05	260	10	75	1200	0.06	290	10
25	100	1300	0.08	420	12	80	1000	0.05	200	12	75	950	0.06	230	12
Depth of cut	 DC:Dia. (Cutting diameter)														

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					Heat resistant alloys Inconel718				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	60	1900	0.025	190	5	30	950	0.02	76	2
12	60	1600	0.035	220	6	30	800	0.03	96	2.4
16	60	1200	0.05	240	8	30	600	0.05	120	3.2
20	60	950	0.05	190	10	30	480	0.05	96	4
25	60	760	0.05	150	12	30	380	0.05	76	5
Depth of cut	 DC:Dia. (Cutting diameter)									

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

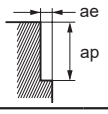
iMX-S4HV

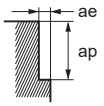
Square head, 4 flute, Irregular helix, Long cutting edge type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling

(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
4	**16**	100	2000	0.09	720	32	0.8	80	1600	0.07	450	32	0.8	60	1200	0.08	380	32	0.8
	20	100	1600	0.09	580	40	1	80	1300	0.07	360	40	1	60	950	0.08	300	40	1
6	**16**	60	1200	0.07	340	32	0.8	50	990	0.05	200	32	0.8	40	800	0.06	190	32	0.8
	20	60	950	0.07	270	40	1	50	800	0.05	160	40	1	40	640	0.06	150	40	1
Depth of cut																			

Workpiece Material		Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
4	**16**	50	990	0.07	280	32	0.8	30	600	0.05	120	32	0.4
	20	50	800	0.07	220	40	1	30	480	0.05	96	40	0.5
6	**16**	30	600	0.05	120	32	0.8	20	400	0.04	64	32	0.4
	20	30	480	0.05	96	40	1	20	320	0.04	51	40	0.5
Depth of cut													

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) The length of the long cutting type is 2 times that of the standard head. L/D demonstrates +1 when installed to a holder of the same size.

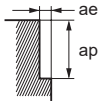
iMX-S4HV

Square head, 4 flute, Irregular helix, Offset type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling

(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	11	150	4300	0.09	1500	11	1.1	120	3500	0.06	840	11	1.1	100	2900	0.075	870	11	1.1
	12	150	4000	0.09	1400	12	1.2	120	3200	0.06	770	12	1.2	100	2700	0.075	810	12	1.2
	13	150	3700	0.09	1300	13	1.3	120	2900	0.065	750	13	1.3	100	2400	0.08	770	13	1.3
	14	150	3400	0.09	1200	14	1.4	120	2700	0.065	700	14	1.4	100	2300	0.08	740	14	1.4
	17	150	2800	0.1	1100	17	1.7	120	2200	0.075	660	17	1.7	100	1900	0.08	610	17	1.7
	18	150	2700	0.1	1100	18	1.8	120	2100	0.075	630	18	1.8	100	1800	0.09	650	18	1.8
	22	150	2200	0.1	880	22	2.2	120	1700	0.075	510	22	2.2	100	1400	0.09	500	22	2.2
	28	150	1700	0.12	820	28	2.8	120	1400	0.075	420	28	2.8	100	1100	0.09	400	28	2.8
	30	150	1600	0.12	770	30	3	120	1300	0.075	390	30	3	100	1100	0.09	400	30	3
	32	150	1500	0.12	720	32	3.2	120	1200	0.075	360	32	3.2	100	990	0.09	360	32	3.2
5	11	90	2600	0.07	730	11	0.4	70	2000	0.05	400	11	0.4	60	1700	0.06	410	11	0.4
	12	90	2400	0.07	670	12	0.5	70	1900	0.05	380	12	0.5	60	1600	0.06	380	12	0.5
	13	90	2200	0.07	620	13	0.5	70	1700	0.05	340	13	0.5	60	1500	0.06	360	13	0.5
	14	90	2000	0.07	560	14	0.6	70	1600	0.05	320	14	0.6	60	1400	0.06	340	14	0.6
	17	90	1700	0.08	540	17	0.7	70	1300	0.06	310	17	0.7	60	1100	0.07	310	17	0.7
	18	90	1600	0.08	510	18	0.7	70	1200	0.06	290	18	0.7	60	1100	0.07	310	18	0.7
	22	90	1300	0.08	420	22	0.9	70	1000	0.06	240	22	0.9	60	870	0.07	240	22	0.9
	28	90	1000	0.1	400	28	1.1	70	800	0.06	190	28	1.1	60	680	0.07	190	28	1.1
	30	90	950	0.1	380	30	1.2	70	740	0.06	180	30	1.2	60	640	0.07	180	30	1.2
	32	90	900	0.1	360	32	1.3	70	700	0.06	170	32	1.3	60	600	0.07	170	32	1.3
7	11	60	1700	0.06	410	11	0.2	50	1400	0.04	220	11	0.2	32	930	0.05	190	11	0.2
	12	60	1600	0.06	380	12	0.2	50	1300	0.04	210	12	0.2	32	850	0.05	170	12	0.2
	13	60	1500	0.06	360	13	0.3	50	1200	0.05	240	13	0.3	32	780	0.06	190	13	0.3
	14	60	1400	0.06	340	14	0.3	50	1100	0.05	220	14	0.3	32	730	0.06	180	14	0.3
	17	60	1100	0.07	310	17	0.3	50	940	0.05	190	17	0.3	32	600	0.06	140	17	0.3
	18	60	1100	0.07	310	18	0.4	50	880	0.05	180	18	0.4	32	570	0.06	140	18	0.4
	22	60	870	0.07	240	22	0.4	50	720	0.05	140	22	0.4	32	460	0.06	110	22	0.4
	28	60	680	0.08	220	28	0.6	50	570	0.05	110	28	0.6	32	360	0.06	86	28	0.6
	30	60	640	0.08	200	30	0.6	50	530	0.05	110	30	0.6	32	340	0.06	82	30	0.6
	32	60	600	0.08	190	32	0.6	50	500	0.05	100	32	0.6	32	320	0.06	77	32	0.6
Depth of cut																			

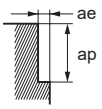
Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

iMX-S4HV

Square head, 4 flute, Irregular helix, Offset type

■ Shoulder milling

(mm)

Workpiece Material		Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	11	75	2200	0.06	530	11	1.1	30	870	0.04	140	11	0.8
	12	75	2000	0.06	480	12	1.2	30	800	0.04	130	12	0.9
	13	75	1800	0.065	470	13	1.3	30	730	0.045	130	13	1
	14	75	1700	0.065	440	14	1.4	30	680	0.045	120	14	1.1
	17	75	1400	0.065	360	17	1.7	40	750	0.045	140	17	1.3
	18	75	1300	0.075	390	18	1.8	40	710	0.05	140	18	1.4
	22	75	1100	0.075	330	22	2.2	40	580	0.05	120	22	1.7
	28	75	850	0.075	260	28	2.8	40	450	0.05	90	28	2.1
	30	75	800	0.075	240	30	3	40	420	0.05	84	30	2.3
	32	75	750	0.075	230	32	3.2	40	400	0.05	80	32	2.4
5	11	50	1400	0.05	280	11	0.4	10	290	0.03	35	11	0.3
	12	50	1300	0.05	260	12	0.5	10	270	0.03	32	12	0.4
	13	50	1200	0.05	240	13	0.5	10	240	0.04	38	13	0.4
	14	50	1100	0.05	220	14	0.6	10	230	0.04	37	14	0.4
	17	50	940	0.06	230	17	0.7	19	360	0.04	58	17	0.5
	18	50	880	0.06	210	18	0.7	19	340	0.04	54	18	0.6
	22	50	720	0.06	170	22	0.9	19	270	0.04	43	22	0.7
	28	50	570	0.06	140	28	1.1	19	220	0.04	35	28	0.8
	30	50	530	0.06	130	30	1.2	19	200	0.04	32	30	0.9
	32	50	500	0.06	120	32	1.3	19	190	0.04	30	32	1
7	11	24	690	0.04	110	11	0.2	–	–	–	–	–	–
	12	24	640	0.04	100	12	0.2	–	–	–	–	–	–
	13	24	590	0.05	120	13	0.3	–	–	–	–	–	–
	14	24	550	0.05	110	14	0.3	–	–	–	–	–	–
	17	24	450	0.05	90	17	0.3	–	–	–	–	–	–
	18	24	420	0.05	84	18	0.4	–	–	–	–	–	–
	22	24	350	0.05	70	22	0.4	–	–	–	–	–	–
	28	24	270	0.05	54	28	0.6	–	–	–	–	–	–
	30	24	250	0.05	50	30	0.6	–	–	–	–	–	–
	32	24	240	0.05	48	32	0.6	–	–	–	–	–	–
Depth of cut													

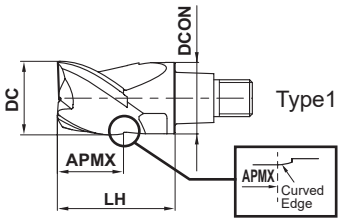
Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

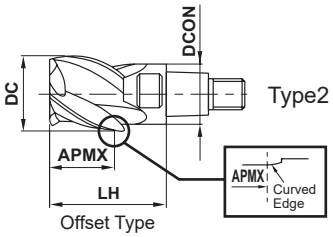
iMX-S3A

Square head, 3 flute, For aluminium alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎







Offset Type

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining due to the sharp cutting edge suitable for aluminium alloy machining and polished rake face.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10S3A10008	10	8	16	9.7	3	●	1
IMX10S3A12010	12	10.1	19	9.7	3	●	2
IMX12S3A12009	12	9.6	19	11.7	3	●	1
IMX12S3A14011	14	11.7	22.5	11.7	3	●	2
IMX16S3A16012	16	12.8	24	15.5	3	●	1
IMX16S3A18014	18	14.9	27	15.5	3	●	2
IMX20S3A20016	20	16	30	19.5	3	●	1
IMX20S3A22018	22	18.6	33	19.5	3	●	2
IMX25S3A25020	25	20	37.5	24.5	3	●	1
IMX25S3A28023	28	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

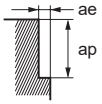
iMX-S3A

Square head, 3 flute, For aluminium alloy

RECOMMENDED CUTTING CONDITIONS

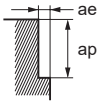
■Shoulder milling (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	500	16000	0.117	5600	8	3
12	500	13000	0.118	4600	9.6	3.6
16	500	9900	0.153	4500	12.8	4.8
20	500	8000	0.175	4200	16	6
25	500	6400	0.211	4100	20	7.5
Depth of Cut						

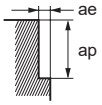
■Shoulder milling (L/D=5)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	300	9500	0.09	2600	8	1.2
12	300	8000	0.09	2200	9.6	1.44
16	300	6000	0.12	2200	12.8	1.92
20	300	4800	0.14	2000	16	2.4
25	300	3800	0.17	1900	20	3
Depth of Cut						

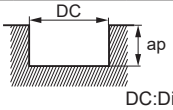
■Shoulder milling (L/D=7)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	200	6400	0.08	1500	8	0.6
12	200	5300	0.08	1300	9.6	0.72
16	200	4000	0.11	1300	12.8	0.96
20	200	3200	0.12	1200	16	1.2
25	200	2500	0.15	1100	20	1.5
Depth of Cut						

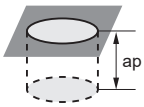
■Slot milling (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075				
DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	500	16000	0.068	3300	5
12	500	13000	0.072	2800	6
16	500	9900	0.093	2800	8
20	500	8000	0.108	2600	10
25	500	6400	0.127	2400	12.5
Depth of Cut	 DC:Dia. (Cutting diameter)				

■Plunging (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap_2
10	300	9500	0.1	950	5	2.5
12	300	8000	0.1	800	6	2.5
16	300	6000	0.1	600	8	2.5
20	300	4800	0.1	480	10	2.5
25	300	3800	0.1	380	12.5	2.5
Depth of Cut						

Note 1) The use of water-soluble coolant is effective.
Note 2) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

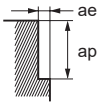
iMX-S3A

Square head, 3 flute, For aluminium alloy, Offset type

RECOMMENDED CUTTING CONDITIONS

■ Side milling

(mm)

Workpiece Material		Aluminium alloy A6061, A7075					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	**12**	500	13000	0.117	4600	9.6	2.4
	14	500	11000	0.118	3900	11.2	2.8
	18	500	8800	0.153	4000	14.4	3.6
	22	500	7200	0.175	3800	17.6	4.4
	28	500	5700	0.211	3600	22.4	5.6
5	**12**	300	8000	0.09	2200	9.6	1.0
	14	300	6800	0.09	1800	11.2	1.1
	18	300	5300	0.12	1900	14.4	1.4
	22	300	4300	0.14	1800	17.6	1.8
	28	300	3400	0.17	1700	22.4	2.2
Depth of cut							

Note 1) The use of water-soluble coolant is effective.
Note 2) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

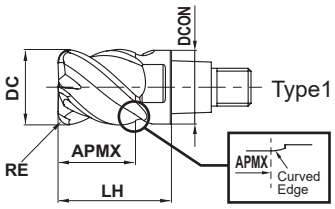
iMX-C4HV

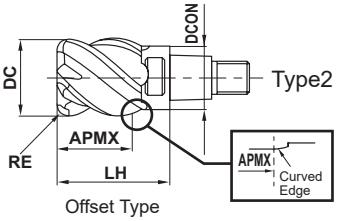
Corner radius head, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	







Offset Type



RE≤6.35				
±0.020				



DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R03010	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010	10	2	10	16	9.7	4	●	1
IMX10C4HV100R25010	10	2.5	10	16	9.7	4	●	1
IMX10C4HV100R30010	10	3	10	16	9.7	4	●	1
IMX10C4HV110R05011	11	0.5	11.5	18	9.7	4	●	2
IMX10C4HV110R10011	11	1	11.5	18	9.7	4	●	2
IMX10C4HV120R03012	12	0.3	12.5	19	9.7	4	●	2
IMX10C4HV120R05012	12	0.5	12.5	19	9.7	4	●	2
IMX10C4HV120R10012	12	1	12.5	19	9.7	4	●	2
IMX10C4HV120R20012	12	2	12.5	19	9.7	4	●	2
IMX12C4HV120R03012	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012	12	2	12	19	11.7	4	●	1
IMX12C4HV120R25012	12	2.5	12	19	11.7	4	●	1
IMX12C4HV120R30012	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012	12	4	12	19	11.7	4	●	1
IMX12C4HV130R05013	13	0.5	13.5	21.5	11.7	4	●	2
IMX12C4HV130R10013	13	1	13.5	21.5	11.7	4	●	2
IMX12C4HV140R03014	14	0.3	14.5	22.5	11.7	4	●	2
IMX12C4HV140R05014	14	0.5	14.5	22.5	11.7	4	●	2
IMX12C4HV140R10014	14	1	14.5	22.5	11.7	4	●	2
IMX12C4HV140R20014	14	2	14.5	22.5	11.7	4	●	2
IMX16C4HV160R03016	16	0.3	16	24	15.5	4	●	1
IMX16C4HV160R05016	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016	16	2	16	24	15.5	4	●	1
IMX16C4HV160R25016	16	2.5	16	24	15.5	4	●	1
IMX16C4HV160R30016	16	3	16	24	15.5	4	●	1

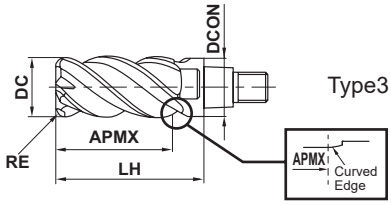
● : Inventory maintained in Japan.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16C4HV160R40016	16	4	16	24	15.5	4	●	1
IMX16C4HV160R50016	16	5	16	24	15.5	4	●	1
IMX16C4HV170R05017	17	0.5	17	26	15.5	4	●	2
IMX16C4HV170R10017	17	1	17	26	15.5	4	●	2
IMX16C4HV180R03018	18	0.3	18	27	15.5	4	●	2
IMX16C4HV180R05018	18	0.5	18.5	27	15.5	4	●	2
IMX16C4HV180R10018	18	1	18.5	27	15.5	4	●	2
IMX16C4HV180R20018	18	2	18.5	27	15.5	4	●	2
IMX16C4HV180R30018	18	3	18.5	27	15.5	4	●	2
IMX20C4HV200R03020	20	0.3	20	30	19.5	4	●	1
IMX20C4HV200R05020	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020	20	2	20	30	19.5	4	●	1
IMX20C4HV200R25020	20	2.5	20	30	19.5	4	●	1
IMX20C4HV200R30020	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020	20	4	20	30	19.5	4	●	1
IMX20C4HV200R50020	20	5	20	30	19.5	4	●	1
IMX20C4HV200R60020	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520	20	6.35	20	30	19.5	4	●	1
IMX20C4HV220R05023	22	0.5	23	33	19.5	4	●	2
IMX20C4HV220R10023	22	1	23	33	19.5	4	●	2
IMX20C4HV220R20023	22	2	23	33	19.5	4	●	2
IMX20C4HV220R30023	22	3	23	33	19.5	4	●	2
IMX25C4HV250R10025	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R20025	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R50025	25	5	25	37.5	24.5	4	●	1
IMX25C4HV250R60025	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525	25	6.35	25	37.5	24.5	4	●	1
IMX25C4HV280R10029	28	1	29	41.5	24.5	4	●	2
IMX25C4HV280R30029	28	3	29	41.5	24.5	4	●	2

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)





Type3

■ Long cutting edge type

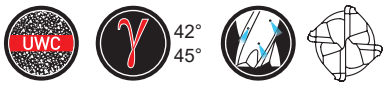
(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16C4HV160R10032	16	1	32	40	15.5	4	●	3
IMX16C4HV160R30032	16	3	32	40	15.5	4	●	3
IMX20C4HV200R10040	20	1	40	50	19.5	4	●	3
IMX20C4HV200R30040	20	3	40	50	19.5	4	●	3

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

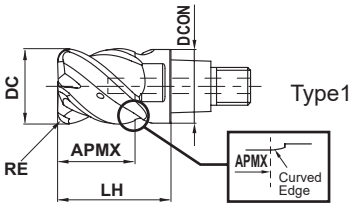
iMX-C4HV-S

Corner radius head, 4 flute, Irregular helix, with coolant hole



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





RE≤6.35				
±0.020				

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant holes for each cutting edge enable stable coolant supply.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R03010S	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010S	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010S	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010S	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010S	10	2	10	16	9.7	4	●	1
IMX10C4HV100R30010S	10	3	10	16	9.7	4	●	1
IMX12C4HV120R03012S	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012S	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012S	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012S	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012S	12	2	12	19	11.7	4	●	1
IMX12C4HV120R30012S	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012S	12	4	12	19	11.7	4	●	1
IMX16C4HV160R05016S	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016S	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016S	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016S	16	2	16	24	15.5	4	●	1
IMX16C4HV160R30016S	16	3	16	24	15.5	4	●	1
IMX16C4HV160R40016S	16	4	16	24	15.5	4	●	1
IMX20C4HV200R05020S	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020S	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020S	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020S	20	2	20	30	19.5	4	●	1
IMX20C4HV200R30020S	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020S	20	4	20	30	19.5	4	●	1
IMX20C4HV200R60020S	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520S	20	6.35	20	30	19.5	4	●	1
IMX25C4HV250R10025S	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R15025S	25	1.5	25	37.5	24.5	4	●	1
IMX25C4HV250R20025S	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025S	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025S	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R60025S	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525S	25	6.35	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ K003

iMX-C4HV/iMX-C4HV-S

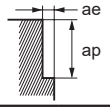
Corner radius head, 4 flute, Irregular helix (With/Without coolant hole)

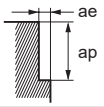
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	0.09	1700	10	2	120	3800	0.06	910	10	2	100	3200	0.075	960	10	2
12	150	4000	0.09	1400	12	2.4	120	3200	0.065	830	12	2.4	100	2700	0.08	860	12	2.4
16	150	3000	0.1	1200	16	3.2	120	2400	0.075	720	16	3.2	100	2000	0.09	720	16	3.2
20	150	2400	0.1	960	20	4	120	1900	0.075	570	20	4	100	1600	0.09	580	20	4
25	150	1900	0.12	910	25	5	120	1500	0.075	450	25	5	100	1300	0.09	470	25	5
Depth of cut																		

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	75	2400	0.06	580	10	2	40	1300	0.04	210	10	1
12	75	2000	0.065	520	12	2.4	40	1100	0.045	200	12	1.2
16	75	1500	0.075	450	16	3.2	40	800	0.05	160	16	1.6
20	75	1200	0.075	360	20	4	40	640	0.05	130	20	2
25	75	950	0.075	290	25	5	40	510	0.05	100	25	2.5
Depth of cut												

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

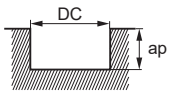
iMX-C4HV/iMX-C4HV-S

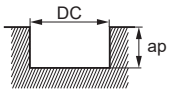
Corner radius head, 4 flute, Irregular helix (With/Without coolant hole)

RECOMMENDED CUTTING CONDITIONS

■ Slot milling

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	100	3200	0.04	510	5	80	2500	0.03	300	5	75	2400	0.03	290	5
12	100	2700	0.05	540	6	80	2100	0.04	340	6	75	2000	0.04	320	6
16	100	2000	0.07	560	8	80	1600	0.05	320	8	75	1500	0.06	360	8
20	100	1600	0.07	450	10	80	1300	0.05	260	10	75	1200	0.06	290	10
25	100	1300	0.08	420	12	80	1000	0.05	200	12	75	950	0.06	230	12
Depth of cut	 DC:Dia. (Cutting diameter)														

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					Heat resistant alloys Inconel718				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	60	1900	0.025	190	5	30	950	0.02	76	2
12	60	1600	0.035	220	6	30	800	0.03	96	2.4
16	60	1200	0.05	240	8	30	600	0.05	120	3.2
20	60	950	0.05	190	10	30	480	0.05	96	4
25	60	760	0.05	150	12	30	380	0.05	76	5
Depth of cut	 DC:Dia. (Cutting diameter)									

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

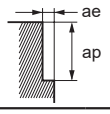
iMX-C4HV

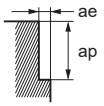
Corner radius head, 4 flute, Irregular helix, Long cutting edge type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling

(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
4	**16**	100	2000	0.09	720	32	0.8	80	1600	0.07	450	32	0.8	60	1200	0.08	380	32	0.8
	20	100	1600	0.09	580	40	1	80	1300	0.07	360	40	1	60	950	0.08	300	40	1
6	**16**	60	1200	0.07	340	32	0.8	50	990	0.05	200	32	0.8	40	800	0.06	190	32	0.8
	20	60	950	0.07	270	40	1	50	800	0.05	160	40	1	40	640	0.06	150	40	1
Depth of cut																			

Workpiece Material		Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
4	**16**	50	990	0.07	280	32	0.8	30	600	0.05	120	32	0.4
	20	50	800	0.07	220	40	1	30	480	0.05	96	40	0.5
6	**16**	30	600	0.05	120	32	0.8	20	400	0.04	64	32	0.4
	20	30	480	0.05	96	40	1	20	320	0.04	51	40	0.5
Depth of cut													

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) The length of the long cutting type is 2 times that of the standard head. L/D demonstrates +1 when installed to a holder of the same size.

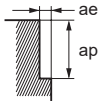
iMX-C4HV

Corner radius head, 4 flute, Irregular helix, Offset type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling

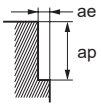
(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	11	150	4300	0.09	1500	11	1.1	120	3500	0.06	840	11	1.1	100	2900	0.075	870	11	1.1
	12	150	4000	0.09	1400	12	1.2	120	3200	0.06	770	12	1.2	100	2700	0.075	810	12	1.2
	13	150	3700	0.09	1300	13	1.3	120	2900	0.065	750	13	1.3	100	2400	0.08	770	13	1.3
	14	150	3400	0.09	1200	14	1.4	120	2700	0.065	700	14	1.4	100	2300	0.08	740	14	1.4
	17	150	2800	0.1	1100	17	1.7	120	2200	0.075	660	17	1.7	100	1900	0.08	610	17	1.7
	18	150	2700	0.1	1100	18	1.8	120	2100	0.075	630	18	1.8	100	1800	0.09	650	18	1.8
	22	150	2200	0.1	880	22	2.2	120	1700	0.075	510	22	2.2	100	1400	0.09	500	22	2.2
	28	150	1700	0.12	820	28	2.8	120	1400	0.075	420	28	2.8	100	1100	0.09	400	28	2.8
	30	150	1600	0.12	770	30	3	120	1300	0.075	390	30	3	100	1100	0.09	400	30	3
	32	150	1500	0.12	720	32	3.2	120	1200	0.075	360	32	3.2	100	990	0.09	360	32	3.2
5	11	90	2600	0.07	730	11	0.4	70	2000	0.05	400	11	0.4	60	1700	0.06	410	11	0.4
	12	90	2400	0.07	670	12	0.5	70	1900	0.05	380	12	0.5	60	1600	0.06	380	12	0.5
	13	90	2200	0.07	620	13	0.5	70	1700	0.05	340	13	0.5	60	1500	0.06	360	13	0.5
	14	90	2000	0.07	560	14	0.6	70	1600	0.05	320	14	0.6	60	1400	0.06	340	14	0.6
	17	90	1700	0.08	540	17	0.7	70	1300	0.06	310	17	0.7	60	1100	0.07	310	17	0.7
	18	90	1600	0.08	510	18	0.7	70	1200	0.06	290	18	0.7	60	1100	0.07	310	18	0.7
	22	90	1300	0.08	420	22	0.9	70	1000	0.06	240	22	0.9	60	870	0.07	240	22	0.9
	28	90	1000	0.1	400	28	1.1	70	800	0.06	190	28	1.1	60	680	0.07	190	28	1.1
	30	90	950	0.1	380	30	1.2	70	740	0.06	180	30	1.2	60	640	0.07	180	30	1.2
	32	90	900	0.1	360	32	1.3	70	700	0.06	170	32	1.3	60	600	0.07	170	32	1.3
7	11	60	1700	0.06	410	11	0.2	50	1400	0.04	220	11	0.2	32	930	0.05	190	11	0.2
	12	60	1600	0.06	380	12	0.2	50	1300	0.04	210	12	0.2	32	850	0.05	170	12	0.2
	13	60	1500	0.06	360	13	0.3	50	1200	0.05	240	13	0.3	32	780	0.06	190	13	0.3
	14	60	1400	0.06	340	14	0.3	50	1100	0.05	220	14	0.3	32	730	0.06	180	14	0.3
	17	60	1100	0.07	310	17	0.3	50	940	0.05	190	17	0.3	32	600	0.06	140	17	0.3
	18	60	1100	0.07	310	18	0.4	50	880	0.05	180	18	0.4	32	570	0.06	140	18	0.4
	22	60	870	0.07	240	22	0.4	50	720	0.05	140	22	0.4	32	460	0.06	110	22	0.4
	28	60	680	0.08	220	28	0.6	50	570	0.05	110	28	0.6	32	360	0.06	86	28	0.6
	30	60	640	0.08	200	30	0.6	50	530	0.05	110	30	0.6	32	340	0.06	82	30	0.6
	32	60	600	0.08	190	32	0.6	50	500	0.05	100	32	0.6	32	320	0.06	77	32	0.6
Depth of cut																			

Note 1) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

■ Shoulder milling

(mm)

Workpiece Material		Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	**11**	75	2200	0.06	530	11	1.1	30	870	0.04	140	11	0.8
	12	75	2000	0.06	480	12	1.2	30	800	0.04	130	12	0.9
	13	75	1800	0.065	470	13	1.3	30	730	0.045	130	13	1
	14	75	1700	0.065	440	14	1.4	30	680	0.045	120	14	1.1
	17	75	1400	0.065	360	17	1.7	40	750	0.045	140	17	1.3
	18	75	1300	0.075	390	18	1.8	40	710	0.05	140	18	1.4
	22	75	1100	0.075	330	22	2.2	40	580	0.05	120	22	1.7
	28	75	850	0.075	260	28	2.8	40	450	0.05	90	28	2.1
	30	75	800	0.075	240	30	3	40	420	0.05	84	30	2.3
	32	75	750	0.075	230	32	3.2	40	400	0.05	80	32	2.4
5	**11**	50	1400	0.05	280	11	0.4	10	290	0.03	35	11	0.3
	12	50	1300	0.05	260	12	0.5	10	270	0.03	32	12	0.4
	13	50	1200	0.05	240	13	0.5	10	240	0.04	38	13	0.4
	14	50	1100	0.05	220	14	0.6	10	230	0.04	37	14	0.4
	17	50	940	0.06	230	17	0.7	19	360	0.04	58	17	0.5
	18	50	880	0.06	210	18	0.7	19	340	0.04	54	18	0.6
	22	50	720	0.06	170	22	0.9	19	270	0.04	43	22	0.7
	28	50	570	0.06	140	28	1.1	19	220	0.04	35	28	0.8
	30	50	530	0.06	130	30	1.2	19	200	0.04	32	30	0.9
	32	50	500	0.06	120	32	1.3	19	190	0.04	30	32	1
7	**11**	24	690	0.04	110	11	0.2	–	–	–	–	–	–
	12	24	640	0.04	100	12	0.2	–	–	–	–	–	–
	13	24	590	0.05	120	13	0.3	–	–	–	–	–	–
	14	24	550	0.05	110	14	0.3	–	–	–	–	–	–
	17	24	450	0.05	90	17	0.3	–	–	–	–	–	–
	18	24	420	0.05	84	18	0.4	–	–	–	–	–	–
	22	24	350	0.05	70	22	0.4	–	–	–	–	–	–
	28	24	270	0.05	54	28	0.6	–	–	–	–	–	–
	30	24	250	0.05	50	30	0.6	–	–	–	–	–	–
	32	24	240	0.05	48	32	0.6	–	–	–	–	–	–
Depth of cut													

Note 1) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

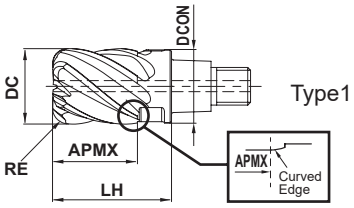
iMX-C6HV-C NEW

Corner radius head, 6 flute, Irregular helix, with coolant hole

UWC γ 36° 40°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎		





Type1

RE≤3				
±0.020				
DC=10	12≤DC<16	20≤DC≤25		
0 - 0.030	0 - 0.040	0 - 0.050		

- Irregular helix controls vibration and achieves stable machining.
- Centre through coolant hole provides excellent chip evacuation.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C6HV100R05010C	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010C	10	1	10	16	9.7	6	●	1
IMX12C6HV120R05012C	12	0.5	12	19	11.7	6	●	1
IMX12C6HV120R10012C	12	1	12	19	11.7	6	●	1
IMX16C6HV160R10016C	16	1	16	24	15.5	6	●	1
IMX16C6HV160R30016C	16	3	16	24	15.5	6	●	1
IMX20C6HV200R10020C	20	1	20	30	19.5	6	●	1
IMX20C6HV200R30020C	20	3	20	30	19.5	6	●	1
IMX25C6HV250R10025C	25	1	25	37.5	24.5	6	●	1
IMX25C6HV250R30025C	25	3	25	37.5	24.5	6	●	1

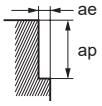
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

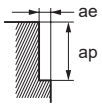
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2						Precipitation-hardening stainless steel, Cobalt chromium alloy, Titanium alloy AISI 630, AISI 631, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	200	6400	0.07	2700	10	1.0	150	4800	0.07	2000	10	1.0	100	3200	0.07	1300	10	1.0
12	200	5300	0.085	2700	12	1.2	150	4000	0.085	2000	12	1.2	100	2700	0.085	1400	12	1.2
16	200	4000	0.088	2100	16	1.6	150	3000	0.088	1600	16	1.6	100	2000	0.088	1100	16	1.6
20	200	3200	0.1	1900	20	2.0	150	2400	0.1	1400	20	2.0	100	1600	0.1	1000	20	2.0
25	200	2500	0.1	1500	25	2.5	150	1900	0.1	1100	25	2.5	100	1300	0.1	800	25	2.5
Depth of cut																		

Workpiece Material	Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	40	1300	0.033	260	10	0.5
12	40	1100	0.035	230	12	0.6
16	40	800	0.038	180	16	0.8
20	40	640	0.04	150	20	1.0
25	40	510	0.04	120	25	1.3
Depth of cut						

Note 1) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

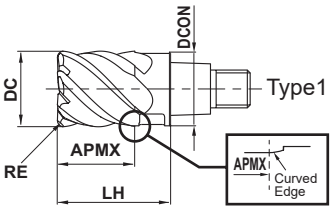
iMX-C6HV/C10HV/C12HV

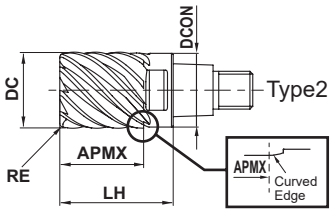
Corner radius head, Multi-flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎		







RE≤1				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- High machining efficiency due to the multi-flute design.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C6HV100R05010	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010	10	1	10	16	9.7	6	●	1
IMX12C6HV120R10012	12	1	12	19	11.7	6	●	1
IMX16C10HV160R10016	16	1	16	24	15.5	10	●	2
IMX20C12HV200R10020	20	1	20	30	19.5	12	●	2
IMX25C12HV250R10025	25	1	25	37.5	24.5	12	●	2

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

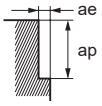
ISO13399 ➤ K003

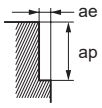
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

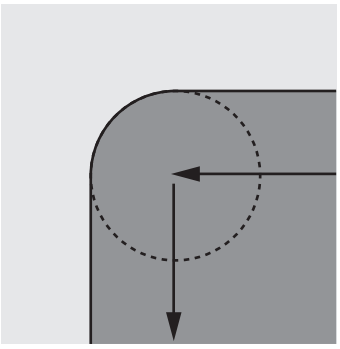
Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2						Precipitation-hardening stainless steel, Cobalt chromium alloy, Titanium alloy AISI 630, AISI 631, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	200	6400	0.07	2700	10	1	150	4800	0.07	2000	10	1	100	3200	0.07	1300	10	1
12	200	5300	0.085	2700	12	1.2	150	4000	0.085	2000	12	1.2	100	2700	0.085	1400	12	1.2
16	200	4000	0.088	3500	16	0.6	150	3000	0.088	2600	16	0.64	100	2000	0.088	1800	16	0.6
20	200	3200	0.1	3800	20	0.8	150	2400	0.1	2900	20	0.8	100	1600	0.1	1900	20	0.8
25	200	2500	0.1	3000	25	1	150	1900	0.1	2300	25	1	100	1300	0.1	1600	25	1
Depth of cut																		

Workpiece Material	Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	40	1300	0.033	260	10	0.5
12	40	1100	0.035	230	12	0.6
16	40	800	0.038	300	16	0.6
20	40	640	0.04	310	20	0.8
25	40	510	0.04	240	25	1
Depth of cut						

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) If the machining radius at the corner is the same as the tool radius when using the head with more than 10 flutes, please set the depth of cut and feed rate to half of the above.



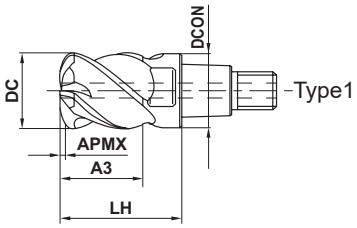
iMX-C4FD-C

With coolant hole Multi-task corner radius end mill for high feed cutting



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎		◎	◎	○	





DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Multi-task corner radius type and 4 flutes offer high feed and high efficiency.
- Coolant hole with the end cutting edge as the centre provides a stable supply of coolant.

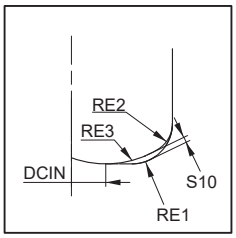
(mm)

Order Number	DC	RE1*1	APMX	A3	LH	DCON	No. of Flutes	RMPX*2	Grade EP7020	Type
IMX10C4FD10010C	10	1.99	0.7	10.5	16	9.7	4	2.1°	●	1
IMX12C4FD12012C	12	2.1	0.8	12.5	19	11.7	4	2.8°	●	1
IMX16C4FD16016C	16	2.75	1	16.5	24	15.5	4	3°	●	1
IMX20C4FD20021C	20	3.07	1.3	21	30	19.5	4	3.3°	●	1
IMX25C4FD25026C	25	4.21	1.6	26	37.5	24.5	4	4.5°	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)
Note 2) Multi-task corner radius is not suitable for corner radius milling that transfers an R-shape because cutting at R is incomplete.
*1 RE1 : Approx. R
*2 RMPX : Max. Ramping Angle

(mm)

Order Number	RE1*1	Multi-task Radius Part			
		S10	DCIN	RE2	RE3
IMX10C4FD10010C	1.99	0.27	3.4	1.5	5
IMX12C4FD12012C	2.1	0.33	4.5	1.5	6
IMX16C4FD16016C	2.75	0.42	6.2	2	8
IMX20C4FD20021C	3.07	0.59	8	2	10
IMX25C4FD25026C	4.21	0.67	10	3	12



Please programme CAM as an R2 cutter radius, when using the **iMX**.
The approximate uncut portions for the programme are as follows.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

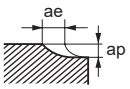
ISO13399 ➤ K003

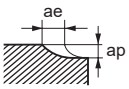
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Hardened steel, Precipitation-hardening stainless steel, Ferritic and Martensitic stainless steels, AISI H13, AISI L6, AISI 431, AISI 420J2, AISI 630, AISI 631					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	0.4	7700	0.5	6	135	4300	0.4	6900	0.5	6	120	3800	0.3	4600	0.5	6
12	150	4000	0.45	7200	0.6	7.2	135	3600	0.45	6500	0.6	7.2	120	3200	0.3	3800	0.6	7.2
16	150	3000	0.5	6000	0.8	9.6	135	2700	0.5	5400	0.8	9.6	120	2400	0.4	3800	0.8	9.6
20	150	2400	0.5	4800	1	12	135	2100	0.5	4200	1	12	120	1900	0.4	3000	1	12
25	150	1900	0.5	3800	1.25	15	135	1700	0.5	3400	1.25	15	120	1500	0.4	2400	1.25	15
Depth of cut																		

Workpiece Material	Austenitic stainless steel, Titanium alloy, Cobalt chromium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, Ti-6Al-4V						Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	40	1300	0.2	1000	0.5	6	25	800	0.1	320	0.5	6
12	40	1100	0.2	880	0.6	7.2	25	660	0.1	260	0.6	7.2
16	40	800	0.3	960	0.8	9.6	25	500	0.15	300	0.8	9.6
20	40	640	0.3	770	1	12	25	400	0.15	240	1	12
25	40	510	0.3	610	1.25	15	25	320	0.15	190	1.25	15
Depth of cut												

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.
Note 4) Reduce the feed by 50% for ramping.

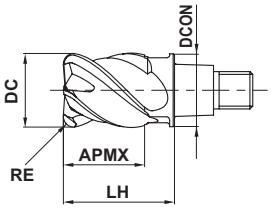
iMX-C4FV

Corner radius head for high efficiency machining, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	◎	◎					





Type1

RE≤3	RE=4			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Corner radius end mill for high efficiency machining
- Irregular helix controls vibration and achieves stable machining.

(mm)

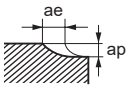
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP6120	Type
IMX10C4FV100R20010	10	2	10.5	16	9.7	4	●	1
IMX12C4FV120R20012	12	2	12.5	19	11.7	4	●	1
IMX16C4FV160R30016	16	3	16.5	24	15.5	4	●	1
IMX20C4FV200R30021	20	3	21	30	19.5	4	●	1
IMX25C4FV250R40026	25	4	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

RECOMMENDED CUTTING CONDITIONS

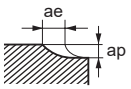
■High depth of cut conditions

(mm)

Workpiece Material		Carbon steel, Alloy steel, Gray cast iron AISI 1045, AISI 4140, AISI No 45 B						Pre-hardened steel, Alloy tool steel AISI P21, AISI P20, SKD, SKT						Hardened steel (45－55HRC) AISI H13, AISI L6					
Dia. **DC**	Corner R **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	**2**	90	2900	0.25	2900	1.2	4.5	75	2400	0.23	2200	1	4.5	60	1900	0.22	1700	0.7	4.5
12	**2**	90	2400	0.25	2400	1.8	6	75	2000	0.23	1800	1.4	6	60	1600	0.22	1400	0.9	6
16	**3**	90	1800	0.25	1800	1.8	7.5	75	1500	0.23	1400	1.4	7.5	60	1200	0.22	1100	0.9	7.5
20	**3**	90	1400	0.25	1400	1.8	9	75	1200	0.23	1100	1.4	9	60	950	0.22	840	0.9	9
25	**4**	90	1100	0.25	1100	2.4	11.5	75	950	0.23	870	1.8	11.5	60	760	0.22	670	1.2	11.5
Depth of cut																			

■High-speed milling

(mm)

Workpiece Material		Carbon steel, Alloy steel, Gray cast iron AISI 1045, AISI 4140, AISI No 45 B						Pre-hardened steel, Alloy tool steel AISI P21, AISI P20, SKD, SKT						Hardened steel (45－55HRC) AISI H13, AISI L6					
Dia. **DC**	Corner R **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	**2**	150	4800	0.4	7700	0.6	4.5	125	4000	0.35	5600	0.46	4.5	100	3200	0.3	3800	0.36	4.5
12	**2**	150	4000	0.45	7200	0.9	6	125	3300	0.4	5300	0.7	6	100	2700	0.3	3200	0.45	6
16	**3**	150	3000	0.5	6000	0.9	7.5	125	2500	0.45	4500	0.7	7.5	100	2000	0.3	2400	0.45	7.5
20	**3**	150	2400	0.5	4800	0.9	9	125	2000	0.45	3600	0.7	9	100	1600	0.35	2200	0.45	9
25	**4**	150	1900	0.5	3800	1.2	11.5	125	1600	0.45	2900	0.9	11.5	100	1300	0.35	1800	0.6	11.5
Depth of cut																			

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece.
Note 4) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

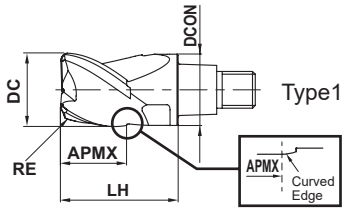
iMX-C3A

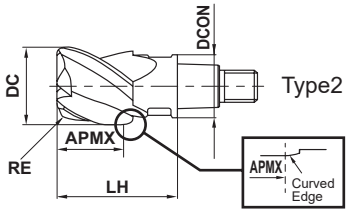
Corner radius head, 3 flute, For aluminium alloy



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
							◎







Offset Type

RE≤5				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining due to the sharp cutting edge suitable for aluminium alloy machining and polished rake face.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10C3A100R10008	10	1	8	16	9.7	3	●	1
IMX10C3A100R25008	10	2.5	8	16	9.7	3	●	1
IMX10C3A120R10010	12	1	10.1	19	9.7	3	●	2
IMX12C3A120R10009	12	1	9.6	19	11.7	3	●	1
IMX12C3A120R32009	12	3.2	9.6	19	11.7	3	●	1
IMX12C3A140R10011	14	1	11.7	22.5	11.7	3	●	2
IMX16C3A160R10012	16	1	12.8	24	15.5	3	●	1
IMX16C3A160R32012	16	3.2	12.8	24	15.5	3	●	1
IMX16C3A180R32014	18	3.2	14.9	27	15.5	3	●	2
IMX20C3A200R10016	20	1	16	30	19.5	3	●	1
IMX20C3A200R32016	20	3.2	16	30	19.5	3	●	1
IMX20C3A220R32018	22	3.2	18.6	33	19.5	3	●	2
IMX25C3A250R10020	25	1	20	37.5	24.5	3	●	1
IMX25C3A250R32020	25	3.2	20	37.5	24.5	3	●	1
IMX25C3A250R50020	25	5	20	37.5	24.5	3	●	1
IMX25C3A280R32023	28	3.2	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

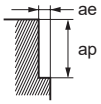
Scan here for product NEWS ▶

ISO13399 ➤ K003

RECOMMENDED CUTTING CONDITIONS

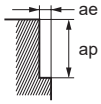
■Shoulder milling (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	500	16000	0.117	5600	8	3
12	500	13000	0.118	4600	9.6	3.6
16	500	9900	0.153	4500	12.8	4.8
20	500	8000	0.175	4200	16	6
25	500	6400	0.211	4100	20	7.5
Depth of Cut						

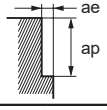
■Shoulder milling (L/D=5)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	300	9500	0.09	2600	8	1.2
12	300	8000	0.09	2200	9.6	1.44
16	300	6000	0.12	2200	12.8	1.92
20	300	4800	0.14	2000	16	2.4
25	300	3800	0.17	1900	20	3
Depth of Cut						

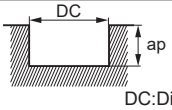
■Shoulder milling (L/D=7)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	200	6400	0.08	1500	8	0.6
12	200	5300	0.08	1300	9.6	0.72
16	200	4000	0.11	1300	12.8	0.96
20	200	3200	0.12	1200	16	1.2
25	200	2500	0.15	1100	20	1.5
Depth of Cut						

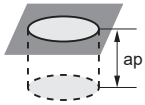
■Slot milling (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075				
DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	500	16000	0.068	3300	5
12	500	13000	0.072	2800	6
16	500	9900	0.093	2800	8
20	500	8000	0.108	2600	10
25	500	6400	0.127	2400	12.5
Depth of Cut	 DC:Dia. (Cutting diameter)				

■Plunging (L/D=3)

(mm)

Workpiece Material	Aluminium alloy A6061, A7075					
DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap_2
10	300	9500	0.1	950	5	2.5
12	300	8000	0.1	800	6	2.5
16	300	6000	0.1	600	8	2.5
20	300	4800	0.1	480	10	2.5
25	300	3800	0.1	380	12.5	2.5
Depth of Cut						

Note 1) The use of water-soluble coolant is effective.
Note 2) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

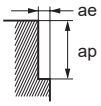
iMX-C3A

Corner radius head, 3 flute, For aluminium alloy, Offset type

RECOMMENDED CUTTING CONDITIONS

■ Side milling

(mm)

Workpiece Material		Aluminium alloy A6061, A7075					
L/D	Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
3	12	500	13000	0.117	4600	9.6	2.4
	14	500	11000	0.118	3900	11.2	2.8
	18	500	8800	0.153	4000	14.4	3.6
	22	500	7200	0.175	3800	17.6	4.4
	28	500	5700	0.211	3600	22.4	5.6
5	12	300	8000	0.09	2200	9.6	1.0
	14	300	6800	0.09	1800	11.2	1.1
	18	300	5300	0.12	1900	14.4	1.4
	22	300	4300	0.14	1800	17.6	1.8
	28	300	3400	0.17	1700	22.4	2.2
Depth of cut							

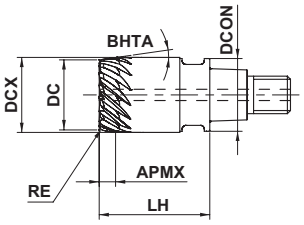
Note 1) The use of water-soluble coolant is effective.
Note 2) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

iMX-C8T/C10T/C12T/C15T-C

Corner radius, Taper head, Multi-flute, With coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
				◎	◎		





Type1

RE ≤2				
±0.015				
DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

- Suitable for 3-dimensional free-form surface cutting such as blades.
- High feed cutting is possible due to multiple cutting edges.

(mm)

Order Number	DC	RE	APMX	DCX	LH	DCON	BHTA	No. of Flutes	Grade EP7020	Type
IMX10C8T080R05T080C	8	0.5	7.12	10	16	9.7	8°	8	●	1
IMX10C8T080R10T080C	8	1	7.12	10	16	9.7	8°	8	●	1
IMX12C10T100R05T080C	10	0.5	7.12	12	19	11.7	8°	10	●	1
IMX12C10T100R10T080C	10	1	7.12	12	19	11.7	8°	10	●	1
IMX16C15T150R05T080C	15	0.5	3.56	16	24	15.5	8°	15	●	1
IMX16C15T150R10T080C	15	1	3.56	16	24	15.5	8°	15	●	1
IMX16C12T150R20T080C	15	2	3.56	16	24	15.5	8°	12	●	1
IMX20C15T190R05T080C	19	0.5	3.56	20	30	19.5	8°	15	●	1
IMX20C15T190R10T080C	19	1	3.56	20	30	19.5	8°	15	●	1
IMX20C12T190R20T080C	19	2	3.56	20	30	19.5	8°	12	●	1

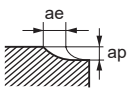
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

Recommended Cutting Conditions

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material		Austenitic stainless steels, Ferritic and Martensitic stainless steels AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2						Precipitation-hardening stainless steels, Titanium alloys AISI 630, AISI 631, Ti-6Al-4V						Heat resistant alloys Inconel718					
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
8	**8**	300	12000	0.1	9600	0.3	1.2	200	8000	0.1	6400	0.3	1.2	60	2400	0.08	1500	0.3	0.8
10	**10**	300	9500	0.1	9500	0.3	1.5	200	6400	0.1	6400	0.3	1.5	60	1900	0.08	1500	0.3	1
15	**12**	300	6400	0.12	9200	0.3	2.2	200	4200	0.12	6000	0.3	2.2	60	1300	0.1	1600	0.3	1.5
15	**15**	300	6400	0.1	9600	0.3	2.2	200	4200	0.1	6300	0.3	2.2	60	1300	0.08	1600	0.3	1.5
19	**12**	300	5000	0.12	7200	0.3	2.8	200	3400	0.12	4900	0.3	2.8	60	1000	0.1	1200	0.3	1.9
19	**15**	300	5000	0.1	7500	0.3	2.8	200	3400	0.1	5100	0.3	2.8	60	1000	0.08	1200	0.3	1.9
Depth of Cut																			

Note 1) The use of water-soluble coolant is effective.
Note 2) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

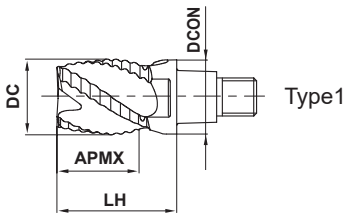
iMX-R4F

Roughing head, 4 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





● The roughing edge geometry reduces cutting resistance.
Effective when rigidity of the machine or workpiece material is low.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10R4F10010	10	10.5	16	9.7	4	●	1
IMX12R4F12012	12	12.5	19	11.7	4	●	1
IMX16R4F16016	16	16.5	24	15.5	4	●	1
IMX20R4F20021	20	21	30	19.5	4	●	1
IMX25R4F25026	25	26	37.5	24.5	4	●	1

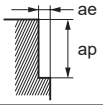
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. DC	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	0.045	860	8	4	120	3800	0.03	460	8	4	100	3200	0.038	490	8	4
12	150	4000	0.045	720	9.6	4.8	120	3200	0.033	420	9.6	4.8	100	2700	0.04	430	9.6	4.8
16	150	3000	0.05	600	12.8	6.4	120	2400	0.038	360	12.8	6.4	100	2000	0.045	360	12.8	6.4
20	150	2400	0.05	480	16	8	120	1900	0.038	290	16	8	100	1600	0.045	290	16	8
25	150	1900	0.06	460	20	10	120	1500	0.038	230	20	10	100	1300	0.045	230	20	10
Depth of cut																		

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

● : Inventory maintained in Japan.

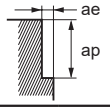
Scan here for product NEWS ▶

ISO13399 ➤ K003

■ Shoulder milling (L/D=3)

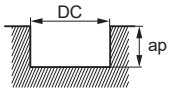
Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

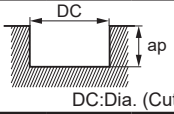
(mm)

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	75	2400	0.03	290	8	4	40	1300	0.04	210	8	1
12	75	2000	0.033	260	9.6	4.8	40	1100	0.045	200	9.6	1.2
16	75	1500	0.038	230	12.8	6.4	40	800	0.05	160	12.8	1.6
20	75	1200	0.038	180	16	8	40	640	0.05	130	16	2
25	75	950	0.038	140	20	10	40	510	0.05	100	20	2.5
Depth of cut												

■ Slot milling

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	100	3200	0.04	510	5	80	2500	0.03	300	5	60	1900	0.02	150	4
12	100	2700	0.045	490	6	80	2100	0.032	270	6	60	1600	0.025	160	4.8
16	100	2000	0.05	400	8	80	1600	0.038	240	8	60	1200	0.03	140	6.4
20	100	1600	0.05	320	10	80	1300	0.038	200	10	60	950	0.034	130	8
25	100	1300	0.06	310	12	80	1000	0.038	150	12	60	760	0.034	100	10
Depth of cut	 DC:Dia. (Cutting diameter)														

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631				
Dia. DC	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	40	1300	0.016	83	4
12	40	1100	0.02	88	4.8
16	40	800	0.024	77	6.4
20	40	640	0.027	70	8
25	40	510	0.027	55	10
Depth of cut	 DC:Dia. (Cutting diameter)				

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.

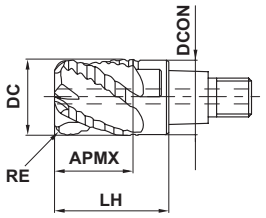
iMX-RC4F-C NEW

Roughing head with coolant hole, 4 flute

UWC γ 35°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy	Copper Alloy	Aluminium Alloy
◎				◎	◎		





Type1

● The roughing edge geometry reduces cutting resistance. Effective when the rigidity of the machine or workpiece material is low.
● Centre through coolant hole provides excellent chip evacuation.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10RC4F100R05010C	10	0.5	10.5	16	9.7	4	●	1
IMX10RC4F100R10010C	10	1	10.5	16	9.7	4	●	1
IMX12RC4F120R05012C	12	0.5	12.5	19	11.7	4	●	1
IMX12RC4F120R10012C	12	1	12.5	19	11.7	4	●	1
IMX12RC4F120R15012C	12	1.5	12.5	19	11.7	4	●	1
IMX12RC4F120R20012C	12	2	12.5	19	11.7	4	●	1
IMX16RC4F160R05016C	16	0.5	16.5	24	15.5	4	●	1
IMX16RC4F160R10016C	16	1	16.5	24	15.5	4	●	1
IMX16RC4F160R15016C	16	1.5	16.5	24	15.5	4	●	1
IMX16RC4F160R20016C	16	2	16.5	24	15.5	4	●	1
IMX16RC4F160R30016C	16	3	16.5	24	15.5	4	●	1
IMX20RC4F200R05021C	20	0.5	21	30	19.5	4	●	1
IMX20RC4F200R10021C	20	1	21	30	19.5	4	●	1
IMX20RC4F200R20021C	20	2	21	30	19.5	4	●	1
IMX20RC4F200R30021C	20	3	21	30	19.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

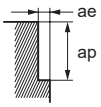
Scan here for product NEWS ▶

ISO13399 ➤ K003

RECOMMENDED CUTTING CONDITIONS

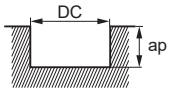
■ Side milling

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140					Titanium Alloy, Austenitic stainless steel, Ferritic and Martensitic stainless steels Ti-6Al-4V, AISI 304, AISI 316LN, AISI 410, AISI 420J2					Precipitation-hardening stainless steel AISI 630, AISI 631				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	150	4800	860	8	4	70	2000	320	8	4	60	1900	230	8	4
12	150	4000	800	9.6	4.8	70	1900	340	9.6	4.8	60	1600	230	9.6	4.8
16	150	3000	600	12.8	6.4	70	1400	280	12.8	6.4	60	1200	200	12.8	6.4
20	150	2400	530	16	8	70	1100	220	16	8	60	950	180	16	8
Depth of cut															

■ Slot milling

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140				Titanium Alloy, Austenitic stainless steel, Ferritic and Martensitic stainless steels Ti-6Al-4V, AISI 304, AISI 316LN, AISI 410, AISI 420J2				Precipitation-hardening stainless steel AISI 630, AISI 631			
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (mm/min)	Depth of cut ap
10	100	3200	510	5	60	1900	230	5	40	1300	100	5
12	100	2700	490	6	60	1600	260	6	40	1100	110	6
16	100	2000	400	8	60	1200	220	8	40	800	96	8
20	100	1600	350	10	60	950	170	10	40	640	90	10
Depth of cut												

DC:Dia. (Cutting diameter)

Note 1) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) For stainless steel, titanium alloy, the use of water-soluble coolant is effective.

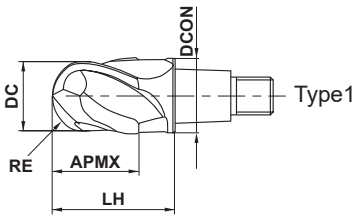
iMX-B2S

Ball nose head, 2 flute, For hardened steels

UWC γ 30°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
			◎				





RE≥8				
±0.020				

● Ideal for machining with long overhangs.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8110	Type
IMX16B2S16016	8	16	16	24	15.5	2	●	1
IMX20B2S20020	10	20	20	30	19.5	2	●	1

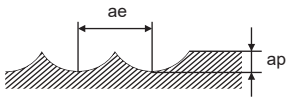
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

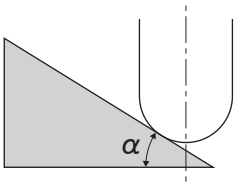
Recommended Cutting Conditions

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Hardened steels (55–65HRC) AISI D2									
Inclination angle	α≤15°				α>15°				Depth of Cut ap	Width of Cut ae
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min⁻¹)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min⁻¹)	Feed per Tooth (mm/t)	Feed rate (mm/min)		
16	**8**	300	6000	0.14	1700	150	3000	0.08	480	0.3	1.6
20	**10**	300	4800	0.14	1300	150	2400	0.08	380	0.3	2
Depth of cut										



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) α is the inclination angle of the machined surface.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

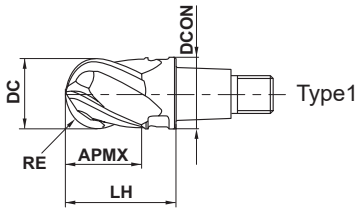
iMX-B4S

Ball nose head, 4 flute, For hardened steels

UWC γ 30°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
			◎				





RE≥8				
±0.020				

●High efficiency machining is realised even with machining using the tip.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8110	Type
IMX16B4S16016	8	16	16	24	15.5	4	●	1
IMX20B4S20020	10	20	20	30	19.5	4	●	1

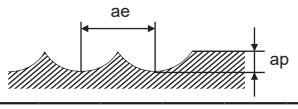
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

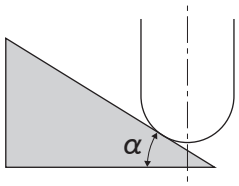
Recommended Cutting Conditions

■Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material	Hardened steels (55–65HRC) AISI D2									
Inclination angle	α≤15°				α>15°				Depth of Cut ap	Width of Cut ae
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min⁻¹)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min⁻¹)	Feed per Tooth (mm/t)	Feed rate (mm/min)		
16	**8**	300	6000	0.07	1700	150	3000	0.06	720	0.3	1.6
20	**10**	300	4800	0.07	1300	150	2400	0.06	580	0.3	2
Depth of cut										



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) α is the inclination angle of the machined surface.

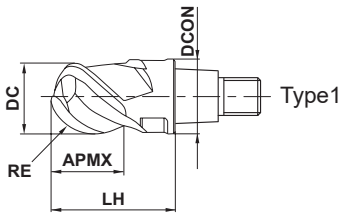
iMX-B3FV

Ball nose head, 3 flute, Irregular curve, For high efficiency machining

UWC 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
	◎	◎					





RE≤6	RE>6			
±0.010	±0.020			

- High efficiency machining is possible in deep engraving processing(DCx5)
- High wear resistance and high chip evacuation is achieved in roughing.
- High vibration control effect enables high efficiency machining in finishing.

(mm)

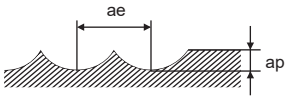
Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8120	Type
IMX10B3FV10008	5	10	8	16	9.7	3	●	1
IMX12B3FV12009	6	12	9.6	19	11.7	3	●	1
IMX16B3FV16012	8	16	12.8	24	15.5	3	●	1
IMX20B3FV20016	10	20	16	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

Recommended Cutting Conditions

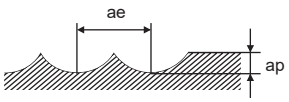
■Shoulder milling (L/D=5)

(mm)

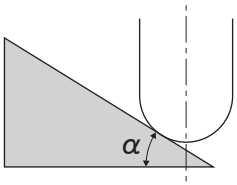
Workpiece Material		Pre-hardened steels, Alloy tool steels										Hardened steels (40−55HRC)									
Inclination angle		α≤15°				α>15°				Depth of Cut ap	Width of Cut ae	α≤15°				α>15°				Depth of Cut ap	Width of Cut ae
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)			Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)		
10	**5**	175	5600	0.22	3700	115	3700	0.15	1700	0.7	2.6	150	4800	0.18	2600	100	3200	0.12	1200	0.5	2
12	**6**	175	4600	0.22	3000	115	3100	0.15	1400	1	3.2	150	4000	0.18	2200	100	2700	0.12	970	0.7	2.5
16	**8**	175	3500	0.22	2300	115	2300	0.15	1000	1.1	3.8	150	3000	0.18	1600	100	2000	0.12	720	0.9	3.5
20	**10**	175	2800	0.22	1800	115	1800	0.15	810	1.2	4.8	150	2400	0.18	1300	100	1600	0.12	580	1.1	4.2
Depth of Cut																					

■Shoulder milling (L/D=7)

(mm)

Workpiece Material		Pre-hardened steels, Alloy tool steels AISI P21, AISI P20、AISI D2、AISI H13、AISI L6										Hardened steels (40−55HRC) AISI H13, AISI L6									
Inclination angle		α≤15°				α>15°				Depth of Cut ap	Width of Cut ae	α≤15°				α>15°				Depth of Cut ap	Width of Cut ae
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)			Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)		
10	**5**	120	3800	0.2	2300	80	2500	0.13	980	0.5	1.3	100	3200	0.13	1200	65	2100	0.085	540	0.4	1
12	**6**	120	3200	0.2	1900	80	2100	0.13	820	0.7	1.6	100	2700	0.13	1100	65	1700	0.085	430	0.6	1.3
16	**8**	120	2400	0.2	1400	80	1600	0.13	620	0.8	1.9	100	2000	0.13	780	65	1300	0.085	330	0.7	1.8
20	**10**	120	1900	0.2	1100	80	1300	0.13	510	0.9	2.4	100	1600	0.13	620	65	1000	0.085	260	0.8	2.1
Depth of Cut																					

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 3) α is the inclination angle of the machined surface.



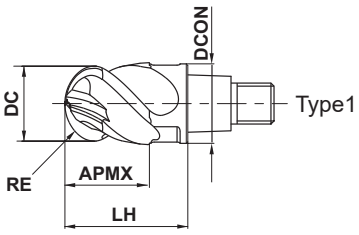
iMX-B4HV

Ball nose head, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





RE≤6	RE>6			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● The irregular helix flutes' cutting edge controls vibration and achieves stable machining.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021	10	20	21	30	19.5	4	●	1
IMX25B4HV25026	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

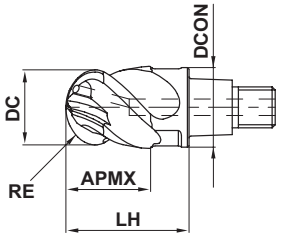
Scan here for product NEWS ▶

iMX-B4HV-E

Ball nose head with coolant hole, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





Type1

RE≤6	RE>6			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant holes for each cutting edge enable stable coolant supply.
- The irregular helix flutes' cutting edge controls vibration and achieves stable machining.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010E	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012E	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016E	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021E	10	20	21	30	19.5	4	●	1
IMX25B4HV25026E	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

iMX-B4HV/iMX-B4HV-E

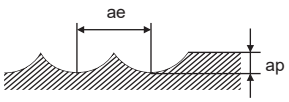
Ball nose head, 4 flute, Irregular helix (With/Without coolant hole)

RECOMMENDED CUTTING CONDITIONS

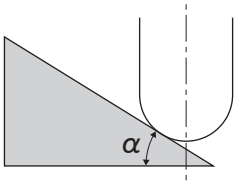
■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Pre-hardened steel AISI 1045, AISI 4140, AISI 4340, ASTM A36, AISI 1010, AISI P21, AISI P20										Austenitic stainless steel, Ferritic and Martensitic stainless steels, Cobalt chromium alloy, Titanium alloy AISI 304, AISI 316, AISI 431, AISI 420J2, AISI 630, AISI 631, Ti-6Al-4V									
Inclination angle		α≤15°				α>15°				Depth of Cut ap	Width of Cut ae	α≤15°				α>15°				Depth of Cut ap	Width of Cut ae
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)			Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min-1)	Feed per Tooth (mm/t)	Feed rate (mm/min)		
10	**5**	300	9500	0.106	4000	200	6400	0.07	1800	1	2.5	225	7200	0.105	3000	150	4800	0.067	1300	1	2.5
12	**6**	300	8000	0.125	4000	200	5300	0.085	1800	1.2	3	225	6000	0.125	3000	150	4000	0.08	1300	1.2	3
16	**8**	300	6000	0.134	3200	200	4000	0.088	1400	1.6	4	225	4500	0.14	2500	150	3000	0.09	1100	1.6	4
20	**10**	300	4800	0.156	3000	200	3200	0.1	1300	2	5	225	3600	0.16	2300	150	2400	0.105	1000	2	5
25	**12.5**	300	3800	0.16	2400	200	2500	0.1	1000	2.5	6	225	2900	0.16	1900	150	1900	0.105	800	2.5	6
Depth of cut																					

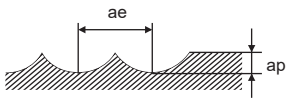
Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) α is the inclination angle of the machined surface.



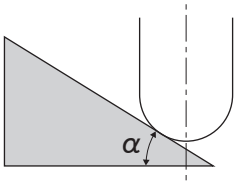
■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material		Heat resistant alloys Inconel718									
Inclination angle		α≤15°				α>15°				Depth of Cut	Width of Cut
Dia **DC**	Radius of Ball Nose **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	ap	ae
10	**5**	60	1900	0.055	420	40	1300	0.035	180	0.5	1
12	**6**	60	1600	0.055	350	40	1100	0.035	150	0.6	1.2
16	**8**	60	1200	0.062	300	40	800	0.04	130	0.8	1.6
20	**10**	60	950	0.062	240	40	640	0.04	100	1	2
25	**12.5**	60	760	0.062	190	40	510	0.04	82	1.2	2.5
Depth of cut											

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) α is the inclination angle of the machined surface.



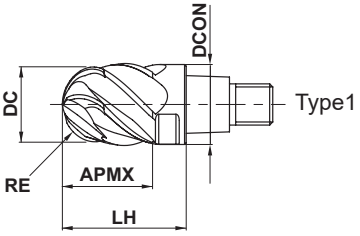
iMX-B6HV

Ball nose head, 6 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎		





RE≤6	RE>6			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

●The irregular helix flutes' cutting edge controls vibration and achieves stable machining.
●6 flutes enable high machining efficiency.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B6HV10010	5	10	10.5	16	9.7	6	●	1
IMX12B6HV12012	6	12	12.5	19	11.7	6	●	1
IMX16B6HV16016	8	16	16.5	24	15.5	6	●	1
IMX20B6HV20021	10	20	21	30	19.5	6	●	1
IMX25B6HV25026	12.5	25	26	37.5	24.5	6	●	1

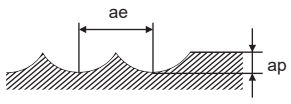
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

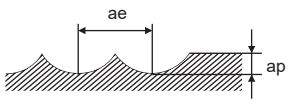
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

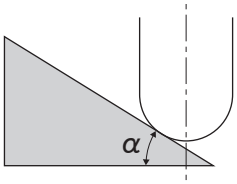
Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

Workpiece Material		Carbon steel, Alloy steel, Mild steel, Pre-hardened steel AISI 1045, AISI 4140, AISI 4340, ASTM A36, AISI 1010, AISI P21, AISI P20										Austenitic stainless steel, Ferritic and Martensitic stainless steels, Cobalt chromium alloy, Titanium alloy AISI 304, AISI 316, AISI 431, AISI 420J2, AISI 630, AISI 631, Ti-6Al-4V									
Inclination angle		α≤15°				α>15°				Depth of Cut	Width of Cut	α≤15°				α>15°				Depth of Cut	Width of Cut
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	ap	ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	ap	ae
10	**5**	300	9500	0.106	6000	200	6400	0.07	2700	0.5	2	225	7200	0.105	4500	150	4800	0.067	1900	0.5	2
12	**6**	300	8000	0.125	6000	200	5300	0.085	2700	0.6	2.4	225	6000	0.125	4500	150	4000	0.08	1900	0.6	2.4
16	**8**	300	6000	0.134	4800	200	4000	0.088	2100	0.8	3.2	225	4500	0.14	3800	150	3000	0.09	1600	0.8	3.2
20	**10**	300	4800	0.156	4500	200	3200	0.1	1900	1	4	225	3600	0.16	3500	150	2400	0.105	1500	1	4
25	**12.5**	300	3800	0.16	3600	200	2500	0.1	1500	1.2	5	225	2900	0.16	2800	150	1900	0.105	1200	1.2	5
Depth of cut																					

Workpiece Material		Heat resistant alloys Inconel718									
Inclination angle		α≤15°				α>15°				Depth of Cut	Width of Cut
Dia DC	Radius of Ball Nose RE	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	ap	ae
10	**5**	60	1900	0.055	630	40	1300	0.035	270	0.5	1
12	**6**	60	1600	0.055	530	40	1100	0.035	230	0.6	1.2
16	**8**	60	1200	0.062	450	40	800	0.04	190	0.8	1.6
20	**10**	60	950	0.062	350	40	640	0.04	150	1	2
25	**12.5**	60	760	0.062	280	40	510	0.04	120	1.2	2.5
Depth of cut											

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.
Note 4) α is the inclination angle of the machined surface.

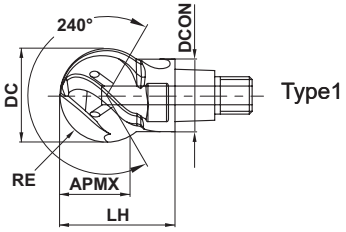


iMX-B4WH-S NEW

Lollipop head with coolant hole, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○			◎	◎	○	





Type1

RE≥6				
±0.015				

●Optimal choice for machining undercut and complex shapes when using a 5-axis machine.
●A stable supply of coolant is maintained even when machining complex component geometries.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4WH12008S	6	12	9	16.5	9.7	4	●	1
IMX12B4WH16008S	8	16	12	20.9	11.7	4	●	1
IMX16B4WH20008S	10	20	15	24.7	15.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

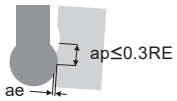
Scan here for product NEWS ▶

ISO13399 ➤ K003

RECOMMENDED CUTTING CONDITIONS

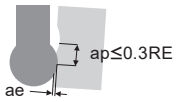
■ Internal Profile Milling, Undercut Machining (L/D=3)

(mm)

Workpiece Material		Mild steel, Carbon steel, Alloy steel, Pre-hardened steel, Copper steel AISI 1045, AISI 4140, AISI 4340, ASTM A36, AISI 1010, AISI P21, AISI P20					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Cobalt chromium alloy, Titanium alloy AISI 304, AISI 316, AISI 431, AISI 420J2, AISI 630, AISI 631, Ti-6Al-4V					Heat resistant alloys Inconel718				
Dia. **DC**	Radius of Ball Nose **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae
12	**6**	100	2700	0.090	970	0.45	80	2100	0.075	630	0.45	30	800	0.040	130	0.36
16	**8**	100	2000	0.100	800	0.60	80	1600	0.080	510	0.60	30	600	0.045	110	0.48
20	**10**	100	1600	0.100	640	0.75	80	1300	0.090	470	0.75	30	480	0.050	96	0.60
Depth of Cut																

■ Internal Profile Milling, Undercut Machining (L/D=5)

(mm)

Workpiece Material		Mild steel, Carbon steel, Alloy steel, Pre-hardened steel, Copper steel AISI 1045, AISI 4140, AISI 4340, ASTM A36, AISI 1010, AISI P21, AISI P20					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Cobalt chromium alloy, Titanium alloy AISI 304, AISI 316, AISI 431, AISI 420J2, AISI 630, AISI 631, Ti-6Al-4V					Heat resistant alloys Inconel718				
Dia. **DC**	Radius of Ball Nose **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae
12	**6**	70	1900	0.070	530	0.30	50	1300	0.050	260	0.30	20	530	0.030	64	0.24
16	**8**	70	1400	0.080	450	0.40	50	990	0.060	240	0.40	20	400	0.040	64	0.32
20	**10**	70	1100	0.080	350	0.50	50	800	0.070	220	0.50	20	320	0.040	51	0.40
Depth of Cut																

■ Internal Profile Milling, Undercut Machining (L/D=7)

(mm)

Workpiece Material		Mild steel, Carbon steel, Alloy steel, Pre-hardened steel, Copper steel AISI 1045, AISI 4140, AISI 4340, ASTM A36, AISI 1010, AISI P21, AISI P20					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Cobalt chromium alloy, Titanium alloy AISI 304, AISI 316, AISI 431, AISI 420J2, AISI 630, AISI 631, Ti-6Al-4V				
Dia. **DC**	Radius of Ball Nose **RE**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Width of cut ae
12	**6**	50	1300	0.030	160	0.15	30	800	0.025	80	0.15
16	**8**	50	990	0.035	140	0.20	30	600	0.030	72	0.20
20	**10**	50	800	0.040	130	0.25	30	480	0.035	67	0.25
Depth of Cut											

Note 1) If the machine or workpiece material is not rigid, or if chatter or abnormal noises occur, adjust the revolution, feed rate and depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) In case of L/D >5, It is recommended to use taper neck type holder.
Note 4) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

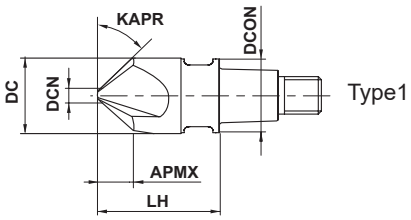
iMX-CH3L

Chamfer head, 3 flute

UWC γ 5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○	○		◎	◎		





Type1

DCN=1.5				
±0.020				

- Chamfered cutting head suitable for inner and outer circumference.
- Anti-vibration design.

(mm)

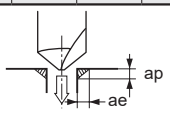
Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10CH3L100A45	10	4.2	45°	1.5	16	9.7	3	●	1
IMX12CH3L120A45	12	5.2	45°	1.5	19	11.7	3	●	1
IMX16CH3L160A45	16	7.2	45°	1.5	24	15.5	3	●	1
IMX20CH3L200A45	20	9.2	45°	1.5	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

RECOMMENDED CUTTING CONDITIONS

■Chamfer milling (Hole circumference)

(mm)

Workpiece Material		Carbon steels, Alloy steels, Gray cast irons AISI 1045, AISI 4140, AISI No 45 B						Alloy tool steels, Carbon steels, Alloy steels, Pre-hardened steels SKD, SKT, AISI 4340, AISI P21, AISI P20						Austenitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V					
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	**3**	40	1300	0.04	160	1.8	1.8	40	1300	0.03	120	1.8	1.8	30	950	0.03	86	1.8	1.8
12	**3**	40	1100	0.04	130	2.2	2.2	40	1100	0.03	99	2.2	2.2	30	800	0.03	72	2.2	2.2
16	**3**	40	800	0.04	96	2.4	2.4	40	800	0.03	72	2.4	2.4	30	600	0.03	54	2.4	2.4
20	**3**	40	640	0.04	77	2.6	2.6	40	640	0.03	58	2.6	2.6	30	480	0.03	43	2.6	2.6
Depth of Cut																			

Note 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 2) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution and feed rate.

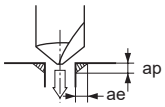
● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ K003

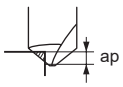
■ Chamfer milling (Hole circumference)

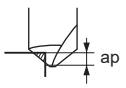
(mm)

Workpiece Material		Hardenned steels (40-55HRC) AISI H13, AISI L6						Heat resistant alloys Inconel718					
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
10	**3**	30	950	0.02	57	1.8	1.8	30	950	0.04	110	1.8	1.8
12	**3**	30	800	0.02	48	2.2	2.2	30	800	0.04	96	2.2	2.2
16	**3**	30	600	0.02	36	2.4	2.4	30	600	0.04	72	2.4	2.4
20	**3**	30	480	0.02	29	2.6	2.6	30	480	0.04	58	2.6	2.6
Depth of Cut													

■ Chamfer milling (Shape circumference)

(mm)

Workpiece Material		Carbon steels, Alloy steels, Gray cast irons AISI 1045, AISI 4140, AISI No 45 B					Alloy tool steels, Carbon steels, Alloy steels, Pre-hardened steels SKD, SKT, AISI 4340, AISI P21, AISI P20					Austenitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	**3**	100	3200	0.05	480	2	70	2200	0.05	300	2	60	1900	0.04	230	2
12	**3**	100	2700	0.05	410	2.4	70	1900	0.05	260	2.4	60	1600	0.04	190	2.4
16	**3**	100	2000	0.05	300	2.7	70	1400	0.05	190	2.7	60	1200	0.04	140	2.7
20	**3**	100	1600	0.05	240	3.2	70	1100	0.05	150	3.2	60	950	0.04	110	3.2
Depth of Cut																

Workpiece Material		Hardenned steels (40-55HRC) AISI H13, AISI L6					Heat resistant alloys Inconel718				
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
10	**3**	50	1600	0.03	140	2	30	950	0.04	110	2
12	**3**	50	1300	0.03	120	2.4	30	800	0.04	96	2.4
16	**3**	50	990	0.03	89	2.7	30	600	0.04	72	2.7
20	**3**	50	800	0.03	72	3.2	30	480	0.04	58	3.2
Depth of Cut											

Note 1) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution and feed rate.

iMX-CH6V

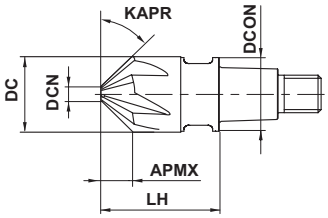
Chamfer head, 6 flute

UWC

1°
3°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminium Alloy
◎	○	○		◎	◎		





Type1

DCN=3				
±0.020				

- Suitable for outer circumference.
- Multiple cutting design for extended tool life.

(mm)

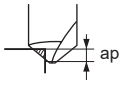
Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX12CH6V120A45	12	4.5	45°	3	19	11.7	6	●	1
IMX16CH6V160A45	16	6.5	45°	3	24	15.5	6	●	1
IMX20CH6V200A45	20	8.5	45°	3	30	19.5	6	●	1

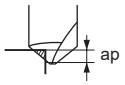
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

RECOMMENDED CUTTING CONDITIONS

■ Chamfer milling (Shape circumference)

(mm)

Workpiece Material		Carbon steels, Alloy steels, Gray cast irons AISI 1045, AISI 4140, AISI No 45 B					Alloy tool steels, Carbon steels, Alloy steels, Pre-hardened steels SKD, SKT, AISI 4340, AISI P21, AISI P20					Austenitic stainless steels, Titanium alloys AISI 304, AISI 316, Ti-6Al-4V				
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
12	**6**	100	2700	0.05	810	2.4	70	1900	0.045	510	2.4	60	1600	0.04	380	2.4
16	**6**	100	2000	0.05	600	2.7	70	1400	0.045	380	2.7	60	1200	0.04	290	2.7
20	**6**	100	1600	0.05	480	3.2	70	1100	0.045	300	3.2	60	950	0.04	230	3.2
Depth of Cut																

Workpiece Material		Hardenned steels (40-55HRC) AISI H13, AISI L6					Heat resistant alloys Inconel718				
Dia. DC	No. of Flutes	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
12	**6**	50	1300	0.03	230	2.4	30	800	0.04	190	2.4
16	**6**	50	990	0.03	180	2.7	30	600	0.04	140	2.7
20	**6**	50	800	0.03	140	3.2	30	480	0.04	120	3.2
Depth of Cut											

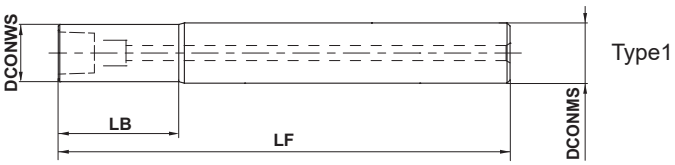
Note 1) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution and feed rate.

iMX

Carbide Holder

■Undercut

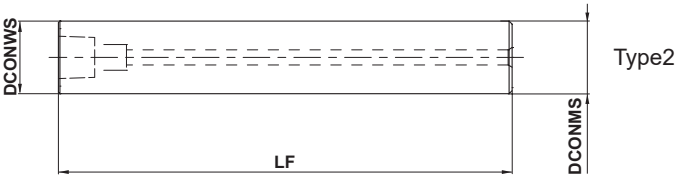




Type1

■Straight

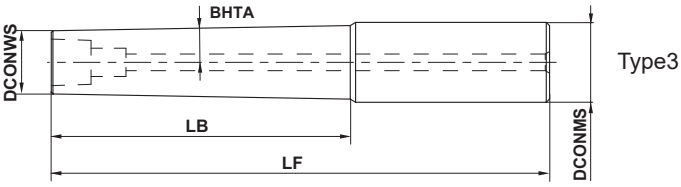




Type2

■Taper Neck Type





Type3

h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

■Carbide Holder

(mm)

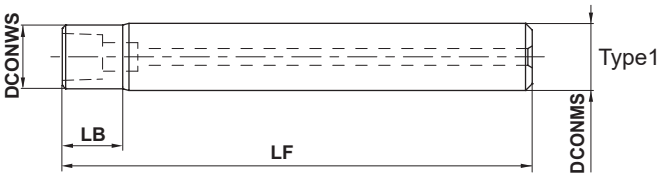
Order Number	BHTA	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N014L070C	—	14	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-S10L090C	—	—	10	90	10	●	2	IMX10	IMX10-WR
IMX10-U10N034L090C	—	34	9.7	90	10	●	1	IMX10	IMX10-WR
IMX10-S10L110C	—	—	10	110	10	●	2	IMX10	IMX10-WR
IMX10-U10N054L110C	—	54	9.7	110	10	●	1	IMX10	IMX10-WR
IMX10-A12N054L110C	1°	54	9.7	110	12	●	3	IMX10	IMX10-WR
IMX12-U12N017L080C	—	17	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-S12L100C	—	—	12	100	12	●	2	IMX12	IMX12-WR
IMX12-U12N041L100C	—	41	11.7	100	12	●	1	IMX12	IMX12-WR
IMX12-S12L130C	—	—	12	130	12	●	2	IMX12	IMX12-WR
IMX12-U12N065L130C	—	65	11.7	130	12	●	1	IMX12	IMX12-WR
IMX12-A16N065L130C	1°	65	11.7	130	16	●	3	IMX12	IMX12-WR
IMX16-U16N024L080C	—	24	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-S16L110C	—	—	16	110	16	●	2	IMX16	IMX16-WR
IMX16-U16N056L110C	—	56	15.5	110	16	●	1	IMX16	IMX16-WR
IMX16-S16L150C	—	—	16	150	16	●	2	IMX16	IMX16-WR
IMX16-U16N088L150C	—	88	15.5	150	16	●	1	IMX16	IMX16-WR
IMX16-A20N088L150C	1°	88	15.5	150	20	●	3	IMX16	IMX16-WR
IMX20-U20N030L090C	—	30	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-S20L130C	—	—	20	130	20	●	2	IMX20	IMX20-WR
IMX20-U20N070L130C	—	70	19.5	130	20	●	1	IMX20	IMX20-WR
IMX20-S20L180C	—	—	20	180	20	●	2	IMX20	IMX20-WR
IMX20-U20N110L180C	—	110	19.5	180	20	●	1	IMX20	IMX20-WR
IMX20-A25N110L180C	1°	110	19.5	180	25	●	3	IMX20	IMX20-WR
IMX25-U25N037L110C	—	37.5	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-S25L160C	—	—	25	160	25	●	2	IMX25	IMX25-WR
IMX25-U25N087L160C	—	87.5	24.5	160	25	●	1	IMX25	IMX25-WR
IMX25-S25L210C	—	—	25	210	25	●	2	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

● : Inventory maintained in Japan.

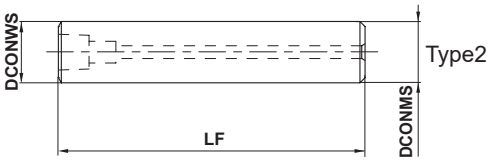
■Undercut





■Highly Rigid Straight





h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25	DCONMS=32	
0 - 0.009	0 - 0.011	0 - 0.013	0 - 0.016	

■Steel Holder

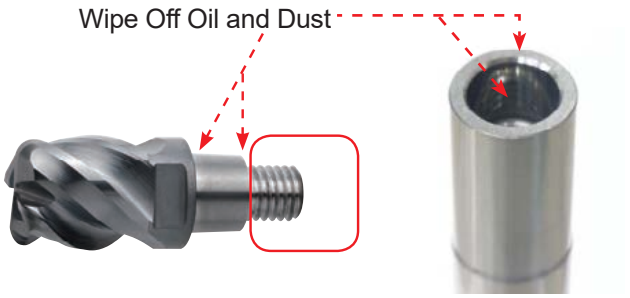
(mm)

Order Number	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N009L070S	9	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-G12L060S	—	12	60	12	●	2	IMX10	IMX10-WR
IMX12-U12N011L080S	11	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-G16L070S	—	16	70	16	●	2	IMX12	IMX12-WR
IMX16-U16N016L080S	16	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-G20L070S	—	20	70	20	●	2	IMX16	IMX16-WR
IMX20-U20N020L090S	20	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-G25L080S	—	25	80	25	●	2	IMX20	IMX20-WR
IMX25-U25N025L110S	25	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-G32L100S	—	32	100	32	●	2	IMX25	IMX25-WR

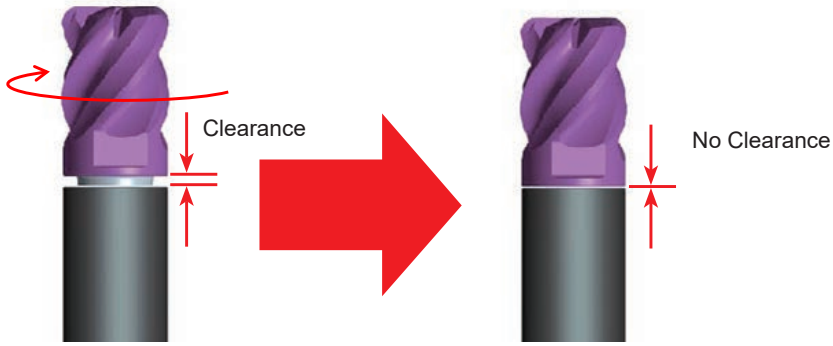
Note 1) The fastening size of the holder and head should be the same. (Refer to K002)

How to Install the Head

1 Using a clean cloth, wipe away oil and dust from the taper and end surfaces of the head and holder.

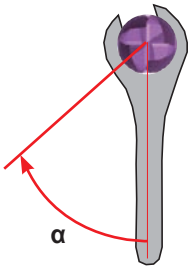


2 Be careful to avoid the possibility of cutting hands when fastening with bare hands directly near the blade tip.
Securely fasten the head and holder end surfaces using the enclosed wrench to close off any remaining gap.



3 Refer to the table at below regarding angles for recommended torque when necessary.
For stricter usage, refer to the table below for torque wrench fastening.

Suitable Head	Reference Tightening Angle α	Recommended Clamping Torque (N·m)
IMX10□	50°	10
IMX12□	50°	15
IMX16□	50°	30
IMX20□	40°	50
IMX25□	35°	75

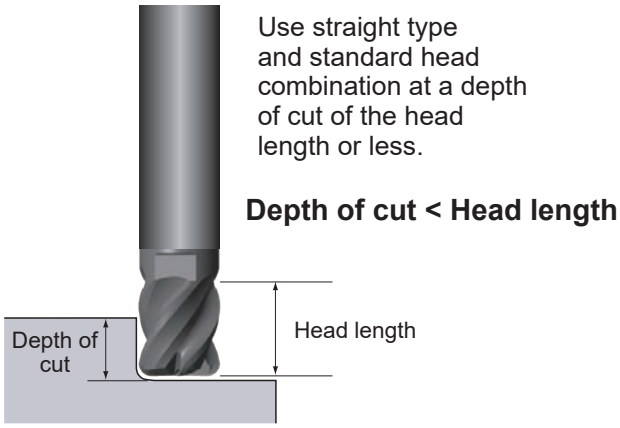


Note 1) Use the enclosed wrench only.
(Typical wrenches differ in thickness.)

iMX holder application

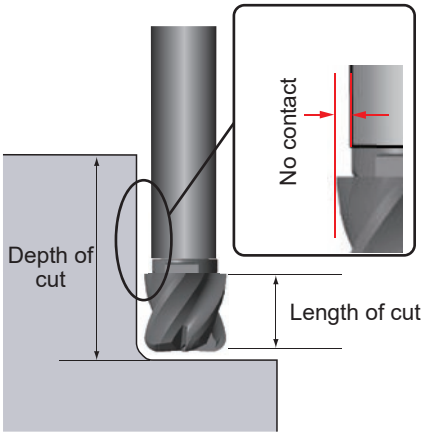
- Combination of the straight type and standard head causes interference when the depth of cut is head length or more. (Because holder diameter = head diameter)
- Combination of the straight type and offset head may make the depth of cutting length or more. (Because holder diameter < head diameter)

Straight + Standard head



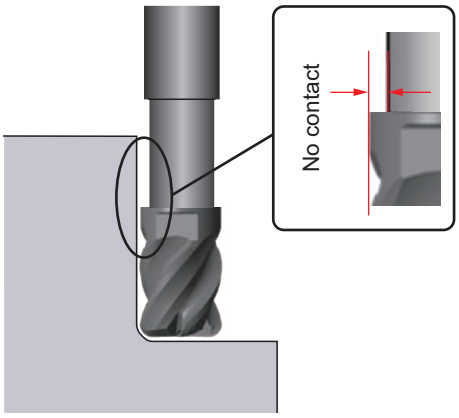
Installation at an overhang of DC×3 or less is also possible, if the depth of cut < head length is assumed.

Straight + Offset head

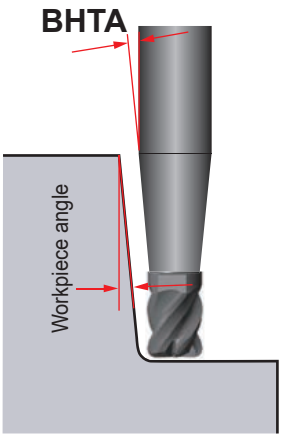


- It is suitable for vertical wall machining, because the undercut type has a relief neck.
- A taper neck with thick relief has high rigidity. Especially a stable cutting is demonstrated at deeper machining.
- Perform straight shank additional grinding together with customer application for undercut taper neck type. (Refer to the cutting edge diameter (Cutting diameter DC) of each type for the minimum machining diameter.)

Undercut + Standard head



Taper neck + Standard head



HOW TO READ THE STANDARD OF INDEXABLE MILLING

●How this section page is organised

①Organised according to the face milling cutting mode.
(Refer to the index on the next page.)

SCOPE OF AVAILABLE WORKPIECE MATERIAL
provides a graph depicting the scope of the available workpiece material for machining.

PRODUCT FEATURES

CORNER ANGLE ICON

APPLICATION ICON
represents available machining applications, such as finishing and roughing.

TYPE/ NAME OF PRODUCT

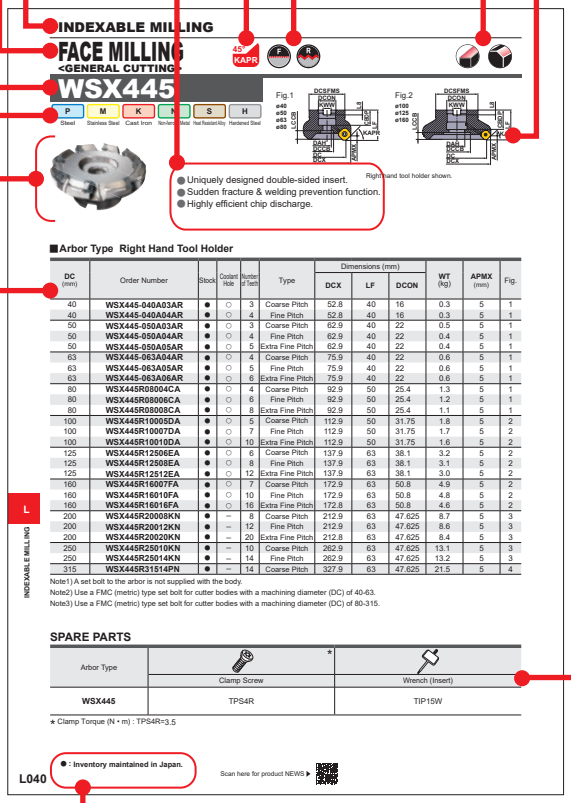
APPLICATION

PRODUCT SECTION

CUTTING MODE ICON
represents available cutting modes, such as face milling and shoulder milling.

GEOMETRY

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.


INDEXABLE MILLING
FACE MILLING
<GENERAL CUTTING>
WSX445
P Steel M Stainless Steel K Cast Iron N Non-ferrous Metal S Heat resistant Alloy H Hardened Steel
Fig.1 Fig.2
● Uniquely designed double-sided insert.
● Sudden fracture & welding prevention function.
● Highly efficient chip discharge.
Right hand tool holder shown.
■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm) DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
40	WSX445-040A03AR	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	WSX445-040A04AR	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	WSX445-050A03AR	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	WSX445-050A04AR	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	WSX445-050A05AR	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	WSX445-063A04AR	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	WSX445-063A05AR	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	WSX445-063A06AR	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	WSX445R08004CA	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
80	WSX445R08006CA	●	○	6	Fine Pitch	92.9	50	25.4	1.2	5	1
80	WSX445R08008CA	●	○	8	Extra Fine Pitch	92.9	50	25.4	1.1	5	1
100	WSX445R10005DA	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
100	WSX445R10007DA	●	○	7	Fine Pitch	112.9	50	31.75	1.7	5	2
100	WSX445R10010DA	●	○	10	Extra Fine Pitch	112.9	50	31.75	1.6	5	2
125	WSX445R12506EA	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
125	WSX445R12508EA	●	○	8	Fine Pitch	137.9	63	38.1	3.1	5	2
125	WSX445R12512EA	●	○	12	Extra Fine Pitch	137.9	63	38.1	3.0	5	2
160	WSX445R16007FA	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
160	WSX445R16010FA	●	○	10	Fine Pitch	172.9	63	50.8	4.8	5	2
160	WSX445R16016FA	●	○	16	Extra Fine Pitch	172.8	63	50.8	4.6	5	2
200	WSX445R20008KN	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
200	WSX445R20012KN	●	–	12	Fine Pitch	212.9	63	47.625	8.6	5	3
200	WSX445R20020KN	●	–	20	Extra Fine Pitch	212.8	63	47.625	8.4	5	3
250	WSX445R25010KN	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3
250	WSX445R25014KN	●	–	14	Fine Pitch	262.9	63	47.625	13.2	5	3
315	WSX445R31514PN	●	–	14	Coarse Pitch	327.9	63	47.625	21.5	5	4

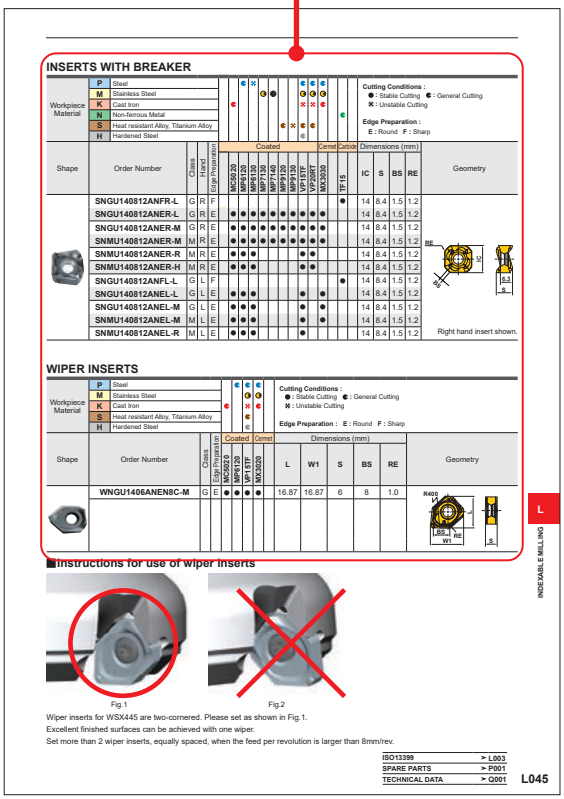
Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-63.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-315.

SPARE PARTS

Arbor Type	Clamp Screw *	Wrench (Insert)
WSX445	TPS4R	TIP15W

★ Clamp Torque (N • m) : TPS4R=3.5

● : Inventory maintained in Japan.
Scan here for product NEWS ▶
L040


INSERTS WITH BREAKER
Workpiece Material: P Steel, M Stainless Steel, K Cast Iron, N Non-ferrous Metal, S Heat resistant Alloy, Titanium Alloy, H Hardened Steel
Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ※ : Unstable Cutting
Edge Preparation : E : Round F : Sharp

Shape	Order Number	Class	Hand	Edge Preparation	Coated MC5020	MP9120	MP9130	MP7140	MP9120	MP9130	VP15TF	VP20RT	Cermet MX3030	Carbide TF15	Dimensions (mm) IC	S	BS	RE	Geometry
	SNGU140812ANFR-L	G	R	F										●	14	8.4	1.5	1.2	
	SNGU140812ANER-L	G	R	E		●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNGU140812ANER-M	G	R	E		●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNMU140812ANER-M	M	R	E		●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNMU140812ANER-R	M	R	E		●	●	●				●	●		14	8.4	1.5	1.2	
	SNMU140812ANER-H	M	R	E		●	●	●				●	●		14	8.4	1.5	1.2	
	SNGU140812ANFL-L	G	L	F										●	14	8.4	1.5	1.2	
	SNGU140812ANEL-L	G	L	E		●	●	●				●	●		14	8.4	1.5	1.2	
	SNGU140812ANEL-M	G	L	E		●	●	●				●	●		14	8.4	1.5	1.2	
	SNMU140812ANEL-M	M	L	E		●	●	●				●	●		14	8.4	1.5	1.2	
	SNMU140812ANEL-R	M	L	E		●	●	●				●			14	8.4	1.5	1.2	

Right hand insert shown.

WIPER INSERTS
Workpiece Material: P Steel, M Stainless Steel, K Cast Iron, S Heat resistant Alloy, Titanium Alloy, H Hardened Steel
Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ※ : Unstable Cutting
Edge Preparation : E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated MC5020	MP9120	MP9130	Cermet MX3020	Dimensions (mm) L	W1	S	BS	RE	Geometry
	WNGU1406ANEN8C-M	G	E	●	●	●	●	16.87	16.87	6	8	1.0	

■Instructions for use of wiper inserts

Fig.1 Fig.2
Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent finished surfaces can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

ISO1399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001
L045

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

SPARE PARTS FOR MIILING TOOLS
indicates the names of the applicable spare parts.

PRODUCT STANDARDS
indicates tool types, order numbers, stock status (per right/left hand), dimensions, etc.

PHOTO OF PRODUCT

●To Order : For title product, please specify ①order number and hand of tool (right/left).
For insert, please specify ①insert number and ②grade.

MILLING TOOLS

INDEXABLE MILLING

SYMBOL DESCRIPTIONS ····· L002
GUIDE FOR ISO13399 SYMBOLS ····· L003
CLASSIFICATION ····· L004
CLASSIFICATION OF SIDE CUTTERS ··· L007
CLASSIFICATION OF BORE BORING TOOLS ··· L007
CLASSIFICATION OF END MILLS ····· L008
CLASSIFICATION OF SCREW-IN TOOLS ··· L012
HOW TO SELECT AN END MILL ····· L014
CLASSIFICATION OF CUTTER INSERTS ··· L016
GRADES FOR MILLING ····· L018
MILLING APPLICATION RANGE ····· L019
COATED CARBIDE (CVD&PVD) ····· L022
CERMET ····· L024
CEMENTED CARBIDE ····· L025
CBN (SINTERED CBN) ····· L026
PCD (SINTERED DIAMOND) ····· L027
CLASSIFICATION ····· L028
LIST OF CUTTING EDGE DIAMETER TOLERANCES ··· L038
MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER ··· L039

STANDARD OF MILLING

FACE MILLING
WSX445 ····· L040
ASX445 ····· L054
AHX440S ····· L062
AHX475S ····· L067
AHX640S ····· L071
AHX640W ····· L079
NEW WSF406W ····· L084
AOX445 ····· L087

FACE MILLING (HIGH FEED)
FMAX ····· L089
NF10000 ····· L096
FF3000 ····· L098

SHOULDER MILLING
NEW WWX400 ····· L100
VOX400 ····· L112
ASX400 ····· L116
BAP300 ····· L122

SIDE CUTTER
NEW VAS300 ····· L126
VAS400 ····· L128
VAS500 ····· L130
VOS400 ····· L134
ASX400 ····· L135

MULTI-FUNCTIONAL MILLING
APX3000 ····· L136
APX4000 ····· L146
VPX200 ····· L156
VPX300 ····· L162
AXD4000 ····· L194
NEW AXD4000A ····· L202
AXD7000 ····· L208
BXD4000 ····· L216
AQX ····· L220
AJX ····· L228
NEW WJX09 ····· L242
WJX14 ····· L250
OCTACUT ····· L258
ARP ····· L264
ARX ····· L270
BRP ····· L274

DEEP SHOULDER MILLING
APX3000 LONG CUTTING EDGE TYPE ····· L142
APX4000 LONG CUTTING EDGE TYPE ····· L152
NEW VPX200 LONG CUTTING EDGE TYPE ····· L159
NEW VPX300 LONG CUTTING EDGE TYPE ····· L165
DCCC ····· L280
SPX ····· L283
NEW ASPX ····· L288
VFX5 ····· L292
VFX6 ····· L296

BALL/RADIUS MILLING
SRF/SRB ····· L300
SUF ····· L304
SRM2 ····· L308
SRM2φ40,φ50 ····· L316

CHAMFER MILLING
CESP,CFSP,CGSP ····· L318

T-SLOT MILLING
TSMP ····· L320

SPOT MILLING
CBJP,CBMP ····· L322

SLOT MILLING
KSMG ····· L324

VERTICAL FEED MILLING
PMC ····· L326
PMF ····· L328
PMR ····· L330

BORING CUTTER
BMR ····· L332

QUICK CHANGE TYPE
FP490 ····· L334
FP590 ····· L336
FE404 ····· L338

Qing SYSTEM
QMC/QWA/QSV ····· L343

SETTING FIXTURE
SEF500/700 ····· L340

ARBOR STANDARDS
FOR SCREW-IN TOOLS ····· L341



*Arranged by Alphabetical order

L062 AHX440S
L067 AHX475S
L071 AHX640S
L079 AHX640W
L228 AJX
L087 AOX445
L136 APX3000
L142 APX3000 LONG CUTTING EDGE TYPE
L146 APX4000
L152 APX4000 LONG CUTTING EDGE TYPE
L220 AQX
L264 ARP
L270 ARX
L288 ASPX
L116 ASX400
L135 ASX400
L054 ASX445
L194 AXD4000
L202 AXD4000A
L208 AXD7000
L122 BAP300
L332 BMR
L274 BRP
L216 BXD4000
L322 CBJP,CBMP
L318 CESP,CFSP,CGSP
L280 DCCC
L338 FE404
L098 FF3000
L089 FMAX
L334 FP490
L336 FP590
L324 KSMG
L096 NF10000
L258 OCTACUT
L326 PMC
L328 PMF
L330 PMR
L343 Qing
L341 SC-M
L340 SEF
L283 SPX
L300 SRF/SRB
L304 SUF
L308 SRM2
L316 SRM2φ40,φ50
L320 TSMP
L126 VAS300
L128 VAS400
L130 VAS500
L292 VFX5
L296 VFX6
L134 VOS400
L112 VOX400
L156 VPX200
L159 VPX200 LONG CUTTING EDGE TYPE
L162 VPX300
L165 VPX300 LONG CUTTING EDGE TYPE
L242 WJX09
L250 WJX14
L084 WSF406W
L040 WSX445
L100 WWX400

SYMBOL DESCRIPTIONS

KAPR (Cutting Edge Angle) List

15° KAPR	15°
30° KAPR	30°
35° KAPR	35°
42° KAPR	42°
45° KAPR	45°
50° KAPR	50°
60° KAPR	60°
84° KAPR	84°
86° KAPR	86°
90° KAPR	90°
94° KAPR	94°
R KAPR	R

● : Inventory maintained.
▲ : Inventory maintained.
To be replaced by new products.
□ : Non stock, produced to order only.

Application


Face Milling


Chamfer Milling


Shoulder Milling with R


Face Milling Near the Wall


Shoulder Milling


Wall Milling


Slot Milling


Step Milling


Pocket Milling


Slot Milling with R


Copy Milling


T-Slot Milling


Spot Milling


Helical Drilling

Accuracy

Finish Cutting

Medium Cutting

Rough Cutting

Workpiece Material Range

1st Recommendation

P M K N S H

2nd Recommendation

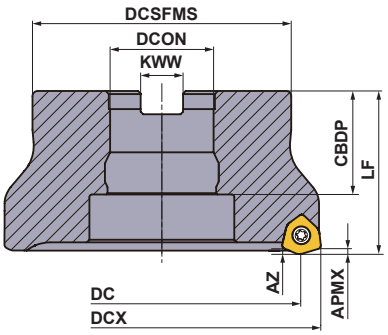
P M K N S H

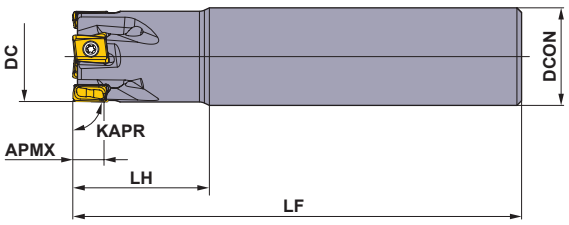
GUIDE FOR ISO13399 SYMBOLS

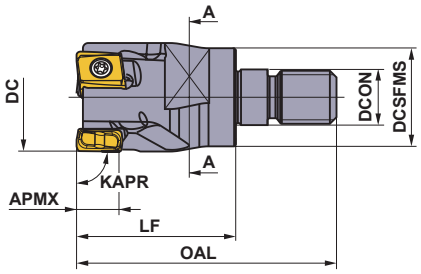
Symbol	Content
APMX	Depth of cut maximum
AZ	Plunge depth maximum
BD	Body diameter
BDX	Body diameter maximum
BS	Wiper edge length
CBDP	Connection bore depth
CRKS	Connection retention knob thread size
CW	Cutting width
DC	Cutting diameter
DCB	Connection bore diameter
DCON	Connection diameter
DCSFMS	Contact surface diameter machine side

Symbol	Content
DCX	Cutting diameter maximum
H	Shank height
KWW	Keyway length
LBX	Body length maximum
LE	Cutting edge effective length
LF	Functional length
LH	Head length
LU	Usable length
OAL	Overall length
RE	Corner radius
RMPX	Ramping angle maximum
WT	Weight of item

*There are exceptions other than those listed above. For more details, please refer to the technical data (page Q002).







CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
For General Cutting **WSX445**  45° KAPR	5	●Uniquely designed double-sided insert. ●Sudden fracture & welding prevention function. ●Highly efficient chip discharge. Info	Ø40 — Ø315	P M K N S H	L040
For General Cutting **ASX445**  45° KAPR	6	●Precision inexpensive moulded type 20° positive insert. ●Screw-on type. ●A wide range of chip breakers. ●High rigidity due to carbide shim. Info	Ø50 — Ø315	P M K N S H	L054
For General Cutting **AHX440S**  50° KAPR	3	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø40 — Ø160	P M K H	L060 L062
For High Feed Cutting **AHX475S**  15° KAPR	1.6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. ●With through coolant holes. Info	Ø50 — Ø160	P K H	L060 L067
For General Cutting **AHX640S**  50° KAPR	6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø63 — Ø200	P M K S H	L060 L071
For High Feed Cutting for Cast Iron **AHX640W**  50° KAPR	6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø80 — Ø315	K	L079
For High Efficiency Cutting for Cast Iron **WSF406W** NEW  84° KAPR	7	●Uniquely designed double-sided insert. ●Adjustable cutting edge run-out system ●Improved surface finish ●Suppression of edge chipping Info	Ø80 — Ø250	K	L084
For High Efficiency Cutting for Cast Iron **AOX445**  45° KAPR	8	●Solid CBN octagonal double-sided insert. ●Economical 16 cutting edge inserts. (When the depth of cut is 3mm) ●For high efficiency roughing through to finishing. ●Easy operation and cleansing. Info	Ø63 — Ø160	K	L087
For High Feed Finishing **FMAX**  90° KAPR	2	●Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing. ●The combination of aluminium alloy and a special steel alloy achieves a light weight, high rigidity body. ●With through coolant holes. Info	Ø40 — Ø160	K N	L089
High-Speed Finishing for Aluminium Alloy and Cast Iron **NF10000**  90° KAPR	4	●Suitable for light alloy and cast iron finishing. ●Adjustable cutting edge run-out function. Info	Ø80 — Ø125	K N	L096
High Feed Finishing **FF3000**  90° KAPR	0.3	●11°positive insert. ●1000–3000mm/min high feed machining. ●For finishing of steel machining. ●Adjustable cutting edge run-out function.	Ø125 — Ø250	P M K N	L098

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
High Feed Cutting for Cast Iron **FP490**  90° KAPR	0.5	●11°positive insert. ●Suitable for cast iron finishing. ●Multi-insert design. ●For high feed cutting. ●Easy tool exchange. ∗Cutter bodies are only available through special orders.	Ø80 — Ø500	K	L334
High Feed Cutting for Cast Iron **FP590**  90° KAPR	0.5	●11°positive insert. ●Suitable for cast iron finishing. ●Multi-insert design. ●For high feed cutting. ●Easy tool exchange. ∗Cutter bodies are only available through special orders.	Ø125 — Ø500	K	L336
High Feed Cutting for Aluminium **FE404**  86° KAPR	9	●21°positive insert. ●High rake and relief angle. ●Multi-insert design. ●Suitable for light alloy machining. ●Easy tool exchange. ∗Cutter bodies are only available through special orders.	Ø100 — Ø500	N	L338
Multi-Functional Milling **WJX09** NEW 	1.2	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	Ø40 — Ø66	P M K S H	L242
Multi-Functional Milling **WJX14** 	2	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	Ø50 — Ø160	P M K S H	L250
Multi-Functional Milling **AJX** 	1.2	●15°positive insert. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	Ø32 — Ø160	P M K S H	L228
Multi-Functional Milling of Difficult-to-cut Materials **ARP**  R KAPR	6	●Run-out does not occur easily when changing sections. ●Solid clamping system. ●Standardized stock of extra fine pitch. ●With through coolant holes. Info	Ø40 — Ø100	M S	L264
Multi-Functional Milling **BRP**  R KAPR	8	●11°positive insert. ●Round shape insert with a strong cutting edge. ●Wide range of tools available. ●Suitable for mould machining. Info	Ø40 — Ø100	P M K S H	L276
Multi-Functional Milling **OCTACUT**  42° KAPR	9	●20°positive insert. ●For octagonal and round type inserts. ●Multi-functional machining.	Ø40 — Ø160	P M K H	L259
For General Cutting **WWX400** NEW  90° KAPR	8.2	●High-stability clamping and high-quality machining. ●The optimised “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners. Info	Ø80 — Ø250	P M K N S H	L100
For Cast Iron **VOX400**  90° KAPR	10	●Vertical inserts with high strength cutting edge. ●Economical 8 cutting edge inserts. ●Screw-on type. Info	Ø50 — Ø250	K	L112

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
For General Cutting **ASX400**  90° KAPR	10	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø50 — Ø250	P M K N S H	L116
For Multi-Functional Cutting **APX3000**  90° KAPR	10	●Low cutting force insert. ●High accuracy, high-quality vertical wall. ●With through air & coolant holes. Info	Ø32 — Ø100	P M K N S H	L137
For Multi-Functional Cutting **APX4000**  90° KAPR	15	●Low cutting force insert. ●High accuracy, high-quality vertical wall. ●With through air & coolant holes. Info	Ø40 — Ø160	P M K S H	L147
Multi-Functional Milling for High Efficiency Machining **VPX200**  90° KAPR	8	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø32 — Ø63	P M K N S H	L158
Multi-Functional Milling for High Efficiency Machining **VPX300**  90° KAPR	11	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø40 — Ø80	P M K N S H	L164
Aluminium Alloy to Difficult-to-cut Material Cutting **AXD4000**  90° KAPR	15.5	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø40 — Ø125	P N S	L195
Ultra-high Speed, Efficient Machining of Aluminium Alloys **AXD4000A** NEW  90° KAPR	15.5	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø50	N	L202
Aluminium Alloy to Difficult-to-cut Material Cutting **AXD7000**  90° KAPR	21	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø50 — Ø125	P N S	L208
Aluminium Alloy to Difficult-to-cut Material Cutting **BXD4000**  90° KAPR	15	●Curved cutting edge and high rigidity holder produce high wall accuracy. ●Low resistance insert and high rigidity design for excellent performance. ●With through coolant holes to ensure smooth chip discharge. ●For high-speed machining. ●With through coolant holes. Info	Ø40 — Ø125	P M N S H	L216

CLASSIFICATION OF SIDE CUTTERS

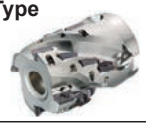
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
VAS300 Side Cutter NEW  90° KAPR	8.6	●Insert with 4 cutting edges secure clamping. ●Excellent sharpness with low cutting resistance insert. ●Holders can load all corner R. ∗Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P K	L126
VAS400 Side Cutter  90° KAPR	12.2	●Insert with 4 cutting edges secure clamping. ●Excellent sharpness with low cutting resistance insert. ●Holders can load all corner R. ∗Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P K	L128
VAS500 Side Cutter  90° KAPR	16.2	●Insert with 4 cutting edges secure clamping. ●Excellent sharpness with low cutting resistance insert. ●Holders can load all corner R. ∗Cutter bodies are only available through special orders. Info	Ø100 — Ø200	P K	L130
VOS400 Side Cutter  90° KAPR	10	●For cast iron. ●Cutter body with high rigidity design. ●Innovative vertical insert. ●Economical 8 cutting edge inserts. ∗Cutter bodies are only available through special orders. Info	Ø80 — Ø160	K	L134
ASX400 Side Cutter  90° KAPR	10	●High precision non-grinding insert. ●Economical 4 cutting edge inserts. ●Excellent wall surface precision with curved cutting edges and high precision body. ∗Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P M K	L135

CLASSIFICATION OF BORE BORING TOOLS

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
BMR  35° KAPR	—	●Double positive breaker. ●12-corner type with right hand. ●Body with peripheral cutting edge run-out regulator. ∗Cutter bodies are only available through special orders. Info	—	K	L332

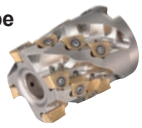
CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
WSX445  45° KAPR	5	●Unique design both sides insert. ●Sudden fracture & welding prevention function. ●Highly efficient chip discharge. ●With through coolant holes. Info	Ø40 — Ø80	P M K N S H	L044
ASX445  45° KAPR	6	●Precision inexpensive moulded type 20°positive insert. ●Screw-on type. ●A wide range of chip breakers. ●High rigidity due to carbide shim. Info	Ø50 — Ø80	P M K N S H	L056
AOX445  45° KAPR	8	●Solid CBN octagonal double-sided insert. ●Economical 16 cutting edge inserts. (when the depth of cut is 3mm) ●For high efficiency roughing through to finishing. ●Easy operation and cleansing. Info	Ø50 Ø63	K	L087
AJX 	1.2	●13° and 15° positive inserts. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	Ø16 — Ø63	P M K S H	L231
WWX400 NEW  90° KAPR	8.2	●High-stability clamping and high-quality machining. ●The optimised “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners. Info	Ø50 — Ø80	P M K N S H	L103
ASX400  90° KAPR	10	●High tolerance M-class inserts. ●Economical 4 cutting edge inserts. ●Curved cutting edge and high rigidity holder. ●Screw-on type. Info	Ø40 — Ø80	P M K N S H	L118
VPX200  90° KAPR	8	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø16 — Ø50	P M K N S H	L156
VPX200 Long Cutting Edge NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø20 — Ø40	P M K N S	L159
VPX200 Shell Type NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø32 — Ø50	P M K N S	L160
VPX300  90° KAPR	11	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø25 — Ø50	P M K N S H	L162
VPX300 Long Cutting Edge NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø40	P M K N S	L165

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
VPX300 **Shell Type** NEW  90° KAPR	63	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø40 — Ø80	P M K N S	L166
APX3000  90° KAPR	10	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø12 — Ø63	P M K N S H	L136
APX3000 **Long Cutting Edge**  90° KAPR	55	●High accuracy, high-quality vertical wall. ●Low cutting force insert. Info	Ø20 — Ø40	P M K N S	L142
APX3000 **Shell Type**  90° KAPR	46	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø40 Ø50	P M K N S	L143
BAP300  90° KAPR	9	●11° positive insert. ●Inserts with wiper edges produce optimal finished surface. ●Multi insert design for high feed machining. Info	Ø10 — Ø63	P M K N S H	L122
APX4000  90° KAPR	15	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø25 — Ø63	P M K S H	L146
APX4000 **Long Cutting Edge**  90° KAPR	84	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø40 Ø50	P M K S	L152
APX4000 **Shell Type**  90° KAPR	56	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø50 Ø63	P M K S	L153
AXD4000  90° KAPR	15.5	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø20 — Ø40	P N S	L194
AXD7000  90° KAPR	21	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø32 — Ø50	P N S	L208
BXD4000  90° KAPR	15	●Curved cutting edge and high rigidity holder produce high wall accuracy. ●Low resistance insert and high rigidity design for excellent performance. ●With through coolant holes to ensure smooth chip discharge. ●For high-speed machining. ●With through coolant holes. Info	Ø20 — Ø40	P M N S H	L218

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
AQX  90° KAPR	55	●The centre bottom cutting edge enables drilling without previously formed hole. ●With through coolant holes. Info	Ø16 — Ø50	P M K N S H	L220
ARP  R KAPR	6	●Run-out does not occur easily when changing sections. ●Solid clamping system. ●Standardized stock of extra fine pitch. ●With through coolant holes. Info	Ø25 — Ø50	M S	L266
ARX  R KAPR	3.5	●15°positive, high tolerance M-class insert. ●Effective for various machining applications. ●With through coolant holes. Info	Ø10 — Ø25	P M K H	L270
WJX09 NEW 	1.2	●Multi-functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	Ø25 — Ø40	P M K S H	L244
WJX14 	2	●Multi-functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	Ø50	P M K S H	L252
OCTACUT  42° KAPR	9	●20°positive insert. ●For octagonal and round type inserts. ●Multi-functional machining.	Ø32 — Ø63	P M K H	L258
BRP  R KAPR	8	●11°positive insert. ●Round shape insert with a strong cutting edge. ●Wide range of tools available. ●Suitable for mould machining. Info	Ø12 — Ø63	P M K S H	L274
DCCC  90° KAPR	93	●Different helical flute angles prevents chattering. Info	Ø25 — Ø50	P M K	L280
SPX  90° KAPR	261	●Low cutting resistance due to the use of wavy inserts. ●Suitable for heavy cutting due to holder rigidity. Info	Ø50 Ø63	P M K S	L283
SPX Shell Type  90° KAPR	58	●Low cutting resistance due to the use of wavy inserts. ●Suitable for heavy cutting due to holder rigidity. Info	Ø63 Ø80	P M K S	L284
ASPX Shell Type NEW  90° KAPR	75	●Highly reliable clamping mechanism. ●Low cutting resistance due to the use of wavy inserts. ●Suitable for heavy cutting due to holder rigidity. Info	Ø50 — Ø80	S	L288

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
ASPX NEW  90° KAPR	127	●Highly reliable clamping mechanism. ●Low cutting resistance due to the use of wavy inserts. ●Suitable for heavy cutting due to holder rigidity. Info	Ø80	S	L289
VFX5 Shell Type  90° KAPR	75	●High performance titanium alloy milling. ●High rigidity design. ●Highly reliable clamping mechanism. ●With through coolant holes. Info	Ø40 — Ø80	S	L292
VFX6 Shell Type  90° KAPR	90	●High performance titanium alloy milling. ●High rigidity design. ●Highly reliable clamping mechanism. ●With through coolant holes. Info	Ø63 — Ø100	S	L296
SRF/SRB  R KAPR	17	●S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills. ●Highly accurate corner radius tolerance allows for high precision finishing. ●Carbide shank type available. Info	Ø10 — Ø32	P K N H	L300
SUF  R KAPR	5.2	●Highly accurate corner radius tolerance allows for high precision finishing. ●Seamless gash. Info	Ø10 — Ø32	P M K H	L304
SRM2  R KAPR	44	●Suitable for roughing to semi-finishing of small and medium moulds. ●High rigidity body design. ●Low resistance chipbreaker. ●Through coolant hole type. Info	Ø16 — Ø30	P M K S H	L308
SRM2 ϕ40/ϕ50  R KAPR	54 63	●Best for roughing of moulds. ●Low resistance chipbreaker. ●Highly rigid body. Info	Ø40 Ø50	P K	L316
CESP•CFSP•CGSP  30° KAPR 45° KAPR 60° KAPR	5.9 I 10.2	●Covers 5 cutting modes. ●Excellent sharpness with 11°positive inserts. ●30°, 45° and 60° chamfer series.	Ø8 — Ø32	P K	L318
TSMP  90° KAPR	18	●T-groove order number 14, 18 and 22 are available. ●86° rhombic shape 11° positive insert. ●Shoulder milling and inversed spot facing are also possible.	Ø25 — Ø40	P K	L320
CBJP•CBMP  94° KAPR	—	●Capable of spot facing machining, boring and interpolation. ●For seat machining of hexagon socket head bolt (M8-M30). ●86°rhombic shape 11°positive insert.	Ø14 — Ø48	P M K	L322
KSMG 	4.5	●Side face grooving tool for machining centres. ●The minimum cutting diameter is ϕ25mm for internal grooving. ●For groove widths of 1.25mm — 6.0mm.	Ø25 Ø40	P K	L324

CLASSIFICATION

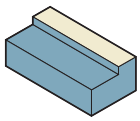
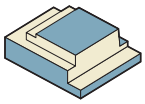
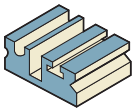
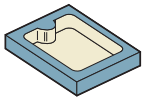
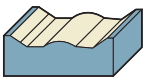
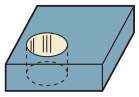
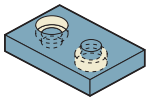
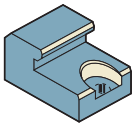
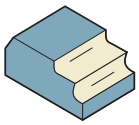
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
PMF 	—	●2 directional cutting with large overhang. ●Excellent straightness. ●Excellent wall accuracy.	Ø50 — Ø80	P K	L328
PMR 	11	●1 directional cutting with large overhang. ●Horizontal feed cutting and oblique cutting are also possible. ●Unique shape of curved edge gives high rigidity and low resistance.	Ø50 — Ø80	P K	L330

CLASSIFICATION OF SCREW-IN TOOLS

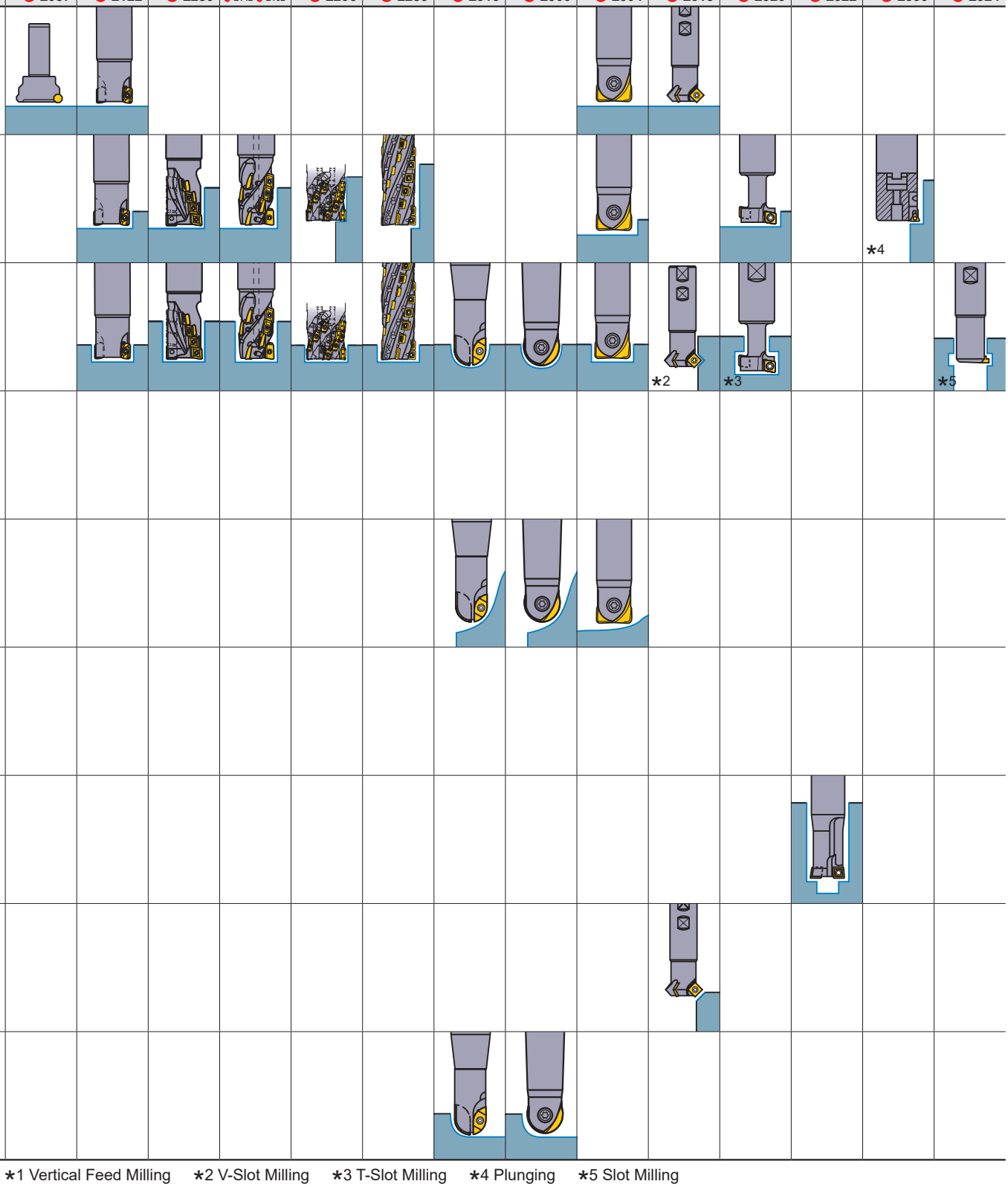
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
ASX400  90° KAPR	10	●High tolerance M-class inserts. ●Economical 4 cutting edge inserts. ●Curved cutting edge and high rigidity holder. ●Screw-on type. ●With through coolant holes. Info	Ø32 Ø40	P M K N S H	L119
APX3000  90° KAPR	10	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø16 — Ø40	P M K N S H	L138
APX4000  90° KAPR	15	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø25 — Ø40	P M K S H	L148
AQX  90° KAPR	18	●The centre bottom cutting edge enables drilling without previously formed hole. ●With through coolant holes. Info	Ø16 — Ø40	P M K N S H	L222
VPX200  90° KAPR	8	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø16 — Ø40	P M K N S H	L157
VPX300  90° KAPR	11	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø25 — Ø40	P M K N S H	L163
AJX 	1.2	●13° and 15° positive inserts. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	Ø16 — Ø40	P M K S H	L233

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
WJX09 NEW 	1.2	●Multi-functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	Ø25 — Ø40	P M K S H	L244
ARP  R KAPR	6	●Run-out does not occur easily when changing sections. ●Solid clamping system. ●With through coolant holes. Info	Ø25 — Ø40	M S	L267
ARX  R KAPR	3	●15°positive, high tolerance M-class insert. ●Effective for various machining applications. ●With through air & coolant holes. Info	Ø16 — Ø25	P M K H	L271
SRF/SRB  R KAPR	17	●S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills. ●Highly accurate corner radius tolerance allows for high precision finishing. ●Carbide shank type available. ●With through coolant holes. Info	Ø16 — Ø32	P K N H	L301
SUF  R KAPR	5.2	●Highly accurate corner radius tolerance allows for high precision finishing. ●Seamless gash. ●With through coolant holes. Info	Ø16 — Ø32	P M K H	L305
SRM2  R KAPR	44	●Suitable for roughing to semi-finishing of small and medium moulds. ●High rigidity body design. ●Low resistance chipbreaker. ●With through coolant holes. Info	Ø16 — Ø32	P M K S H	L310
PMC 	3.5	●For under-cutting trimmed part of press mould. ●2 directional cutting with large overhang. ●With through coolant holes. Info	Ø25 — Ø40	P K	L326

CLASSIFICATION

Cutting Mode \ Product Name	Multi-Functional Type									General Type		
	VPX200 VPX300	APX3000 APX4000	AXD4000 AXD7000	BXD4000	NEW WJX09 WJX14 AJX	AQX	ARX	ARP BRP	OCTACUT	NEW WWX400	ASX400	ASX445 WSX445
												
	➲ L156 ➲ L162	➲ L136 ➲ L146	➲ L194 ➲ L208	➲ L218	➲ L244 ➲ L252 ➲ L231	➲ L220	➲ L270	➲ L266 ➲ L274	➲ L258	➲ L103	➲ L118	➲ L056 ➲ L044
Face Milling												
Shoulder Milling												
Slot Milling												
Pocket Milling												
Copy Milling												
Helical Drilling												
Spot Milling												
Chamfer Milling												
Radius Milling												

General Type		Long Cutting Edge Type				Ball/Radius Type			Special Purpose Type				
AOX445	BAP300	DCCC	NEW VPX200 VPX300 APX3000 APX4000 Long Cutting Edge Type	VFX5 VFX6	NEW ASPX SPX	SRM2	SRF/SRB For Finishing	SUF For Finishing	CESP CFSP CGSP	TSMP	CBJP CBMP	PMC ✶1 PMF PMR	KSMG
													
L087	L122	L280	L159 L165 L142 L152	L292 L296	L288 L283	L308 L316	L300	L304	L318	L320	L322	L326 L328 L330	L324



✶1 Vertical Feed Milling ✶2 V-Slot Milling ✶3 T-Slot Milling ✶4 Plunging ✶5 Slot Milling

IDENTIFICATION

Symbol	Insert Shape	
6	Special Design	—
N	Heptagonal	
O	Octagonal	
S	Square	
T	Triangular	
C	Rhombic80°	
M	Rhombic86°	
A	Parallelogram85°	
R	Round	
L	Rectangular	
J	Special Design	—
X	Special Design	—
W	Wiper	—

① **Insert Shape**

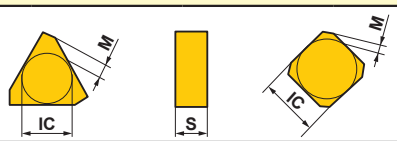
Symbol	Normal Clearance **AN**
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other Normal Clearance
X	Other Normal Clearance

② **Normal Clearance**

① ② ③ ④

S **E** **E** **R**

③ Tolerance Class



Symbol	Tolerance of Nose Height **M** (mm)	Tolerance of Inscribed Circle **IC** (mm)	Tolerance of Thickness **S** (mm)
A	±0.005	±0.025	±0.025
C	±0.013	±0.025	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
K*	±0.013	±0.05—±0.15	±0.025
M*	±0.08—±0.18	±0.05—±0.15	±0.13
N*	±0.08—±0.18	±0.05—±0.15	±0.025

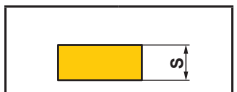
The surface of insert with ✱ mark is sintered.

④ Fixing and/or for Chip Breaker

Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40°—60°)	No	
T	With Hole		Single Sided	
U	With Hole	Cylindrical Hole + One Countersink (40°—60°)	Double Sided	
B	With Hole	Cylindrical Hole + One Countersink (70°—90°)	No	
N	Without Hole	—	No	
R	Without Hole	—	Single Sided	
X	—	—	—	Special Design

Symbol R	Symbol C	Symbol S	Symbol T	Diameter of Inscribed Circle
	06	06	11	6.35
	08	07	13	7.94
	09	09	16	9.525
10				10.00
12				12.00
	12	12	22	12.70
	16	15	27	15.875
20				20.00

⑤ Insert Size



Symbol	Insert Thickness (mm)
03	3.18
T3	3.97
04	4.76

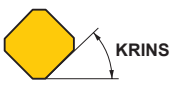
⑥ Insert Thickness

Symbol	Edge Preparation(Honing)
F	Sharp
E	Round
T	Chamfer
S	Chamfer + Round

⑨ Cutting Edge Condition

⑤	⑥	⑦	⑧	⑨	⑩	⑪		⑫
12	03	A	F	E	R	1	-	JS

⑦ Wiper Insert Cutting Angle



Symbol	Wiper Insert Cutting Angle
A	45°
E	75°
P	90°
Z	Other Angle

⑧ Clearance of Wiper Insert

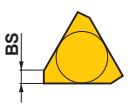


Symbol	Clearance Angle
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

⑩ Hand Tool Holder

Symbol	Hand Tool Holder
L	Left Hand Tool Holder
N	For Both Right and Left Hand Tool Holder
R	Right Hand Tool Holder

⑪ Width of Wiper Insert



Symbol	Width of Wiper Insert
1	1.4 (1.94 only for TEKN)
2	2.0 (2.4 for SFAN,SFCN)

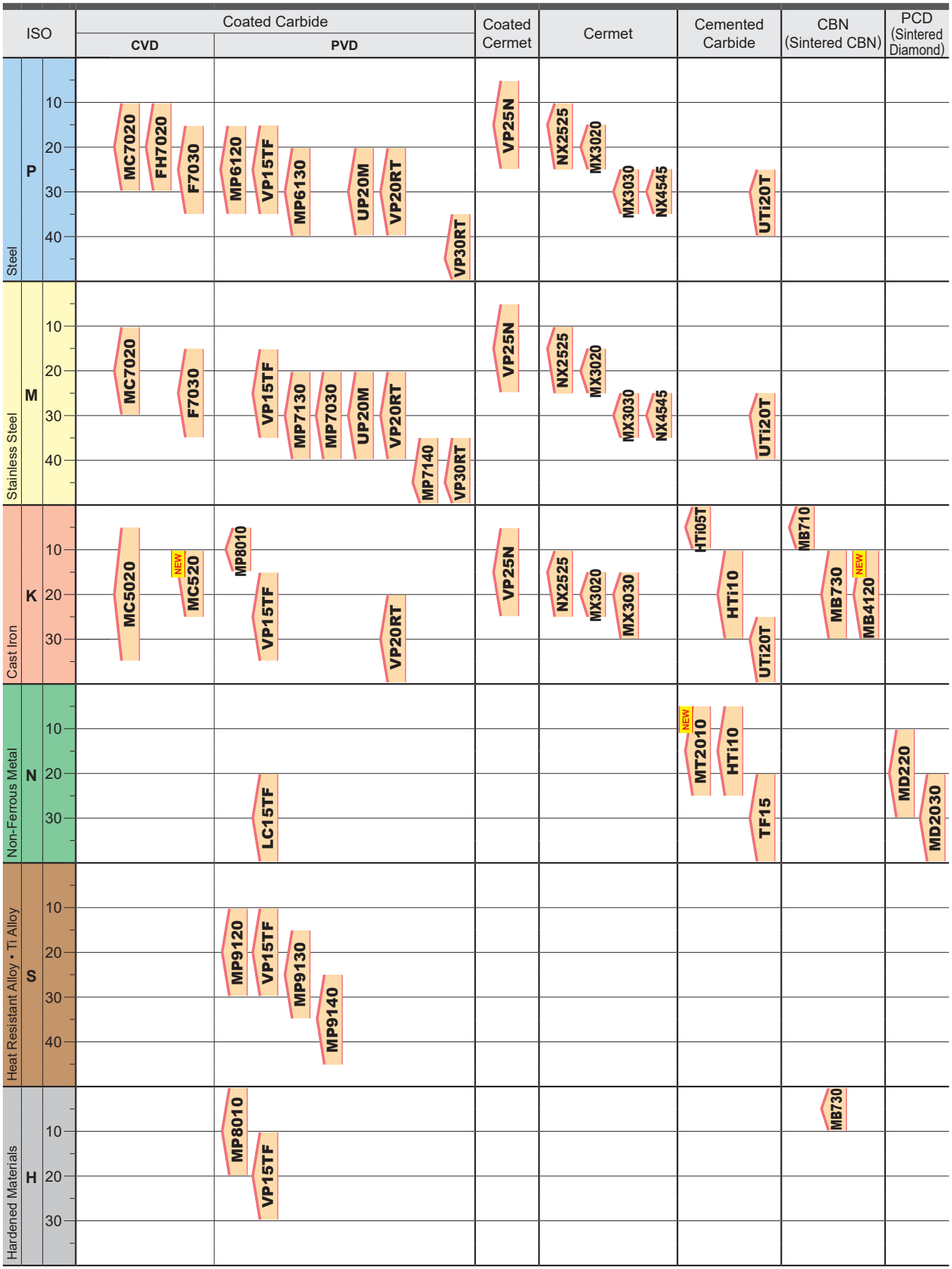
⑫ Chip Breaker

Symbol	Name
FT	FT Breaker
HS	HS Breaker
JH	JH Breaker
JM	JM Breaker
JP	JP Breaker
JS	JS Breaker
LS	LS Breaker
MM	MM Breaker
MS	MS Breaker

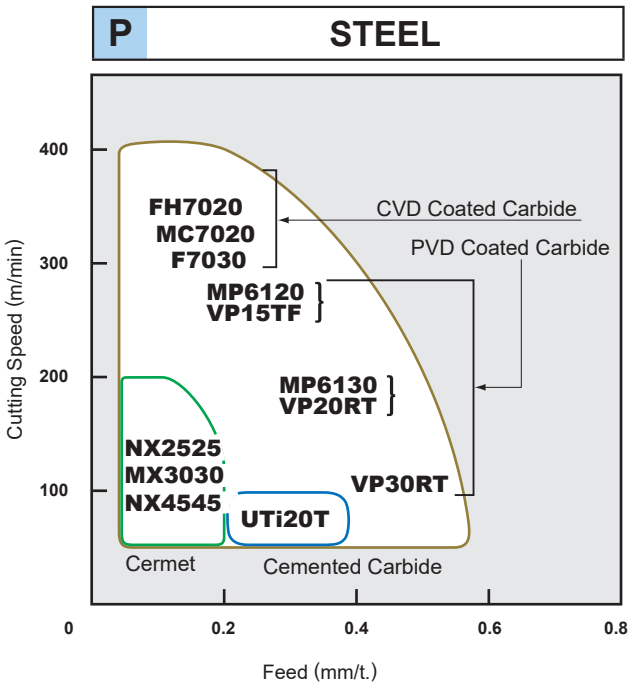
The above table shown as reference example.

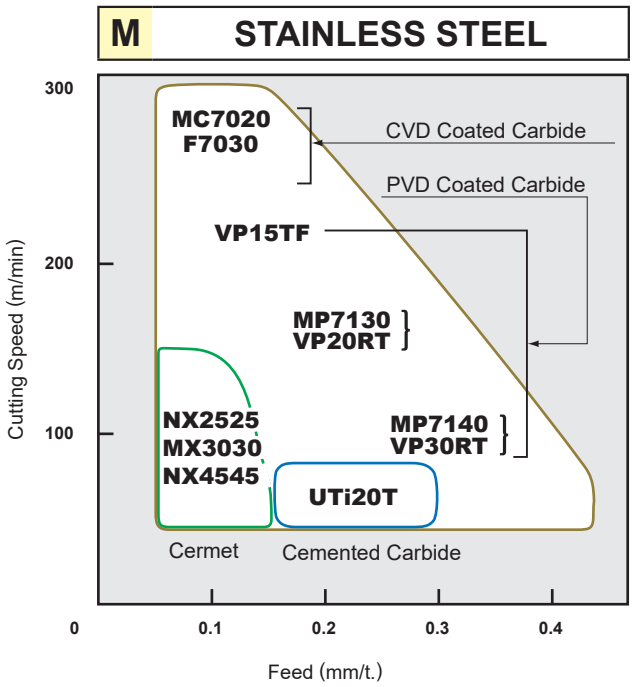
GRADES FOR MILLING

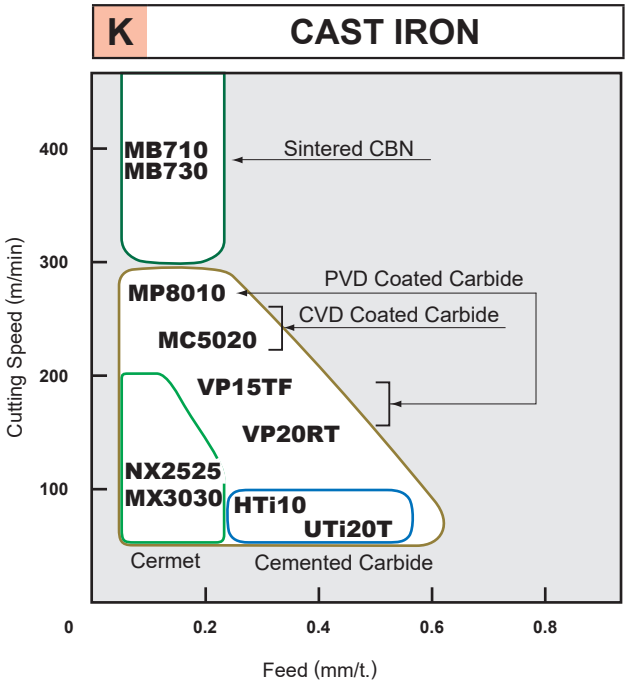
●INDEXABLE INSERT GRADES FOR MILLING

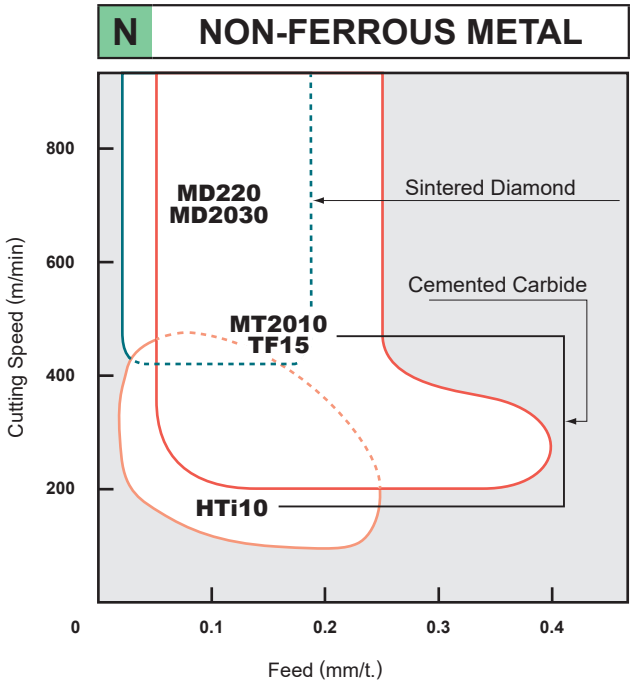


MILLING APPLICATION RANGE





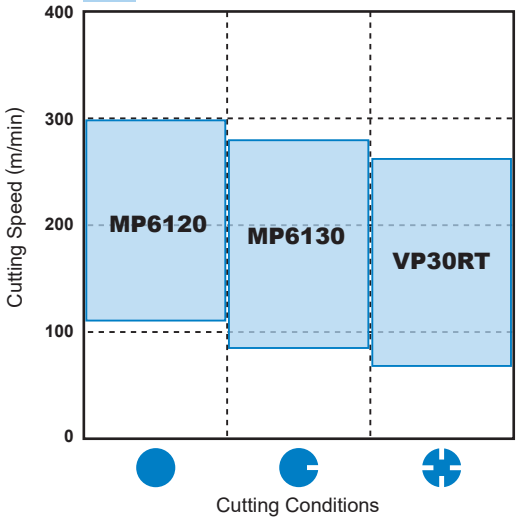




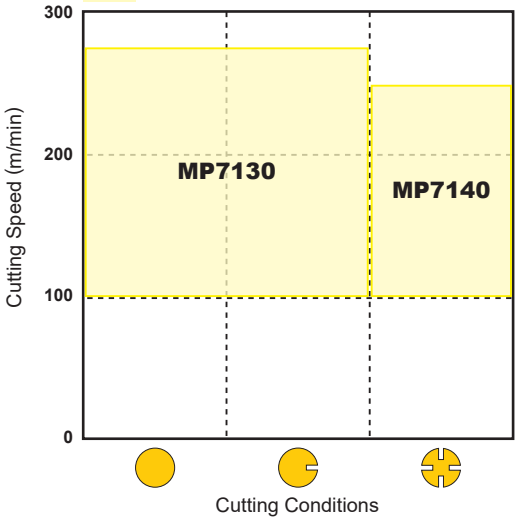
MILLING APPLICATION RANGE

●Recommendation of the insert grade based on cutting speed and conditions for each workpiece.

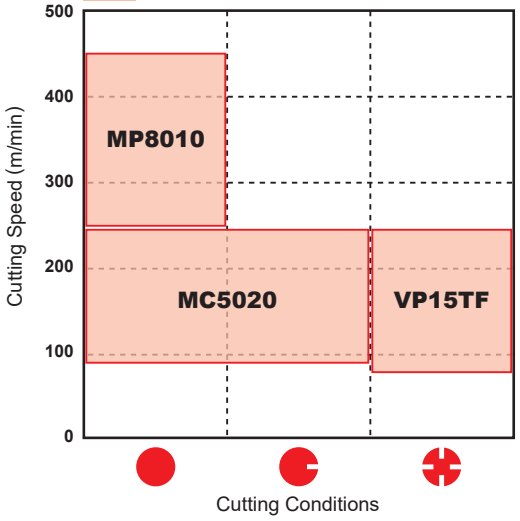
P STEEL (Medium to Rough Cutting)



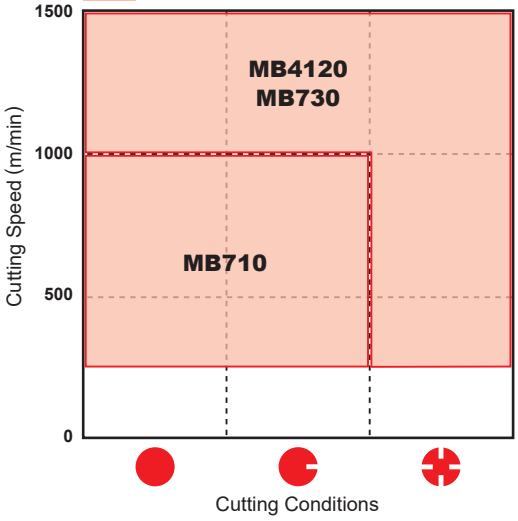
M STAINLESS STEEL



K CAST IRON



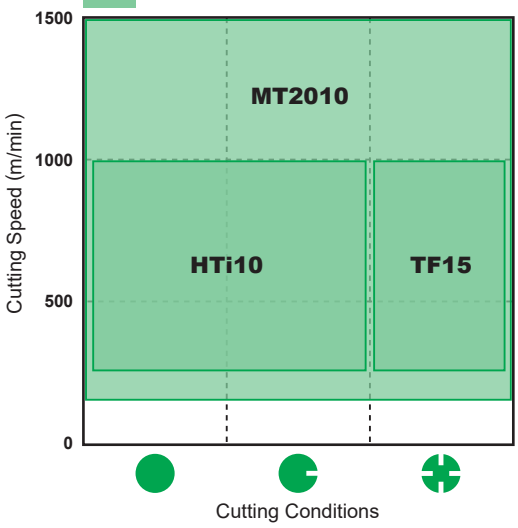
K CAST IRON (CBN)



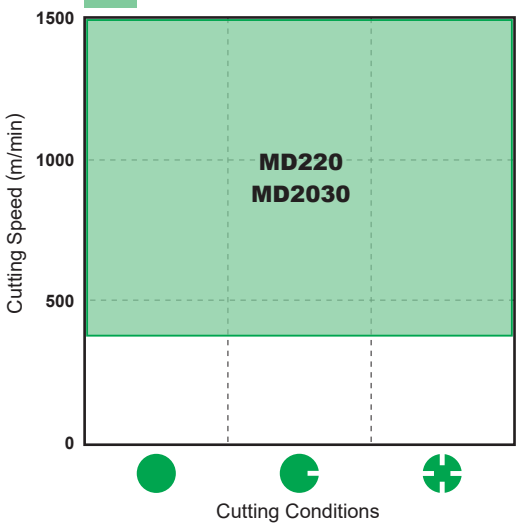
■CUTTING CONDITIONS

Stable Cutting	Plane Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component Cutting
General Cutting	
Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity Cutting

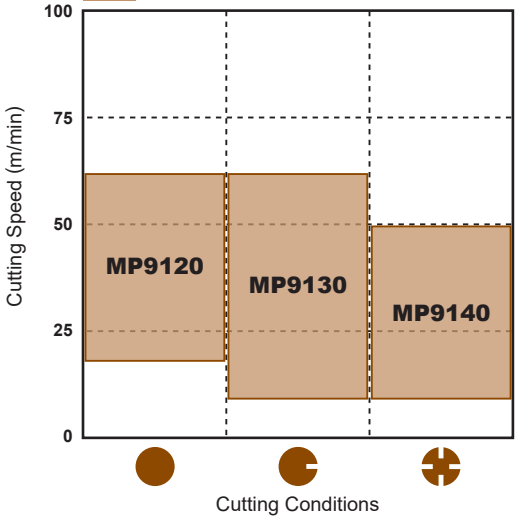
N NON-FERROUS METAL



N NON-FERROUS METAL (PCD)



S HEAT RESISTANT ALLOY, TITANIUM ALLOY



COATED CARBIDE (CVD&PVD)

<CVD>
- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.

<PVD>
- PVD coating prolongs tool life when compared to cemented carbide under the same cutting conditions.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

■SELECTION STANDARD

	Workpiece Material	Recommended Grade	ISO	Application Range
P	Steel	F7030 MC7020 MP6120 MP6130 VP15TF	P	MC7020, FH7020, F7030, MP6120, VP15TF, MP6130, UP20M, VP20RT, VP30RT
M	Stainless Steel	F7030 MC7020 MP7030 MP7130 MP7140 VP15TF	M	MC7020, F7030, VP15TF, MP7130, MP7030, UP20M, VP20RT, MP7140, VP30RT
K	Cast Iron	MC5020 NEW MC520 VP15TF	K	MC5020, NEW MC520, MP8010, VP15TF, VP20RT
N	Aluminium Alloy	LC15TF	N	LC15TF
S	Heat Resistant Alloy Ti Alloy	MP9120 VP15TF MP9130 MP9140	S	MP9120, VP15TF, MP9130, MP9140
H	Hardened Materials	MP8010 VP15TF	H	MP8010, VP15TF

■GRADE CHARACTERISTICS

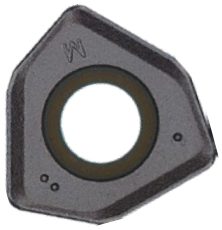
Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MC5020	91.0	TiCN-Al_2O_3-Ti Compound	Thick
NEW **MC520**	91.0	TiCN-Al_2O_3-Ti Compound	Thick
MC7020	88.8	TiCN-Al_2O_3-Ti Compound	Thick
FH7020	89.0	TiCN-Al_2O_3-Ti Compound	Thick
F7030	88.8	TiCN-Al_2O_3-TiN	Thin
MP6120	91.5	(Al,Ti,Cr)N	Thin
MP6130	90.5	(Al,Ti,Cr)N	Thin
MP7030	90.5	(Al,Ti)N-Ti Compound	Thin
MP7130	90.5	(Al,Ti)N-Ti Compound	Thin
MP7140	88.8	(Al,Ti)N-Ti Compound	Thin

Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MP8010	93.5	(Al,Ti,Si)N	Thin
MP9120	91.5	(Al,Ti,Cr)N	Thin
MP9130	90.5	(Al,Ti,Cr)N	Thin
MP9140	89.0	(Al,Ti)N	Thin
VP15TF	91.5	(Al,Ti)N	Thin
VP20RT	90.5	(Al,Ti)N	Thin
VP30RT	88.8	(Al,Ti)N	Thin
UP20M	90.5	TiN-TiCN-TiN	Thin

Note 1) The hardness values shown represent the typical values of the internal hardness.

For machining of steels and stainless steels

MC7020



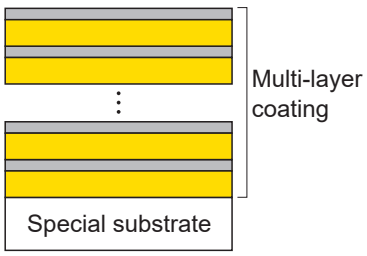
The micro-grain wear resistant Al_2O_3 and fibrous TiCN layers deliver excellent wear resistance in high-speed cutting. Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

For machining of stainless steel

MP7130



MP7130 has a multi-layer coating based on a newly developed Ti-compound. It provides superior wear and fracture resistance in stainless steel machining. A special tough cemented carbide substrate gives excellent performance in machining of difficult-to-cut materials such as stainless steel.



Heat resistant Alloy, Cutting For Titanium Alloy

MP9130



An enhanced super fine cemented carbide substrate has increased toughness while maintaining hardness. The Al-Ti-Cr-N accumulative coating ensures optimum heat and wear resistance. The combination of these properties gives excellent fracture resistance and welding resistance because of low coefficient of friction when machining titanium alloys.

MP9140



The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

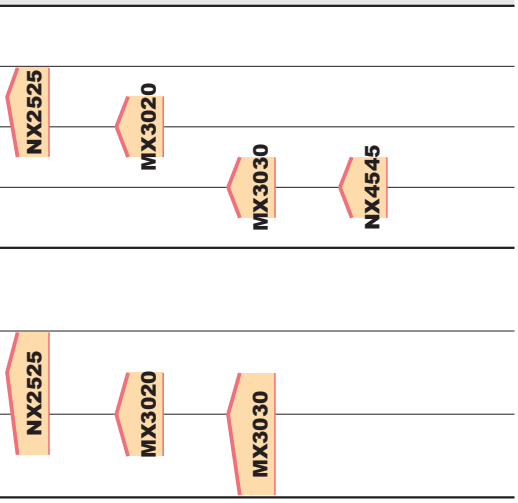
CERMET

- NX2525 for high-speed milling.
- NX4545, MX3030 for general milling.

■SELECTION STANDARD

MILLING

	Workpiece Material	Recommended Grade	ISO	Application Range
P / M	Steel Stainless Steel	NX2525	P / M	10
		MX3020		20
		MX3030 NX4545		30
K	Cast Iron	NX2525	K	10
		MX3020		20
		MX3030		



Note 1) In case of wet cutting, please use coated carbide VP15TF for steel cutting and coated carbide MC5020 for cast iron cutting.

■GRADE CHARACTERISTICS

Grade	Hardness (HRA)
NX2525	92.2
MX3030	91.0
NX4545	90.0

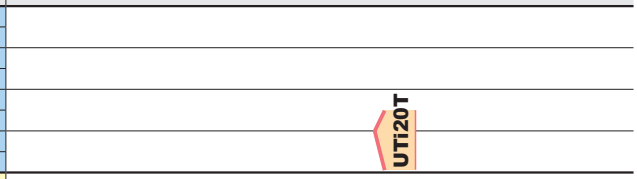
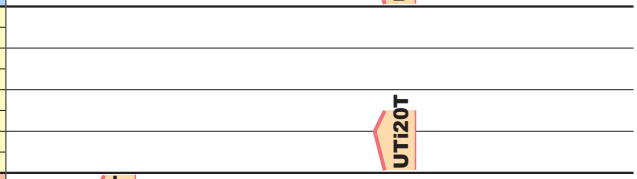
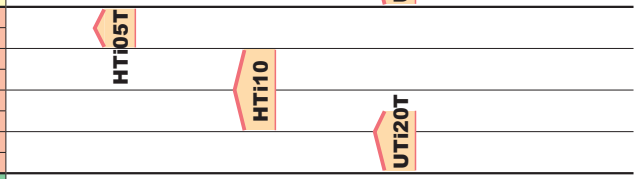
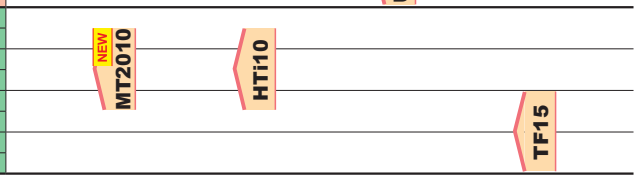
Note 1) The hardness values shown represent the typical values of the internal hardness.

CEMENTED CARBIDE

● **Available grade series are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.**

■SELECTION STANDARD

MILLING

Workpiece Material		Recommended Grade	ISO	Application Range
P	Steel	**UTi20T**	P	
M	Stainless Steel	**UTi20T**	M	
K	Cast Iron	**HTi05T** **HTi10** **UTi20T**	K	
N	Non-Ferrous Metal	**HTi10** NEW **MT2010** **TF15**	N	

■MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Workpiece Material
P M	WC-TiC-TaC-Co	Heat / Deformation resistance.	Carbon steel, Alloy steel, Stainless steel and Cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, Non-Ferrous metals and Non-metal

■GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)
P M	**UTi20T**	90.5
K N	**HTi05T**	92.5
K N	**HTi10**	92.0
N	**MT2010**	91.8
N	**TF15**	91.5

Note 1) The hardness values shown represent the typical values of the internal hardness.

CBN (SINTERED CBN)





- MB4120, MB710 and MB730 for cast iron cutting.
- MB4120 for high efficiency machining of cast iron.
- BC5030 for high-speed machining of cast irons available.
- The combination of the BC5030 insert geometry and the AOX allows the use of up to 16 corners per insert, enabling cost effective, high efficiency machining.

■SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

Recommended Cutter : NF10000, OCTACUT, PMF, ASX445

Workpiece Material		Structure	Cutting Speed (m/min) 250 500 750 1000 1250	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	JIS FC250	Ferritic + Pearilitic	MB710 / MB730	—0.3	—0.5	Dry
	JIS FC300	Pearilitic				

Recommended Cutter : FMAX

Workpiece Material		Structure	Cutting Speed (m/min) 250 500 750 1000 1250	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	JIS FC300	Pearilitic	MB4120	—0.15	—0.5	Dry

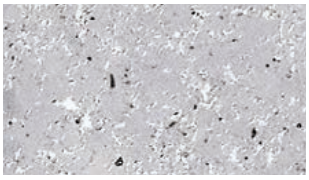
Recommended Cutter : AOX445

Workpiece Material		Structure	Cutting Speed (m/min) 250 500 1000 1500 2000	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	JIS FC250	Pearilitic	BC5030	—0.15	—3.0	Dry

■FEATURES AND BASE

Grade	Application	Features	Main Component	Coating Layer
NEW MB4120	For High Efficiency Machining For High-Speed Cutting For interrupted Cutting	Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining. Optimised grade prevents fracture, edge chipping and thermal cracks under both dry cutting conditions and when cutting workpieces following the wet cutting process.	CBN Co Base Alloy	—
MB710	For General Cutting	General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al_2O_3	—
MB730	For High-Speed Cutting For interrupted Cutting	Has the largest CBN content and therefore displays good thermal conductivity. It is suitable for the high temperatures that are generated in high-speed cutting.	CBN (High Content) Co Base Alloy	—
BC5030	For High-Speed Machining at Large Depths of Cut High-Speed Interrupted Machining at Large Depths of Cut	High CBN content and high thermal conductivity. The whole insert is composed of sintered CBN. This enables high-speed, high efficiency machining at larger depths of cut. The coated grade for easy recognition of used corners.	CBN AlN	TiN

PCD (SINTERED DIAMOND)



Micro-Structure of **MD220**



Micro-Structure of **MD2030**

- **Suitable for cutting of non-ferrous metals such as aluminium alloys.**
- **Suitable for extremely high-speed finishing.**

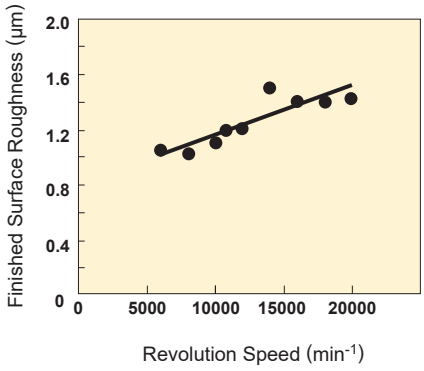
■GRADE FEATURES

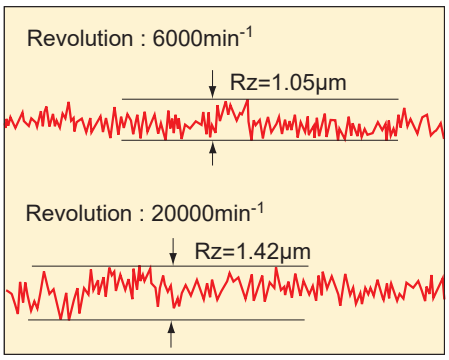
Grade	Features
MD220	Excellent in the balance between wear resistance and fracture resistance. For a wide range of tooling applications.
MD2030	Improved fracture resistance when used in unstable applications. The stability of the cutting edge can meet a wide variety of workpiece material and cutting conditions.

■RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Cutting Speed (m/min)	Grade	Feed per Tooth (mm/t)	Depth of Cut (mm)
Aluminium Alloy (Si ≤12%)	2000—3000	**MD220** **MD2030**	—0.2	—3.0
Aluminium Alloy (Si ≥13%)	400—800			

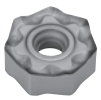
■CUTTING PERFORMANCE





<Cutting Conditions>
Workpiece : JIS A7075-T6
Insert : NP-GDCW1240PDFR2
Grade : MD220
Tool : V10000R0406D
Feed : 0.2mm/t
Depth of Cut : 0.5mm
Width of Cut : 80mm
Dry Cutting

CLASSIFICATION

Cutter Type Shape	Order Number	Page
AF5000 	LDCN190412R	L350
AHX440S AHX475S 	NNMU130508ZER-L NNMU130508ZEN-M NNMU130532ZEN-M NNMU130532ZEN-R	L062 L067
	WNEU1305ZEN4C-M	L062
AHX640S 	NNMU200708ZEN-M	L071
	NNMU200708ZEN-MP	L071
	NNMU200712ZER-L	L071
	NNMU200712ZER-MM	L071

Cutter Type Shape	Order Number	Page
AHX640S 	WNEU2007ZEN7C-M	L071
	WNEU2007ZEN7C-WP	L071
	NNMU200608ZEN-MK	L071
	NNMU200608ZEN-HK	L071
	WNEU2006ZEN7C-WK	L071
AHX640W 	NNMU200608ZEN-MK	L079
	NNMU200608ZEN-HK	L079

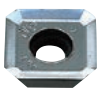
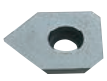
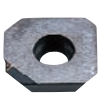
Cutter Type Shape	Order Number	Page
AHX640W 	WNEU2006ZEN7C-WK	L079
AJX PMC 	JOMW06T215ZZSR-FT JOMW080320ZZSR-FT JDMW09T320ZDSR-FT JDMW120420ZDSR-FT JDMW140520ZDSR-FT	L228 L326
	JOMT06T215ZZSR-JM JOMT080320ZZSR-JM JDMT09T320ZDSR-JM JDMT120420ZDSR-JM JDMT140520ZDSR-JM	L228 L326
	JDMT120420ZDSR-ST JDMT140520ZDSR-ST	L228 L326
	JOMT06T216ZZER-JL JOMT080322ZZER-JL JDMT09T323ZDER-JL JDMT120423ZDER-JL JDMT140523ZDER-JL	L228
AOX445 	SL-ONEN120404ASN	L087

Cutter Type Shape	Order Number	Page
APX3000 **APX3000** Long Cutting Edge Type	AOGT123602PEFR-GM	
	AOGT123604PEFR-GM	
	AOGT123608PEFR-GM	L136 L142
	AOMT123602PEER-M	
	AOMT123604PEER-M	
	AOMT123608PEER-M	
	AOMT123610PEER-M	
	AOMT123612PEER-M	
	AOMT123616PEER-M	L136 L142
	AOMT123620PEER-M	
	AOMT123624PEER-M	
	AOMT123630PEER-M	
	AOMT123632PEER-M	
	AOMT123604PEER-H	
	AOMT123608PEER-H	
	AOMT123616PEER-H	L136 L142
APX4000 **APX4000** Long Cutting Edge Type	AOMT184804PEER-H	
	AOMT184808PEER-H	
	AOMT184816PEER-H	
	AOMT184832PEER-H	L146 L152
	AOMT184840PEER-H	
	AOMT184850PEER-H	
	AOMT184864PEER-H	
	AOMT184804PEER-M	
	AOMT184808PEER-M	
	AOMT184810PEER-M	
	AOMT184812PEER-M	L146 L152
	AOMT184816PEER-M	
	AOMT184820PEER-M	

Cutter Type Shape	Order Number	Page
AQX	QOMT0830R-M2	
	QOMT1035R-M2	
	QOMT1342R-M2	
	QOMT1651R-M2	L220
	QOMT1856R-M2	
	QOMT2062R-M2	
	QOMT2576R-M2	
	QOGT0830R-G1	
	QOGT1035R-G1	
	QOGT1342R-G1	
	QOGT1651R-G1	L220
	QOGT1856R-G1	
	QOGT2062R-G1	
	QOGT2576R-G1	
ARP	RPHT1040M0E4-L	
	RPMT1040M0E4-L	
	NEW RPMT1040M0E8-L1	
	NEW RPMT1040M0E4-L2	
	RPHT1040M0E4-M	
	RPMT1040M0E4-M	L264
	NEW RPMT1040M0E8-M1	
	NEW RPMT1040M0E4-M2	
	RPHT1040M0E4-R	
	RPMT1040M0E4-R	
	NEW RPMT1040M0E8-R1	
	RPHT1248M0E4-L	
	RPMT1248M0E4-L	
	NEW RPMT1248M0E8-L1	
	NEW RPMT1248M0E4-L2	
	RPHT1248M0E4-M	
	RPMT1248M0E4-M	L264
	NEW RPMT1248M0E8-M1	
	NEW RPMT1248M0E4-M2	
	RPHT1248M0E4-R	
	RPMT1248M0E4-R	
	NEW RPMT1248M0E8-R1	

Cutter Type Shape	Order Number	Page
ARX	RDMW0517M0E	
	RDMW0620M0E	
	RDMW0724M0E	L270
ASPX	JPGX1404080PPER-JM	
	JPGX1404120PPER-JM	
	JPGX1404160PPER-JM	
NEW	JPGX1404240PPER-JM	
	JPGX1404320PPER-JM	L288
	JPGX1404400PPER-JM	
	JPGX1404500PPER-JM	
	JPGX1404635PPER-JM	
	SPGX1204100PPER-JM	
NEW		
		L288
ASX400 **ASX400** **Side Cutter**	SOET12T308PEER-JL	
		L116
	SOMT12T308PEER-JM	
	SOMT12T308PEEL-JM	L116 L135
	SOMT12T308PEER-JH	
		L116
	SOMT12T320PEER-FT	
		L116

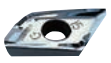
CLASSIFICATION

Cutter Type Shape	Order Number	Page
ASX400 ASX400 Side Cutter	SOGT12T308PEFR-JP	L116
	WOEW12T308PEER8C	L116
	WOEW12T308PETR8C	
ASX445	SEET13T3AGEN-JL	L054
	SEMT13T3AGSN-JM	L054
	SEMT13T3AGSN-JH	L054
	SEMT13T3AGSN-FT	L054
	SEGT13T3AGFN-JP	L054
	WEEW13T3AGER8C	L054
	WEEW13T3AGTR8C	
	WEEW13T3AGFR3C	L054
	WEEW13T3AGTR3C	

Cutter Type Shape	Order Number	Page
AXD4000 AXD4000A	XDGX175004PDFR-GL	L194 L202
	XDGX175008PDFR-GL	
	XDGX175012PDFR-GL	
	XDGX175016PDFR-GL	
	XDGX175020PDFR-GL	
	XDGX175024PDFR-GL	
	XDGX175030PDFR-GL	
	XDGX175032PDFR-GL	
	XDGX175040PDFR-GL	
	XDGX175050PDFR-GL	
	XDGX175004PDER-GM	L194 L202
	XDGX175008PDER-GM	
	XDGX175012PDER-GM	
	XDGX175016PDER-GM	
	XDGX175020PDER-GM	
	XDGX175024PDER-GM	
	XDGX175030PDER-GM	
	XDGX175032PDER-GM	
	XDGX175040PDER-GM	
	XDGX175050PDER-GM	
	XDGX175004PDFR-GM	L194 L202
	XDGX175008PDFR-GM	
	XDGX175012PDFR-GM	
	XDGX175016PDFR-GM	
	XDGX175020PDFR-GM	
	XDGX175024PDFR-GM	
	XDGX175030PDFR-GM	
	XDGX175032PDFR-GM	
	XDGX175040PDFR-GM	
	XDGX175050PDFR-GM	

Cutter Type Shape	Order Number	Page
AXD7000	XDGX227008PDFR-GL	L208
	XDGX227016PDFR-GL	
	XDGX227020PDFR-GL	
	XDGX227030PDFR-GL	
	XDGX227032PDFR-GL	
	XDGX227040PDFR-GL	
	XDGX227050PDFR-GL	
	XDGX227008PDER-GLA	L208
	XDGX227016PDER-GLA	
	XDGX227020PDER-GLA	
	XDGX227024PDER-GLA	
	XDGX227030PDER-GLA	
	XDGX227032PDER-GLA	
	XDGX227040PDER-GLA	
	XDGX227050PDER-GLA	
BAE	AEMW150304ER	L344
	AEMW150308ER	
	AEMW19T304ER	
	AEMW19T308ER	
BAP300 BAP300 Long Cutting Edge Type	APMT1135PDER-H1	L122 L344
	APMT1135PDER-H2	
	APMT1135PDER-H3	
	APMT1135PDER-H4	
	APMT1135PDER-H6	
	APMT1135PDER-M0	L122 L344
	APMT1135PDER-M1	
	APMT1135PDER-M2	
	APGT1135PDFR-G2	L122 L344
		

Cutter Type Shape	Order Number	Page
BAP400 	APMT1604PDER-H1	L344
	APMT1604PDER-H2	
	APMT1604PDER-H4	
	APMT1604PDER-H6	
	APMT1604PDER-H8	
	APMT1604PDER-M2	L344
	APGT1604PDFR-G2	L344
BF407 QBF407 	SFAN1203ZFFR2	L346
	SFAN1203ZFFL2	
	SFCN1203ZFFR2	
	SFCN1203ZFFL2	
BMR 	HNMX1206EN06-R	L332
	HNMX1206ER12-R	L332
BN425 DN 	SNC43B2G	L346
	SNC43B2S	
	SNMF43B2G	L347

Cutter Type Shape	Order Number	Page
BRP 	RPMW08T2M0T	L274
	RPMW10T3M0E	
	RPMW10T3M0T	
	RPMW1204M0E	
	RPMW1204M0T	
	RPMW1606M0E	
	RPMW1606M0T	
	RPMT08T2M0E-JS	L274
	RPMT10T3M0E-JS	
	RPMT1204M0E-JS	
	RPMT1606M0E-JS	
BXD4000 	XDGT1550PDER-G04	L216
	XDGT1550PDER-G08	
	XDGT1550PDER-G12	
	XDGT1550PDER-G16	
	XDGT1550PDER-G20	
	XDGT1550PDER-G30	
	XDGT1550PDER-G32	
	XDGT1550PDER-G40	
	XDGT1550PDER-G50	
	XDGT1550PDFR-G04	L216
	XDGT1550PDFR-G08	
	XDGT1550PDFR-G12	
	XDGT1550PDFR-G16	
	XDGT1550PDFR-G20	
	XDGT1550PDFR-G30	
	XDGT1550PDFR-G32	
	XDGT1550PDFR-G40	
	XDGT1550PDFR-G50	
	XDGT1550PDFR-GL04	L216
	XDGT1550PDFR-GL08	

Cutter Type Shape	Order Number	Page
CBJP TAB 	JPMT060204-E	L322 L345
CBMP ECMP TAB 	MPMT070308	L322 L345
	MPMT090308	
	MPMT120408	
CESP CFSP CGSP 	SPMW090304	L318
	SPMW090308	
	SPMW120304	
	SPMW120308	
DCCC 	CCMX083508EN-A	L280
	CCMX09T308EN-A	
	CCMX09T308EN-B	L280
	ZCMX083508ER-A	L280
	ZCMX09T308ER-A	
	ZCMX09T308ER-B	L280

CLASSIFICATION

Cutter Type Shape	Order Number	Page
E404 FE404 	SEA42C10GR SEA42C10GL	L338 L345
FBP415 QBP415 	SPEN1203EEER1 SPEN1203EEEL1 SPNN1203EEER1 SPNN1203EEEL1	L347
	SPER1203EEER-JS	L347
	SPEN1203EETR1	L350
	WPC42EEER10C WPC42EEEL10C	L349
FF3000 	SPCA53Z	L098
	SPCG53Z	L098

Cutter Type Shape	Order Number	Page
FMAX 	GOER1404PXFR2 GOER1408PXFR2	L089
NEW 	NP-GOEN1404PXSR05 NP-GOEN1408PXSR05	L089
	GOER1408PXFR2-8	L089
	GOER1401ZXFR2	L089
FMSD 	SDEN1203AEN	L345
FP490 	SPEN424A	L334
FP590 	SPEN535A	L336

Cutter Type Shape	Order Number	Page
NF10000 	GDCN2004PDFR3	L096
	NP-GDCN2004PDSR3	L096
MG200 	MGEEW1035PFTR	L345
MG300 	MGEEW1242PFTR	L345
MG400 	MGEEW1650PFTR	L345
MG245 	MGEEW1035AFTR	L345
MG345 	MGEEW1242AFTR	L345

Cutter Type Shape	Order Number	Page
MG445 	MGEEW1650AFTR	L345
NSE300 SE300 	TEEN1603PEFR1 TEEN1603PEER1 TEEN1603PETR1 TEEN1603PESR1	L348
	TECN1603PEFR1W TECN1603PEER1W TECN1603PETR1W	L348
	TEER1603PEER-JS	L348
NSE400 SE400 	TECN2204PEFR1 TECN2204PEER1 TECN2204PETR1 TEEN2204PEFR1 TEEN2204PEER1 TEEN2204PETR1 TEEN2204PESR1	L348
	TEER2204PEER-JS	L348

Cutter Type Shape	Order Number	Page
OCTACUT 	OEMX12T3ETR1 OEMX12T3ESR1 OEMX1705ESR1 OEMX1705ETR1	L258
	OEMX12T3ETR1	L258
	OEMX12T3EER1-JS OEMX1705EER1-JS OEMX1705ETR1-JS	L258
	REMX1705SN	L258
	REMX12T3EN-JS REMX1705EN-JS	L258
PMF 	TPEW1303ZPER2	L328
	TPEW1303ZPTR2	L328

Cutter Type Shape	Order Number	Page
PMR 	CPMT1205ZPEN-M2 CPMT1205ZPEN-M3 CPMT1906ZPEN-M2 CPMT1906ZPEN-M3	L330 L344
S400 	SPMN120304 SPMN120304T SPMN120308 SPMN120312 SPMN120408 SPMN120412 SPGN120304 SPGN120308 SPGN120312	L347
S500 	SPMN150408 SPMN150412 SPGN150404 SPGN150408	L347
SE415 QSE415 	SEEN1203EFFR1 SEEN1203EFER1 SEEN1203EFTR1 SEEN1203EFSR1	L346
	SEER1203EFER-JS	L346
	WEC42EFER5C WEC42EFTR5C	L349

CLASSIFICATION

Cutter Type Shape	Order Number	Page
SE445 LSE445 	SECN1203AFTN1	L345
	SEEN1203AFFN1	
	SEEN1203AFEN1	
	SEEN1203AFTN1	
	SEEN1203AFSN1	
	SEER1203AFEN-JS	L346
	WEC42AFTR5C	L349
SE515 	SECN1504EFTR1	L346
	SEEN1504EFER1	
	SEEN1504EFSR1	
	SEEN1504EFTR1	
	WEC53EFTR5C	L349
SE545 	SEEN1504AFEN1	L346
	SEEN1504AFSN1	
	SEEN1504AFTN1	
	SEER1504AFEN-JS	L346

Cutter Type Shape	Order Number	Page
SE545 	WEC53AFER5C	L349
	WEC53AFTR5C	
SG20 	RGEN2004M0EN	L345
	RGEN2004M0SN	
SPX 	JPMX140412-JM	L283
	JPMX190412-JM	
	JPMX140412-WH	L283
	JPMX190412-WH	
	MPMX120412-JM	L283
	MPMX120412-WH	L283
	SPMX120408-JM	L283
	SPMX120408-WH	L283
SRB 	SRBT10	L300
	SRBT12	
	SRBT16	
	SRBT20	
	SRBT25	
	SRBT30	
	SRBT32	

Cutter Type Shape	Order Number	Page
SRF 	SRFT10	L300
	SRFT12	
	SRFT16	
	SRFT20	
	SRFT25	
	SRFT30	
	SRFT32	
SRM2 	SRM16C-M	L308
	SRM20C-M	
	SRM25C-M	
	SRM30C-M	
	SRM32C-M	
	SRM16E-M	L308
	SRM20E-M	
	SRM25E-M	
	SRM30E-M	
	SRM32E-M	
	SRG16C	L308
	SRG20C	
	SRG25C	
	SRG30C	
	SRG32C	
	SRG16E	L308
	SRG20E	
	SRG25E	
	SRG30E	
	SRG32E	
	APMT1135PDER-H2	L308
	APMT1604PDER-H2	
	APMT1135PDER-M2	L308
	APMT1604PDER-M2	

Cutter Type Shape	Order Number	Page
SRM2ϕ40 ϕ50 	SRG40C	L316
	SRG50C	
	SRG40E	L316
	SRG50E	
	APMT1604PDER-H2	L316
	APMT1604PDER-M2	L316
SUF 	SUFT10R05	L304
	SUFT10R10	
	SUFT10R20	
	SUFT12R05	
	SUFT12R10	
	SUFT12R20	
	SUFT12R30	
	SUFT16R05	
	SUFT16R10	
	SUFT16R15	
	SUFT16R20	
	SUFT16R30	
	SUFT20R05	
	SUFT20R10	
	SUFT20R15	
	SUFT20R20	
	SUFT20R30	
	SUFT25R05	
	SUFT25R10	

Cutter Type Shape	Order Number	Page
SUF 	SUFT25R20	L304
	SUFT25R30	
	SUFT30R05	
	SUFT30R10	
	SUFT30R20	
	SUFT30R30	
	SUFT32R05	
	SUFT32R10	
	SUFT32R20	
TBE1 	SPMT120408-A	L348
TSMP 	MPMW070308	L320
	MPMW090308	
	MPMW120408	
V10000 	NP-GDCW1240PDFR2	L350
VAS300 Side Cutter NEW 	LNGU090604PNER-M	L126
	LNGU090604PNEL-M	
	LNGU090608PNER-M	
	LNGU090608PNEL-M	
	LNGU090612PNER-M	
	LNGU090612PNEL-M	
	LNGU090616PNER-M	
	LNGU090616PNEL-M	
	LNGU090620PNER-M	
	LNGU090620PNEL-M	
	LNGU090624PNER-M	
	LNGU090624PNEL-M	
	LNGU090630PNER-M	
	LNGU090630PNEL-M	
	LNGU090640PNER-M	
	LNGU090640PNEL-M	

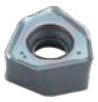
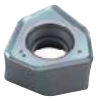
Cutter Type Shape	Order Number	Page
VAS400 Side Cutter 	LNGU130804PNER-M	L128
	LNGU130804PNEL-M	
	LNGU130808PNER-M	
	LNGU130808PNEL-M	
	LNGU130812PNER-M	
	LNGU130812PNEL-M	
	LNGU130816PNER-M	
	LNGU130816PNEL-M	
	LNGU130820PNER-M	
	LNGU130820PNEL-M	
	LNGU130824PNER-M	
	LNGU130824PNEL-M	
	LNGU130830PNER-M	
	LNGU130830PNEL-M	
	LNGU130840PNER-M	
	LNGU130840PNEL-M	
	LNGU130850PNER-M	
	LNGU130850PNEL-M	
	LNGU130804PNER-R	L128
	LNGU130804PNEL-R	
	LNGU130808PNER-R	
	LNGU130808PNEL-R	
	LNGU130812PNER-R	
	LNGU130812PNEL-R	
	LNGU130816PNER-R	
	LNGU130816PNEL-R	
	LNGU130820PNER-R	
	LNGU130820PNEL-R	
	LNGU130824PNER-R	
	LNGU130824PNEL-R	
	LNGU130830PNER-R	
	LNGU130830PNEL-R	
	LNGU130840PNER-R	
	LNGU130840PNEL-R	
	LNGU130850PNER-R	
	LNGU130850PNEL-R	

CLASSIFICATION

Cutter Type Shape	Order Number	Page
VAS500 Side Cutter 	LNGU171004PNER-R	L130
	LNGU171004PNEL-R	
	LNGU171008PNER-R	
	LNGU171008PNEL-R	
	LNGU171012PNER-R	
	LNGU171012PNEL-R	
	LNGU171016PNER-R	
	LNGU171016PNEL-R	
	LNGU171020PNER-R	
	LNGU171020PNEL-R	
	LNGU171024PNER-R	
	LNGU171024PNEL-R	
	LNGU171030PNER-R	
	LNGU171030PNEL-R	
	LNGU171040PNER-R	
	LNGU171040PNEL-R	
	LNGU171050PNER-R	
	LNGU171050PNEL-R	
	LNGU171060PNER-R	
	LNGU171060PNEL-R	
	LNGU171070PNER-R	
	LNGU171070PNEL-R	
VFX5 	XNMU160708R-MS	L292
	XNMU160712R-MS	
	XNMU160716R-MS	
	XNMU160724R-MS	
	XNMU160732R-MS	
	XNMU160740R-MS	
	XNMU160708R-HS	L292
	XNMU160708R-LS	L292

Cutter Type Shape	Order Number	Page
VFX6 	XNMU190912R-MS	L296
	XNMU190916R-MS	
	XNMU190924R-MS	
	XNMU190932R-MS	
	XNMU190940R-MS	
	XNMU190950R-MS	
	XNMU190912R-HS	L296
	XNMU190912R-LS	L296
VOX400 VOS400 Side Cutter 	SONX1206PER	L112 L134
	SONX1206PEL	
	WOEX1206PER5C	L112
VPX200 VPX200 Long Cutting Edge Type 	LOGU0904020PNER-L	L156 L159
	LOGU0904040PNER-L	
	LOGU0904080PNER-L	
	LOGU0904100PNER-L	
	LOGU0904120PNER-L	
	LOGU0904160PNER-L	
	LOGU0904020PNFR-L	
	LOGU0904040PNFR-L	
	LOGU0904080PNFR-L	
	LOGU0904100PNFR-L	
	LOGU0904120PNFR-L	
	LOGU0904160PNFR-L	

Cutter Type Shape	Order Number	Page
VPX200 VPX200 Long Cutting Edge Type 	LOGU0904020PNER-M	L156 L159
	LOGU0904040PNER-M	
	LOGU0904080PNER-M	
	LOGU0904100PNER-M	
	LOGU0904120PNER-M	
	LOGU0904160PNER-M	
	LOGU0904020PNFR-M	
	LOGU0904040PNFR-M	
	LOGU0904080PNFR-M	
	LOGU0904100PNFR-M	
	LOGU0904120PNFR-M	
	LOGU0904160PNFR-M	
VPX300 VPX300 Long Cutting Edge Type NEW 	LOGU1207020PNER-L	L162 L165
	LOGU1207040PNER-L	
	LOGU1207080PNER-L	
	LOGU1207100PNER-L	
	LOGU1207120PNER-L	
	LOGU1207160PNER-L	
	LOGU1207200PNER-L	
	LOGU1207240PNER-L	
	LOGU1207300PNER-L	
	LOGU1207320PNER-L	
NEW 	LOGU1207020PNFR-L	L162 L165
	LOGU1207040PNFR-L	
	LOGU1207080PNFR-L	
	LOGU1207100PNFR-L	
	LOGU1207120PNFR-L	
	LOGU1207160PNFR-L	
	LOGU1207200PNFR-L	
	LOGU1207240PNFR-L	
	LOGU1207300PNFR-L	
	LOGU1207320PNFR-L	

Cutter Type Shape	Order Number	Page
VPX300 **VPX300** Long Cutting Edge Type 	LOGU1207020PNER-M LOGU1207040PNER-M LOGU1207080PNER-M LOGU1207100PNER-M LOGU1207120PNER-M LOGU1207160PNER-M LOGU1207200PNER-M LOGU1207240PNER-M LOGU1207300PNER-M LOGU1207320PNER-M	L162 L165
	LOGU1207020PNFR-M LOGU1207040PNFR-M LOGU1207080PNFR-M LOGU1207100PNFR-M LOGU1207120PNFR-M LOGU1207160PNFR-M LOGU1207200PNFR-M LOGU1207240PNFR-M LOGU1207300PNFR-M LOGU1207320PNFR-M	L162 L165
WJX09 NEW 	JOMU090512ZZER-L JOMU090512ZZER-M JOMU090512ZZER-R	L242
WJX14 	NEW JOMU140715ZZER-L JOMU140715ZZER-M NEW JOMU140715ZZER-R	L250

Cutter Type Shape	Order Number	Page
WSF406W NEW 	SNMU1206C05ZNER-M	L084
NEW 	WNGU1206ZNER5C-M	L084
WSX445 	SNGU140812ANFR-L SNGU140812ANER-L SNGU140812ANER-M SNMU140812ANER-M SNMU140812ANER-R SNMU140812ANER-H SNGU140812ANFL-L SNGU140812ANEL-L SNGU140812ANEL-M SNMU140812ANEL-M SNMU140812ANEL-R	L040
	WNGU1406ANEN8C-M	L040
WWX400 NEW 	6NGU1409040PNER-L 6NGU1409080PNER-L 6NGU1409040PNFR-L 6NGU1409080PNFR-L 6NGU1409040PNER-M 6NGU1409080PNER-M 6NMU1409040PNER-M 6NMU1409080PNER-M 6NMU1409080PNER-R	L100

Cutter Type Shape	Order Number	Page
WWX400 NEW 	2NGU1406ZNER6C-M	L100
Corner Angle 0° 11° Positive 	TPEN1603PPR TPEN2204PDR	L348
Corner Angle 15° 11° Positive 	SPEN1203EDR	L347
Negative 	SNMN120408 SNMN120412	L347
11° Positive 	TPMN160304 TPMN160308 TPMN160312 TPMN220404 TPMN220408 TPMN220412	L348

LIST OF CUTTING EDGE DIAMETER TOLERANCES

Cutter Type	Cutting Edge Diameter Tolerance (mm)
AJX	−0.1 −0.4
APX3000 Arbor Type	−0.1 −0.4
APX3000 Shank Type	−0.1 −0.2
APX3000 Long Cutting Edge Type	−0.1 −0.3
APX4000 Arbor Type	−0.1 −0.4
APX4000 Shank Type	−0.1 −0.2
APX4000 Long Cutting Edge Type	−0.1 −0.3
AQX	−0.1 −0.3
ARP Arbor Type	−0.1 −0.3
ARP Shank Type	−0.1 −0.2
ARX	−0.05 −0.15
ASPX	−0.1 −0.3
ASX400	0 −0.3
AXD4000 Arbor Type	−0.1 −0.4
AXD4000 Shank Type	−0.1 −0.2
AXD4000A	−0.2 −0.4
AXD7000 Arbor Type	−0.1 −0.4
AXD7000 Shank Type	−0.1 −0.2
BAP300	0 −0.3
BRP	−0.1 −0.3
BXD4000 Arbor Type	−0.1 −0.4
BXD4000 Shank Type	−0.1 −0.2
CBJP	0 −0.3
CBMP	0 −0.3
OCTACUT	0 −0.3
PMC	±0.05
PMF	0 −0.3
PMR	0 −0.3
SPX	−0.1 −0.3
SRF	0 −0.027
SRM	−0.05 −0.15
SUF	0 −0.02
TSMP	−0.1 −0.3
VAS300	0 −0.3
VFX5, VFX6 Shell Type	−0.1 −0.3
VOX400	−0.1 −0.4
VPX200,VPX300 Arbor Type	−0.1 −0.3
VPX200,VPX300 Shank Type	−0.1 −0.2
VPX200,VPX300 Long Cutting Edge Type	−0.1 −0.3
WJX	−0.1 −0.3
WSF406W	±0.1
WWX400	−0.1 −0.3

Note 1) Cutting edge diameter tolerance when the gauge insert is set.
Note 2) When setting the insert available, the insert tolerance is added to the above tolerance.
(Tolerance when setting the insert for SRF.)

MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER

Diameter (mm)	WSX445		ASX445		AOX445		ASX400		WSF406W		WJX14	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
40	19000	3.5	—	—	—	—	—	—	—	—	—	—
50	17000	3.5	18000	3.5	13000	8	18000	3.5	—	—	5000	5.0
52	—	—	—	—	—	—	—	—	—	—	5000	5.0
63	15000	3.5	16000	3.5	12000	8	16000	3.5	—	—	18200	5.0
66	—	—	—	—	—	—	—	—	—	—	17700	5.0
80	14000	3.5	14000	3.5	11000	8	14000	3.5	7800	6.0	15600	5.0
100	12000	3.5	13000	3.5	9300	8	13000	3.5	7000	6.0	13500	5.0
125	11000	3.5	12000	3.5	8300	8	12000	3.5	6250	6.0	11600	5.0
160	9500	3.5	10000	3.5	7200	8	10000	3.5	5500	6.0	9900	5.0
200	8500	3.5	9000	3.5	6400	8	9000	3.5	4900	6.0	—	—
250	7500	—	8000	3.5	—	—	8000	3.5	4400	6.0	—	—
315	6500	—	6500	3.5	—	—	—	—	—	—	—	—

Diameter (mm)	FMAX		NF10000		AHX440S		AHX475S		AHX640S		AHX640W	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
40	30000	—	—	—	21000	3.5	—	—	—	—	—	—
50	30000	3.5	—	—	19800	3.5	18300	3.5	—	—	—	—
63	27000	3.5	—	—	18300	3.5	17200	3.5	12000	5	—	—
80	24500	3.5	16000	8.5	16500	3.5	15700	3.5	10000	5	8900	6
100	22000	3.5	14000	8.5	14600	3.5	14000	3.5	8700	5	7800	6
125	19600	3.5	12000	8.5	12600	3.5	12200	3.5	7500	5	6600	6
160	—	—	—	—	10200	3.5	9900	3.5	6100	5	5300	6
200	—	—	—	—	—	—	—	—	5100	5	4100	6
250	—	—	—	—	—	—	—	—	—	—	2900	6
315	—	—	—	—	—	—	—	—	—	—	1700	6

Diameter (mm)	AXD4000		AXD7000		BXD4000		VPX200		VPX300		WJX09	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
16	—	—	—	—	—	—	37900	1.0	—	—	—	—
18	—	—	—	—	—	—	35300	1.0	—	—	—	—
20	15000	1.5	—	—	15000	4	33200	1.0	—	—	—	—
22	—	—	—	—	—	—	31400	1.0	—	—	—	—
25	49000	1.5	—	—	38000	4	29000	1.0	24100	3.0	33500	2.0
28	48500	1.5	—	—	—	—	27200	1.0	22500	3.0	30300	2.0
30	—	—	—	—	—	—	26000	1.0	21500	3.0	—	—
32	48000	1.5	41000	3.5	33000	4	25100	1.0	20600	3.0	27300	2.0
35	45000	1.5	—	—	31000	4	23800	1.0	19500	3.0	25500	2.0
40	41000	1.5	36000	3.5	29000	4	22000	1.0	17900	3.0	23200	2.0
50	35000	1.5	30000	3.5	24000	4	19200	1.0	15500	3.0	20000	2.0
52	—	—	—	—	—	—	—	—	—	—	19500	2.0
63	30000	1.5	25000	3.5	21000	4	16700	1.0	13400	3.0	17300	2.0
66	—	—	—	—	—	—	—	—	—	—	16800	2.0
80	27000	1.5	23000	3.5	19000	4	—	—	11500	3.0	—	—
100	23000	1.5	19000	3.5	16000	4	—	—	—	—	—	—
125	20000	1.5	16000	3.5	14000	4	—	—	—	—	—	—

Note 1) All values shown on this chart are based on the insert being properly seated in pocket and torqued to the recommended values.

FACE MILLING
<GENERAL CUTTING>

45° KAPR

WSX445

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



Fig.1

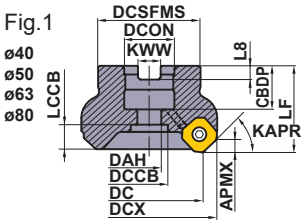
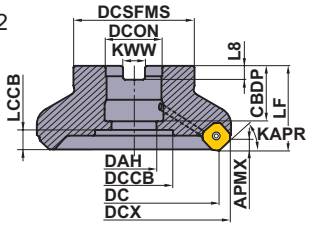


Fig.2



Right hand tool holder shown.

- Uniquely designed double-sided insert.
- Sudden fracture & welding prevention function.
- Highly efficient chip discharge.

■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
40	**WSX445-040A03AR**	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	**WSX445R08004CA**	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
80	**WSX445R08006CA**	●	○	6	Fine Pitch	92.9	50	25.4	1.2	5	1
80	**WSX445R08008CA**	●	○	8	Extra Fine Pitch	92.9	50	25.4	1.1	5	1
100	**WSX445R10005DA**	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
100	**WSX445R10007DA**	●	○	7	Fine Pitch	112.9	50	31.75	1.7	5	2
100	**WSX445R10010DA**	●	○	10	Extra Fine Pitch	112.9	50	31.75	1.6	5	2
125	**WSX445R12506EA**	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
125	**WSX445R12508EA**	●	○	8	Fine Pitch	137.9	63	38.1	3.1	5	2
125	**WSX445R12512EA**	●	○	12	Extra Fine Pitch	137.9	63	38.1	3.0	5	2
160	**WSX445R16007FA**	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
160	**WSX445R16010FA**	●	○	10	Fine Pitch	172.9	63	50.8	4.8	5	2
160	**WSX445R16016FA**	●	○	16	Extra Fine Pitch	172.8	63	50.8	4.6	5	2
200	**WSX445R20008KN**	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
200	**WSX445R20012KN**	●	–	12	Fine Pitch	212.9	63	47.625	8.6	5	3
200	**WSX445R20020KN**	●	–	20	Extra Fine Pitch	212.8	63	47.625	8.4	5	3
250	**WSX445R25010KN**	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3
250	**WSX445R25014KN**	●	–	14	Fine Pitch	262.9	63	47.625	13.2	5	3
315	**WSX445R31514PN**	●	–	14	Coarse Pitch	327.9	63	47.625	21.5	5	4

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-63.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-315.

SPARE PARTS

Arbor Type	 * Clamp Screw	 Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (N • m) : TPS4R=3.5

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

Fig.3

ø200
ø250

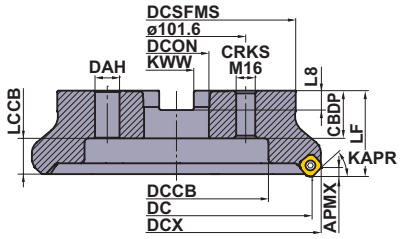
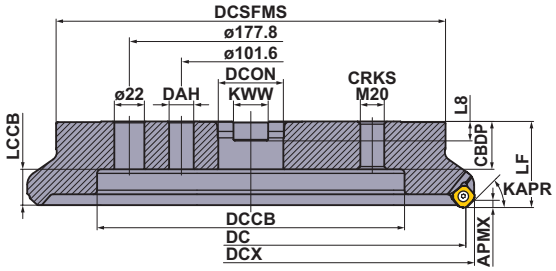


Fig.4

ø315



Right hand tool holder shown.

■Arbor Type Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
80	**WSX445L08004CA**	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
100	**WSX445L10005DA**	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
125	**WSX445L12506EA**	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
160	**WSX445L16007FA**	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
200	**WSX445L20008KN**	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
250	**WSX445L25010KN**	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-250.

SET BOLT (SOLD SEPARATELY)

Arbor Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
WSX445-040A○○AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1
WSX445-050A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-063A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-080A○○A○	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445-100B○○A○	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
WSX445-125B○○A○	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-160C○○N○	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-200C○○NR	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445-250C○○NR	—	—	1	24	M16×2	61–	16	14	–	–	Fig.2
WSX445-315C○○NR	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445○080○○CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445○100○○DA	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
WSX445○125○○EA	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445○160○○FA	MBA24045H	—	2	65	M24×3	59	14	17	10	37	
WSX445○200○○KN	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445○250○○KN	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445○315○○PN	—	—	1	30	M20×2.5	68–	20	17	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

ISO13399 ➤ L003
MOUNTING DIMENSION ➤ L046
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Metric Standard

The cutter bore diameter DCON is indicated in millimetres.



Fig.1

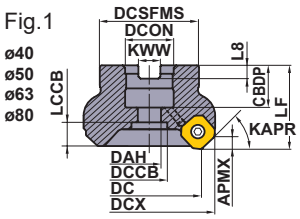
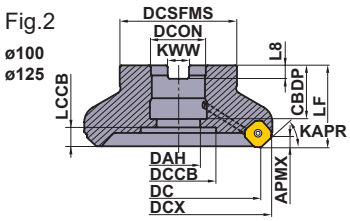


Fig.2



Right hand tool holder shown.

■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm) DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
40	**WSX445-040A03AR**	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	**WSX445-080A04AR**	●	○	4	Coarse Pitch	92.9	50	27	1.3	5	1
80	**WSX445-080A06AR**	●	○	6	Fine Pitch	92.9	50	27	1.2	5	1
80	**WSX445-080A08AR**	●	○	8	Extra Fine Pitch	92.9	50	27	1.1	5	1
100	**WSX445-100B05AR**	●	○	5	Coarse Pitch	112.9	50	32	1.9	5	2
100	**WSX445-100B07AR**	●	○	7	Fine Pitch	112.9	50	32	1.9	5	2
100	**WSX445-100B10AR**	●	○	10	Extra Fine Pitch	112.9	50	32	1.8	5	2
125	**WSX445-125B06AR**	●	○	6	Coarse Pitch	137.9	63	40	3.4	5	2
125	**WSX445-125B08AR**	●	○	8	Fine Pitch	137.9	63	40	3.4	5	2
125	**WSX445-125B12AR**	●	○	12	Extra Fine Pitch	137.9	63	40	3.2	5	2
160	**WSX445-160C07NR**	●	–	7	Coarse Pitch	172.9	63	40	4.9	5	3
160	**WSX445-160C10NR**	●	–	10	Fine Pitch	172.9	63	40	4.8	5	3
160	**WSX445-160C16NR**	●	–	16	Extra Fine Pitch	172.8	63	40	4.6	5	3
200	**WSX445-200C08NR**	●	–	8	Coarse Pitch	212.9	63	60	7.5	5	4
200	**WSX445-200C12NR**	●	–	12	Fine Pitch	212.9	63	60	7.4	5	4
200	**WSX445-200C20NR**	●	–	20	Extra Fine Pitch	212.8	63	60	7.2	5	4

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-100.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-200.

SPARE PARTS

Arbor Type	 * Clamp Screw	 Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (N • m) : TPS4R=3.5

● : **Inventory maintained in Japan.**

Fig.3
ø160

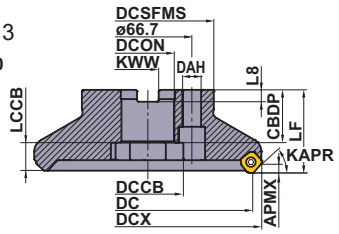
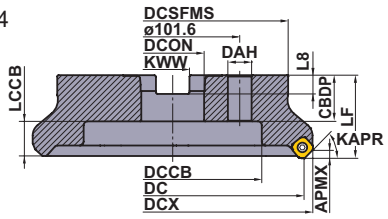


Fig.4
ø200



Right hand tool holder shown.

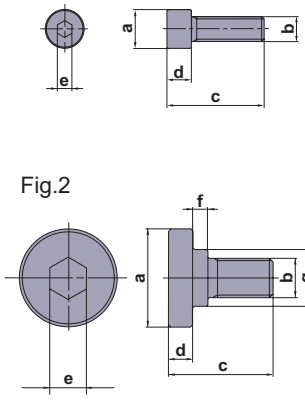
■Arbor Type Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm) DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
80	**WSX445-080A04AL**	●	○	4	Coarse Pitch	92.9	50	27	1.3	5	1
100	**WSX445-100B05AL**	●	○	5	Coarse Pitch	112.9	50	32	1.9	5	2
125	**WSX445-125B06AL**	●	○	6	Coarse Pitch	137.9	63	40	3.4	5	2
160	**WSX445-160C07NL**	●	–	7	Coarse Pitch	172.9	63	40	4.9	5	3

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-100.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-160.

SET BOLT (SOLD SEPARATELY)

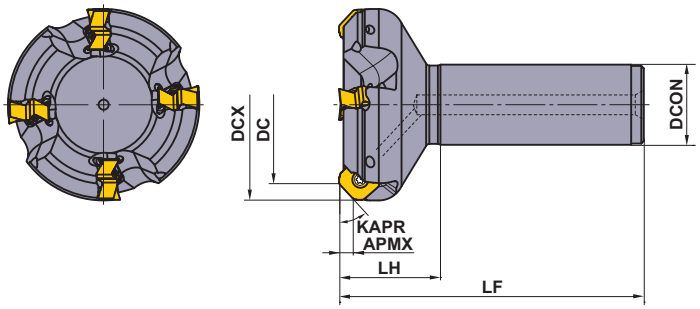
Arbor Type	Set Bolt: With Coolant Hole Order Number	Set Bolt: Without Coolant Hole Order Number	Fig.	Reference Dimensions (mm) a	b	c	d	e	f	g	Geometry
WSX445-040A○○AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1
WSX445-050A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-063A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-080A○○A○	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445-100B○○A○	MBA16033H	—	2	40	M16×2	43	10	14	6	23	Fig.2
WSX445-125B○○A○	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-160C○○N○	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-200C○○NR	—	—	1	24	M16×2	61–	16	14	–	–	



Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

ISO13399	➢ L003
MOUNTING DIMENSION	➢ L046
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001





Right hand tool holder only.

■SHANK TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)				WT (kg)	APMX (mm)
						DCX	LF	DCON	LH		
40	**WSX445R4003SA32M**	●	○	3	Coarse Pitch	52.8	125	32	40	0.8	5
40	**WSX445R4004SA32M**	●	○	4	Fine Pitch	52.8	125	32	40	0.8	5
50	**WSX445R5003SA32M**	●	○	3	Coarse Pitch	62.9	125	32	40	1.0	5
50	**WSX445R5004SA32M**	●	○	4	Fine Pitch	62.9	125	32	40	1.0	5
63	**WSX445R6304SA32M**	●	○	4	Coarse Pitch	75.9	125	32	40	1.2	5
63	**WSX445R6305SA32M**	●	○	5	Fine Pitch	75.9	125	32	40	1.2	5
80	**WSX445R8004SA32M**	●	○	4	Coarse Pitch	92.9	125	32	40	1.6	5
80	**WSX445R8006SA32M**	●	○	6	Fine Pitch	92.9	125	32	40	1.5	5

SPARE PARTS

Arbor Type	 *	
	Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (N • m) : TPS4R=3.5

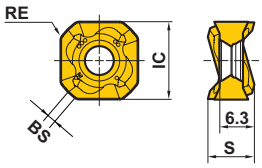
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS WITH BREAKER

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp

Shape	Order Number	Class	Hand	Edge Preparation	Coated									Cermet		Carbide		Dimensions (mm)				Geometry
					MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030		TF15		IC	S	BS	RE	
	**SNGU140812ANFR-L**	G	R	F												●		14	8.4	1.5	1.2	
	SNGU140812ANER-L	G	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNGU140812ANER-M	G	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNMU140812ANER-M	M	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNMU140812ANER-R	M	R	E	●	●	●					●	●					14	8.4	1.5	1.2	
	SNMU140812ANER-H	M	R	E	●	●	●					●	●					14	8.4	1.5	1.2	
	SNGU140812ANFL-L	G	L	F												●		14	8.4	1.5	1.2	
	SNGU140812ANEL-L	G	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNGU140812ANEL-M	G	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNMU140812ANEL-M	M	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNMU140812ANEL-R	M	L	E		●	●	●				●						14	8.4	1.5	1.2	

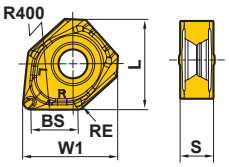
Right hand insert shown.

WIPER INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation : **E** : Round **F** : Sharp

Shape	Order Number	Class	Edge Preparation	Coated			Cermet		Dimensions (mm)					Geometry
				MC5020	MP6120	VP15TF	MX3020		L	W1	S	BS	RE	
	**WNGU1406ANEN8C-M**	G	E	●	●	●	●		16.87	16.87	6	8	1.0	

■Instructions for use of wiper inserts



Fig.1

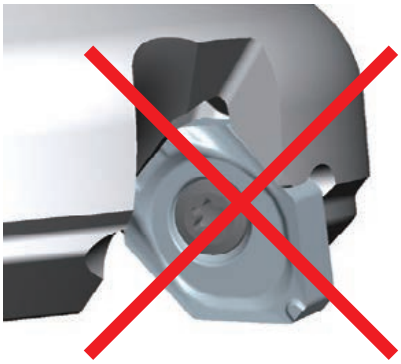


Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent finished surfaces can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

L
INDEXABLE MILLING
L045

Arbor Type Mounting Dimensions

Fig.1
ø40
ø50
ø63
ø80

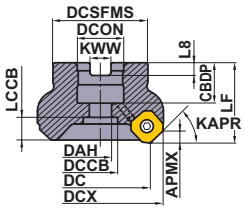


Fig.2
ø100
ø125
ø160

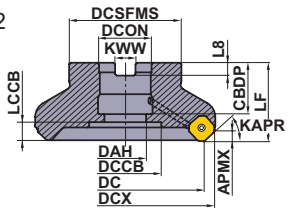
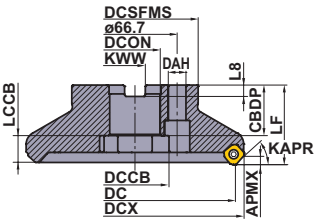


Fig.3
ø160



Right hand insert shown.

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
40	**WSX445-040A03AR**	16	18	9	14	13.3	37	8.4	5.6	1
40	**WSX445-040A04AR**	16	18	9	14	13.3	37	8.4	5.6	1
50	**WSX445-050A03AR**	22	20	11	17	11.3	47	10.4	6.3	1
50	**WSX445-050A04AR**	22	20	11	17	11.3	47	10.4	6.3	1
50	**WSX445-050A05AR**	22	20	11	17	11.3	47	10.4	6.3	1
63	**WSX445-063A04AR**	22	20	11	17	11.3	50	10.4	6.3	1
63	**WSX445-063A05AR**	22	20	11	17	11.3	50	10.4	6.3	1
63	**WSX445-063A06AR**	22	20	11	17	11.3	50	10.4	6.3	1
80	**WSX445R08004CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445R08006CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445R08008CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445L08004CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445-080A04AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A06AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A08AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A04AL**	27	23	13	20	14.3	56	12.4	7	1
100	**WSX445R10005DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445R10007DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445R10010DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445L10005DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445-100B05AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B07AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B10AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B05AL**	32	26	26	45	16.3	78	14.4	8	2
125	**WSX445R12506EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445R12508EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445R12512EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445L12506EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445-125B06AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B08AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B12AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B06AL**	40	28	30	56	21.3	89	16.4	9	2

Fig.4

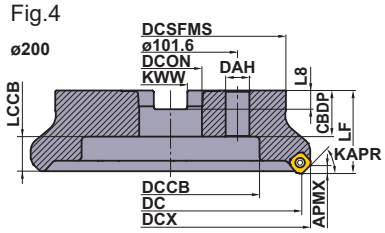


Fig.5

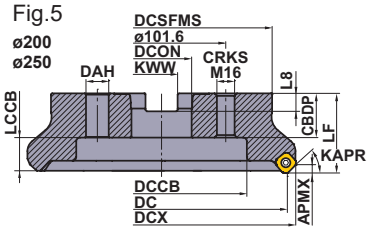
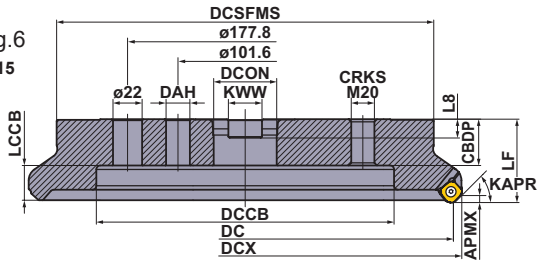


Fig.6



Right hand insert shown.

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
160	**WSX445-160C07NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C10NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C16NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C07NL**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445R16007FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445R16010FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445R16016FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445L16007FA**	50.8	38	40	72	16.3	100	19.1	11	2
200	**WSX445R20008KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445R20012KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445R20020KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445L20008KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445-200C08NR**	60	32	18	135	29.3	160	25.7	14.22	4
200	**WSX445-200C12NR**	60	32	18	135	29.3	160	25.7	14.22	4
200	**WSX445-200C20NR**	60	32	18	135	29.3	160	25.7	14.22	4
250	**WSX445R25010KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
250	**WSX445R25014KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
250	**WSX445L25010KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
315	**WSX445R31514PN**	47.625	35	18	225	26.3	285	25.4	14.22	6

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Workpiece Material		Hardness	1st Recommendation	2nd Recommendation	**vc** (m/min)	Finish Cutting	
						fz (mm/t)	**ap**
P						L Breaker	
	Mild Steel	≤ 180HB	MP6120	VP15TF	250 (200—300)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	240 (190—290)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	180 (130—230)	0.15 (0.1—0.2)	≤ 1.0
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	220 (170—270)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	220 (170—270)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Pre-Hardened Steel	35—45HRC	MP6120	VP15TF	140 (100—180)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	120 (90—150)	0.15 (0.1—0.2)	≤ 1.0
M						L Breaker	
	Austenitic Stainless Steel	≤ 200HB	MP7130	VP15TF	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	130 (100—180)	0.15 (0.1—0.2)	≤ 1.0
	Austenitic Stainless Steel	>200HB	MP7130	VP15TF	170 (120—220)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	170 (120—220)	0.15 (0.1—0.2)	≤ 1.0
	Two-phase Stainless Steel	≤ 280HB	MP7130	VP15TF	160 (110—210)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	160 (110—210)	0.15 (0.1—0.2)	≤ 1.0
	Precipitation-Hardening Stainless Steel	≤ 450HB	MP7130	VP15TF	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
K						L Breaker	
	Gray Cast Iron	Tensile Strength ≤ 350MPa	MC5020	—	220 (200—270)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	—	180 (130—250)	0.15 (0.1—0.2)	≤ 1.0
			VP20RT	—	170 (120—240)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 450MPa	MC5020	—	200 (180—250)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	VP20RT	160 (110—240)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 800MPa	MC5020	—	200 (180—250)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	—	160 (110—240)	0.15 (0.1—0.2)	≤ 1.0
			VP20RT	—	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
H						M Breaker	
	Hardened Steel	40—55HRC	VP15TF	—	50 (30—70)	0.05 (0.05—0.1)	≤ 1.0
	Hardened Steel	55—62HRC	VP15TF	—	40 (20—50)	0.05 (0.05—0.1)	≤ 1.0

Note 1) Refer to the table above and set the cutting conditions to match the application.
Note 2) Wet cutting is recommended, when focusing on the surface finish. (Tool life is lower than when dry cutting.)

(mm)

Feed per revolution by machining area **fz**(mm/t) and the depth of cut **ap**								
	Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
	fz (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	L,M Breaker		M Breaker					
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	—	—	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	M,R Breaker		R,H Breaker					
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Workpiece Material		Hardness	1st Recommendation	2nd Recommendation	**vc** (m/min)	Finish Cutting	
						fz (mm/t)	**ap**
P						L Breaker	
	Mild Steel	≤ 180HB	MP6120	VP15TF	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	120 (80—160)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	120 (80—160)	0.15 (0.1—0.2)	≤ 1.0
	Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	120 (80—160)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	120 (80—160)	0.15 (0.1—0.2)	≤ 1.0
	Pre-Hardened Steel	35—45HRC	MP6120	VP15TF	100 (80—120)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	100 (80—120)	0.15 (0.1—0.2)	≤ 1.0
M						L Breaker	
	Austenitic Stainless Steel	≤ 200HB	MP7130	VP15TF	130 (80—180)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	130 (80—180)	0.15 (0.1—0.2)	≤ 1.0
	Austenitic Stainless Steel	> 200HB	MP7130	VP15TF	100 (80—150)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	100 (80—150)	0.15 (0.1—0.2)	≤ 1.0
	Two-phase Stainless Steel	≤ 280HB	MP7130	VP15TF	100 (80—150)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	100 (80—150)	0.15 (0.1—0.2)	≤ 1.0
	Precipitation-Hardening Stainless Steel	< 450HB	MP7130	VP15TF	90 (50—140)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	90 (50—140)	0.15 (0.1—0.2)	≤ 1.0
K						L Breaker	
	Gray Cast Iron	Tensile Strength ≤ 350MPa	MC5020	—	180 (160—200)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	VP20RT	130 (100—160)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 450MPa	MC5020	—	180 (160—200)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	VP20RT	130 (100—160)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 800MPa	MC5020	—	180 (160—200)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	VP20RT	110 (80—140)	0.15 (0.1—0.2)	≤ 1.0
N						L Breaker	
	Aluminium Alloy	—	TF15	—	≥ 300	0.15 (0.1—0.2)	≤ 1.0
S						L Breaker	
	Titanium Alloy	—	MP9120	VP15TF	50 (40—60)	0.05 (0.05—0.1)	≤ 1.0
			MP9130	VP20RT	50 (40—60)	0.05 (0.05—0.1)	≤ 1.0
	Heat Resistant Alloy	—	MP9120	VP15TF	40 (20—50)	0.05 (0.05—0.1)	≤ 1.0
			MP9130	VP20RT	40 (20—50)	0.05 (0.05—0.1)	≤ 1.0

Note 1) Refer to the table above and set the cutting conditions to match the application.
Note 2) Wet cutting is recommended, when focusing on the surface finish. (Tool life is lower than when dry cutting.)

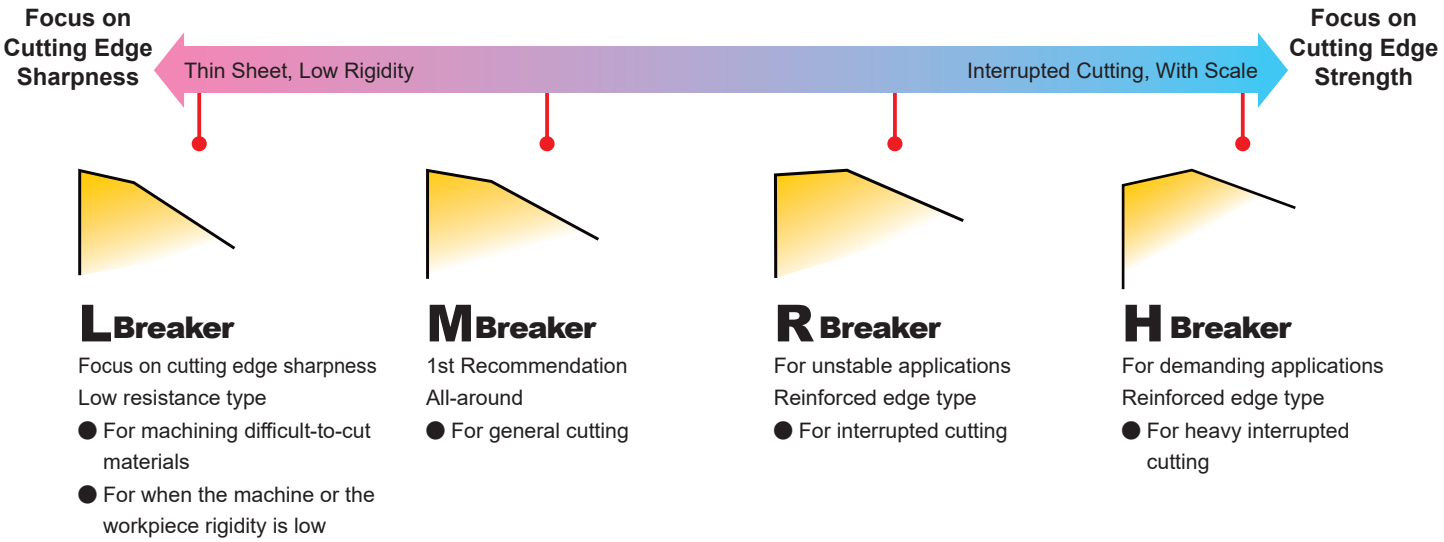
(mm)

Feed per revolution by machining area **fz**(mm/t) and the depth of cut **ap**

Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
fz (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**
L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
L,M Breaker		M Breaker					
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
L Breaker		L Breaker		L Breaker		L Breaker	
0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
L,M Breaker		M Breaker					
0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—

Breaker System

Breaker Series for Varied Cutting Conditions



L Breaker

Focus on cutting edge sharpness
Low resistance type

- For machining difficult-to-cut materials
- For when the machine or the workpiece rigidity is low

M Breaker

1st Recommendation
All-around

- For general cutting

R Breaker

For unstable applications
Reinforced edge type

- For interrupted cutting

H Breaker

For demanding applications
Reinforced edge type

- For heavy interrupted cutting

Workpiece Material	Cutting Conditions		
	Light Cutting	General Cutting	Heavy Cutting
P	L	M	R, H
M	L	M	
K	L	M	R, H
N	L		
S	L	M	
H	M	R	H

Memo

FACE MILLING
<GENERAL CUTTING>

45° KAPR

F R

ASX445

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



- Precision inexpensive moulded type 20°positive insert.
- Screw-on type.
- A wide range of chip breakers.
- High rigidity due to carbide shim.

Fig.1
ø50
ø63

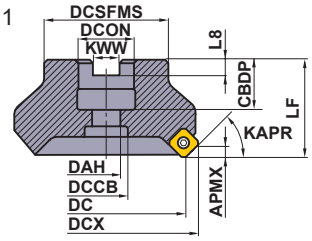


Fig.2
ø80
ø100
ø125
ø160

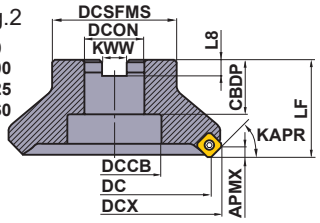


Fig.3
ø200
ø250

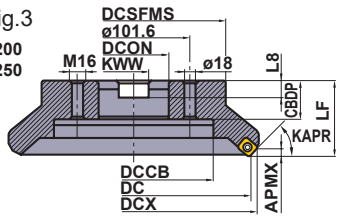
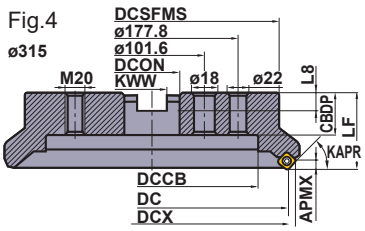


Fig.4
ø315



Right hand tool holder only.

■ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	APMX (mm)	Fig.
Coarse Pitch	ASX445-050A03R	●	3	50	63.0	40	22	20	11	17	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	17	50	10.4	6.3	0.7	6	1
	ASX445R08004C	●	4	80	93.2	50	25.4	26	—	38	56	9.5	6	1.1	6	2
	ASX445R10005D	●	5	100	113.2	50	31.75	32	—	45	70	12.7	8	1.8	6	2
	ASX445R12506E	●	6	125	138.0	63	38.1	35	—	60	80	15.9	10	2.9	6	2
	ASX445R16007F	●	7	160	173.0	63	50.8	38	—	80	100	19.1	11	4.7	6	2
	ASX445R20008K	●	8	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.9	6	3
	ASX445R25010K	●	10	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.9	6	3
	ASX445R31514P	●	14	315	327.9	63	47.625	40	—	245	285	25.4	14.22	22.4	6	4
Fine Pitch	ASX445-050A04R	●	4	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445R08006C	●	6	80	93.2	50	25.4	26	—	38	56	9.5	6	1.0	6	2
	ASX445R10007D	●	7	100	113.2	50	31.75	32	—	45	70	12.7	8	1.7	6	2
	ASX445R12508E	●	8	125	138.0	63	38.1	35	—	60	80	15.9	10	2.8	6	2
	ASX445R16010F	●	10	160	173.0	63	50.8	38	—	80	100	19.1	11	4.6	6	2
	ASX445R20012K	●	12	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.8	6	3
	ASX445R25014K	●	14	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.8	6	3
	ASX445R31518P	●	18	315	327.9	63	47.625	40	—	245	285	25.4	14.22	22.2	6	4
Extra Fine Pitch	ASX445-050A05R	●	5	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445R08008C	●	8	80	93.2	50	25.4	26	—	38	56	9.5	6	1.1	6	2
	ASX445R10010D	●	10	100	113.2	50	31.75	32	—	45	70	12.7	8	1.8	6	2
	ASX445R12512E	●	12	125	138.0	63	38.1	35	—	60	80	15.9	10	2.9	6	2
	ASX445R16016F	●	16	160	173.0	63	50.8	38	—	80	100	19.1	11	4.7	6	2
	ASX445R20020K	●	20	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.8	6	3
	ASX445R25024K	●	24	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.8	6	3
	ASX445R31528P	●	28	315	327.9	63	47.625	40	—	245	285	25.4	14.22	21.8	6	4

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.



ø50, ø63



Over ø80

Fig.1
ø50
ø63

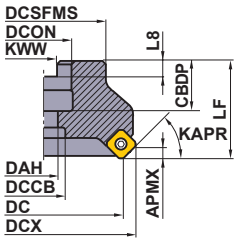


Fig.2
ø80
ø100

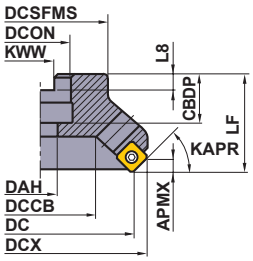


Fig.3
ø125

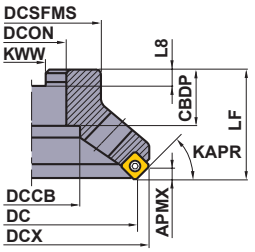


Fig.4
ø160

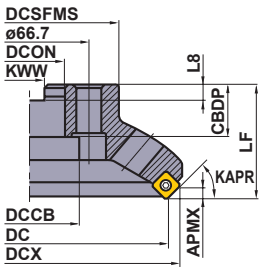
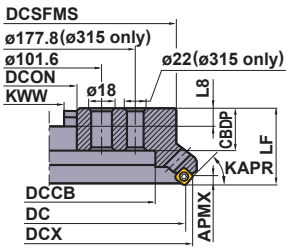


Fig.5
ø200
ø250
ø315



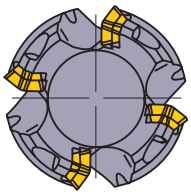
■ARBOR TYPE

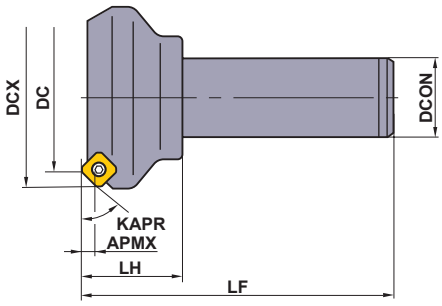
Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)										WT (kg)	APMX (mm)	Fig.
		R		DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	ASX445-050A03R	●	3	50	63.0	40	22	20	11	17	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	17	50	10.4	6.3	0.7	6	1
	ASX445-080A04R	●	4	80	93.2	50	27	23	13	37.84	56	12.4	7	1.0	6	2
	ASX445-100A05R	●	5	100	113.2	50	32	26	17	56.92	70	14.4	8	1.6	6	2
	ASX445-125B06R	●	6	125	138.0	63	40	32	—	56	80	16.4	9	2.4	6	3
	ASX445-160C07R	●	7	160	173.0	63	40	29	—	56	100	16.4	9	3.9	6	4
	ASX445-200C08R	●	8	200	212.9	63	60	32	—	135	155	25.7	14.22	6.7	6	5
	ASX445-250C10R	●	10	250	262.9	63	60	32	—	174	200	25.7	14.22	10.5	6	5
	ASX445-315C14R	●	14	315	327.9	80	60	57	—	256.8	285	25.7	14.22	22.4	6	5
Fine Pitch	ASX445-050A04R	●	4	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445-080A06R	●	6	80	93.2	50	27	23	13	37.84	56	12.4	7	0.9	6	2
	ASX445-100A07R	●	7	100	113.2	50	32	26	17	56.92	70	14.4	8	1.5	6	2
	ASX445-125B08R	●	8	125	138.0	63	40	32	—	56	80	16.4	9	2.3	6	3
	ASX445-160C10R	●	10	160	173.0	63	40	29	—	56	100	16.4	9	3.6	6	4
	ASX445-200C12R	●	12	200	212.9	63	60	32	—	135	155	25.7	14.22	5.8	6	5
	ASX445-250C14R	●	14	250	262.9	63	60	32	—	174	200	25.7	14.22	10.6	6	5
	ASX445-315C18R	●	18	315	327.9	80	60	57	—	256.8	285	25.7	14.22	22.2	6	5
Extra Fine Pitch	ASX445-050A05R	●	5	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445-080A08R	●	8	80	93.2	50	27	23	13	37.84	56	12.4	7	0.9	6	2
	ASX445-100A10R	●	10	100	113.2	50	32	26	17	56.92	70	14.4	8	1.5	6	2
	ASX445-125B12R	●	12	125	138.0	63	40	32	—	56	80	16.4	9	2.3	6	3
	ASX445-160C16R	●	16	160	173.0	63	40	29	—	56	100	16.4	9	3.6	6	4
	ASX445-200C20R	●	20	200	212.9	63	60	32	—	135	155	25.7	14.22	6.5	6	5
	ASX445-250C24R	●	24	250	262.9	63	60	32	—	174	200	25.7	14.22	10.3	6	5
	ASX445-315C28R	●	28	315	327.9	80	60	57	—	256.8	285	25.7	14.22	21.8	6	5

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



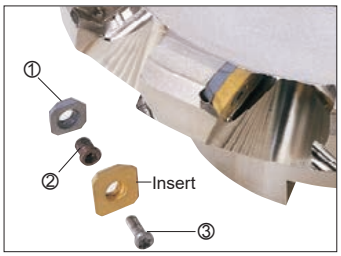




Right hand tool holder only.

■ SHANK TYPE

Order Number	Stock	Number of Teeth	Dimensions(mm)					APMX (mm)
	R		DC	DCX	LF	DCON	LH	
ASX445R503S32	●	3	50	63.0	125	32	40	6
ASX445R634S32	●	4	63	75.9	125	32	40	6
ASX445R804S32	●	4	80	93.2	125	32	40	6



SPARE PARTS

Tool Holder Number	①	② *	③ *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX445	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

Wrench	1. Wrench The ASX445 uses a TORXPLUS clamp screw. The attached wrench is for the exclusive use of this screw. To ensure the effectiveness of TORXPLUS only use the attached wrench. 2. Hexagonal wrench The attached hexagonal wrench is for use with the seat and the shim. The wrench size is 3.5mm.
Spare Parts	Only use the original parts that were supplied when purchased. If other parts are used the performance and safety can not be assured.

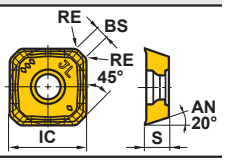
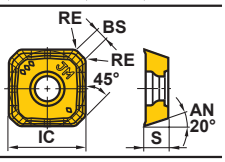
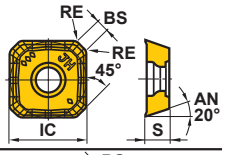
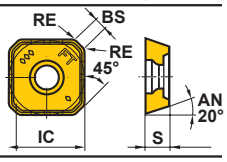
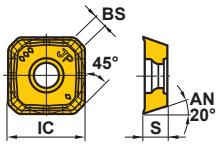
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp
S : Chamfer + Round **T** : Chamfer

Application	Shape	Order Number	Class	Edge Preparation	Coated										Cermet		Carbide		Dimensions(mm)				Geometry
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545		HTi10		IC	S	BS	RE	
Finish–Light Cutting	**JL** Breaker	**SEET13T3AGEN-JL**	E	E	●		●	●	●	●	●	●	●	●	●				13.4	3.97	1.9	1.5	
Light–Rough Cutting	**JM** Breaker	**SEMT13T3AGSN-JM**	M	S	●	●	●	●	●	●	●	●	●	●	●				13.4	3.97	1.9	1.5	
Medium–Heavy Cutting	**JH** Breaker	**SEMT13T3AGSN-JH**	M	S	●	●	●	●	●	●	●	●	●	●					13.4	3.97	1.9	1.5	
Roughing For Cast Iron	**FT** Breaker	**SEMT13T3AGSN-FT**	M	S		●													13.4	3.97	1.9	1.5	
For Aluminium Alloy	**JP** Breaker	**SEGT13T3AGFN-JP**	G	F													●		13.4	3.97	2.2	—	

■ Instructions for use of the JP breaker

Note1) The JP breaker has sharp cutting edges.
Wear gloves when handling.

Note2) When machining aluminium alloy, welding to the cutting edge tends to occur, often leading to insert failure.

Note3) Wet cutting is recommended.

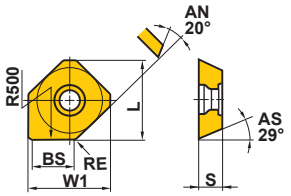
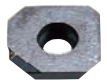
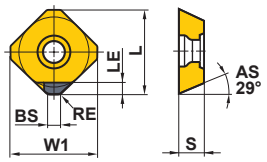
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

WIPER INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp
S : Chamfer + Round **T :** Chamfer

Shape	Order Number	Class	Edge Preparation	Coated		Cermet		Coated Cermet		Carbide		CBN		PCD		Dimensions(mm)						Geometry
				MC5020	VP15TF	NX2525		VP25N		HTi05T		MB710		MD220		L	LE	W1	S	BS	RE	
	**WEEW13T3AGER8C**	E	E	●	●					●						16.6	—	16.48	3.97	7.5	1.5	
	WEEW13T3AGTR8C	E	T			●		●								16.6	—	16.48	3.97	7.5	1.5	
	**WEEW13T3AGFR3C**	E	F											●		16.6	1.8	16.48	3.97	3.0	1.5	
	WEEW13T3AGTR3C	E	T									▲				16.6	1.8	16.48	3.97	3.0	1.5	

*Wiper inserts are single-cornered.
*CBN grade MB710 is for cast iron.
*PCD grade MD220 is for aluminium alloy.

■Instructions for use of wiper inserts



Fig.1



Fig.2

Note 1) These wiper inserts are single-cornered.
Note 2) Install the insert so that the cutting edge is located as shown in Fig. 1.
Do not install the wiper insert as shown in Fig. 2. (The insert may be damaged by a too heavy cutting load.)
Note 3) Recommended depth of cutting is ap=0.2-0.5(mm). (Be aware of the cutting load if the depth of cut is over the recommendation.)
Note 4) The major cutting edge of a wiper insert is set more inside than a general tooth.
This is to prevent heavy loads on the wiper insert. (To prevent fracture set the feed under 0.2 mm/t)
Note 5) Excellent finished surface can be obtained with one wiper insert.
Note 6) When the feed per revolution is larger than the width of the wiper edge, install 2 or more wiper inserts equally inside the cutting body.

RECOMMENDED CUTTING CONDITIONS WHEN USING A WIPER INSERT

Workpiece Material	Grade	Recommended Cutting Speed (m/min)
P	**VP25N**	200 (80—250)
	VP15TF	180 (80—250)
M	**VP15TF**	120—270
K	**MC5020**	130—250
	VP15TF	
	MB710	
S	**VP15TF**	20—50
H	**VP15TF**	40—80
N	**MD220**	650 (300—1000)

●Recommended depth of cut (ap) is 0.2mm-0.5mm and feed per tooth (fz) is up to 0.2mm/t.

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one CBN/PCD insert per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker
P	Mild Steel	≤180HB	**F7030**	280 (210—350)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 VP15TF	250 (200—300)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	240 (190—290)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	230 (180—280)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	180 (130—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	250 (200—300)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 VP15TF	220 (170—270)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	200 (150—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
		280—350HB	**F7030**	180 (130—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 VP15TF	140 (100—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	120 (90—150)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	100 (80—160)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	100 (80—160)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	220 (170—270)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP7140 VP30RT	200 (150—250)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	200 (150—250)	—	—	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH FT**
			VP15TF	180 (130—250)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
		Tensile Strength ≥450MPa	**MC5020**	110 (80—150)	—	—	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH FT**
N	Aluminium Alloy	—	**HTi10**	650 (300—1000)	0.15 (0.1—0.2)	**JP**	0.2 (0.1—0.3)	**JP**	0.3 (0.2—0.4)	**JP**
S	Titanium Alloy	—	**MP9120 VP15TF**	50 (40—60)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP9130	45 (30—55)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
	Heat Resistant Alloy (Inconel718 etc.)	—	**MP9120 VP15TF**	40 (20—50)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP9130	35 (15—45)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
H	Hardened Steel	40—55HRC	**VP15TF**	80 (60—100)	0.1 (0.05—0.15)	**JL**	0.15 (0.1—0.2)	**JM**	0.2 (0.1—0.3)	**JH**

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC) ●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

FACE MILLING
<GENERAL CUTTING>

AHX440S/475S/640S

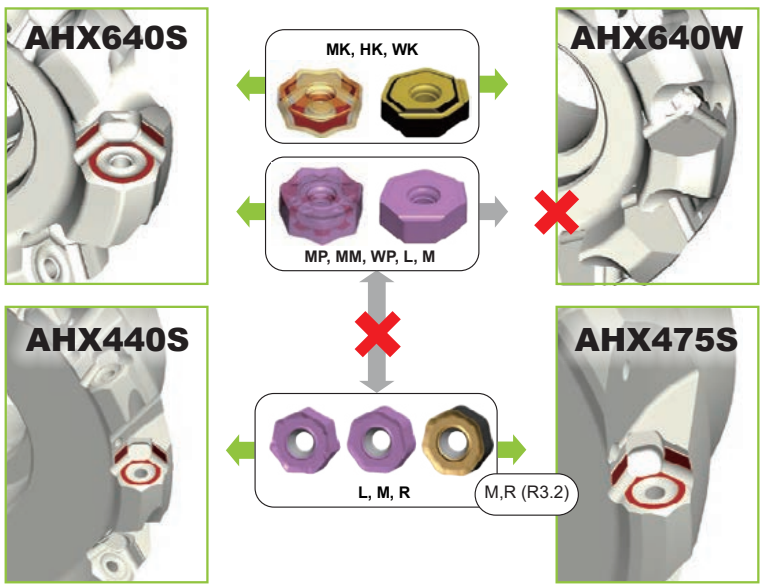
Selection Reference Table (Cutting Edge Count and Cutting Conditions)

DC	Type	Number of Teeth	AHX440S			AHX475S			AHX640S		
			General Cutting			High Feed Machining			General Cutting		
			Stock	fr (mm/rev)	APMX	Stock	fr (mm/rev)	APMX	Stock	fr (mm/rev)	APMX
40	Fine Pitch	3	●	0.6—1.2	3						
	Extra Fine Pitch	4	●	0.8—1.6	3						
50	Fine Pitch	4	●	0.8—1.6	3	●	2.4—4.0	1.6			
	Extra Fine Pitch	5	●	1.0—2.0	3	●	3.0—5.0	1.6			
	Super Extra Fine Pitch	6	●	1.2—2.4	3						
63	Coarse Pitch	4							●	0.8—1.6	6
	Fine Pitch	5	●	1.0—2.0	3	●	3.0—5.0	1.6	●	1.0—2.0	6
	Extra Fine Pitch	6	●	1.2—2.4	3	●	3.6—6.0	1.6			
	Super Extra Fine Pitch	8	●	1.6—3.2	3						
80	Coarse Pitch	4							●	0.8—1.6	6
	Fine Pitch	6	●	1.2—2.4	3	●	3.6—6.0	1.6	●	1.2—2.4	6
	Extra Fine Pitch	8	●	1.6—3.2	3	●	4.8—8.0	1.6			
	Super Extra Fine Pitch	10	●	2.0—4.0	3						
100	Coarse Pitch	5							●	1.0—2.0	6
	Fine Pitch	7	●	1.4—2.8	3	●	4.2—7.0	1.6	●	1.4—2.8	6
	Extra Fine Pitch	9				●	5.4—9.0	1.6			
		10	●	2.0—4.0	3						
	Super Extra Fine Pitch	12	●	2.4—4.8	3						
125	Coarse Pitch	6							●	1.2—2.4	6
	Fine Pitch	8	●	1.6—3.2	3	●	4.8—8.0	1.6	●	1.6—3.2	6
	Extra Fine Pitch	10				●	6.0—10.0	1.6			
		12	●	2.4—4.8	3						
	Super Extra Fine Pitch	14	●	2.8—5.6	3						
160	Coarse Pitch	7							●	1.4—2.8	6
	Fine Pitch	10	●	2.0—4.0	3	●	6.0—10.0	1.6	●	2.0—4.0	6
	Extra Fine Pitch	12				●	7.2—12.0	1.6			
		14	●	2.8—5.6	3						
	Super Extra Fine Pitch	16	●	3.2—6.4	3						
200	Coarse Pitch	8							●	1.6—3.2	6
	Fine Pitch	12							●	2.4—4.8	6

Note 1) fr : Feed rate per revolution (AHX475S : the feed rate per cutter (fz) will be limited by the cutting width ae. Please refer to page L069 for details.)
Note 2) APMX : Maximum depths of cut (AHX440S : the maximum depths of cut will vary depending on the breaker)
Note 3) The depths of cut and feed rate are identical to the recommended conditions for carbon steel and alloy steel.

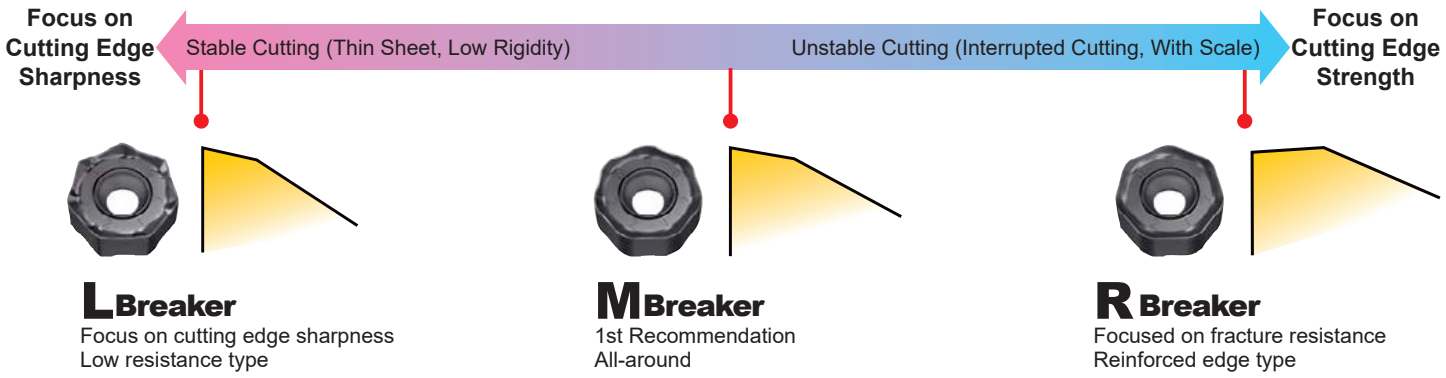
Compatibility with Inserts for AHX Series

The RE = 3.2 mm insert for use with AHX440S can be mounted on AHX475S.
All inserts for use with AHX640 can be mounted on AHX640S (note, however, that the set height will differ).
The inserts for mounting on AHX640W are the MK, HK, and WK breakers for casting.



Breaker System

Breaker Series for Varied Cutting Conditions



L Breaker
Focus on cutting edge sharpness
Low resistance type

M Breaker
1st Recommendation
All-around

R Breaker
Focused on fracture resistance
Reinforced edge type

Workpiece Material	Cutting Conditions		
	Stable Cutting	General Cutting	Unstable Cutting
P	AHX440S: L (With Wiper); M(R0.8) (With Wiper); M(R3.2) (Shared with AHX475); R (Shared with AHX475)		
	AHX640S: M; MP		
M	AHX440S: L (With Wiper); M(R0.8) (With Wiper); M(R3.2); R		
	AHX640S: MM		
K	AHX440S: L (With Wiper); M(R0.8) (With Wiper); M(R3.2) (Shared with AHX475); R (Shared with AHX475)		
	AHX640S: MK; HK		

Wiper Insert of AHX640S

Based on the number of inserts and the cutting conditions, use of wiper inserts can improve overall surface finishes.

P

WP + combination with **MP**
Right-hand 2 corners, left-hand 2 corners.



K

WK + combination with **MK**
Right-hand 2 corners, left-hand 2 corners.



FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX440S

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel



Fig. 1
ø40
ø50
ø63
ø80

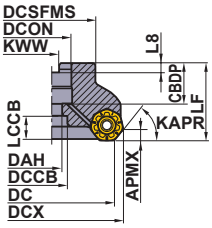


Fig. 2
ø100
ø125
ø160

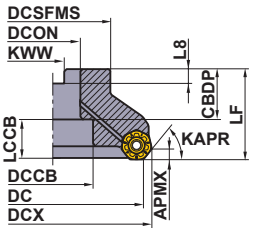
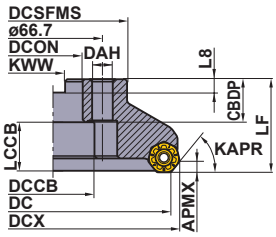


Fig. 3
ø160



Right hand tool holder only.

DCON = Inch size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
40	**AHX440S-040A03AR**	●	○	3	40	48.4	16	1	0.3	3
	AHX440S-040A04AR	●	○	4	40	48.4	16	1	0.2	3
50	**AHX440S-050A04AR**	●	○	4	40	58.4	22	1	0.4	3
	AHX440S-050A05AR	●	○	5	40	58.4	22	1	0.4	3
	AHX440S-050A06AR	●	○	6	40	58.4	22	1	0.4	3
63	**AHX440S-063A05AR**	●	○	5	40	71.4	22	1	0.6	3
	AHX440S-063A06AR	●	○	6	40	71.4	22	1	0.6	3
	AHX440S-063A08AR	●	○	8	40	71.4	22	1	0.5	3
80	**AHX440SR08006CA**	●	○	6	50	88.4	25.4	1	1.1	3
	AHX440SR08008CA	●	○	8	50	88.4	25.4	1	1.1	3
	AHX440SR08010CA	●	○	10	50	88.4	25.4	1	1.1	3
100	**AHX440SR10007DA**	●	○	7	50	108.4	31.75	2	1.6	3
	AHX440SR10010DA	●	○	10	50	108.4	31.75	2	1.6	3
	AHX440SR10012DA	●	○	12	50	108.3	31.75	2	1.6	3
125	**AHX440SR12508EA**	●	○	8	63	133.4	38.1	2	3.0	3
	AHX440SR12512EA	●	○	12	63	133.4	38.1	2	3.0	3
	AHX440SR12514EA	●	○	14	63	133.3	38.1	2	2.9	3
160	**AHX440SR16010FA**	●	○	10	63	168.4	50.8	2	4.8	3
	AHX440SR16014FA	●	○	14	63	168.4	50.8	2	4.6	3
	AHX440SR16016FA	●	○	16	63	168.4	50.8	2	4.7	3

Note 1) The cutter body does not have a set bolt for an arbor.
Note 2) The above "APMX" will vary depending on the breaker insert.

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench (Insert)
AHX440S	TS35R	TKY15T

* Clamp Torque (N • m) : TS35R=3.5

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

Metric Standard

DCON = mm size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
40	**AHX440S-040A03AR**	●	○	3	40	48.4	16	1	0.3	3
	AHX440S-040A04AR	●	○	4	40	48.4	16	1	0.2	3
50	**AHX440S-050A04AR**	●	○	4	40	58.4	22	1	0.4	3
	AHX440S-050A05AR	●	○	5	40	58.4	22	1	0.4	3
	AHX440S-050A06AR	●	○	6	40	58.4	22	1	0.4	3
63	**AHX440S-063A05AR**	●	○	5	40	71.4	22	1	0.6	3
	AHX440S-063A06AR	●	○	6	40	71.4	22	1	0.6	3
	AHX440S-063A08AR	●	○	8	40	71.4	22	1	0.5	3
80	**AHX440S-080A06AR**	●	○	6	50	88.4	27	1	1.1	3
	AHX440S-080A08AR	●	○	8	50	88.4	27	1	1.1	3
	AHX440S-080A10AR	●	○	10	50	88.4	27	1	1.1	3
100	**AHX440S-100B07AR**	●	○	7	50	108.4	32	2	1.6	3
	AHX440S-100B10AR	●	○	10	50	108.4	32	2	1.6	3
	AHX440S-100B12AR	●	○	12	50	108.3	32	2	1.6	3
125	**AHX440S-125B08AR**	●	○	8	63	133.4	40	2	3.0	3
	AHX440S-125B12AR	●	○	12	63	133.4	40	2	3.0	3
	AHX440S-125B14AR	●	○	14	63	133.3	40	2	2.9	3
160	**AHX440S-160C10NR**	●	–	10	63	168.4	40	3	4.8	3
	AHX440S-160C14NR	●	–	14	63	168.4	40	3	4.6	3
	AHX440S-160C16NR	●	–	16	63	168.4	40	3	4.7	3

Note 1) The cutter body does not have a set bolt for an arbor.Please refer to the table below,when ordering.
Note 2) The above "APMX" will vary depending on the breaker insert.

SET BOLT (SOLD SEPARATELY)

Tool Holder Number	Set Bolt: With Coolant Hole Order Number	Set Bolt: Without Coolant Hole Order Number	Fig.	Reference Dimensions (mm) a	b	c	d	e	f	g	Geometry
AHX440S-040A○○AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1
AHX440S-050A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX440S-063A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX440S-080A○○AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX440S-100B○○AR	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
AHX440S-125B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	Fig.2
AHX440S-160C○○NR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX440SR080○○CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX440SR100○○DA	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
AHX440SR125○○EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX440SR160○○FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

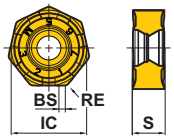
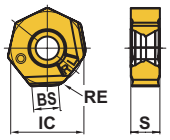
Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

ISO13399 ➤ L003
MOUNTING DIMENSION ➤ L077
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

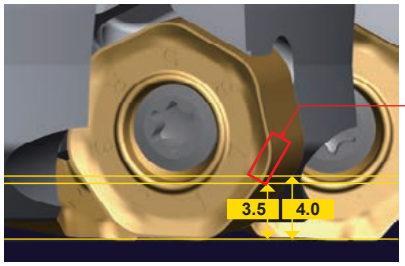
INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting
Edge Preparation :
E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated						Dimensions (mm)					Geometry
					MP6120	MP6130	MP7130	MP7140	MC5020	VP15TF	IC	RE	BS	S	APMX	
Stable Cutting		**NNMU130508ZER-L**	M	E	●	●	●	●	●	●	13.4	0.8	1	5.09	3	
General Cutting		**NNMU130508ZEN-M**	M	E	●	●	●	●	●	●	13.4	0.8	1	5.09	✱1 4	
		NNMU130532ZEN-M	M	E	●	●	●	●	●	●	13.4	3.2	—	5.09	✱1 4	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	●	●	●	13.4	3.2	—	5.09	✱1 4	
Finish Cutting	 Wiper	**WNEU1305ZEN4C-M**	E	E	●				●	●	13.4	2.7	4	5.09	0.5	

✱1 When not using the Wiper, APMX = 3.5mm



Corner R on Opposite Side

If using corner R on the opposite side, APMX = 4.0 mm
If not using the opposite corner, APMX = 3.5 mm

■Instructions for Use of Wiper Inserts

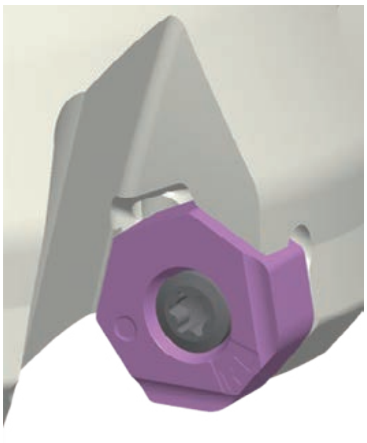


Fig.1



Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.
Note 2) Satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
P	Mild Steel	≤180HB	**MP6120,VP15TF**	250 (200－300)	0.3 (0.2－0.4)	≤3
			MP6130	240 (190－290)	0.3 (0.2－0.4)	≤3
	Carbon Steel,Alloy Steel	180－280HB	**MP6120,VP15TF**	220 (170－270)	0.3 (0.2－0.4)	≤3
			MP6130	200 (150－250)	0.3 (0.2－0.4)	≤3
	Carbon Steel,Alloy Steel	280－350HB	**MP6120,VP15TF**	140 (100－180)	0.3 (0.2－0.4)	≤3
			MP6130	120 (90－150)	0.3 (0.2－0.4)	≤3
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120,VP15TF**	140 (100－180)	0.15 (0.1－0.2)	≤1
			MP6130	120 (90－150)	0.15 (0.1－0.2)	≤1
	Pre-hardened Steel	35－45HRC	**MP6120,VP15TF**	140 (100－180)	0.15 (0.1－0.2)	≤1
			MP6130	120 (90－150)	0.15 (0.1－0.2)	≤1
M	Austenitic Stainless Steel	≤200HB	**MP7130,VP15TF**	200 (150－250)	0.2 (0.1－0.3)	≤3
			MP7140	180 (120－230)	0.2 (0.1－0.3)	≤3
		> 200HB	**MP7130,VP15TF**	150 (100－200)	0.2 (0.1－0.3)	≤3
			MP7140	130 (80－180)	0.2 (0.1－0.3)	≤3
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7130,VP15TF**	200 (150－250)	0.2 (0.1－0.3)	≤3
			MP7140	180 (120－230)	0.2 (0.1－0.3)	≤3
		> 200HB	**MP7130,VP15TF**	150 (100－200)	0.2 (0.1－0.3)	≤3
			MP7140	130 (80－180)	0.2 (0.1－0.3)	≤3
	Two-phase Stainless Steel	≤280HB	**MP7130,VP15TF**	140 (100－180)	0.15 (0.05－0.25)	≤3
			MP7140	120 (80－160)	0.15 (0.05－0.25)	≤3
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	130 (100－160)	0.15 (0.05－0.25)	≤3
			MP7140	110 (80－140)	0.15 (0.05－0.25)	≤3
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	220 (150－300)	0.3 (0.2－0.4)	≤3
			VP15TF	180 (130－230)	0.3 (0.2－0.4)	≤3
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	200 (150－250)	0.2 (0.1－0.3)	≤3
			VP15TF	170 (120－220)	0.2 (0.1－0.3)	≤3
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	170 (150－200)	0.2 (0.1－0.3)	≤3
			VP15TF	140 (100－180)	0.2 (0.1－0.3)	≤3
H	Hardened Steel	40－55HRC	**VP15TF**	80 (60－100)	0.15 (0.1－0.2)	≤1

■ Wet Cutting

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
M	Austenitic Stainless Steel	≤200HB	**MP7130,VP15TF**	125 (100－150)	0.15 (0.1－0.2)	≤3
			MP7140	100 (80－140)	0.15 (0.1－0.2)	≤3
		> 200HB	**MP7130,VP15TF**	100 (75－125)	0.15 (0.1－0.2)	≤3
			MP7140	80 (55－105)	0.15 (0.1－0.2)	≤3
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7130,VP15TF**	125 (100－150)	0.15 (0.1－0.2)	≤3
			MP7140	100 (80－140)	0.15 (0.1－0.2)	≤3
		> 200HB	**MP7130,VP15TF**	100 (75－125)	0.15 (0.1－0.2)	≤3
			MP7140	80 (55－105)	0.15 (0.1－0.2)	≤3
	Two-phase Stainless Steel	≤280HB	**MP7130,VP15TF**	80 (60－100)	0.1 (0.05－0.15)	≤3
			MP7140	60 (40－80)	0.1 (0.05－0.15)	≤3
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	70 (50－90)	0.1 (0.05－0.15)	≤3
			MP7140	50 (30－70)	0.1 (0.05－0.15)	≤3

RECOMMENDED CUTTING CONDITIONS

■ Cutting Conditions with Wiper Insert

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
P	Mild Steel	≤180HB	**MP6120,VP15TF**	250(200－300)	0.3(0.2－0.4)	≤0.5
	Carbon Steel,Alloy Steel	180－280HB	**MP6120,VP15TF**	220(170－270)	0.3(0.2－0.4)	≤0.5
		280－350HB	**MP6120,VP15TF**	140(100－180)	0.3(0.2－0.4)	≤0.5
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120,VP15TF**	140(100－180)	0.15(0.1－0.2)	≤0.5
	Pre-hardened Steel	35－45HRC	**MP6120,VP15TF**	140(100－180)	0.15(0.1－0.2)	≤0.5
M	Austenitic Stainless Steel	≤200HB	**VP15TF**	125(100－150)	0.15(0.1－0.2)	≤0.5
		> 200HB	**VP15TF**	100(75－125)	0.15(0.1－0.2)	≤0.5
	Ferritic and Maltensitic Stainless Steel	≤200HB	**VP15TF**	125(100－150)	0.15(0.1－0.2)	≤0.5
		> 200HB	**VP15TF**	100(75－125)	0.15(0.1－0.2)	≤0.5
	Two-phase Stainless Steel	≤280HB	**VP15TF**	80(60－100)	0.1(0.05－0.15)	≤0.5
	Precipitation-Hardening Stainless Steel	< 450HB	**VP15TF**	70(50－90)	0.1(0.05－0.15)	≤0.5
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	320(250－400)	0.3(0.2－0.4)	≤0.5
			VP15TF	220(150－300)	0.3(0.2－0.4)	≤0.5
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	250(200－300)	0.2(0.1－0.3)	≤0.5
			VP15TF	200(150－250)	0.2(0.1－0.3)	≤0.5
		Tensile Strength ≤800MPa	**MC5020**	220(200－250)	0.2(0.1－0.3)	≤0.5
			VP15TF	170(150－200)	0.2(0.1－0.3)	≤0.5
H	Hardened Steel	40－55HRC	**VP15TF**	80(60－100)	0.15(0.1－0.2)	≤0.5

Note 1) Refer to the table above and set up cutting conditions according to cutting applications.
Note 2) When placing emphasis on surface finish quality, wet cutting is recommended. (Tool life is lower when compared to dry cutting)
Note 3) The recommended depth of cut differs according to insert geometry.
Note 4) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.
Note 5) Recommended wet cutting for good surface finishing of stainless steel.

FACE MILLING
<HIGH FEED CUTTING>

15° KAPR

AHX475S

P	M	K	N	S	H
Steel		Cast Iron			Hardened Steel



Fig.1

ø50
ø63
ø80
ø100

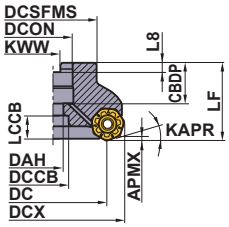
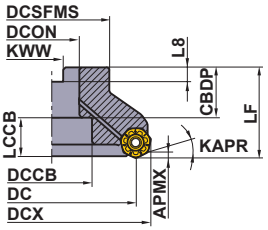


Fig.2

ø125
ø160



Right hand tool holder only.

DCON = Inch size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
50	AHX475S-050A04AR	●	○	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	●	○	5	50	65.7	22	1	0.6	1.6
63	AHX475S-063A05AR	●	○	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	●	○	6	50	78.7	22	1	1.0	1.6
80	AHX475SR08006DA	●	○	6	63	95.6	31.75	1	2.0	1.6
	AHX475SR08008DA	●	○	8	63	95.6	31.75	1	2.0	1.6
100	AHX475SR10007DA	●	○	7	63	115.6	31.75	1	3.2	1.6
	AHX475SR10009DA	●	○	9	63	115.6	31.75	1	3.2	1.6
125	AHX475SR12508EA	●	○	8	63	140.6	38.1	2	4.0	1.6
	AHX475SR12510EA	●	○	10	63	140.6	38.1	2	4.0	1.6
160	AHX475SR16010FA	●	○	10	63	175.6	50.8	2	5.5	1.6
	AHX475SR16012FA	●	○	12	63	175.6	50.8	2	5.5	1.6

Note 1) The cutter body does not have a set bolt for an arbor.

Metric Standard

DCON = mm size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
50	AHX475S-050A04AR	●	○	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	●	○	5	50	65.7	22	1	0.6	1.6
63	AHX475S-063A05AR	●	○	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	●	○	6	50	78.7	22	1	1.0	1.6
80	AHX475S-080A06AR	●	○	6	50	95.6	27	1	1.6	1.6
	AHX475S-080A08AR	●	○	8	50	95.6	27	1	1.6	1.6
100	AHX475S-100A07AR	●	○	7	63	115.6	32	1	3.3	1.6
	AHX475S-100A09AR	●	○	9	63	115.6	32	1	3.3	1.6
125	AHX475S-125B08AR	●	○	8	63	140.6	40	2	4.0	1.6
	AHX475S-125B10AR	●	○	10	63	140.6	40	2	4.0	1.6
160	AHX475S-160B10AR	●	○	10	63	175.6	40	2	6.0	1.6
	AHX475S-160B12AR	●	○	12	63	175.6	40	2	6.0	1.6

Note 1) The cutter body does not have a set bolt for an arbor.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399	➤ L003
MOUNTING DIMENSION	➤ L077
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench (Insert)
AHX475S	TS35R	TKY15T

* Clamp Torque (N • m) : TS35R=3.5

SET BOLT (SOLD SEPARATELY)

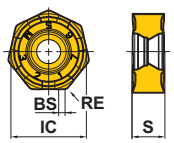
Tool Holder Number	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
AHX475S-050A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	Fig.1
AHX475S-063A○○AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX475S-080A○○AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX475S-100B○○AR	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475S-125B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	Fig.2
AHX475S-160B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR080○○DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR100○○DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR125○○EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR160○○FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

INSERTS

Workpiece Material		
P	Steel	
K	Cast Iron	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting
Edge Preparation : E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated				Dimensions (mm)					Geometry
					MP6120	MP6130	MC5020	VP15TF	IC	RE	BS	S	APMX	
General Cutting		**NNMU130532ZEN-M**	M	E	●	●	●	●	13.4	3.2	–	5.09	1.6	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	●	13.4	3.2	–	5.09	1.6	

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Workpiece Material	Hardness	Grade	Breaker	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**MP6120**	**R**	150(100－200)	0.6	≤1.6	≤0.5DC
			MP6120	**R**	150(100－200)	0.8	≤1.6	0.5－0.8DC
			MP6120	**M**	150(100－200)	1	≤1.6	0.8－1DC
			MP6130	**R**	130(80－180)	0.6	≤1.6	≤0.5DC
			MP6130	**R**	130(80－180)	0.8	≤1.6	0.5－0.8DC
			MP6130	**M**	130(80－180)	1	≤1.6	0.8－1DC
	Carbon Steel,Alloy Steel	180－280HB	**MP6120**	**R**	130(80－180)	0.6	≤1.6	≤0.5DC
			MP6120	**R**	130(80－180)	0.8	≤1.6	0.5－0.8DC
			MP6120	**M**	130(80－180)	1	≤1.6	0.8－1DC
			MP6130	**R**	110(60－160)	0.6	≤1.6	≤0.5DC
			MP6130	**R**	110(60－160)	0.8	≤1.6	0.5－0.8DC
			MP6130	**M**	110(60－160)	1	≤1.6	0.8－1DC
	Carbon Steel,Alloy Steel	280－350HB	**MP6120**	**R**	100(50－150)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(50－150)	0.6	≤1.6	0.5－0.8DC
			MP6120	**R**	100(50－150)	0.7	≤1.6	0.8－1DC
			MP6130	**R**	80(30－130)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(30－130)	0.6	≤1.6	0.5－0.8DC
			MP6130	**R**	80(30－130)	0.7	≤1.6	0.8－1DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**R**	100(50－150)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(50－150)	0.6	≤1.6	0.5－0.8DC
			MP6120	**R**	100(50－150)	0.7	≤1.6	0.8－1DC
			MP6130	**R**	80(30－120)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(30－120)	0.6	≤1.6	0.5－0.8DC
			MP6130	**R**	80(30－120)	0.7	≤1.6	0.8－1DC
	Pre-hardened Steel	35－45HRC	**MP6120**	**R**	100(70－130)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(70－130)	0.6	≤1.6	0.5－0.8DC
			MP6120	**R**	100(70－130)	0.7	≤1.6	0.8－1DC
			MP6130	**R**	80(50－110)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(50－110)	0.6	≤1.6	0.5－0.8DC
			MP6130	**R**	80(50－110)	0.7	≤1.6	0.8－1DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**R**	150(100－200)	0.6	≤1.6	≤0.5DC
			MC5020	**R**	150(100－200)	0.8	≤1.6	0.5－0.8DC
			MC5020	**M**	150(100－200)	1	≤1.6	0.8－1DC
			VP15TF	**M**	120(80－160)	0.6	≤1.6	≤0.5DC
			VP15TF	**M**	120(80－160)	0.8	≤1.6	0.5－0.8DC
			VP15TF	**M**	120(80－160)	1	≤1.6	0.8－1DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**R**	150(100－200)	0.6	≤1.6	≤0.5DC
			MC5020	**R**	150(100－200)	0.8	≤1.6	0.5－0.8DC
			MC5020	**M**	150(100－200)	1	≤1.6	0.8－1DC
			VP15TF	**R**	120(80－160)	0.6	≤1.6	≤0.5DC
			VP15TF	**R**	120(80－160)	0.8	≤1.6	0.5－0.8DC
			VP15TF	**M**	120(80－160)	1	≤1.6	0.8－1DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**R**	150(100－200)	0.5	≤1.6	≤0.5DC
			MC5020	**R**	150(100－200)	0.6	≤1.6	0.5－0.8DC
			MC5020	**R**	150(100－200)	0.7	≤1.6	0.8－1DC
			VP15TF	**R**	120(80－160)	0.5	≤1.6	≤0.5DC
			VP15TF	**R**	120(80－160)	0.6	≤1.6	0.5－0.8DC
			VP15TF	**R**	120(80－160)	0.7	≤1.6	0.8－1DC
H	Hardened Steel	40－55HRC	**VP15TF**	**R**	70(50－90)	0.4	≤1.6	≤0.5DC
			VP15TF	**R**	70(50－90)	0.5	≤1.6	0.5－0.8DC
			VP15TF	**R**	70(50－90)	0.6	≤1.6	0.8－1DC

Note 1) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Memo

FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX640S

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



Fig. 1
ø63
ø80

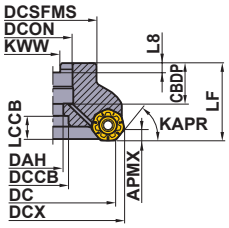


Fig. 2
ø100
ø125
ø160

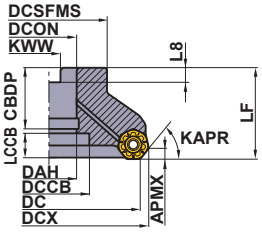
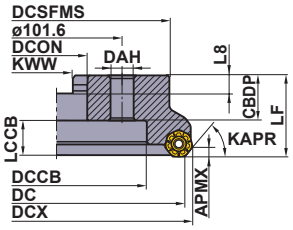
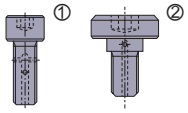


Fig. 3
ø200



Right hand tool holder only.

DC(mm)	Set Bolt		Geometry
ϕ63	HSC10030H	①	
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	MBA24045H		
ϕ200	—	—	With Coolant Hole

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
63	AHX640S-063A04AR	●	○	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	●	○	5	50	75.55	22	1	0.6	6
80	AHX640SR08004CA	●	○	4	50	92.55	25.4	1	1.1	6
	AHX640SR08006CA	●	○	6	50	92.55	25.4	1	1.0	6
100	AHX640SR10005DA	●	○	5	50	112.55	31.75	2	1.7	6
	AHX640SR10007DA	●	○	7	50	112.55	31.75	2	1.5	6
125	AHX640SR12506EA	●	○	6	63	137.55	38.1	2	3.0	6
	AHX640SR12508EA	●	○	8	63	137.55	38.1	2	2.9	6
160	AHX640SR16007FA	●	○	7	63	172.55	50.8	2	4.9	6
	AHX640SR16010FA	●	○	10	63	172.55	50.8	2	4.7	6
200	AHX640SR20008KN	●	–	8	63	212.55	47.625	3	8.2	6
	AHX640SR20012KN	●	–	12	63	212.55	47.625	3	7.9	6

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399	➤ L003
MOUNTING DIMENSION	➤ L077
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001



Fig. 1
ø63
ø80

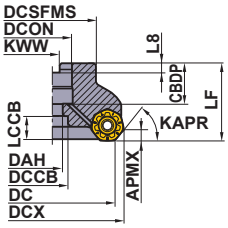


Fig. 2
ø100
ø125

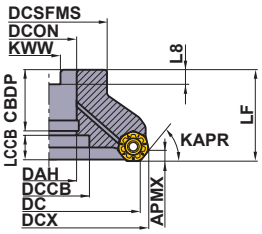


Fig. 3
ø160

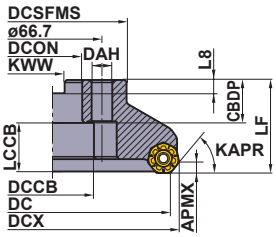
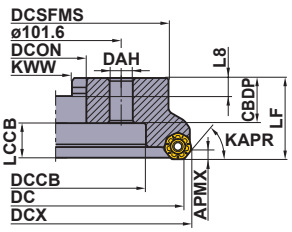
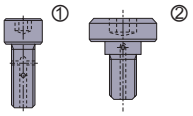


Fig. 4
ø200



Right hand tool holder only.

DC(mm)	Set Bolt		Geometry
ϕ63	HSC10030H	①	
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	—	—	
ϕ200	—	—	With Coolant Hole

Metric Standard

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
63	**AHX640S-063A04AR**	●	○	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	●	○	5	50	75.55	22	1	0.6	6
80	**AHX640S-080A04AR**	●	○	4	50	92.55	27	1	1.1	6
	AHX640S-080A06AR	●	○	6	50	92.55	27	1	1.0	6
100	**AHX640S-100B05AR**	●	○	5	50	112.55	32	2	1.7	6
	AHX640S-100B07AR	●	○	7	50	112.55	32	2	1.6	6
125	**AHX640S-125B06AR**	●	○	6	63	137.55	40	2	3.1	6
	AHX640S-125B08AR	●	○	8	63	137.55	40	2	3.0	6
160	**AHX640S-160C07NR**	●	–	7	63	172.55	40	3	5.4	6
	AHX640S-160C10NR	●	–	10	63	172.55	40	3	5.2	6
200	**AHX640S-200C08NR**	●	–	8	63	212.55	60	4	7.8	6
	AHX640S-200C12NR	●	–	12	63	212.55	60	4	7.5	6

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench (Insert)
AHX640S	CS5015060T	TKY20T

* Clamp Torque (N • m) : CS5015060T=5.0

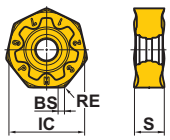
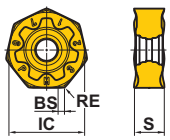
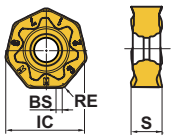
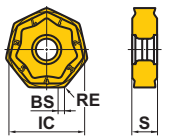
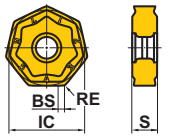
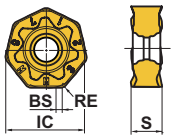
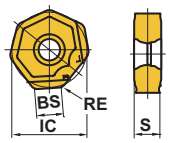
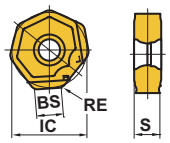
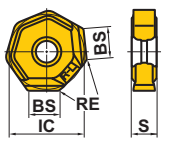
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			MP6120	MP6130	MP7030	MP9120	MP9130	MC5020	VP15TF	VP20RT
	P	Steel	●	✱					●	●
	M	Stainless Steel			◔				◔	◔
	K	Cast Iron						●	✱	✱
	N	Non-ferrous Metal								
	S	Heat resistant Alloy, Titanium Alloy			●	●	✱		●	●
	H	Hardened Steel							◔	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (mm)					Geometry
					MP6120	MP6130	MP7030	MP9120	MP9130	MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX	
For Steel General Cutting		**NNMU200708ZEN-M**	M	E	●	●							20	0.8	1	7.28	6	
For Steel General Cutting		**NNMU200708ZEN-MP**	M	E							●		20	0.8	1	7.28	6	
For Stainless Steel		**NNMU200712ZER-MM**	M	E			●						20	1.2	1	7.28	6	
For Cast Iron General Cutting		**NNMU200608ZEN-MK**	M	E						●	●	●	20	0.8	1	6.1	6	
For Cast Iron Strong Cutting Edge Type		**NNMU200608ZEN-HK**	M	E						●	●	●	20	0.8	1	6.1	6	
For Titanium Alloy and Heat Resistant Alloy		**NNMU200712ZER-L**	M	E				●	●				20	1.2	1	7.24	6	
For Steel	 Wiper	**WNEU2007ZEN7C-M**	E	E	●								20	0.8	7.2	6.85	0.5	
General Cutting	 Wiper	**WNEU2007ZEN7C-WP**	E	E							●		20	0.8	7.1	6.85	0.5	
For Cast Iron	 Wiper	**WNEU2006ZEN7C-WK**	E	E						●			20	0.8	7.4	6.55	0.5	

Note 1) The height of cutter when setting MK, HK inserts are different from when setting MP, MM inserts.

ISO13399 ➤ L003
MOUNTING DIMENSION ➤ L077
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

■Instructions for Use of Wiper Iinserts

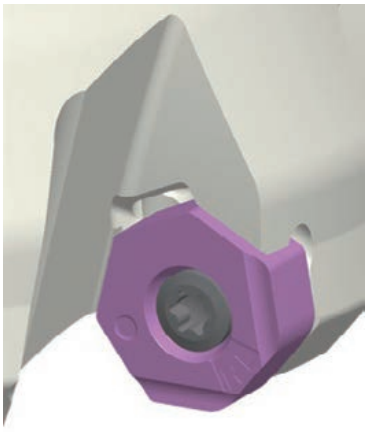


Fig.1



Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.
Note 2) Satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Workpiece Material	Hardness	Grade	Breaker	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**MP6120**	**M**	250(200－300)	0.3(0.2－0.4)	≤5	≤0.8DC
			VP15TF	**MP**	250(200－300)	0.3(0.2－0.4)	≤5	≤0.8DC
			MP6130	**M**	220(170－270)	0.4(0.3－0.5)	≤5	≤0.8DC
	Carbon Steel,Alloy Steel	180－280HB	**MP6120**	**M**	220(170－270)	0.3(0.2－0.4)	≤5	≤0.8DC
			VP15TF	**MP**	220(170－270)	0.3(0.2－0.4)	≤5	≤0.8DC
			MP6130	**M**	190(140－240)	0.4(0.3－0.5)	≤5	≤0.8DC
	Carbon Steel,Alloy Steel	280－350HB	**MP6120**	**M**	140(100－180)	0.3(0.2－0.4)	≤5	≤0.8DC
			VP15TF	**MP**	140(100－180)	0.3(0.2－0.4)	≤5	≤0.8DC
			MP6130	**M**	110(70－150)	0.4(0.3－0.5)	≤5	≤0.8DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**M**	140(100－180)	0.15(0.1－0.2)	≤3	≤0.8DC
			VP15TF	**MP**	140(100－180)	0.15(0.1－0.2)	≤3	≤0.8DC
			MP6130	**M**	110(70－150)	0.25(0.2－0.3)	≤3	≤0.8DC
	Pre-hardened Steel	35－45HRC	**MP6120**	**M**	140(100－180)	0.15(0.1－0.2)	≤3	≤0.8DC
			VP15TF	**MP**	140(100－180)	0.15(0.1－0.2)	≤5	≤0.8DC
			MP6130	**M**	110(70－150)	0.25(0.2－0.3)	≤3	≤0.8DC
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	200(150－250)	0.2(0.1－0.3)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	150(100－200)	0.2(0.1－0.3)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	140(100－180)	0.15(0.05－0.25)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	200(150－250)	0.2(0.1－0.3)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	150(100－200)	0.2(0.1－0.3)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	130(100－160)	0.15(0.05－0.25)	≤5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	220(150－300)	0.3(0.2－0.4)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	180(130－230)	0.3(0.2－0.4)	≤5	≤0.8DC
			VP15TF	**MP**	180(130－230)	0.3(0.2－0.4)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	200(150－250)	0.2(0.1－0.3)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	170(120－220)	0.2(0.1－0.3)	≤5	≤0.8DC
			VP15TF	**MP**	170(120－220)	0.2(0.1－0.3)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	170(150－200)	0.2(0.1－0.3)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	140(100－180)	0.2(0.1－0.3)	≤5	≤0.8DC
			VP15TF	**MP**	140(100－180)	0.2(0.1－0.3)	≤5	≤0.8DC
H	Hardened Steel	40－55HRC	**VP15TF**	**MP**	80(60－100)	0.15(0.1－0.2)	≤3	≤0.8DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) Wet cutting is recommended with internal coolant for titanium alloys and heat resistant alloys.
Note3) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

Wet Cutting

	Workpiece Material	Hardness	Breaker	Grade	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100−150)	0.15(0.1−0.2)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75−125)	0.15(0.1−0.2)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	80(60−100)	0.1(0.05−0.15)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100−150)	0.15(0.1−0.2)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75−125)	0.15(0.1−0.2)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	70(50−90)	0.1(0.05−0.15)	≤5	≤0.8DC
S	Titanium Alloy	–	**MP7030**	**MM**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		–	**MP9120**	**L**	60(50−70)	0.1(0.05−0.15)	≤3	≤0.6DC
		–	**MP9130**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
	Heat Resistant Alloy	–	**MP7030**	**MM**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		–	**MP9120**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		–	**MP9130**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) Wet cutting is recommended with internal coolant for titanium alloys and heat resistant alloys.
Note3) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

Cutting Conditions with Wiper Insert

	Workpiece Material	Hardness	Main Insert	Grade	Wiper Insert	Grade	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**VP15TF**	**MP**	**VP15TF**	**WP**	250(200−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	250(200−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	180−280HB	**VP15TF**	**MP**	**VP15TF**	**WP**	220(170−270)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	220(170−270)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	280−350HB	**VP15TF**	**MP**	**VP15TF**	**WP**	140(100−180)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	140(100−180)	0.3(0.2−0.4)	≤0.5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	320(250−400)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	220(150−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	250(200−300)	0.2(0.1−0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	200(150−250)	0.2(0.1−0.3)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	220(200−250)	0.2(0.1−0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	170(150−200)	0.2(0.1−0.3)	≤0.5	≤0.8DC
S	Heat Resistant Alloy	–	**VP15TF**	**MP**	**VP15TF**	**WP**	40(20−50)	0.15(0.1−0.2)	≤0.5	≤0.8DC
H	Hardened Steel	40−55HRC	**VP15TF**	**MP**	**VP15TF**	**WP**	80(60−100)	0.15(0.1−0.2)	≤0.5	≤0.8DC

Note 1) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.
Note 2) Please use a WP breaker in combination with a MP breaker, and a WK breaker with a MK/HK breaker.

AHX440S, AHX475S, AHX640S Mounting Dimensions

Fig. 1

ø40
ø50
ø63
ø80

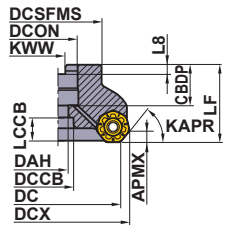


Fig. 2

ø100
ø125
ø160

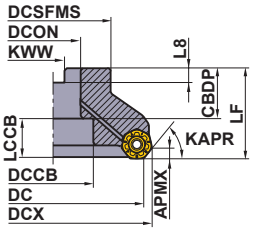
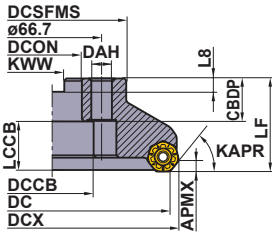


Fig. 3

ø160



Right hand tool holder only.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
16	40	**AHX440S-040A03AR**	18	9	14	13.9	37	8.4	5.6	1
16	40	**AHX440S-040A04AR**	18	9	14	13.9	37	8.4	5.6	1
22	50	**AHX440S-050A04AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A05AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A06AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX475S-050A04AR**	20	11	17	16.7	47	10.4	6.3	5
22	50	**AHX475S-050A05AR**	20	11	17	16.7	47	10.4	6.3	5
22	63	**AHX440S-063A05AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A06AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A08AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX475S-063A05AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX475S-063A06AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX640S-063A04AR**	20	11	17	16.2	50	10.4	6.3	1
22	63	**AHX640S-063A05AR**	20	11	17	16.2	50	10.4	6.3	1
25.4	80	**AHX440SR08006CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08008CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08010CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX640SR08004CA**	26	13	20	14.2	56	9.5	6	1
25.4	80	**AHX640SR08006CA**	26	13	20	14.2	56	9.5	6	1
27	80	**AHX440S-080A06AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A08AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A10AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX475S-080A06AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX475S-080A08AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX640S-080A04AR**	23	13	20	15.2	56	12.4	7	1
27	80	**AHX640S-080A06AR**	23	13	20	15.2	56	12.4	7	1
31.75	80	**AHX475SR08006DA**	32	17	26	19.7	76	12.7	8	5
31.75	80	**AHX475SR08008DA**	32	17	26	19.7	76	12.7	8	5
31.75	100	**AHX440SR10007DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10010DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10012DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX475SR10007DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX475SR10009DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX640SR10005DA**	35	—	45	13.2	70	12.7	8	2
31.75	100	**AHX640SR10007DA**	35	—	45	13.2	70	12.7	8	2

Fig. 4
ø200

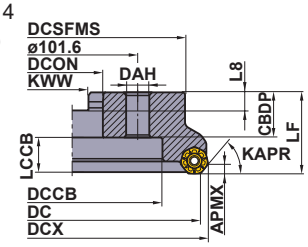


Fig.5
ø50
ø63
ø80
ø100

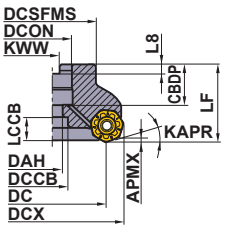
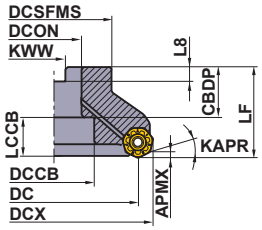


Fig.6
ø125
ø160



Right hand tool holder only.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
32	100	**AHX440S-100B07AR**	32	—	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B10AR**	32	—	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B12AR**	32	—	45	16.9	78	14.4	8	2
32	100	**AHX475S-100A07AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX475S-100A09AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX640S-100B05AR**	32	—	45	16.2	78	14.4	8	2
32	100	**AHX640S-100B07AR**	32	—	45	16.2	78	14.4	8	2
38.1	125	**AHX440SR12508EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12512EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12514EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX475SR12508EA**	42	—	56	19.7	100	15.9	10	6
38.1	125	**AHX475SR12510EA**	42	—	56	19.7	100	15.9	10	6
38.1	125	**AHX640SR12506EA**	42	—	56	19.2	80	15.9	10	2
38.1	125	**AHX640SR12508EA**	42	—	56	19.2	80	15.9	10	2
40	125	**AHX440S-125B08AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B12AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B14AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX475S-125B08AR**	40	—	56	21.7	100	16.4	9	6
40	125	**AHX475S-125B10AR**	40	—	56	21.7	100	16.4	9	6
40	125	**AHX640S-125B06AR**	42	—	56	19.2	89	16.4	9	2
40	125	**AHX640S-125B08AR**	42	—	56	19.2	89	16.4	9	2
40	160	**AHX440S-160C10NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C14NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C16NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX475S-160B10AR**	40	—	56	21.7	100	16.4	9	6
40	160	**AHX475S-160B12AR**	40	—	56	21.7	100	16.4	9	6
40	160	**AHX640S-160C07NR**	29	14	56	32.2	120	16.4	9	3
40	160	**AHX640S-160C10NR**	29	14	56	32.2	120	16.4	9	3
47.625	200	**AHX640SR20008KN**	35	18	140	26.2	175	25.4	14.22	4
47.625	200	**AHX640SR20012KN**	35	18	140	26.2	175	25.4	14.22	4
50.8	160	**AHX440SR16010FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16014FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16016FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX475SR16010FA**	45	—	72	16.7	100	19.1	11	6
50.8	160	**AHX475SR16012FA**	45	—	72	16.7	100	19.1	11	6
50.8	160	**AHX640SR16007FA**	43	—	72	18.2	100	19.1	11	2
50.8	160	**AHX640SR16010FA**	43	—	72	18.2	100	19.1	11	2
60	200	**AHX640S-200C08NR**	32	18	140	29.2	175	25.7	14.22	4
60	200	**AHX640S-200C12NR**	32	18	140	29.2	175	25.7	14.22	4

ISO13399 ➤ L003

FACE MILLING
<HIGH FEED CUTTING FOR CAST IRON>

50° KAPR

AHX640W

P | M | **K** | N | S | H

Cast Iron



Fig.1
ø80

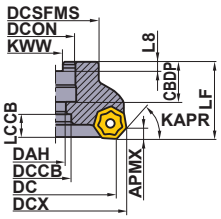


Fig.2
ø100
ø125
ø160

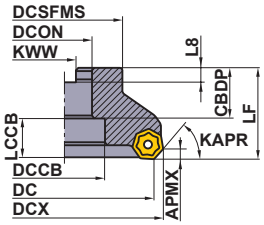


Fig.3
ø200
ø250

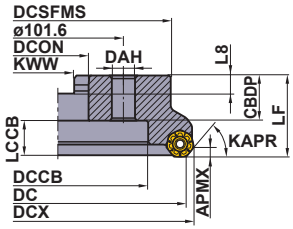
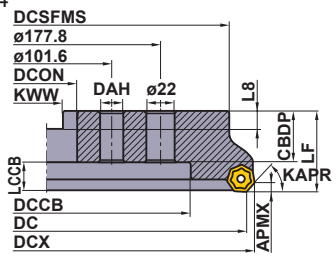


Fig.4
ø315



Right hand tool holder shown.

■ Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
80	**AHX640WR08008C**	●	–	8	50	92.6	25.4	1	1.5	6
	AHX640WR08010C	●	–	10	50	92.6	25.4	1	1.5	6
100	**AHX640WR10010D**	●	–	10	50	112.6	31.75	2	2.1	6
	AHX640WR10014D	●	–	14	50	112.6	31.75	2	2.1	6
125	**AHX640WR12512E**	●	–	12	63	137.6	38.1	2	3.5	6
	AHX640WR12518E	●	–	18	63	137.6	38.1	2	3.5	6
160	**AHX640WR16016F**	●	–	16	63	172.6	50.8	2	5.6	6
	AHX640WR16022F	●	–	22	63	172.6	50.8	2	5.6	6
200	**AHX640WR20020K**	●	–	20	63	212.6	47.625	3	9.0	6
	AHX640WR20028K	●	–	28	63	212.6	47.625	3	9.0	6
250	**AHX640WR25024K**	●	–	24	63	262.6	47.625	3	14.4	6
	AHX640WR25036K	●	–	36	63	262.6	47.625	3	14.4	6
315	**AHX640WR31528P**	●	–	28	63	327.6	47.625	4	23.8	6
	AHX640WR31544P	●	–	44	63	327.6	47.625	4	23.8	6

■ Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
80	**AHX640WL08008C**	●	–	8	50	92.6	25.4	1	1.5	6
	AHX640WL08010C	●	–	10	50	92.6	25.4	1	1.5	6
100	**AHX640WL10010D**	●	–	10	50	112.6	31.75	2	2.1	6
	AHX640WL10014D	●	–	14	50	112.6	31.75	2	2.1	6
125	**AHX640WL12512E**	●	–	12	63	137.6	38.1	2	3.5	6
	AHX640WL12518E	●	–	18	63	137.6	38.1	2	3.5	6
160	**AHX640WL16016F**	●	–	16	63	172.6	50.8	2	5.6	6
	AHX640WL16022F	●	–	22	63	172.6	50.8	2	5.6	6
200	**AHX640WL20020K**	●	–	20	63	212.6	47.625	3	9.0	6
	AHX640WL20028K	●	–	28	63	212.6	47.625	3	9.0	6
250	**AHX640WL25024K**	●	–	24	63	262.6	47.625	3	14.4	6
	AHX640WL25036K	●	–	36	63	262.6	47.625	3	14.4	6
315	**AHX640WL31528P**	●	–	28	63	327.6	47.625	4	23.8	6
	AHX640WL31544P	●	–	44	63	327.6	47.625	4	23.8	6

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399	➤ L003
MOUNTING DIMENSION	➤ L082
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001



Fig.1 ø80

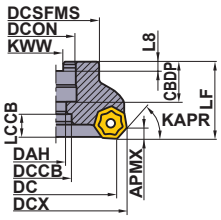


Fig.2 ø100 ø125

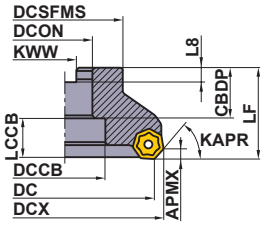


Fig.3 ø160

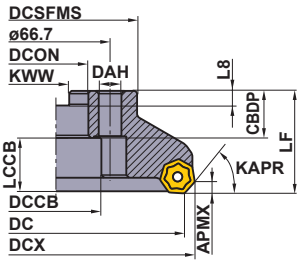


Fig.4 ø200 ø250

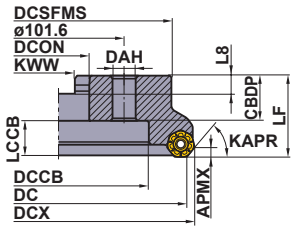
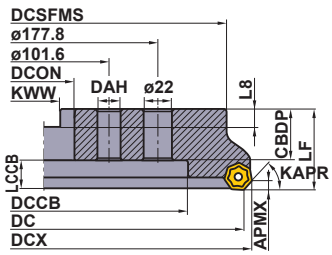


Fig.5 ø315



Metric Standard

Right hand tool holder shown.

■ Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
80	**AHX640W-080A08R**	●	–	8	50	92.6	27	1	1.5	6
	AHX640W-080A10R	●	–	10	50	92.6	27	1	1.5	6
100	**AHX640W-100B10R**	●	–	10	50	112.6	32	2	2.1	6
	AHX640W-100B14R	●	–	14	50	112.6	32	2	2.1	6
125	**AHX640W-125B12R**	●	–	12	63	137.6	40	2	3.1	6
	AHX640W-125B18R	●	–	18	63	137.6	40	2	3.1	6
160	**AHX640W-160C16R**	●	–	16	63	172.6	40	3	5.6	6
	AHX640W-160C22R	●	–	22	63	172.6	40	3	5.6	6
200	**AHX640W-200C20R**	●	–	20	63	212.6	60	4	8	6
	AHX640W-200C28R	●	–	28	63	212.6	60	4	8	6
250	**AHX640W-250C24R**	●	–	24	63	262.6	60	4	12.6	6
	AHX640W-250C36R	●	–	36	63	262.6	60	4	12.6	6
315	**AHX640W-315C28R**	●	–	28	80	327.6	60	5	31.5	6
	AHX640W-315C44R	●	–	44	80	327.6	60	5	31.5	6

■ Left Hand Tool Holder

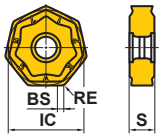
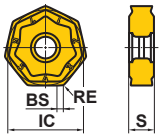
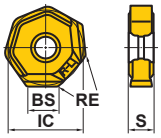
DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	DCX	DCON	Fig.	WT (kg)	APMX (mm)
80	**AHX640W-080A08L**	●	–	8	50	92.6	27	1	1.5	6
	AHX640W-080A10L	●	–	10	50	92.6	27	1	1.5	6
100	**AHX640W-100B10L**	●	–	10	50	112.6	32	2	2.1	6
	AHX640W-100B14L	●	–	14	50	112.6	32	2	2.1	6
125	**AHX640W-125B12L**	●	–	12	63	137.6	40	2	3.1	6
	AHX640W-125B18L	●	–	18	63	137.6	40	2	3.1	6
160	**AHX640W-160C16L**	●	–	16	63	172.6	40	3	5.6	6
	AHX640W-160C22L	●	–	22	63	172.6	40	3	5.6	6
200	**AHX640W-200C20L**	●	–	20	63	212.6	60	4	8.0	6
	AHX640W-200C28L	●	–	28	63	212.6	60	4	8.0	6
250	**AHX640W-250C24L**	●	–	24	63	262.6	60	4	12.6	6
	AHX640W-250C36L	●	–	36	63	262.6	60	4	12.6	6
315	**AHX640W-315C28L**	●	–	28	80	327.6	60	5	31.5	6
	AHX640W-315C44L	●	–	44	80	327.6	60	5	31.5	6

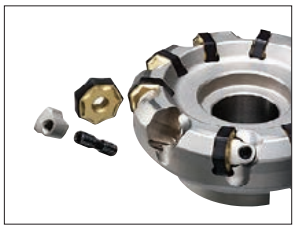
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material	K	Cast Iron

Cutting Conditions (Guide) : ● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting
Edge Preparation : **E** : Round

Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated VP15TF	Coated VP20RT	Dimensions(mm) IC	RE	BS	S	APMX	Geometry
 General Cutting	**NNMU200608ZEN-MK**	M	E	●	●	●	20	0.8	1.0	6.1	6	
 Strong Cutting Edge Type	**NNMU200608ZEN-HK**	M	E	●	●	●	20	0.8	1.0	6.1	6	
 Wiper	**WNEU2006ZEN7C-WK**	E	E	●			20	0.8	7.4	6.55	0.5	



SPARE PARTS

Tool Holder Number	 Wedge	 * Clamp Screw	 Wrench
AHX640W	CWAHX640WN	LS0622T	TKY15T

* Clamp Torque (N • m) : LS0622T=6.0

RECOMMENDED CUTTING CONDITIONS

■ Dry·Wet Cutting

Workpiece Material		Tensile Strength	Grade	vc (m/min)	fz (mm/t)
K	Gray Cast Iron	≤350MPa	**MC5020**	220 (150—300)	0.3 (0.2—0.4)
			VP15TF VP20RT	180 (130—250)	0.3 (0.2—0.4)
	Ductile Cast Iron	≤450MPa	**MC5020**	200 (150—250)	0.2 (0.1—0.3)
			VP15TF VP20RT	170 (120—220)	0.2 (0.1—0.3)
		≤800MPa	**MC5020**	170 (150—200)	0.2 (0.1—0.3)
			VP15TF VP20RT	140 (100—180)	0.2 (0.1—0.3)

■ Finishing (Use of Wiper Inserts)

Workpiece Material		Grade	ap (mm)	vc (m/min)	fz (mm/t)
K	Gray Cast Iron	**MC5020**	<0.5	320 (250—400)	0.2 (0.1—0.3)
			0.5—3	270 (200—350)	
	Ductile Cast Iron		<0.5	270 (200—350)	
			0.5—3	220 (200—250)	

*Please use 2-3 wiper inserts if the feed per revolution is exceeds 6mm/rev.

Note 1) With reference to the above examples, adjust the cutting conditions according to the cutting environment.
Note 2) Tool life when wet cutting is short compared to dry cutting.

ISO13399	➤ L003
MOUNTING DIMENSION	➤ L082
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

AHX640W Mounting Dimensions

Fig.1

ø80

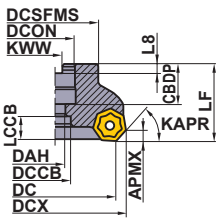
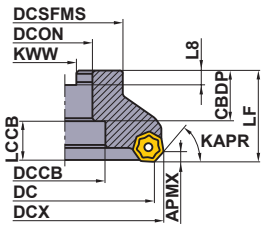


Fig.2

ø100
ø125
ø160



Right hand tool holder shown.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
25.4	80	**AHX640WL08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WL08010C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08010C**	26	13	20	14.8	56	9.5	6	1
27	80	**AHX640W-080A08L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A08R**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10R**	23	13	20	14.8	56	12.4	7	1
31.75	100	**AHX640WL10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WL10014D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10014D**	32	—	45	16.8	70	12.7	8	2
32	100	**AHX640W-100B10L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B10R**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14R**	32	—	45	16.8	70	14.4	8	2
38.1	125	**AHX640WL12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WL12518E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12518E**	35	—	56	26.8	80	15.9	10	2
40	125	**AHX640W-125B12L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B12R**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18R**	32	—	56	29.8	80	16.4	9	2
40	160	**AHX640W-160C16L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C16R**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22R**	29	14	56	32.8	100	16.4	9	3

Fig.3

ø160

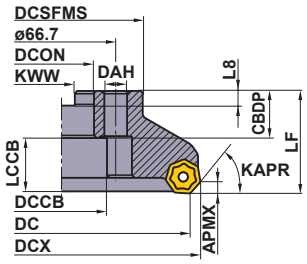


Fig.4

ø200
ø250

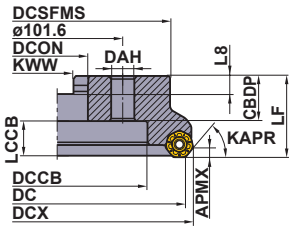
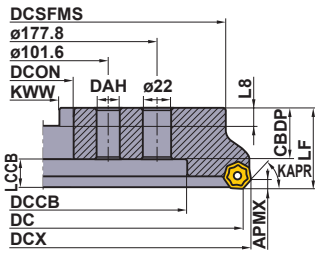


Fig.5

ø315



Right hand tool holder shown.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
47.625	200	**AHX640WL20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WL20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	250	**AHX640WL25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WL25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	315	**AHX640WL31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WL31544P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31544P**	40	18	225	21.8	285	25.4	14.22	5
50.8	160	**AHX640WL16016F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WL16022F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16016F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16022F**	38	—	72	23.8	100	19.1	11	2
60	200	**AHX640W-200C20L**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C20R**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C28L**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C28R**	32	18	135	29.8	155	25.7	14.22	4
60	250	**AHX640W-250C24L**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C24R**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C36L**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C36R**	32	18	180	29.8	200	25.7	14.22	4
60	315	**AHX640W-315C28L**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C28R**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C44L**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C44R**	57	18	225	21.8	285	25.7	14.22	5

FACE MILLING

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

84° KAPR

WSF406W NEW

P	M	K	N	S	H

Cast Iron



Fig. 1

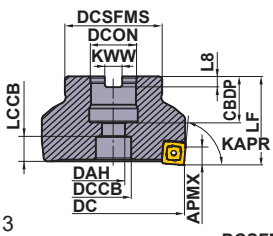


Fig. 2

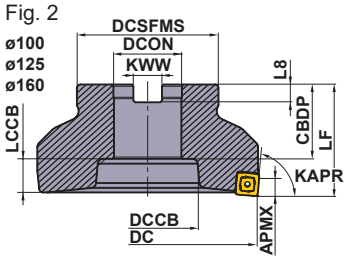
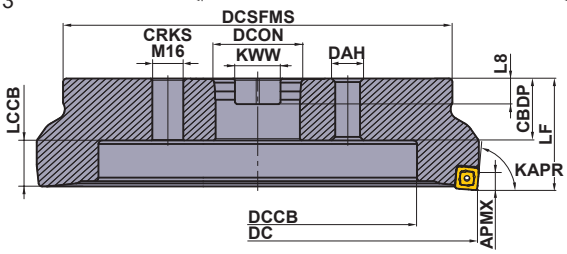


Fig. 3



Right hand tool holder only.

■ARBOR TYPE

DCON = Inch size, No coolant hole

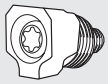
DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) LF	Dimensions (mm) DCON	WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.
80	**WSF406WR08006CN**	●	6	50	25.4	1.2	7.0	7800	1
80	**WSF406WR08009CN**	●	9	50	25.4	1.2	7.0	7800	1
100	**WSF406WR10008DN**	●	8	50	31.75	1.7	7.0	7000	2
100	**WSF406WR10012DN**	●	12	50	31.75	1.7	7.0	7000	2
125	**WSF406WR12510EN**	●	10	63	38.1	3.3	7.0	6250	2
125	**WSF406WR12516EN**	●	16	63	38.1	3.2	7.0	6250	2
160	**WSF406WR16014FN**	●	14	63	50.8	5	7.0	5500	2
160	**WSF406WR16020FN**	●	20	63	50.8	4.9	7.0	5500	2
200	**WSF406WR20016KN**	●	16	63	47.625	8.6	7.0	4900	3
200	**WSF406WR20024KN**	●	24	63	47.625	8.5	7.0	4900	3
250	**WSF406WR25022KN**	●	22	63	47.625	14	7.0	4400	3
250	**WSF406WR25032KN**	●	32	63	47.625	13.9	7.0	4400	3

Note1) A set bolt for the arbor is not supplied with the body. Please refer to page L085 to find the correct type of set bolt to order.

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
80	**WSF406WR080**	25.4	34	13	20	14	55	9.5	6	1
100	**WSF406WR100**	31.75	32	—	46	16	70	12.7	8	2
125	**WSF406WR125**	38.1	42	—	56	19	80	15.9	10	2
160	**WSF406WR160**	50.8	45	—	80	16	100	19.1	11	2
200	**WSF406WR200**	47.625	35	18	140	26	175	25.4	14.22	3
250	**WSF406WR250**	47.625	35	18	180	26	220	25.4	14.22	3

SPARE PARTS

Tool Holder Type		 *		
	Wedge	Clamp Screw	Wrench	Adjustable Run-Out System
WSF406W	CWSF406N	LS0622T	TKY15T	ADW04

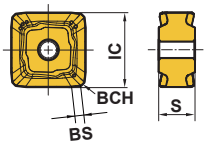
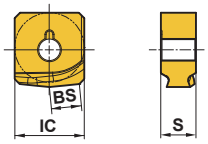
* Clamp Torque (N • m) : LS6022T = 6.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

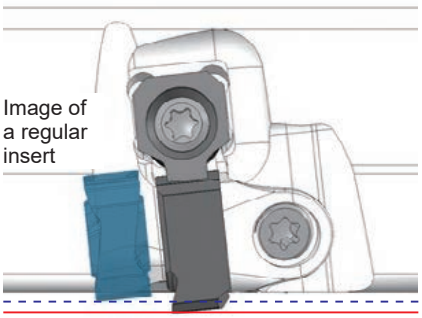
INSERTS

Workpiece Material			Coated	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting Edge Preparation : E : Round
	K	Cast Iron	◐	

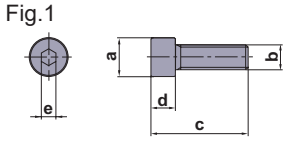
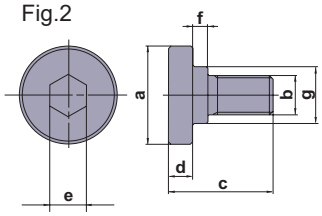
Shape	Order Number	Class	Edge Preparation	Coated MC520	Dimensions (mm) IC	S	BS	BCH	Geometry
	**SNMU1206C05ZNER-M**	M	E	●	12.7	6.2	1.6	0.5	
 Wiper	**WNGU1206ZNER5C-M**	G	E	●	12.3	6.2	5.3	–	

How to Use Wiper Insert for Best Results

- The WSF406W can obtain a good surface finish when using a standard insert due to the adjustable run-out system, but by using a wiper insert an excellent surface finish can be achieved without having to set a high accuracy face run-out. When a wiper insert is mounted, aim to set the standard insert run-out accuracy to within 0.04mm.
- Just one wiper insert is enough to achieve excellent finished surfaces.
  However, if the feed per revolution is greater than 5.0mm/rev, attach two or more wiper inserts so that they are evenly spaced in the cutter body and set the run-out accuracy between multiple wiper inserts to within 0.003mm before use.



SET BOLT (SOLD SEPARATELY)

Tool Holder Type	Set Bolt Order Number	Fig.	Reference Dimensions (mm) a	b	c	d	e	f	g	Geometry
WSF406WR080	HSC12035	1	18	M12x1.75	47	12	10	–	–	Fig.1 
WSF406WR100	–	2	40	M16x2	43	10	14	6	23	
WSF406WR125	–	2	50	M20x2.5	54	14	17	6	27	
WSF406WR160	–	2	65	M24x3	59	14	17	10	37	
WSF406WR200	–	1	24	M16x2	61–	16	14	–	–	Fig.2 
WSF406WR250	–	1	24	M16x2	61–	16	14	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

(mm)

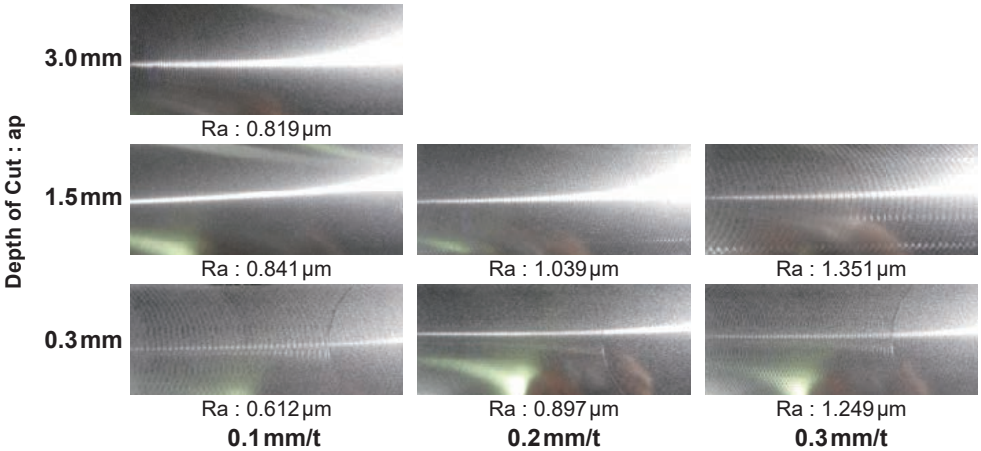
	Workpiece Material	Characteristics	Cutting Conditions	Depth of Cut **ap**	Insert	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)	Width of Cut **ae**
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	ap≤0.5	MC520	300(250—300)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	250(210—300)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	220(190—260)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	200(180—230)	0.10(0.08—0.15)	≤0.8DC
			◕	ap≤0.5	MC520	250(210—300)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	220(190—260)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	200(180—230)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	180(160—210)	0.10(0.08—0.15)	≤0.8DC
			✣	ap≤0.5	MC520	220(190—260)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(180—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(160—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	150(100—180)	0.10(0.08—0.15)	≤0.8DC
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	ap≤0.5	MC520	230(200—250)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(170—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(150—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	160(130—190)	0.10(0.08—0.15)	≤0.8DC
			◕	ap≤0.5	MC520	200(170—230)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	180(150—210)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	160(130—190)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	140(110—170)	0.10(0.08—0.15)	≤0.8DC
			✣	ap≤0.5	MC520	180(150—200)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	160(130—190)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	140(110—170)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	120(90—150)	0.10(0.08—0.15)	≤0.8DC
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	ap≤0.5	MC520	230(200—250)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(170—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(150—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	160(130—190)	0.10(0.08—0.15)	≤0.8DC
			◕	ap≤0.5	MC520	200(170—230)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	180(150—210)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	160(130—190)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	140(110—170)	0.10(0.08—0.15)	≤0.8DC
			✣	ap≤0.5	MC520	180(150—210)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	160(130—190)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	140(110—170)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	120(90—150)	0.10(0.08—0.15)	≤0.8DC

Note 1) Set the cutting conditions according to the usage written on the table above.
Note 2) When using a wiper insert, the cutting conditions for the finishing area are ap≤0.5mm.

CUTTING PERFORMANCE

Comparison of Surface Finishes for Each Depth of Cut and Feed: JIS FC300

Achieves an Ra of 1.6μm or less for a wide range of feeds and depth of cut.



<Cutting Conditions>
Workpiece Material : FC300
Tool : WSF406WR12516EN
Insert : SNMU1206C05ZNER-M (MC520)
Cutting Speed : vc=250m/min
Width of Cut : ae=100mm
Cutting Mode : Dry Cutting
Minor Cutting Edge Run-out Accuracy=3μm

FACE MILLING
<HIGH EFFICIENCY CUTTING FOR CAST IRON>

45° KAPR F R

AOX445

P M **K** N S H

Cast Iron



- **Solid CBN octagonal double-sided insert.**
- **Economical 16 cutting edge inserts. (when the depth of cut is 3mm)**
- **For high efficiency roughing through to finishing.**
- **Easy operation and cleansing.**

Fig.1 ø63

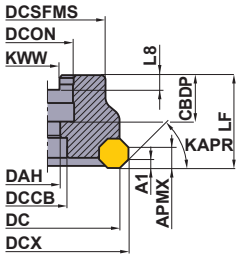
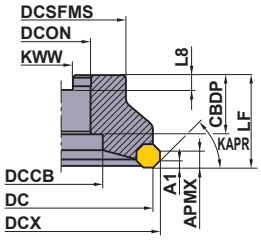


Fig.2 ø80 ø100 ø125 ø160



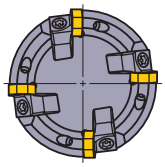
■ ARBOR TYPE

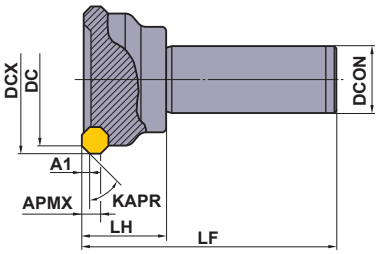
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	A1 (mm)	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.
Coarse Pitch	**AOX445-063A04R**	●	4	63	70.8	40	22	20	11	17	50	10.4	6.3	0.6	3	8	12000	1
	AOX445R08006C	●	6	80	87.8	50	25.4	26	—	38	60	9.5	6	1.2	3	8	11000	2
	AOX445R10008D	●	8	100	107.8	50	31.75	32	—	45	70	12.7	8	1.8	3	8	9300	2
	AOX445R12510E	●	10	125	132.8	63	38.1	35	—	60	80	15.9	10	3.0	3	8	8300	2
	AOX445R16012F	●	12	160	167.8	63	50.8	38	—	80	100	19.1	11	4.9	3	8	7200	2

Note 1) When machining with a depth of cut of 8mm, 16 corners cannot be used.







■ SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	DCX	LF	DCON	LH	WT (kg)	A1 (mm)	APMX (mm)	Max. Allowable Revolution (min^{-1})
Coarse Pitch	**AOX445R503S32**	●	3	50	57.8	125	32	40	1.1	3	8	13000
	AOX445R634S32	●	4	63	70.8	125	32	40	1.4	3	8	12000

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

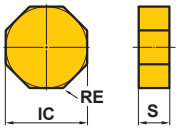
SPARE PARTS

Tool Holder Number		 *	
	Wedge	Clamp Screw	Wrench
AOX445	CWAOX445N	LS15T	TKY25T

* Clamp Torque (N • m) : LS15T=8.0

INSERTS

Workpiece Material	K	Cast Iron	◐		**Cutting Conditions (Guide) :** ● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting **Edge Preparation : E :** Round

Shape	Order Number	Edge Preparation	CBN BC5030		Dimensions(mm) IC	RE	S	Geometry
	**SL-ONEN120404ASN**	E	●		12.7	0.4	4.76	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤200MPa	**BC5030**	1000 (800—1500)	0.1 (0.05—0.15)
		250—350 MPa			

Note 1) Dry cutting is recommended.

L

INDEXABLE MILLING

● : Inventory maintained in Japan.
(Contains one CBN insert per case.)

FACE MILLING
<FOR HIGH FEED FINISHING>

90° KAPR

F

FMAX
For Compact and Smaller Machining Centres

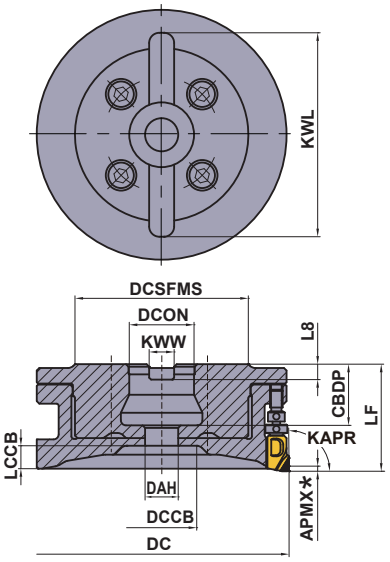
NEW

P	M	K	N	S	H
		Cast Iron	Non-ferrous Metal		



- **Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing.**
- **The combination of aluminium alloy and a special steel alloy achieves a light weight, high rigidity body.**
- **Precise run-out adjustment of cutting edge (5μm or less) for high precision cutting**

Fig.1
ø100
ø125



Right hand tool holder only.

■ARBOR TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min-1)	Fig.
					LF	DCON			
100	**FMAXR10010CLW**	●	○	10	42	25.4	1.06	22000	1
100	**FMAXR10016CLW**	●	○	16	42	25.4	1.11	22000	1
125	**FMAXR12514CLW**	●	○	14	42	25.4	1.44	19600	1
125	**FMAXR12520CLW**	●	○	20	42	25.4	1.48	19600	1

∗ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).
Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
25.4	100	**FMAXR10010CLW**	24	13	27	9	68	9.5	6	80	1
25.4	100	**FMAXR10016CLW**	24	13	27	9	68	9.5	6	80	1
25.4	125	**FMAXR12514CLW**	24	13	52	9	68	9.5	6	80	1
25.4	125	**FMAXR12520CLW**	24	13	52	9	68	9.5	6	80	1

SPARE PARTS

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
					
TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S

∗ Clamp Torque (N • m) : TSS04505S = 3.5
Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Scan here for product NEWS ▶

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

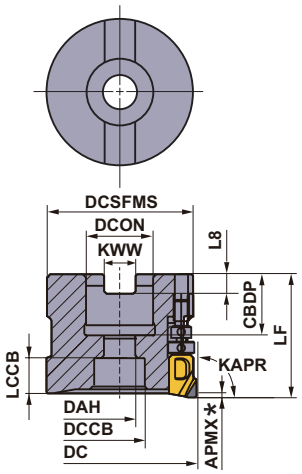
FMAX - 40/50/63

P | M | **K** Cast Iron | **N** Non-ferrous Metal | S | H



Fig.1

ø40
ø50
ø63



Right hand tool holder only.

■ARBOR TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm) LF	Dimensions (mm) DCON	WT (kg)	RPMX (min-1)	Fig.
40	**FMAX-040A04R**	●	○	4	40	16	0.24	30000	1
40	**FMAX-040A06R**	●	○	6	40	16	0.23	30000	1
50	**FMAX-050A08R**	●	○	8	40	22	0.37	30000	1
50	**FMAX-050A10R**	●	○	10	40	22	0.35	30000	1
63	**FMAX-063A10R**	●	○	10	40	22	0.67	27000	1
63	**FMAX-063A12R**	●	○	12	40	22	0.66	27000	1

* For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).
Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm) CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
16	40	**FMAX-040A04R**	18	9	14	10	37	8.4	5.6	—	1
16	40	**FMAX-040A06R**	18	9	14	10	37	8.4	5.6	—	1
22	50	**FMAX-050A08R**	20	11	17	12	47	10.4	6.3	—	1
22	50	**FMAX-050A10R**	20	11	17	12	47	10.4	6.3	—	1
22	63	**FMAX-063A10R**	20	11	17	12	60	10.4	6.3	—	1
22	63	**FMAX-063A12R**	20	11	17	12	60	10.4	6.3	—	1

SPARE PARTS

DC (mm)	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
40	**FMAX-040**	TSS04505S	KSN3	KSS2	HSC08030H	TKY10T	RKY25S
50	**FMAX-050**	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	**FMAX-063**	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S

* Clamp Torque (N • m) : TSS04505S = 3.5
Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

● : **Inventory maintained in Japan.**

FMAX

P | M | **K** | **N** | S | H

Cast Iron | Non-ferrous Metal



Fig.1

ø80
ø160

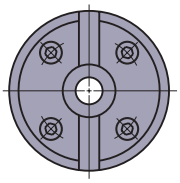
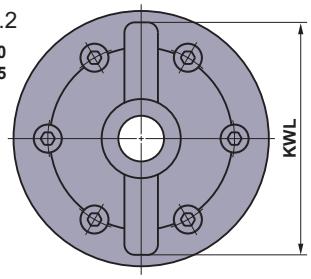
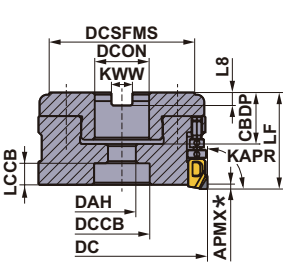
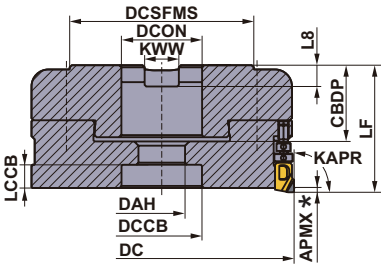


Fig.2

ø100
ø125







Right hand tool holder only.

■Arbor Type

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min-1)	Fig.
					LF	DCON			
80	**FMAXR08010C**	●	○	10	45	25.4	1.11	24500	1
80	**FMAXR08014C**	●	○	14	45	25.4	1.09	24500	1
100	**FMAXR10012D**	●	○	12	50	31.75	1.85	22000	2
100	**FMAXR10018D**	●	○	18	50	31.75	1.81	22000	2
125	**FMAXR12516E**	●	○	16	60	38.1	3.33	19600	2
125	**FMAXR12524E**	●	○	24	60	38.1	3.27	19600	2
160	**FMAXR16016D**	●	○	16	63	31.75	3.30	10000	1
160	**FMAXR16024D**	●	○	24	63	31.75	3.39	10000	1

∗ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
25.4	80	**FMAXR08010C**	24	13	26	11	68	9.5	6	—	1
25.4	80	**FMAXR08014C**	24	13	26	11	68	9.5	6	—	1
31.75	100	**FMAXR10012D**	32	17	32	10	79	12.7	8	90	2
31.75	100	**FMAXR10018D**	32	17	32	10	79	12.7	8	90	2
38.1	125	**FMAXR12516E**	36	22	38	12	88	15.9	10	112	2
38.1	125	**FMAXR12524E**	36	22	38	12	88	15.9	10	112	2
31.75	160	**FMAXR16016D**	38	17	53	10	75	12.7	8	—	1
31.75	160	**FMAXR16024D**	38	17	53	10	75	12.7	8	—	1

SPARE PARTS

DC (mm)	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
80	**FMAXR080**	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	**FMAXR100**	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	**FMAXR125**	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S
160	**FMAXR160**	TSS04505S	KSN3	KSS2	HSCX16045H	TKY10T	RKY25S

∗ Clamp Torque (N • m) : TSS04505S = 3.5

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Metric Standard



The cutter bore diameter DCON is indicated in millimetres.

Fig.1
ø80

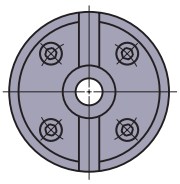
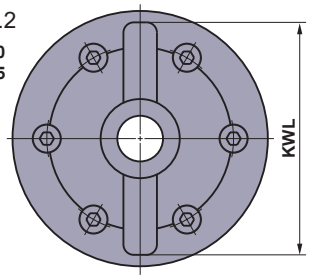
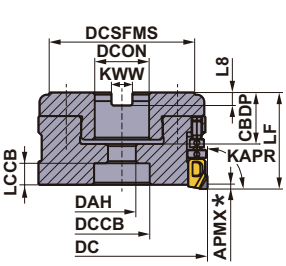
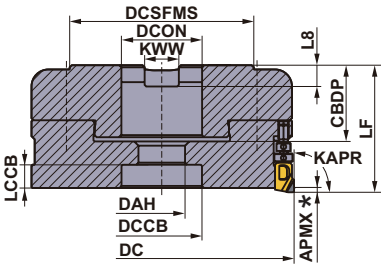


Fig.2
ø100
ø125







Right hand tool holder only.

■Arbor Type

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min-1)	Fig.
					LF	DCON			
80	**FMAX-080B14R**	●	○	14	45	27	1.08	24500	1
100	**FMAX-100B18R**	●	○	18	50	32	1.81	22000	2
125	**FMAX-125B24R**	●	○	24	60	40	3.26	19600	2

∗ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).
Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
27	80	**FMAX-080B14R**	24	13	26	11	68	12.4	7	—	1
32	100	**FMAX-100B18R**	32	17	32	10	79	14.4	8	90	2
40	125	**FMAX-125B24R**	36	22	38	12	88	16.4	9	112	2

SPARE PARTS

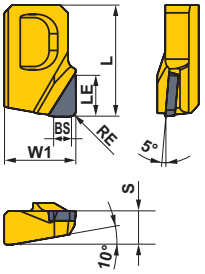
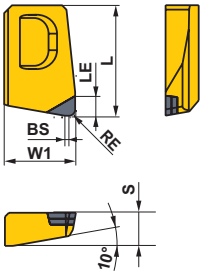
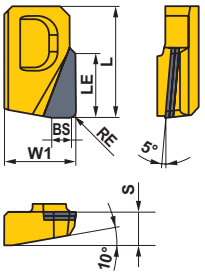
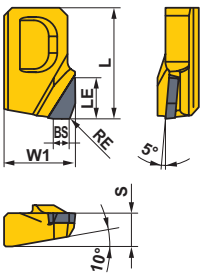
DC (mm)	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
80	**FMAX-080**	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	**FMAX-100**	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	**FMAX-125**	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

∗ Clamp Torque (N • m) : TSS04505S = 3.5
Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

● : Inventory maintained in Japan.
(Contains one piece per case.)

INSERTS

Workpiece Material			MD220	MD2030	MB4120	Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
	K	Cast Iron			◐	
	N	Non-ferrous Metal	◐	◐		

Shape	Order Number	MD220	MD2030	MB4120	Dimensions (mm) L	LE	W1	S	BS	RE	Geometry
For Aluminium Alloys  General Purpose	GOER1404PXFR2	●	●		14.0	5.0	9.0	4.2	2.0	0.4	
	GOER1408PXFR2	●	●		14.0	5.0	9.0	4.2	2.0	0.8	
For Gray Cast Irons  General Purpose	NEW NP-GOEN1404PXSR05			●	14.0	2.5	9.0	4.2	0.5	0.4	
	NEW NP-GOEN1408PXSR05			●	14.0	2.5	9.0	4.2	0.5	0.8	
For Aluminium Alloys  Long Edge	GOER1408PXFR2-8	●			14.0	8.0	9.0	4.2	2.0	0.8	
For Aluminium Alloys  Burr Prevention	GOER1401ZXFR2	●			14.0	5.0	9.0	4.2	2.0	0.1	

For Aluminium Alloys : Sharp Edge

For Gray Cast Irons : Chamfered and Rounded (0.13mmx15°+R0.01)

Note 1) If general purpose inserts (RE = 0.4mm, 0.8mm), burr prevention inserts and long edge inserts are used together, they will not be able to sufficiently display their full performance. Inserts of the same shape should be used according to the application.

Note 2) The cutting diameter will change depending on the shape.
Be particularly careful when cutting near vertical walls, since there is a possibility of interference with the holder.

Note 3) The long edge inserts corresponds to the gate remainder and can not be used for constant depth cutting.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

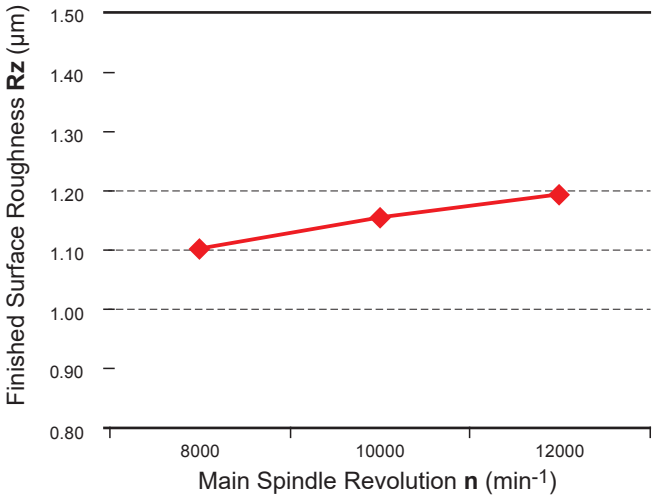
RECOMMENDED CUTTING CONDITIONS

Workpiece material		Characteristics	Grade	Cutting Speed **vc** (m/min)	Depth of Cut		Feed per Tooth **fz** (mm/t)	Cutting Mode
					ae (mm)	**ap** (mm)		
K	Gray Cast Irons	Tensile Strength ≤350MPa	**MB4120**	1000 (700—1300)	≤ 0.8 DC	≤ 0.5	0.07 (0.05—0.15)	Dry Cutting
N	Aluminium Alloys	Content Si < 5%	**MD2030 MD220**	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content 5% ≤ Si ≤ 10%	**MD2030 MD220**	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content 10% < Si < 15%	**MD220 MD2030**	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content Si ≥ 15%	**MD220 MD2030**	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		

Note 1) Please adjust the depth of cut (ap) depending on the width of cut (ae).
Note 2) When using the long edge insert, please select the conditions depending on depths of cut (ap) excluding the length of the gate.

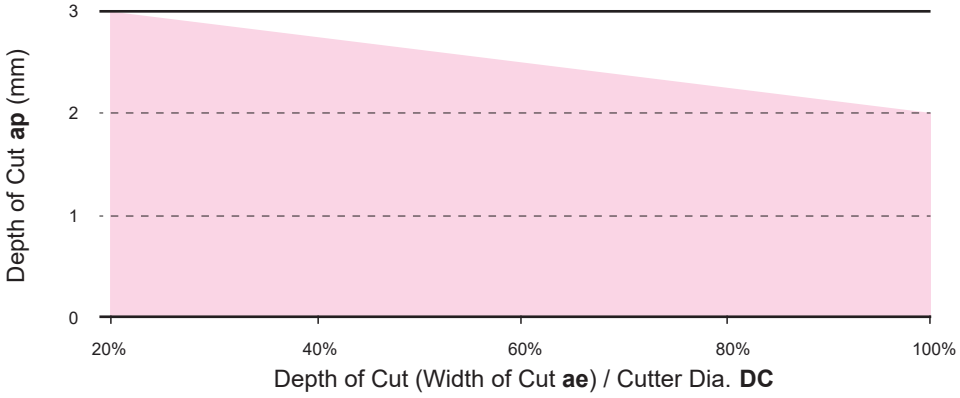
CUTTING PERFORMANCE

Aluminium Alloy Finished Surface Roughness (Rz) Comparison by PCD Grade

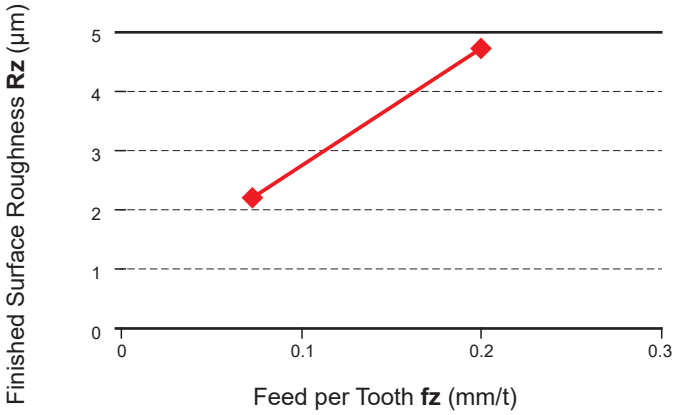


<Cutting Conditions>
Workpiece material : ADC12 Cylinder Head
Tool : FMAXR12524E
Insert : GOER1408PXFR2
Grade : MD2030
Revolution : n = 8000–12000 min-1
Feed per Tooth : fz = 0.08 mm/t
Depth of Cut : ap = 2.0 mm
: ae = 68 mm x 3
Cutting Mode : Internal Coolant 4MPa

Aluminium Alloy Effective Chip Disposal Range Comparison by PCD Grade



Gray Cast Iron Finished Surface Roughness (Rz) Comparison by CBN Grade



<Cutting Conditions>
Workpiece material : FC250
Tool : FMAXR12524E
Insert : NP-GOEN1408PXSR05
Grade : MB4120
Revolution : n = 2546 min-1
Feed per Tooth : fz = 0.07 mm/t 0.20mm/t
Depth of Cut : ap = 0.5 mm
Cutting Mode : Dry Cutting

FACE MILLING

<FOR ALUMINIUM ALLOY AND CAST IRON / HIGH FEED RATE AND FINISHING>

90° KAPR

F

NF10000

P | M | **K** Cast Iron | **N** Non-ferrous Metal | S | H



- **Suitable for high-speed finishing of light alloy and cast iron.**
- **Adjustable cutting edge run-out function.**

Fig.1
ø80
ø100

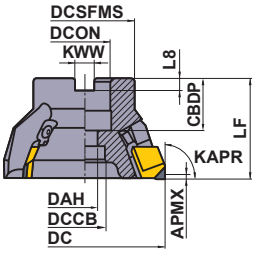
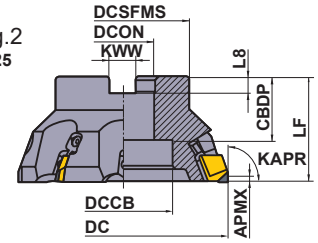


Fig.2
ø125



Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	APMX (mm) PCD	CBN	Max. Allowable Revolution (min^{-1}) *	Fig.
Coarse Pitch	**NF10000R0305C**	▲	5	80	50	25.4	26	13	20	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0406D	▲	6	100	63	31.75	32	17	25	60	12.7	8	1.8	4.0	1.0	14000	1
	NF10000R0508E	▲	8	125	63	38.1	38	—	60	80	15.9	10	2.7	4.0	1.0	12000	2
Fine Pitch	**NF10000R0306C**	▲	6	80	50	25.4	26	13	20	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0408D	▲	8	100	63	31.75	32	17	25	60	12.7	8	1.8	4.0	1.0	14000	1
	NF10000R0510E	▲	10	125	63	38.1	38	—	60	80	15.9	10	2.7	4.0	1.0	12000	2

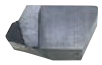
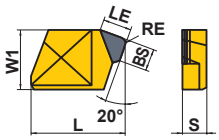
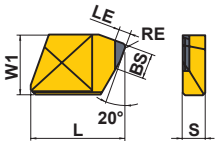
* Ensure max. spindle speed is achieved under the conditions that the cutter is clamped by a machine clamping force of 18kN with a standard type arbor. (HSK 63A-FMA○○○-60) The figure varies in actual machining depending on cutting conditions, such as the length of overhang or if there is insufficient drawing force from the arbor.

Scan here for product NEWS ▶

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one piece per case.)

INSERTS

Workpiece Material	K	Cast Iron			◐		Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	◐				

Shape	Order Number	Class	PCD MD220		CBN MB730		Dimensions(mm) L	W1	S	BS	LE	RE	Geometry
	**GDCN2004PDFR3**	C	●				20	12.7	4.76	3	5	1.2	
	**NP-GDCN2004PDSR3**	C			▲		20	12.7	4.76	3	2.5	0.8	

SPARE PARTS

Tool Holder Number	 Wedge	 * Clamp Screw	 Wrench
NF10000R0305C - NF10000R0510E	CWAF10R1	LS10T	TKY25T

* Clamp Torque (N • m) : LS10T=8.0

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	**MB730**	1000 (800—1500)	0.15 (0.05—0.5)
N	Aluminium Alloy	**MD220**	3500 (1000—4500)	0.12 (0.05—0.20)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FACE MILLING
<GENERAL HIGH FEED FINISHING>

90° KAPR

F

FF3000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		



- 11°positive insert.
- 1000—3000mm/min high feed machining.
- For finishing of steel.
- Adjustable cutting edge run-out function.

Fig.1

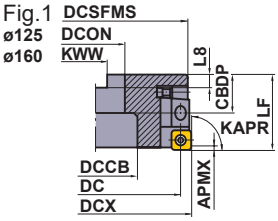
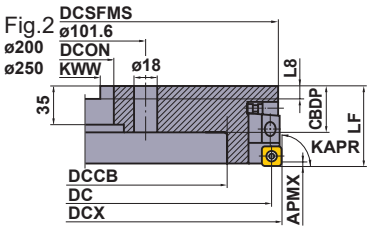


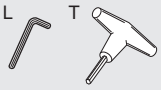
Fig.2



Right hand tool holder only.

Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DCCB	DCSFMS	KWW	L8	WT (kg)	APMX (mm)	Fig.
FF3000R0502E	●	2	125	140.4	75	38.1	38	60	85	15.9	10	5.8	0.3	1
FF3000R0602F	●	2	160	175.4	75	50.8	38	80	110	19.1	11	9.0	0.3	1
FF3000R0802K	●	2	200	215.4	75	47.625	45	134	130	25.4	14	12.6	0.3	2
FF3000R1002K	●	2	250	265.4	75	47.625	45	182	130	25.4	14	19.5	0.3	2

SPARE PARTS

Tool Holder Number	 Cartridge	 Shim	 * Lock Pin	 * Cartridge Clamp Screw	 Washer	 Radial Spring
FF3000R0502E — FF3000R1002K	FFCSR	FFSS	FFP	HBH08040	FFW	FFRP
	 Adjusting Wedge	 Adjusting Screw	 Lever	 Lever Screw	 Axial Spring	 Wrench
	FFAWR	LS3	FFL	FFLB	HP3	HKY25L HKY40T

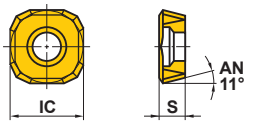
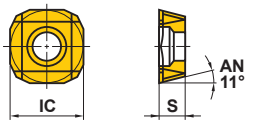
* Clamp Torque (N • m) : FFP=2.2, HBH08040=9.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			Cermet	Carbide
	P	Steel	●	
	M	Stainless Steel	●	
	K	Cast Iron	●	●
	N	Non-ferrous Metal		●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Class	Cermet NX2525	Carbide HTi05T	Dimensions(mm) IC	Dimensions(mm) S	Geometry
	**SPCA53Z**	C	●		15.88	4.8	
	**SPCG53Z**	C	●	●	15.88	4.8	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**NX2525 (SPCG)**	280 (250—300)	2.25 (2—2.5)
P	Carbon Steel Alloy Steel	180—280HB	**NX2525 (SPCG)**	180 (150—220)	2.25 (2—2.5)
P	High Alloy Steel	200—280HB	**NX2525 (SPCA)**	120 (80—150)	2.25 (2—2.5)
M	Stainless Steel	≤200HB	**NX2525 (SPCA)**	250 (230—280)	3.0 (2.5—3.5)
K	Cast Iron	Tensile Strength ≤450MPa	**NX2525 (SPCG)**	180 (130—200)	2.25 (2—2.5)
K	Cast Iron	Tensile Strength ≤450MPa	**HTi05T**	120 (100—150)	2.25 (2—2.5)
N	Aluminium Alloy	—	**HTi05T**	≤500	0.85 (0.7—1.0)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)
=Feed per Tooth x Number of Teeth x Cutter Revolution

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

SHOULDER MILLING
<GENERAL CUTTING>

90° KAPR

WWX400 NEW

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

ø50





Fig.1
ø50

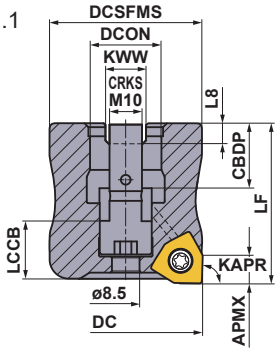
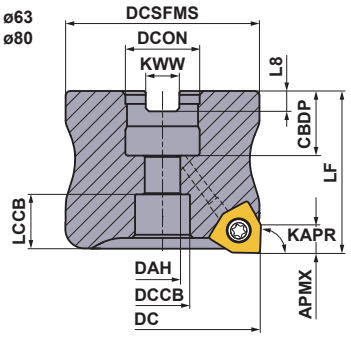


Fig.2
ø63
ø80



Right hand tool holder only.

■ ARBOR TYPE

DCON = Inch size

DC (mm)	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm) LF	Dimensions (mm) DCON	WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.
80	**WWX400R08004CA**	●	○	4	50	25.4	1.0	8.2	0.16°	12200	2
80	**WWX400R08005CA**	●	○	5	50	25.4	1.0	8.2	0.16°	12200	2
80	**WWX400R08007CA**	●	○	7	50	25.4	0.9	8.2	0.16°	12200	2
100	**WWX400R10005DA**	●	○	5	50	31.75	1.4	8.2	—	10700	3
100	**WWX400R10007DA**	●	○	7	50	31.75	1.4	8.2	—	10700	3
100	**WWX400R10009DA**	●	○	9	50	31.75	1.3	8.2	—	10700	3
125	**WWX400R12506EA**	●	○	6	63	38.1	2.8	8.2	—	9500	3
125	**WWX400R12508EA**	●	○	8	63	38.1	2.8	8.2	—	9500	3
125	**WWX400R12512EA**	●	○	12	63	38.1	2.7	8.2	—	9500	3
160	**WWX400R16008FA**	●	○	8	63	50.8	4.5	8.2	—	8300	3
160	**WWX400R16010FA**	●	○	10	63	50.8	4.4	8.2	—	8300	3
160	**WWX400R16014FA**	●	○	14	63	50.8	4.3	8.2	—	8300	3
200	**WWX400R20010KN**	●	–	10	63	47.625	8.1	8.2	—	7300	5
200	**WWX400R20012KN**	●	–	12	63	47.625	8.1	8.2	—	7300	5
200	**WWX400R20016KN**	●	–	16	63	47.625	8.0	8.2	—	7300	5
250	**WWX400R25012KN**	●	–	12	63	47.625	12.1	8.2	—	6400	5
250	**WWX400R25014KN**	●	–	14	63	47.625	12.1	8.2	—	6400	5
250	**WWX400R25018KN**	●	–	18	63	47.625	12.0	8.2	—	6400	5

Note 1) A set bolt for the arbor is not supplied with the body. Please refer to page L102 to find the correct type of set bolt to order.
Note 2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-250.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.3

ø100
ø125
ø160

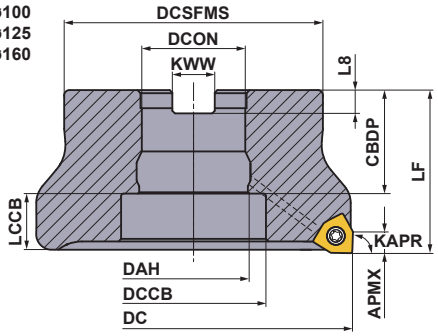


Fig.4

ø160 (DCON=mm size)

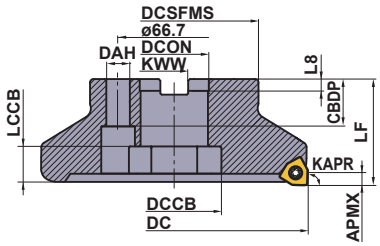
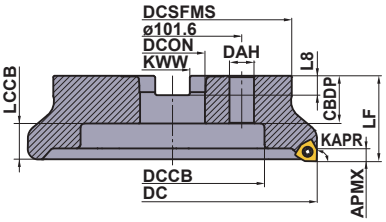


Fig.5

ø200
ø250



Right hand tool holder only.

■ ARBOR TYPE

DCON=mm size

DC (mm)	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm) LF	Dimensions (mm) DCON	WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.
50	**WWX400-050A03AR**	●	○	3	55	22	0.5	8.2	0.4°	5000	1
50	**WWX400-050A04AR**	●	○	4	55	22	0.5	8.2	0.4°	5000	1
63	**WWX400-063A03AR**	●	○	3	40	22	0.5	8.2	0.26°	14100	2
63	**WWX400-063A04AR**	●	○	4	40	22	0.5	8.2	0.26°	14100	2
63	**WWX400-063A05AR**	●	○	5	40	22	0.5	8.2	0.26°	14100	2
80	**WWX400-080A04AR**	●	○	4	50	27	1.0	8.2	0.16°	12200	2
80	**WWX400-080A05AR**	●	○	5	50	27	1.0	8.2	0.16°	12200	2
80	**WWX400-080A07AR**	●	○	7	50	27	0.9	8.2	0.16°	12200	2
100	**WWX400-100B05AR**	●	○	5	50	32	1.6	8.2	—	10700	3
100	**WWX400-100B07AR**	●	○	7	50	32	1.5	8.2	—	10700	3
100	**WWX400-100B09AR**	●	○	9	50	32	1.5	8.2	—	10700	3
125	**WWX400-125B06AR**	●	○	6	63	40	3.0	8.2	—	9500	3
125	**WWX400-125B08AR**	●	○	8	63	40	3.0	8.2	—	9500	3
125	**WWX400-125B12AR**	●	○	12	63	40	2.9	8.2	—	9500	3
160	**WWX400-160C08NR**	●	–	8	63	40	4.5	8.2	—	8300	4
160	**WWX400-160C10NR**	●	–	10	63	40	4.4	8.2	—	8300	4
160	**WWX400-160C14NR**	●	–	14	63	40	4.4	8.2	—	8300	4
200	**WWX400-200C10NR**	●	–	10	63	60	6.7	8.2	—	7300	5
200	**WWX400-200C12NR**	●	–	12	63	60	6.7	8.2	—	7300	5
200	**WWX400-200C16NR**	●	–	16	63	60	6.6	8.2	—	7300	5
250	**WWX400-250C12NR**	●	–	12	63	60	11.5	8.2	—	6400	5
250	**WWX400-250C14NR**	●	–	14	63	60	11.5	8.2	—	6400	5
250	**WWX400-250C18NR**	●	–	18	63	60	11.4	8.2	—	6400	5

Note 1) A set bolt for the arbor is not supplied with the body. Please refer to page L102 to find the correct type of set bolt to order.
Note 2) The milling cutter with cutting diameter DC=50 mm has a built-in set bolt. The set bolt cannot be replaced.
Therefore, absolutely do not disassemble the milling cutter.
Note 3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 63-100.
Note 4) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-250.

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

ISO13399	➤ L003
MOUNTING DIMENSION	➤ L102
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

Mounting Dimensions

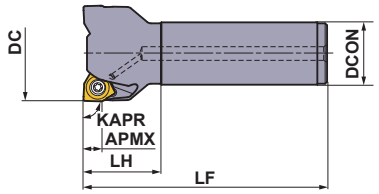
DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**WWX400-050A03AR**	22	20	—	—	12.2	47	10.4	6.3	1
50	**WWX400-050A04AR**	22	20	—	—	12.2	47	10.4	6.3	1
63	**WWX400-063A03AR**	22	20	11	17	11.2	50	10.4	6.3	2
63	**WWX400-063A04AR**	22	20	11	17	11.2	50	10.4	6.3	2
63	**WWX400-063A05AR**	22	20	11	17	11.2	50	10.4	6.3	2
80	**WWX400R08004CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400R08005CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400R08007CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400-080A04AR**	27	23	13	20	14.2	56	12.4	7	2
80	**WWX400-080A05AR**	27	23	13	20	14.2	56	12.4	7	2
80	**WWX400-080A07AR**	27	23	13	20	14.2	56	12.4	7	2
100	**WWX400R10005DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400R10007DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400R10009DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400-100B05AR**	32	32	32	45	16.2	78	14.4	8	3
100	**WWX400-100B07AR**	32	32	32	45	16.2	78	14.4	8	3
100	**WWX400-100B09AR**	32	32	32	45	16.2	78	14.4	8	3
125	**WWX400R12506EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400R12508EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400R12512EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400-125B06AR**	40	40	40	56	21.2	89	16.4	9	3
125	**WWX400-125B08AR**	40	40	40	56	21.2	89	16.4	9	3
125	**WWX400-125B12AR**	40	40	40	56	21.2	89	16.4	9	3
160	**WWX400-160C08NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400-160C10NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400-160C14NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400R16008FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
160	**WWX400R16010FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
160	**WWX400R16014FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
200	**WWX400R20010KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400R20012KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400R20016KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400-200C10NR**	60	32	18	135	29.2	160	25.7	14.22	5
200	**WWX400-200C12NR**	60	32	18	135	29.2	160	25.7	14.22	5
200	**WWX400-200C16NR**	60	32	18	135	29.2	160	25.7	14.22	5
250	**WWX400R25012KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400R25014KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400R25018KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400-250C12NR**	60	32	18	180	29.2	210	25.7	14.22	5
250	**WWX400-250C14NR**	60	32	18	180	29.2	210	25.7	14.22	5
250	**WWX400-250C18NR**	60	32	18	180	29.2	210	25.7	14.22	5

SET BOLT (SOLD SEPARATELY)

Tool Holder Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
WWX400R080○○CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	Fig.1
WWX400R100○○DA	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400R125○○EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400R160○○FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	
WWX400R200○○KN	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400R250○○KN	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	Fig.2
WWX400-080A○○AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WWX400-100B○○AR	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400-125B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-160C○○NR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-200C○○NR	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400-250C○○NR	–	–	1	24	M16×2	61–	16	14	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.
Note 3) The milling cutter with cutting diameter DC=50 mm has a built-in set bolt.
Please use a 7 mm Allen wrench to tighten/loosen the set bolt.





Right hand tool holder only.

■ SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) LF	DCON	LH	WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})
50	**WWX400R5003SA32M**	●	3	125	32	40	0.8	8.2	0.4°	16000
50	**WWX400R5004SA32M**	●	4	125	32	40	0.8	8.2	0.4°	16000
63	**WWX400R6303SA32M**	●	3	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6304SA32M**	●	4	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6305SA32M**	●	5	125	32	40	1.0	8.2	0.26°	14100
80	**WWX400R8004SA32M**	●	4	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8005SA32M**	●	5	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8007SA32M**	●	7	125	32	40	1.2	8.2	0.16°	12200

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

● : Inventory maintained in Japan.

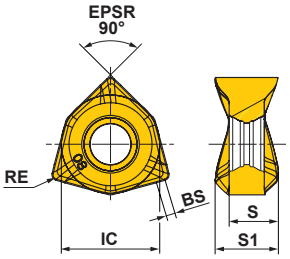
ISO13399	➢ L003
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001

INSERTS

Workpiece Material		
	P	Steels
	M	Stainless Steels
	K	Cast Irons
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steels

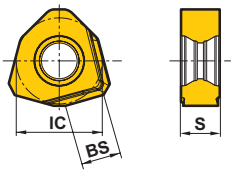
Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		Dimensions (mm)					Geometry
					MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15		IC	S	S1	BS	RE	
	6NGU1409040PNER-L	G	E		●	●	●	●	●	●	●			14	7	9	1.7	0.4	
	6NGU1409080PNER-L	G	E		●	●	●	●	●	●	●			14	7	9	1.3	0.8	
	6NGU1409040PNFR-L	G	F									●		14	7	9	1.7	0.4	
	6NGU1409080PNFR-L	G	F									●		14	7	9	1.3	0.8	
	6NGU1409040PNER-M	G	E		●	●	●	●	●	●	●			14	7	9	1.7	0.4	
	6NGU1409080PNER-M	G	E		●	●	●	●	●	●	●			14	7	9	1.3	0.8	
	6NMU1409040PNER-M	M	E		●	●	●	●	●	●	●			14	7	9	1.7	0.4	
	6NMU1409080PNER-M	M	E		●	●	●	●	●	●	●			14	7	9	1.3	0.8	
	6NMU1409080PNER-R	M	E		●	●	●		●	●	●			14	7	9	1.3	0.8	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Wiper Inserts

Shape	Order Number	Class	Edge Preparation	Coated					Dimensions (mm)			Geometry
				MC5020	MP6120	VP15TF			IC	S	BS	
	**2NGU1406ZNER6C-M**	G	E	●	●	●			14	6.3	6.5	

Instructions for Use of Wiper Inserts

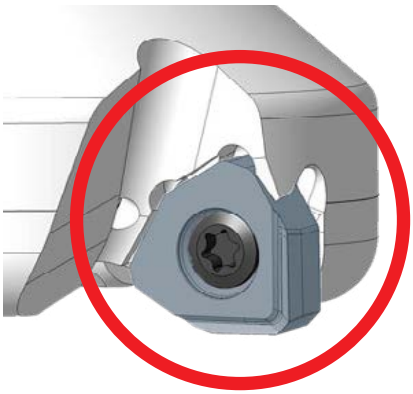


Fig.1

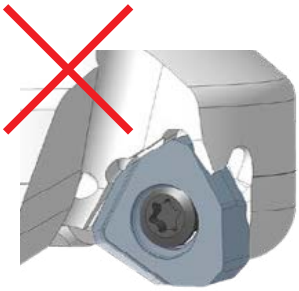


Fig.2

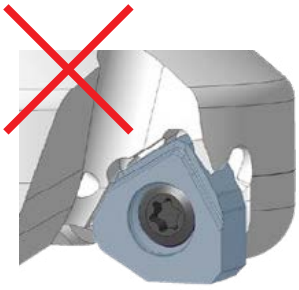


Fig.3

Wiper inserts for WWX400 are two-cornered. Please set as shown in Fig.1.
Excellent surface finish can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 6.5mm/rev.
For a wiper insert, select a general insert that has similar cutting conditions.

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Cutting Speed

(mm)

	Workpiece Material	Properties	Cutting Conditions	Grade	ae 0.5DC≥	ae 0.8DC≥	ae DC(Slot)
					vc (m/min)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	240(200—280)	220(180—260)	200(160—240)
			◐	MP6130	230(190—270)	210(170—250)	190(150—230)
			✲	MP6130,VP15TF	210(170—250)	190(150—230)	170(130—210)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	210(170—250)	190(150—230)	170(130—210)
			◐	MP6130	200(160—240)	180(140—220)	160(120—200)
			✲	MP6130,VP15TF	180(140—220)	160(120—200)	140(100—180)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	200(160—240)	180(140—220)	160(120—200)
			◐	MP6130	190(150—230)	170(130—210)	150(110—190)
			✲	MP6130,VP15TF	170(130—210)	150(110—190)	130(90—170)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	140(120—160)	—	—
			◐	MP6130	120(100—140)	—	—
			✲	MP6130,VP15TF	110(90—130)	—	—
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	180(160—200)	160(140—180)	—
			◐	MP7130,VP15TF	170(150—190)	150(130—170)	—
			✲	MP7130,VP15TF	150(130—170)	130(110—150)	—
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	170(150—190)	150(130—170)	—
			◐	MP7130,VP15TF	160(140—180)	140(120—160)	—
			✲	MP7130,VP15TF	140(120—160)	120(100—140)	—
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	180(160—200)	160(140—180)	—
			◐	MP7130,VP15TF	170(150—190)	150(130—170)	—
			✲	MP7130,VP15TF	150(130—170)	130(110—150)	—
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	160(140—180)	140(120—160)	—
			◐	MP7130,VP15TF	150(130—170)	130(110—150)	—
			✲	MP7130,VP15TF	130(110—150)	110(90—130)	—
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	140(120—160)	—	—
			◐	MP7130,VP15TF	130(110—150)	—	—
			✲	MP7130,VP15TF	110(90—130)	—	—
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	250(210—290)	230(190—270)	210(170—250)
			◐	MC5020	240(200—280)	220(180—260)	200(160—240)
			◐	VP15TF	240(200—280)	220(180—260)	—
			✲	MC5020,VP15TF	220(180—260)	200(160—240)	180(140—220)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	220(180—260)	200(160—240)	180(140—220)
			◐	MC5020	210(170—250)	190(150—230)	170(130—210)
			◐	VP15TF	210(170—250)	190(150—230)	—
			✲	MC5020,VP15TF	190(150—230)	170(130—210)	150(110—190)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	180(140—220)	160(120—200)	140(100—180)
			◐	MC5020	170(130—210)	150(110—190)	130(90—170)
			◐	VP15TF	170(130—210)	150(110—190)	—
			✲	MC5020,VP15TF	150(110—190)	130(90—170)	110(70—150)
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	50(30—70)	—	—
			◐	VP15TF	50(30—70)	—	—

Note 1) The recommended cutting speed has been calculated for a depth of cut 2mm. Please reduce the cutting speed by an appropriate amount corresponding to the increase in cutting depth.

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

■ Wet Cutting
Cutting Speed

(mm)

	Workpiece Material	Properties	Cutting Conditions	Grade	ae 0.5DC≥	ae 0.8DC≥	ae DC(Slot)
					vc (m/min)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	150(140—160)	130(120—140)	120(110—130)
			◕	MP6130	140(130—150)	120(110—130)	110(100—120)
			✣	MP6130,VP15TF	120(110—130)	100(90—110)	90(80—100)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	150(140—160)	130(120—140)	120(110—130)
			◕	MP6130	140(130—150)	120(110—130)	110(100—120)
			✣	MP6130,VP15TF	120(110—130)	100(90—110)	90(80—100)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	140(130—150)	120(110—130)	110(100—120)
			◕	MP6130	130(120—140)	110(100—120)	100(90—110)
			✣	MP6130,VP15TF	110(100—120)	90(80—100)	80(70—90)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	110(100—120)	—	—
			◕	MP6130	100(90—110)	—	—
			✣	MP6130,VP15TF	80(70—90)	—	—
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	130(120—140)	110(100—120)	—
			◕	MP7130,VP15TF	120(110—130)	100(90—110)	—
			✣	MP7130,VP15TF	100(90—110)	80(70—90)	—
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	130(120—140)	110(100—120)	—
			◕	MP7130,VP15TF	120(110—130)	100(90—110)	—
			✣	MP7130,VP15TF	100(90—110)	80(70—90)	—
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	130(120—140)	110(100—120)	—
			◕	MP7130,VP15TF	120(110—130)	100(90—110)	—
			✣	MP7130,VP15TF	100(90—110)	80(70—90)	—
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	120(110—130)	100(90—110)	—
			◕	MP7130,VP15TF	110(100—120)	90(80—100)	—
			✣	MP7130,VP15TF	90(80—100)	70(60—80)	—
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	120(110—130)	—	—
			◕	MP7130,VP15TF	110(100—120)	—	—
			✣	MP7130,VP15TF	90(80—100)	—	—
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	170(150—190)	150(130—170)	130(110—150)
			◕	MC5020	160(140—180)	140(120—160)	120(100—140)
			◕	VP15TF	160(140—180)	140(120—160)	—
			✣	MC5020,VP15TF	140(120—160)	120(100—140)	100(80—120)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	170(150—190)	150(130—170)	130(110—150)
			◕	MC5020	160(140—180)	140(120—160)	120(100—140)
			◕	VP15TF	160(140—180)	140(120—160)	—
			✣	MC5020,VP15TF	140(120—160)	120(100—140)	100(80—120)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	160(150—170)	140(130—150)	120(110—130)
			◕	MC5020	150(140—160)	130(120—140)	110(100—120)
			◕	VP15TF	150(140—160)	130(120—140)	—
			✣	MC5020,VP15TF	130(120—140)	110(100—120)	90(80—100)
N	Aluminium Alloys	Content Si<5%	●	TF15	500(300—900)	500(300—900)	500(300—900)
			◕	TF15	500(300—900)	500(300—900)	500(300—900)
			✣	TF15	400(200—800)	400(200—800)	400(200—800)
S	Titanium Alloys	—	●	MP9120	80(60—100)	—	—
			◕	MP9120	70(50—90)	—	—
			✣	MP9130	60(40—80)	—	—
	Heat Resistant Alloys	—	●	MP9120	60(50—70)	—	—
			◕	MP9120	50(30—60)	—	—
			✣	MP9130	40(20—40)	—	—
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	50(30—70)	—	—
			◕	VP15TF	50(30—70)	—	—

Note 1) Set the cutting conditions according to the usage written on the table above.

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	Cutting Conditions	Grade	ae 0.5DC≥ Breaker	ap	fz (mm/t)
P	Mild Steels	Hardness ≤180HB	●	MP6120	L,M	≤4.0	0.13(0.10—0.15)
			●	MP6130	L,M	≤4.0	0.13(0.10—0.15)
			●		M,R	≤4.0	0.16(0.10—0.20)
			✱	MP6130,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	L,M	≤4.0	0.13(0.10—0.15)
			●	MP6130	L,M	≤4.0	0.13(0.10—0.15)
			●		M,R	≤4.0	0.16(0.10—0.20)
			✱	MP6130,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	L,M	≤3.0	0.13(0.10—0.15)
			●	MP6130	L,M	≤3.0	0.13(0.10—0.15)
			●		M,R	≤3.0	0.16(0.10—0.20)
			✱	MP6130,VP15TF	M,R	≤3.0	0.13(0.10—0.15)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	L,M	≤2.0	0.13(0.10—0.15)
			●	MP6130	L,M	≤2.0	0.13(0.10—0.15)
			●		M,R	≤2.0	0.16(0.10—0.20)
			✱	MP6130,VP15TF	M,R	≤2.0	0.13(0.10—0.15)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ●	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			●	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✱	MP7130,VP15TF	M	≤4.0	0.13(0.10—0.15)
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			●	MP7130	L,M	≤3.0	0.13(0.10—0.15)
			●	VP15TF	M	≤3.0	0.16(0.10—0.20)
			✱	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	● ●	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			●	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✱	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
	Duplex Stainless Steels	Hardness ≤280HB	● ●	MP7130	L,M	≤3.0	0.13(0.10—0.15)
			● ●	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			●	VP15TF	M	≤3.0	0.16(0.10—0.20)
			●	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✱	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
			✱	MP7130,VP15TF	M	≤4.0	0.13(0.10—0.15)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	L,M	≤2.0	0.13(0.10—0.15)
			●	MP7130	L,M	≤2.0	0.13(0.10—0.15)
			●	VP15TF	M	≤2.0	0.16(0.10—0.20)
			✱	MP7130,VP15TF	M	≤2.0	0.13(0.10—0.15)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ●	MC5020	L,M	≤4.0	0.13(0.10—0.15)
			●	VP15TF	M,R	≤4.0	0.16(0.10—0.20)
			✱	MC5020,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ●	MC5020	L,M	≤4.0	0.13(0.10—0.15)
			●	VP15TF	M,R	≤4.0	0.16(0.10—0.20)
			✱	MC5020,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
N	Aluminium Alloys	Content Si<5%	● ● ✱	TF15	L	≤4.0	0.13(0.10—0.15)
S	Titanium Alloys	—	● ●	MP9120	L,M	≤2.0	0.10(0.05—0.13)
			✱	MP9130	L,M	≤2.0	0.10(0.05—0.13)
	Heat Resistant Alloys	—	● ●	MP9120	L,M	≤2.0	0.10(0.05—0.13)
			✱	MP9130	L,M	≤2.0	0.10(0.05—0.13)
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	M	≤2.0	0.05(0.05—0.10)
			●	VP15TF	M,R	≤2.0	0.05(0.05—0.10)

Note 1) Set the cutting conditions according to the usage written on the table above.

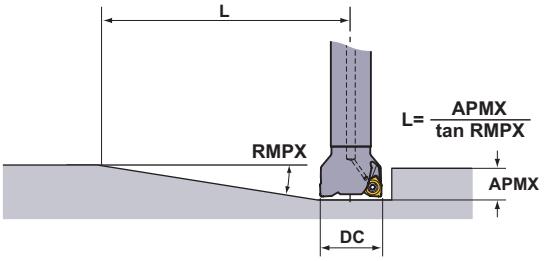
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

(mm)

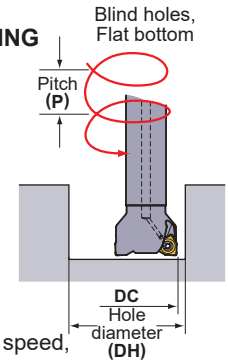
ae						Cutting Mode
0.8DC≥			DC(Slot)			
Breaker	**ap**	**fz** (mm/t)	Breaker	**ap**	**fz** (mm/t)	
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤3.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry
M	≤3.0	0.16(0.10—0.20)	—	—	—	Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry
M	≤3.0	0.13(0.10—0.15)	—	—	—	Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M,R	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M,R	≤2.0	0.13(0.10—0.15)	Dry, Wet
L	≤3.0	0.13(0.10—0.15)	L	≤2.0	0.13(0.10—0.15)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.05(0.05—0.10)	Dry, Wet
—	—	—	—	—	0.05(0.05—0.10)	Dry, Wet

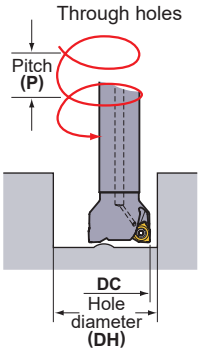
RAMPING/HELICAL CUTTING

● **RAMPING**



● **HELICAL CUTTING**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

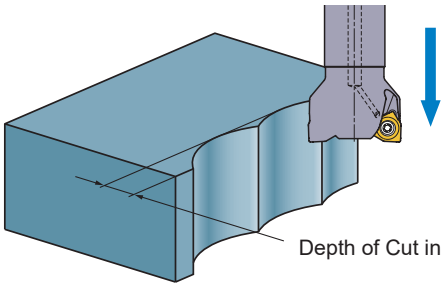
(mm)

DC	RE	APMX	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance * **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
50	0.4	8	0.40°	1175	98.5	1.06	95.2	0.99	82.5	0.7
50	0.8	8	0.40°	1175	97.7	1.05	95.2	0.99	82.5	0.7
63	0.4	8	0.26°	1807	124.5	0.88	121.2	0.83	108.6	0.6
63	0.8	8	0.26°	1807	123.7	0.87	121.2	0.83	108.6	0.6
80	0.4	8	0.16°	2936	158.5	0.69	155.2	0.66	142.6	0.5
80	0.8	8	0.16°	2936	157.7	0.68	155.3	0.66	142.6	0.5

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping and helical milling, long continuous chips may be scattered so please be careful.
* L (=8.2 / tan RMPX). Cutters' moving distance until depth of cut reaches 8.2mm at a maximum ramping angle.

<Helical Milling>
To obtain a flat bottom surface when helical milling, "the uncut part" in the centre of the workpiece material needs to be removed during the final pass.
When helical milling, make sure that the depth of cut per helical pass doesn't exceed the maximum depth of cut (**APMX**).

● **Plunging**



Depth of Cut in the Radius Direction : **ae** = 8mm

Memo

SHOULDER MILLING
<FOR CAST IRON>

90° KAPR

VOX400

P M **K** N S H

Cast Iron



- Vertical inserts with high strength cutting edge.
- Economical 8 cutting edge inserts.
- Screw-on type.

Fig.1

ø50
ø63
ø80

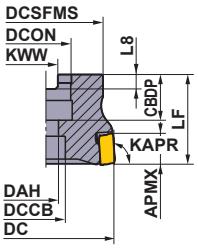


Fig.2

ø100
ø125
ø160

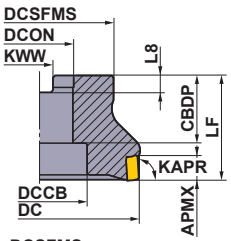
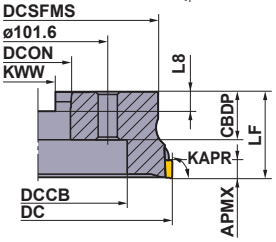


Fig.3

ø200
ø250



Right hand tool holder only.

■ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	APMX (mm)	Fig.	* Clamp Screw	Wrench
Coarse Pitch	**VOX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400R08004C	●	4	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10006D	●	6	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2	CS401160T	TKY15T
	VOX400R12508E	●	8	125	63	38.1	40	—	60	80	15.9	10	2.7	10	2	CS401160T	TKY15T
	VOX400R16010F	●	10	160	63	50.8	43	—	80	120	19.1	11	5.3	10	2	CS401160T	TKY15T
	VOX400R20012K	●	12	200	63	47.625	35	—	130	175	25.4	14.22	8.5	10	3	CS401160T	TKY15T
	VOX400R25016K	●	16	250	63	47.625	35	—	180	220	25.4	14.22	13.3	10	3	CS401160T	TKY15T
Fine Pitch	**VOX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400R08008C	●	8	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10010D	●	10	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2	CS401160T	TKY15T
	VOX400R12512E	●	12	125	63	38.1	40	—	60	80	15.9	10	2.7	10	2	CS401160T	TKY15T
	VOX400R16016F	●	16	160	63	50.8	43	—	80	120	19.1	11	5.3	10	2	CS401160T	TKY15T
	VOX400R20020K	●	20	200	63	47.625	35	—	130	175	25.4	14.22	8.5	10	3	CS401160T	TKY15T
	VOX400R25024K	●	24	250	63	47.625	35	—	180	220	25.4	14.22	13.3	10	3	CS401160T	TKY15T
Extra Fine Pitch	**VOX400-063A08R**	●	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1	CS401160T	TKY15T
	VOX400R08010C	●	10	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10012D	●	12	100	50	31.75	32	—	45	70	12.7	8	1.4	10	2	CS401160T	TKY15T
	VOX400R12516E	●	16	125	63	38.1	40	—	60	80	15.9	10	2.6	10	2	CS401160T	TKY15T
	VOX400R16020F	●	20	160	63	50.8	43	—	80	120	19.1	11	5.1	10	2	CS401160T	TKY15T
	VOX400R20026K	●	26	200	63	47.625	35	—	130	175	25.4	14.22	8.2	10	3	CS401160T	TKY15T
	VOX400R25034K	●	34	250	63	47.625	35	—	180	220	25.4	14.22	13.0	10	3	CS401160T	TKY15T

* Clamp Torque (N • m) : CS401160T=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig.1

ø50
ø63
ø80

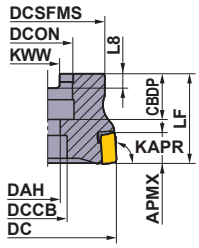


Fig.2

ø100
ø125

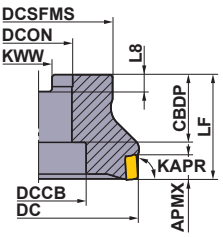
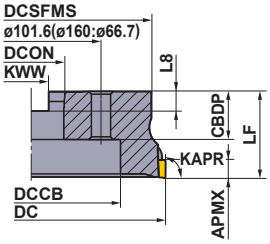


Fig.3

ø160
ø200
ø250



Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

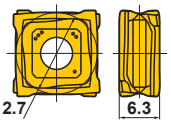
■ ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.	* Clamp Screw	Wrench
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8					
Coarse Pitch	**VOX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400-080A04R	●	4	80	50	27	23	13	20	56	12.4	7	1	10	1	CS401160T	TKY15T
	VOX400-100B06R	●	6	100	50	32	32	—	45	78	14.4	8	1.7	10	2	CS401160T	TKY15T
	VOX400-125B08R	●	8	125	63	40	32	—	56	89	16.4	9	3	10	2	CS401160T	TKY15T
	VOX400-160C10R	●	10	160	63	40	29	—	56	120	16.4	9	5.4	10	3	CS401160T	TKY15T
	VOX400-200C12R	●	12	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3	CS401160T	TKY15T
	VOX400-250C16R	●	16	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3	CS401160T	TKY15T
Fine Pitch	**VOX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400-080A08R	●	8	80	50	27	23	13	20	56	12.4	7	1	10	1	CS401160T	TKY15T
	VOX400-100B10R	●	10	100	50	32	32	—	45	78	14.4	8	1.7	10	2	CS401160T	TKY15T
	VOX400-125B12R	●	12	125	63	40	32	—	56	89	16.4	9	3	10	2	CS401160T	TKY15T
	VOX400-160C16R	●	16	160	63	40	29	—	56	120	16.4	9	5.4	10	3	CS401160T	TKY15T
	VOX400-200C20R	●	20	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3	CS401160T	TKY15T
	VOX400-250C24R	●	24	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3	CS401160T	TKY15T
Extra Fine Pitch	**VOX400-063A08R**	●	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1	CS401160T	TKY15T
	VOX400-080A10R	●	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1	CS401160T	TKY15T
	VOX400-100B12R	●	12	100	50	32	32	—	45	78	14.4	8	1.6	10	2	CS401160T	TKY15T
	VOX400-125B16R	●	16	125	63	40	32	—	56	89	16.4	9	2.8	10	2	CS401160T	TKY15T
	VOX400-160C20R	●	20	160	63	40	29	—	56	120	16.4	9	5.2	10	3	CS401160T	TKY15T
	VOX400-200C26R	●	26	200	63	60	32	—	130	175	25.7	14.22	7.9	10	3	CS401160T	TKY15T
	VOX400-250C34R	●	34	250	63	60	32	—	180	210	25.7	14.22	11.5	10	3	CS401160T	TKY15T

* Clamp Torque (N • m) : CS401160T=3.5

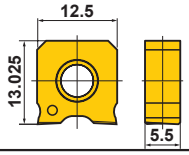
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated VP15TF	Geometry
K	Cast Iron			SONX1206PER	N	E	●	●	 ø12.7 6.3 Right hand tool holder shown.
				SONX1206PEL	N	E		●	

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

WIPER INSERTS

Workpiece Material			Shape	Order Number	Class	Edge Preparation	Coated VP15TF	Geometry
K	Cast Iron			WOEX1206PER5C	E	E	●	 12.5 13.025 5.5

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

∗ Left hand insert use for the side cutter (special products).
Please refer to the TOOL NEWS B242G Side Cutter Series.

RECOMMENDED CUTTING CONDITIONS

■ VOX400 (Standard Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ50－ϕ250 Radial Depth of Cut ae (mm)	ϕ50－ϕ250 Depth of Cut ap (mm)	ϕ50－ϕ250 Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤DC	≤10	0.2(0.1－0.3)

■ VOX400 (Fine Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ50,ϕ63 Radial Depth of Cut ae (mm)	ϕ50,ϕ63 Depth of Cut ap (mm)	ϕ50,ϕ63 Feed per Tooth fz (mm/t)	ϕ80 Radial Depth of Cut ae (mm)	ϕ80 Depth of Cut ap (mm)	ϕ80 Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.8DC	≤10	0.3(0.2－0.4)	≤0.6DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.8DC	≤10	0.3(0.2－0.4)	≤0.6DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.8DC	≤10	0.2(0.1－0.3)	≤0.6DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.8DC	≤10	0.2(0.1－0.3)	≤0.6DC	≤10	0.2(0.1－0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ100 Radial Depth of Cut ae (mm)	ϕ100 Depth of Cut ap (mm)	ϕ100 Feed per Tooth fz (mm/t)	ϕ125 Radial Depth of Cut ae (mm)	ϕ125 Depth of Cut ap (mm)	ϕ125 Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.5DC	≤10	0.3(0.2－0.4)	≤0.4DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.5DC	≤10	0.3(0.2－0.4)	≤0.4DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.5DC	≤10	0.2(0.1－0.3)	≤0.4DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.5DC	≤10	0.2(0.1－0.3)	≤0.4DC	≤10	0.2(0.1－0.3)

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ160			ϕ200, ϕ250		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.3DC	≤10	0.3(0.2－0.4)	≤0.2DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.3DC	≤10	0.3(0.2－0.4)	≤0.2DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.3DC	≤10	0.2(0.1－0.3)	≤0.2DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.3DC	≤10	0.2(0.1－0.3)	≤0.2DC	≤10	0.2(0.1－0.3)

Note 1) DC is cutter diameter.
Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

■ VOX400 (Extra Fine Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ63			ϕ80		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.6DC	≤10	0.3(0.2－0.4)	≤0.5DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.6DC	≤10	0.3(0.2－0.4)	≤0.5DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.6DC	≤10	0.2(0.1－0.3)	≤0.5DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.6DC	≤10	0.2(0.1－0.3)	≤0.5DC	≤10	0.2(0.1－0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ100			ϕ125		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.4DC	≤10	0.3(0.2－0.4)	≤0.3DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.4DC	≤10	0.3(0.2－0.4)	≤0.3DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.4DC	≤10	0.2(0.1－0.3)	≤0.3DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.4DC	≤10	0.2(0.1－0.3)	≤0.3DC	≤10	0.2(0.1－0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ160			ϕ200, ϕ250		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250－350)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
			VP15TF	250(200－300)	≤DC	≤10	0.4(0.3－0.5)	≤DC	≤10	0.4(0.3－0.5)
		≤350MPa	MC5020	220(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
			VP15TF	200(150－300)	≤DC	≤10	0.3(0.2－0.4)	≤DC	≤10	0.3(0.2－0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150－250)	≤0.25DC	≤10	0.3(0.2－0.4)	≤0.15DC	≤10	0.3(0.2－0.4)
			VP15TF	170(150－200)	≤0.25DC	≤10	0.3(0.2－0.4)	≤0.15DC	≤10	0.3(0.2－0.4)
		≤800MPa	MC5020	170(150－200)	≤0.25DC	≤10	0.2(0.1－0.3)	≤0.15DC	≤10	0.2(0.1－0.3)
			VP15TF	150(100－200)	≤0.25DC	≤10	0.2(0.1－0.3)	≤0.15DC	≤10	0.2(0.1－0.3)

Note 1) DC is cutter diameter.
Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

SHOULDER MILLING
<GENERAL CUTTING>

90° KAPR

ASX400

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

Fig.1
ø50
ø63

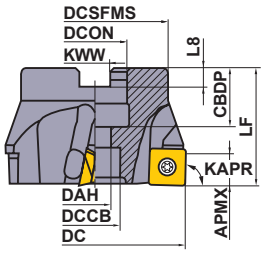


Fig.2
ø80
ø100
ø125
ø160

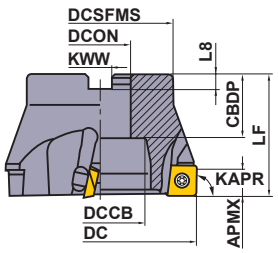
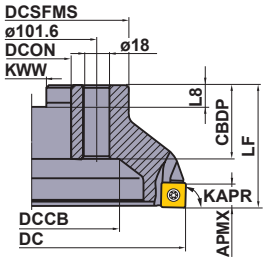


Fig.3
ø200
ø250





- High tolerance M-class inserts.
- Economical 4 cutting edge inserts.
- Curved cutting edge and high rigidity holder.
- Screw-on type.

■ ARBOR TYPE

No coolant hole

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	APMX (mm)	Fig.
Coarse Pitch	ASX400-050A03R	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400R08004C	●	4	80	50	25.4	26	—	38	60	9.5	6	1.0	10	2
	ASX400R10005D	●	5	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2
	ASX400R12506E	●	6	125	63	38.1	35	—	60	80	15.9	10	2.5	10	2
	ASX400R16008F	●	8	160	63	50.8	38	—	90	100	19.1	11	4.0	10	2
	ASX400R20010K	●	10	200	63	47.625	35	—	135	160	25.4	14.22	7.0	10	3
	ASX400R25012K	●	12	250	63	47.625	35	—	180	210	25.4	14.22	12.0	10	3
Fine Pitch	ASX400-050A04R	●	4	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A05R	●	5	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400R08006C	●	6	80	50	25.4	26	—	38	60	9.5	6	1.0	10	2
	ASX400R10007D	●	7	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2
	ASX400R12508E	●	8	125	63	38.1	35	—	60	80	15.9	10	2.5	10	2
	ASX400R16012F	●	12	160	63	50.8	38	—	90	100	19.1	11	4.0	10	2
	ASX400R20016K	●	16	200	63	47.625	35	—	135	160	25.4	14.22	7.0	10	3
	ASX400R25018K	●	18	250	63	47.625	35	—	180	210	25.4	14.22	12.0	10	3

SPARE PARTS

Tool Holder Number	 Shim	 * Shim Screw	 * Clamp Screw	 Wrench (Insert)	 Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig.1
ø50
ø63

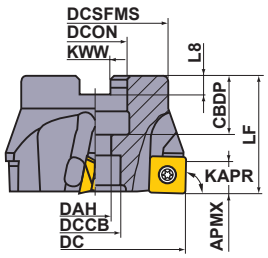


Fig.2
ø80
ø100
ø125

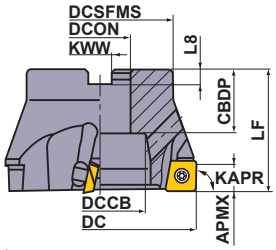


Fig.3
ø160

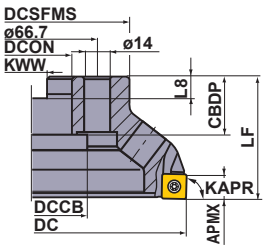
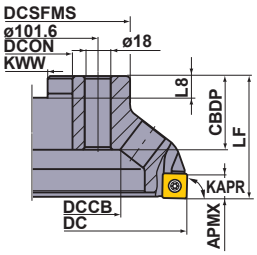


Fig.4
ø200
ø250



For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

■ ARBOR TYPE

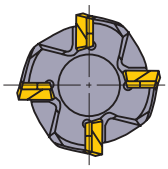
No coolant hole

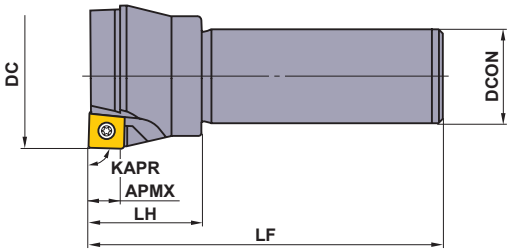
Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	**ASX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B04R	●	4	80	50	27	29	–	38	60	12.4	7	0.9	10	2
	ASX400-100B05R	●	5	100	50	32	32	–	45	70	14.4	8	1.4	10	2
	ASX400-125B06R	●	6	125	63	40	32	–	60	80	16.4	9	2.3	10	2
	ASX400-160C08R	●	8	160	63	40	29	–	56	100	16.4	9	3.6	10	3
	ASX400-200C10R	●	10	200	63	60	32	–	135	160	25.7	14.22	6.3	10	4
	ASX400-250C12R	●	12	250	63	60	32	–	180	210	25.7	14.22	10.8	10	4
Fine Pitch	**ASX400-050A04R**	●	4	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A05R	●	5	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B06R	●	6	80	50	27	29	–	38	60	12.4	7	0.9	10	2
	ASX400-100B07R	●	7	100	50	32	32	–	45	70	14.4	8	1.4	10	2
	ASX400-125B08R	●	8	125	63	40	32	–	60	80	16.4	9	2.2	10	2
	ASX400-160C12R	●	12	160	63	40	29	–	56	100	16.4	9	3.5	10	3
	ASX400-200C16R	●	16	200	63	60	32	–	135	160	25.7	14.22	6.2	10	4
	ASX400-250C18R	●	18	250	63	60	32	–	180	210	25.7	14.22	10.7	10	4
Extra Fine Pitch	**ASX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B08R	●	8	80	50	27	29	–	38	60	12.4	7	0.9	10	2
	ASX400-100B10R	●	10	100	50	32	32	–	45	70	14.4	8	1.4	10	2
	ASX400-125B12R	●	12	125	63	40	32	–	60	80	16.4	9	2.1	10	2
	ASX400-160C15R	●	15	160	63	40	29	–	56	100	16.4	9	3.4	10	3
	ASX400-200C19R	●	19	200	63	60	32	–	135	160	25.7	14.22	6.2	10	4
	ASX400-250C22R	●	22	250	63	60	32	–	180	210	25.7	14.22	10.5	10	4

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001







SHANK TYPE

Right hand tool holder only.

No coolant hole

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)				
		R		DC	LF	DCON	LH	APMX
Coarse Pitch	**ASX400R403S32**	●	3	40	125	32	40	10
	ASX400R503S32	●	3	50	125	32	40	10
	ASX400R634S32	●	4	63	125	32	40	10
	ASX400R804S32	●	4	80	125	32	40	10
Fine Pitch	**ASX400R504S32**	●	4	50	125	32	40	10
	ASX400R635S32	●	5	63	125	32	40	10
	ASX400R806S32	●	6	80	125	32	40	10

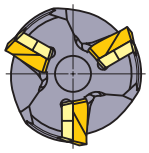
SPARE PARTS

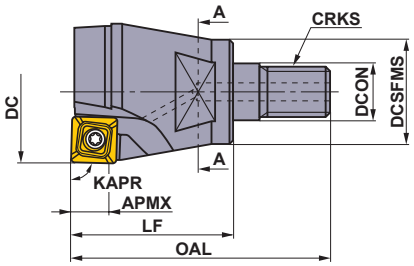
Tool Holder Number		 *	 *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

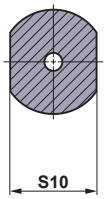
* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

● : **Inventory maintained in Japan.**









■ SCREW-IN TYPE

Right hand tool holder only.

With Coolant Hole

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT	Shim	Shim Screw *	Clamp Screw *	Wrench (Insert)	Wrench (Shim)
	R			DC	DCON	DCSFMS	OAL	LF	S10	CRKS	APMX	(kg)					
ASX400R322AM1640	●	○	2	32	17	29	63	40	24	M16	10	0.3	–	WCS503507H	TPS35	TIP15T	HKY35R
ASX400R403AM1645	●	○	3	40	17	29	68	45	24	M16	10	0.3	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

Note 1) For screw-in type arbors, refer to page L341.

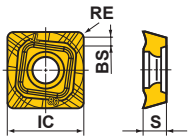
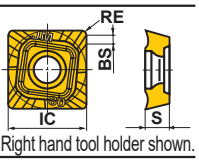
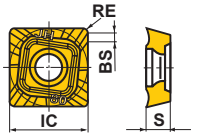
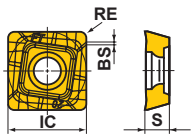
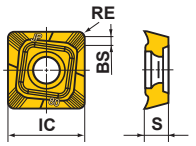
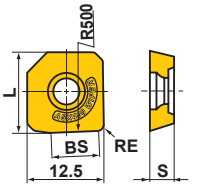
ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting
✠ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp **T :** Chamfer

Application	Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated MC5020	Coated MP6120	Coated MP6130	Coated MP7130	Coated MP7140	Coated MP9120	Coated MP9130	Coated VP15TF	Coated VP30RT	Cermet NX4545	Cermet NX2525	Carbide HTi10	Carbide HTi05T	L	IC	S	BS	RE	Geometry
Finish–Light Cutting	**JL** Breaker 	**SOET12T308PEER-JL**	E	E	●		●	●	●	●	●	●	●	●	●				–	12.7	3.97	1.4	0.8	
Light–Rough Cutting	**JM** Breaker 	**SOMT12T308PEER-JM**	M	E	●	●	●	●	●	●	●	●	●	●	●				–	12.7	3.97	1.4	0.8	 Right hand tool holder shown.
		SOMT12T308PEEL-JM	M	E									●						–	12.7	3.97	1.4	0.8	
Medium–Heavy Cutting	**JH** Breaker 	**SOMT12T308PEER-JH**	M	E	●	●	●	●	●	●	●	●	●	●					–	12.7	3.97	1.4	0.8	
Heavy Interrupted Cutting	**FT** Breaker 	**SOMT12T320PEER-FT**	M	E		●	●				●	●	●						–	12.7	3.97	0.5	2.0	
For Aluminium Alloy	**JP** Breaker 	**SOGT12T308PEFR-JP**	G	F													●		–	12.7	3.97	1.4	0.8	
Wiper 		**WOEW12T308PEER8C**	E	E														●	13.2	–	3.97	8	0.8	
		WOEW12T308PETR8C	E	T												●			13.2	–	3.97	8	0.8	

INSTRUCTIONS FOR USING INSERTS

■ Instructions for use of the JP breaker

- The JP breaker has sharp cutting edges. Wear gloves when handling.
- When machining aluminium alloy, welding to the cutting edge tends to occur, often leading to insert failure. To prevent this, wet cutting is recommended.

■ Instructions for use of wiper inserts



- Wiper inserts for the ASX400 are single-cornered.
- When installing the wiper insert, place the insert so that the small chamfer is located as shown.
- The peripheral cutting edge of the wiper insert is located further back than general inserts. Beware of wear of the insert just behind the wiper insert.
- When using wiper set the following standard conditions. Depth of Cut (ap)≤0.5mm, Feed per Tooth (fz)≤0.2mm/t

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker
P	Mild Steel	≤180HB	**F7030**	280 (210—350)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			MP6120 VP15TF	250 (200—300)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
			MP6130	240 (190—290)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			VP30RT	230 (180—280)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			NX4545	180 (130—230)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	250 (200—300)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			MP6120 VP15TF	220 (170—270)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH FT**
			MP6130	180 (150—230)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			VP30RT	150 (120—180)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			NX4545	150 (120—180)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	—	—
		280—350HB	**F7030**	180 (130—230)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			MP6120 VP15TF	140 (100—180)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP6130	120 (90—150)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			VP30RT	100 (80—160)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			NX4545	100 (80—160)	0.10 (0.05—0.15)	**JL**	0.13 (0.10—0.20)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	220 (170—270)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH FT**
			MP7140 VP30RT	200 (150—250)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			NX4545	150 (120—180)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	200 (150—250)	—	—	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
			VP15TF	180 (130—230)	0.18 (0.10—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
N	Aluminium Alloy	—	**HTi10**	650 (300—1000)	0.15 (0.10—0.20)	**JP**	0.20 (0.10—0.30)	**JP**	0.30 (0.20—0.40)	**JP**
S	Titanium Alloy	—	**MP9120 VP15TF**	50 (40—60)	0.12 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP9130	45 (30—55)	0.10 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
	Heat Resistant Alloy (Inconel etc.)	—	**MP9120 VP15TF**	40 (20—50)	0.12 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP9130	35 (15—45)	0.10 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
H	Hardened Steel	40—55HRC	**VP15TF**	80 (60—100)	0.08 (0.04—0.13)	**JL**	0.10 (0.05—0.15)	**JM**	0.12 (0.07—0.17)	**JH FT**

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

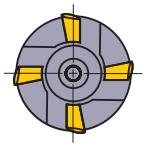
SHOULDER MILLING

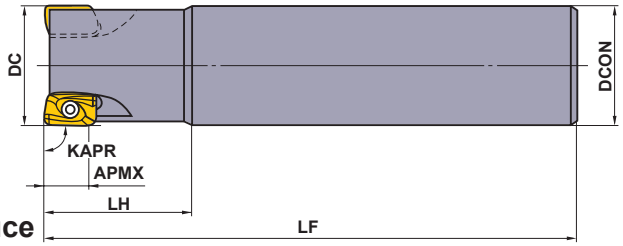
90° KAPR

BAP300

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel







- 11° positive insert.
- Inserts with wiper edges produce optimal finished surface.
- Multi insert design for high feed machining.

■ SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)					* Clamp Screw	Wrench	Insert
		R		DC	LF	DCON	LH	APMX			
Standard	BAP300R101S16	▲	1	10	85	16	25	9	TS25	TKY08F	APG/MT1135PD□R-□□
	BAP300R121S16	▲	1	12	85	16	25	9	TS25	TKY08F	
	BAP300R141S16	▲	1	14	85	16	25	9	TS25	TKY08F	
	BAP300R162S16	▲	2	16	85	16	25	9	TS25	TKY08F	
	BAP300R182S16	▲	2	18	85	16	25	9	TS25	TKY08F	
	BAP300R203S20	▲	3	20	100	20	30	9	TS25	TKY08F	
	BAP300R223S20	▲	3	22	100	20	30	9	TS25	TKY08F	
	BAP300R254S25	▲	4	25	115	25	35	9	TS25	TKY08F	
	BAP300R284S25	▲	4	28	115	25	35	9	TS25	TKY08F	
	BAP300R304S32	▲	4	30	125	32	45	9	TS25	TKY08F	
	BAP300R325S32	▲	5	32	125	32	45	9	TS25	TKY08F	
	BAP300R406S32	▲	6	40	125	32	45	9	TS25	TKY08F	
	BAP300R507S32	▲	7	50	125	32	45	9	TS25	TKY08F	
	BAP300R638S32	▲	8	63	125	32	45	9	TS25	TKY08F	
Long	BAP300R202LS20	▲	2	20	150	20	60	9	TS25	TKY08F	APG/MT1135PD□R-□□
	BAP300R253LS25	▲	3	25	170	25	70	9	TS25	TKY08F	
	BAP300R323LS32	▲	3	32	190	32	90	9	TS25	TKY08F	
	BAP300R403LS32	▲	3	40	190	32	90	9	TS25	TKY08F	

* Clamp Torque (N • m) : TS25=1.0

Scan here for product NEWS ▶

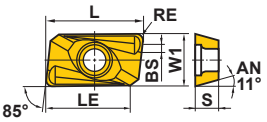
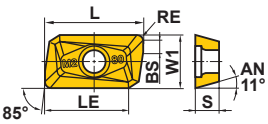
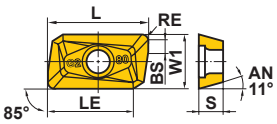
● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	VP15TF			NX2525	NX4545	HTi10	
	P	Steel	●	●			●	●		
	M	Stainless Steel	◔	◔			○	◔		
	K	Cast Iron		✱			●		●	
	N	Non-ferrous Metal							◔	
	S	Heat resistant Alloy, Titanium Alloy		◕					◕	
	H	Hardened Steel		◔						

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp

Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated VP15TF	Cermet NX2525	Cermet NX4545	Carbide HTi10	L	LE	W1	S	BS	RE	Geometry
	**APMT1135PDER-H1**	M	E	●	●	●	●	●	11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-H2	M	E	●	●	●	●	●	11.25	9	6.35	3.5	1.2	0.8	
	APMT1135PDER-H3	M	E	●					11.26	9	6.35	3.5	0.8	1.2	
	APMT1135PDER-H4	M	E	●					11.24	9	6.35	3.5	0.4	1.6	
	APMT1135PDER-H6	M	E	●					11.10	9	6.35	3.5	0.4	2.4	
	**APMT1135PDER-M0**	M	E	●					11.25	9	6.35	3.5	1.8	0.2	
	APMT1135PDER-M1	M	E	●					11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-M2	M	E	●	●		●		11.18	9	6.35	3.5	1.2	0.8	
	**APGT1135PDFR-G2**	G	F					●	11.3	9.7	6.35	3.5	1.2	0.8	

RECOMMENDED CUTTING CONDITIONS

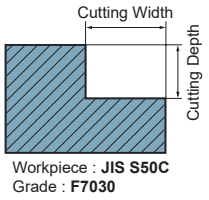
	Workpiece Material	Hardness	Grade	Breaker	Cutting Mode	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**NX4545**	**H**	Finish Cutting	160 (120—180)	0.1 (0.05—0.15)
			F7030	**M**	General Cutting	180 (150—200)	0.15 (0.1—0.2)
	Carbon Steel Alloy Steel	180—280HB	**NX4545**	**H**	Finish Cutting	120 (100—160)	0.08 (0.05—0.1)
			F7030	**M**	General Cutting	150 (120—200)	0.15 (0.1—0.2)
			F7030	**H**	Unstable Cutting	120 (100—160)	0.15 (0.1—0.2)
		280—350HB	**NX4545**	**H**	Finish Cutting	100 (80—120)	0.08 (0.05—0.1)
			F7030	**M**	General Cutting	140 (120—160)	0.15 (0.1—0.2)
			F7030	**H**	Unstable Cutting	100 (80—120)	0.2 (0.1—0.25)
M	Stainless Steel	≤200HB	**F7030**	**M**	General Cutting	140 (120—160)	0.15 (0.1—0.2)
			F7030	**H**	Unstable Cutting	120 (80—140)	0.2 (0.1—0.25)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**M**	General Cutting	140 (120—160)	0.15 (0.1—0.2)
			HTi10	**H**	General Cutting	120 (100—140)	0.2 (0.1—0.25)
	Ductile Cast Iron (≤JIS FCD450)	Tensile Strength ≤450MPa	**VP15TF**	**M**	General Cutting	120 (100—140)	0.15 (0.1—0.2)
			HTi10	**H**	General Cutting	100 (80—120)	0.2 (0.1—0.25)
	Ductile Cast Iron (≥JIS FCD500)	Tensile Strength 500—800MPa	**VP15TF**	**M**	General Cutting	100 (80—120)	0.1 (0.05—0.15)
			HTi10	**H**	General Cutting	80 (60—100)	0.15 (0.1—0.2)
N	Aluminium Alloy	—	**HTi10**	**G**	General Cutting	500 (200—1000)	0.2 (0.1—0.3)
S	Ti Alloy	≥350HB	**HTi10**	**G**	General Cutting	40 (30—60)	0.2 (0.1—0.3)
	Heat Resistant Alloy	—	**F7030**	**M**	General Cutting	30 (20—40)	0.15 (0.1—0.2)
H	Hardened Steel	≥40HRC	**VP15TF**	**M**	General Cutting	70 (50—100)	0.1 (0.05—0.15)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

■ CUTTING PERFORMANCE

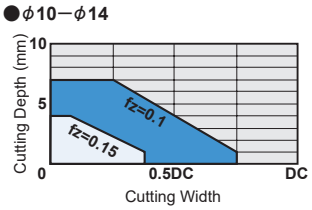
Cemented carbide/Coated carbide

Shoulder Milling

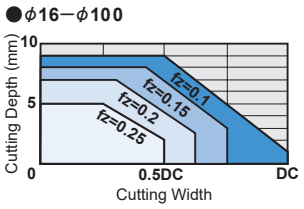


Workpiece : **JIS S50C**
Grade : **F7030**

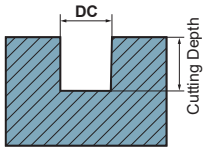
●ϕ10—ϕ14



●ϕ16—ϕ100

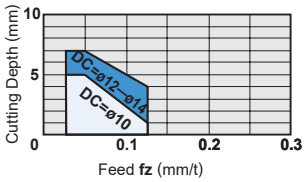


Slot Milling

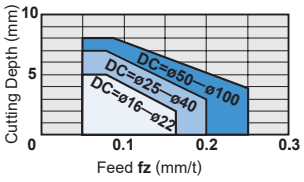


Workpiece : **JIS S50C**
Grade : **F7030**

●ϕ10—ϕ14

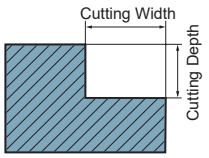


●ϕ16—ϕ100



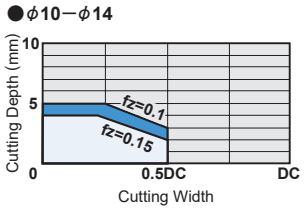
Cermet

Shoulder Milling

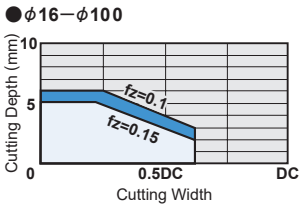


Workpiece : **JIS S50C**
Grade : **NX2525**

●ϕ10—ϕ14



●ϕ16—ϕ100



Note 1) The cutting capacity in the table is set for carbon steel (S50C). In case of alloy steel, etc., lower the cutting conditions by 20%—30%.
Note 2) In the case of deep slot milling, an air blower should be used.
Note 3) The diameter "DC" is taken from the tools peripheral cutting edge.

SIDE CUTTER

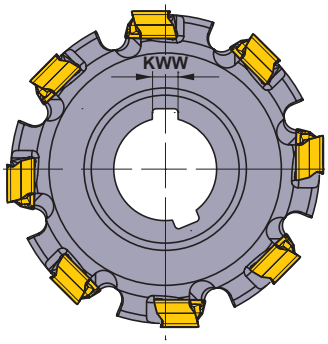
90° KAPR

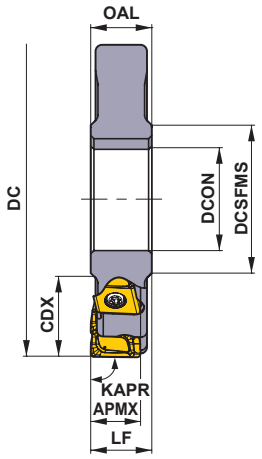
VAS300 NEW

P Steel | M | K Cast Iron | N | S | H

Table Regarding Special Designs





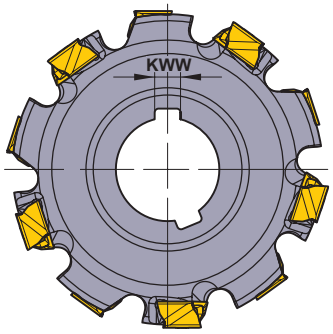


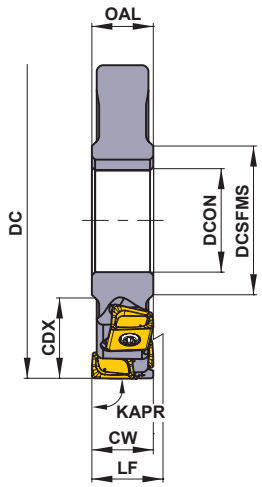
Max. Cutting Diameter **DC** : ø300mm
Max. Depth of Cut **APMX** : 8.6mm

■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						Insert Type
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥12	20.0	27	40	≥12	7	LNGU09
100	10	≥12	27.0	32	46	≥12	8	LNGU09
125	12	≥12	35.0	40	55	≥12	10	LNGU09
160	14	≥12	52.5	40	55	≥12	10	LNGU09







Largest Width **CW** : 17.2mm
Max. Cutting Diameter **DC** : ø300mm

■ FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)							Insert Type
			LF	CW	CDX	DCON	DCSFMS	OAL	KWW	
80	4	8	≥12	12 – 17.2	20.0	27	40	≥12	7	LNGU09
100	5	10	≥12	12 – 17.2	27.0	32	46	≥12	8	LNGU09
125	6	12	≥12	12 – 17.2	35.0	40	55	≥12	10	LNGU09
160	7	14	≥12	12 – 17.2	52.5	40	55	≥12	10	LNGU09

Note 1) Please contact us for details of any geometry of half sides and full sides.

Scan here for product NEWS ▶

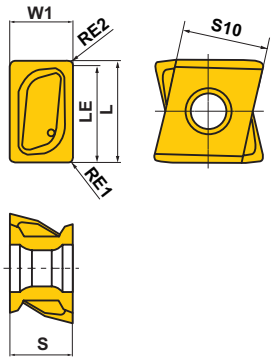
INSERTS

Workpiece Material		
P	Steel	●
K	Cast Iron	✱

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated			Dimensions (mm)							Geometry
					VP15TF			L	LE	S	S10	RE1	RE2	W1	
Low Resistance Type **M** Breaker	**LNGU090604PNER-M**	R	G	E	●			9.0	8.6	6.0	8.5	0.4	0.4	6.0	
	LNGU090604PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	0.4	0.4	6.0	
	LNGU090608PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	0.8	0.4	6.0	
	LNGU090608PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	0.8	0.4	6.0	
	LNGU090612PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	1.2	0.4	6.0	
	LNGU090612PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	1.2	0.4	6.0	
	LNGU090616PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	1.6	0.4	6.0	
	LNGU090616PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	1.6	0.4	6.0	
	LNGU090620PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	2.0	0.4	6.0	
	LNGU090620PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	2.0	0.4	6.0	
	LNGU090624PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	2.4	0.4	6.0	
	LNGU090624PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	2.4	0.4	6.0	
	LNGU090630PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	3.0	0.4	6.0	
	LNGU090630PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	3.0	0.4	6.0	
	LNGU090640PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	4.0	0.4	6.0	
	LNGU090640PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	4.0	0.4	6.0	





Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399	➤ L003
SPARE PARTS	➤ L132
CUTTING CONDITIONS	➤ L133
TECHNICAL DATA	➤ Q001

SIDE CUTTER

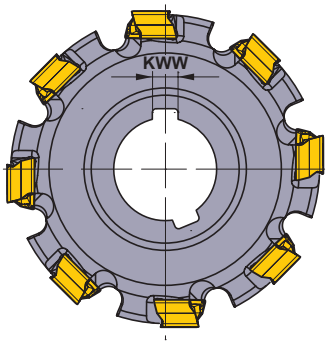
90° KAPR

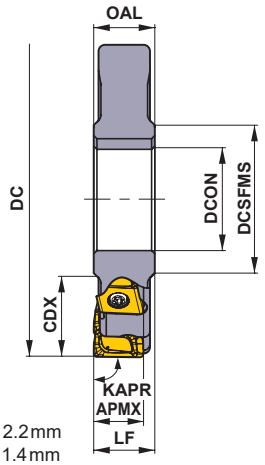
VAS400

P Steel | M | K Cast Iron | N | S | H

Table Regarding Special Designs





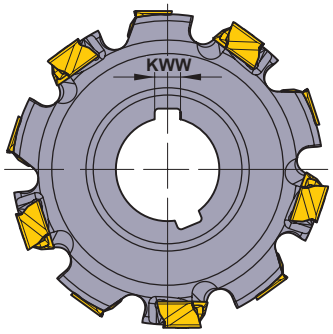


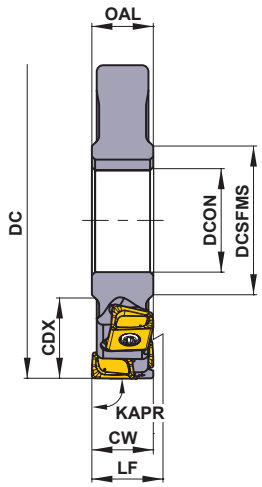
Max. Cutting Diameter **DC** : ø400mm
Max. Depth of Cut **APMX** : RE1<3.0mm 12.2mm
RE1≥3.0mm 11.4mm

■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						Insert Type
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥17	20.0	27	40	≥17	7	LNGU13
100	10	≥17	27.0	32	46	≥17	8	LNGU13
125	12	≥17	35.0	40	55	≥17	10	LNGU13
160	14	≥17	52.5	40	55	≥17	10	LNGU13







Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø400mm

■ FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)							Insert Type
			LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	
80	4	8	≥17	18 — 24	20.0	27	40	≥17	7	LNGU13
100	5	10	≥17	18 — 24	27.0	32	46	≥17	8	LNGU13
125	6	12	≥17	18 — 24	35.0	40	55	≥17	10	LNGU13
160	7	14	≥17	18 — 24	52.5	40	55	≥17	10	LNGU13

*1 In case of adjustment piece specification. LF : ≥24

*2 CW of RE1<3.0mm is 24mm, and RE1≥3.0mm is 22.8mm. If these values are exceeded, multilevel designs can be used.
Multilevel designs are available for CW of each size.

Note 1) Please contact us for details of any geometry of half sides and full sides.

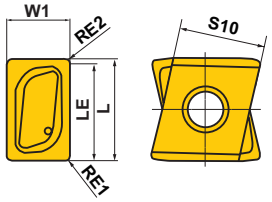
Scan here for product NEWS ▶

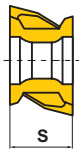
INSERTS

Workpiece Material		
	P	Steel
	K	Cast Iron

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated MP6120	Coated VP15TF		L	LE	S	S10	RE1	RE2	W1	Geometry
Low Resistance Type **M** Breaker	**LNGU130804PNER-M**	R	G	E		●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130804PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130808PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130808PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130812PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130812PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130816PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	**LNGU130816PNEL-M**	L	G	E		●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130820PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130820PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130824PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130824PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130830PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130830PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130840PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130840PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130850PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
	LNGU130850PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
Strong Cutting Edge Type **R** Breaker	**LNGU130804PNER-R**	R	G	E	●	●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130804PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130808PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130808PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130812PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130812PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130816PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	**LNGU130816PNEL-R**	L	G	E	●	●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130820PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130820PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130824PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130824PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130830PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130830PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130840PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130840PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130850PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
	LNGU130850PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	





Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399	➤ L003
SPARE PARTS	➤ L132
CUTTING CONDITIONS	➤ L133
TECHNICAL DATA	➤ Q001

SIDE CUTTER

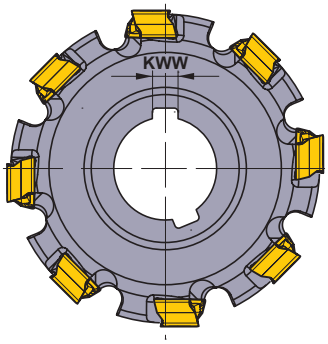
90° KAPR

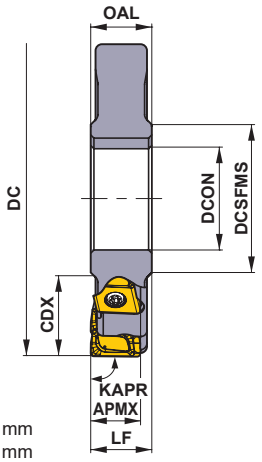
VAS500

P Steel | M | K Cast Iron | N | S | H

Table Regarding Special Designs







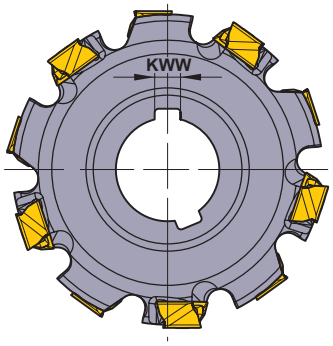
Max. Cutting Diameter **DC** : ø660mm
Max. Depth of Cut **APMX** : RE1<3.0mm 16.2mm
RE1≥3.0mm 15.4mm

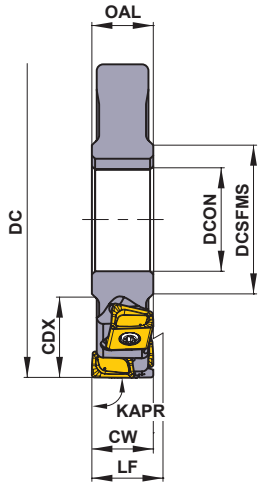
■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions(mm)						Insert Type
		LF *	CDX	DCON	DCSFMS	OAL	KWW	
100	8	≥23	27.0	32	46	≥23	8	LNGU17
125	10	≥23	35.0	40	55	≥23	10	LNGU17
160	12	≥23	52.5	40	55	≥23	10	LNGU17
200	16	≥23	65.0	50	70	≥23	12	LNGU17

* In case of adjustment piece specification. **LF** : ≥29







Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø660mm

■ FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions(mm)							Insert Type
			LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	
100	4	8	≥23	23 – 32	27.0	32	46	≥23	8	LNGU17
125	5	10	≥23	23 – 32	35.0	40	55	≥23	10	LNGU17
160	6	12	≥23	23 – 32	52.5	40	55	≥23	10	LNGU17
200	8	16	≥23	23 – 32	65.0	50	70	≥23	12	LNGU17

*1 In case of adjustment piece specification. **LF** : ≥29

*2 CW of RE1<3.0mm is 32mm, and RE1≥3.0mm is 30.8mm. If these values are exceeded, multilevel designs can be used.
Multilevel designs are available for CW of each size.

Note 1) Please contact us for details of any geometry of half sides and full sides.

Scan here for product NEWS ▶

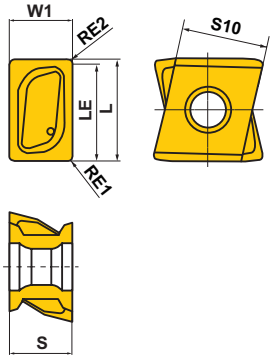
INSERTS

Workpiece Material		
P	Steel	
K	Cast Iron	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated MP6120	Coated VP15TF		Dimensions (mm) L	LE	S	S10	RE1	RE2	W1	Geometry
Strong Cutting Edge Type **R** Breaker	**LNGU171004PNER-R**	R	G	E	●	●		17.0	16.2	10.0	13.0	0.4	0.8	10.0	
	LNGU171004PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	0.4	0.8	10.0	
	LNGU171008PNER-R	R	G	E	●	●		17.0	16.2	10.0	13.0	0.8	0.8	10.0	
	LNGU171008PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	0.8	0.8	10.0	
	LNGU171012PNER-R	R	G	E	●	●		17.0	16.2	10.0	13.0	1.2	0.8	10.0	
	LNGU171012PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	1.2	0.8	10.0	
	LNGU171016PNER-R	R	G	E	●	●		17.0	16.2	10.0	13.0	1.6	0.8	10.0	
	LNGU171016PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	1.6	0.8	10.0	
	LNGU171020PNER-R	R	G	E	●	●		17.0	16.2	10.0	13.0	2.0	0.8	10.0	
	LNGU171020PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	2.0	0.8	10.0	
	LNGU171024PNER-R	R	G	E	●	●		17.0	16.2	10.0	13.0	2.4	0.8	10.0	
	LNGU171024PNEL-R	L	G	E	●	●		17.0	16.2	10.0	13.0	2.4	0.8	10.0	
	LNGU171030PNER-R	R	G	E	●	●		17.0	15.4	10.0	13.0	3.0	1.6	10.0	
	LNGU171030PNEL-R	L	G	E	●	●		17.0	15.4	10.0	13.0	3.0	1.6	10.0	
	LNGU171040PNER-R	R	G	E	●	●		17.0	15.4	10.0	13.0	4.0	1.6	10.0	
	LNGU171040PNEL-R	L	G	E	●	●		17.0	15.4	10.0	13.0	4.0	1.6	10.0	
	LNGU171050PNER-R	R	G	E	●	●		17.0	15.4	10.0	13.0	5.0	1.6	10.0	
	LNGU171050PNEL-R	L	G	E	●	●		17.0	15.4	10.0	13.0	5.0	1.6	10.0	
	LNGU171060PNER-R	R	G	E	●	●		17.0	15.4	10.0	13.0	6.0	1.6	10.0	
	LNGU171060PNEL-R	L	G	E	●	●		17.0	15.4	10.0	13.0	6.0	1.6	10.0	
	LNGU171070PNER-R	R	G	E	●	●		17.0	15.4	10.0	13.0	7.0	1.6	10.0	
	LNGU171070PNEL-R	L	G	E	●	●		17.0	15.4	10.0	13.0	7.0	1.6	10.0	





Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399	➤ L003
SPARE PARTS	➤ L132
CUTTING CONDITIONS	➤ L133
TECHNICAL DATA	➤ Q001

VAS300/400/500

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS300	TS304	TKY08W	MK1KS

* Clamp Torque (N • m) : TS304=1.5

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS400	TS406	TKY15T	MK1KS

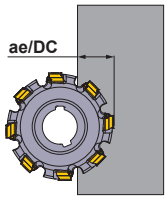
* Clamp Torque (N • m) : TS406=3.5

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS500	TS53	TKY25T	MK1KS

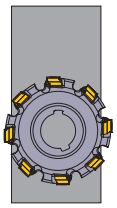
* Clamp Torque (N • m) : TS53=7.5

RECOMMENDED CUTTING CONDITIONS (DRY CUTTING)

Shoulder Milling

	Workpiece Material	Properties	Insert Grade	**vc** (m/min)	**ap** (mm)	**ae/DC**	**fz** (mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	MP6120 VP15TF	150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<30%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.15)	
	Carbon Steels Alloy Steels	Hardness 180—280HB	MP6120 VP15TF	150 (130—180)	≤2.0	≤50%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	<10%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	≤50%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.12)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	VP15TF	150 (130—180)	≤2.0	≤50%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	<10%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	≤50%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤450MPa	VP15TF	130 (110—160)	≤2.0	≤50%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	<10%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	≤50%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	<10%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	≤50%	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤800MPa	VP15TF	130 (110—160)	≤2.0	≤50%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	<10%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	≤50%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	<10%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	≤50%	0.10 (0.08—0.12)	

Face Milling (Centre Cutting)

	Workpiece Material	Properties	Insert Grade	**vc** (m/min)	**ap** (mm)	**fz** (mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	MP6120 VP15TF	150 (130—180)	≤APMX	0.10 (0.08—0.15)	
	Carbon Steels Alloy Steels	Hardness 180—280HB	MP6120 VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤450MPa	VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤800MPa	VP15TF	130 (110—160)	≤2.0	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	0.10 (0.08—0.12)	

SIDE CUTTER

90° KAPR

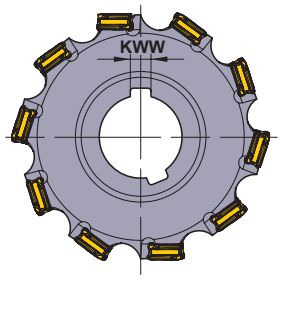
VOS400

P M **K** N S H

Cast Iron

Table Regarding Special Designs



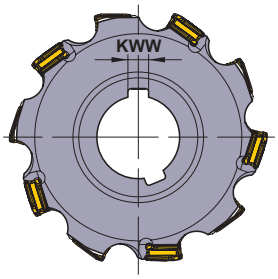


■ HALF SIDE

Max. Cutting Diameter **DC** : ø400mm

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥16	20.0	27	40	≥16.8	7	10.0
100	10	≥16	27.0	32	46	≥16.8	8	10.0
125	12	≥16	35.0	40	55	≥16.8	10	10.0
160	14	≥16	52.5	40	55	≥16.8	10	10.0





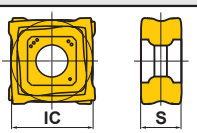
Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø400mm

■ FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)						
			LF	CW	CDX	DCON	DCSFMS	OAL	KWW
80	4	8	≥16	16 – 20	20.0	27	40	≥16	7
100	5	10	≥16	16 – 20	27.0	32	46	≥16	8
125	6	12	≥16	16 – 20	35.0	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20mm.
Note 2) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Shape	Order Number	Hand	Class	Edge Preparation	Coated	Dimensions (mm)		Geometry
					VP15TF	IC	S	
	**SONX1206PER**	R	N	E	●	12.7	6.3	
	SONX1206PEL	L	N	E	●	12.7	6.3	

Right hand insert shown.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

SIDE CUTTER

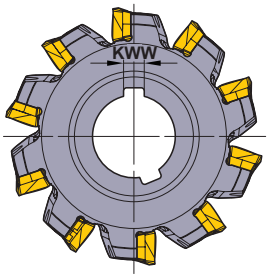
90° KAPR

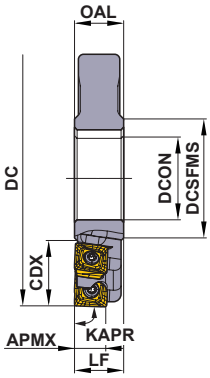
ASX400

P Steel | M Stainless Steel | K Cast Iron | N | S | H

Table Regarding Special Designs





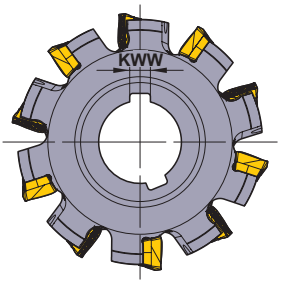


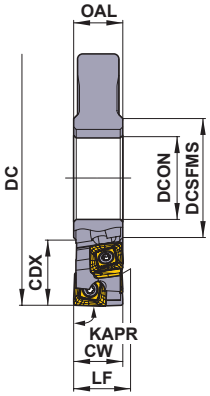
Max. Cutting Diameter **DC** : ø400mm

■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥16	20.0	27	40	≥16.8	7	10.0
100	10	≥16	27.0	32	46	≥16.8	8	10.0
125	12	≥16	35.0	40	55	≥16.8	10	10.0
160	14	≥16	52.5	40	55	≥16.8	10	10.0







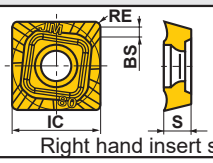
Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø400mm

■ FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)						
			LF	CW	CDX	DCON	DCSFMS	OAL	KWW
80	4	8	≥16	16 – 20	20.0	27	40	≥16	7
100	5	10	≥16	16 – 20	27.0	32	46	≥16	8
125	6	12	≥16	16 – 20	35.0	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20mm.
Note 2) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Shape	Order Number	Hand	Class	Edge Preparation	Coated VP15TF		Dimensions (mm) IC	S	BS	RE	Geometry
	**SOMT12T308PEER-JM**	R	M	E	●		12.7	3.97	1.4	0.8	
	SOMT12T308PEEL-JM	L	M	E	●		12.7	3.97	1.4	0.8	

Right hand insert shown.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

ISO13399 ➤ L003
TECHNICAL DATA ➤ Q001

MULTI-FUNCTIONAL MILLING

90° KAPR

APX3000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



- High accuracy, high-quality vertical wall.
- Low cutting force insert.

Fig.1



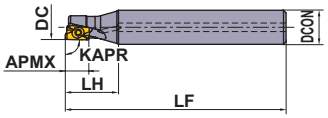


Fig.2



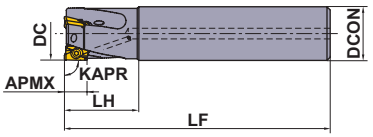
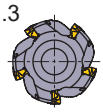
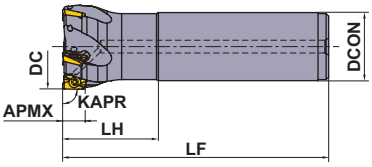


Fig.3





Right hand tool holder only.

■ SHANK TYPE

With Coolant Hole

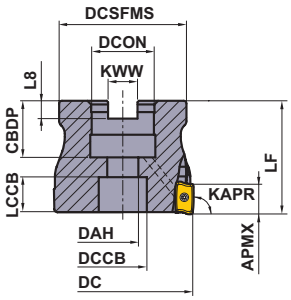
DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	LF	LH	WT (kg)	APMX (mm)	RMPX	RPMX (min-1)	Fig.	Insert Type
12	APX3000R121SA16SA	●	1	16	85	25	0.10	10	6.0°	10500	1	AO□T12
14	APX3000R141SA16SA	●	1	16	85	25	0.11	10	6.0°	9000	1	AO□T12
16	APX3000R162SA16SA	●	2	16	85	25	0.11	10	11.3°	20900	2	AO□T12
18	APX3000R182SA16SA	●	2	16	85	25	0.11	10	8.6°	19600	3	AO□T12
18	APX3000R182SA16LA	●	2	16	120	25	0.16	10	8.6°	19600	3	AO□T12
18	APX3000R182SA16ELA	●	2	16	180	25	0.25	10	8.6°	19600	3	AO□T12
20	APX3000R202SA20SA	●	2	20	100	30	0.21	10	6.9°	18500	2	AO□T12
20	APX3000R203SA20SA	●	3	20	100	30	0.21	10	6.9°	18500	2	AO□T12
20	APX3000R202SA20LA	●	2	20	150	60	0.32	10	6.9°	18500	2	AO□T12
20	APX3000R202SA20ELA	●	2	20	200	70	0.42	10	6.9°	18500	2	AO□T12
22	APX3000R223SA20SA	●	3	20	115	30	0.25	10	5.7°	17600	3	AO□T12
22	APX3000R222SA20LA	●	2	20	150	30	0.34	10	5.7°	17600	3	AO□T12
22	APX3000R222SA20ELA	●	2	20	200	30	0.45	10	5.7°	17600	3	AO□T12
25	APX3000R252SA25SA	●	2	25	115	35	0.38	10	4.6°	16400	2	AO□T12
25	APX3000R253SA25SA	●	3	25	115	35	0.38	10	4.6°	16400	2	AO□T12
25	APX3000R254SA25SA	●	4	25	115	35	0.38	10	4.6°	16400	2	AO□T12
25	APX3000R252SA25LA	●	2	25	170	70	0.51	10	4.6°	16400	2	AO□T12
25	APX3000R253SA25LA	●	3	25	170	70	0.51	10	4.6°	16400	2	AO□T12
25	APX3000R252SA25ELA	●	2	25	220	80	0.75	10	4.6°	16400	2	AO□T12
25	APX3000R253SA25ELA	●	3	25	220	80	0.75	10	4.6°	16400	2	AO□T12
28	APX3000R284SA25SA	●	4	25	115	35	0.40	10	3.8°	15500	3	AO□T12
28	APX3000R282SA25LA	●	2	25	170	35	0.61	10	3.8°	15500	3	AO□T12
28	APX3000R283SA25LA	●	3	25	170	35	0.61	10	3.8°	15500	3	AO□T12
28	APX3000R282SA25ELA	●	2	25	220	35	0.80	10	3.8°	15500	3	AO□T12
28	APX3000R283SA25ELA	●	3	25	220	35	0.79	10	3.8°	15500	3	AO□T12
30	APX3000R304SA32SA	●	4	32	125	45	0.64	10	3.4°	14900	2	AO□T12
32	APX3000R323SA32SA	●	3	32	125	45	0.68	10	3.1°	14400	2	AO□T12
32	APX3000R324SA32SA	●	4	32	125	45	0.67	10	3.1°	14400	2	AO□T12
32	APX3000R325SA32SA	●	5	32	125	45	0.68	10	3.1°	14400	2	AO□T12
32	APX3000R322SA32LA	●	2	32	190	90	1.07	10	3.1°	14400	2	AO□T12
32	APX3000R323SA32LA	●	3	32	190	90	1.05	10	3.1°	14400	2	AO□T12
32	APX3000R322SA32ELA	●	2	32	260	100	1.47	10	3.1°	14400	2	AO□T12
32	APX3000R323SA32ELA	●	3	32	260	100	1.45	10	3.1°	14400	2	AO□T12
35	APX3000R352SA32LA	●	2	32	190	45	1.12	10	2.7°	13700	3	AO□T12
35	APX3000R353SA32LA	●	3	32	190	45	1.11	10	2.7°	13700	3	AO□T12
35	APX3000R352SA32ELA	●	2	32	260	45	1.53	10	2.7°	13700	3	AO□T12
35	APX3000R353SA32ELA	●	3	32	260	45	1.52	10	2.7°	13700	3	AO□T12
40	APX3000R403SA32SA	●	3	32	125	45	0.75	10	2.2°	12800	3	AO□T12
40	APX3000R405SA32SA	●	5	32	125	45	0.75	10	2.2°	12800	3	AO□T12
40	APX3000R406SA32SA	●	6	32	125	45	0.76	10	2.2°	12800	3	AO□T12
50	APX3000R507SA32SA	●	7	32	125	45	0.90	10	1.7°	11300	3	AO□T12
63	APX3000R638SA32SA	●	8	32	125	45	1.04	10	1.3°	10000	3	AO□T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

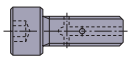
● : Inventory maintained in Japan.

Scan here for product NEWS ▶





Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
32, 40	HSC08030H	
50, 63	HSC10030H	
80	HSC12035H	
100	HSC16040H	With Coolant Hole

■ARBOR TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	RPMX (min-1)	Insert Type
32	**APX3000-032A05RA**	●	5	40	16	0.2	10	3.1°	14400	AO□T12
40	**APX3000-040A06RA**	●	6	40	16	0.3	10	2.2°	12800	AO□T12
50	**APX3000-050A07RA**	●	7	40	22	0.4	10	1.7°	11300	AO□T12
63	**APX3000-063A08RA**	●	8	40	22	0.7	10	1.3°	10000	AO□T12
80	**APX3000R08009CA**	●	9	50	25.4	1.3	10	1.0°	8800	AO□T12
80	**APX3000-080A09RA**	●	9	50	27	1.3	10	1.0°	8800	AO□T12
100	**APX3000R10011DA**	●	11	63	31.75	2.2	10	0.8°	7800	AO□T12
100	**APX3000-100A11RA**	●	11	63	32	2.2	10	0.8°	7800	AO□T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**APX3000-032A05RA**	16	18	9	14	10.22	30	8.4	5.6
40	**APX3000-040A06RA**	16	18	9	14	10.35	34	8.4	5.6
50	**APX3000-050A07RA**	22	20	11	17	12.35	45	10.4	6.3
63	**APX3000-063A08RA**	22	20	11	17	12.35	55	10.4	6.3
80	**APX3000R08009CA**	25.4	26	13	20	15.35	70	9.5	6
80	**APX3000-080A09RA**	27	23	13	20	16.35	70	12.4	7
100	**APX3000R10011DA**	31.75	32	17	26	20.35	80	12.7	8
100	**APX3000-100A11RA**	32	26	17	26	26.35	80	14.4	8

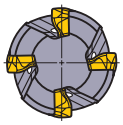
SPARE PARTS

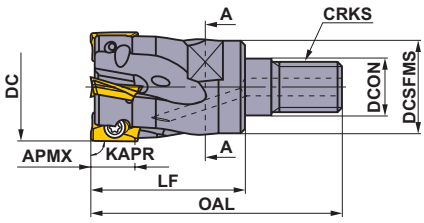
DC (mm)	Tool Holder Type	DC (mm)	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
12	**APX3000R12**	14	**APX3000R14**	TPS25	TIP07F	MK1KS
16	**APX3000R16**	18	**APX3000R18**	TPS25	TIP07F	MK1KS
20	**APX3000R20**			TPS25	TIP07F	MK1KS
22	**APX3000R22**	25	**APX3000R25**	TPS25-1	TIP07F	MK1KS
28	**APX3000R28**	30	**APX3000R30**	TPS25-1	TIP07F	MK1KS
32	**APX3000R32**	32	**APX3000-032**	TPS25-1	TIP07F	MK1KS
35	**APX3000R35**			TPS25-1	TIP07F	MK1KS
40	**APX3000R40**	40	**APX3000-040**	TPS25-1	TIP07F	MK1KS
50	**APX3000R50**	50	**APX3000-050**	TPS25-1	TIP07F	MK1KS
63	**APX3000R63**	63	**APX3000-063**	TPS25-1	TIP07F	MK1KS
80	**APX3000R080**	80	**APX3000-080**	TPS25-1	TIP07F	MK1KS
100	**APX3000R100**	100	**APX3000-100**	TPS25-1	TIP07F	MK1KS

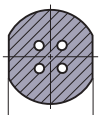
* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001









■SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX (mm)	RMPX	Insert Type
16	**APX3000R162M08A30**	●	2	8.5	13	48	30	10	M8	0.1	10	11.3°	AO□T12
18	**APX3000R182M08A30**	●	2	8.5	13	48	30	10	M8	0.1	10	8.6°	AO□T12
20	**APX3000R203M10A30**	●	3	10.5	18	49	30	14	M10	0.1	10	6.9°	AO□T12
22	**APX3000R223M10A30**	●	3	10.5	18	49	30	14	M10	0.1	10	5.7°	AO□T12
25	**APX3000R254M12A35**	●	4	12.5	21	57	35	19	M12	0.2	10	4.6°	AO□T12
28	**APX3000R284M12A35**	●	4	12.5	21	57	35	19	M12	0.2	10	3.8°	AO□T12
30	**APX3000R304M16A40**	●	4	17	29	63	40	24	M16	0.3	10	3.4°	AO□T12
32	**APX3000R325M16A40**	●	5	17	29	63	40	24	M16	0.3	10	3.1°	AO□T12
35	**APX3000R355M16A40**	●	5	17	29	63	40	24	M16	0.3	10	2.7°	AO□T12
40	**APX3000R406M16A40**	●	6	17	29	63	40	24	M16	0.3	10	2.2°	AO□T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
16	**APX3000R16**	TPS25	TIP07F	MK1KS
18	**APX3000R18**	TPS25	TIP07F	MK1KS
20	**APX3000R20**	TPS25	TIP07F	MK1KS
22	**APX3000R22**	TPS25-1	TIP07F	MK1KS
25	**APX3000R25**	TPS25-1	TIP07F	MK1KS
28	**APX3000R28**	TPS25-1	TIP07F	MK1KS
30	**APX3000R30**	TPS25-1	TIP07F	MK1KS
32	**APX3000R32**	TPS25-1	TIP07F	MK1KS
35	**APX3000R35**	TPS25-1	TIP07F	MK1KS
40	**APX3000R40**	TPS25-1	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

■CAUTION FOR USE

- Only use the inserts and parts provided by Mitsubishi Materials with this tool.
- Clamp the inserts at a specified torque of only.
- The maximum spindle speeds **RPMX** are shown in Table 1. Ensure that the cutter operates under the maximum spindle speed. The maximum spindle speeds **RPMX** for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high-speed machining–Safety requirements).

Table 1 Max. Spindle Speed RPMX

Cutting Edge Diameter **DC** (mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Spindle Speed **RPMX**(min-1)	–	–	19500	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC** (mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Spindle Speed **RPMX**(min-1)	9500	9000	7500	6000	5000	3500	3000	2500	1500

- It is recommended that flank wear does not exceed 0.3mm.

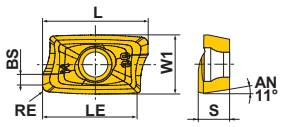
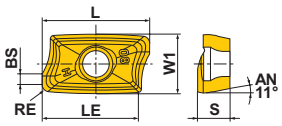
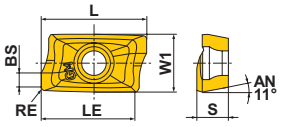
● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
	P	Steels
	M	Stainless Steels
	K	Cast Irons
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steels

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✱ : Unstable Cutting

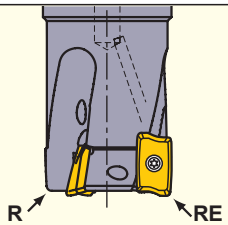
Edge Preparation :
E : Round **F** : Sharp

Shape	Order Number	Class	Edge Preparation	Coated								Carbide		Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15		L	LE	W1	S	BS	RE ✱	
General M Breaker	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.8	0.2	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	AOMT123610PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.0	1.0	
	**AOMT123612PEER-M**	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.8	1.2	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.0	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.4	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.0	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.2	
Strong Cutting Edge Type H Breaker	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	**AOMT123608PEER-H**	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	AOMT123616PEER-H	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
For Machining of Aluminium Alloys GM Breaker	**AOGT123602PEFR-GM**	G	F									●		12	10	6.6	3.6	1.8	0.2	
	AOGT123604PEFR-GM	G	F									●		12	10	6.6	3.6	1.6	0.4	
	**AOGT123608PEFR-GM**	G	F									●		12	10	6.6	3.6	1.2	0.8	

✱ Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body. For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX3000

When using inserts with corner radius RE≥R2.4mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	R (mm)
2.4	1.9
3.0	2.5
3.2	2.7

R : Holder End Radius
RE : Insert Corner Radius

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

Workpiece Material		Characteristics	Insert Grade Priority 1st	Insert Grade Priority 2nd	Breaker		ae (mm) ≤0.25DC	ae (mm) 0.25—0.5DC	ae (mm) 0.5—0.75DC	ae (mm) DC (Slot)
							vc (m/min)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	230(180—270)	220(170—260)	180(140—210)	180(140—210)
			MP6130	VP20RT	M	H	200(150—240)	190(140—230)	150(110—180)	150(110—180)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
			MP6130	VP20RT	M	H	150(110—180)	140(100—170)	110(80—130)	110(80—130)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	—	250(200—300)	240(190—290)	210(160—260)	140(110—160)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	—	130(100—150)	120(90—140)	100(80—120)	100(80—120)
N	Aluminium Alloy	—	TF15	MP9120	GM	M	500(200—1000)	500(200—1000)	500(200—1000)	500(200—1000)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	M	H	50(40—70)	—	—	50(40—70)
			MP9130	VP20RT	M	H	40(30—60)	—	—	40(30—60)
	Heat resistant Alloy	—	MP9120	VP15TF	M	H	40(30—60)	—	—	40(30—60)
			MP9130	VP20RT	M	H	30(20—40)	—	—	30(20—40)
H	Hardened Steel	40—55HRC	VP15TF	—	H	—	90(70—100)	85(60—100)	70(50—80)	70(50—80)

DEPTH OF CUT AND FEED

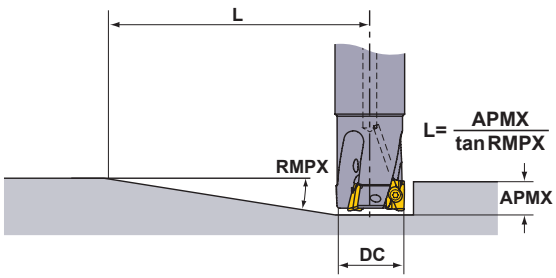
Workpiece Material		Characteristics	ae (mm)	DC ø12—ø16 Depth of Cut ap (mm)	DC ø12—ø16 Feed per Tooth fz (mm/t)	DC ø18—ø25 Depth of Cut ap (mm)	DC ø18—ø25 Feed per Tooth fz (mm/t)	DC ø28—ø100 Depth of Cut ap (mm)	DC ø28—ø100 Feed per Tooth fz (mm/t)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180—350HB	≤0.25DC	≤4	0.15	≤5	0.25	≤5	0.20
				4—7	0.10	5—7	0.20	5—7	0.15
				—	—	7—8.5	0.15	7—8.5	0.10
				—	—	8.5—10	0.10	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.25	≤3	0.20
				2—5	0.10	3—5.5	0.20	3—5.5	0.15
				—	—	5.5—8	0.15	5.5—8	0.10
				—	—	8—10	0.10	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.15	≤3	0.10
				—	—	4—10	0.10	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
M	Stainless Steel	≤270HB	≤0.25DC	≤4	0.15	≤5	0.20	≤5	0.20
				4—7	0.10	5—7	0.15	5—7	0.15
				—	—	7—8.5	0.10	7—8.5	0.10
				—	—	8.5—10	0.07	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.20	≤3	0.20
				2—5	0.10	3—5.5	0.15	3—5.5	0.15
				—	—	5.5—8	0.10	5.5—8	0.10
				—	—	8—10	0.07	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.10	≤3	0.10
				—	—	4—10	0.07	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	≤4	0.15	≤5	0.25	≤5	0.20
				4—7	0.10	5—7	0.20	5—7	0.15
				—	—	7—8.5	0.15	7—8.5	0.10
				—	—	8.5—10	0.10	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.25	≤3	0.20
				2—5	0.10	3—5.5	0.20	3—5.5	0.15
				—	—	5.5—8	0.15	5.5—8	0.10
				—	—	8—10	0.10	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.15	≤3	0.10
				—	—	4—10	0.10	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	≤4	0.10	≤5	0.20	≤5	0.20
				4—7	0.07	5—7	0.15	5—7	0.15
				—	—	7—8.5	0.10	7—8.5	0.10
				—	—	8.5—10	0.07	8.5—10	0.07
			0.25—0.5DC	≤2	0.10	≤3	0.20	≤3	0.20
				2—5	0.07	3—5.5	0.15	3—5.5	0.15
				—	—	5.5—8	0.10	5.5—8	0.10
				—	—	8—10	0.07	8—10	0.07
			0.5—0.75DC	≤4	0.07	≤4	0.10	≤3	0.10
				—	—	4—10	0.07	3—7	0.07
			DC (Slot)	≤3	0.07	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07

Workpiece Material		Characteristics	ae (mm)	DC					
				ø12—ø16		ø18—ø25		ø28—ø100	
				Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
N	Aluminium Alloy	—	≤0.25DC	≤4	0.15	≤4	0.25	≤4	0.20
				4—7	0.10	4—7	0.15	4—7	0.10
			0.25—0.5DC	≤4	0.15	≤4	0.20	≤4	0.20
				4—7	0.10	4—7	0.10	4—7	0.10
			0.5—0.75DC	≤5	0.10	≤5	0.15	≤5	0.10
			DC (Slot)	≤5	0.10	≤5	0.20	≤5	0.15
S	Titanium Alloy	≤350HB	≤0.25DC	≤4	0.15	≤4	0.15	≤4	0.10
				4—7	0.10	4—7	0.10	4—7	0.07
			0.25—0.5DC	≤3	0.05	≤3	0.05	≤3	0.05
	Heat resistant Alloy	—	0.5—0.75DC	≤2	0.10	≤2	0.05	≤2	0.05
			DC (Slot)	≤1	0.05	≤1	0.05	≤1	0.05
H	Hardened Steel	40—55HRC	≤0.25DC	≤4	0.10	≤5	0.15	≤5	0.15
				4—7	0.07	5—7	0.10	5—7	0.10
				—	—	7—8.5	0.07	—	—
			0.25—0.5DC	≤2	0.10	≤3	0.15	≤3	0.15
				2—5	0.07	3—5.5	0.10	—	—
			0.5—0.75DC	≤4	0.07	≤4	0.07	≤3	0.07
			DC (Slot)	≤3	0.07	≤4	0.07	≤3	0.07

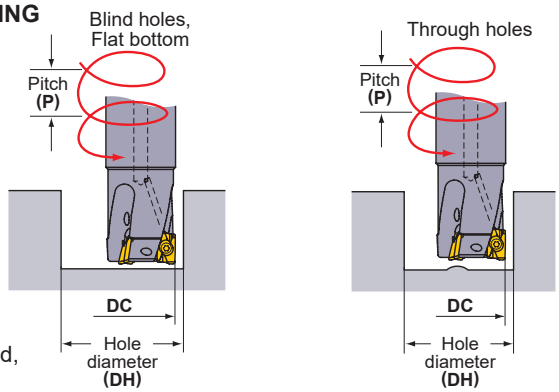
Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING



Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

Cutting Edge Diameter DC(mm)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle RMPX	Minimum Distance ∗1 L(mm)	Maximum Hole Diameter∗2 DH max.(mm)	Maximum Pitch P max.(mm)	Minimum Hole Diameter DH min.(mm)	Maximum Pitch P max.(mm)	Minimum Hole Diameter DH min.(mm)	Maximum Pitch P max.(mm)
12	6.0°	95	22	2.5	20.5	2	14	0.5
14	6.0°	95	26	2.5	24.5	2	18	1
16	11.3°	50	30	9	28	7	21	2
18	8.6°	66	34	5	32	4.5	25	2
20	6.9°	83	38	5	36	4.5	29	2
22	5.7°	100	42	5	40	4.5	33	2
25	4.6°	124	48	6	46	5	39	3
28	3.8°	151	54	4.5	52	4	45	2
30	3.4°	168	58	4.5	56	4	49	2
32	3.1°	185	62	4.5	60	4	53	2
35	2.7°	212	68	4	66	3.5	59	2
40	2.2°	260	78	4	76	3.5	69	2
50	1.7°	337	98	2	96	2	89	2
63	1.3°	441	124	2	122	2	115	2
80	1.0°	573	158	2	156	2	149	2
100	0.8°	716	198	1	196	1	189	1

Note 1) When machining highly ductile materials with ramping angles above, chips can become long.
In this case, decrease the ramping angle or feed per tooth.
∗1 L (=10 / tan RMPX). Cutters' moving distance until depth of cut reaches 10mm at a maximum ramping angle.
∗2 In case corner radius of 0.8mm. Find other sizes with the formula below.
{(cutting edge diameter DC)—(corner radius)—0.2)}×2

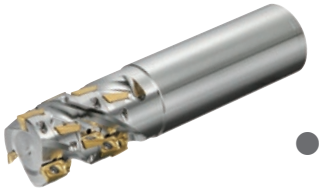
DEEP SHOULDER MILLING

90° KAPR

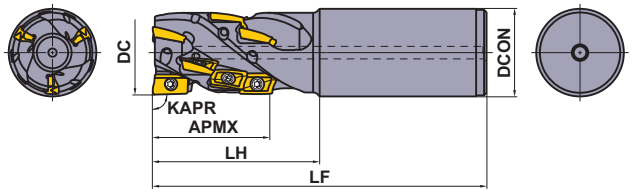
APX3000

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	



- High accuracy, high-quality vertical wall.
- Low cutting force insert.



Right hand tool holder only.

■SHANK TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Flutes	Total	Dimensions(mm)			WT (kg)	APMX (mm)	
		R				DCON	LF	LH			Insert Type
20	**APX3KR2004SN20S028A**	●	–	1	4	20	125	45	0.27	28	AO□T12
25	**APX3KR2506SA25S028A**	●	○	2	6	25	125	45	0.40	28	AO□T12
25	**APX3KR2508SA25M037A**	●	○	2	8	25	130	50	0.41	37	AO□T12
32	**APX3KR3208SA32S037A**	●	○	2	8	32	130	50	0.70	37	AO□T12
32	**APX3KR3210SA32M046A**	●	○	2	10	32	140	60	0.74	46	AO□T12
32	**APX3KR3212SA32S037A**	●	○	3	12	32	130	50	0.67	37	AO□T12
32	**APX3KR3215SA32M046A**	●	○	3	15	32	140	60	0.71	46	AO□T12
40	**APX3KR4015SA42S046A**	●	○	3	15	42	140	60	1.24	46	AO□T12
40	**APX3KR4018SA42M055A**	●	○	3	18	42	150	70	1.31	55	AO□T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L144.
Note 2) Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Inserts RE 0.2mm and 0.4mm can also be used.

SPARE PARTS

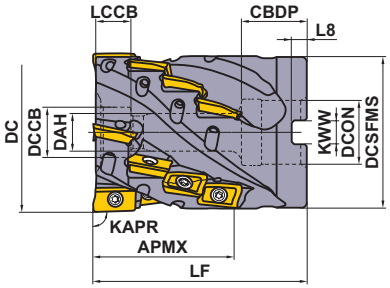
DC (mm)	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
20	**APX3KR20**	TPS25	TIP07F	MK1KS
25	**APX3KR25**	TPS25-1	TIP07F	MK1KS
32	**APX3KR32**	TPS25-1	TIP07F	MK1KS
40	**APX3KR40**	TPS25-1	TIP07F	MK1KS
40	**APX3K-040**	TPS25-1	TIP07F	MK1KS
50	**APX3K-050**	TPS25-1	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

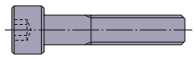
● : Inventory maintained in Japan.

Scan here for product NEWS ▶



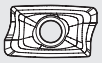


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
40	HSC08040	
50	HSC10045	

■ SHELL TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	
		R			LF	DCON			Insert Type
40	**APX3K-040A16A037RA**	●	4	16	50	16	0.25	37	AO□T12
50	**APX3K-050A20A046RA**	●	4	20	60	22	0.54	46	AO□T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L144.
Note 2) Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Inserts RE 0.2mm and 0.4mm can also be used.
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**APX3K-040A16A037RA**	16	18	9	14	9.9	38.5	8.4	5.6
50	**APX3K-050A20A046RA**	22	20	11	17	11.9	48.4	10.4	6.3

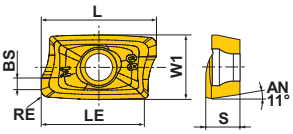
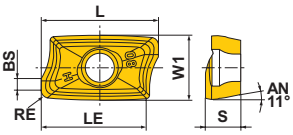
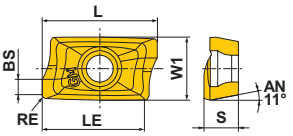
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
N	Non-ferrous Metals	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

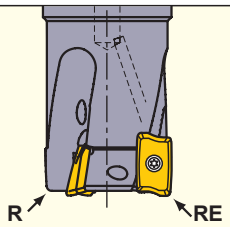
Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated								Carbide		Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15		L	LE	W1	S	BS	RE*	
General M Breaker	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.8	0.2	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	AOMT123610PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.0	1.0	
	**AOMT123612PEER-M**	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.8	1.2	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.0	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.4	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.0	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.2	
Strong Cutting Edge Type H Breaker	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-H	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	**AOMT123616PEER-H**	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
For Machining of Aluminium Alloys GM Breaker	**AOGT123602PEFR-GM**	G	F									●		12	10	6.6	3.6	1.8	0.2	
	AOGT123604PEFR-GM	G	F									●		12	10	6.6	3.6	1.6	0.4	
	**AOGT123608PEFR-GM**	G	F									●		12	10	6.6	3.6	1.2	0.8	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body. For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX3000

When using inserts with corner radius RE≥R2.4mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	R (mm)
2.4	1.9
3.0	2.5
3.2	2.7

R : Holder End Radius
RE : Insert Corner Radius

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

Cutting Speed

Workpiece Material		Insert Grade Priority 1st	Insert Grade Priority 2nd	Breaker		ae (mm) ≤0.25DC	ae (mm) 0.25—0.75DC	ae (mm) DC (Slot)
						vc (m/min)		
P	Mild Steels	MP6120	VP15TF	M	H	180(140—220)	150(110—180)	120(100—140)
		MP6130	VP20RT	M	H	160(120—200)	130(100—160)	100(80—120)
	Carbon Steels Alloy Steels, Alloy Tool Steels	MP6120	VP15TF	M	H	150(100—200)	120(90—150)	100(80—120)
		MP6130	VP20RT	M	H	130(90—170)	90(70—110)	80(60—100)
	Pre-hardened Steels	MP6120	VP15TF	M	H	120(80—160)	100(70—130)	90(50—120)
		MP6130	VP20RT	M	H	100(70—130)	90(60—120)	70(50—100)
M	Stainless Steels	MP7130	—	M	—	150(120—180)	120(100—140)	100(80—120)
K	Gray Cast Irons	MC5020	—	H	—	200(150—250)	180(150—210)	—
		VP15TF	—	M	H	180(120—240)	150(100—200)	100(60—140)
	Ductile Cast Irons	VP15TF	—	M	H	160(120—200)	140(100—180)	80(60—100)
N	Aluminium Alloys	TF15	MP9120	GM	M	400(200—800)	400(200—800)	400(200—800)
S	Titanium Alloys	MP9130	—	M	—	40(30—60)	—	40(30—60)
		MP9120	—	M	—	50(40—70)	—	50(40—70)
	Heat Resistant Alloys	MP9120	VP15TF	M	H	40(30—60)	—	40(30—60)
		MP9130	VP20RT	M	H	30(20—40)	—	30(20—40)

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	ae (mm)	DC (mm) ø20 ap (mm)	DC (mm) ø20 fz (mm/t)	DC (mm) ø25 ap (mm)	DC (mm) ø25 fz (mm/t)	DC (mm) ø32—ø50 ap (mm)	DC (mm) ø32—ø50 fz (mm/t)
P	Mild Steels	≤180HB	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	≤28	0.12	≤37	0.15	≤55	0.17
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Carbon Steels Alloy Steels	180—280HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Tool Alloy Steels	≤350HB (Annealing)	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Pre-hardened Steels	35—45HRC	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
M	Ferritic and Martensitic Stainless Steels	—	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Duplex Stainless Steels	≤280HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Precipitation-Hardening Stainless Steel	<450HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	≤28	0.12	≤37	0.15	≤55	0.17
			DC (Slot)	≤18	0.1	≤18	0.1	≤18	0.1
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
N	Aluminium Alloys	—	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	—	—	≤9	0.17	≤9	0.2
			DC (Slot)	—	—	≤9	0.17	≤9	0.2
S	Titanium Alloys	≤350HB	≤0.25DC	≤28	0.1	≤37	0.1	≤55	0.1
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤18	0.06	≤18	0.06	≤18	0.06
	Heat Resistant Alloys	—	≤0.25DC	≤28	0.08	≤37	0.08	≤55	0.08
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤18	0.05	≤18	0.05	≤18	0.05

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece materials, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

MULTI-FUNCTIONAL MILLING

APX4000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



- **High accuracy, high-quality vertical wall.**
- **Low cutting force insert.**

Fig.1



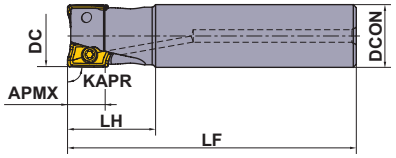
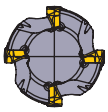
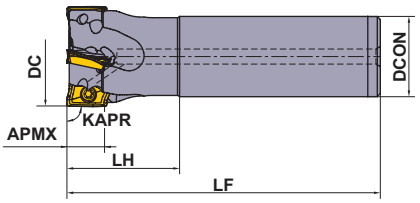


Fig.2





Right hand tool holder only.

■ SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	LF	LH	WT (kg)	APMX (mm)	RMPX	RPMX (min-1)	Fig.	Insert Type
25	**APX4000R252SA25SA**	●	2	25	115	35	0.40	15	11.0°	18900	1	AO□T18
25	**APX4000R252SA25LA**	●	2	25	170	35	0.61	15	11.0°	18900	1	AO□T18
25	**APX4000R252SA25ELA**	●	2	25	220	80	0.76	15	11.0°	18900	1	AO□T18
28	**APX4000R282SA25LA**	●	2	25	170	35	0.63	15	9.0°	17700	2	AO□T18
28	**APX4000R282SA25ELA**	●	2	25	220	35	0.81	15	9.0°	17700	2	AO□T18
32	**APX4000R322SA32SA**	●	2	32	125	45	0.71	15	7.0°	16300	1	AO□T18
32	**APX4000R323SA32SA**	●	3	32	125	45	0.71	15	7.0°	16300	1	AO□T18
32	**APX4000R322SA32LA**	●	2	32	190	45	1.11	15	7.0°	16300	1	AO□T18
32	**APX4000R323SA32LA**	●	3	32	190	45	1.11	15	7.0°	16300	1	AO□T18
32	**APX4000R322SA32ELA**	●	2	32	260	100	1.49	15	7.0°	16300	1	AO□T18
32	**APX4000R323SA32ELA**	●	3	32	260	100	1.49	15	7.0°	16300	1	AO□T18
35	**APX4000R352SA32LA**	●	2	32	190	45	1.14	15	6.0°	15400	2	AO□T18
35	**APX4000R353SA32LA**	●	3	32	190	45	1.14	15	6.0°	15400	2	AO□T18
35	**APX4000R352SA32ELA**	●	2	32	260	45	1.57	15	6.0°	15400	2	AO□T18
35	**APX4000R353SA32ELA**	●	3	32	260	45	1.57	15	6.0°	15400	2	AO□T18
40	**APX4000R403SA32SA**	●	3	32	125	45	0.80	15	6.0°	14200	2	AO□T18
40	**APX4000R404SA32SA**	●	4	32	125	45	0.80	15	6.0°	14200	2	AO□T18
40	**APX4000R402SA32LA**	●	2	32	190	45	1.19	15	6.0°	14200	2	AO□T18
40	**APX4000R403SA32LA**	●	3	32	190	45	1.19	15	6.0°	14200	2	AO□T18
40	**APX4000R404SA32LA**	●	4	32	190	45	1.19	15	6.0°	14200	2	AO□T18
40	**APX4000R402SA32ELA**	●	2	32	260	45	1.62	15	6.0°	14200	2	AO□T18
40	**APX4000R403SA32ELA**	●	3	32	260	45	1.62	15	6.0°	14200	2	AO□T18
40	**APX4000R404SA32ELA**	●	4	32	260	45	1.62	15	6.0°	14200	2	AO□T18
50	**APX4000R504SA32SA**	●	4	32	125	45	0.93	15	4.0°	12400	2	AO□T18
50	**APX4000R505SA32SA**	●	5	32	125	45	0.93	15	4.0°	12400	2	AO□T18
63	**APX4000R634SA32SA**	●	4	32	125	45	1.15	15	3.0°	10800	2	AO□T18
63	**APX4000R636SA32SA**	●	6	32	125	45	1.15	15	3.0°	10800	2	AO□T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

SPARE PARTS

DC (mm)	Tool Holder Type	DC (mm)	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
25	**APX4000R25**	28	**APX4000R28**	TPS4	TIP15W	MK1KS
32	**APX4000R32**	35	**APX4000R35**	TPS4	TIP15W	MK1KS
40	**APX4000R40**	40	**APX4000-040**	TPS43	TIP15W	MK1KS
50	**APX4000R50**	50	**APX4000-050**	TPS43	TIP15W	MK1KS
63	**APX4000R63**	63	**APX4000-063**	TPS43	TIP15W	MK1KS
80	**APX4000R080**	80	**APX4000-080**	TPS43	TIP15W	MK1KS
100	**APX4000R100**	100	**APX4000-100**	TPS43	TIP15W	MK1KS
125	**APX4000R125**	125	**APX4000-125**	TPS43	TIP15W	MK1KS
160	**APX4000R160**	160	**APX4000-160**	TPS43	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS4 = 4.0, TPS43 = 4.0

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶



Fig.1

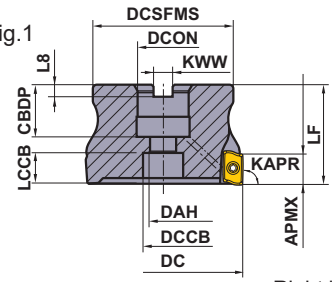
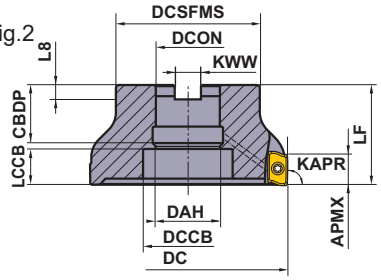
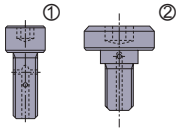


Fig.2



Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
40	HSC08030H	①
50, 63	HSC10030H	
80	HSC12035H	
100	HSC16040H	
125	MBA20040H	②
160	MBA24045H	



With Coolant Hole

■ARBOR TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	RPMX (min-1)	Fig.	Insert Type
40	**APX4000-040A04RA**	●	4	40	16	0.2	15	6.0°	14200	1	AO□T18
50	**APX4000-050A05RA**	●	5	40	22	0.3	15	4.0°	12400	1	AO□T18
63	**APX4000-063A06RA**	●	6	40	22	0.5	15	3.0°	10800	1	AO□T18
80	**APX4000R08007CA**	●	7	50	25.4	1.2	15	2.0°	9300	1	AO□T18
80	**APX4000-080A07RA**	●	7	50	27	1.2	15	2.0°	9300	1	AO□T18
100	**APX4000R10008DA**	●	8	63	31.75	2.1	15	1.5°	8100	1	AO□T18
100	**APX4000-100A08RA**	●	8	50	32	2.1	15	1.5°	8100	1	AO□T18
125	**APX4000R12509EA**	●	9	63	38.1	3.3	15	1.0°	7100	2	AO□T18
125	**APX4000-125A09RA**	●	9	63	40	3.3	15	1.0°	7100	2	AO□T18
160	**APX4000-160A10RA**	●	10	63	40	4.8	15	1.0°	6100	2	AO□T18
160	**APX4000R16010FA**	●	10	63	50.8	4.8	15	1.0°	6100	2	AO□T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

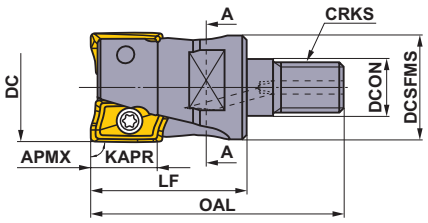
Mounting Dimensions

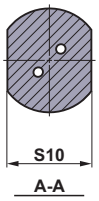
DC (mm)	Order Number	Dimensions(mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**APX4000-040A04RA**	16	18	9	14	10.08	34	8.4	5.6
50	**APX4000-050A05RA**	22	20	11	17	12.26	45	10.4	6.3
63	**APX4000-063A06RA**	22	20	11	17	12.35	50	10.4	6.3
80	**APX4000R08007CA**	25.4	26	13	20	15.35	70	9.5	6
80	**APX4000-080A07RA**	27	23	13	20	15.35	60	12.4	7
100	**APX4000R10008DA**	31.75	32	17	26	20.35	80	12.7	8
100	**APX4000-100A08RA**	32	26	17	27	17.35	70	14.4	8
125	**APX4000R12509EA**	38.1	40	40	56	22.35	100	15.9	10
125	**APX4000-125A09RA**	40	40	42	56	22.35	90	16.4	9
160	**APX4000-160A10RA**	40	40	42	72	22.35	100	16.4	9
160	**APX4000R16010FA**	50.8	40	53	72	19.35	100	19.1	11

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001









Right hand tool holder only.

■ SCREW-IN TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX (mm)	RMPX	Insert Type
25	**APX4000R252M12A35**	●	2	12.5	23.5	57	35	19	M12	0.2	15	11.0°	AO□T18
28	**APX4000R282M12A35**	●	2	12.5	23.5	57	35	19	M12	0.2	15	9.0°	AO□T18
32	**APX4000R322M16A40**	●	2	17	28.5	63	40	24	M16	0.3	15	7.0°	AO□T18
32	**APX4000R323M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	7.0°	AO□T18
35	**APX4000R352M16A40**	●	2	17	28.5	63	40	24	M16	0.3	15	6.0°	AO□T18
35	**APX4000R353M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	6.0°	AO□T18
40	**APX4000R403M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	6.0°	AO□T18
40	**APX4000R404M16A40**	●	4	17	28.5	63	40	24	M16	0.3	15	6.0°	AO□T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

DC (mm)	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
25	**APX4000R25**	TPS4	TIP15W	MK1KS
28	**APX4000R28**	TPS4	TIP15W	MK1KS
32	**APX4000R32**	TPS4	TIP15W	MK1KS
35	**APX4000R35**	TPS4	TIP15W	MK1KS
40	**APX4000R40**	TPS43	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS4 = 4.0, TPS43 = 4.0

■ CAUTION FOR USE

- Only use the inserts and parts provided by Mitsubishi Materials with this tool.
- Clamp the inserts at a specified torque of only.
- The maximum spindle speeds **RPMX** are shown in Table 1. Ensure that the cutter operates under the maximum spindle speed.
  The maximum spindle speeds **RPMX** for safety purposes are determined in accordance with ISO15641
  (Milling Cutters for high-speed machining–Safety requirements).

Table 1 Max. Spindle Speed RPMX

Cutting Edge Diameter **DC** (mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Spindle Speed **RPMX**(min-1)	–	–	19500	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC** (mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Spindle Speed **RPMX**(min-1)	9500	9000	7500	6000	5000	3500	3000	2500	1500

- It is recommended that flank wear does not exceed 0.3mm.

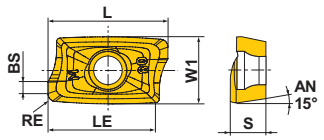
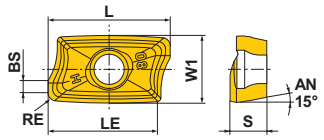
● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
	P	Steels
	M	Stainless Steels
	K	Cast Irons
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steels

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

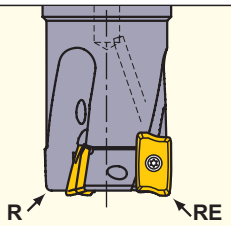
Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	L	LE	W1	S	BS	RE *	
General M Breaker	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184810PEER-M	M	E		●			●	●	●		18	15	9	4.8	1.0	1.0	
	**AOMT184812PEER-M**	M	E		●			●	●	●		18	15	9	4.8	0.8	1.2	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184820PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.4	2.0	
Strong Cutting Edge Type H Breaker	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184832PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	3.2	
	**AOMT184840PEER-H**	M	E			●	●				●	18	15	9	4.8	0.4	4.0	
	AOMT184850PEER-H	M	E			●	●				●	18	15	9	4.8	–	5.0	
	AOMT184864PEER-H	M	E			●	●				●	18	15	9	4.8	–	6.35	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body. For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX4000

When using inserts with corner radius RE≥R3.2mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	R (mm)
3.2	2.0
4.0	2.5
5.0	3.5
6.35	5.0

R : Holder End Radius
RE : Insert Corner Radius

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

Workpiece Material		Characteristics	Insert				ae (mm)			
			Grade Priority		Breaker		≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC (Slot)
			1st	2nd			Cutting Speed **vc** (m/min)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	230(180—270)	220(170—260)	180(140—210)	180(140—210)
			MP6130	VP20RT	M	H	200(150—240)	190(140—230)	150(110—180)	150(110—180)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
			MP6130	VP20RT	M	H	150(110—180)	140(100—170)	110(80—130)	110(80—130)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	–	250(200—300)	240(190—290)	210(160—260)	140(110—160)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	–	130(100—150)	120(90—140)	100(80—120)	100(80—120)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	50(40—70)	–	–	50(40—70)
			MP9130	VP20RT	H	M	40(30—60)	–	–	40(30—60)
	Heat resistant Alloy	–	MP9120	VP15TF	H	M	40(30—60)	–	–	40(30—60)
			MP9130	VP20RT	H	M	30(20—40)	–	–	30(20—40)
H	Hardened Steel	40—55HRC	VP15TF	–	H	–	90(70—100)	85(60—100)	70(50—80)	70(50—80)

DEPTH OF CUT AND FEED PER TOOTH

Workpiece Material		Characteristics	**ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)		
					Cutter Diameter **DC** (mm)		
					ø25—ø40	**ø50—ø80**	**ø100—ø160**
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180—350HB	≤0.5DC	≤5	0.30	0.30	0.25
				5—7.5	0.25	0.25	0.20
				7.5—10	0.20	0.20	0.15
				10—12.5	0.15	0.15	0.10
				12.5—15	0.10	0.10	0.07
			0.5—0.75DC	≤5	0.20	0.20	0.15
				5—10	0.15	0.15	0.10
				10—15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07
M	Stainless Steel	≤270HB	≤0.5DC	≤5	0.30	0.25	0.25
				5—7.5	0.25	0.20	0.20
				7.5—10	0.20	0.15	0.15
				10—12.5	0.15	0.10	0.10
				12.5—15	0.10	0.07	0.07
			0.5—0.75DC	≤5	0.20	0.15	0.15
				5—10	0.15	0.10	0.10
				10—15	0.10	0.07	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.5DC	≤5	0.30	0.30	0.25
				5—7.5	0.25	0.25	0.20
				7.5—10	0.20	0.20	0.15
				10—12.5	0.15	0.15	0.10
				12.5—15	0.10	0.10	0.07
			0.5—0.75DC	≤5	0.20	0.20	0.15
				5—10	0.15	0.15	0.10
				10—15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.5DC	≤5	0.25	0.25	0.25
				5—7.5	0.20	0.20	0.20
				7.5—10	0.15	0.15	0.15
				10—12.5	0.10	0.10	0.10
				12.5—15	0.07	0.07	0.07
			0.5—0.75DC	≤5	0.20	0.20	0.15
				5—10	0.15	0.15	0.10
				10—15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07

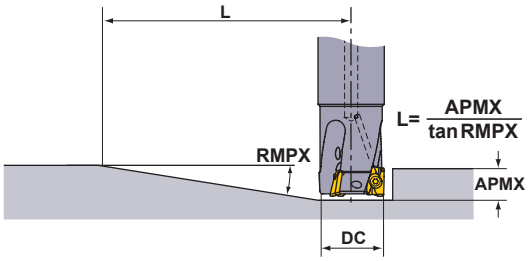
Workpiece Material		Characteristics	**ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t) Cutter Diameter **DC** (mm)		
					ø25—ø40	**ø50—ø80**	**ø100—ø160**
S	Titanium Alloy	≤350HB	≤0.25DC	≤5	0.15	0.10	0.10
				5—7.5	0.10	0.05	0.05
				7.5—10	0.05	—	—
			DC (Slot)	≤5	0.05	0.05	0.05
	Heat resistant Alloy	—	≤0.25DC	≤2	0.10	0.05	0.05
			DC (Slot)	≤1	0.05	0.05	0.05
H	Hardened Steel	40—55HRC	≤0.25DC	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07
			0.25—0.5DC	≤5	0.10	0.10	0.10
				5—7.5	0.07	0.07	0.07
			0.5—0.75DC	≤5	0.07	0.07	0.07
			DC (Slot)	≤5	0.07	0.07	0.07

Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

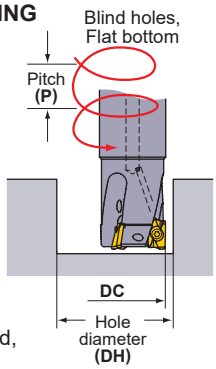
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

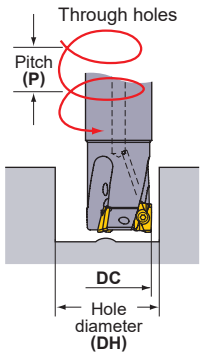
RAMPING/HELICAL CUTTING

● **RAMPING**



● **HELICAL CUTTING**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

Cutting Edge Diameter **DC** (mm)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance ✱1 **L** (mm)	Maximum Hole Diameter ✱2 **DH max.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)
25	11°	85	48	14	45	12	32	4
28	9°	105	54	12	51	11	38	4
32	7°	135	62	11	59	10	46	5
35	6°	158	68	10	65	9	52	5
40	6°	158	78	12	75	11	62	7
50	4°	238	98	10	95	9	82	7
63	3°	318	124	10	121	9	108	7
80	2°	477	158	8	155	8	142	6
100	1.5°	636	198	8	195	7	182	6
125	1°	954	248	6	245	6	232	5
160	1°	954	318	8	315	8	302	7

Note 1) When machining highly ductile materials with ramping angles above, chips can become long.
In this case, decrease the ramping angle or feed per tooth.
✱1 L (=15 / tan RMPX). Cutters' moving distance until depth of cut reaches 15mm at a maximum ramping angle.
✱2 In case corner radius of 0.8mm. Find other sizes with the formula below.
{(cutting edge diameter DC)—(corner radius)—0.2}×2

DEEP SHOULDER MILLING

APX4000

P Steel | M Stainless Steel | K Cast Iron | N | S Heat Resistant Alloy | H



- High accuracy, high-quality vertical wall.
- Low cutting force insert.

LONG CUTTING EDGE

Fig.1

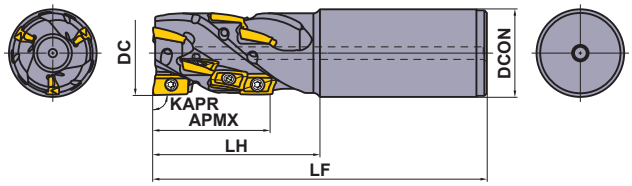
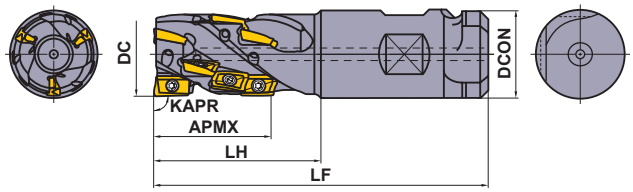


Fig.2



■SHANK TYPE

With Coolant Hole

Right hand tool holder only.

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) DCON	LF	LH	WT (kg)	APMX (mm)	Fig.	Insert Type
40	**APX4KR4008SA42S056A**	●	2	8	42	160	80	1.54	56	1	AO□T18
40	**APX4KR4012SA42S056A**	●	3	12	42	160	80	1.54	56	1	AO□T18
50	**APX4KR5012WA508S056A**	●	3	12	50.8	160	80	1.76	56	2	AO□T18
50	**APX4KR5018WA508M084A**	●	3	18	50.8	190	110	2.18	84	2	AO□T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L154.
Note 2) Only corner radius RE 0.4mm and 0.8mm can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).

SPARE PARTS

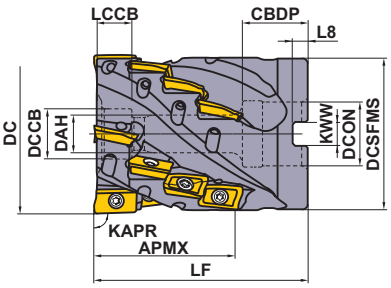
*		
		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS43	TIP15W	MK1KS

∗ Clamp Torque (N • m) : TPS43 = 4.0

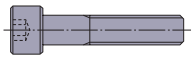
● : Inventory maintained in Japan.

Scan here for product NEWS ▶



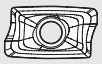


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
50	HSC10050	
63	HSC12070	

■ SHELL TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	
		R			LF	DCON			Insert Type
50	**APX4K-050A09A042RA**	●	3	9	65	22	0.75	42	AO□T18
63	**APX4KR06316CA056A**	●	4	16	85	25.4	1.66	56	AO□T18
63	**APX4K-063A16A056RA**	●	4	16	85	27	1.63	56	AO□T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L154.
Note 2) Only corner radius RE 0.4mm and 0.8mm can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**APX4K-050A09A042RA**	22	22	11	17	12.5	48	10.4	6.3
63	**APX4KR06316CA056A**	25.4	26	13	20	14	60.7	9.5	6
63	**APX4K-063A16A056RA**	27	28	13	20	14	60.7	12.4	7

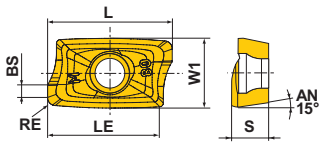
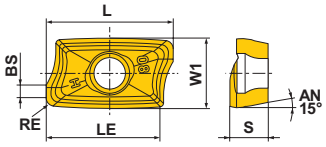
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

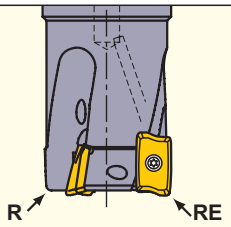
Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	L	LE	W1	S	BS	RE *	
General M Breaker	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184810PEER-M	M	E		●			●	●	●		18	15	9	4.8	1.0	1.0	
	**AOMT184812PEER-M**	M	E		●			●	●	●		18	15	9	4.8	0.8	1.2	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184820PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.4	2.0	
Strong Cutting Edge Type H Breaker	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184832PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	3.2	
	**AOMT184840PEER-H**	M	E			●	●				●	18	15	9	4.8	0.4	4.0	
	AOMT184850PEER-H	M	E			●	●				●	18	15	9	4.8	–	5.0	
	AOMT184864PEER-H	M	E			●	●				●	18	15	9	4.8	–	6.35	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body. For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX4000

When using inserts with corner radius RE≥R3.2mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	R (mm)
3.2	2.0
4.0	2.5
5.0	3.5
6.35	5.0

R : Holder End Radius
RE : Insert Corner Radius

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

Workpiece Material		Hardness	Insert Grade 1st Recommendation	Insert Grade 2nd Recommendation	Breaker		Cutting Width **ae** (mm) ≤0.15DC	0.15—0.3DC	DC (Slot)
							Cutting Speed **vc** (m/min)		
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	200(160—250)	160(120—200)	140(120—160)
			MP6130	VP20RT	M	H	170(130—220)	130(90—170)	110(90—130)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	160(120—200)	120(100—140)	100(80—120)
			MP6130	VP20RT	M	H	130(90—170)	90(70—110)	70(50—90)
M	Stainless Steel	≤270HB	MP7130	VP15TF	M	H	160(120—200)	120(100—140)	100(80—120)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	—	230(180—280)	190(140—240)	190(140—240)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	—	190(140—220)	170(120—220)	170(120—220)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	50(40—70)	—	50(40—70)
			MP9130	VP20RT	H	M	40(30—60)	—	40(30—60)
	Heat resistant Alloy	—	MP9120	VP15TF	H	M	40(30—60)	—	40(30—60)
			MP9130	VP20RT	H	M	30(20—40)	—	30(20—40)

■ DEPTH OF CUT AND FEED

Workpiece Material		Characteristics	Depth of Cut **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t) Cutter Diameter **DC** (mm) ø40 Length of cut 56mm ø50 Length of cut 42mm	ø50 Length of cut 56mm ø63 Length of cut 56mm	ø50 Length of cut 84mm
P	Mild Steel	≤180HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤20	0.20	0.20	0.15
				20—50	0.15	0.15	—
	Carbon Steel Alloy Steel	180—350HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤20	0.15	0.15	0.10
				20—50	0.10	0.10	—
M	Stainless Steel	≤270HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤10	0.10	0.10	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.15DC	≤10	0.30	0.30	0.25
				10—50	0.25	0.25	0.20
				50—80	—	—	0.15
			0.15—0.3DC	≤10	0.25	0.25	0.20
				10—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤10	0.25	0.25	0.20
				10—50	0.20	0.20	0.15
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.15DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			0.15—0.3DC	≤20	0.20	0.20	0.15
				20—50	0.15	0.15	0.10
				50—80	—	—	0.07
			DC (Slot)	≤10	0.15	0.15	0.10
				10—50	0.10	0.10	—
S	Titanium Alloy	≤350HB	≤0.15DC	≤20	0.10	0.10	—
				20—50	0.10	0.10	—
			DC (Slot)	≤50	0.08	0.08	—
	Heat resistant Alloy	—	≤0.15DC	≤10	0.07	0.07	—
			DC (Slot)	≤20	0.05	0.05	—

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX200

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



Fig.1



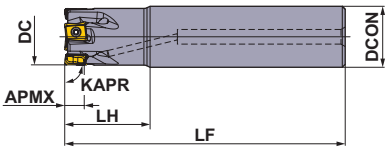
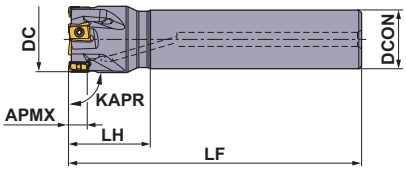


Fig.2





Right hand tool holder only.

■SHANK TYPE

With Coolant Hole

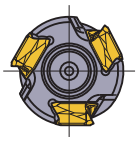
DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	LF	LH	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	WT (kg)	Fig.	Insert Type
16	**VPX200R1602SA16S**	●	2	16	85	25	8	1.85°	37900	0.11	1	LOGU09
18	**VPX200R1802SA16S**	●	2	16	85	25	8	1.56°	35300	0.12	2	LOGU09
18	**VPX200R1802SA16L**	●	2	16	120	25	8	1.56°	35300	0.17	2	LOGU09
20	**VPX200R2002SA16S**	●	2	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2003SA16S**	●	3	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2002SA20S**	●	2	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2003SA20S**	●	3	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2002SA20L**	●	2	20	150	60	8	1.35°	33200	0.32	1	LOGU09
22	**VPX200R2202SA20S**	●	2	20	115	30	8	1.16°	31400	0.26	2	LOGU09
22	**VPX200R2203SA20S**	●	3	20	115	30	8	1.16°	31400	0.25	2	LOGU09
22	**VPX200R2202SA20L**	●	2	20	150	30	8	1.16°	31400	0.34	2	LOGU09
25	**VPX200R2503SA20S**	●	3	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2504SA20S**	●	4	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2503SA25S**	●	3	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2504SA25S**	●	4	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2503SA25L**	●	3	25	170	70	8	0.97°	29000	0.57	1	LOGU09
28	**VPX200R2803SA25S**	●	3	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2804SA25S**	●	4	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2803SA25L**	●	3	25	170	35	8	0.84°	27200	0.61	2	LOGU09
30	**VPX200R3003SA25S**	●	3	25	125	35	8	0.77°	26000	0.46	2	LOGU09
30	**VPX200R3004SA25S**	●	4	25	125	35	8	0.77°	26000	0.46	2	LOGU09
32	**VPX200R3203SA32S**	●	3	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3204SA32S**	●	4	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3205SA32S**	●	5	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3203SA32L**	●	3	32	190	90	8	0.71°	25100	1.06	1	LOGU09
35	**VPX200R3503SA32L**	●	3	32	190	45	8	0.63°	23800	1.14	2	LOGU09
40	**VPX200R4004SA32S**	●	4	32	125	45	8	0.54°	22000	0.81	2	LOGU09
40	**VPX200R4006SA32S**	●	6	32	125	45	8	0.54°	22000	0.80	2	LOGU09
50	**VPX200R5005SA32S**	●	5	32	125	45	8	0.42°	19200	0.91	2	LOGU09
50	**VPX200R5007SA32S**	●	7	32	125	45	8	0.42°	19200	0.91	2	LOGU09

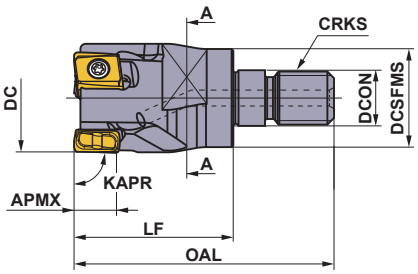
Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

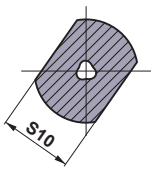
● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶









A-A Section

Right hand tool holder only.

■ SCREW-IN TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	Insert Type
		R		DCON	DCSFMS	OAL	LF	S10	CRKS				
16	**VPX200R1602AM0830**	●	2	8.5	14.5	48	30	10	M08	0.03	8	1.85°	LOGU09
18	**VPX200R1802AM0830**	●	2	8.5	14.5	48	30	10	M08	0.04	8	1.56°	LOGU09
20	**VPX200R2002AM1030**	●	2	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
20	**VPX200R2003AM1030**	●	3	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
22	**VPX200R2202AM1030**	●	2	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
22	**VPX200R2203AM1030**	●	3	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
25	**VPX200R2503AM1235**	●	3	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
25	**VPX200R2504AM1235**	●	4	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
32	**VPX200R3203AM1640**	●	3	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3204AM1640**	●	4	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3205AM1640**	●	5	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
35	**VPX200R3503AM1640**	●	3	17.0	28.5	63	40	24	M16	0.24	8	0.63°	LOGU09
35	**VPX200R3505AM1640**	●	5	17.0	28.5	63	40	24	M16	0.23	8	0.63°	LOGU09
40	**VPX200R4004AM1640**	●	4	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09
40	**VPX200R4006AM1640**	●	6	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09

Note 1) For screw-in type arbors, refer to page L341.

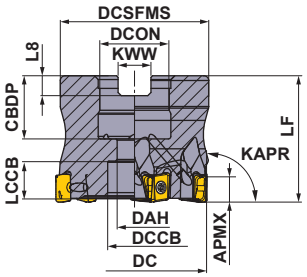
SPARE PARTS

DC (mm)	Tool Holder Type	 *		
		Clamp Screw	Wrench	Anti-seize Lubricant
16	**VPX200R16**	TPS27F1	TIP07F	MK1KS
18	**VPX200R18**	TPS27F1	TIP07F	MK1KS
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
30	**VPX200R30**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS
50	**VPX200R50**	TPS27F2	TIP07F	MK1KS

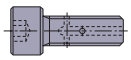
* Clamp Torque (N • m) : TPS27F1 = 1.0,TPS27F2 = 1.0

ISO13399	➤ L003	ARBORS	➤ L341
INSERTS	➤ L161	SPARE PARTS	➤ P001
CUTTING CONDITIONS	➤ L168—L192	TECHNICAL DATA	➤ Q001





Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
ϕ32, ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	With Coolant Hole

■ARBOR TYPE

With Coolant Hole

DCON = mm size

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
		R		LF	DCON					
32	**VPX200-032A03AR**	●	3	35	16	0.11	8	0.71°	25100	LOGU09
32	**VPX200-032A05AR**	●	5	35	16	0.11	8	0.71°	25100	LOGU09
40	**VPX200-040A04AR**	●	4	40	16	0.23	8	0.54°	22000	LOGU09
40	**VPX200-040A06AR**	●	6	40	16	0.22	8	0.54°	22000	LOGU09
50	**VPX200-050A05AR**	●	5	40	22	0.36	8	0.42°	19200	LOGU09
50	**VPX200-050A07AR**	●	7	40	22	0.36	8	0.42°	19200	LOGU09
63	**VPX200-063A06AR**	●	6	40	22	0.66	8	0.32°	16700	LOGU09
63	**VPX200-063A09AR**	●	9	40	22	0.66	8	0.32°	16700	LOGU09

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A03AR**	16	18	9	14	8	30	8.4	5.6
32	**VPX200-032A05AR**	16	18	9	14	8	30	8.4	5.6
40	**VPX200-040A04AR**	16	18	9	14	13	37	8.4	5.6
40	**VPX200-040A06AR**	16	18	9	14	13	37	8.4	5.6
50	**VPX200-050A05AR**	22	20	11	17	11	47	10.4	6.3
50	**VPX200-050A07AR**	22	20	11	17	11	47	10.4	6.3
63	**VPX200-063A06AR**	22	20	11	17	11	60	10.4	6.3
63	**VPX200-063A09AR**	22	20	11	17	11	60	10.4	6.3

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F2 = 1.0

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

DEEP SHOULDER MILLING

90° KAPR

VPX200

NEW

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	



Fig.1

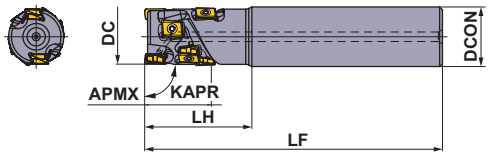
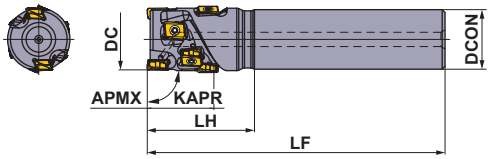


Fig.2



Right hand tool holder only.

■SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) DCON	LF	LH	APMX (mm)	RMPX	WT (kg)	Fig.	Insert Type *
20	**VPX200R202SA20S01404**	●	2	4	20	100	30	14	1.35°	0.21	1	LOGU09
22	**VPX200R222SA20S01404**	●	2	4	20	115	30	14	1.16°	0.26	2	LOGU09
25	**VPX200R252SA25S02106**	●	2	6	25	115	35	21	0.97°	0.39	1	LOGU09
25	**VPX200R252SA25S02808**	●	2	8	25	125	45	28	0.97°	0.41	1	LOGU09
28	**VPX200R282SA25S02106**	●	2	6	25	115	35	21	0.84°	0.40	2	LOGU09
28	**VPX200R282SA25S02808**	●	2	8	25	125	45	28	0.84°	0.43	2	LOGU09
32	**VPX200R322SA32S02808**	●	2	8	32	125	45	28	0.71°	0.68	1	LOGU09
32	**VPX200R323SA32S02812**	●	3	12	32	125	45	28	0.71°	0.67	1	LOGU09
32	**VPX200R322SA32S03510**	●	2	10	32	130	50	35	0.71°	0.70	1	LOGU09
32	**VPX200R323SA32S03515**	●	3	15	32	130	50	35	0.71°	0.68	1	LOGU09
35	**VPX200R352SA32S02808**	●	2	8	32	125	45	28	0.63°	0.72	2	LOGU09
35	**VPX200R353SA32S02812**	●	3	12	32	125	45	28	0.63°	0.71	2	LOGU09
35	**VPX200R352SA32S03510**	●	2	10	32	130	50	35	0.63°	0.74	2	LOGU09
35	**VPX200R353SA32S03515**	●	3	15	32	130	50	35	0.63°	0.73	2	LOGU09
40	**VPX200R403SA32S03515**	●	3	15	32	130	50	35	0.54°	0.81	2	LOGU09
40	**VPX200R404SA32S03520**	●	4	20	32	130	50	35	0.54°	0.80	2	LOGU09
40	**VPX200R403SA32S04218**	●	3	18	32	140	60	42	0.54°	0.88	2	LOGU09
40	**VPX200R404SA32S04224**	●	4	24	32	140	60	42	0.54°	0.86	2	LOGU09

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE 0.2mm and 0.4 mm can also be used.

SPARE PARTS

DC (mm)	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F1 = 1.0,TPS27F2 = 1.0

ISO13399	➤ L003
INSERTS	➤ L161
CUTTING CONDITIONS	➤ L168—L192
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

Scan here for product NEWS ▶



Fig.1

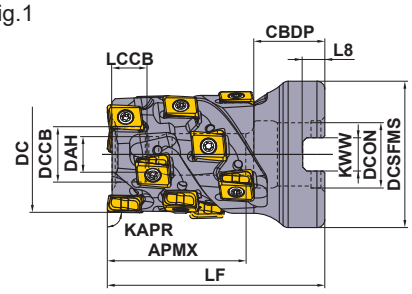
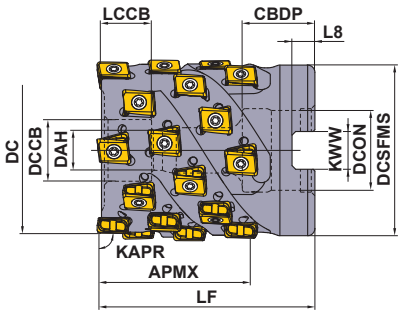


Fig.2



Right hand tool holder only.

DC (mm)	APMX (mm)	Set Bolt	Geometry
ϕ32	35	HSC08045	
ϕ40	42	HSC08050	
ϕ50	42	HSC10045	

■ SHELL TYPE

With Coolant Hole

DCON = mm size

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type *
32	**VPX200-032A02A035R10**	●	2	10	55	16	0.22	35	0.71°	1	LOGU09
32	**VPX200-032A03A035R15**	●	3	15	55	16	0.20	35	0.71°	1	LOGU09
40	**VPX200-040A03A042R18**	●	3	18	60	16	0.34	42	0.54°	2	LOGU09
40	**VPX200-040A04A042R24**	●	4	24	60	16	0.33	42	0.54°	2	LOGU09
50	**VPX200-050A04A042R24**	●	4	24	60	22	0.55	42	0.42°	2	LOGU09
50	**VPX200-050A05A042R30**	●	5	30	60	22	0.54	42	0.42°	2	LOGU09

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used for the peripheral cutting edges.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A02A035R10**	16	18	9	14	8	37	8.4	5.6
32	**VPX200-032A03A035R15**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A03A042R18**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A04A042R24**	16	18	9	14	8	37	8.4	5.6
50	**VPX200-050A04A042R24**	22	20	11	17	13	47	10.4	6.3
50	**VPX200-050A05A042R30**	22	20	11	17	13	47	10.4	6.3

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F2 = 1.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

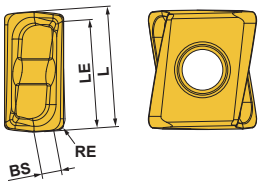
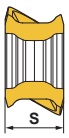
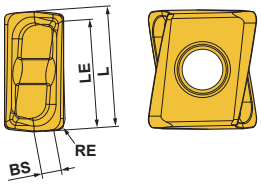
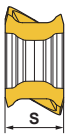
VPX200 Including long types for deep cutting

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		Dimensions(mm)					Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15		L	RE	LE	S	BS	
Low Resistance Type **L Breaker**	**LOGU0904020PNER-L**	G	E	●	●	●	●	●	●	●			8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNER-L	G	E	●	●	●	●	●	●	●			8.7	0.4	7.6	4.3	1.5	
	LOGU0904080PNER-L	G	E	●	●	●	●	●	●	●			8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNER-L	G	E	●	●	●	●	●	●	●			8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNER-L	G	E	●	●	●	●	●	●	●			8.7	1.2	7.6	4.3	0.8	
	LOGU0904160PNER-L	G	E	●	●	●	●	●	●	●			8.7	1.6	7.6	4.3	0.5	
	**LOGU0904020PNFR-L**	G	F								●		8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNFR-L	G	F								●		8.7	0.4	7.6	4.3	1.5	
	LOGU0904080PNFR-L	G	F								●		8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNFR-L	G	F								●		8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNFR-L	G	F								●		8.7	1.2	7.6	4.3	0.8	
	LOGU0904160PNFR-L	G	F								●		8.7	1.6	7.6	4.3	0.5	Right hand insert only.
General **M Breaker**	**LOGU0904020PNER-M**	G	E	●	●	●	●	●	●	●			8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNER-M	G	E	●	●	●	●	●	●	●			8.7	0.4	7.6	4.3	1.6	
	LOGU0904080PNER-M	G	E	●	●	●	●	●	●	●			8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNER-M	G	E	●	●	●	●	●	●	●			8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNER-M	G	E	●	●	●	●	●	●	●			8.7	1.2	7.6	4.3	0.9	
	LOGU0904160PNER-M	G	E	●	●	●	●	●	●	●			8.7	1.6	7.6	4.3	0.5	
	**LOGU0904020PNFR-M**	G	F								●		8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNFR-M	G	F								●		8.7	0.4	7.6	4.3	1.6	
	LOGU0904080PNFR-M	G	F								●		8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNFR-M	G	F								●		8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNFR-M	G	F								●		8.7	1.2	7.6	4.3	0.9	
	LOGU0904160PNFR-M	G	F								●		8.7	1.6	7.6	4.3	0.5	Right hand insert only.

ISO13399	➤ L003
CUTTING CONDITIONS	➤ L168—L192
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX300

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



Fig.1



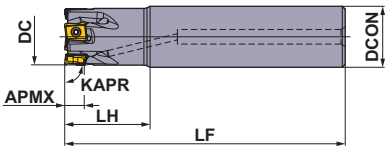
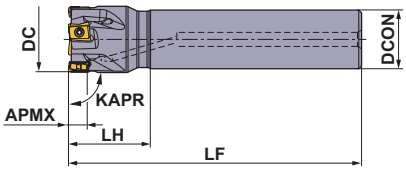


Fig.2





Right hand tool holder only.

■SHANK TYPE

With Coolant Hole

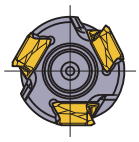
DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	LF	LH	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	WT (kg)	Fig.	Insert Type
25	**VPX300R2502SA25S**	●	2	25	115	35	11	2.13°	24100	0.38	1	LOGU12
25	**VPX300R2502SA25L**	●	2	25	170	70	11	2.13°	24100	0.56	1	LOGU12
28	**VPX300R2802SA25S**	●	2	25	115	35	11	1.77°	22500	0.40	2	LOGU12
28	**VPX300R2802SA25L**	●	2	25	170	35	11	1.77°	22500	0.60	2	LOGU12
30	**VPX300R3002SA25S**	●	2	25	125	35	11	1.61°	21500	0.45	2	LOGU12
30	**VPX300R3003SA25S**	●	3	25	125	35	11	1.61°	21500	0.44	2	LOGU12
32	**VPX300R3202SA32S**	●	2	32	125	45	11	1.47°	20600	0.69	1	LOGU12
32	**VPX300R3203SA32S**	●	3	32	125	45	11	1.47°	20600	0.68	1	LOGU12
32	**VPX300R3203SA32L**	●	3	32	190	90	11	1.47°	20600	1.04	1	LOGU12
35	**VPX300R3503SA32L**	●	3	32	190	45	11	1.28°	19500	1.10	2	LOGU12
40	**VPX300R4003SA32S**	●	3	32	125	45	11	1.06°	17900	0.76	2	LOGU12
40	**VPX300R4004SA32S**	●	4	32	125	45	11	1.06°	17900	0.76	2	LOGU12
50	**VPX300R5004SA32S**	●	4	32	125	45	11	0.79°	15500	0.89	2	LOGU12
50	**VPX300R5006SA32S**	●	6	32	125	45	11	0.79°	15500	0.88	2	LOGU12

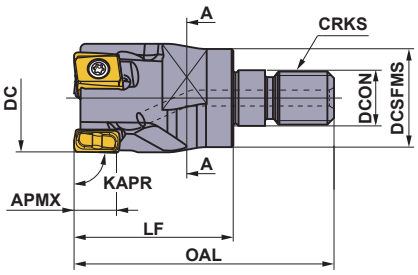
Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

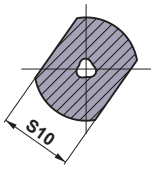
● : Inventory maintained in Japan.

Scan here for product NEWS ▶









A-A Section

Right hand tool holder only.

■ SCREW-IN TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX (mm)	RMPX	Insert Type
25	**VPX300R2502AM1235**	●	2	12.5	23.5	57	35	19	M12	0.10	11	2.13°	LOGU12
28	**VPX300R2802AM1235**	●	2	12.5	23.5	57	35	19	M12	0.12	11	1.77°	LOGU12
32	**VPX300R3202AM1640**	●	2	17.0	28.5	63	40	24	M16	0.20	11	1.47°	LOGU12
32	**VPX300R3203AM1640**	●	3	17.0	28.5	63	40	24	M16	0.19	11	1.47°	LOGU12
35	**VPX300R3502AM1640**	●	2	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
35	**VPX300R3503AM1640**	●	3	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
40	**VPX300R4003AM1640**	●	3	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12
40	**VPX300R4004AM1640**	●	4	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12

Note 1) For screw-in type arbors, refer to page L341.

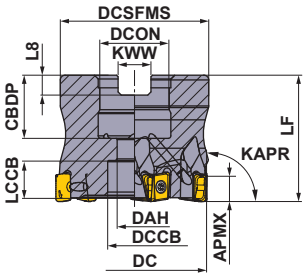
SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

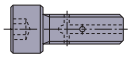
* Clamp Torque (N • m) : TPS40F1 = 3.0

ISO13399	➤ L003	ARBORS	➤ L341
INSERTS	➤ L167	SPARE PARTS	➤ P001
CUTTING CONDITIONS	➤ L168—L192	TECHNICAL DATA	➤ Q001





Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	
ϕ80	HSC12035H	
		With Coolant Hole

■ARBOR TYPE

With Coolant Hole

DCON = Inch size

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
80	**VPX300R08007CA**	●	7	50	25.4	1.00	11	0.45°	11500	LOGU12
80	**VPX300R08010CA**	●	10	50	25.4	1.00	11	0.45°	11500	LOGU12

DCON = mm size

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
40	**VPX300-040A03AR**	●	3	40	16	0.21	11	1.06°	17900	LOGU12
40	**VPX300-040A04AR**	●	4	40	16	0.21	11	1.06°	17900	LOGU12
50	**VPX300-050A04AR**	●	4	40	22	0.34	11	0.79°	15500	LOGU12
50	**VPX300-050A06AR**	●	6	40	22	0.33	11	0.79°	15500	LOGU12
63	**VPX300-063A06AR**	●	6	40	22	0.61	11	0.60°	13400	LOGU12
63	**VPX300-063A08AR**	●	8	40	22	0.62	11	0.60°	13400	LOGU12
80	**VPX300-080A07AR**	●	7	50	27	0.99	11	0.45°	11500	LOGU12
80	**VPX300-080A10AR**	●	10	50	27	0.99	11	0.45°	11500	LOGU12

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A03AR**	16	18	9	14	12.4	37	8.4	5.6
40	**VPX300-040A04AR**	16	18	9	14	12.4	37	8.4	5.6
50	**VPX300-050A04AR**	22	20	11	17	10.4	47	10.4	6.3
50	**VPX300-050A06AR**	22	20	11	17	10.4	47	10.4	6.3
63	**VPX300-063A06AR**	22	20	11	17	10.4	60	10.4	6.3
63	**VPX300-063A08AR**	22	20	11	17	10.4	60	10.4	6.3
80	**VPX300R08007CA**	25.4	26	13	20	13.4	56	9.5	6
80	**VPX300R08010CA**	25.4	26	13	20	13.4	56	9.5	6
80	**VPX300-080A07AR**	27	23	13	20	13.4	56	12.4	7
80	**VPX300-080A10AR**	27	23	13	20	13.4	56	12.4	7

SPARE PARTS

Tool Holder Type	*  Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS40F1 = 3.0

● : **Inventory maintained in Japan.**

DEEP SHOULDER MILLING

90° KAPR

VPX300

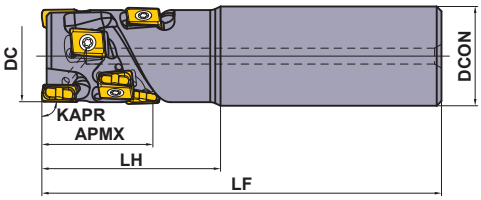
NEW

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	







Right hand tool holder only.

■SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) DCON	LF	LH	APMX (mm)	RMPX	WT (kg)	Insert Type *
40	**VPX300R402SA32S02104**	●	2	4	32	125	45	21	1.06°	0.78	LOGU12
40	**VPX300R402SA32S03106**	●	2	6	32	130	50	31	1.06°	0.79	LOGU12
40	**VPX300R402SA32S04208**	●	2	8	32	140	60	42	1.06°	0.84	LOGU12

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE 0.2mm and 0.4 mm can also be used.

SPARE PARTS

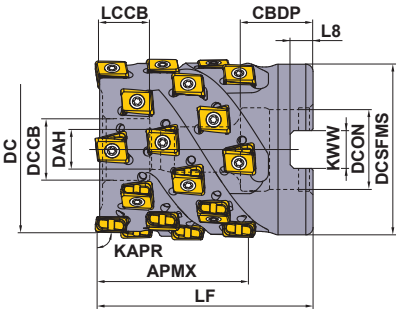
Tool Holder Type	Clamp Screw *	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS40F1 = 3.5

Scan here for product NEWS ▶

ISO13399	➤ L003
INSERTS	➤ L167
CUTTING CONDITIONS	➤ L168—L192
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001





Right hand tool holder only.

Order Number	APMX (mm)	Set Bolt	Geometry
VPX300-040A02A031	31	HSC08040	
VPX300-040A02A042	42	HSC08050	
VPX300-050A03A031	31	HSC10040	
VPX300-050A03A042	42	HSC10050	
VPX300-050A03A052	52	HSC10060	
VPX300-063A04A042	42	HSC12050	
VPX300-063A04A052	52	HSC12060	
VPX300-080A05A052	52	HSC12060	
VPX300-080A05A063	63	HSC12070	
VPX300R08005CA052	52	HSC16055	
VPX300R08005CA063	63	HSC16065	

■ SHELL TYPE

With Coolant Hole
DCON = mm size

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	Insert Type *
40	VPX300-040A02A031R06	●	2	6	50	16	0.26	31	1.06°	LOGU12
40	VPX300-040A02A042R08	●	2	8	60	16	0.31	42	1.06°	LOGU12
50	VPX300-050A03A031R09	●	3	9	55	22	0.47	31	0.79°	LOGU12
50	VPX300-050A03A042R12	●	3	12	65	22	0.55	42	0.79°	LOGU12
50	VPX300-050A03A052R15	●	3	15	75	22	0.63	52	0.79°	LOGU12
63	VPX300-063A04A042R16	●	4	16	65	27	0.92	42	0.6°	LOGU12
63	VPX300-063A04A052R20	●	4	20	75	27	1.06	52	0.6°	LOGU12
80	VPX300-080A05A052R25	●	5	25	75	27	1.94	52	0.45°	LOGU12
80	VPX300-080A05A063R30	●	5	30	85	27	2.20	63	0.45°	LOGU12

DCON = Inch size

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm) LF	Dimensions(mm) DCON	WT (kg)	APMX (mm)	RMPX	Insert Type *
80	VPX300R08005CA05225	●	5	25	75	31.75	1.81	52	0.45°	LOGU12
80	VPX300R08005CA06330	●	5	30	85	31.75	2.06	63	0.45°	LOGU12

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used for the peripheral cutting edges.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	VPX300-040A02A031R06	16	18	9	14	8.4	37	8.4	5.6
40	VPX300-040A02A042R08	16	18	9	14	8.4	37	8.4	5.6
50	VPX300-050A03A031R09	22	20	11	17	12.4	47	10.4	6.3
50	VPX300-050A03A042R12	22	20	11	17	12.4	47	10.4	6.3
50	VPX300-050A03A052R15	22	20	11	17	12.4	47	10.4	6.3
63	VPX300-063A04A042R16	27	23	13	20	12.4	76	12.4	7.0
63	VPX300-063A04A052R20	27	23	13	20	12.4	76	12.4	7.0
80	VPX300-080A05A052R25	27	23	13	20	12.4	76	12.4	7.0
80	VPX300-080A05A063R30	27	23	13	20	12.4	76	12.4	7.0
80	VPX300R08005CA05225	31.75	32	17	26	17.4	76	12.7	8.0
80	VPX300R08005CA06330	31.75	32	17	26	17.4	76	12.7	8.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

SPARE PARTS ➤ L165

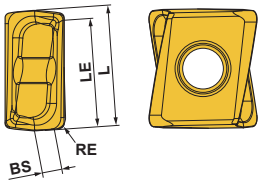
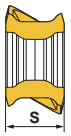
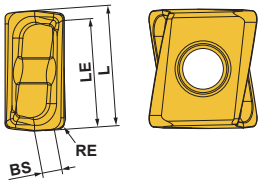
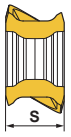
VPX300 Including long types for deep cutting

INSERTS

Workpiece Material		
	P	Steels
	M	Stainless Steels
	K	Cast Irons
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steels

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated								Carbide		Dimensions(mm)					Geometry
					MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15		L	RE	LE	S	BS	
Low Cutting Resistance L Breaker	LOGU1207020PNER-L	G	E		●	●	●	●	●	●	●			12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNER-L	G	E		●	●	●	●	●	●	●			12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNER-L	G	E		●	●	●	●	●	●	●			12.4	0.8	11.3	7.0	2.6	
	LOGU1207100PNER-L	G	E		●	●	●	●	●	●	●			12.4	1.0	11.3	7.0	2.5	
	LOGU1207120PNER-L	G	E		●	●	●	●	●	●	●			12.4	1.2	11.3	7.0	2.4	
	LOGU1207160PNER-L	G	E		●	●	●	●	●	●	●			12.4	1.6	11.3	7.0	1.8	
	LOGU1207200PNER-L	G	E		●	●	●	●	●	●	●			12.4	2.0	11.3	7.0	1.4	
NEW	LOGU1207240PNER-L	G	E		●	●	●	●	●	●	●			12.4	2.4	11.3	7.0	1.2	
	LOGU1207300PNER-L	G	E		●	●	●	●	●	●	●			12.4	3.0	11.3	7.0	0.6	
	LOGU1207320PNER-L	G	E		●	●	●	●	●	●	●			12.4	3.2	11.3	7.0	0.4	
	LOGU1207020PNFR-L	G	F									●		12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNFR-L	G	F									●		12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNFR-L	G	F									●		12.4	0.8	11.3	7.0	2.6	
	LOGU1207100PNFR-L	G	F									●		12.4	1.0	11.3	7.0	2.5	
	LOGU1207120PNFR-L	G	F									●		12.4	1.2	11.3	7.0	2.4	
	LOGU1207160PNFR-L	G	F									●		12.4	1.6	11.3	7.0	1.8	
	LOGU1207200PNFR-L	G	F									●		12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNFR-L	G	F									●		12.4	2.4	11.3	7.0	1.2	
	LOGU1207300PNFR-L	G	F									●		12.4	3.0	11.3	7.0	0.6	
	LOGU1207320PNFR-L	G	F									●		12.4	3.2	11.3	7.0	0.4	Right hand insert only.
General Use M Breaker	LOGU1207020PNER-M	G	E		●	●	●	●	●	●	●			12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNER-M	G	E		●	●	●	●	●	●	●			12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNER-M	G	E		●	●	●	●	●	●	●			12.4	0.8	11.3	7.0	2.4	
	LOGU1207100PNER-M	G	E		●	●	●	●	●	●	●			12.4	1.0	11.3	7.0	2.3	
	LOGU1207120PNER-M	G	E		●	●	●	●	●	●	●			12.4	1.2	11.3	7.0	2.1	
	LOGU1207160PNER-M	G	E		●	●	●	●	●	●	●			12.4	1.6	11.3	7.0	1.7	
	LOGU1207200PNER-M	G	E		●	●	●	●	●	●	●			12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNER-M	G	E		●	●	●	●	●	●	●			12.4	2.4	11.3	7.0	1.0	
	LOGU1207300PNER-M	G	E		●	●	●	●	●	●	●			12.4	3.0	11.3	7.0	0.5	
	LOGU1207320PNER-M	G	E		●	●	●	●	●	●	●			12.4	3.2	11.3	7.0	0.3	
	LOGU1207020PNFR-M	G	F									●		12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNFR-M	G	F									●		12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNFR-M	G	F									●		12.4	0.8	11.3	7.0	2.4	
	LOGU1207100PNFR-M	G	F									●		12.4	1.0	11.3	7.0	2.3	
	LOGU1207120PNFR-M	G	F									●		12.4	1.2	11.3	7.0	2.1	
	LOGU1207160PNFR-M	G	F									●		12.4	1.6	11.3	7.0	1.7	
	LOGU1207200PNFR-M	G	F									●		12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNFR-M	G	F									●		12.4	2.4	11.3	7.0	1.0	
	LOGU1207300PNFR-M	G	F									●		12.4	3.0	11.3	7.0	0.5	
	LOGU1207320PNFR-M	G	F									●		12.4	3.2	11.3	7.0	0.3	Right hand insert only.

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L168—L192
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

VPX200/300

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Breaker Selection Table by Workpiece Material Cutting State

	Workpiece Material	Characteristics	Cutting Conditions	Breaker		Grade	
				1st Recommended	2nd Recommended	1st Recommended	2nd Recommended
P	Mild Steel	Hardness ≤180HB	● ◔	L	M	MP6120	VP15TF
			✣	M	L	MP6130	—
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180-350HB ≤350HB (Annealing)	●	L	M	MP6120	VP15TF
			◔	M	L	MP6120	VP15TF
			✣	M	L	MP6130	—
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	M	L	MP6120	VP15TF
			✣	M	L	MP6130	—
M	Austenitic Stainless Steel	Hardness ≤280HB	● ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
		Hardness >200HB	● ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Duplex Stainless Steel	Hardness ≤280HB	● ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Ferritic and Martensitic Stainless Steel	—	● ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	—
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	—
N	Aluminium Alloy	Content Si<5%	● ◔	L	M	TF15	—
			✣	M	L	TF15	—
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✣	M	L	MP9130	—
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✣	M	L	MP9130	—
	Heat Resistant Alloy	—	● ◔	M	L	MP9120	VP15TF
			✣	M	L	MP9130	—
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✣	M	—	VP15TF	—

The following table shows recommended conditions for dry cutting and wet cutting accordingly.

VPX200

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

■ Dry cutting
Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm) ≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steel	Hardness ≤180HB	● ◔	MP6120,VP15TF	230 (180—270)	220 (170—260)	180 (140—210)	180 (140—210)
			✣	MP6130	200 (150—240)	190 (140—230)	150 (110—180)	150 (110—180)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
			✣	MP6130	150 (110—180)	140 (100—170)	110 (80—130)	110 (80—130)
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	MP6120,VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
			✣	MP6130	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steel	Hardness ≤200HB	○ ◔ ✣	MP7130,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
		Hardness >200HB	○ ◔ ✣	MP7130,VP15TF	150 (110—180)	140 (100—160)	110 (80—130)	110 (80—130)
	Duplex Stainless Steel	Hardness ≤280HB	○ ◔ ✣	MP7130,VP15TF	140 (110—170)	130 (90—150)	100 (70—120)	100 (70—120)
	Ferritic and Martensitic Stainless Steel	—	○ ◔ ✣	MP7130,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	○ ◔ ✣	MP7130,VP15TF	130 (100—160)	120 (80—140)	90 (60—110)	90 (60—110)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	250 (200—300)	240 (190—290)	210 (160—260)	210 (160—260)
			● ◔ ✣	VP15TF	200 (150—250)	190 (140—240)	160 (110—210)	160 (110—210)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	MC5020	180 (150—200)	170 (140—190)	150 (120—170)	150 (120—170)
			● ◔ ✣	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
N	Aluminium Alloy	Content Si<5%	● ◔ ✣	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✣	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø16—ø18 ap (mm)	ø16—ø18 fz (mm/t)	ø20—ø25 ap (mm)	ø20—ø25 fz (mm/t)	ø28—ø63 ap (mm)	ø28—ø63 fz (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ● ✻	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
			0.25—0.5DC	● ● ✻	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.20
			0.5—0.75DC	● ● ✻	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.10—0.15
			DC(Slot)	● ● ✻	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ● ✻	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
			0.25—0.5DC	● ● ✻	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.20
			0.5—0.75DC	● ● ✻	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.10—0.15
			DC(Slot)	● ● ✻	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ● ✻	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ● ✻	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ● ✻	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ● ✻	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.05—0.10
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ● ✻	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ● ✻	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ● ✻	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ● ✻	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
M	Austenitic Stainless Steel	—	≤0.25DC	● ●	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✻	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ●	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
				✻	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ●	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✻	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ●	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✻	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ●	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✻	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ●	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
				✻	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ●	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✻	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ●	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✻	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ●	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✻	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ●	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
				✻	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ●	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✻	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ●	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✻	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ●	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.15
				✻	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ●	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
				✻	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ●	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
				✻	≤4	0.06—0.08	≤6	0.06—0.08	≤6	0.06—0.08
			DC(Slot)	● ●	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✻	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø16—ø18 **ap** (mm)	ø16—ø18 **fz** (mm/t)	ø20—ø25 **ap** (mm)	ø20—ø25 **fz** (mm/t)	ø28—ø63 **ap** (mm)	ø28—ø63 **fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◔	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
				✲	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ◔	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.10—0.15
				✲	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.15
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.08—0.10
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◔	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✲	≤6	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.25—0.5DC	● ◔	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.08—0.12
				✲	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◔	≤6	0.10—0.20	≤8	0.10—0.25	≤8	0.10—0.25
				✲	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
			0.25—0.5DC	● ◔	≤5	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✲	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.06—0.15	≤6	0.08—0.15
				✲	≤4	0.06—0.10	≤6	0.06—0.15	≤6	0.08—0.15
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.15	≤4	0.08—0.15
				✲	≤2	0.06—0.08	≤4	0.06—0.12	≤4	0.08—0.12
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◔	≤4	0.08—0.15	≤4	0.08—0.15	≤4	0.08—0.15
				✲	≤4	0.08—0.12	≤4	0.08—0.12	≤4	0.08—0.12
			0.25—0.5DC	● ◔	≤3	0.08—0.12	≤3	0.08—0.12	≤3	0.08—0.12
				✲	≤3	0.06—0.10	≤3	0.08—0.10	≤3	0.06—0.10
			0.5—0.75DC	● ◔	≤2	0.06—0.10	≤2	0.08—0.10	≤2	0.06—0.10
				✲	≤2	0.06—0.08	≤2	0.06—0.08	≤2	0.06—0.08
			DC(Slot)	● ◔	≤1	0.06—0.10	≤1	0.06—0.10	≤1	0.06—0.10
				✲	≤1	0.06—0.08	≤1	0.06—0.08	≤1	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting
Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm) ≤0.25DC	ae (mm) 0.25—0.5DC	ae (mm) 0.5—0.75DC	ae (mm) DC(Slot)
					vc (m/min)			
P	Mild Steel	Hardness ≤180HB	● ● ✱	MP6120 MP6130 VP15TF	140 (100—190)	130 (90—180)	100 (70—120)	100 (70—120)
P	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ● ✱	MP6120 MP6130 VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
P	Pre-hardened Steel	Hardness 35—45HRC	● ● ✱	MP6120 MP6130 VP15TF	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ● ✱	MP7130,VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
M		Hardness >200HB	● ● ✱	MP7130,VP15TF	100 (80—130)	90 (70—110)	70 (50—100)	70 (50—100)
M	Duplex Stainless Steel	Hardness ≤280HB	● ● ✱	MP7130,VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
M	Ferritic and Martensitic Stainless Steel	—	● ● ✱	MP7130,VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ● ✱	MP7130,VP15TF	90 (70—120)	80 (60—110)	60 (40—90)	60 (40—90)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ●	MC5020	180 (160—220)	170 (150—210)	150 (130—190)	150 (130—190)
K			● ● ✱	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
K	Ductile Cast Iron	Tensile Strength ≤800MPa	● ●	MC5020	160 (140—180)	150 (130—170)	130 (110—150)	130 (110—150)
K			● ● ✱	VP15TF	110 (80—140)	100 (70—130)	80 (60—120)	80 (60—120)
N	Aluminium Alloy	Content Si<5%	● ● ✱	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	● ●	MP9120,VP15TF	50 (40—70)	50 (40—70)	50 (40—70)	50 (40—70)
S			✱	MP9130	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
S	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ● ✱	MP9120 MP9130 VP15TF	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
S	Heat Resistant Alloy	—	● ●	MP9120,VP15TF	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
S			✱	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
H	Hardened Steel	Hardness 40—55HRC	● ● ✱	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø16—ø18 **ap** (mm)	ø16—ø18 **fz** (mm/t)	ø20—ø25 **ap** (mm)	ø20—ø25 **fz** (mm/t)	ø28—ø63 **ap** (mm)	ø28—ø63 **fz** (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ◐ ✲	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
			0.25—0.5DC	● ◐ ✲	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.20
			0.5—0.75DC	● ◐ ✲	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.10—0.15
			DC(Slot)	● ◐ ✲	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ◐ ✲	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
			0.25—0.5DC	● ◐ ✲	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.20
			0.5—0.75DC	● ◐ ✲	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.10—0.15
			DC(Slot)	● ◐ ✲	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ◐ ✲	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ◐ ✲	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ◐ ✲	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ◐ ✲	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ◐ ✲	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ◐ ✲	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ◐ ✲	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ◐ ✲	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
M	Austenitic Stainless Steel	—	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✲	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✲	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✲	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.12
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✲	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✲	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐	≤4	0.06—0.10	≤6	0.08—0.12	≤6	0.08—0.12
				✲	≤4	0.06—0.08	≤6	0.06—0.10	≤6	0.05—0.10
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.05—0.10
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.05—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.15	≤8	0.10—0.15
				✲	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
				✲	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.05—0.10
				✲	≤4	0.06—0.08	≤6	0.06—0.08	≤6	0.05—0.08
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.05—0.10
				✲	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.05—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting
Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø16—ø18 ap (mm)	ø16—ø18 fz (mm/t)	ø20—ø25 ap (mm)	ø20—ø25 fz (mm/t)	ø28—ø63 ap (mm)	ø28—ø63 fz (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◔	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
				✣	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ◔	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
				✣	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.10—0.15
				✣	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.15
				✣	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.10
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◔	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✣	≤6	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.25—0.5DC	● ◔	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
				✣	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.08—0.12
				✣	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.06—0.10
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✣	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◔	≤6	0.10—0.20	≤8	0.10—0.25	≤8	0.10—0.25
				✣	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
			0.25—0.5DC	● ◔	≤5	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✣	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.5—0.75DC	● ◔	≤4	0.08—0.12	≤6	0.06—0.15	≤6	0.08—0.15
				✣	≤4	0.06—0.10	≤6	0.06—0.15	≤6	0.08—0.15
			DC(Slot)	● ◔	≤2	0.06—0.10	≤4	0.06—0.15	≤4	0.08—0.15
				✣	≤2	0.06—0.08	≤4	0.06—0.12	≤4	0.08—0.12
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	≤0.25DC	● ◔ ✣	≤6	0.08—0.15	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ◔ ✣	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◔ ✣	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◔ ✣	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤0.25DC	● ◔ ✣	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ◔ ✣	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◔ ✣	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◔ ✣	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
	Heat Resistant Alloy	—	≤0.25DC	● ◔ ✣	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ◔ ✣	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◔ ✣	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◔ ✣	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◔	≤4	0.08—0.15	≤4	0.08—0.15	≤4	0.08—0.15
				✣	≤4	0.08—0.12	≤4	0.08—0.12	≤4	0.08—0.12
			0.25—0.5DC	● ◔	≤3	0.08—0.12	≤3	0.08—0.12	≤3	0.08—0.12
				✣	≤3	0.06—0.10	≤3	0.06—0.10	≤3	0.06—0.10
			0.5—0.75DC	● ◔	≤2	0.06—0.10	≤2	0.06—0.10	≤2	0.06—0.10
				✣	≤2	0.06—0.10	≤2	0.06—0.10	≤2	0.06—0.10
			DC(Slot)	● ◔	≤1	0.06—0.10	≤1	0.06—0.10	≤1	0.06—0.10
				✣	≤1	0.06—0.10	≤1	0.06—0.10	≤1	0.06—0.10

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Cutting Speed

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	ae (mm) ≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steels	Hardness ≤180HB	● ◔	MP6120, VP15TF	230 (180—270)	220 (170—260)	180 (140—210)	180 (140—210)
			✣	MP6130	200 (150—240)	190 (170—260)	150 (110—180)	150 (110—180)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—180)
			✣	MP6130	150 (110—180)	140 (100—170)	110 (80—130)	110 (80—130)
	Pre-hardened Steels	Hardness 35—45HRC	● ◔	MP6120, VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
			✣	MP6130	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◔ ✣	MP7130, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
		Hardness >200HB	● ◔ ✣	MP7130, VP15TF	150 (110—180)	140 (100—160)	110 (80—130)	110 (80—130)
	Duplex Stainless Steels	Hardness ≤280HB	● ◔ ✣	MP7130, VP15TF	140 (110—170)	130 (90—150)	100 (70—120)	100 (70—120)
	Ferritic and Martensitic Stainless Steels	—	● ◔ ✣	MP7130, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◔ ✣	MP7130, VP15TF	130 (100—160)	120 (80—140)	90 (60—110)	90 (60—110)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◔	MC5020	250 (200—300)	240 (190—290)	210 (160—260)	210 (160—260)
			● ◔ ✣	VP15TF	200 (150—250)	190 (140—240)	160 (110—210)	160 (110—210)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◔	MC5020	180 (150—200)	170 (140—190)	150 (120—170)	150 (120—170)
			● ◔ ✣	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
N	Aluminium Alloys	Content Si<5%	● ◔ ✣	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
H	Hardened Steels	Hardness 40—55HRC	● ◔ ✣	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø25 ap (mm)	DC (mm) ø25 fz (mm/t)	DC (mm) ø28—ø80 ap (mm)	DC (mm) ø28—ø80 fz (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ● ✻	≤11	0.10 — 0.20	≤11	0.10 — 0.30
			0.25—0.5DC	● ● ✻	≤11	0.10 — 0.15	≤11	0.10 — 0.25
			0.5—0.75DC	● ● ✻	≤8	0.08 — 0.12	≤8	0.10 — 0.20
			DC(Slot)	● ● ✻	≤5	0.06 — 0.10	≤5	0.08 — 0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ● ✻	≤11	0.10 — 0.20	≤11	0.10 — 0.30
			0.25—0.5DC	● ● ✻	≤11	0.10 — 0.15	≤11	0.10 — 0.25
			0.5—0.75DC	● ● ✻	≤8	0.08 — 0.12	≤8	0.10 — 0.20
			DC(Slot)	● ● ✻	≤5	0.06 — 0.10	≤5	0.08 — 0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ● ✻	≤11	0.10 — 0.15	≤11	0.10 — 0.25
			0.25—0.5DC	● ● ✻	≤11	0.08 — 0.12	≤11	0.10 — 0.20
			0.5—0.75DC	● ● ✻	≤8	0.06 — 0.10	≤8	0.10 — 0.15
			DC(Slot)	● ● ✻	≤5	0.06 — 0.10	≤5	0.08 — 0.12
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ● ✻	≤11	0.10 — 0.15	≤11	0.10 — 0.25
			0.25—0.5DC	● ● ✻	≤11	0.08 — 0.12	≤11	0.10 — 0.20
			0.5—0.75DC	● ● ✻	≤8	0.06 — 0.10	≤8	0.10 — 0.15
			DC(Slot)	● ● ✻	≤5	0.06 — 0.10	≤5	0.08 — 0.12
M	Austenitic Stainless Steel	—	≤0.25DC	● ●	≤11	0.10 — 0.20	≤11	0.10 — 0.20
				✻	≤11	0.08 — 0.15	≤11	0.08 — 0.15
			0.25—0.5DC	● ●	≤11	0.08 — 0.15	≤11	0.08 — 0.15
				✻	≤11	0.08 — 0.12	≤11	0.08 — 0.12
			0.5—0.75DC	● ●	≤8	0.08 — 0.12	≤8	0.08 — 0.12
				✻	≤8	0.06 — 0.10	≤8	0.06 — 0.10
			DC(Slot)	● ●	≤5	0.06 — 0.10	≤5	0.06 — 0.10
				✻	≤5	0.06 — 0.08	≤5	0.06 — 0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ●	≤11	0.10 — 0.20	≤11	0.10 — 0.20
				✻	≤11	0.08 — 0.15	≤11	0.08 — 0.15
			0.25—0.5DC	● ●	≤11	0.08 — 0.15	≤11	0.08 — 0.15
				✻	≤11	0.08 — 0.12	≤11	0.08 — 0.12
			0.5—0.75DC	● ●	≤8	0.08 — 0.12	≤8	0.08 — 0.12
				✻	≤8	0.06 — 0.10	≤8	0.06 — 0.10
			DC(Slot)	● ●	≤5	0.06 — 0.10	≤5	0.06 — 0.10
				✻	≤5	0.06 — 0.08	≤5	0.06 — 0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ●	≤11	0.10 — 0.20	≤11	0.10 — 0.20
				✻	≤11	0.08 — 0.15	≤11	0.08 — 0.15
			0.25—0.5DC	● ●	≤11	0.08 — 0.15	≤11	0.08 — 0.15
				✻	≤11	0.08 — 0.12	≤11	0.08 — 0.12
			0.5—0.75DC	● ●	≤8	0.08 — 0.12	≤8	0.08 — 0.12
				✻	≤8	0.06 — 0.10	≤8	0.06 — 0.10
			DC(Slot)	● ●	≤5	0.06 — 0.10	≤5	0.06 — 0.10
				✻	≤5	0.06 — 0.08	≤5	0.06 — 0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ●	≤11	0.10 — 0.15	≤11	0.10 — 0.15
				✻	≤11	0.08 — 0.12	≤11	0.08 — 0.12
			0.25—0.5DC	● ●	≤11	0.08 — 0.12	≤11	0.08 — 0.12
				✻	≤11	0.08 — 0.12	≤11	0.06 — 0.10
			0.5—0.75DC	● ●	≤8	0.06 — 0.10	≤8	0.06 — 0.10
				✻	≤8	0.06 — 0.08	≤8	0.06 — 0.08
			DC(Slot)	● ●	≤5	0.06 — 0.10	≤5	0.06 — 0.10
				✻	≤5	0.06 — 0.08	≤5	0.06 — 0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø25 **ap** (mm)	ø25 **fz** (mm/t)	ø28—ø80 **ap** (mm)	ø28—ø80 **fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤11	0.10 —0.20	≤11	0.10 —0.30
				✲	≤11	0.08 —0.15	≤11	0.10 —0.25
			0.25—0.5DC	● ◐	≤11	0.08 —0.15	≤11	0.10 —0.25
				✲	≤11	0.08 —0.12	≤11	0.10 —0.20
			0.5—0.75DC	● ◐	≤8	0.08 —0.12	≤8	0.10 —0.20
				✲	≤8	0.06 —0.10	≤8	0.08 —0.15
			DC(Slot)	● ◐	≤5	0.06 —0.10	≤5	0.08 —0.15
				✲	≤5	0.06 —0.08	≤5	0.08 —0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤11	0.10 —0.20	≤11	0.10 —0.25
				✲	≤11	0.10 —0.15	≤11	0.10 —0.20
			0.25—0.5DC	● ◐	≤11	0.10 —0.15	≤11	0.10 —0.20
				✲	≤11	0.08 —0.12	≤11	0.10 —0.15
			0.5—0.75DC	● ◐	≤8	0.08 —0.12	≤8	0.10 —0.15
				✲	≤8	0.08 —0.12	≤8	0.08 —0.12
			DC(Slot)	● ◐	≤5	0.06 —0.10	≤5	0.08 —0.12
				✲	≤5	0.06 —0.08	≤5	0.06 —0.10
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◐	≤11	0.10 —0.25	≤11	0.10 —0.25
				✲	≤11	0.10 —0.20	≤11	0.10 —0.20
			0.25—0.5DC	● ◐	≤11	0.10 —0.20	≤11	0.10 —0.20
				✲	≤11	0.10 —0.15	≤11	0.10 —0.15
			0.5—0.75DC	● ◐	≤8	0.06 —0.15	≤8	0.08 —0.15
				✲	≤8	0.06 —0.15	≤8	0.08 —0.15
			DC(Slot)	● ◐	≤5	0.06 —0.15	≤5	0.08 —0.15
				✲	≤5	0.06 —0.15	≤5	0.08 —0.12
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◐	≤5	0.08 —0.15	≤5	0.08 —0.15
				✲	≤5	0.08 —0.12	≤5	0.08 —0.12
			0.25—0.5DC	● ◐	≤4	0.08 —0.12	≤4	0.08 —0.12
				✲	≤4	0.06 —0.10	≤4	0.06 —0.10
			0.5—0.75DC	● ◐	≤3	0.06 —0.10	≤3	0.06 —0.10
				✲	≤3	0.06 —0.08	≤3	0.06 —0.08
			DC(Slot)	● ◐	≤2	0.06 —0.10	≤2	0.06 —0.10
				✲	≤2	0.06 —0.08	≤2	0.06 —0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting
Cutting Speed

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	ae (mm) ≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steels	Hardness ≤180HB	● ● ✲	MP6120 MP6130 VP15TF	140 (100—190)	130 (90—180)	100 (70—120)	100 (70—120)
P	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ● ✲	MP6120 MP6130 VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
P	Pre-hardened Steels	Hardness 35—45HRC	● ● ✲	MP6120 MP6130 VP15TF	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ● ✲	MP7130, VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
M		Hardness >200HB	● ● ✲	MP7130, VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
M	Duplex Stainless Steels	Hardness ≤280HB	● ● ✲	MP7130, VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
M	Ferritic and Martensitic Stainless Steels	—	● ● ✲	MP7130, VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ● ✲	MP7130, VP15TF	90 (70—120)	80 (60—110)	60 (40—90)	60 (40—90)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ●	MC5020	180 (160—220)	170 (150—210)	150 (130—190)	150 (130—190)
K			● ● ✲	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
K	Ductile Cast Irons	Tensile Strength ≤800MPa	● ●	MC5020	160 (140—180)	150 (130—170)	130 (110—150)	130 (110—150)
K			● ● ✲	VP15TF	110 (80—140)	100 (70—130)	80 (60—120)	80 (60—120)
N	Aluminium Alloys	Content Si<5%	● ● ✲	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ●	MP9120, VP15TF	50 (40—70)	50 (40—70)	50 (40—70)	50 (40—70)
S			✲	MP9130	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
S	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ●	MP9120, VP15TF	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
S			✲	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
S	Heat Resistant Alloys	—	● ●	MP9120, VP15TF	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
S			✲	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
H	Hardened Steels	Hardness 40—55HRC	● ● ✲	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

■ Wet Cutting
Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø25 **ap** (mm)	ø25 **fz** (mm/t)	ø28–ø80 **ap** (mm)	ø28–ø80 **fz** (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ◔ ✲	≤11	0.10—0.20	≤11	0.10—0.30
			0.25—0.5DC	● ◔ ✲	≤11	0.10—0.15	≤11	0.10—0.25
			0.5—0.75DC	● ◔ ✲	≤8	0.08—0.12	≤8	0.10—0.20
			DC(Slot)	● ◔ ✲	≤5	0.06—0.10	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ◔ ✲	≤11	0.10—0.20	≤11	0.10—0.30
			0.25—0.5DC	● ◔ ✲	≤11	0.10—0.15	≤11	0.10—0.25
			0.5—0.75DC	● ◔ ✲	≤8	0.08—0.12	≤8	0.10—0.20
			DC(Slot)	● ◔ ✲	≤5	0.06—0.10	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ◔ ✲	≤11	0.10—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◔ ✲	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◔ ✲	≤8	0.06—0.10	≤8	0.10—0.15
			DC(Slot)	● ◔ ✲	≤5	0.06—0.10	≤5	0.08—0.12
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ◔ ✲	≤11	0.10—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◔ ✲	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◔ ✲	≤8	0.06—0.10	≤8	0.10—0.15
			DC(Slot)	● ◔ ✲	≤5	0.06—0.10	≤5	0.08—0.12
M	Austenitic Stainless Steel	—	≤0.25DC	● ◔	≤11	0.10—0.20	≤11	0.10—0.20
				✲	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◔	≤11	0.08—0.12	≤11	0.08—0.15
				✲	≤11	0.06—0.10	≤11	0.08—0.12
			0.5—0.75DC	● ◔	≤8	0.06—0.10	≤8	0.08—0.12
				✲	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◔	≤5	0.06—0.10	≤5	0.06—0.10
				✲	≤5	0.06—0.08	≤5	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ◔	≤11	0.10—0.20	≤11	0.10—0.20
				✲	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◔	≤11	0.08—0.15	≤11	0.08—0.15
				✲	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◔	≤8	0.08—0.12	≤8	0.08—0.12
				✲	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◔	≤5	0.06—0.10	≤5	0.06—0.10
				✲	≤5	0.06—0.08	≤5	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ◔	≤11	0.10—0.20	≤11	0.10—0.20
				✲	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◔	≤11	0.08—0.15	≤11	0.08—0.15
				✲	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◔	≤8	0.08—0.12	≤8	0.08—0.12
				✲	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◔	≤5	0.06—0.10	≤5	0.06—0.10
				✲	≤5	0.06—0.08	≤5	0.06—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◔	≤11	0.10—0.15	≤11	0.10—0.15
				✲	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◔	≤11	0.08—0.12	≤11	0.08—0.12
				✲	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◔	≤8	0.06—0.10	≤8	0.06—0.10
				✲	≤8	0.06—0.08	≤8	0.06—0.08
			DC(Slot)	● ◔	≤5	0.06—0.10	≤5	0.06—0.10
				✲	≤5	0.06—0.08	≤5	0.06—0.08

VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting
Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø25 **ap** (mm)	ø25 **fz** (mm/t)	ø28–ø80 **ap** (mm)	ø28–ø80 **fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.30
				✣	≤11	0.08—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◐	≤11	0.08—0.15	≤11	0.10—0.25
				✣	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.20
				✣	≤8	0.06—0.10	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.15
				✣	≤5	0.06—0.08	≤5	0.08—0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.25
				✣	≤11	0.10—0.15	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.15	≤11	0.10—0.20
				✣	≤11	0.08—0.12	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.15
				✣	≤8	0.06—0.10	≤8	0.08—0.12
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.12
				✣	≤5	0.06—0.08	≤5	0.06—0.10
N	Aluminium Alloy	Content Si<5%	≤0.25DC	● ◐	≤11	0.10—0.25	≤11	0.10—0.25
				✣	≤11	0.10—0.20	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				✣	≤11	0.10—0.15	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.06—0.15	≤8	0.08—0.15
				✣	≤8	0.06—0.15	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.15	≤5	0.08—0.15
				✣	≤5	0.06—0.15	≤5	0.08—0.12
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	≤0.25DC	● ◐ ✣	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◐ ✣	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✣	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✣	≤5	0.06—0.10	≤5	0.06—0.10
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤0.25DC	● ◐ ✣	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◐ ✣	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✣	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✣	≤5	0.06—0.10	≤5	0.06—0.10
	Heat Resistant Alloy	—	≤0.25DC	● ◐ ✣	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◐ ✣	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✣	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✣	≤5	0.06—0.10	≤5	0.06—0.10
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◐	≤5	0.08—0.15	≤5	0.08—0.15
				✣	≤5	0.08—0.12	≤5	0.08—0.12
			0.25—0.5DC	● ◐	≤4	0.08—0.12	≤4	0.08—0.12
				✣	≤4	0.06—0.10	≤4	0.06—0.10
			0.5—0.75DC	● ◐	≤3	0.06—0.10	≤3	0.06—0.10
				✣	≤3	0.06—0.10	≤3	0.06—0.08
			DC(Slot)	● ◐	≤2	0.06—0.10	≤2	0.06—0.10
				✣	≤2	0.06—0.10	≤2	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200/300
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm) ≤0.25DC	ae (mm) 0.25—0.5DC	ae (mm) 0.5—0.75DC	ae (mm) DC(Slot)	Cutting Mode
					vc (m/min)				
P	Mild Steels	Hardness ≤180HB	● ◐	MP6120,VP15TF	140(100—190)	130(90—180)	100(70—120)	100(70—120)	Dry, Wet
			✲	MP6130	140(100—190)	130(90—180)	100(70—120)	100(70—120)	Dry, Wet
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	MP6120,VP15TF	120(90—140)	110(80—130)	100(70—120)	100(70—120)	Dry, Wet
			✲	MP6130	120(90—140)	110(80—130)	100(70—120)	100(70—120)	Dry, Wet
	Pre-hardened Steels	Hardness 180—350HB	● ◐	MP6120,VP15TF	100(80—120)	90(70—110)	80(60—100)	80(60—100)	Dry, Wet
			✲	MP6130	100(80—120)	90(70—110)	80(60—100)	80(60—100)	Dry, Wet
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐	MP7130,VP15TF	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
			✲	MP7130	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
		Hardness >200HB	● ◐	MP7130,VP15TF	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
			✲	MP7130	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
	Ferritic and Martensitic Stainless Steels	—	● ◐	MP7130,VP15TF	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
			✲	MP7130	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
	Duplex Stainless Steels	Hardness ≤280HB	● ◐	MP7130,VP15TF	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
			✲	MP7130	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	MP7130,VP15TF	90(70—120)	80(60—110)	60(40—90)	60(40—90)	Dry, Wet
			✲	MP7130	90(70—120)	80(60—110)	60(40—90)	60(40—90)	Dry, Wet
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	180(160—220)	170(150—210)	150(130—190)	150(130—190)	Dry, Wet
			◐ ✲	VP15TF	130(100—150)	120(90—140)	100(80—120)	100(80—120)	Dry, Wet
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	160(140—180)	150(130—170)	130(110—150)	130(110—150)	Dry, Wet
			◐ ✲	VP15TF	110(80—140)	100(70—130)	80(60—120)	80(60—120)	Dry, Wet
N	Aluminium Alloys	Content Si<5%	● ◐ ✲	TF15	600(400—1000)	600(400—1000)	600(400—1000)	600(400—1000)	Dry, Wet
S	Titanium Alloys (Ti-6Al-4V etc.)	—	● ◐	MP9120	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
			●	VP15TF	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
			◐ ✲	MP9130	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
	Titanium Alloys (Ti-6Al-5V-5Mo-3Cr etc.)	—	● ◐	MP9120	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
			●	VP15TF	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
			◐ ✲	MP9130	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
	Heat Resistant Alloys	—	● ◐	MP9120	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet
			●	VP15TF	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet
			◐ ✲	MP9130	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø20—ø28 ap (mm)	ø20—ø28 fz (mm/t)	ø32—ø50 ap (mm)	ø32—ø50 fz (mm/t)
P	Mild Steels	Hardness ≤180HB	≤0.25DC	● ◐ ✲	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐ ✲	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐ ✲	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
			DC(Slot)	● ◐ ✲	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤0.25DC	● ◐ ✲	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐ ✲	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐ ✲	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
			DC(Slot)	● ◐ ✲	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤0.25DC	● ◐ ✲	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐ ✲	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤6	0.10 (0.08—0.12)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Pre-hardened Steels	Hardness 35—45HRC	≤0.25DC	● ◐ ✲	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐ ✲	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤6	0.10 (0.08—0.12)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
M	Austenitic Stainless Steels	—	≤0.25DC	○ ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✲	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	○ ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✲	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	○ ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✲	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	○ ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✲	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.25DC	○ ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✲	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	○ ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✲	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	○ ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✲	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	○ ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✲	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Duplex Stainless Steels	Hardness ≤280HB	≤0.25DC	○ ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✲	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	○ ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✲	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	○ ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✲	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	○ ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✲	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	○ ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
				✲	≤14	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	○ ◐	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
				✲	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	○ ◐	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
				✲	≤6	0.07 (0.06—0.08)	≤14	0.07 (0.06—0.08)
			DC(Slot)	○ ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✲	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	DC (mm) ø20—ø28 **ap** (mm)	ø20—ø28 **fz** (mm/t)	ø32—ø50 **ap** (mm)	ø32—ø50 **fz** (mm/t)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤14	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
				✲	≤14	0.10(0.08—0.12)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	● ◐	≤8	0.10(0.08—0.12)	≤28	0.12(0.08—0.15)
				✲	≤8	0.08(0.06—0.10)	≤28	0.10(0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.10(0.08—0.12)	≤14	0.10(0.08—0.12)
				✲	≤6	0.08(0.06—0.10)	≤14	0.08(0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08(0.06—0.10)	≤4	0.08(0.06—0.10)
				✲	≤4	0.07(0.06—0.08)	≤4	0.07(0.06—0.08)
	Ductile Cast Irons	—	≤0.25DC	● ◐	≤14	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
				✲	≤14	0.10(0.08—0.12)	≤APMX	0.13(0.10—0.15)
			0.25—0.5DC	● ◐	≤8	0.10(0.08—0.12)	≤28	0.13(0.10—0.15)
				✲	≤8	0.08(0.06—0.10)	≤28	0.10(0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.10(0.08—0.12)	≤14	0.10(0.08—0.12)
				✲	≤6	0.08(0.06—0.10)	≤14	0.08(0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08(0.06—0.10)	≤4	0.08(0.06—0.10)
				✲	≤4	0.07(0.06—0.08)	≤4	0.07(0.06—0.08)
N	Aluminium Alloys	Content Si<5%	≤0.25DC	● ◐	≤14	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
				✲	≤14	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ◐	≤8	0.13(0.10—0.15)	≤28	0.15(0.10—0.20)
				✲	≤8	0.10(0.08—0.12)	≤28	0.13(0.10—0.15)
			0.5—0.75DC	● ◐	≤6	0.10(0.08—0.12)	≤14	0.11(0.06—0.15)
				✲	≤6	0.08(0.06—0.10)	≤14	0.11(0.06—0.15)
			DC(Slot)	● ◐	≤4	0.08(0.06—0.10)	≤4	0.11(0.06—0.15)
				✲	≤4	0.07(0.06—0.08)	≤4	0.09(0.06—0.12)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤0.25DC	● ◐ ✲	≤14	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	● ◐ ✲	≤8	0.10(0.08—0.12)	≤28	0.10(0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤6	0.08(0.06—0.10)	≤14	0.08(0.06—0.10)
			DC(Slot)	● ◐ ✲	≤4	0.08(0.06—0.10)	≤4	0.08(0.06—0.10)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤0.25DC	● ◐ ✲	≤14	0.10(0.08—0.12)	≤APMX	0.10(0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤8	0.10(0.08—0.12)	≤28	0.10(0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤6	0.08(0.06—0.10)	≤14	0.08(0.06—0.10)
			DC(Slot)	● ◐ ✲	≤4	0.08(0.06—0.10)	≤4	0.08(0.06—0.10)
	Heat Resistant Alloys	—	≤0.25DC	● ◐ ✲	≤14	0.10(0.08—0.12)	≤APMX	0.10(0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤8	0.10(0.08—0.12)	≤28	0.10(0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤6	0.08(0.06—0.10)	≤14	0.08(0.06—0.10)
			DC(Slot)	● ◐ ✲	≤4	0.08(0.06—0.10)	≤4	0.08(0.06—0.10)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø40 ap (mm)	DC (mm) ø40 fz (mm/t)	DC (mm) ø50—ø80 ap (mm)	DC (mm) ø50—ø80 fz (mm/t)
P	Mild Steels	Hardness ≤180HB	≤0.25DC	● ● ✻	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ● ✻	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤0.25DC	● ● ✻	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ● ✻	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤0.25DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ● ✻	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ● ✻	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
	Pre-hardened Steels	Hardness 35—45HRC	≤0.25DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ● ✻	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ● ✻	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
M	Austenitic Stainless Steels	—	≤0.25DC	○ ○	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ○	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ○	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	○ ○	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.25DC	○ ○	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ○	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ○	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
			DC(Slot)	○ ○	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.05—0.08)
	Duplex Stainless Steels	Hardness ≤280HB	≤0.25DC	○ ○	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ○	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ○	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	○ ○	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	○ ○	≤APMX	0.13(0.10—0.15)	≤APMX	0.13(0.10—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤APMX	0.10(0.08—0.12)
			0.25—0.5DC	○ ○	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ○	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
				✻	≤21	0.07(0.06—0.08)	≤21	0.07(0.05—0.08)
			DC(Slot)	○ ○	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm) ø40 **ap** (mm)	ø40 **fz** (mm/t)	ø50—ø80 **ap** (mm)	ø50—ø80 **fz** (mm/t)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.18 (0.10—0.25)
				✲	≤APMX	0.12 (0.08—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.12 (0.08—0.15)	≤31	0.15 (0.10—0.20)
				✲	≤APMX	0.10 (0.08—0.12)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.13 (0.10—0.15)
				✲	≤21	0.08 (0.06—0.10)	≤21	0.10 (0.08—0.12)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.12 (0.08—0.15)
				✲	≤5	0.07 (0.06—0.08)	≤5	0.08 (0.06—0.10)
	Ductile Cast Irons	—	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
				✲	≤APMX	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
				✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.10 (0.08—0.12)
				✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
				✲	≤5	0.07 (0.06—0.08)	≤5	0.07 (0.06—0.08)
N	Aluminium Alloys	Content Si < 5%	≤0.25DC	● ◐	≤APMX	0.18 (0.10—0.25)	≤APMX	0.18 (0.10—0.25)
				✲	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤31	0.15 (0.10—0.20)
				✲	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
				✲	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
			DC(Slot)	● ◐	≤5	0.11 (0.06—0.15)	≤5	0.12 (0.08—0.15)
				✲	≤5	0.09 (0.06—0.12)	≤5	0.10 (0.08—0.12)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤0.25DC	● ◐ ✲	≤APMX	0.12 (0.08—0.15)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤0.25DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Heat Resistant Alloys	—	≤0.25DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

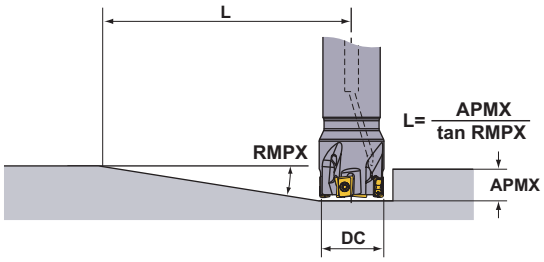
Memo

Memo

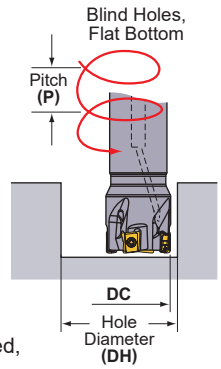
VPX200 Including long types for deep cutting

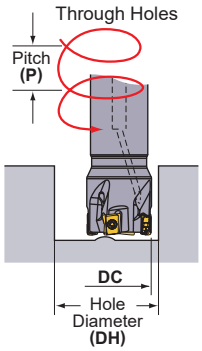
■ Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
16	0.2	1.85°	248	31	1.5	27.5	1.2	24.2	0.8
	0.4	1.85°	248	30.6	1.5	27.5	1.2	24.2	0.8
	0.8	1.85°	248	29.8	1.4	27.5	1.2	24.2	0.8
	1	1.85°	248	29.4	1.4	27.5	1.2	24.2	0.8
	1.2	1.85°	248	29	1.3	27.5	1.2	24.2	0.8
	1.6	1.85°	248	28.2	1.2	27.5	1.2	24.2	0.8
18	0.2	1.56°	294	35	1.5	31.5	1.2	28.1	0.9
	0.4	1.56°	294	34.6	1.4	31.5	1.2	28.1	0.9
	0.8	1.56°	294	33.8	1.4	31.5	1.2	28.1	0.9
	1	1.56°	294	33.4	1.3	31.5	1.2	28.1	0.9
	1.2	1.56°	294	33	1.3	31.5	1.2	28.1	0.9
	1.6	1.56°	294	32.2	1.2	31.5	1.2	28.1	0.9
20	0.2	1.35°	340	39	1.4	35.5	1.1	32	0.9
	0.4	1.35°	340	38.6	1.4	35.5	1.1	32	0.9
	0.8	1.35°	340	37.8	1.3	35.5	1.1	32	0.9
	1	1.35°	340	37.4	1.3	35.5	1.1	32	0.9
	1.2	1.35°	340	37	1.3	35.5	1.1	32	0.9
	1.6	1.35°	340	36.2	1.2	35.5	1.1	32	0.9
22	0.2	1.16°	396	43	1.3	39.5	1.1	36	0.9
	0.4	1.16°	396	42.6	1.3	39.5	1.1	36	0.9
	0.8	1.16°	396	41.8	1.3	39.5	1.1	36	0.9
	1	1.16°	396	41.4	1.2	39.5	1.1	36	0.9
	1.2	1.16°	396	41	1.2	39.5	1.1	36	0.9
	1.6	1.16°	396	40.2	1.2	39.5	1.1	36	0.9
25	0.2	0.97°	473	49	1.3	45.5	1.1	42	0.9
	0.4	0.97°	473	48.6	1.3	45.5	1.1	42	0.9
	0.8	0.97°	473	47.8	1.2	45.5	1.1	42	0.9
	1	0.97°	473	47.4	1.2	45.5	1.1	42	0.9
	1.2	0.97°	473	47	1.2	45.5	1.1	42	0.9
	1.6	0.97°	473	46.2	1.1	45.5	1.1	42	0.9
28	0.2	0.84°	546	55	1.2	51.5	1.1	48	0.9
	0.4	0.84°	546	54.6	1.2	51.5	1.1	48	0.9
	0.8	0.84°	546	53.8	1.2	51.5	1.1	48	0.9
	1	0.84°	546	53.4	1.2	51.5	1.1	48	0.9
	1.2	0.84°	546	53	1.2	51.5	1.1	48	0.9
	1.6	0.84°	546	52.2	1.1	51.5	1.1	48	0.9
30	0.2	0.77°	596	59	1.2	55.5	1.1	52	0.9
	0.4	0.77°	596	58.6	1.2	55.5	1.1	52	0.9
	0.8	0.77°	596	57.8	1.2	55.5	1.1	52	0.9
	1	0.77°	596	57.4	1.2	55.5	1.1	52	0.9
	1.2	0.77°	596	57	1.1	55.5	1.1	52	0.9
	1.6	0.77°	596	56.2	1.1	55.5	1.1	52	0.9
32	0.2	0.71°	646	62.8	1.2	59.4	1.1	56	0.9
	0.4	0.71°	646	62.4	1.2	59.4	1.1	56	0.9
	0.8	0.71°	646	61.6	1.2	59.4	1.1	56	0.9
	1	0.71°	646	61.2	1.1	59.4	1.1	56	0.9
	1.2	0.71°	646	60.8	1.1	59.4	1.1	56	0.9
	1.6	0.71°	646	60	1.1	59.4	1.1	56	0.9

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

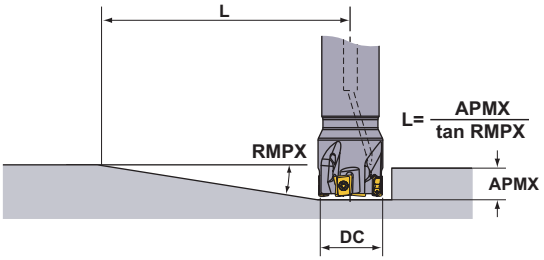
DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
35	0.2	0.63°	728	69	1.2	65.5	1.1	62	0.9
	0.4	0.63°	728	68.6	1.2	65.5	1.1	62	0.9
	0.8	0.63°	728	67.8	1.1	65.5	1.1	62	0.9
	1	0.63°	728	67.4	1.1	65.5	1.1	62	0.9
	1.2	0.63°	728	67	1.1	65.5	1.1	62	0.9
	1.6	0.63°	728	66.2	1.1	65.5	1.1	62	0.9
40	0.2	0.54°	849	78.8	1.2	75.4	1	72	0.9
	0.4	0.54°	849	78.4	1.1	75.4	1	72	0.9
	0.8	0.54°	849	77.6	1.1	75.4	1	72	0.9
	1	0.54°	849	77.2	1.1	75.4	1	72	0.9
	1.2	0.54°	849	76.8	1.1	75.4	1	72	0.9
	1.6	0.54°	849	76	1.1	75.4	1	72	0.9
50	0.2	0.42°	1092	98.8	1.1	95.4	1	92	1
	0.4	0.42°	1092	98.4	1.1	95.4	1	92	1
	0.8	0.42°	1092	97.6	1.1	95.4	1	92	1
	1	0.42°	1092	97.2	1.1	95.4	1	92	1
	1.2	0.42°	1092	96.8	1.1	95.4	1	92	1
	1.6	0.42°	1092	96	1.1	95.4	1	92	1
63	0.2	0.32°	1433	124.8	1.1	121.4	1	118	1
	0.4	0.32°	1433	124.4	1.1	121.4	1	118	1
	0.8	0.32°	1433	123.6	1.1	121.4	1	118	1
	1	0.32°	1433	123.2	1.1	121.4	1	118	1
	1.2	0.32°	1433	122.8	1.1	121.4	1	118	1
	1.6	0.32°	1433	122	1	121.4	1	118	1

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips can become long.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

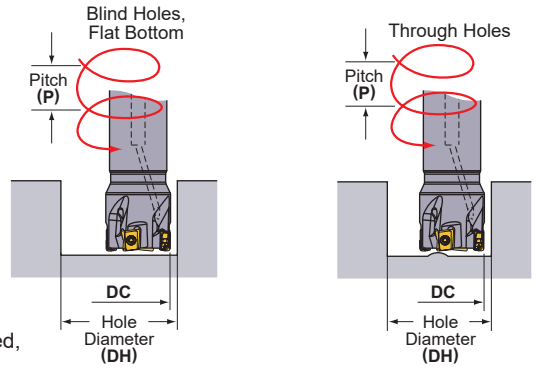
VPX300 Including long types for deep cutting

■ Ramping / Helical Milling

● Ramping



● Helical Milling



Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
25	0.2	2.13°	296	49	2.8	42.7	2.1	36.9	1.4
	0.4	2.13°	296	48.6	2.8	42.7	2.1	36.9	1.4
	0.8	2.13°	296	47.8	2.7	42.7	2.1	36.9	1.4
	1	2.13°	296	47.4	2.6	42.7	2.1	36.9	1.4
	1.2	2.13°	296	47	2.6	42.7	2.1	36.9	1.4
	1.6	2.13°	296	46.2	2.5	42.7	2.1	36.9	1.4
	2	2.13°	296	45.4	2.4	42.7	2.1	36.9	1.4
	2.4	2.13°	296	44.6	2.3	42.7	2.1	36.9	1.4
	3	2.13°	296	43.4	2.2	42.7	2.1	36.9	1.4
	3.2	2.13°	296	43	2.1	42.7	2.1	36.9	1.4
28	0.2	1.77°	356	55	2.6	48.7	2	42.7	1.4
	0.4	1.77°	356	54.6	2.6	48.7	2	42.7	1.4
	0.8	1.77°	356	53.8	2.5	48.7	2	42.7	1.4
	1	1.77°	356	53.4	2.5	48.7	2	42.7	1.4
	1.2	1.77°	356	53	2.4	48.7	2	42.7	1.4
	1.6	1.77°	356	52.2	2.4	48.7	2	42.7	1.4
	2	1.77°	356	51.4	2.3	48.7	2	42.7	1.4
	2.4	1.77°	356	50.6	2.2	48.7	2	42.7	1.4
	3	1.77°	356	49.4	2.1	48.7	2	42.7	1.4
	3.2	1.77°	356	49	2	48.7	2	42.7	1.4
30	0.2	1.61°	392	59	2.6	52.7	2	46.6	1.5
	0.4	1.61°	392	58.6	2.5	52.7	2	46.6	1.5
	0.8	1.61°	392	57.8	2.5	52.7	2	46.6	1.5
	1	1.61°	392	57.4	2.4	52.7	2	46.6	1.5
	1.2	1.61°	392	57	2.4	52.7	2	46.6	1.5
	1.6	1.61°	392	56.2	2.3	52.7	2	46.6	1.5
	2	1.61°	392	55.4	2.2	52.7	2	46.6	1.5
	2.4	1.61°	392	54.6	2.2	52.7	2	46.6	1.5
	3	1.61°	392	53.4	2.1	52.7	2	46.6	1.5
	3.2	1.61°	392	53	2	52.7	2	46.6	1.5
32	0.2	1.47°	429	63	2.5	56.7	2	50.6	1.5
	0.4	1.47°	429	62.6	2.5	56.7	2	50.6	1.5
	0.8	1.47°	429	61.8	2.4	56.7	2	50.6	1.5
	1	1.47°	429	61.4	2.4	56.7	2	50.6	1.5
	1.2	1.47°	429	61	2.3	56.7	2	50.6	1.5
	1.6	1.47°	429	60.2	2.3	56.7	2	50.6	1.5
	2	1.47°	429	59.4	2.2	56.7	2	50.6	1.5
	2.4	1.47°	429	58.6	2.1	56.7	2	50.6	1.5
	3	1.47°	429	57.4	2.1	56.7	2	50.6	1.5
	3.2	1.47°	429	57	2	56.7	2	50.6	1.5

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips can become long.
* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle L (= 11/tan RMPX).

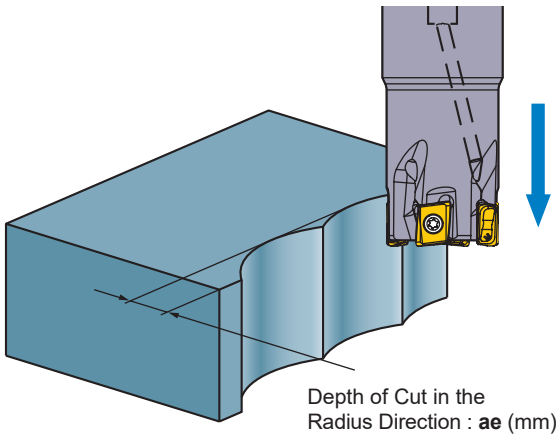
DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	**L** (mm) *	**DH max.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)
35	0.2	1.28°	493	69	2.4	62.8	1.9	56.6	1.5
	0.4	1.28°	493	68.6	2.4	62.8	1.9	56.6	1.5
	0.8	1.28°	493	67.8	2.3	62.8	1.9	56.6	1.5
	1	1.28°	493	67.4	2.3	62.8	1.9	56.6	1.5
	1.2	1.28°	493	67	2.2	62.8	1.9	56.6	1.5
	1.6	1.28°	493	66.2	2.2	62.8	1.9	56.6	1.5
	2	1.28°	493	65.4	2.1	62.8	1.9	56.6	1.5
	2.4	1.28°	493	64.6	2.1	62.8	1.9	56.6	1.5
	3	1.28°	493	63.4	2	62.8	1.9	56.6	1.5
	3.2	1.28°	493	63	2	62.8	1.9	56.6	1.5
40	0.2	1.06°	595	78.8	2.3	72.7	1.9	66.5	1.5
	0.4	1.06°	595	78.4	2.2	72.7	1.9	66.5	1.5
	0.8	1.06°	595	77.6	2.2	72.7	1.9	66.5	1.5
	1	1.06°	595	77.2	2.2	72.7	1.9	66.5	1.5
	1.2	1.06°	595	76.8	2.1	72.7	1.9	66.5	1.5
	1.6	1.06°	595	76	2.1	72.7	1.9	66.5	1.5
	2	1.06°	595	75.2	2	72.7	1.9	66.5	1.5
	2.4	1.06°	595	74.4	2	72.7	1.9	66.5	1.5
	3	1.06°	595	73.2	1.9	72.7	1.9	66.5	1.5
	3.2	1.06°	595	72.8	1.9	72.7	1.9	66.5	1.5
50	0.2	0.79°	798	98.8	2.1	92.7	1.8	86.5	1.6
	0.4	0.79°	798	98.4	2.1	92.7	1.8	86.5	1.6
	0.8	0.79°	798	97.6	2.1	92.7	1.8	86.5	1.6
	1	0.79°	798	97.2	2	92.7	1.8	86.5	1.6
	1.2	0.79°	798	96.8	2	92.7	1.8	86.5	1.6
	1.6	0.79°	798	96	2	92.7	1.8	86.5	1.6
	2	0.79°	798	95.2	2	92.7	1.8	86.5	1.6
	2.4	0.79°	798	94.4	1.9	92.7	1.8	86.5	1.6
	3	0.79°	798	93.2	1.9	92.7	1.8	86.5	1.6
	3.2	0.79°	798	92.8	1.9	92.7	1.8	86.5	1.6
63	0.2	0.6°	1051	124.8	2	118.7	1.8	112.5	1.6
	0.4	0.6°	1051	124.4	2	118.7	1.8	112.5	1.6
	0.8	0.6°	1051	123.6	2	118.7	1.8	112.5	1.6
	1	0.6°	1051	123.2	2	118.7	1.8	112.5	1.6
	1.2	0.6°	1051	122.8	2	118.7	1.8	112.5	1.6
	1.6	0.6°	1051	122	1.9	118.7	1.8	112.5	1.6
	2	0.6°	1051	121.2	1.9	118.7	1.8	112.5	1.6
	2.4	0.6°	1051	120.4	1.9	118.7	1.8	112.5	1.6
	3	0.6°	1051	119.2	1.9	118.7	1.8	112.5	1.6
	3.2	0.6°	1051	118.8	1.8	118.7	1.8	112.5	1.6
80	0.2	0.45°	1401	158.8	1.9	152.6	1.8	146.5	1.6
	0.4	0.45°	1401	158.4	1.9	152.7	1.8	146.5	1.6
	0.8	0.45°	1401	157.6	1.9	152.7	1.8	146.5	1.6
	1	0.45°	1401	157.2	1.9	152.7	1.8	146.5	1.6
	1.2	0.45°	1401	156.8	1.9	152.7	1.8	146.5	1.6
	1.6	0.45°	1401	156	1.9	152.7	1.8	146.5	1.6
	2	0.45°	1401	155.2	1.9	152.7	1.8	146.5	1.6
	2.4	0.45°	1401	154.4	1.8	152.7	1.8	146.5	1.6
	3	0.45°	1401	153.2	1.8	152.7	1.8	146.5	1.6
	3.2	0.45°	1401	152.8	1.8	152.7	1.8	146.5	1.6

VPX200/300 Including long types for deep cutting

■ For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● Plunging



VPX200

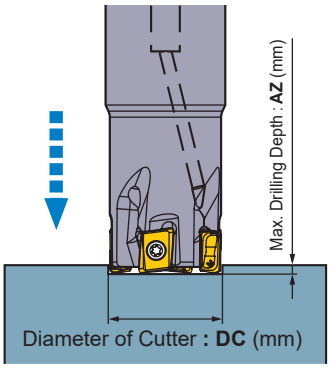
DC (mm)	ae max. (mm)
16	3.9
18	3.9
20	3.9
22	4.0
25	4.0
28	4.0
30	4.0
32	4.0
35	4.0
40	4.0
50	4.0
63	4.0

VPX300

DC (mm)	ae max. (mm)
25	6.5
28	6.6
30	6.6
32	6.6
35	6.7
40	6.7
50	6.7
63	6.7
80	6.7

Note 1) No step feed necessary.

● Drilling



VPX200

DC (mm)	AZ max. (mm)
16	0.3
18	0.3
20	0.3
22	0.3
25	0.3
28	0.3
30	0.3
32	0.3
35	0.3
40	0.3
50	0.3
63	0.3

VPX300

DC (mm)	AZ max. (mm)
25	0.55
28	0.55
30	0.55
32	0.55
35	0.55
40	0.55
50	0.55
63	0.55
80	0.55

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminium alloy).

Memo

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

AXD4000

P	M	K	N	S	H
Steel			Non-ferrous Metal	Heat Resistant Alloy	



Fig.1

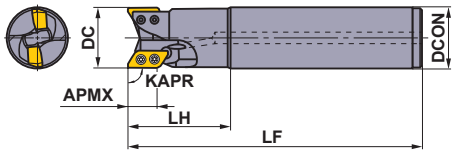
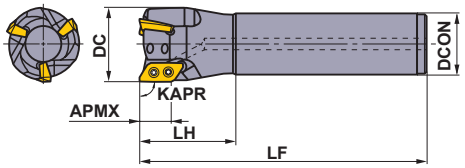


Fig.2



SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	LH	DCON	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.4 | 3.2	AXD4000R201SA20SA	●	1	20	110	35	20	15.5	15000	1	TS3SBS	TKY08D	MK1KS	XDGX1750◯◯
		AXD4000R252SA25SA	●	2	25	125	50	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LA	●	2	25	170	80	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25SA	●	2	28	125	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25ELA	●	2	28	220	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SA	●	2	32	150	50	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LA	●	2	32	200	80	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32SA	●	2	35	150	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32ELA	●	2	35	250	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SA	●	3	40	150	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SA	●	3	40	170	80	42	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32ELA	●	3	40	250	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
B Type	4.0 | 5.0	AXD4000R201SA20SB	●	1	20	110	35	20	14.8	15000	1	TS3SBS	TKY08D	MK1KS	
		AXD4000R252SA25SB	●	2	25	125	50	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LB	●	2	25	170	80	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25SB	●	2	28	125	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25ELB	●	2	28	220	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SB	●	2	32	150	50	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LB	●	2	32	200	80	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32SB	●	2	35	150	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32ELB	●	2	35	250	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SB	●	3	40	150	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SB	●	3	40	170	80	42	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32ELB	●	3	40	250	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.
* Clamp Torque (N • m) : TS3SBS=1.5, TS3SB=1.5
Use the clamp screw by setting the bundled screw.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig. 1

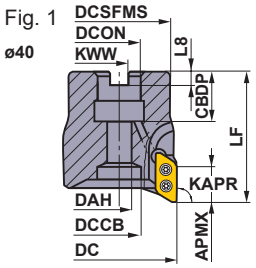


Fig. 2

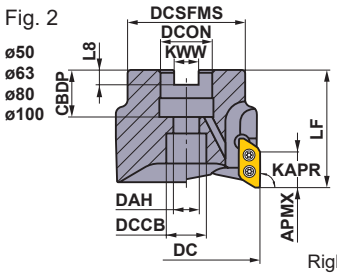
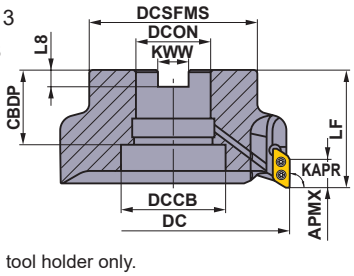
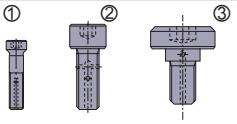


Fig. 3



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	②
ϕ100	HSC16040H	②
ϕ125	MBA20040H	③



With Coolant Hole

■ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	Max. Allowable Revolution (min⁻¹)	Fig.	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Type	0.4 – 3.2	**AXD4000-040A02RA**	●	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	XDGX1750○○
		AXD4000-040A03RA	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RA	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RA	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R08005CA	●	5	80	50	25.4	26	13	60	9.5	6	20	1	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R10006DA	●	6	100	63	31.75	32	17	70	12.7	8	26	2	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EA	●	7	125	63	38.1	40	—	90	15.9	10	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Type	4.0 – 5.0	**AXD4000-040A02RB**	●	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-040A03RB	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RB	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RB	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R08005CB	●	5	80	50	25.4	26	13	60	9.5	6	20	1	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R10006DB	●	6	100	63	31.75	32	17	70	12.7	8	26	2	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EB	●	7	125	63	38.1	40	—	90	15.9	10	56	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	Max. Allowable Revolution (min⁻¹)	Fig.	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Type	0.4 – 3.2	**AXD4000-040A02RA**	●	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	XDGX1750○○
		AXD4000-040A03RA	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RA	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RA	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RA	●	5	80	50	27	23	13	60	12.4	7	20	1	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RA	●	6	100	63	32	26	17	78	14.4	8	26	2	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RA	●	7	125	63	40	40	—	90	16.4	9	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Type	4.0 – 5.0	**AXD4000-040A02RB**	●	2	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-040A03RB	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RB	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RB	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RB	●	5	80	50	27	23	13	60	12.4	7	20	1	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RB	●	6	100	63	32	26	17	78	14.4	8	26	2	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RB	●	7	125	63	40	40	—	90	16.4	9	56	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

Note 1) The maximum allowable spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF dimension decrease.
* Clamp Torque (N • m) : TS3SB=1.5
Use the clamp screw by setting the bundled screw.

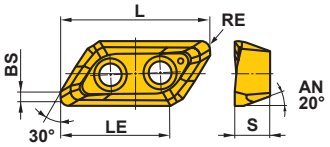
ISO13399 ➤ L003
CAUTION FOR USE ➤ L213
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			LC15TF	MP6120	MP9120	TF15
	P	Steel	✲	◐	✲	◐
	N	Aluminium Alloy	✲		✲	◐
	S	Titanium Alloy			◐	

Cutting Conditions (Guide):
● :Stable Cutting ◐ :General Cutting ✲ :Unstable Cutting

Edge Preparation:
F :Sharp **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP6120	Stock: Coated MP9120	Stock: Carbide TF15	L	LE	S	BS	RE*	Geometry
GL Breaker 	**XDGX175004PDFR-GL**	G	F	●			●	23	16.9	5	1.7	0.4	
	XDGX175008PDFR-GL	G	F	●			●	23	17	5	1.3	0.8	
	XDGX175012PDFR-GL	G	F	●			●	23	17	5	0.9	1.2	
	XDGX175016PDFR-GL	G	F	●			●	22	16.4	5	1.4	1.6	
	XDGX175020PDFR-GL	G	F	●			●	22	16.4	5	1.0	2.0	
	XDGX175024PDFR-GL	G	F	●			●	22	16.4	5	0.6	2.4	
	XDGX175030PDFR-GL	G	F	●			●	21.1	16.1	5	0.8	3.0	
	XDGX175032PDFR-GL	G	F	●			●	21.1	16.1	5	0.6	3.2	
	XDGX175040PDFR-GL	G	F	●			●	20	15.6	5	0.8	4.0	
	XDGX175050PDFR-GL	G	F	●			●	19.4	15.3	5	0.4	5.0	
GM Breaker 	**XDGX175004PDER-GM**	G	E		●	●		23	17	5	1.7	0.4	
	XDGX175008PDER-GM	G	E		●	●		23	17	5	1.2	0.8	
	XDGX175012PDER-GM	G	E		●	●		23	17	5	0.9	1.2	
	XDGX175016PDER-GM	G	E		●	●		22	15.9	5	1.3	1.6	
	XDGX175020PDER-GM	G	E		●	●		22	15.9	5	0.8	2.0	
	XDGX175024PDER-GM	G	E		●	●		22	15.9	5	0.4	2.4	
	XDGX175030PDER-GM	G	E		●	●		21.1	16	5	0.6	3.0	
	XDGX175032PDER-GM	G	E		●	●		21.1	16	5	0.4	3.2	
	XDGX175040PDER-GM	G	E		●	●		20	14.8	5	0.5	4.0	
	XDGX175050PDER-GM	G	E		●	●		19.4	15	5	0.3	5.0	
GM Breaker 	**XDGX175004PDFR-GM**	G	F				●	23	17	5	1.7	0.4	
	XDGX175008PDFR-GM	G	F				●	23	17	5	1.2	0.8	
	XDGX175012PDFR-GM	G	F				●	23	17	5	0.9	1.2	
	XDGX175016PDFR-GM	G	F				●	22	15.9	5	1.3	1.6	
	XDGX175020PDFR-GM	G	F				●	22	15.9	5	0.8	2.0	
	XDGX175024PDFR-GM	G	F				●	22	15.9	5	0.4	2.4	
	XDGX175030PDFR-GM	G	F				●	21.1	16	5	0.6	3.0	
	XDGX175032PDFR-GM	G	F				●	21.1	16	5	0.4	3.2	
	XDGX175040PDFR-GM	G	F				●	20	14.8	5	0.5	4.0	
	XDGX175050PDFR-GM	G	F				●	19.4	15	5	0.3	5.0	

* Be careful because corner R(RE) has a different shape than machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

■ Holder And Insert Corner Radius Combination

Holder	**A** Type Holder								**B** Type Holder	
	AXD4000–○○○○○○○A **AXD4000R○○○○○○○A**								**AXD4000–○○○○○○○B** **AXD4000R○○○○○○○B**	
Applicable Insert Corner R (RE)	R0.4	R0.8	R1.2	R1.6	R2.0	R2.4	R3.0	R3.2	R4.0	R5.0
	XDGX 175004PD○R-○○	**XDGX 175008PD○R-○○**	**XDGX 175012PD○R-○○**	**XDGX 175016PD○R-○○**	**XDGX 175020PD○R-○○**	**XDGX 175024PD○R-○○**	**XDGX 175030PD○R-○○**	**XDGX 175032PD○R-○○**	**XDGX 175040PD○R-○○**	**XDGX 175050PD○R-○○**

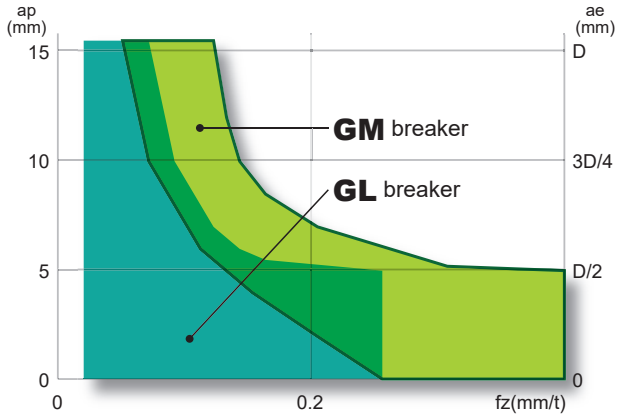
Not interchangeable with the corresponding inserts of the A type and B type holders.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

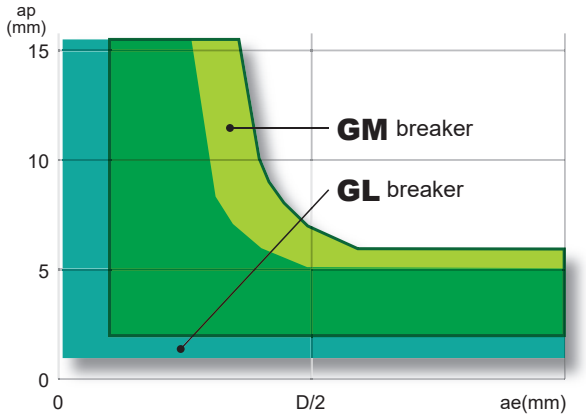
Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
1st recommendation for stable cutting condition is the GL breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth



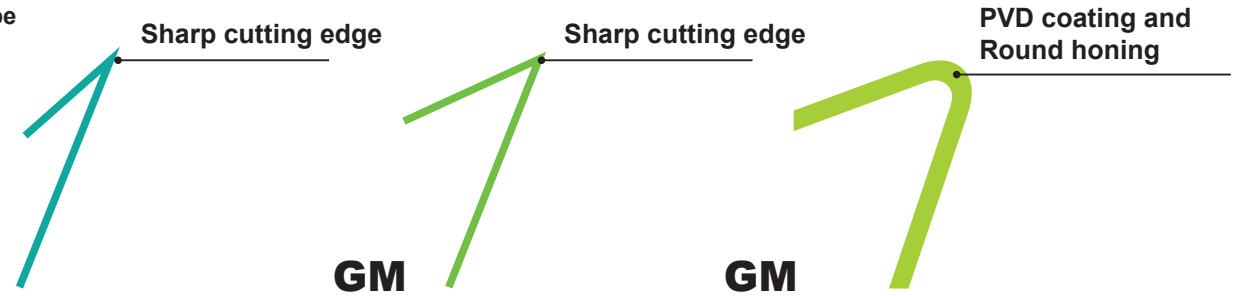
Selection of insert according to the width of cut and the required cutting depth



1st recommendation for machining aluminium alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge

Insert type

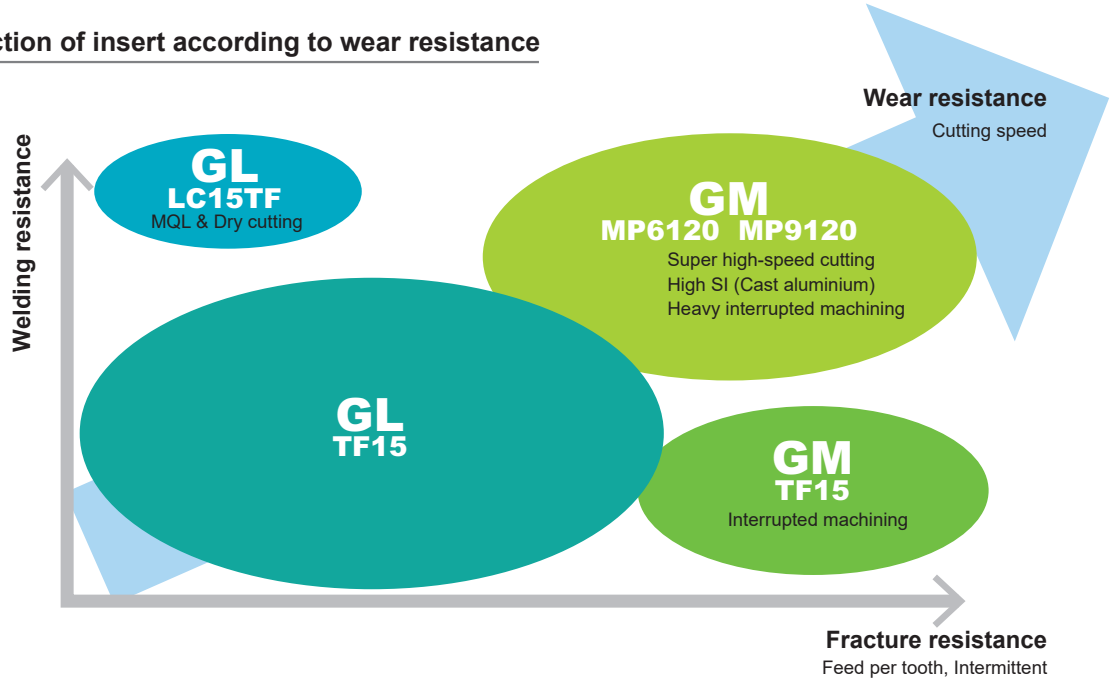


GL
TF15/LC15TF
Low cutting resistance
(LC15TF: Excellent weld resistance)

GM
TF15
Tougher cutting edge

GM
MP9120
Tougher cutting edge & wear resistance
Machining of difficult-to-cut materials & aluminium

Selection of insert according to wear resistance



RECOMMENDED CUTTING CONDITIONS

■Cutting Speed

	Workpiece Material		Greade	Breaker	Cutting Speed **vc** (m/min)
P	Mild Steel (ASTM A36,AISI 1010)	**≤180HB**	**MP6120**	**GM**	200 (150—220)
	Carbon Steel, Alloy Steel (AISI 1045,AISI 4140)	**180—280HB**	**MP6120**	**GM**	200 (150—220)
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**TF15 LC15TF**	**GL**	1000 (200—3000)
			TF15 MP9120	**GM**	1000 (200—3000)
	Aluminium Alloy (AC4B, ADC12, A390 etc)	**5%≤Si≤10% Si>10%**	**MP9120**	**GM**	1000 (200—3000)
S	Titanium Alloy (Ti-6Al-4V etc)	—	**MP9120**	**GM**	40 (30—60)

■Depth of Cut / Feed per Tooth

	Workpiece Material		Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t) Cutting Edge Diameter **DC** (mm)					
						20	**25, 28**	**32, 35**	**40**	**50, 63, 80**	**100, 125**
P	Mild Steel (ASTM A36,AISI 1010)	**≤180HB**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	—	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	—	≤ 0.08	≤ 0.10	≤ 0.10	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 10	—	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
	Carbon Steel, Alloy Steel (AISI 1045,AISI 4140)	**180—280HB**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	—	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	—	≤ 0.08	≤ 0.10	≤ 0.10	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 10	—	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred.
If vibrations occur make adjustments according to the machining conditions.
Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

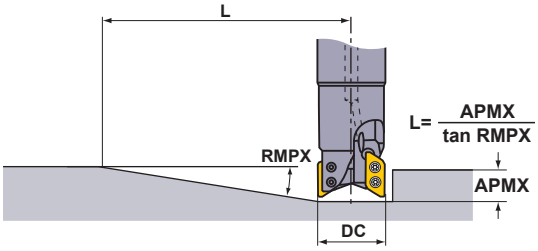
Workpiece Material			Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)					
						Cutting Edge Diameter **DC** (mm)					
						20	**25, 28**	**32, 35**	**40**	**50, 63, 80**	**100, 125**
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GL**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	≤ 0.05	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	–	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	–	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	–	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	–	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 14.5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	–	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 14.5	–	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	–	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 14.5	–	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
	Aluminium Alloy (AC4B etc) Aluminium Alloy (ADC12, A390 etc)	**5%≤Si≤10% Si>10%**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 14.5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	–	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 14.5	–	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	–	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 14.5	–	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
S	Titanium Alloy (Ti-6Al-4V etc)	–	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	–	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	–	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	–	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	–	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred.
If vibrations occur make adjustments according to the machining conditions.

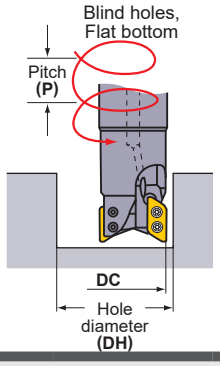
Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

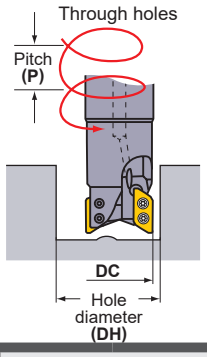
■RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING





RAMPING/HELICAL CUTTING (Aluminium Alloy)

Holder Type	Cutting Edge Diameter **DC** (mm)	Insert Corner R **RE** (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** *1 (mm)	Maximum Hole Diameter **DH max.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)
A type	20	0.4—1.2	20.7°	42	37.1 *2	14	36.1	14	22	2
		1.6—2.4	19.9°	43	34.7 *3	13	34.6	13	22	2
		3.0—3.2	18.9°	46	33.1 *4	12	33.3	12	22	1
	25	0.4—1.2	23.1°	37	47.1 *2	14	46	14	31.6	8
		1.6—2.4	22.0°	39	44.7 *3	13	44.4	13	31.6	8
		3.0—3.2	18.7°	46	43.1 *4	12	43	12	31.6	7
	28	0.4—1.2	19.2°	45	53.1 *2	14	52	14	36	8
		1.6—2.4	18.5°	47	50.7 *3	13	50.4	13	36	8
		3.0—3.2	16.7°	52	49.1 *4	12	48.9	12	36	7
	32	0.4—1.2	15.4°	57	61.1 *2	14	59.9	14	45.5	11
		1.6—2.4	14.7°	60	58.7 *3	13	58.3	13	45.5	11
		3.0—3.2	13.8°	64	57.1 *4	12	56.8	12	45.5	10
	35	0.4—1.2	13.4°	66	67.1 *2	14	65.8	14	50	11
		1.6—2.4	12.7°	69	64.7 *3	13	64.3	13	50	10
		3.0—3.2	11.8°	75	63.1 *4	12	62.8	12	50	9
	40	0.4—1.2	11.1°	80	76.7 *2	14	75.9	14	61.5	13
		1.6—2.4	10.4°	85	74.3 *3	13	74.2	13	61.5	12
		3.0—3.2	9.7°	91	72.7 *4	12	72.7	12	61.5	11
	50	0.4—1.2	8.2°	108	96.7 *2	14	95.6	14	81.4	14
		1.6—2.4	7.6°	117	94.3 *3	13	94	13	81.4	13
		3.0—3.2	6.9°	129	92.7 *4	12	92.4	12	81.4	11
	63	0.4—1.2	6.1°	146	122.7 *2	14	121.6	14	107.4	14
		1.6—2.4	5.6°	159	120.3 *3	13	119.9	13	107.4	13
		3.0—3.2	5.2°	171	118.7 *4	12	118.4	12	107.4	12
	80	0.4—1.2	4.6°	193	156.7 *2	14	155.6	14	141.4	14
		1.6—2.4	4.2°	212	154.3 *3	13	153.9	13	141.4	13
		3.0—3.2	3.8°	234	152.7 *4	12	152.4	12	141.4	12
	100	0.4—1.2	3.5°	254	196.7 *2	14	195.5	14	181.5	14
		1.6—2.4	3.2°	278	194.3 *3	13	193.9	13	181.5	13
		3.0—3.2	2.9°	306	192.7 *4	12	192.3	12	181.5	12
	125	0.4—1.2	2.7°	329	246.7 *2	14	245.5	14	231.5	14
		1.6—2.4	2.5°	356	244.3 *3	13	243.8	13	231.5	13
		3.0—3.2	2.3°	386	242.7 *4	12	242.3	12	231.5	12

Note 1) Ramping, helical, and drilling are not recommended for machining of steel and titanium alloys.

Holder Type	Cutting Edge Diameter **DC** (mm)	Insert Corner R **RE** (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** *1 (mm)	Maximum Hole Diameter **DH max.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)
B type	20	4	17.5°	47	31.5	10	31.8	10	22	1
		5	16.6°	71	29.5	6	31.1	7	22	1
	25	4	15.1°	55	41.5	10	41.4	10	31.7	5
		5	13.7°	61	39.5	9	40.6	9	31.7	5
	28	4	14.1°	59	47.5	10	47.2	10	36	6
		5	13°	65	45.5	9	46.4	9	36	5
	32	4	12.7°	66	55.5	10	55.1	10	45.5	9
		5	12°	70	53.5	9	54.3	9	45.5	8
	35	4	10.8°	78	61.5	10	61	10	50	8
		5	10.2°	83	59.5	9	60.2	9	50	8
	40	4	8.8°	96	71.1	10	70.9	10	61.5	10
		5	8.2°	103	69.1	9	70.1	9	61.5	9
	50	4	6.3°	135	91.1	10	90.6	10	81.3	10
		5	5.8°	146	89.1	9	89.8	9	81.3	9
	63	4	4.6°	184	117.1	10	116.6	10	107.4	10
		5	4.2°	202	115.1	9	115.7	9	107.3	9
	80	4	3.4°	250	151.1	10	150.5	10	141.4	10
		5	3.1°	274	149.1	9	149.6	9	141.4	9
	100	4	2.6°	326	191.1	10	190.5	10	181.4	10
		5	2.4°	354	189.1	9	189.6	9	181.4	9
	125	4	2°	424	241.1	10	240.5	10	231.4	10
		5	1.8°	471	239.1	9	239.6	9	229.9	9

Note 1) The recommended ramping feed is 0.05mm/t or under.

*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L= (maximum depth of cut APMX/tan RMPX). Maximum depth of cut A type is 15.5mm, B type is 14.8mm.

*2 Corner radius of 1.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

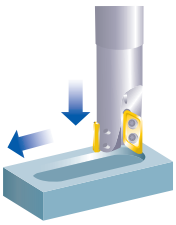
*3 Corner radius of 2.4mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

*4 Corner radius of 3.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

■ Max.Drilling Depth (Aluminium Alloy)

Type	Insert Corner R **RE** (mm)	Max.Drilling Depth (mm)					
		Cutting Edge Diameter **DC** (mm)					
		ϕ20	**ϕ25**	**ϕ28**	**ϕ32**	**ϕ35**	**ϕ40–ϕ125**
A type	0.4	5.3	5.2	5.2	5.2	5.3	5.3
	0.8	5.3	5.2	5.2	5.2	5.3	5.3
	1.2	5.3	5.2	5.2	5.2	5.3	5.3
	1.6	4.8	4.6	4.7	4.7	4.9	4.8
	2.0	4.8	4.6	4.7	4.7	4.9	4.8
	2.4	4.8	4.6	4.7	4.7	4.9	4.8
	3.0	4.3	3.7	4.2	4.2	4.4	4.4
	3.2	4.3	3.7	4.2	4.2	4.4	4.4
B type	4.0	3.7	2.7	3.7	3.6	3.8	3.8
	5.0	3.4	2.3	3.3	3.3	3.5	3.5

AXD4000 can be effectively used for pocket machining without the need for a prepared hole.



MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY MATERIAL CUTTING>

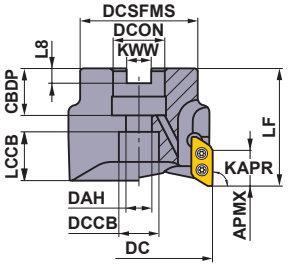
90° KAPR

AXD4000A NEW

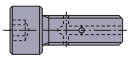
P	M	K	N	S	H
			Non-ferrous Metal		



ø50



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ50	HSC10030H	 With Coolant Hole

■ARBOR TYPE

DCON = inch size, With Coolant Hole

DC (mm)	Type	Insert Corner Radius **RE** (mm)	Order Number	Stock **R**	Number of Teeth	Dimensions (mm) **LF**	Dimensions (mm) **DCON**	**WT** (kg)	**APMX** (mm)	**RPMX** (min^{-1})	Insert Type
50	D	0.4–3.2	**AXD4000A-050A04RD**	●	4	50	22	0.4	15.5	34000	XDGX1750
50	E	4.0–5.0	**AXD4000A-050A04RE**	●	4	50	22	0.4	14.8	34000	XDGX1750

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
RPMX (max. rev/min) for holders must also be considered.
Note 2) Tool should be set with balancing quality of G6.3 (ISO1940) or ISO16084, in case over 6000 min^{-1} spindle rotation.
Note 3) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 4) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF dimensions decrease.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**AXD4000A-050A04RD**	22	20	11	17	15.4	45	10.4	6.3
50	**AXD4000A-050A04RE**	22	20	11	17	14.6	45	10.4	6.3

SPARE PARTS

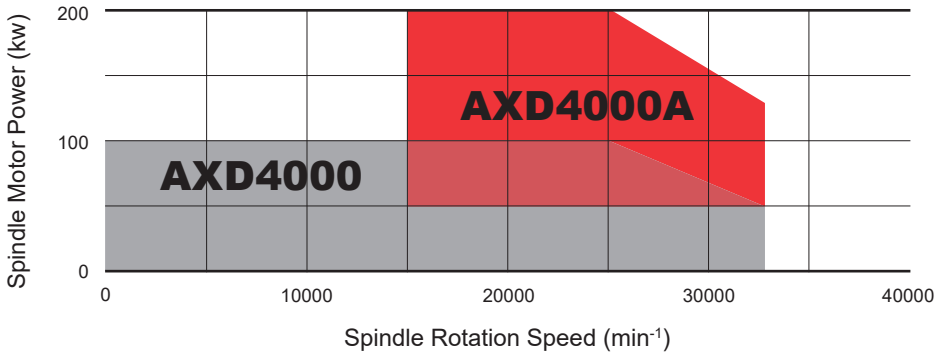
 *		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS3SB	TIP10D	MK1KS

* Clamp Torque (N • m) : TPS3SB = 3.0

Note 1) Clamp screw and wrench of AXD4000A are different from AXD4000.

How to Choose AXD4000A or AXD4000

AXD4000A is specifically engineered for continuous high-speed and ultra-high-speed machining of aluminium alloys, and can be better utilized on more powerful machines with a motors of more than 80kW.

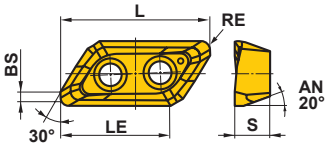


ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material	N	Aluminium Alloys

Cutting Conditions (Guide):
● :Stable Cutting ◔ :General Cutting ✲ :Unstable Cutting
Edge Preparation:
F :Sharp **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP9120	Stock: Coated	Stock: Carbide MT2010	Stock: Carbide TF15	L	LE	S	BS	RE*	Geometry
Strong Cutting Edge **GM** Breaker 	**XDGX175004PDFR-GM**	G	F				●	●	23.0	17.0	5	1.7	0.4	
	XDGX175008PDFR-GM	G	F				●	●	23.0	17.0	5	1.2	0.8	
	XDGX175012PDFR-GM	G	F				●	●	23.0	17.0	5	0.9	1.2	
	XDGX175016PDFR-GM	G	F				●	●	22.0	15.9	5	1.3	1.6	
	XDGX175020PDFR-GM	G	F				●	●	22.0	15.9	5	0.8	2.0	
	XDGX175024PDFR-GM	G	F				●	●	22.0	15.9	5	0.4	2.4	
	XDGX175030PDFR-GM	G	F				●	●	21.1	16.0	5	0.6	3.0	
	XDGX175032PDFR-GM	G	F				●	●	21.1	16.0	5	0.4	3.2	
	XDGX175040PDFR-GM	G	F				●	●	20.0	14.8	5	0.5	4.0	
	XDGX175050PDFR-GM	G	F				●	●	19.4	15.0	5	0.3	5.0	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker 	**XDGX175004PDER-GM**	G	E		●				23.0	17.0	5	1.7	0.4	
	XDGX175008PDER-GM	G	E		●				23.0	17.0	5	1.2	0.8	
	XDGX175012PDER-GM	G	E		●				23.0	17.0	5	0.9	1.2	
	XDGX175016PDER-GM	G	E		●				22.0	15.9	5	1.3	1.6	
	XDGX175020PDER-GM	G	E		●				22.0	15.9	5	0.8	2.0	
	XDGX175024PDER-GM	G	E		●				22.0	15.9	5	0.4	2.4	
	XDGX175030PDER-GM	G	E		●				21.1	16.0	5	0.6	3.0	
	XDGX175032PDER-GM	G	E		●				21.1	16.0	5	0.4	3.2	
	XDGX175040PDER-GM	G	E		●				20.0	14.8	5	0.5	4.0	
	XDGX175050PDER-GM	G	E		●				19.4	15.0	5	0.3	5.0	
Low Cutting Resistance **GL** Breaker 	**XDGX175004PDFR-GL**	G	F	●				●	23.0	16.9	5	1.7	0.4	
	XDGX175008PDFR-GL	G	F	●				●	23.0	17.0	5	1.3	0.8	
	XDGX175012PDFR-GL	G	F	●				●	23.0	17.0	5	0.9	1.2	
	XDGX175016PDFR-GL	G	F	●				●	22.0	16.4	5	1.4	1.6	
	XDGX175020PDFR-GL	G	F	●				●	22.0	16.4	5	1.0	2.0	
	XDGX175024PDFR-GL	G	F	●				●	22.0	16.4	5	0.6	2.4	
	XDGX175030PDFR-GL	G	F	●				●	21.1	16.1	5	0.8	3.0	
	XDGX175032PDFR-GL	G	F	●				●	21.1	16.1	5	0.6	3.2	
	XDGX175040PDFR-GL	G	F	●				●	20.0	15.6	5	0.8	4.0	
	XDGX175050PDFR-GL	G	F	●				●	19.4	15.3	5	0.4	5.0	

* Be careful because corner R(RE) has a different shape than machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

■ Holder And Insert Corner Radius Combination

Holder	**D** Type Holder								**E** Type Holder	
	AXD4000A–050A04RD								**AXD4000A–050A04RE**	
Applicable Insert Corner R (**RE**)	R0.4	R0.8	R1.2	R1.6	R2.0	R2.4	R3.0	R3.2	R4.0	R5.0
	XDGX 175004PD R-	XDGX 175008PD R-	XDGX 175012PD R-	XDGX 175016PD R-	XDGX 175020PD R-	XDGX 175024PD R-	XDGX 175030PD R-	XDGX 175032PD R-	XDGX 175040PD R-	XDGX 175050PD R-

Not interchangeable with the corresponding inserts of the C type and D type holders.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

Inserts to be used with the AXD4000A ,which include clamping screws, must be ordered via the kit order numbers referenced below.

Insert Kit

Package contents of insert kit (10 inserts and 20 clamp screws)

Workpiece Material	N	Aluminium Alloys	◐	✣			◐	✣		Cutting Conditions (Guide): ● :Stable Cutting ◐ :General Cutting ✣ :Unstable Cutting

Shape	Order Number	Stock						Inserts		Clamp Screw		Use
		Coated				Carbide						
		LC15TF	MP9120			MT2010	TF15	Order Number	Pieces	Order Number	Pieces	
Strong Cutting Edge **GM** Breaker 	**K-XDGX175004PDFR-GM**					□	□	XDGX175004PDFR-GM	10	TPS3SB	20	First Recommendation High-Speed, High Efficiency and High Load Machining
	K-XDGX175008PDFR-GM					□	□	XDGX175008PDFR-GM	10	TPS3SB	20	
	K-XDGX175012PDFR-GM					□	□	XDGX175012PDFR-GM	10	TPS3SB	20	
	K-XDGX175016PDFR-GM					□	□	XDGX175016PDFR-GM	10	TPS3SB	20	
	K-XDGX175020PDFR-GM					□	□	XDGX175020PDFR-GM	10	TPS3SB	20	
	K-XDGX175024PDFR-GM					□	□	XDGX175024PDFR-GM	10	TPS3SB	20	
	K-XDGX175030PDFR-GM					□	□	XDGX175030PDFR-GM	10	TPS3SB	20	
	K-XDGX175032PDFR-GM					□	□	XDGX175032PDFR-GM	10	TPS3SB	20	
	K-XDGX175040PDFR-GM					□	□	XDGX175040PDFR-GM	10	TPS3SB	20	
	K-XDGX175050PDFR-GM					□	□	XDGX175050PDFR-GM	10	TPS3SB	20	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker 	**K-XDGX175004PDER-GM**		□					XDGX175004PDER-GM	10	TPS3SB	20	
	K-XDGX175008PDER-GM		□					XDGX175008PDER-GM	10	TPS3SB	20	
	K-XDGX175012PDER-GM		□					XDGX175012PDER-GM	10	TPS3SB	20	
	K-XDGX175016PDER-GM		□					XDGX175016PDER-GM	10	TPS3SB	20	
	K-XDGX175020PDER-GM		□					XDGX175020PDER-GM	10	TPS3SB	20	
	K-XDGX175024PDER-GM		□					XDGX175024PDER-GM	10	TPS3SB	20	
	K-XDGX175030PDER-GM		□					XDGX175030PDER-GM	10	TPS3SB	20	
	K-XDGX175032PDER-GM		□					XDGX175032PDER-GM	10	TPS3SB	20	
	K-XDGX175040PDER-GM		□					XDGX175040PDER-GM	10	TPS3SB	20	
	K-XDGX175050PDER-GM		□					XDGX175050PDER-GM	10	TPS3SB	20	
Low Cutting Resistance **GL** Breaker 	**K-XDGX175004PDFR-GL**	□					□	XDGX175004PDFR-GL	10	TPS3SB	20	General Machining
	K-XDGX175008PDFR-GL	□					□	XDGX175008PDFR-GL	10	TPS3SB	20	
	K-XDGX175012PDFR-GL	□					□	XDGX175012PDFR-GL	10	TPS3SB	20	
	K-XDGX175016PDFR-GL	□					□	XDGX175016PDFR-GL	10	TPS3SB	20	
	K-XDGX175020PDFR-GL	□					□	XDGX175020PDFR-GL	10	TPS3SB	20	
	K-XDGX175024PDFR-GL	□					□	XDGX175024PDFR-GL	10	TPS3SB	20	
	K-XDGX175030PDFR-GL	□					□	XDGX175030PDFR-GL	10	TPS3SB	20	
	K-XDGX175032PDFR-GL	□					□	XDGX175032PDFR-GL	10	TPS3SB	20	
	K-XDGX175040PDFR-GL	□					□	XDGX175040PDFR-GL	10	TPS3SB	20	
	K-XDGX175050PDFR-GL	□					□	XDGX175050PDFR-GL	10	TPS3SB	20	

For safety reasons, clamping screws must be replaced at the same time as inserts.

Note 1) Use the GM type insert when using with a high-speed, high-power spindle machine for the AXD4000A (spindle RPM of 20000 min^{-1} or more, motor power of 80 kw or more).

Note 2) The clamp screws and wrenches are different for the AXD4000 and the AXD4000A.

Note 3) For insert dimensions, refer to page L204.

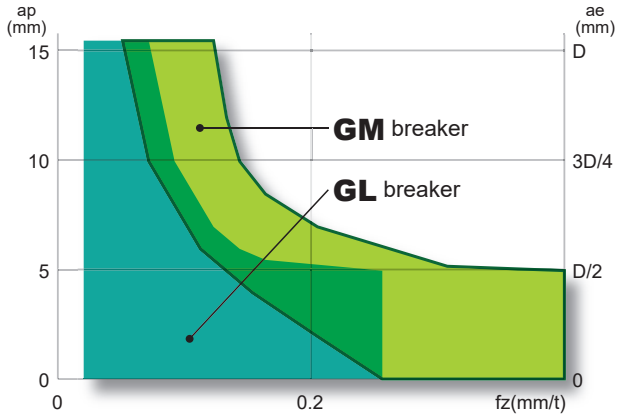
□ : Non stock, produced to order only.

When ordering please specify : (1) insert kit order number and (2) insert grades.

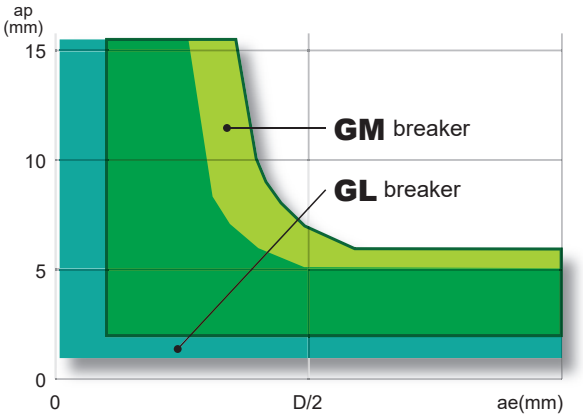
AXD4000 Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
The first recommendation for efficient, high load machining with a high-speed spindle is the GM breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth



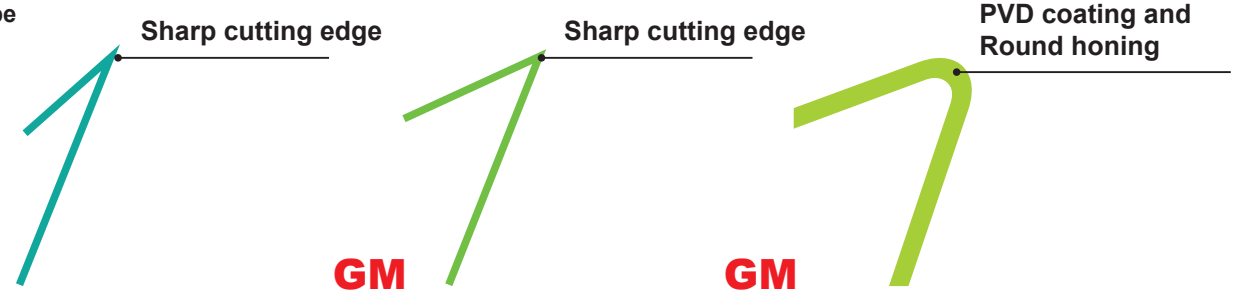
Selection of insert according to the width of cut and the required cutting depth



1st recommendation for machining aluminium alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge

Insert type



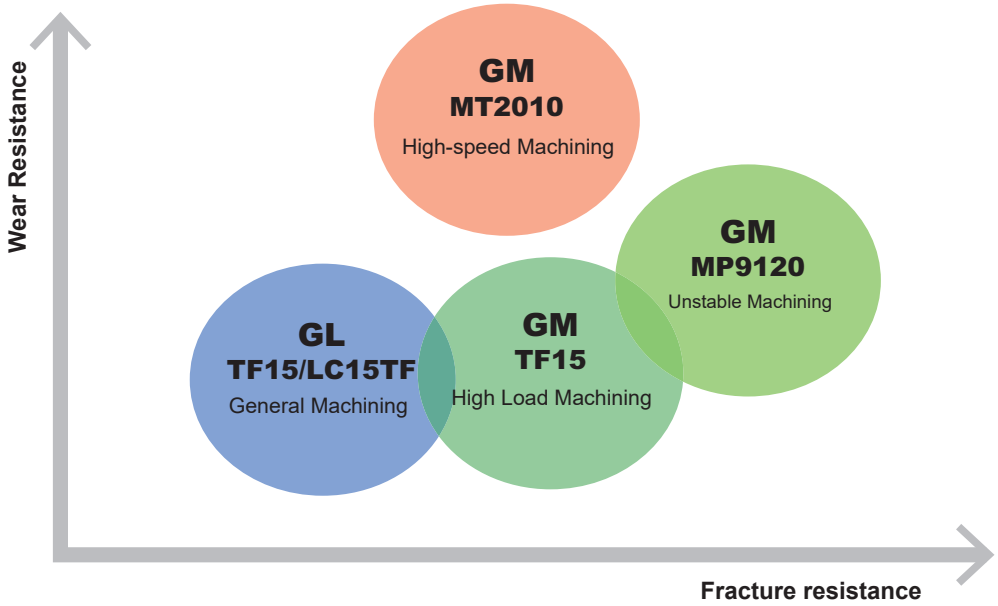
GL
TF15/LC15TF
Low cutting resistance
(LC15TF: Excellent weld resistance)

GM
MT2010/TF15
Tougher cutting edge

GM
MP9120
Strong Fracture Resistant Cutting Edge

Selection of insert according to wear resistance

For ultra-high-speed, high efficiency machining with cutting speeds of 3,000-5,000 m/min for extra super duralumin and aluminium-lithium alloys, and also includes a GM breaker and MT2010, which combine fracture resistance and wear resistance at a high levels making this the first recommendation.



RECOMMENDED CUTTING CONDITIONS

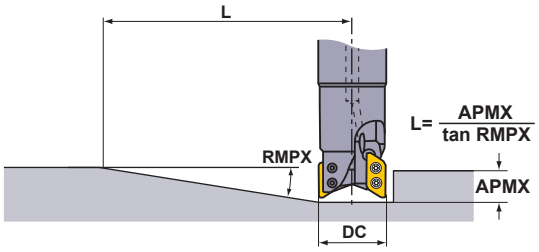
(mm)

	Workpiece Material	Characteristics	Grade	Breaker	Cutting Speed **vc** (m/min)	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (mm/t)
N	Aluminium Alloys (A7050, A7075, A2024, A6061 etc) Aluminium-lithium Alloy	Content Si<5%	MT2010 TF15 MP9120	**GM**	4000(2000—5000)	≤0.5 DC	≤ 5	≤ 0.35
							≤ 10	≤ 0.30
							≤ 14.5	≤ 0.25
						≤0.75 DC	≤ 5	≤ 0.30
							≤ 10	≤ 0.25
							≤ 14.5	≤ 0.20
						DC (Slot)	≤ 5	≤ 0.30
			TF15 LC15TF	**GL**	4000(2000—5000)	≤0.75 DC	≤ 5	≤ 0.20
							≤ 10	≤ 0.15
							≤ 14.5	≤ 0.10
						DC (Slot)	≤ 5	≤ 0.20

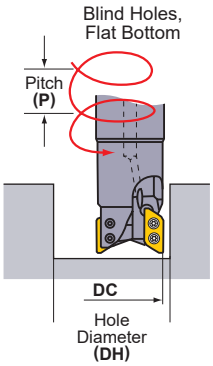
Note 1) The above cutting conditions are determined based on high workpiece materials and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
Note 2) Note, vibrations may occur in the following conditions.
- When using a long tool overhang.
- When pocket machining corner radii.
- When the workpiece materials has poor clamping rigidity or when the machine rigidity or workpiece material rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

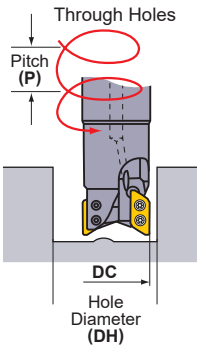
■ Ramping / Helical Milling / Drilling

● **Ramping**



● **Helical Milling**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(mm)

DC	Type	Insert Corner R RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)			Helical Milling (Through Hole)		Drilling
			RMPX	L *1	DH max.	DH min.	P max.	DH min.	P max.	
50	D	0.4—1.2	8.2°	108	96.8 *2	95.4	14	81.2	14	5.5
		1.6—2.4	7.6°	117	94.4 *3	93.6	13	81.2	13	5.0
		3.0—3.2	6.9°	129	92.8 *4	92.0	12	81.2	12	4.5
	E	4.0	6.3°	135	91.2	90.0	10	81.2	10	3.9
		5.0	5.8°	146	89.2	88.8	9	81.2	9	3.6

*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L= (maximum depth of cut APMX/tan RMPX). Maximum depth of cut D type is 15.5mm, E type is 14.8mm.
*2 Corner radius of 1.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)–0.3}×2
*3 Corner radius of 2.4mm. For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)–0.3}×2
*4 Corner radius of 3.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)–0.3}×2
Note 1) The recommended ramping feed is 0.05mm/t or under.

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

AXD7000

P	M	K	N	S	H
Steel			Non-ferrous Metal	Heat Resistant Alloy	



- Low resistance chipbreaker.
- Low resistance insert and high rigidity design for excellent performance.
- For high-speed machining.
- Multi-functional machining.

Fig.1

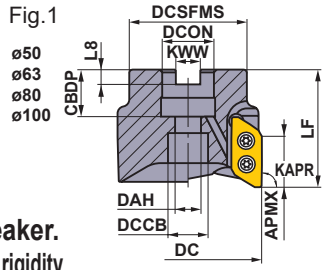
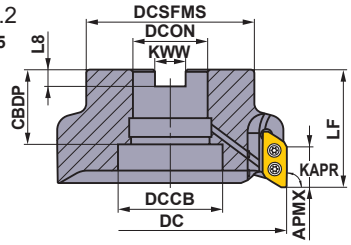
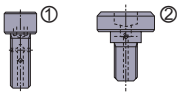


Fig.2



Right hand tool holder only.

Cutter Diameter DC (mm)	Set Bolt	Geometry
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②



With Coolant Hole

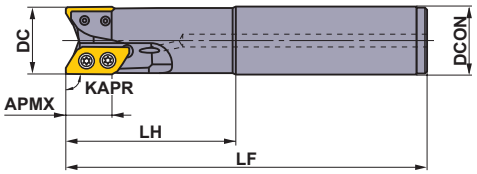
■ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	Max. Allowable Revolution (min⁻¹)	Fig.	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	AXD7000-050A03RA	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	21	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270○○
		AXD7000-063A03RA	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	21	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R08004CA	●	4	80	63	25.4	26	13	63	9.5	6	20	1.2	21	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R10005DA	●	5	100	63	31.75	32	17	70	12.7	8	26	1.8	21	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EA	●	6	125	63	38.1	40	—	90	15.9	10	56	2.7	21	16000	2	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	AXD7000-050A03RB	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	20.4	30000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-063A03RB	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	20.4	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R08004CB	●	4	80	63	25.4	26	13	63	9.5	6	20	1.2	20.4	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R10005DB	●	5	100	63	31.75	32	17	70	12.7	8	26	1.8	20.4	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EB	●	6	125	63	38.1	40	—	90	15.9	10	56	2.7	20.4	16000	2	TS4SBL	TKY15D	MK1KS	







■SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	LH	DCON	APMX (mm)	Max. Allowable Revolution (min⁻¹)	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	AXD7000R322SA32SA	●	2	32	170	80	32	21	41000	TS4SB	TKY15D	MK1KS	XDGX2270○○
		AXD7000R402SA42SA	●	2	40	170	80	42	21	36000	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	AXD7000R322SA32SB	●	2	32	170	80	32	20.4	41000	TS4SB	TKY15D	MK1KS	
		AXD7000R402SA42SB	●	2	40	170	80	42	20.4	36000	TS4SBL	TKY15D	MK1KS	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 3) Note for inserts with a corner radius of 3.0 and above, as corner radius increases the LF and LH dimensions decreases.
* Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5
Use the clamp screw by setting the bundled screw.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig.1

ø50
ø63
ø80
ø100

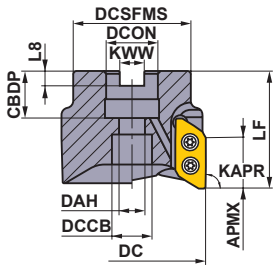
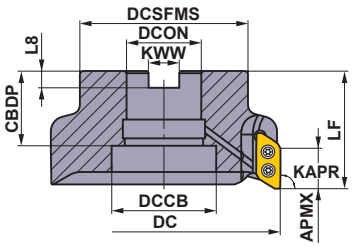


Fig.2

ø125

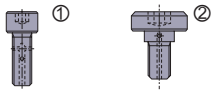


Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②



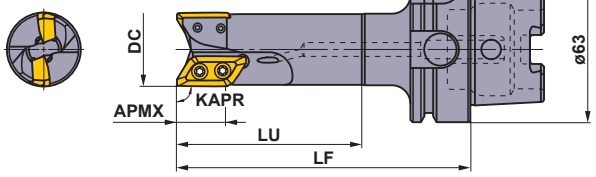
With Coolant Hole

■ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000-050A03RA**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	21	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□
		AXD7000-063A03RA	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	21	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RA	●	4	80	63	27	23	13	63	12.4	7	20	1.2	21	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RA	●	5	100	63	32	26	17	70	14.4	8	26	1.8	21	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RA	●	6	125	63	40	40	—	90	16.4	9	56	2.7	21	16000	2	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	**AXD7000-050A03RB**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	20.4	30000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-063A03RB	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	20.4	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RB	●	4	80	63	27	23	13	63	12.4	7	20	1.2	20.4	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RB	●	5	100	63	32	26	17	70	14.4	8	26	1.8	20.4	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RB	●	6	125	63	40	40	—	90	16.4	9	56	2.7	20.4	16000	2	TS4SBL	TKY15D	MK1KS	





■HSK63A SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	LU	APMX (mm)	Max. Allowable Revolution (min^{-1})	* Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000R03202A-H63A**	●	2	32	127	80	21	41000	TS4SB	TKY15D	MK1KS	
		AXD7000R04002A-H63A	●	2	40	132	85	21	36000	TS4SBL	TKY15D	MK1KS	XDGX2270□□
		AXD7000R05003A-H63A	●	3	50	137	90	21	30000	TS4SBL	TKY15D	MK1KS	

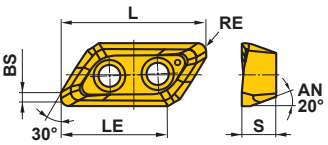
Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for inserts with a corner radius of 3.0 and above, as corner radius increases the LF and LU dimensions decreases.
Note 4) No hole for data carrier.
Note 5) The HSK63A shank type has a built-in coolant pipe for installation.
* Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5
Use the clamp screw by setting the bundled screw.

ISO13399 ➤ L003
CAUTION FOR USE ➤ L213
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

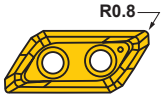
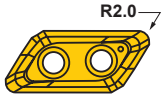
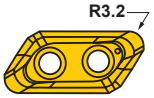
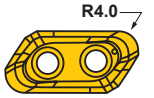
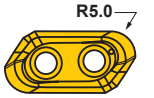
Workpiece Material			LC15TF	MP6120	MP9120	TF15
	P	Steel	✲	◐	✲	◐
	N	Aluminium Alloy	✲		✲	◐
	S	Titanium Alloy			●	

Cutting Conditions (Guide):
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting
Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP6120	Stock: Coated MP9120	Stock: Carbide TF15	Dimensions (mm) L	LE	S	BS	RE *	Geometry
	**XDGX227008PDFR-GL**	G	F	●			●	30	21.6	7	2.0	0.8	
	XDGX227016PDFR-GL	G	F	●			●	30	21.7	7	1.2	1.6	
	XDGX227020PDFR-GL	G	F	●			●	30	21.7	7	0.8	2	
	XDGX227030PDFR-GL	G	F	●			●	28.8	21.2	7	0.8	3	
	XDGX227032PDFR-GL	G	F	●			●	28.8	21.2	7	0.6	3.2	
	XDGX227040PDFR-GL	G	F	●			●	27.5	20.6	7	0.9	4	
	XDGX227050PDFR-GL	G	F	●			●	27	20.3	7	0.4	5	
	XDGX227008PDER-GLA	G	E		●	●		30	21.7	7	1.9	0.8	
	XDGX227016PDER-GLA	G	E		●	●		30	21.7	7	1.1	1.6	
	XDGX227020PDER-GLA	G	E		●	●		30	21.7	7	0.7	2	
	XDGX227024PDER-GLA	G	E		●	●		30	21.7	7	0.3	2.4	
	XDGX227030PDER-GLA	G	E		●	●		28.8	21.1	7	0.7	3	
	XDGX227032PDER-GLA	G	E		●	●		28.8	21.1	7	0.5	3.2	
	XDGX227040PDER-GLA	G	E		●	●		27.5	20.4	7	0.8	4	
	XDGX227050PDER-GLA	G	E		●	●		27	20.2	7	0.2	5	

* GLA breaker corner R (RE) is designed with almost same corner R as a machined corner R of workpiece.
* Please note that the GL breaker is slightly different from the workpiece R geometry after machining due to the influence of the rake angle of the cutting edge.

■HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	**A** Holder					**B** Holder	
	AXD7000–○○○○○○○A **AXD7000R○○○○○○○A** **AXD7000R○○○○A-H63A**					**AXD7000–○○○○○○○B** **AXD7000R○○○○○○○B**	
Insert Corner Radius (**RE**)	R0.8	R1.6	R2.0	R3.0	R3.2	R4.0	R5.0
							
	XDGX 227008PDFR-G○	**XDGX 227016PDFR-G○**	**XDGX 227020PDFR-G○**	**XDGX 227030PDFR-G○**	**XDGX 227032PDFR-G○**	**XDGX 227040PDFR-G○**	**XDGX 227050PDFR-G○**

Not interchangeable with the corresponding inserts of the A type and B type holders.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■Cutting Speed

	Workpiece Material		Greade	Breaker	Cutting Speed **vc** (m/min)
P	Mild Steel (JIS SS400, S10C etc)	**≤180HB**	**MP6120**	**GLA**	200 (150—220)
	Carbon Steel Alloy Steel (JIS S45C, SCM440 etc)	**180—280HB**	**MP6120**	**GLA**	200 (150—220)
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**LC15TF**	**GL**	1000 (200—3000)
			TF15	**GL**	1000 (200—3000)
	Aluminium Alloy (AC4B, ADC12, A390 etc)	**5%≤Si≤10% Si>10%**	**LC15TF**	**GL**	1000 (200—3000)
S	Titanium Alloy (Ti-6Al-4V etc)	—	**MP9120**	**GLA**	40 (30—60)

■Depth of Cut / Feed per Tooth

	Workpiece Material		Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t) Cutting Edge Diameter **DC** (mm)			
						32	**40**	**50, 63, 80**	**100, 125**
P	Mild Steel (JIS SS400, S10C etc)	**≤180HB**	**GLA**	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.15	≤ 0.15
	Carbon Steel Alloy Steel (JIS S45C, SCM440 etc)	**180—280HB**	**GLA**	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.15	≤ 0.15

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

RECOMMENDED CUTTING CONDITIONS

■ Depth of Cut / Feed per Tooth

Workpiece Material			Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)			
						Cutting Edge Diameter **DC** (mm)			
						32	**40**	**50, 63, 80**	**100, 125**
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GL**	≤0.25 DC	≤ 5	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.25
				≤0.5 DC	≤ 5	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				≤0.75 DC	≤ 5	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.15	≤ 0.15	≤ 0.2	≤ 0.2
				DC (Slot)	≤ 5	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.15	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.1	≤ 0.15	≤ 0.2	≤ 0.2
	Aluminium Alloy (AC4B etc) Aluminium Alloy (ADC12, A390 etc)	**5%≤Si≤10%** **Si>10%**	**GL**	≤0.25 DC	≤ 5	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.25
				≤0.5 DC	≤ 5	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				≤0.75 DC	≤ 5	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.15	≤ 0.15	≤ 0.2	≤ 0.2
				DC (Slot)	≤ 5	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.15	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.1	≤ 0.15	≤ 0.2	≤ 0.2
S	Titanium Alloy (Ti-6Al-4V etc)	–	**GLA**	≤0.25 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	–	≤ 0.1	≤ 0.1	–
				≤0.75 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	–	≤ 0.1	≤ 0.1	–
				DC (Slot)	≤ 5	≤ 0.08	≤ 0.08	≤ 0.08	–
					≤ 10	≤ 0.05	≤ 0.08	≤ 0.08	–

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

■CAUTION FOR USE

Procedure for attaching inserts

1) Clean the seat by air blowing or with a brush before installing the insert.
2) Tighten the clamp screw using the accessory wrench while pressing the insert against the seat.
3) Tighten the clamp screw as shown in Figure 1.
4) Coat the clamp screw with anti-seize compound and tighten it to the specified tightening torque.
   The tightening torque is shown below.
   AXD7000 3.5N•m(2.58ft•lb)
   AXD4000 1.5N•m(1.11ft•lb)
5) The clamp screw is an important part in ensuring safety.
   Purchase an official product from Mitsubishi Materials.
   When using over the revolution shown in Table 2, replacing the clamp screw simultaneously with insert replacement is recommended.

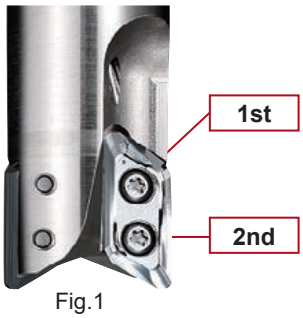
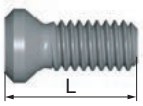


Fig.1

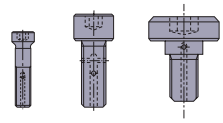
Type	AXD4000		AXD7000		
Cutting Edge Diameter **DC**(mm)	ø20	ø25–ø125	ø32	ø40–ø125	
Clamp Screw Number	TS3SBS	TS3SB	TS4SB	TS4SBL	
Overall Length **L**(mm)	6.5	8	9	10.5	

6) Check that there is no clearance at the insert seat surface.

Installation of arbor type

1) Clean carefully the inside and face of the hole and the arbor face before installing the body to the arbor.
2) Set the body at the arbor and tighten it with the accessory. Refer to the table shown below for the tightening torque.
3) The set bolt supplied with the AXD is a special coolant through compatible nozzle. Be careful not to lose it.

AXD4000

Geometry	Set Bolt	Clamp Torque (N • m)	Cutting Edge Diameter **DC**(mm)	Fig
Fig.1 Fig.2 Fig.3  With Coolant Hole	HFF08043H	11	ø40	1
	HSC10030H	40	ø50, ø63	2
	HSC12035H	80	ø80	2
	HSC16040H	150	ø100	2
	MBA20040H	320	ø120	3

AXD7000

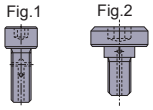
Geometry	Set Bolt	Clamp Torque (N•m)	Cutting Edge Diameter **DC**(mm)	Fig
Fig.1 Fig.2  With Coolant Hole	HSC10030H	40	ø50, ø63	1
	HSC12035H	80	ø80	1
	HSC16040H	150	ø100	1
	MBA20040H	320	ø120	2

Table 1 Max. Allowable Revolution

AXD4000

Cutting Edge Diameter **DC**(mm)	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	49000	48000	41000	35000	30000	27000	23000	20000

AXD7000

Cutting Edge Diameter **DC**(mm)	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	41000	36000	30000	25000	23000	19000	16000

● Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G6.3 or betterbased on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore,ensure to use machines that are provided with safety measures in case of cutter breakage.

Note 1) The balance quality of the holder (without inserts and clamp screws) is G6.3 or better at 10,000min^{-1}.

Table 2 Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

AXD4000

Cutting Edge Diameter **DC**(mm)	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	12000	9500	7600	6000	4800	3800	3000	2400

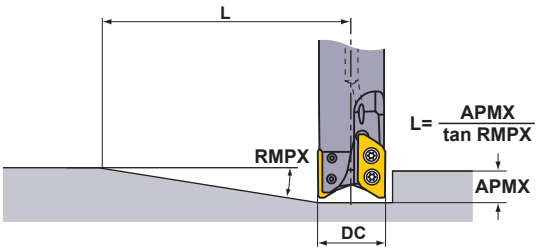
AXD7000

Cutting Edge Diameter **DC**(mm)	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	9500	7600	6000	4800	3800	3000	2400

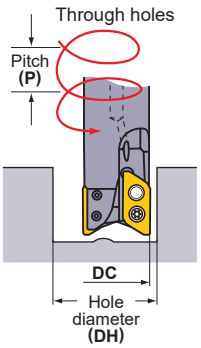
● When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
● Use the specified set bolt when using the arbor type with through coolant.
● The inserts have sharp cutting edges and handling them with bare hands may cause injuries.
   Always wear safety gloves whenhandling the indexable inserts.

■RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING



RAMPING/HELICAL CUTTING (ALUMINIUM ALLOY)

Type	DC (mm)	RE (mm)	Ramping	
			RMPX	L (mm) ∗1
A type	32	0.8 - 2.4	19°	61
		3,3.2	18°	65
	40	0.8 - 2.4	14°	85
		3, 3.2	13°	91
	50	0.8 - 2.4	10°	120
		3, 3.2	9°	133
	63	0.8 - 2.4	8°	150
		3, 3.2	7°	172
	80	0.8 - 2.4	6°	200
		3, 3.2	5°	241
	100	0.8 - 2.4	4°	301
		3, 3.2	4°	301
	125	0.8 - 2.4	3°	401
		3, 3.2	3°	401
B type	32	4, 5	18°	63
	40	4, 5	11°	105
	50	4, 5	8°	146
	63	4, 5	6°	195
	80	4, 5	4°	292
	100	4, 5	3°	390
	125	4, 5	2°	585

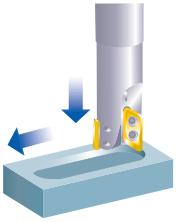
Type	DC (mm)	RE (mm)	Helical Milling	
			DH min. (mm)	P max. (mm)
A type	32	0.8 - 2.4	41	8
		3, 3.2	41	7
	40	0.8 - 2.4	57	10
		3, 3.2	57	9
	50	0.8 - 2.4	77	12
		3, 3.2	77	11
	63	0.8 - 2.4	103	13
		3, 3.2	103	12
	80	0.8 - 2.4	137	14
		3, 3.2	137	12
	100	0.8 - 2.4	177	14
		3, 3.2	177	13
	125	0.8 - 2.4	227	15
		3, 3.2	227	13
B type	32	4	41	7
		5	41	6
	40	4	57	9
		5	57	8
	50	4	77	10
		5	77	9
	63	4	103	10
		5	103	10
	80	4	137	11
		5	137	10
	100	4	177	11
		5	177	10
	125	4	227	11
		5	227	11

Note 1) The recommended ramping feed is 0.05mm/t or under.
Ramping, helical, and drilling are not recommended for machining of steel and titanium alloys.
∗1 L= (Max. Depth of Cut / tan RMPX) until the maximum depth of cut (APMX) is reached at the maximum ramping angle.
Maximum depth of cut A type is 21mm, B type is 20.4mm.
∗2 The maximum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−0.3}×2
∗3 The minimum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−(Width of wiper edge BS)−0.1}×2

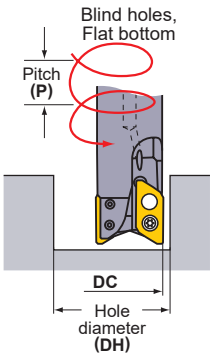
■Max. Drilling Depth (Aluminium Alloy)

Type	Insert corner radius RE (mm)	Max. Drilling Depth (mm)
Type A	0.8−2.4	5
	3, 3.2	4.5
Type B	4	4
	5	3.5

AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



● **HELICAL CUTTING**



RAMPING/HELICAL CUTTING (ALUMINIUM ALLOY)

Type	DC (mm)	RE (mm)	BS (mm)	Helical Cutting (Blind Hole, Flat Bottom)			
				DH max. (mm) *2	P max. (mm)	DH min. (mm) *3	P max. (mm)
A type	32	0.8	2	61.9	20	58.3	20
		1.6	1.2	60.3	19	58.3	19
		2	0.8	59.5	18	58.3	18
		2.4	0.4	58.7	18	58.3	18
		3	0.8	57.5	17	56.2	17
		3.2	0.6	57.1	17	56.2	17
	40	0.8	2	77.9	20	74.3	20
		1.6	1.2	76.3	19	74.3	19
		2	0.8	75.5	18	74.3	18
		2.4	0.4	74.7	18	74.3	18
		3	0.8	73.5	17	72.2	17
		3.2	0.6	73.1	17	72.2	17
	50	0.8	2	97.5	20	94.1	20
		1.6	1.2	95.9	19	94.1	19
		2	0.8	95.1	18	94.1	18
		2.4	0.4	94.3	18	94.1	18
		3	0.8	93.1	17	92.1	17
		3.2	0.6	92.7	17	92.1	17
	63	0.8	2	123.5	20	120.1	19
		1.6	1.2	121.9	19	120.1	19
		2	0.8	121.1	18	120.1	18
		2.4	0.4	120.3	18	120.1	18
		3	0.8	119.1	17	118	16
		3.2	0.6	118.7	17	118	16
	80	0.8	2	157.5	19	154.1	18
		1.6	1.2	155.9	19	154.1	18
		2	0.8	155.1	18	154.1	18
		2.4	0.4	154.3	18	154.1	18
		3	0.8	153.1	16	152	16
		3.2	0.6	152.7	16	152	16
	100	0.8	2	197.5	18	194.1	18
		1.6	1.2	195.9	18	194.1	18
		2	0.8	195.1	18	194.1	18
		2.4	0.4	194.3	18	194.1	18
		3	0.8	193.1	15	192	15
		3.2	0.6	192.7	15	192	15
	125	0.8	2	247.5	18	244.1	17
		1.6	1.2	245.9	17	244.1	17
		2	0.8	245.1	17	244.1	17
		2.4	0.4	244.3	17	244.1	17
		3	0.8	243.1	15	242	15
		3.2	0.6	242.7	15	242	15
B type	32	4	0.9	55.5	16	54	16
		5	0.4	53.5	15	53.1	15
	40	4	0.9	71.5	16	70	16
		5	0.4	69.5	15	69	14
	50	4	0.9	91.1	15	89.8	15
		5	0.4	89.1	14	88.9	14
	63	4	0.9	117.1	14	115.8	14
		5	0.4	115.1	13	114.9	13
	80	4	0.9	151.1	14	149.8	13
		5	0.4	149.1	12	148.9	12
	100	4	0.9	191.1	13	189.8	13
		5	0.4	189.1	12	188.8	12
	125	4	0.9	241.1	13	239.8	13
		5	0.4	239.1	12	238.8	12

Note 1) The recommended ramping feed is 0.05mm/t or under.

*1 L= (Max. Depth of Cut / tan RMPX) until the maximum depth of cut (APMX) is reached at the maximum ramping angle.
Maximum depth of cut A type is 21mm, B type is 20.4mm.

*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−0.3}×2

*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−(Width of wiper edge BS)−0.1}×2

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

BXD4000

P	M	K	N	S	H
Steel	Stainless Steel		Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



- Curved cutting edge and high rigidity holder produce high wall accuracy.
- Low resistance insert and high rigidity design for excellent performance.
- With through coolant holes to ensure smooth chip discharge.
- For high-speed machining.

Fig.1

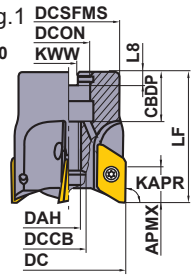


Fig.2

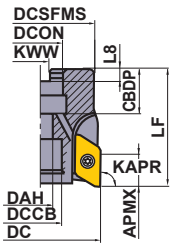
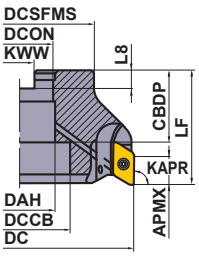
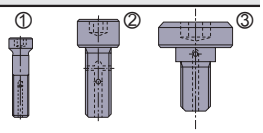


Fig.3



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	②
ϕ100	HSC16040H	②
ϕ125	MBA20040H	③



With Coolant Hole

● The set bolts in the table to the right are supplied with respective cutter.

■ ARBOR TYPE

With Coolant Hole

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	RMPX	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Insert
A type	0.4 – 3.2	BXD4000-040A03RA	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-050A04RA	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000R08005CA	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD○R-GL○○
		BXD4000R10006DA	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EA	●	7	125	63	38.1	40	42	80	15.9	10	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B type	4.0 – 5.0	BXD4000-040A03RB	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-050A04RB	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000R08005CB	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000R10006DB	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EB	●	7	125	63	38.1	40	42	80	15.9	10	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Clamp Torque (N • m) : TS4SL=4.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig.1 ø40

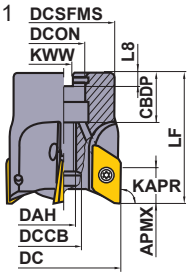


Fig.2 ø50 ø63 ø80 ø100

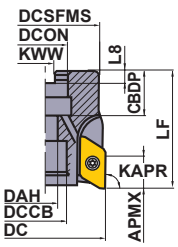
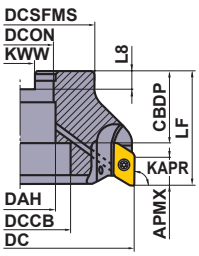
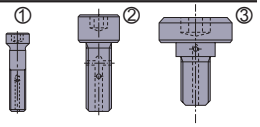


Fig.3 ø125



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	②
ϕ100	HSC16040H	②
ϕ125	MBA20040H	③



With Coolant Hole

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

■ARBOR TYPE

With Coolant Hole

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	RMPX	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Insert
A type	0.4 – 3.2	**BXD4000-040A03RA**	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-050A04RA	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RA	●	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RA	●	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RA	●	7	125	63	40	40	42	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B type	4.0 – 5.0	**BXD4000-040A03RB**	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-050A04RB	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RB	●	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RB	●	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RB	●	7	125	63	40	40	42	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Clamp Torque (N • m) : TS4SL=4.0

■CAUTION FOR USE

- Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.
- The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed. The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high-speed machining–Safety requirements).

Table 1 Max. Allowable Revolution

Cutting Edge Diameter **DC**(mm)	ø20	ø25	ø28	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	15000*	38000	35000	33000	31000	29000	24000	21000	19000	16000	14000

* ϕ20mm with one tooth balancing is necessary to adjust sensitively.

- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G40 or betterbased on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore,ensure to use machines that are provided with safety measures in case of cutter breakage.

Table 2 Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(mm)	ø20	ø25	ø28	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	15000	12000	10800	9500	8700	7600	6000	4800	3800	3000	2400

- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

L
INDEXABLE MILLING



Fig.1 Straight Shank

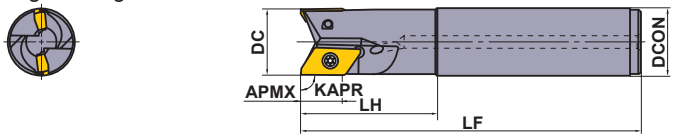
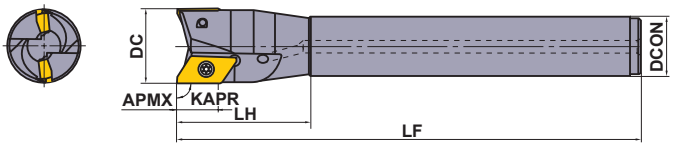


Fig.2 Offset Shank



■SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Radius RE	Shank Type	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	APMX	LF	LH	DCON	RMPX	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Insert
Type A	0.4 – 3.2	Standard	BXD4000R201SA20SA	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD□R-G□□ / XDGT1550 PD□R-GL□□
			BXD4000R252SA25SA	●	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SA	●	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SA	●	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SA	●	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SA	●	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SA	●	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	BXD4000R252SA25LA	●	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LA	●	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	BXD4000R282SA25ELA	●	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELA	●	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELA	●	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	
Type B	4.0 – 5.0	Standard	BXD4000R201SA20SB	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD□R-G□□
			BXD4000R252SA25SB	●	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SB	●	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SB	●	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SB	●	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SB	●	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SB	●	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	BXD4000R252SA25LB	●	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LB	●	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	BXD4000R282SA25ELB	●	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELB	●	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELB	●	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	

Note 1) The maximum allowed revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high revolutions, ensure that the tool and arbor are correctly balanced.
∗ Clamp Torque (N • m) : TS4SL=4.0

■HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	A Holder							B Holder	
	BXD4000R□□□□□□□A							BXD4000R□□□□□□□B	
Insert Corner Radius (RE)	R 0.4	R 0.8	R 1.2	R 1.6	R 2.0	R 3.0	R 3.2	R 4.0	R 5.0
	XDGT.....-G04 XDGT.....-GL04	XDGT.....-G08 XDGT.....-GL08	XDGT.....-G12	XDGT.....-G16	XDGT.....-G20	XDGT.....-G30	XDGT.....-G32	XDGT.....-G40	XDGT.....-G50

Note 1) Please only use the holder and insert corner radius combinations shown above.
Note 2) XDGT....-GL08 and -G12 inserts are compatible only with the BXD4000R□□□□□□□A type holder.

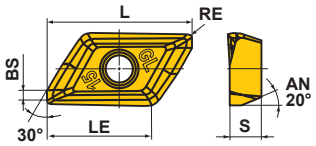
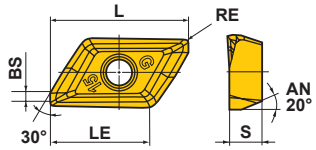
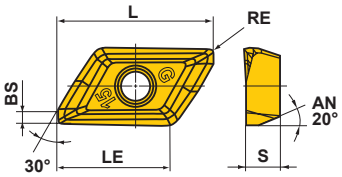
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
P	Steel	●
M	Stainless Steel	◕
K	Cast Iron	✱
N	Non-ferrous Metal	◕
S	Heat resistant Alloy, Titanium Alloy	◕
H	Hardened Steel	◕

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Stock: Coated VP15TF	Stock: Coated LC15TF	Stock: Coated	Stock: Carbide TF15	Stock: Carbide	L	LE	S	BS	RE	Geometry
Low Resistance Type 	**XDGT1550PDFR-GL04**	G	F				●		22	15.5	5	1.5	0.4	
	XDGT1550PDFR-GL08	G	F				●		22	15.5	5	1.1	0.8	
	**XDGT1550PDFR-G04**	G	F		●		●		22	15.5	5	1.5	0.4	
	XDGT1550PDFR-G08	G	F		●		●		22	15.5	5	1.1	0.8	
	XDGT1550PDFR-G12	G	F		●		●		22	15.5	5	0.7	1.2	
	XDGT1550PDFR-G16	G	F		●		●		22	15.6	5	0.4	1.6	
	XDGT1550PDFR-G20	G	F		●		●		21.7	15.6	5	0.2	2.0	
	XDGT1550PDFR-G30	G	F		●		●		20	14.8	5	0.6	3.0	
	XDGT1550PDFR-G32	G	F		●		●		20	14.8	5	0.4	3.2	
	XDGT1550PDFR-G40	G	F		●		●		19	14.4	5	0.5	4.0	
	XDGT1550PDFR-G50	G	F		●		●		18	14	5	0.4	5.0	
	XDGT1550PDER-G04	G	E	●					22	15.5	5	1.5	0.4	
	XDGT1550PDER-G08	G	E	●					22	15.5	5	1.1	0.8	
	XDGT1550PDER-G12	G	E	●					22	15.5	5	0.7	1.2	
	XDGT1550PDER-G16	G	E	●					22	15.6	5	0.4	1.6	
	XDGT1550PDER-G20	G	E	●					21.7	15.6	5	0.2	2.0	
	XDGT1550PDER-G30	G	E	●					20	14.8	5	0.6	3.0	
	XDGT1550PDER-G32	G	E	●					20	14.8	5	0.4	3.2	
	XDGT1550PDER-G40	G	E	●					19	14.4	5	0.5	4.0	
	XDGT1550PDER-G50	G	E	●					18	14	5	0.4	5.0	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—200)	0.15 (0.1—0.2)
P	Carbon Steel Alloy Steel	≤280HB	**VP15TF**	150 (120—200)	0.15 (0.1—0.2)
P		280—350HB	**VP15TF**	140 (120—160)	0.15 (0.1—0.2)
M	Stainless Steel	≤270HB	**VP15TF**	140 (120—160)	0.2 (0.1—0.3)
N	Aluminium Alloy	—	**LC15TF TF15**	1000 (200—3000)	0.3 (0.1—0.5)
S	Ti Alloy	—	**VP15TF**	40 (30—60)	0.1 (0.1—0.3)
S	Heat Resistance Alloy (Inconel etc.)	—	**VP15TF**	30 (20—40)	0.15 (0.1—0.2)
H	Hardened Steel	40—60HRC	**VP15TF**	70 (50—100)	0.1 (0.05—0.15)

●Figures above are a guide lines for optimum general use. They may vary depending on machine rigidity, work clamping and length of tool overhang.
●When using ϕ20 shank type, set the table feed at under 0.05mm/t and maintain observation during cutting.
●Please adjust the table feed when using long- and extra-long-shank types.
●Please adjust the table feed when ramping (Recommended feed:0.05 mm/t under).

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

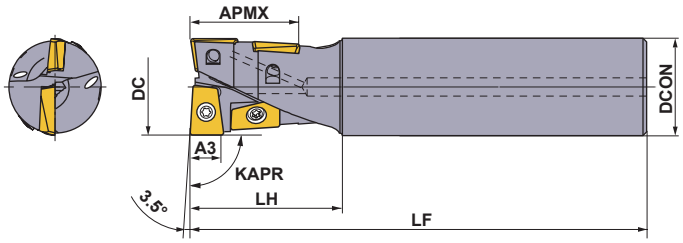
MULTI-FUNCTIONAL MILLING

90° KAPR

AQX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel





- The centre bottom cutting edge enables drilling without previously formed hole.
- With through coolant holes.

STANDARD EDGE TYPE

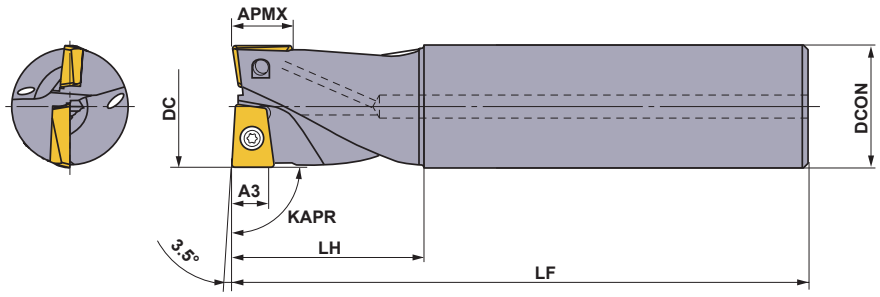
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					*2 APMX (mm)	*3 Clamp Screw	F D T Wrench	Insert
		R		DC	LF	DCON	LH	A3 *1				
Standard	AQXR164SA16S	●	○	16	120	16	30	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16S	●	–	16	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16S	●	○	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16S	●	–	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20S	●	○	20	130	20	35	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20S	●	–	20	130	20	35	6	22	TS25	TKY08F	
	AQXR214SA20S	●	○	21	130	20	35	6	22	TS25	TKY08F	
	AQXR214SN20S	●	–	21	130	20	35	6	22	TS25	TKY08F	
	AQXR254SA25S	●	○	25	140	25	40	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25S	●	–	25	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SA25S	●	○	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25S	●	–	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32S	●	○	32	150	32	50	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32S	●	–	32	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SA32S	●	○	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32S	●	–	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32S	●	○	35	150	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32S	●	–	35	150	32	50	11	40	TS407	TKY15D	
	AQXR404SA32S	●	○	40	160	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32S	●	–	40	160	32	60	12	44	TS55	TKY25D	
	AQXR504SA42S	●	○	50	170	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42S	●	–	50	170	42	70	15	55	TS6S	TKY30T	
Long	AQXR164SA16L	●	○	16	175	16	50	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16L	●	–	16	175	16	50	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16L	●	○	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16L	●	–	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20L	●	○	20	185	20	60	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20L	●	–	20	185	20	60	6	22	TS25	TKY08F	
	AQXR214SA20L	●	○	21	185	20	35	6	22	TS25	TKY08F	
	AQXR214SN20L	●	–	21	185	20	35	6	22	TS25	TKY08F	
	AQXR254SA25L	●	○	25	220	25	75	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25L	●	–	25	220	25	75	7.5	27.5	TS33	TKY08D	
	AQXR264SA25L	●	○	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25L	●	–	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32L	●	○	32	230	32	90	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32L	●	–	32	230	32	90	9.5	35.2	TS407	TKY15D	
	AQXR334SA32L	●	○	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32L	●	–	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32L	●	○	35	230	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32L	●	–	35	230	32	50	11	40	TS407	TKY15D	
	AQXR404SA32L	●	○	40	240	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32L	●	–	40	240	32	60	12	44	TS55	TKY25D	
	AQXR504SA42L	●	○	50	250	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42L	●	–	50	250	42	70	15	55	TS6S	TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts. *2 APMX : Maximum depth of cut.
*3 Clamp Torque (N • m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Number of Teeth : **2**

■SHORT EDGE TYPE

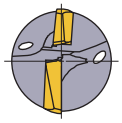
Right hand tool holder only.

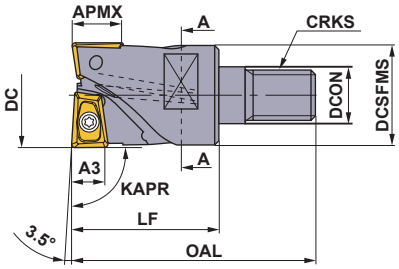
Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					*2 APMX (mm)	*3 Clamp Screw	F D T Wrench	Insert
		R		DC	LF	DCON	LH	A3 *1				
Standard	**AQXR162SA16S**	●	○	16	120	16	30	4.5	7.4	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16S	●	–	16	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16S	●	○	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16S	●	–	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20S	●	○	20	130	20	35	6	9.2	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20S	●	–	20	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SA20S	●	○	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20S	●	–	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25S	●	○	25	140	25	40	7.5	11.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25S	●	–	25	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SA25S	●	○	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25S	●	–	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32S	●	○	32	150	32	50	9.5	14.5	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32S	●	–	32	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SA32S	●	○	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32S	●	–	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32S	●	○	35	150	32	50	11	16	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32S	●	–	35	150	32	50	11	16	TS407	TKY15D	
	AQXR402SA32S	●	○	40	160	32	60	12	18	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32S	●	–	40	160	32	60	12	18	TS55	TKY25D	
	AQXR502SA42S	●	○	50	170	42	70	15	23	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42S	●	–	50	170	42	70	15	23	TS6S	TKY30T	
Long	**AQXR162SA16L**	●	○	16	175	16	50	4.5	7.4	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16L	●	–	16	175	16	50	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16L	●	○	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16L	●	–	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20L	●	○	20	185	20	60	6	9.2	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20L	●	–	20	185	20	60	6	9.2	TS25	TKY08F	
	AQXR212SA20L	●	○	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20L	●	–	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25L	●	○	25	220	25	75	7.5	11.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25L	●	–	25	220	25	75	7.5	11.5	TS33	TKY08D	
	AQXR262SA25L	●	○	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25L	●	–	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32L	●	○	32	230	32	90	9.5	14.5	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32L	●	–	32	230	32	90	9.5	14.5	TS407	TKY15D	
	AQXR332SA32L	●	○	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32L	●	–	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32L	●	○	35	230	32	50	11	16	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32L	●	–	35	230	32	50	11	16	TS407	TKY15D	
	AQXR402SA32L	●	○	40	240	32	60	12	18	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32L	●	–	40	240	32	60	12	18	TS55	TKY25D	
	AQXR502SA42L	●	○	50	250	42	70	15	23	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42L	●	–	50	250	42	70	15	23	TS6S	TKY30T	

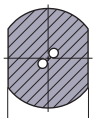
∗1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
∗2 APMX : Maximum depth of cut.
∗3 Clamp Torque (N • m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001









A-A section

■SCREW-IN TYPE

Number of Teeth : **2**

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Dimensions (mm)								APMX (mm)	WT (kg)	✱2 Clamp Screw	F D Wrench	Insert Type
	R		DC	DCON	DCSFMS	OAL	LF	S10	CRKS	A3 ✱1					
AQXR162M08A30	●	○	16	8.5	14.7	48	30	10	M8	4.5	7.4	0.1	TS2A	TKY06F	QO□T0830R
AQXR172M08A30	●	○	17	8.5	14.5	48	30	10	M8	4.5	7.4	0.1	TS2A	TKY06F	
AQXR202M10A30	●	○	20	10.5	18.6	49	30	14	M10	6	9.2	0.2	TS25	TKY08F	QO□T1035R
AQXR212M10A30	●	○	21	10.5	18.5	49	30	14	M10	6	9.2	0.2	TS25	TKY08F	
AQXR252M12A35	●	○	25	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	TKY08D	QO□T1342R
AQXR262M12A35	●	○	26	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	TKY08D	
AQXR322M16A40	●	○	32	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	TKY15D	QO□T1651R
AQXR332M16A40	●	○	33	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	TKY15D	
AQXR352M16A40	●	○	35	17	28.5	63	40	24	M16	11	16	0.3	TS407	TKY15D	QO□T1856R
AQXR402M16A45	●	○	40	17	28.5	68	45	24	M16	12	18	0.3	TS55	TKY25D	QO□T2062R

✱1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
✱2 Clamp Torque (N • m) : TS2A=0.5, TS25=1.0, TS33=1.5, TS407=3.5, TS55=7.5
Note 1) For screw-in type arbors, refer to page L341.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

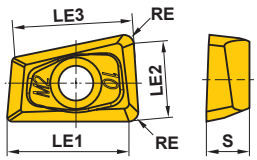
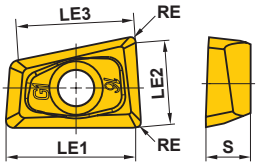
ISO13399	➤ L003
ARBORS	➤ L341
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Materials

Cutting Conditions (Guide):
●: Stable Cutting ◕: General Cutting ✲: Unstable Cutting

Edge Preparation:
E: Round F: Sharp

Shape	Order Number	DC	Class	Edge Preparation	Coated							Carbide			Dimensions (mm)					Geometry
					MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	HTi10			LE1	LE2	LE3	S	RE	
	QOMT0830R-M2	ϕ16,17	M	E	●	●	●	●	●	●	●				7.3	4.4	7.3	3	0.8	
	QOMT1035R-M2	ϕ20,21	M	E	●	●	●	●	●	●	●				9.5	5.9	9.3	3.5	0.8	
	QOMT1342R-M2	ϕ25,26	M	E	●	●	●	●	●	●	●				12	7.6	11.6	4.2	0.8	
	QOMT1651R-M2	ϕ32,33	M	E	●	●	●	●	●	●	●				15.4	9.9	14.6	5.1	0.8	
	QOMT1856R-M2	ϕ35	M	E	●	●	●	●	●	●	●				16.9	10.9	16	5.6	0.8	
	QOMT2062R-M2	ϕ40	M	E	●	●	●	●	●	●	●				19.4	12.6	18.1	6.2	0.8	
	QOMT2576R-M2	ϕ50	M	E	●	●	●	●	●	●	●				24.8	16.1	23.1	7.6	0.8	
	QOGT0830R-G1	ϕ16,17	G	E*	●				●	●		●			7.7	4.9	7.3	3	0.4	
	QOGT1035R-G1	ϕ20,21	G	E*	●				●	●		●			9.9	6.4	9.3	3.5	0.4	
	QOGT1342R-G1	ϕ25,26	G	E*	●				●	●		●			12.4	8.1	11.6	4.2	0.4	
	QOGT1651R-G1	ϕ32,33	G	E*	●				●	●		●			15.8	10.4	14.6	5.1	0.4	
	QOGT1856R-G1	ϕ35	G	E*	●				●	●		●			17.3	11.4	16	5.6	0.4	
	QOGT2062R-G1	ϕ40	G	E*	●				●	●		●			19.8	13.1	18.1	6.2	0.4	
	QOGT2576R-G1	ϕ50	G	E*	●				●	●		●			25.2	16.6	23.1	7.6	0.4	

* HTi10 insert honing is "F" type.

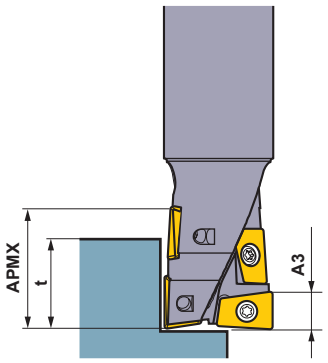
RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

Workpiece Material		No.	Hardness	Breaker	Cutting Speed for Different Grades **vc** (m/min)		
P					**MP6120**	**VP15TF**	**MP6130**
	Mild Steel (ASTM A36, AISI 1010 etc.)	1	≤180HB	**M2/G1**	200 (170—240)	180 (150—220)	160 (130—200)
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140 etc.)	2	180—350HB	**M2**	180 (140—220)	160 (120—200)	140 (100—180)
M					**MP7130**	**MP7140**	**VP30RT(VP15TF)**
	Austenitic Stainless Steel (AISI 304, AISI 316 etc.)	1	≤200HB	**M2/G1**	170 (120—200)	160 (100—180)	150 (120—180)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LN etc.)	2	>200HB	**M2**			
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430 etc.)	3	≤200HB	**M2**			
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420 etc.)	4	>200HB	**M2**			
K					**VP15TF**		
	Gray Cast Iron (AISI No45B etc.)	1	≤350MPa	**M2**	180 (150—220)	—	—
	Ductile Cast Iron (FCD450 etc.)	2	≤450MPa	**M2**	180 (150—220)	—	—
N					**HTi10**		
	Aluminium Alloy (A6061, A7075 etc.)	1	Si<5%	**G1**	500 (200—800)	—	—
	Aluminium Alloy (AC4B etc.)	2	5%≤Si≤10%	**G1**	100 (50—300)	—	—
	Aluminium Alloy (ADC12, A390 etc.)	3	Si>5%	**G1**	100 (50—300)	—	—
S					**MP9120**		
	Titanium Alloy* (Ti-6Al-4V etc.)	1	—	**M2**	50 (30—70)	—	—
H					**VP15TF**		
	Hardened Steel (AISI H13, AISI L6 etc.)	1	40—55HRC	**M2**	80 (50—120)	—	—

* Wet cutting is recommended for Titanium alloy.

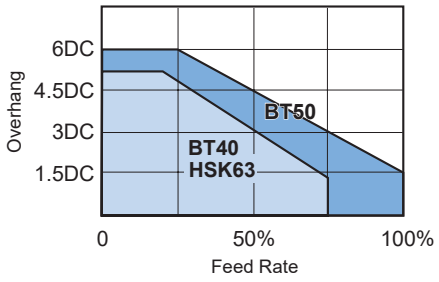
RECOMMENDED CUTTING CONDITIONS



* Figures for A3 and APMX are shown in the standard holder tables on the previous pages.

- A3 is the depth of cut for the full dual insert portion at the end of the cutting edge.
- Beyond the range of A3 where overlapping occurs, there is an area where the cutting edge becomes a single insert, not forming full dual insert configuration. As such, please pay special attention to the relationship between depth of cut and feed.
- In general, the edge at the border of cut tends to suffer from damages. At large depth of cut operations, applying the following depth of cut (**t**), at which the edge is full dual insert at the border of cut, is recommended to prevent damage to the cutting edge. (mm)

Tool diameter	Recommended depth of cut t (mm)
ϕ16,17	12 – 14
ϕ20,21	14 – 17
ϕ25,26	17 – 22
ϕ32,33	22 – 28
ϕ35	25 – 32
ϕ40	28 – 35
ϕ50	35 – 45



- Chatter vibration and other problems tend to occur at operations where overhang length is large and/or machine rigidity is low, resulting in unstable machining.
- Please reduce feed accordingly, using the chart above as a guideline.

CUTTING CONDITIONS FOR SHOULDER MILLING

	Workpiece Material	No.	Hardness	ϕ16, 17			ϕ20, 21			ϕ25, 26		
				ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤4.5	≤8	0.25	≤6	≤10	0.3	≤7.5	≤12.5	0.35
				4.5–12	≤5	0.16	6–14	≤7	0.25	7.5–17	≤8	0.28
				12–17	≤3	0.1	14–22	≤4	0.18	17–27	≤5	0.2
	Carbon Steel Alloy Steel	2	180–350HB	≤4.5	≤8	0.2	≤6	≤10	0.25	≤7.5	≤12.5	0.3
				4.5–12	≤4	0.14	6–14	≤6	0.2	7.5–17	≤7	0.25
				12–17	≤2	0.08	14–22	≤3	0.16	17–27	≤4	0.18
M	Stainless Steel	1,2,3,4	–	≤4.5	≤8	0.2	≤6	≤10	0.25	≤7.5	≤12.5	0.3
				4.5–12	≤4	0.14	6–14	≤6	0.2	7.5–17	≤7	0.25
				12–17	≤2	0.08	14–22	≤3	0.16	17–27	≤4	0.18
K	Cast Iron	1,2	–	≤4.5	≤8	0.25	≤6	≤10	0.3	≤7.5	≤12.5	0.35
				4.5–12	≤5	0.16	6–14	≤7	0.25	7.5–17	≤8	0.28
				12–17	≤3	0.1	14–22	≤4	0.18	17–27	≤5	0.2
N	Aluminium Alloy	1,2,3	–	≤4.5	≤11	0.3	≤6	≤14	0.35	≤7.5	≤12.5	0.4
				4.5–12	≤8	0.21	6–14	≤10	0.3	7.5–17	≤7	0.33
				12–17	≤5	0.15	14–22	≤6	0.23	17–27	≤4	0.25
S	Titanium Alloy	1	–	≤4.5	≤8	0.14	≤6	≤10	0.18	≤7.5	≤17.5	0.21
				4.5–12	≤4	0.1	6–14	≤6	0.14	7.5–17	≤12.5	0.18
				12–17	≤2	0.06	14–22	≤3	0.11	17–27	≤7.5	0.13
H	Hardened Steel	1	40–55HRC	≤4.5	≤5	0.16	≤6	≤6	0.2	≤7.5	≤7	0.22
				4.5–12	≤3	0.1	6–14	≤4	0.16	7.5–17	≤4	0.18
				12–17	≤1	0.06	14–22	≤2	0.12	17–27	≤2	0.14

	Workpiece Material	No.	Hardness	ϕ32, 33			ϕ35			ϕ40			ϕ50		
				ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤9.5	≤16	0.4	≤11	≤17.5	0.45	≤12	≤20	0.5	≤15	≤25	0.6
				9.5–22	≤11	0.32	11–25	≤12	0.35	12–28	≤13	0.4	15–35	≤16	0.5
				22–35	≤6	0.25	25–40	≤6.5	0.28	28–44	≤7	0.3	35–55	≤10	0.35
	Carbon Steel Alloy Steel	2	180–350HB	≤9.5	≤16	0.35	≤11	≤17.5	0.37	≤12	≤20	0.4	≤15	≤25	0.5
				9.5–22	≤10	0.28	11–25	≤11	0.3	12–28	≤12	0.32	15–35	≤14	0.4
				22–35	≤5	0.2	25–40	≤5.5	0.22	28–44	≤6	0.25	35–55	≤8	0.3
M	Stainless Steel	1,2,3,4	–	≤9.5	≤16	0.35	≤11	≤17.5	0.37	≤12	≤20	0.4	≤15	≤25	0.5
				9.5–22	≤10	0.28	11–25	≤12	0.3	12–28	≤12	0.32	15–35	≤14	0.4
				22–35	≤5	0.2	25–40	≤6.5	0.22	28–44	≤6	0.25	35–55	≤8	0.3
K	Cast Iron	1,2	–	≤9.5	≤16	0.4	≤11	≤17.5	0.45	≤12	≤20	0.5	≤15	≤25	0.6
				9.5–22	≤11	0.32	11–25	≤12	0.35	12–28	≤13	0.4	15–35	≤16	0.5
				22–35	≤6	0.25	25–40	≤6.5	0.28	28–44	≤7	0.3	35–55	≤10	0.35
N	Aluminium Alloy	1,2,3	–	≤9.5	≤16	0.45	≤11	≤17.5	0.5	≤12	≤20	0.55	≤15	≤25	0.65
				9.5–22	≤10	0.37	11–25	≤12	0.4	12–28	≤12	0.45	15–35	≤14	0.55
				22–35	≤5	0.3	25–40	≤6.5	0.32	28–44	≤6	0.35	35–55	≤8	0.4
S	Titanium Alloy	1	–	≤9.5	≤23	0.25	≤11	≤24.5	0.26	≤12	≤28	0.28	≤15	≤35	0.35
				9.5–22	≤16	0.2	11–25	≤17.5	0.21	12–28	≤20	0.22	15–35	≤25	0.28
				22–35	≤10	0.14	25–40	≤10.5	0.15	28–44	≤12	0.18	35–55	≤15	0.21
H	Hardened Steel	1	40–55HRC	≤9.5	≤8	0.25	≤11	≤9	0.28	≤12	≤10	0.3	≤15	≤14	0.35
				9.5–22	≤5	0.2	11–25	≤5.5	0.22	12–28	≤6	0.24	15–35	≤8	0.3
				22–35	≤2	0.16	25–40	≤2	0.17	28–44	≤2	0.18	35–55	≤4	0.22

Note 1) Please pay special attention on the depth of cut when using the short edge type.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

■ SLOT MILLING

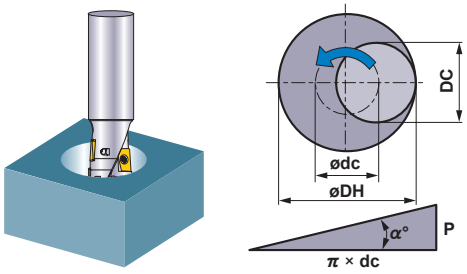
Workpiece Material		No.	Hardness	ϕ16, 17		ϕ20, 21		ϕ25, 26	
				ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤4.5	0.16	≤6	0.18	≤7.5	0.2
				4.5—12	0.1	6—14	0.14	7.5—17	0.16
				12—17	0.07	14—22	0.1	17—27	0.12
	Carbon Steel Alloy Steel	2	180—350HB	≤4.5	0.14	≤6	0.16	≤7.5	0.18
				4.5—12	0.09	6—14	0.12	7.5—17	0.14
				12—17	0.05	14—22	0.1	17—27	0.1
M	Stainless Steel	1,2,3,4	—	≤4.5	0.14	≤6	0.16	≤7.5	0.18
				4.5—12	0.09	6—14	0.12	7.5—17	0.14
				12—17	0.05	14—22	0.1	17—27	0.1
K	Gray Cast Iron	1	≤350MPa	≤4.5	0.16	≤6	0.18	≤7.5	0.2
				4.5—12	0.1	6—14	0.14	7.5—17	0.16
				12—17	0.07	14—22	0.1	17—27	0.12
N	Aluminium Alloy	1,2,3	—	≤4.5	0.18	≤6	0.2	≤7.5	0.22
				4.5—12	0.12	6—14	0.16	7.5—17	0.18
				12—17	0.09	14—22	0.12	17—27	0.14
S	Titanium Alloy	1	—	≤4.5	0.1	≤6	0.12	≤7.5	0.15
				4.5—12	0.05	6—14	0.08	7.5—17	0.1
				12—17	0.03	14—22	0.05	17—27	0.08
H	Hardened Steel	1	40—55HRC	≤4.5	0.1	≤6	0.12	≤7.5	0.14
				4.5—12	0.07	6—14	0.1	7.5—17	0.12
				—	—	—	—	—	—

Workpiece Material		No.	Hardness	ϕ32, 33		ϕ35		ϕ40		ϕ50	
				ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤9.5	0.25	≤11	0.27	≤12	0.3	≤15	0.35
				9.5—22	0.2	11—25	0.22	12—28	0.25	15—35	0.3
				22—35	0.14	25—40	0.16	28—44	0.18	35—55	0.22
	Carbon Steel Alloy Steel	2	180—350HB	≤9.5	0.2	≤11	0.22	≤12	0.25	≤15	0.3
				9.5—22	0.16	11—25	0.18	12—28	0.2	15—35	0.25
				22—35	0.12	25—40	0.13	28—44	0.14	35—55	0.16
M	Stainless Steel	1,2,3,4	—	≤9.5	0.2	≤11	0.22	≤12	0.25	≤15	0.3
				9.5—22	0.16	11—25	0.18	12—28	0.2	15—35	0.25
				22—35	0.12	25—40	0.13	28—44	0.14	35—55	0.16
K	Gray Cast Iron	1	≤350MPa	≤9.5	0.25	≤11	0.27	≤12	0.3	≤15	0.35
				9.5—22	0.2	11—25	0.22	12—28	0.25	15—35	0.3
				22—35	0.14	25—40	0.16	28—44	0.18	35—55	0.22
N	Aluminium Alloy	1,2,3	—	≤9.5	0.27	≤11	0.3	≤12	0.32	≤15	0.37
				9.5—22	0.22	11—25	0.25	12—28	0.27	15—35	0.32
				22—35	0.16	25—40	0.18	28—44	0.2	35—55	0.25
S	Titanium Alloy	1	—	≤9.5	0.18	≤11	0.2	≤12	0.23	≤15	0.25
				9.5—22	0.12	11—25	0.15	12—28	0.2	15—35	0.23
				22—35	0.1	25—40	0.12	28—44	0.15	35—55	0.18
H	Hardened Steel	1	40—55HRC	≤9.5	0.16	≤11	0.17	≤12	0.18	≤15	0.22
				9.5—22	0.12	11—25	0.13	12—28	0.14	15—35	0.16
				—	—	—	—	—	—	—	—

Note 1) Please pay special attention on the depth of cut when using the short edge type.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

RECOMMENDED CUTTING CONDITIONS

■ FOR HELICAL CUTTING



● How to derive a locus of the centre of the tool.

$$\text{Ø dc (Locus of the centre of the tool)} = \text{Ø DH (Desired hole diameter)} - \text{DC (Cutting edge diameter)}$$

● Depth of cut for each pass.

$$P = \pi \times dc \times \tan \alpha°$$

(Note) $\alpha° \leq 3°$

● Min. machined hole diameter for helical cutting : 1.2DC
Max. machined hole diameter for helical cutting : 1.8DC

● For efficient chip discharge, always apply air blow.

● When using the G1 breaker, VP15TF, use 80% of the feed rate listed in the table below.

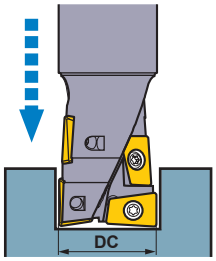
Workpiece Material		No.	Hardness	ϕ16, 17				ϕ20, 21				ϕ25, 26			
				DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)
P	Mild Steel	1	≤180HB	20	8	0.16	0.44	24	10	0.18	0.44	30	12.5	0.2	0.55
				25	12	0.14	0.99	30	15	0.16	1.1	38	19	0.18	1.43
				29	16	0.12	1.43	36	20	0.14	1.76	45	25	0.16	2.2
	Carbon Steel Alloy Steel	2	180−350HB	20	8	0.14	0.33	24	10	0.16	0.33	30	12.5	0.18	0.41
				25	12	0.12	0.74	30	15	0.14	0.82	38	19	0.16	1.07
				29	16	0.1	1.07	36	20	0.12	1.32	45	25	0.14	1.65
M	Stainless Steel	1,2,3,4	–	20	3	0.14	0.22	24	4	0.16	0.22	30	5	0.18	0.27
				25	5	0.12	0.49	30	7	0.14	0.55	38	9	0.16	0.71
				29	8	0.1	0.71	36	10	0.12	0.88	45	12.5	0.14	1.1
K	Gray Cast Iron	1	≤350MPa	20	10	0.16	0.55	24	14	0.18	0.55	30	18	0.2	0.69
				25	13	0.14	1.23	30	17	0.16	1.37	38	21	0.18	1.78
				29	16	0.12	1.78	36	20	0.14	2.19	45	25	0.16	2.74
N	Aluminium Alloy	1,2,3	–	20	10	0.18	0.44	24	14	0.2	0.44	30	18	0.22	0.55
				25	13	0.16	0.99	30	17	0.18	1.1	38	21	0.2	1.43
				29	16	0.14	1.43	36	20	0.16	1.76	45	25	0.18	2.2
S	Titanium Alloy	1	–	20	3	0.1	0.22	24	4	0.11	0.22	30	5	0.13	0.27
				25	5	0.08	0.49	30	7	0.1	0.55	38	9	0.11	0.71
				29	8	0.07	0.71	36	10	0.08	0.88	45	12.5	0.1	1.1
H	Hardened Steel	1	40−55HRC	20	3	0.1	0.22	24	4	0.12	0.22	30	5	0.14	0.27
				25	5	0.08	0.49	30	7	0.1	0.55	38	9	0.12	0.71
				29	8	0.06	0.71	36	10	0.08	0.88	45	12.5	0.1	1.1

Workpiece Material		No.	Hardness	ϕ32, 33				ϕ35				ϕ40				ϕ50			
				DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)
P	Mild Steel	1	≤180HB	38	16	0.25	0.66	42	18	0.28	0.77	48	20	0.3	0.88	60	25	0.35	1.1
				48	24	0.22	1.76	53	27	0.24	1.97	60	30	0.26	2.19	75	38	0.3	2.74
				58	32	0.2	2.85	63	35	0.21	3.07	72	40	0.22	3.51	90	50	0.26	4.39
	Carbon Steel Alloy Steel	2	180−350HB	38	16	0.2	0.49	42	18	0.22	0.58	48	20	0.25	0.66	60	25	0.28	0.82
				48	24	0.18	1.32	53	27	0.2	1.48	60	30	0.22	1.65	75	38	0.26	2.06
				58	32	0.16	2.14	63	35	0.18	2.3	72	40	0.2	2.63	90	50	0.24	3.29
M	Stainless Steel	1,2,3,4	–	38	6	0.2	0.33	42	7	0.22	0.38	48	8	0.25	0.44	60	10	0.28	0.55
				48	11	0.18	0.88	53	13	0.2	0.99	60	14	0.22	1.1	75	18	0.26	1.37
				58	16	0.16	1.43	63	18	0.18	1.53	72	20	0.2	1.75	90	25	0.27	2.19
K	Gray Cast Iron	1	≤350MPa	38	22	0.25	0.82	42	25	0.28	0.95	48	28	0.3	1.1	60	35	0.35	1.37
				48	27	0.22	2.19	53	30	0.24	2.47	60	34	0.26	2.74	75	43	0.3	3.43
				58	32	0.2	3.57	63	35	0.21	3.84	72	40	0.22	4.39	90	50	0.26	5.49
N	Aluminium Alloy	1,2,3	–	38	22	0.27	0.66	42	25	0.3	0.77	48	28	0.32	0.88	60	35	0.37	1.1
				48	27	0.24	1.76	53	30	0.26	1.97	60	34	0.28	2.19	75	43	0.32	2.74
				58	32	0.22	2.85	63	35	0.21	3.07	72	40	0.24	3.51	90	50	0.27	4.39
S	Titanium Alloy	1	–	38	6	0.14	0.33	42	7	0.15	0.38	48	8	0.18	0.44	60	10	0.2	0.55
				48	11	0.13	0.88	53	13	0.14	0.99	60	14	0.15	1.1	75	18	0.18	1.37
				58	16	0.11	1.43	63	18	0.13	1.53	72	20	0.14	1.75	90	25	0.17	2.19
H	Hardened Steel	1	40−55HRC	38	6	0.16	0.33	42	7	0.17	0.38	48	8	0.18	0.44	60	10	0.2	0.55
				48	11	0.14	0.88	53	13	0.15	0.99	60	14	0.16	1.1	75	18	0.18	1.37
				58	16	0.12	1.43	63	18	0.13	1.53	72	20	0.14	1.75	90	25	0.16	2.19

Note 1) Helical grooving is strongly recommended for machining tempered steel.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

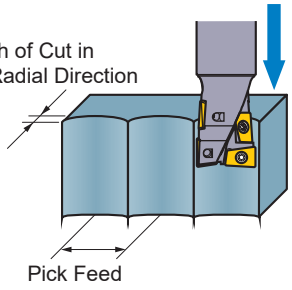
■ FOR DRILLING AND PLUNGING

● Drilling



- The recommended drilling depth is less than 0.5DC.
- Use step feed when drilling (0.25—0.5mm) to ensure that the chips are effectively broken.
- Use internal or external cooling to ensure that the chip disposal is sufficiently achieved.
- The chips generated can dispel in any direction, so ensure that adequate safety precautions are taken.

● Plunging



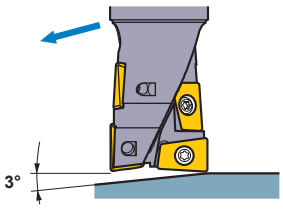
- The feed for plunging is the same as the feed for drilling.
- No step feed necessary.
- Please refer to the following table for the depth of cut at plunging operations.

Depth of Cut in the Radial Direction	≤ 0.4DC
Pick Feed	≤ 0.5DC

Workpiece Material		No.	Hardness	ϕ16, 17		ϕ20, 21		ϕ25, 26		ϕ32, 33, 35		ϕ40		ϕ50	
				fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)
P	Mild Steel	1	≤180HB	0.035	0.2	0.045	0.3	0.05	0.3	0.055	0.3	0.06	0.3	0.065	0.3
	Carbon Steel Alloy Steel	2	180—350HB	0.03	0.2	0.04	0.3	0.045	0.3	0.05	0.3	0.055	0.3	0.06	0.3
M	Stainless Steel	1,2,3,4	—	0.03	0.15	0.04	0.25	0.045	0.25	0.05	0.25	0.055	0.25	0.06	0.25
K	Gray Cast Iron	1	≤350MPa	0.04	0.4	0.05	0.5	0.06	0.5	0.065	0.5	0.07	0.5	0.075	0.5
N	Aluminium Alloy	1,2,3	—	0.04	0.2	0.05	0.3	0.06	0.3	0.065	0.3	0.07	0.3	0.075	0.3
H	Hardened Steel	1	40—55HRC	0.02	0.15	0.03	0.25	0.035	0.25	0.04	0.25	0.045	0.25	0.05	0.25

Note 1) Helical grooving is strongly recommended for machining tempered steel.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

■ FOR RAMPING



- When machining steel the recommended ramping angle is 3°. If a ramping angle larger than 3° is used, then the chips may not be broken effectively resulting in chips wrapping around the tool.
- During ramping, it is recommended to reduce the feed rate to about 60% of the recommended cutting conditions.

MULTI-FUNCTIONAL MILLING

AJX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



Fig.1

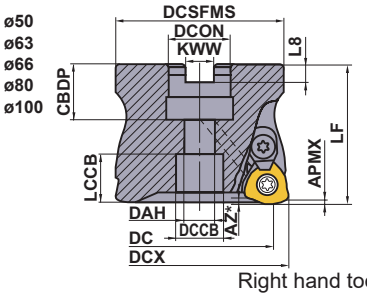
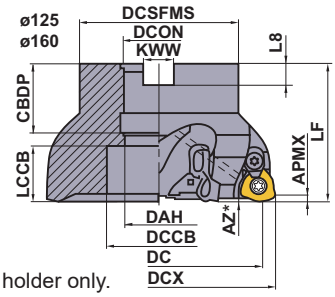


Fig.2



Right hand tool holder only.

DCX (mm)		Set Bolt	Geometry	
DCON inch size	DCON mm size			
ϕ50, ϕ63	ϕ50, ϕ63(DCON=22)	HSC10030H	①	① ② With Coolant Hole
	ϕ63(DCON=27), ϕ80	HSC12035H		
ϕ80, ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125, ϕ160	MBA20040H	②	
ϕ160		MBA24045H		

■ARBOR TYPE

With Coolant Hole

DCX=mm size, DCON=inch size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
50	**AJX12R05003B**	●	3	38.3	50	22.225	0.4	1.2	2°	1	JDM□1204
50	**AJX12R05004B**	●	4	38.3	50	22.225	0.4	1.2	2°	1	JDM□1204
50	**AJX09R05005B**	●	5	40.0	50	22.225	0.5	1.2	1.1°	1	JDM□09T3
63	**AJX14R06303B**	●	3	51.1	50	22.225	0.7	1.2	2.8°	1	JDM□1405
63	**AJX14R06304B**	●	4	51.1	50	22.225	0.7	1.2	2.8°	1	JDM□1405
63	**AJX12R06305B**	●	5	51.3	50	22.225	0.9	1.2	1.5°	1	JDM□1204
80	**AJX14R08004D**	●	4	68.1	63	31.75	1.3	1.2	1.8°	1	JDM□1405
80	**AJX14R08005D**	●	5	68.1	63	31.75	1.3	1.2	1.8°	1	JDM□1405
80	**AJX12R08006D**	●	6	68.3	63	31.75	1.7	1.2	1.1°	1	JDM□1204
100	**AJX14R10005D**	●	5	88.1	63	31.75	2.4	1.2	1.2°	1	JDM□1405
100	**AJX14R10006D**	●	6	88.1	63	31.75	2.4	1.2	1.2°	1	JDM□1405
100	**AJX12R10007D**	●	7	88.3	63	31.75	2.9	1.2	0.8°	1	JDM□1204
125	**AJX14R12505E**	●	5	113.2	63	38.1	3.3	1.2	0.8°	2	JDM□1405
125	**AJX14R12507E**	●	7	113.2	63	38.1	3.3	1.2	0.8°	2	JDM□1405
160	**AJX14R16006F**	●	6	148.2	63	50.8	5.0	1.2	0.5°	2	JDM□1405
160	**AJX14R16008F**	●	8	148.2	63	50.8	5.0	1.2	0.5°	2	JDM□1405

DCX=mm size, DCON=mm size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
50	**AJX12-050A03R**	●	3	38.3	50	22	0.4	1.2	2°	1	JDM□1204
50	**AJX12-050A04R**	●	4	38.3	50	22	0.4	1.2	2°	1	JDM□1204
50	**AJX09-050A05R**	●	5	40.0	50	22	0.5	1.2	1.1°	1	JDM□09T3
63	**AJX14-063A03R**	●	3	51.1	50	22	0.7	1.2	2.8°	1	JDM□1405
63	**AJX14-063A04R**	●	4	51.1	50	22	0.7	1.2	2.8°	1	JDM□1405
63	**AJX12-063A05R**	●	5	51.3	50	22	0.9	1.2	1.5°	1	JDM□1204
NEW 63	**AJX14-063X03R**	●	3	51.1	50	27	0.6	1.2	2.8°	1	JDM□1405
NEW 63	**AJX14-063X04R**	●	4	51.1	50	27	0.6	1.2	2.8°	1	JDM□1405
NEW 63	**AJX12-063X05R**	●	5	51.3	50	27	0.6	1.2	1.5°	1	JDM□1204
NEW 66	**AJX14-066X03R**	●	3	54.1	50	27	0.6	1.2	2.6°	1	JDM□1405
NEW 66	**AJX14-066X04R**	●	4	54.1	50	27	0.6	1.2	2.6°	1	JDM□1405
NEW 66	**AJX12-066X05R**	●	5	54.3	50	27	0.7	1.2	1.4°	1	JDM□1204
80	**AJX14-080A04R**	●	4	68.1	50	27	1.2	1.2	1.8°	1	JDM□1405
80	**AJX14-080A05R**	●	5	68.1	50	27	1.2	1.2	1.8°	1	JDM□1405
80	**AJX12-080A06R**	●	6	68.3	50	27	1.2	1.2	1.1°	1	JDM□1204
100	**AJX14-100A05R**	●	5	88.1	63	32	2.4	1.2	1.2°	1	JDM□1405
100	**AJX14-100A06R**	●	6	88.1	63	32	2.4	1.2	1.2°	1	JDM□1405
100	**AJX12-100A07R**	●	7	88.3	63	32	2.6	1.2	0.8°	1	JDM□1204

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
125	**AJX14-125B05R**	●	5	113.2	63	40	3.3	1.2	0.8°	2	JDM□1405
125	**AJX14-125B07R**	●	7	113.2	63	40	3.3	1.2	0.8°	2	JDM□1405
160	**AJX14-160B06R**	●	6	148.2	63	40	5.0	1.2	0.5°	2	JDM□1405
160	**AJX14-160B08R**	●	8	148.2	63	40	5.0	1.2	0.5°	2	JDM□1405

∗ Refer to page L237, for the max. drilling depth (**AZ**).
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.



Fig.3

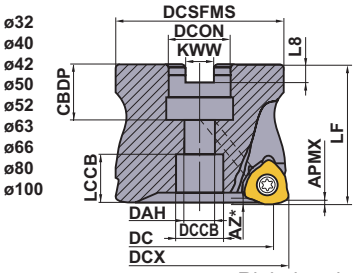
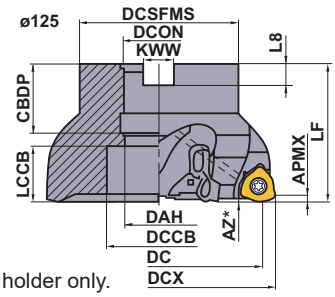
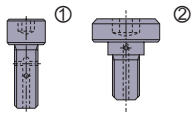


Fig.4



Right hand tool holder only.

DCX (mm)	Set Bolt	Geometry
ϕ32, ϕ40, ϕ42	HSC08025H	①
ϕ50, ϕ52, ϕ63 ϕ66 (DCON=22)	HSC10030H	①
ϕ63 ϕ66 (DCON=27), ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②



With Coolant Hole

■Arbor Type Super Extra Fine Pitch

With Coolant Hole
DCX=mm size, DCON=mm size

	DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
NEW	32	**AJX06-032A05R**	●	5	24.9	40	16	0.1	0.6	0.5°	3	JOM□06T2
NEW	32	**AJX06-032A06R**	●	6	24.9	40	16	0.1	0.6	0.5°	3	JOM□06T2
NEW	40	**AJX08-040A06R**	●	6	31.4	40	16	0.2	0.9	1°	3	JOM□0803
NEW	42	**AJX08-042A06R**	●	6	33.4	40	16	0.2	0.9	0.9°	3	JOM□0803
NEW	50	**AJX09-050A06R**	●	6	39.3	50	22	0.4	1.2	1.1°	3	JDM□09T3
NEW	50	**AJX08-050A07R**	●	7	41.4	50	22	0.4	0.9	0.7°	3	JOM□0803
NEW	52	**AJX09-052A06R**	●	6	41.9	50	22	0.4	1.2	1°	3	JDM□09T3
NEW	52	**AJX08-052A07R**	●	7	43.4	50	22	0.5	0.9	0.7°	3	JOM□0803
NEW	63	**AJX12-063A06R**	●	6	51.3	50	22	0.7	1.2	1.5°	3	JDM□1204
NEW	63	**AJX09-063A07R**	●	7	52.9	50	22	0.7	1.2	0.8°	3	JDM□09T3
NEW	63	**AJX12-063X06R**	●	6	51.3	50	27	0.6	1.2	1.5°	3	JDM□1204
NEW	63	**AJX09-063X07R**	●	7	52.9	50	27	0.7	1.2	0.8°	3	JDM□09T3
NEW	66	**AJX12-066A06R**	●	6	54.3	50	22	0.7	1.2	1.4°	3	JDM□1204
NEW	66	**AJX09-066A07R**	●	7	55.9	50	22	0.8	1.2	0.8°	3	JDM□09T3
NEW	66	**AJX12-066X06R**	●	6	54.3	50	27	0.7	1.2	1.4°	3	JDM□1204
NEW	66	**AJX09-066X07R**	●	7	55.9	50	27	0.8	1.2	0.8°	3	JDM□09T3
NEW	80	**AJX12-080A08R**	●	8	68.3	50	27	1.1	1.2	1.1°	3	JDM□1204
NEW	100	**AJX12-100A09R**	●	9	88.3	63	32	2.5	1.2	0.8°	3	JDM□1204
NEW	125	**AJX14-125B09R**	●	9	113.2	63	40	3.0	1.2	0.8°	4	JDM□1405

∗ Refer to page L237, for the max. drilling depth (**AZ**).
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Mounting Dimensions

Fig.1

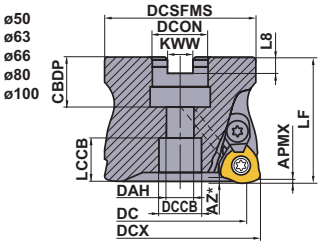


Fig.2

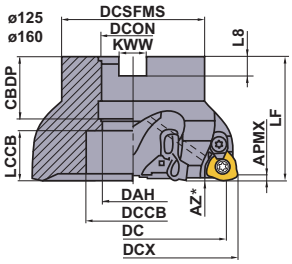


Fig.3

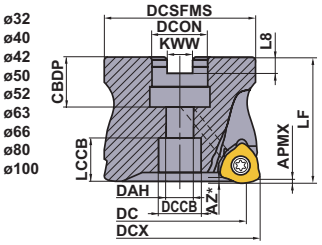
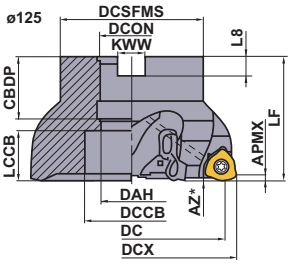


Fig.4



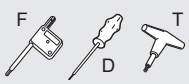
DCX = mm size, DCON = inch size

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**AJX12R050**	22.225	19	11	17	18.3	47	8.4	5	1
50	**AJX09R050**	22.225	19	11	17	18.3	47	8.4	5	1
63	**AJX14R063**	22.225	19	11	17	18.2	60	8.4	5	1
63	**AJX12R063**	22.225	19	11	17	18.3	60	8.4	5	1
80	**AJX14R080**	31.75	32	17	26	20.2	76	12.7	8	1
80	**AJX12R080**	31.75	32	17	26	20.3	76	12.7	8	1
100	**AJX14R100**	31.75	32	17	26	20.2	96	12.7	8	1
100	**AJX12R100**	31.75	32	17	26	20.3	96	12.7	8	1
125	**AJX14R125**	38.1	40	40	56	22.1	100	15.9	10	2
160	**AJX14R160**	50.8	43	53	72	19.1	100	19.1	11	2

DCX = mm size, DCON = mm size

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
32	**AJX06-032A**	16	18	9	14	14.45	30	8.4	5.6	3
40	**AJX08-040A**	16	18	9	14	14.3	37	8.4	5.6	3
42	**AJX08-042A**	16	18	9	14	14.3	37	8.4	5.6	3
50	**AJX12-050A**	22	20	11	17	17.28	47	10.4	6.3	1
50	**AJX09-050A**	22	20	11	17	17.31	47	10.4	6.3	1, 3
50	**AJX08-050A**	22	20	11	17	17.36	47	10.4	6.3	3
52	**AJX09-052A**	22	20	11	17	17.31	47	10.4	6.3	3
52	**AJX08-052A**	22	20	11	17	17.36	47	10.4	6.3	3
63	**AJX14-063A**	22	20	11	17	17.16	60	10.4	6.3	1
63	**AJX12-063A**	22	20	11	17	17.28	60	10.4	6.3	1, 3
63	**AJX09-063A**	22	20	11	17	17.31	60	10.4	6.3	3
63	**AJX14-063X**	27	23	13	20	16.16	60	12.4	7.0	1
63	**AJX12-063X**	27	23	13	20	16.28	60	12.4	7.0	3
63	**AJX09-063X**	27	23	13	20	16.31	60	12.4	7.0	3
66	**AJX12-066A**	22	20	11	17	17.28	60	10.4	6.3	3
66	**AJX09-066A**	22	20	11	17	17.31	60	10.4	6.3	3
66	**AJX14-066X**	27	23	13	20	16.16	60	12.4	7.0	1
66	**AJX12-066X**	27	23	13	20	16.28	60	12.4	7.0	1, 3
66	**AJX09-066X**	27	23	13	20	16.31	60	12.4	7.0	3
80	**AJX14-080A**	27	23	13	19	16.16	76	12.4	7.0	1
80	**AJX12-080A**	27	23	13	19	16.28	76	12.4	7.0	1, 3
100	**AJX14-100A**	32	26	17	26	26.16	96	14.4	8.0	1
100	**AJX12-100A**	32	26	17	26	26.28	96	14.4	8.0	1, 3
125	**AJX14-125B**	40	40	42	56	22.14	100	16.4	9.0	2, 4
160	**AJX14-160B**	40	40	42	56	22.14	100	16.4	9.0	2

SPARE PARTS

Tool Holder Type	 *		 *		
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06 Super Extra Fine Pitch	TS25	–	–	–	TKY08F
AJX08 Super Extra Fine Pitch	TS33	–	–	–	TKY08D
AJX09	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09 Super Extra Fine Pitch	TS351	–	–	–	TKY10D
AJX12	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJX12 Super Extra Fine Pitch	TS43	–	–	–	TKY15T
AJX14	TS54	AMS5	AJS5014T25	ASS3	TKY25T
AJX14 Super Extra Fine Pitch	TS54	–	–	–	TKY25T

* Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

● : Inventory maintained in Japan.



Fig.1

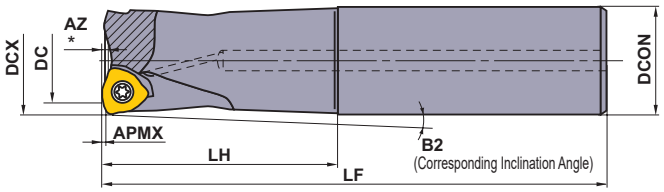


Fig.2

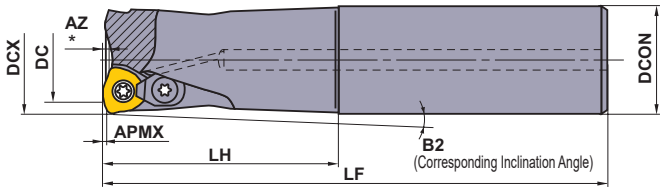
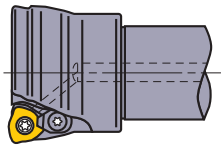


Fig.3



Right hand tool holder only.

■ SHANK TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) LF	DC	LH	DCON	B2	APMX (mm)	RMPX	Fig.	Insert Type
16	**AJX06R162SA16SS**	●	2	70	8.9	20	16	3.5°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16S**	●	2	110	8.9	30	16	2.25°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16L**	●	2	150	8.9	70	16	0.93°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16EL**	●	2	200	8.9	100	16	0.64°	0.6	3°	1	JOM□06T2
17	**AJX06R172SA16SS**	●	2	70	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16S**	●	2	110	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16L**	●	2	150	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16EL**	●	2	200	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
20	**AJX08R202SA20S**	●	2	130	11.4	50	20	1.34°	0.9	3.5°	1	JOM□0803
20	**AJX06R203SA20S**	●	3	130	12.9	50	20	1.31°	0.6	1.5°	1	JOM□06T2
20	**AJX08R202SA20L**	●	2	180	11.4	100	20	0.65°	0.9	3.5°	1	JOM□0803
20	**AJX06R203SA20L**	●	3	180	12.9	100	20	0.64°	0.6	1.5°	1	JOM□06T2
20	**AJX08R202SA20EL**	●	2	250	11.4	130	20	0.5°	0.9	3.5°	1	JOM□0803
22	**AJX08R222SA20S**	●	2	130	13.4	30	20	—	0.9	3°	1	JOM□0803
22	**AJX06R223SA20S**	●	3	130	14.9	30	20	—	0.6	1°	1	JOM□06T2
22	**AJX08R222SA20L**	●	2	180	13.4	30	20	—	0.9	3°	1	JOM□0803
22	**AJX06R223SA20L**	●	3	180	14.9	30	20	—	0.6	1°	1	JOM□06T2
22	**AJX08R222SA20EL**	●	2	250	13.4	30	20	—	0.9	3°	1	JOM□0803
25	**AJX09R252SA25S**	●	2	140	14.9	60	25	1.1°	1.2	4°	2	JDM□09T3
25	**AJX08R253SA25S**	●	3	140	16.4	60	25	1.1°	0.9	2°	1	JOM□0803
NEW 25	**AJX06R254SA25S**	●	4	140	17.9	60	25	1.11°	0.6	0.8°	1	JOM□06T2
25	**AJX09R252SA25L**	●	2	200	14.9	120	25	0.54°	1.2	4°	2	JDM□09T3
25	**AJX08R253SA25L**	●	3	200	16.4	120	25	0.54°	0.9	2°	1	JOM□0803
NEW 25	**AJX06R254SA25L**	●	4	200	17.9	120	25	0.54°	0.6	0.8°	1	JOM□06T2
25	**AJX09R252SA25EL**	●	2	300	14.9	180	25	0.36°	1.2	4°	2	JDM□09T3
28	**AJX09R282SA25S**	●	2	140	17.9	40	25	—	1.2	3°	2	JDM□09T3
28	**AJX08R283SA25S**	●	3	140	19.4	40	25	—	0.9	1.7°	1	JOM□0803
NEW 28	**AJX06R284SA25S**	●	4	140	20.9	40	25	—	0.6	0.7°	1	JOM□06T2
28	**AJX09R282SA25L**	●	2	200	17.9	40	25	—	1.2	3°	2	JDM□09T3
28	**AJX08R283SA25L**	●	3	200	19.4	40	25	—	0.9	1.7°	1	JOM□0803
NEW 28	**AJX06R284SA25L**	●	4	200	20.9	40	25	—	0.6	0.7°	1	JOM□06T2
28	**AJX09R282SA25EL**	●	2	300	17.9	40	25	—	1.2	3°	2	JDM□09T3
30	**AJX12R302SA32S**	●	2	150	18.3	70	32	1.82°	1.2	4.5°	2	JDM□1204
30	**AJX09R303SA32S**	●	3	150	20	70	32	1.79°	1.2	2.7°	2	JDM□09T3
30	**AJX12R302SA32L**	●	2	200	18.3	120	32	1.04°	1.2	4.5°	2	JDM□1204
30	**AJX09R303SA32L**	●	3	200	20	120	32	1.03°	1.2	2.7°	2	JDM□09T3
30	**AJX12R302SA32EL**	●	2	300	18.3	180	32	0.69°	1.2	4.5°	2	JDM□1204

⁎ Refer to page L237, for the max. drilling depth (**AZ**).

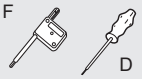
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) LF	DC	LH	DCON	B2	APMX (mm)	RMPX	Fig.	Insert Type
32	**AJX12R322SA32S**	●	2	150	20.3	70	32	0.96°	1.2	4°	2	JDM□1204
32	**AJX09R323SA32S**	●	3	150	21.9	70	32	0.94°	1.2	2.5°	2	JDM□09T3
NEW 32	**AJX08R324SA32S**	●	4	150	23.4	70	32	0.95°	0.9	1.4°	1	JOM□0803
NEW 32	**AJX06R325SA32S**	●	5	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM□06T2
NEW 32	**AJX06R326SA32S**	●	6	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM□06T2
32	**AJX12R322SA32L**	●	2	200	20.3	120	32	0.55°	1.2	4°	2	JDM□1204
32	**AJX09R323SA32L**	●	3	200	21.9	120	32	0.54°	1.2	2.5°	2	JDM□09T3
NEW 32	**AJX08R324SA32L**	●	4	200	23.4	120	32	0.55°	0.9	1.4°	1	JOM□0803
NEW 32	**AJX06R325SA32L**	●	5	200	24.9	120	32	0.54°	0.6	0.5°	1	JOM□06T2
32	**AJX12R322SA32EL**	●	2	300	20.3	180	32	0.36°	1.2	4°	2	JDM□1204
35	**AJX12R352SA32S**	●	2	150	23.3	50	32	–	1.2	3.5°	2	JDM□1204
35	**AJX09R353SA32S**	●	3	150	24.9	50	32	–	1.2	2°	2	JDM□09T3
35	**AJX12R352SA32L**	●	2	200	23.3	50	32	–	1.2	3.5°	2	JDM□1204
35	**AJX09R353SA32L**	●	3	200	24.9	50	32	–	1.2	2°	2	JDM□09T3
35	**AJX12R352SA32EL**	●	2	300	23.3	50	32	–	1.2	3.5°	2	JDM□1204
40	**AJX12R403SA32S**	●	3	150	28.3	50	32	–	1.2	3°	2	JDM□1204
40	**AJX09R404SA32S**	●	4	150	29.9	50	32	–	1.2	1.5°	2	JDM□09T3
NEW 40	**AJX08R406SA32S**	●	6	150	31.4	50	32	–	0.9	1°	1	JOM□0803
40	**AJX12R403SA32L**	●	3	250	28.3	50	32	–	1.2	3°	2	JDM□1204
40	**AJX09R404SA32L**	●	4	250	29.9	50	32	–	1.2	1.5°	2	JDM□09T3
NEW 40	**AJX08R406SA32L**	●	6	250	31.4	50	32	–	0.9	1°	1	JOM□0803
40	**AJX12R402SA32EL**	●	2	350	28.3	50	32	–	1.2	3°	2	JDM□1204
40	**AJX12R403SA42S**	●	3	150	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
40	**AJX09R404SA42S**	●	4	150	29.9	70	42	1.8°	1.2	1.5°	2	JDM□09T3
40	**AJX12R403SA42L**	●	3	250	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
40	**AJX09R404SA42L**	●	4	250	29.9	70	42	1.8°	1.2	1.5°	2	JDM□09T3
40	**AJX12R402SA42EL**	●	2	350	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
50	**AJX14R503SA42S**	●	3	150	38.2	50	42	–	1.2	4.2°	2	JDM□1405
50	**AJX14R503SA42L**	●	3	250	38.1	50	42	–	1.2	4.2°	2	JDM□1405
63	**AJX14R634SA42S**	●	4	150	51.1	50	42	–	1.2	2.8°	3	JDM□1405
63	**AJX14R634SA42L**	●	4	250	51.1	50	42	–	1.2	2.8°	3	JDM□1405

∗ Refer to page L237, for the max. drilling depth (**AZ**).
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

SPARE PARTS

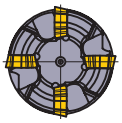
Tool Holder Type	 ∗ Clamp Screw	 Clamp Bridge	 ∗ Clamp Bridge Screw	 Spring	 F D Wrench
AJX06R	TS25	–	–	–	TKY08F
AJX08R	TS33	–	–	–	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R30	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R32	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R35	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R40	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX14R	TS54	AMS5	AJS5014T25	ASS3	TKY25D

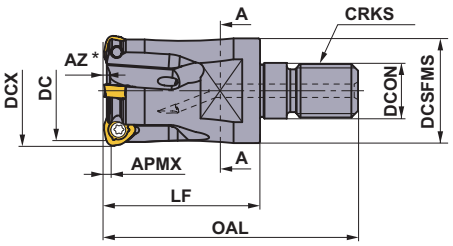
∗ Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS407=3.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

● : **Inventory maintained in Japan.**



Fig.1





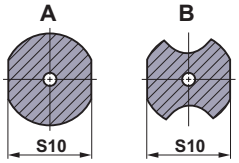
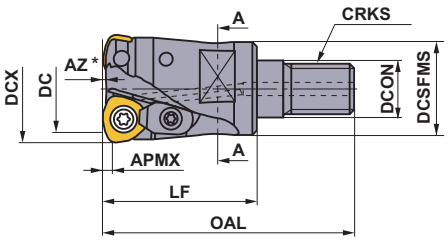
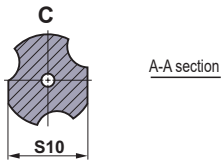


Fig.2







Right hand tool holder only.

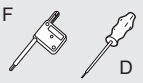
■ SCREW-IN TYPE

With Coolant Hole

	DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	OAL	DCON	WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
	16	**AJX06R162AM0830**	●	2	8.9	30	48	8.5	0.1	0.6	3°	1	JOM□06T2
	17	**AJX06R172AM0830**	●	2	9.9	30	48	8.5	0.1	0.6	2.5°	1	JOM□06T2
	20	**AJX08R202AM1030**	●	2	11.4	30	49	10.5	0.1	0.9	3.5°	1	JOM□0803
	20	**AJX06R203AM1030**	●	3	12.9	30	49	10.5	0.1	0.6	1.5°	1	JOM□06T2
	22	**AJX08R222AM1030**	●	2	13.4	30	49	10.5	0.1	0.9	3°	1	JOM□0803
	22	**AJX06R223AM1030**	●	3	14.9	30	49	10.5	0.1	0.6	1°	1	JOM□06T2
	25	**AJX09R252AM1235**	●	2	14.9	35	57	12.5	0.2	1.2	4°	2	JDM□09T3
	25	**AJX08R253AM1235**	●	3	16.4	35	57	12.5	0.1	0.9	2°	1	JOM□0803
NEW	25	**AJX06R254AM1235**	●	4	17.9	35	57	12.5	0.1	0.6	0.8°	1	JOM□06T2
	28	**AJX09R282AM1235**	●	2	17.9	35	57	12.5	0.2	1.2	3°	2	JDM□09T3
	28	**AJX08R283AM1235**	●	3	19.4	35	57	12.5	0.1	0.9	1.7°	1	JOM□0803
NEW	28	**AJX06R284AM1235**	●	4	20.9	35	57	12.5	0.1	0.6	0.7°	1	JOM□06T2
	30	**AJX12R302AM1645**	●	2	18.3	45	68	17.0	0.3	1.2	4.5°	2	JDM□1204
	30	**AJX09R303AM1645**	●	3	20	45	68	17.0	0.2	1.2	2.7°	2	JDM□09T3
	32	**AJX12R322AM1645**	●	2	20.3	45	68	17.0	0.3	1.2	4°	2	JDM□1204
	32	**AJX09R323AM1645**	●	3	21.9	45	68	17.0	0.2	1.2	2.5°	2	JDM□09T3
NEW	32	**AJX08R324AM1645**	●	4	23.4	45	68	17.0	0.2	0.9	1.4°	1	JOM□0803
	35	**AJX12R352AM1645**	●	2	23.3	45	68	17.0	0.3	1.2	3.5°	2	JDM□1204
	35	**AJX09R353AM1645**	●	3	24.9	45	68	17.0	0.2	1.2	2°	2	JDM□09T3
NEW	35	**AJX08R354AM1645**	●	4	26.4	45	68	17.0	0.2	0.9	1.2°	1	JOM□0803
	40	**AJX12R403AM1645**	●	3	28.3	45	68	17.0	0.3	1.2	3°	2	JDM□1204
	40	**AJX09R404AM1645**	●	4	29.9	45	68	17.0	0.2	1.2	1.5°	2	JDM□09T3
NEW	40	**AJX08R406AM1645**	●	6	31.4	45	68	17.0	0.3	0.9	1°	1	JOM□0803

∗ Refer to page L237, for the max. drilling depth (**AZ**).
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Clamp Bridge	 * Clamp Bridge Screw	 Spring	 F D Wrench
AJX06R	TS25	—	—	—	TKY08F
AJX08R	TS33	—	—	—	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R30	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R32	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R35	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R40	TS43	AMS4	AJS4012T15	ASS2	TKY15D

∗ Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS407=3.5, TS43=3.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

ISO13399	➤ **L003**	**SPARE PARTS**	➤ **P001**
ARBORS	➤ **L341**	**TECHNICAL DATA**	➤ **Q001**

Mounting Dimensions

	DCX (mm)	Order Number	Dimensions (mm)				Connection Type	Shank Arbor Type
			DCON	DCSFMS	S10	CRKS		
	16	**AJX06R162AM0830**	8.5	13	10	M8	A	SC16M08
	17	**AJX06R172AM0830**	8.5	13	10	M8	A	SC16M08
	20	**AJX08R202AM1030**	10.5	18	14	M10	B	SC20M10
	20	**AJX06R203AM1030**	10.5	18	14	M10	C	SC20M10
	22	**AJX08R222AM1030**	10.5	18	14	M10	B	SC20M10
	22	**AJX06R223AM1030**	10.5	18	14	M10	C	SC20M10
	25	**AJX09R252AM1235**	12.5	21	19	M12	B	SC25M12
	25	**AJX08R253AM1235**	12.5	21	19	M12	A	SC25M12
NEW	25	**AJX06R254AM1235**	12.5	23.5	19	M12	A	SC25M12
	28	**AJX09R282AM1235**	12.5	21	19	M12	B	SC25M12
	28	**AJX08R283AM1235**	12.5	21	19	M12	A	SC25M12
NEW	28	**AJX06R284AM1235**	12.5	23.5	19	M12	A	SC25M12
	30	**AJX12R302AM1645**	17.0	29	24	M16	B	SC32M16
	30	**AJX09R303AM1645**	17.0	29	24	M16	A	SC32M16
	32	**AJX12R322AM1645**	17.0	29	24	M16	B	SC32M16
	32	**AJX09R323AM1645**	17.0	29	24	M16	A	SC32M16
NEW	32	**AJX08R324AM1645**	17.0	29	24	M16	A	SC32M16
	35	**AJX12R352AM1645**	17.0	29	24	M16	B	SC32M16
	35	**AJX09R353AM1645**	17.0	29	24	M16	A	SC32M16
NEW	35	**AJX08R354AM1645**	17.0	29	24	M16	A	SC32M16
	40	**AJX12R403AM1645**	17.0	29	24	M16	B	SC32M16
	40	**AJX09R404AM1645**	17.0	29	24	M16	A	SC32M16
NEW	40	**AJX08R406AM1645**	17.0	29	24	M16	A	SC32M16

HOW TO INSTALL THE SCREW-IN HEAD

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.



Screw Size	Recommended Torque (N • m)	Wrench Size (mm)
M8	23	10
M10	46	14
M12	80	19
M16	90	24

- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle the cutting tools with bare hands as this may cause injuries.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

| Workpiece Material | | |

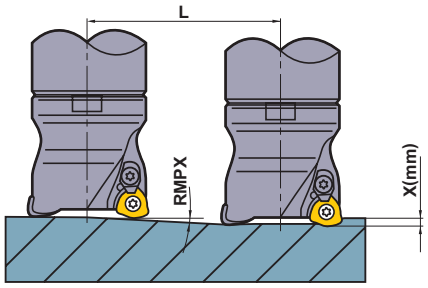
RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

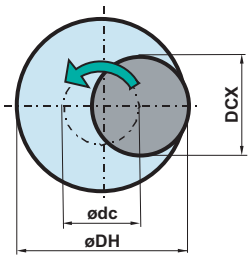
	Workpiece Material	Characteristics	Cutting Speed (m/min) for Different Grades			
P			FH7020	MP6120	MP6130	VP30RT
	Mild Steels	Hardness ≤180HB	170 (120—220)	150 (100—200)	130 (80—180)	110 (60—160)
	Carbon Steels Alloy Steels	Hardness 180—280HB	150 (100—200)	130 (80—180)	110 (60—160)	90 (40—140)
	Carbon Steels Alloy Steels	Hardness 280—350HB	130 (80—180)	100 (50—150)	80 (30—130)	60 (20—110)
	Alloy Tool Steels	Hardness ≤350HB (Annealing)	130 (80—180)	100 (50—150)	80 (30—120)	60 (20—90)
	Pre-hardened Steels	Hardness 35—45HRC	—	100 (70—130)	80 (50—110)	80 (30—90)
M			MP7130	MP7140		
	Stainless Steels	Hardness ≤270HB	140 (100—180)	120 (80—160)	—	—
K			FH7020	VP15TF		
	Gray Cast Irons	Tensile Strength ≤350MPa	150 (100—200)	—	—	—
	Ductile Cast Irons	Tensile Strength ≤800MPa	—	120 (80—160)	—	—
S			MP9120	MP9130	MP9140	
	Heat Resistant Alloys	Hardness ≤350HB	30 (20—40)	25 (20—35)	20 (15—30)	—
	Titanium Alloys	—	50 (40—60)	45 (30—55)	40 (30—50)	
H			VP15TF			
	Hardened Steels	Hardness 40—55HRC	70 (50—90)	—	—	—

MAXIMUM CAPACITIES BY MODE

■ RAMPING



■ HELICAL DRILLING



- How to derive a locus of the centre of the tool.

ødc = øDH - DCX

Locus of the centre of the tool | Desired hole diameter | Cutting Diameter Maximum

- For the depth of cut per pass, refer to the cutting conditions above for helical drilling.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

- When ramping and helical cutting, please apply a lower feed.
- When drilling, please set the feed in the axial direction at 0.2mm/rev or less.
- The long chips generated can disperse, ensure that adequate safety precautions are taken.

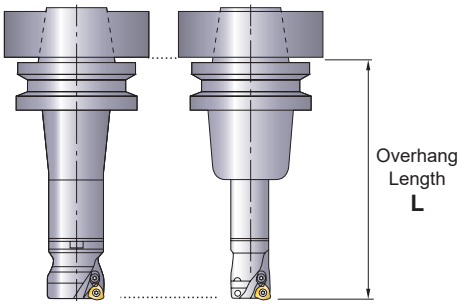
	Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)		RMPX	Ramping				Helical Drilling		AZ (mm)
							L Required distance for X mm depth				DH (mm)		
				FT/JM/ST Breaker	JL Breaker		X=1	X=1.2	X=1.5	X=2	Min	Max	
Shank type/Screw-in type	**AJX06**	16	8.9	1.0	0.6	3°	19.1	—	—	—	23	29	0.3
	AJX06	17	9.9	1.0	0.6	2.5°	22.9	—	—	—	25	31	0.3
	AJX06	20	12.9	1.0	0.6	1.5°	38.2	—	—	—	31	37	0.3
	AJX06	22	14.9	1.0	0.6	1°	57.3	—	—	—	35	41	0.3
	AJX08	20	11.4	1.5	0.9	3.5°	16.3	19.6	24.5	—	27	36	0.5
	AJX08	22	13.4	1.5	0.9	3°	19.1	22.9	28.6	—	31	40	0.5
	AJX08	25	16.4	1.5	0.9	2°	28.6	34.4	43.0	—	37	46	0.5
	AJX08	28	19.4	1.5	0.9	1.7°	33.7	40.4	50.5	—	43	52	0.5
	AJX09	25	14.9	2.0	1.2	4°	14.3	17.2	21.5	28.6	33	46	1.0
	AJX09	28	17.9	2.0	1.2	3°	19.1	22.9	28.6	38.1	39	52	1.0
	AJX09	30	20.0	2.0	1.2	2.7°	21.2	25.4	31.8	42.4	43	56	1.0
	AJX09	32	21.9	2.0	1.2	2.5°	22.9	27.5	34.4	45.8	47	60	1.0
	AJX09	35	24.9	2.0	1.2	2°	28.6	34.4	43.0	57.3	53	66	1.0
	AJX09	40	29.9	2.0	1.2	1.5°	38.2	45.8	57.3	76.4	63	76	1.0
	AJX12	30	18.3	2.0	1.2	4.5°	12.7	15.2	19.0	25.4	39	56	1.5
	AJX12	32	20.3	2.0	1.2	4°	14.3	17.2	21.4	28.6	41	60	1.5
	AJX12	35	23.3	2.0	1.2	3.5°	16.3	19.6	24.5	32.7	47	66	1.5
	AJX12	40	28.3	2.0	1.2	3°	19.1	22.9	28.6	38.2	57	76	1.5
	AJX14	50	38.2	2.0	1.2	4.2°	13.6	16.3	20.4	27.2	72	96	2.0
	AJX14	63	51.1	2.0	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2.0
Arbor type	**AJX06**	32	24.9	1.0	0.6	0.5°	114.6	137.5	171.9	229.2	51	61	0.3
	AJX08	40	31.4	1.5	0.9	1°	57.3	68.7	85.9	114.6	65	76	0.5
	AJX08	42	33.4	1.5	0.9	0.9°	63.7	76.4	95.5	127.3	69	80	0.5
	AJX08	50	41.4	1.5	0.9	0.7°	81.8	98.2	122.8	163.7	85	96	0.5
	AJX08	52	43.4	1.5	0.9	0.7°	81.8	98.2	122.8	163.7	89	100	0.5
	AJX09	50	40.0	2.0	1.2	1.1°	52.1	62.5	78.1	104.2	83	96	1.0
	AJX09	52	41.9	2.0	1.2	1°	57.3	68.7	85.9	114.6	85	100	1.0
	AJX09	63	52.9	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	107	122	1.0
	AJX09	66	55.9	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	113	128	1.0
	AJX12	50	38.3	2.0	1.2	2°	28.6	34.4	43.0	57.3	77	96	1.5
	AJX12	63	51.3	2.0	1.2	1.5°	38.2	45.8	57.3	76.4	103	122	1.5
	AJX12	66	54.3	2.0	1.2	1.4°	40.9	49.1	61.4	81.8	109	128	1.5
	AJX12	80	68.3	2.0	1.2	1.1°	52.1	62.5	78.1	104.2	137	156	1.5
	AJX12	100	88.3	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	177	196	1.5
	AJX14	63	51.1	2.0	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2.0
	AJX14	66	54.1	2.0	1.2	2.6°	22.0	26.4	33.0	44.0	108	128	2.0
	AJX14	80	68.1	2.0	1.2	1.8°	31.8	38.2	47.7	63.6	132	156	2.0
	AJX14	100	88.1	2.0	1.2	1.2°	47.7	57.3	71.6	95.5	172	196	2.0
	AJX14	125	113.2	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	222	246	2.0
	AJX14	160	148.2	2.0	1.2	0.5°	114.6	137.5	171.9	229.2	292	316	2.0

RECOMMENDED CUTTING CONDITIONS

■ DEPTH OF CUT / FEED

	Workpiece Material	Characteristics	Shank Type / Screw-in Type								
			DCX=ø16, ø17			DCX=ø20, ø22			DCX=ø25, ø28		
			L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)
P	Mild Steel	Hardness ≤180HB	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
			180	0.6	0.6	210	0.8	0.8	230	0.8	1.0
			210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
	Carbon Steel Alloy Steel	Hardness 180—280HB	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
			180	0.6	0.6	210	0.8	0.8	230	0.8	1.0
			210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
	Carbon Steel Alloy Steel	Hardness 280—350HB	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
	Alloy Tool Steel	Hardness ≤350HB	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
	Pre-hardened Steel	Hardness 35—45HRC	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
			180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
			210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
M	Stainless Steel	Hardness ≤270HB	140	0.8	0.7	160	1.0	0.8	170	1.0	1.0
			180	0.6	0.5	210	0.8	0.6	230	0.8	0.8
			210	0.4	0.3	240	0.6	0.4	290	0.6	0.6
K	Gray Cast Iron	Tensile Strength ≤350MPa	140	0.8	1.0	160	1.0	1.2	170	1.0	1.4
			180	0.6	0.8	210	0.8	1.0	230	0.8	1.2
			210	0.4	0.6	240	0.6	0.8	290	0.6	1.0
	Ductile Cast Iron	Tensile Strength ≤800MPa	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
S	Heat Resistant Alloy	Hardness ≤350HB	140	0.6	0.6	160	0.8	0.6	170	1.0	0.6
			180	0.4	0.4	210	0.6	0.4	230	0.8	0.4
	Titanium Alloy	—	210	0.3	0.3	240	0.4	0.3	290	0.6	0.3
H	Hardened Steel	Hardness 40—55HRC	140	0.5	0.5	160	0.5	0.6	170	0.5	0.8
			180	0.4	0.3	210	0.4	0.4	230	0.4	0.6
			210	0.3	0.2	240	0.3	0.2	290	0.3	0.4

① Overhang Length **L**



② Main Spindle Revolution
$n(min^{-1})$=(Recommended Cutting Speed x 1000)÷(DCX x 3.14)

③ Table Feed Rate
vf(mm/min)=n x Feed per Tooth x Number of Teeth

④ Recommended width of cut (ae) is more than 60% of the cutting edge diameter (DCX).

⑤ The above cutting conditions are guides to cutting on a #50 BT machine. In case of #40 BT and #63 HSK machines, a cutting edge diameter of under 35mm is recommended. In this case, reduce the depth of cut and table feed rate.

⑥ Use of ST chipbreaker with tougher cutting edges is recommended for machining parts that require interrupted cutting. First recommended insert grade for non-standard 06/08/09 ST chipbreakers is VP30RT irrespective of the workpiece material.

⑦ Cutter body with coarse pitch is recommended for the unstable cutting caused by the long tool overhang.

⑧ Use the "sharp" JM chipbreaker to lower cutting forces or when long tool overhangs are used.

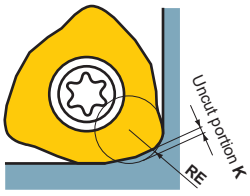
⑨ Heavy chips are generated when machining with the AJX. To avoid chip jamming-related problems, use air blower while machining to discharging chips effectively.

⑩ The maximum depth of cut of JL breaker is different in the insert size. 06 size is up to 0.6mm, 08 size is up to 0.9mm, and 09,12,14 size is up to 1.2mm.

	Shank Type / Screw-in Type												Arbor Type					
	DCX=ø30, ø32, ø35			DCX=ø40 (ø32 Shank)			DCX=ø40 (ø42 Shank)			DCX=ø50, ø63			DCX=ø50, ø63, ø66			DCX≥ø80		
	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)
	180	1.2	1.4	180	1.2	1.4	180	1.2	1.5	180	1.4	1.5	150	1.5	1.5	170	1.5	1.5
	230	1.0	1.2	240	1.0	1.2	240	1.0	1.3	240	1.2	1.3	250	1.3	1.3	300	1.3	1.3
	290	0.8	1.0	300	0.8	1.0	300	0.8	1.1	–	–	–	350	1.1	1.1	450	1.0	1.0
	180	1.2	1.4	180	1.2	1.4	180	1.2	1.5	180	1.4	1.5	150	1.5	1.5	170	1.5	1.5
	230	1.0	1.2	240	1.0	1.2	240	1.0	1.3	240	1.2	1.3	250	1.3	1.3	300	1.3	1.3
	290	0.8	1.0	300	0.8	1.0	300	0.8	1.1	–	–	–	350	1.1	1.1	450	1.0	1.0
	180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
	230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
	290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	–	–	–	350	0.9	1.1	450	0.8	1.0
	180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
	230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
	290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	–	–	–	350	0.9	1.1	450	0.8	1.0
	180	1.0	1.2	180	1.0	1.2	180	1.0	1.3	180	1.2	1.3	150	1.3	1.3	170	1.3	1.3
	230	0.8	1.0	240	0.8	1.0	240	0.8	1.1	240	1.0	1.1	250	1.1	1.1	300	1.1	1.1
	290	0.6	0.8	300	0.6	0.8	300	0.6	0.9	–	–	–	350	0.9	0.9	450	0.8	0.8
	180	1.2	1.2	180	1.2	1.2	180	1.2	1.3	180	*1.4	1.3	150	*1.5	1.3	170	*1.5	1.3
	230	1.0	1.0	240	1.0	1.0	240	1.0	1.1	240	1.2	1.1	250	*1.3	1.1	300	*1.3	1.1
	290	0.8	0.8	300	0.8	0.8	300	0.8	0.9	–	–	–	350	1.1	0.9	450	1.0	0.8
	180	1.2	1.6	180	1.2	1.6	180	1.2	1.7	180	1.4	1.7	150	1.5	1.7	170	1.5	1.7
	230	1.0	1.4	240	1.0	1.4	240	1.0	1.5	240	1.2	1.5	250	1.3	1.5	300	1.3	1.5
	290	0.8	1.2	300	0.8	1.2	300	0.8	1.3	–	–	–	350	1.1	1.3	450	1.0	1.2
	180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
	230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
	290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	–	–	–	350	0.9	1.1	450	0.8	1.0
	180	1.2	0.6	180	1.2	0.6	180	1.2	0.6	180	1.2	0.6	150	1.2	0.6	170	1.2	0.6
	230	1.0	0.4	240	1.0	0.4	240	1.0	0.4	240	1.0	0.4	250	1.0	0.4	300	1.0	0.4
	290	0.8	0.3	300	0.8	0.3	300	0.8	0.3	–	–	–	350	0.8	0.3	450	0.8	0.3
	180	0.6	1.0	180	0.6	1.0	180	0.6	1.1	180	0.8	1.1	150	0.9	1.1	170	0.9	1.1
	230	0.5	0.8	240	0.5	0.8	240	0.5	0.9	240	0.6	0.9	250	0.7	0.9	300	0.7	0.9
	290	0.4	0.6	300	0.4	0.6	300	0.4	0.7	–	–	–	–	–	–	–	–	–

* Depth of cut of JL breaker is up to 1.2 mm.

NOTE FOR PROGRAMMING



When using the AJX, please programme as an R3 radius cutter. The approximate radius RE and uncut amount K at that time are as shown on the table to the right.

Insert Size	Breaker	Approx. RE (mm)	Uncut Portion K (mm)
06	FT / JM	2.0	0.33
	JL	2.5	0.32
08	FT / JM	2.5	0.46
	JL	2.0	0.40
09	FT / JM	3.0	0.47
	JL	3.0	0.46
12	FT / JM / ST	3.0	0.63
	JL	3.0	0.53
14	FT / JM / ST	3.0	0.64
	JL	3.0	0.55

Note 1) The uncut portion may change slightly depending on cutting conditions.

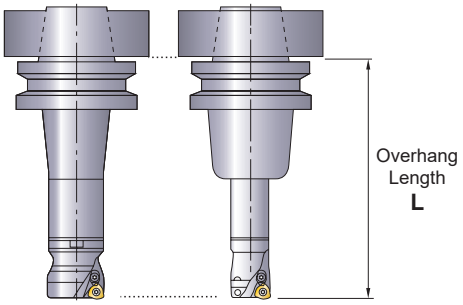
Shank / Screw-in Type Extra Fine Pitch and Arbor Type Super Extra Fine Pitch

RECOMMENDED CUTTING CONDITIONS

■ DEPTH OF CUT / FEED

	Workpiece Material	Characteristics	Shank Type / Screw-in Type								
			DCX=ø25, ø28			DCX=ø30, ø32, ø35			DCX=ø40 (ø32 Shank)		
			L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)
P	Mild Steels	Hardness ≤180HB	170	0.5	1.2	180	0.7	1.4	180	0.8	1.4
			230	0.4	1.0	230	0.5	1.2	240	0.6	1.2
			290	0.3	0.8	290	0.3	1.0	300	0.4	1.0
	Carbon Steels Alloy Steels	Hardness 180—280HB	170	0.5	1.2	180	0.7	1.4	180	0.8	1.4
			230	0.4	1.0	230	0.5	1.2	240	0.6	1.2
			290	0.3	0.8	290	0.3	1.0	300	0.4	1.0
	Carbon Steels Alloy Steels	Hardness 280—350HB	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
	Alloy Tool Steels	Hardness ≤350HB	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
	Pre-hardened Steels	Hardness 35—45HRC	170	0.4	1.0	180	0.5	1.2	180	0.6	1.2
			230	0.3	0.8	230	0.4	1.0	240	0.5	1.0
			290	0.2	0.6	290	0.3	0.8	300	0.4	0.8
M	Stainless Steels	Hardness ≤270HB	170	0.5	1.0	180	0.7	1.2	180	0.8	1.2
			230	0.4	0.8	230	0.5	1.0	240	0.6	1.0
			290	0.3	0.6	290	0.3	0.8	300	0.4	0.8
K	Gray Cast Irons	Tensile Strength ≤350MPa	170	0.5	1.4	180	0.7	1.6	180	0.8	1.6
			230	0.4	1.2	230	0.5	1.4	240	0.6	1.4
			290	0.3	1.0	290	0.3	1.2	300	0.4	1.2
	Ductile Cast Irons	Tensile Strength ≤800MPa	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
S	Heat Resistant Alloys	Hardness ≤350HB	170	0.5	0.6	180	0.7	0.6	180	0.8	0.6
			230	0.4	0.4	230	0.5	0.4	240	0.6	0.4
	Titanium Alloys	—	290	0.3	0.3	290	0.3	0.3	300	0.4	0.3
H	Hardened Steels	Hardness 40—55HRC	170	0.3	0.8	180	0.4	1.0	180	0.5	1.0
			230	0.2	0.6	230	0.3	0.8	240	0.4	0.8
			290	0.1	0.4	290	0.2	0.6	300	0.3	0.6

① Overhang Length **L**



② Main Spindle Revolution
$n(min^{-1})$=(Recommended Cutting Speed x 1000)÷(DCX x 3.14)

③ Table Feed Rate
vf(mm/min)=n x Feed per Tooth x Number of Teeth

④ Recommended width of cut (ae) is more than 60% of the cutting edge diameter (DCX).

⑤ The above cutting conditions are guides to cutting on a #50 BT machine. In case of #40 BT and #63 HSK machines, a cutting edge diameter of under 35mm is recommended. In this case, reduce the depth of cut and table feed rate.

⑥ Use of ST chipbreaker with tougher cutting edges is recommended for machining parts that require interrupted cutting. First recommended insert grade for non-standard 06/08/09 ST chipbreakers is VP30RT irrespective of the workpiece material.

⑦ Cutter body with coarse pitch is recommended for the unstable cutting caused by the long tool overhang.

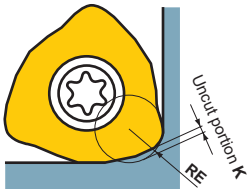
⑧ Use the "sharp" JM chipbreaker to lower cutting forces or when long tool overhangs are used.

⑨ Heavy chips are generated when machining with the AJX. To avoid chip jamming-related problems, use air blower while machining to discharging chips effectively.

⑩ The maximum depth of cut of JL breaker is different in the insert size. 06 size is up to 0.6mm, 08 size is up to 0.9mm, and 09,12,14 size is up to 1.2mm.

	Arbor Type											
	DCX=ø40 (ø42 Shank)			DCX=ø32, ø40, ø42			DCX=ø50, ø63, ø66			DCX≥ø80		
	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)
	180	0.8	1.5	180	0.8	1.4	150	0.8	1.5	170	1.1	1.5
	240	0.6	1.3	230	0.6	1.2	250	0.6	1.3	300	0.9	1.3
	300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.7	1.0
	180	0.8	1.5	180	0.8	1.4	150	0.8	1.5	170	1.1	1.5
	240	0.6	1.3	230	0.6	1.2	250	0.6	1.3	300	0.9	1.3
	300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.7	1.0
	180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
	240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
	300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
	180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
	240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
	300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
	180	0.6	1.3	180	0.6	1.2	150	0.6	1.3	170	0.9	1.3
	240	0.5	1.1	230	0.5	1.0	250	0.5	1.1	300	0.7	1.1
	300	0.4	0.9	290	0.4	0.8	350	0.3	0.9	450	0.5	0.8
	180	0.8	1.3	180	0.8	1.2	150	0.8	1.3	170	1.1	1.3
	240	0.6	1.1	230	0.6	1.0	250	0.6	1.1	300	0.9	1.1
	300	0.4	0.9	290	0.4	0.8	350	0.3	0.9	450	0.7	0.8
	180	0.8	1.7	180	0.8	1.6	150	0.8	1.7	170	1.1	1.7
	240	0.6	1.5	230	0.6	1.4	250	0.6	1.5	300	0.9	1.5
	300	0.4	1.3	290	0.4	1.2	350	0.3	1.3	450	0.7	1.2
	180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
	240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
	300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
	180	0.8	0.6	180	0.5	0.6	150	0.5	0.6	170	0.8	0.6
	240	0.6	0.4	230	0.4	0.4	250	0.4	0.4	300	0.6	0.4
	300	0.4	0.3	290	0.3	0.3	350	0.3	0.3	450	0.4	0.3
	180	0.5	1.1	180	0.4	1.0	150	0.4	1.1	170	0.7	1.1
	240	0.4	0.9	230	0.3	0.8	250	0.3	0.9	300	0.5	0.9
	300	0.3	0.7	–	–	–	–	–	–	–	–	–

NOTE FOR PROGRAMMING



When using the AJX, please programme as an R3 radius cutter. The approximate radius RE and uncut amount K at that time are as shown on the table to the right.

Insert Size	Breaker	Approx. **RE** (mm)	Uncut Portion **K** (mm)
06	**FT / JM**	2.0	0.33
	JL	2.5	0.32
08	**FT / JM**	2.5	0.46
	JL	2.0	0.40
09	**FT / JM**	3.0	0.47
	JL	3.0	0.46
12	**FT / JM / ST**	3.0	0.63
	JL	3.0	0.53
14	**FT / JM / ST**	3.0	0.64
	JL	3.0	0.55

Note 1) The uncut portion may change slightly depending on cutting conditions.

MULTI-FUNCTIONAL MILLING

WJX09 NEW

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



Fig.1
ø40

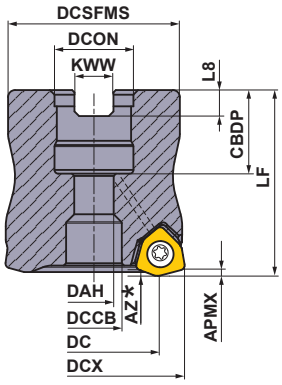
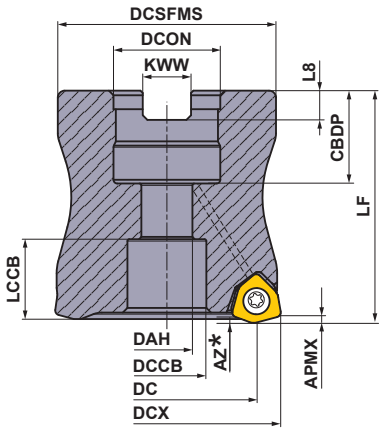


Fig.2
ø50
ø52
ø63
ø66



Right hand tool holder only.

DCON		Set Bolt	Geometry	
inch size	mm size			
	ϕ16	HFF08033H	①	① ②
ϕ22.225	ϕ22	HSC10030H	②	
	ϕ27	HSC12035H		
				With Coolant Hole

■ ARBOR TYPE

With Coolant Hole

DCON = Inch size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX09R05004BA**	●	4	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
50	**WJX09R05006BA**	●	6	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
63	**WJX09R06305BA**	●	5	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905
63	**WJX09R06307BA**	●	7	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905

DCON = mm size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
40	**WJX09-040A04AR**	●	4	28.8	40	16	0.2	1.2	23200	1	JOMU0905
40	**WJX09-040A05AR**	●	5	28.8	40	16	0.2	1.2	23200	1	JOMU0905
50	**WJX09-050A04AR**	●	4	38.8	50	22	0.4	1.2	20000	2	JOMU0905
50	**WJX09-050A06AR**	●	6	38.8	50	22	0.4	1.2	20000	2	JOMU0905
52	**WJX09-052A06AR**	●	6	40.8	50	22	0.5	1.2	19500	2	JOMU0905
63	**WJX09-063A05AR**	●	5	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063A07AR**	●	7	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063X07AR**	●	7	51.8	50	27	0.7	1.2	17300	2	JOMU0905
66	**WJX09-066X07AR**	●	7	54.8	50	27	0.8	1.2	16800	2	JOMU0905

∗ Refer to page L249, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

Mounting Dimensions

DCX (mm)	Order Number	Dimensions(mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
40	**WJX09-040A04AR**	16	18	8.5	12	–	37	8.4	5.6	1
40	**WJX09-040A05AR**	16	18	8.5	12	–	37	8.4	5.6	1
50	**WJX09-050A04AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09-050A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09R05004BA**	22.225	19	11	17	18.2	47	8.4	5	2
50	**WJX09R05006BA**	22.225	19	11	17	18.2	47	8.4	5	2
52	**WJX09-052A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
63	**WJX09-063A05AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09-063A07AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09R06305BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09R06307BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09-063X07AR**	27	23	13	20	16.2	60	12.4	7	2
66	**WJX09-066X07AR**	27	23	13	20	16.2	60	12.4	7	2

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX09	TPS3R	TIP10D	MK1KS

* Clamp Torque (N • m) : TPS3R = 2.0

ISO13399 ➢ L003
HOW TO USE ➢ L257
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001



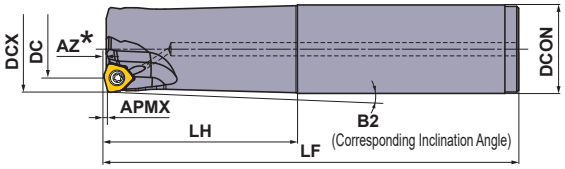


Fig.1

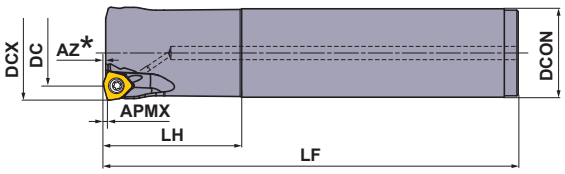


Fig.2

■ SHANK TYPE

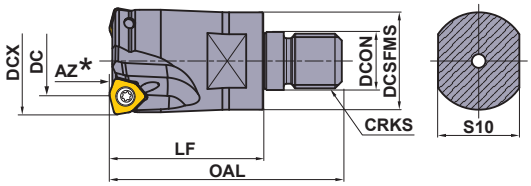
With Coolant Hole

Right hand tool holder only.

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	LH	DCON	B2	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
25	**WJX09R2502SA25S**	●	2	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25S**	●	3	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25L**	●	2	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25L**	●	3	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25EL**	●	2	14	300	180	25	0.35°	1.2	33500	1	JOMU0905
28	**WJX09R2802SA25S**	●	2	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25S**	●	3	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25L**	●	2	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25L**	●	3	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25EL**	●	2	16.9	300	40	25	—	1.2	30300	2	JOMU0905
32	**WJX09R3202SA32S**	●	2	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32S**	●	3	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32L**	●	2	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32L**	●	3	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32EL**	●	2	20.9	300	180	32	0.35°	1.2	27300	1	JOMU0905
35	**WJX09R3503SA32S**	●	3	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32S**	●	4	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3503SA32L**	●	3	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32L**	●	4	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3502SA32EL**	●	2	23.8	300	50	32	—	1.2	25500	2	JOMU0905
40	**WJX09R4003SA32S**	●	3	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32S**	●	4	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32L**	●	3	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32L**	●	4	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32EL**	●	3	28.8	300	50	32	—	1.2	23200	2	JOMU0905

∗ Refer to page L249, for the maximum drilling depth (**AZ**).





■ SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	OAL	DCON	DCSFMS	S10	CRKS	WT (kg)	APMX (mm)	RPMX (min^{-1})	Insert Type
25	**WJX09R2502AM1235**	●	2	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
25	**WJX09R2503AM1235**	●	3	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
28	**WJX09R2802AM1235**	●	2	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
28	**WJX09R2803AM1235**	●	3	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
32	**WJX09R3202AM1645**	●	2	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
32	**WJX09R3203AM1645**	●	3	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
35	**WJX09R3502AM1645**	●	2	23.8	45	68	17.0	28.5	24	M16	0.3	1.2	25500	JOMU0905
35	**WJX09R3503AM1645**	●	3	23.8	45	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
35	**WJX09R3504AM1645**	●	4	23.8	35	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
40	**WJX09R4003AM1645**	●	3	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4004AM1645**	●	4	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4005AM1645**	●	5	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905

∗ Refer to page L249, for the maximum drilling depth (**AZ**).
Note 1) For screw-in type arbors, refer to page L341.

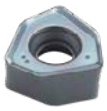
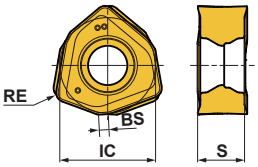
● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

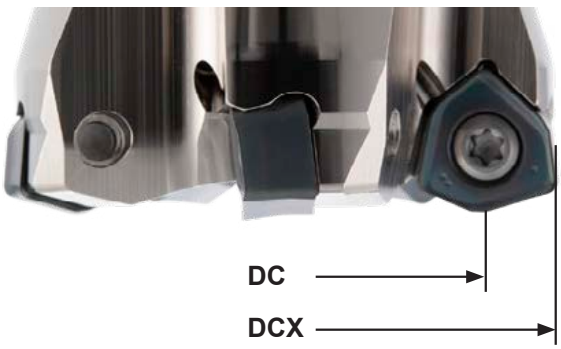
Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Edge Preparation : E : Round

Shape	Order Number	Class	Edge Preparation	Coated									Dimensions(mm)				Geometry
				MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	IC	S	BS	RE	
	JOMU090512ZZER-L	M	E	●	●	●	●	●	●	●	●	●	9.525	4.73	0.88	1.2	 Right hand insert only.
	JOMU090512ZZER-M	M	E	●	●	●	●	●	●	●	●	●	9.525	4.75	0.88	1.2	
	JOMU090512ZZER-R	M	E	●	●	●					●	●	9.525	4.83	0.88	1.2	

■Cutter Diameter and Flat Surface Milling

The maximum cutting diameter (DCX) shown in the WJX items table is not the same as the possible dimensions for plane cutting.
The possible dimensions for plane cutting are given as the cutting axle DC value. Please note that this is smaller than the DCX value.



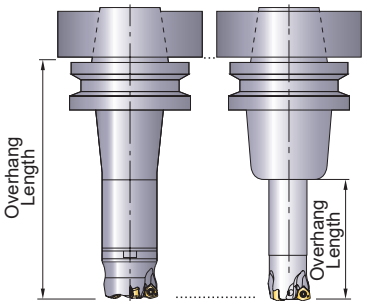
ISO13399 ➤ L003
HOW TO USE ➤ L257
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

Correction Value According to Overhang Length

Please use by multiplying the recommended cutting conditions by the correction factor for the overhang length.

Type	DCX (mm)	Overhang Length (mm)	Correction Value		
			vc (m/min)	ap (mm)	fz (mm/t)
Shank Type Screw-in Type	25—40	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	85%	90%	85%
		5.0×DCON	80%	85%	80%
		7.5×DCON	70%	75%	75%
Arbor Type	40—66	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
		6.0×DCX	70%	70%	40%



Cutting Speed (Dry Cutting)

	Workpiece Material	Characteristics	Cutting Speed (Priority Basis) vc (m/min)				
P			MP6130	MP6120	VP15TF	MC7020	VP30RT
	Mild Steels	≤180HB	160 (110—200)	170 (120—220)	170 (120—220)	230 (180—280)	140 (100—180)
	Carbon Steels Alloy Steels	180—280HB	140 (90—200)	160 (100—220)	160 (100—220)	220 (170—270)	120 (80—170)
	Carbon Steels Alloy Steels	280—350HB	140 (90—200)	160 (100—220)	160 (100—220)	220 (170—270)	120 (80—170)
	Alloy Tool Steels	≤350HB (Annealing)	140 (90—200)	160 (100—220)	160 (100—220)	220 (170—270)	120 (80—170)
	Pre-hardened Steels	35—45HRC	100 (60—140)	120 (80—160)	120 (80—160)	—	90 (50—130)
M			MP7130	MP7140	MC7020	VP30RT	
	Austenitic Stainless Steels	≤200HB	160 (130—200)	150 (120—180)	220 (170—270)	150 (120—180)	
	Austenitic Stainless Steels	>200HB	140 (100—200)	130 (80—180)	190 (140—240)	130 (80—180)	
	Ferritic and Martensitic Stainless Steels	≤200HB	150 (100—200)	130 (80—180)	220 (170—270)	130 (80—180)	
	Duplex Stainless Steels	≤280HB	130 (80—180)	110 (60—160)	180 (130—230)	110 (60—160)	
	Precipitation-Hardening Stainless Steel	<450HB	110 (60—160)	90 (50—130)	170 (120—220)	90 (50—130)	
K			VP15TF				
	Gray Cast Irons	≤350MPa	180 (140—220)				
	Ductile Cast Irons	≤450MPa	160 (120—210)				
	Ductile Cast Irons	≤800MPa	130 (90—170)				
S			MP9130	MP9120	VP15TF		
	Titanium Alloys	—	40 (30—60)	50 (30—65)	50 (30—65)		
	Heat Resistant Alloys	—	30 (20—40)	40 (20—50)	40 (20—50)		
H			VP15TF				
	Hardened Steels	40—55HRC	70 (40—100)				

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table above by 80% and the feed rate per tooth by 80%.

■ Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	Depth of Cut **ap** (mm)	Breaker	Cutting Dia. Max. DCX=25,28(Z=2) Feed **fz**(mm/t)	Cutting Dia. Max. DCX=25,28(Z=3) Feed **fz**(mm/t)	Cutting Dia. Max. DCX=32– Feed **fz**(mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	≤0.5	M,R	1.3(0.4–2.0)	1.3(0.4–2.0)	1.5(0.5–2.0)	Dry
				L	1.2(0.4–1.6)	1.2(0.4–1.6)	1.2(0.4–1.6)	
			≤1.0	M,R	1.0(0.3–1.3)	0.8(0.3–1.0)	1.2(0.4–1.5)	
				L	0.8(0.3–1.2)	0.8(0.3–1.0)	0.8(0.3–1.2)	
			≤1.5	M,R	0.6(0.3–1.0)	–	0.8(0.4–1.2)	
	Carbon Steels Alloy Steels	Hardness 180–280HB	≤0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.2(0.3–1.5)	1.2(0.3–1.5)	1.2(0.3–1.5)	
			≤1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.7(0.2–1.0)	0.7(0.2–0.9)	0.7(0.2–1.0)	
			≤1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≤350HB (Annealing)	≤0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.2(0.3–1.5)	1.2(0.3–1.5)	1.2(0.3–1.5)	
			≤1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.7(0.2–1.0)	0.7(0.2–0.9)	0.7(0.2–1.0)	
			≤1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Pre-hardened Steels	Hardness 35–45HRC	≤0.5	M,R	1.0(0.3–1.3)	1.0(0.3–1.3)	1.2(0.3–1.5)	Dry
				L	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	
			≤1.0	M,R	0.6(0.2–0.8)	0.6(0.2–0.8)	0.8(0.2–1.0)	
				L	0.5(0.2–0.8)	0.5(0.2–0.8)	0.5(0.2–0.8)	
M	Austenitic Stainless Steels	–	≤0.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	Dry
				M	1.0(0.4–1.2)	1.0(0.4–1.2)	1.0(0.4–1.2)	
			≤1.0	L	0.6(0.2–0.8)	0.6(0.2–0.8)	0.6(0.2–0.8)	
				M	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	Dry
				M	1.0(0.4–1.2)	1.0(0.4–1.2)	1.0(0.4–1.2)	
			≤1.0	L	0.6(0.2–0.8)	0.6(0.2–0.8)	0.6(0.2–0.8)	
				M	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	
	Duplex Stainless Steels	Hardness ≤280HB	≤0.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	0.6(0.3–0.8)	Dry
				M	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
			≤1.0	L	0.5(0.2–0.7)	0.5(0.2–0.7)	0.5(0.2–0.7)	
				M	0.6(0.3–0.7)	0.6(0.3–0.7)	0.6(0.3–0.7)	
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	0.6(0.3–0.8)	Dry
				M	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
			≤1.0	L	0.5(0.2–0.7)	0.5(0.2–0.7)	0.5(0.2–0.7)	
				M	0.6(0.3–0.7)	0.6(0.3–0.7)	0.6(0.3–0.7)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.5	M,R	1.3(0.4–2.0)	1.3(0.4–2.0)	1.5(0.5–2.0)	Dry
				L	1.2(0.4–1.6)	1.2(0.4–1.6)	1.2(0.4–1.6)	
			≤1.0	M,R	1.0(0.3–1.3)	0.8(0.3–1.0)	1.2(0.4–1.5)	
				L	1.0(0.3–1.3)	0.8(0.3–1.0)	1.0(0.3–1.3)	
			≤1.5	M,R	0.6(0.3–1.0)	–	0.8(0.4–1.2)	
	Ductile Cast Irons	Tensile Strength ≤450MPa	≤0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.0(0.3–1.3)	1.0(0.3–1.3)	1.0(0.3–1.3)	
			≤1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.8(0.2–1.0)	0.7(0.2–0.9)	0.8(0.2–1.2)	
			≤1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤0.5	M,R	1.0(0.2–1.5)	1.0(0.2–1.5)	1.3(0.3–1.7)	Dry
				L	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	
			≤1.0	M,R	0.8(0.2–1.0)	0.6(0.2–0.8)	1.0(0.3–1.2)	
				L	0.5(0.2–0.8)	0.5(0.2–0.8)	0.5(0.2–0.8)	
S	Titanium Alloys	–	≤0.5	L	0.3(0.2–0.6)	0.3(0.2–0.6)	0.3(0.2–0.6)	Wet
			≤1.0	L	0.3(0.2–0.4)	0.3(0.2–0.4)	0.3(0.2–0.4)	
	Heat Resistant Alloys	–	≤0.5	L,M,R	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	Wet
			≤1.0	L,M,R	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
H	Hardened Steels	Hardness 40–55HRC	≤0.5	R,M	0.6(0.3–1.0)	0.6(0.3–1.0)	0.6(0.3–1.0)	Dry
			≤1.0	R,M	0.5(0.3–0.8)	0.4(0.3–0.6)	0.5(0.3–0.8)	

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, multiply the cutting speed listed in the table on page L246 by 80% and the feed rate per tooth listed in the table above by 80%.
Note 4) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

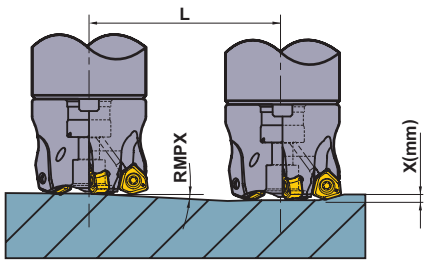
■ Selecting the Proper Breaker

	Workpiece Material	Characteristics	L Breaker		M Breaker		R Breaker	
			Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)
P	Mild Steels	Hardness ≤180HB	● ◐	≤1.0	● ◐	≤1.5	◐ ✣	≤1.5
P	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	≤1.0	● ◐	≤1.5	◐ ✣	≤1.5
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	≤1.0	● ◐	≤1.0	—	—
K	Ductile Cast Irons	Tensile Strength ≤450MPa	● ◐	≤1.0	● ◐	≤1.5	—	≤1.5
K	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	≤1.0	● ◐	≤1.0	—	≤1.0

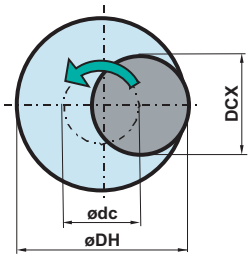
Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table on page L246 by 80% and the feed rate per tooth listed in the table above by 80%.

Maximum Capacities by Mode

■ Ramping



■ Helical Milling



● How to derive a locus of the centre of the tool.

ødc = øDH - DCX

ødc: Locus of the Centre of the Tool
øDH: Desired Hole Diameter
DCX: Cutting Diameter Maximum

Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)		AZ (mm)
				RMPX	L (mm) Required Distance for X mm Depth	DH (mm)		DH (mm)	Maximum Pitch	
					x = 1 (mm)	Min.	Max.	Min.	P max. (mm)	
WJX09R25	25	14.0	1.2	4.7°	12.2	38	47	34	1.2	0.8
WJX09R28	28	16.9	1.2	5.6°	10.2	44	53	38	1.2	1.2
WJX09R32	32	20.9	1.2	4.2°	13.7	52	61	46	1.2	1.2
WJX09R35	35	23.8	1.2	3.6°	15.9	58	67	52	1.2	1.2
WJX09R40	40	28.8	1.2	2.9°	19.8	68	77	61	1.2	1.2
WJX09-040	40	28.8	1.2	2.9°	19.8	68	77	61	1.2	1.2
WJX09-050	50	38.8	1.2	2.0°	28.7	88	97	81	1.2	1.2
WJX09R050	50	38.8	1.2	2.0°	28.7	88	97	81	1.2	1.2
WJX09-052	52	40.8	1.2	1.9°	30.2	92	101	85	1.2	1.2
WJX09-063	63	51.8	1.2	1.4°	41.0	114	123	107	1.2	1.2
WJX09R063	63	51.8	1.2	1.4°	41.0	114	123	107	1.2	1.2
WJX09-066	66	54.8	1.2	1.4°	41.0	120	129	113	1.2	1.2

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the centre of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at 0.2 mm/rev or less.

MULTI-FUNCTIONAL MILLING

WJX14

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



Fig.1

ø50
ø52

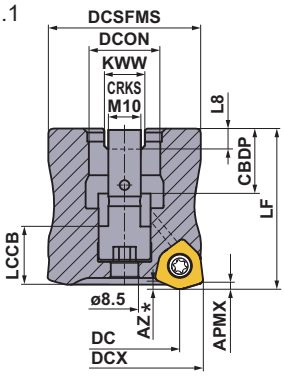


Fig.2

ø63
ø66
ø80
ø100

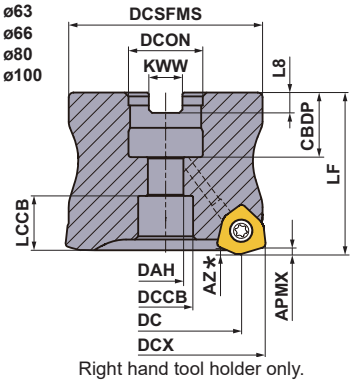
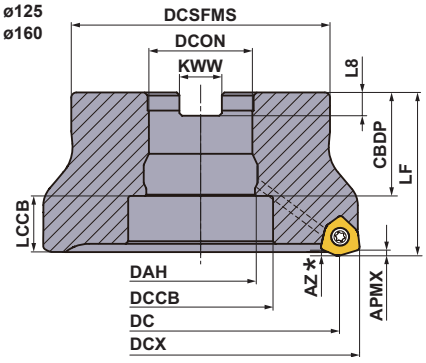


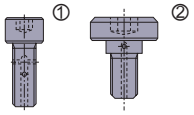
Fig.3

ø125
ø160



Right hand tool holder only.

DCON		Set Bolt	Geometry
inch size	mm size		
ϕ22.225	ϕ22	HSC10030H	① ②
ϕ31.75	ϕ27	HSC12035H	①
ϕ38.1	ϕ32	HSC16040H	
ϕ50.8	ϕ40	MBA20040H	②
		MBA24045H	②



With Coolant Hole

Note 1) The milling cutter with a cutting diameter of maximum DCX = 50mm and 52mm has a built in set bolt.
Please use a 7mm Allen wrench to tighten/loosen the set bolt.

■ ARBOR TYPE

With Coolant Hole

DCON = Inch size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX14R05003BA**	●	3	34.5	50	22.225	0.4	2	5000	1	JOMU1407
50	**WJX14R05004BA**	●	4	34.5	50	22.225	0.4	2	5000	1	JOMU1407
63	**WJX14R06304BA**	●	4	47.5	50	22.225	0.7	2	18200	2	JOMU1407
63	**WJX14R06305BA**	●	5	47.5	50	22.225	0.7	2	18200	2	JOMU1407
80	**WJX14R08005DA**	●	5	64.4	63	31.75	1.4	2	15600	2	JOMU1407
80	**WJX14R08006DA**	●	6	64.4	63	31.75	1.4	2	15600	2	JOMU1407
100	**WJX14R10006DA**	●	6	84.4	63	31.75	2.5	2	13500	2	JOMU1407
100	**WJX14R10007DA**	●	7	84.4	63	31.75	2.5	2	13500	2	JOMU1407
125	**WJX14R12507EA**	●	7	109.4	63	38.1	3.2	2	11600	3	JOMU1407
125	**WJX14R12509EA**	●	9	109.4	63	38.1	3.1	2	11600	3	JOMU1407
160	**WJX14R16009FA**	●	9	144.4	63	50.8	4.5	2	9900	3	JOMU1407

DCON = mm size

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX14-050A03AR**	●	3	34.5	50	22	0.4	2	5000	1	JOMU1407
50	**WJX14-050A04AR**	●	4	34.5	50	22	0.4	2	5000	1	JOMU1407
52	**WJX14-052A04AR**	●	4	36.5	50	22	0.4	2	5000	1	JOMU1407
63	**WJX14-063A04AR**	●	4	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063A05AR**	●	5	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063X05AR**	●	5	47.5	50	27	0.6	2	18200	2	JOMU1407
66	**WJX14-066X05AR**	●	5	50.4	50	27	0.7	2	17700	2	JOMU1407
80	**WJX14-080A05AR**	●	5	64.4	50	27	1.2	2	15600	2	JOMU1407
80	**WJX14-080A06AR**	●	6	64.4	50	27	1.2	2	15600	2	JOMU1407
100	**WJX14-100A06AR**	●	6	84.4	63	32	2.5	2	13500	2	JOMU1407
100	**WJX14-100A07AR**	●	7	84.4	63	32	2.5	2	13500	2	JOMU1407
125	**WJX14-125B07AR**	●	7	109.4	63	40	3.2	2	11600	3	JOMU1407
125	**WJX14-125B09AR**	●	9	109.4	63	40	3.1	2	11600	3	JOMU1407
160	**WJX14-160B09AR**	●	9	144.4	63	40	4.9	2	9900	3	JOMU1407

∗ Refer to page L256, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

Mounting Dimensions

DCX (mm)	Order Number	Dimensions(mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**WJX14-050A03AR**	22	20	—	—	18.3	47	10.4	6.3	1
50	**WJX14-050A04AR**	22	20	—	—	18.3	47	10.4	6.3	1
50	**WJX14R05003BA**	22.225	20	—	—	18.3	47	8.4	5	1
50	**WJX14R05004BA**	22.225	20	—	—	18.3	47	8.4	5	1
52	**WJX14-052A04AR**	22	20	—	—	18.3	47	10.4	6.3	1
63	**WJX14-063A04AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14-063A05AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14R06304BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14R06305BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14-063X05AR**	27	23	13	20	15.7	60	12.4	7	2
66	**WJX14-066X05AR**	27	23	13	20	15.7	60	12.4	7	2
80	**WJX14-080A05AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14-080A06AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14R08005DA**	31.75	32	17	26	19.7	76	12.7	8	2
80	**WJX14R08006DA**	31.75	32	17	26	19.7	76	12.7	8	2
100	**WJX14R10006DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14R10007DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14-100A06AR**	32	26	17	26	25.7	96	14.4	8	2
100	**WJX14-100A07AR**	32	26	17	26	25.7	96	14.4	8	2
125	**WJX14R12507EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14R12509EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14-125B07AR**	40	40	42	56	21.7	100	16.4	9	3
125	**WJX14-125B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14-160B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14R16009FA**	50.8	43	53	72	18.7	100	19.1	11	3

∗ Refer to page L256, for the maximum drilling depth (**AZ**).

Note 1) The milling cutter with a cutting diameter of DC = 50 mm and 52 mm has a built-in set bolt cannot be replaced. Therefore, absolutely do not disassemble the milling cutter.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

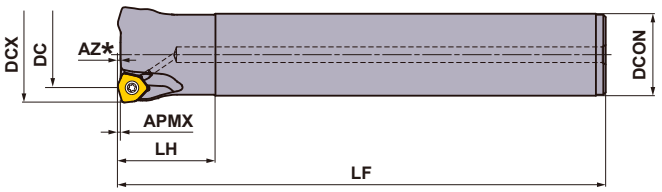
SPARE PARTS

Tool Holder Type	 ∗		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20T	MK1KS

∗ Clamp Torque (N • m) : TS5R = 5.0

ISO13399 ➤ L003
HOW TO USE ➤ L257
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001





Right hand tool holder only.

SHANK TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	LH	DCON	APMX (mm)	RPMX (min^{-1})	Insert Type
50	**WJX14R5003SA42S**	●	3	34.5	150	50	42	2	21200	JOMU1407
50	**WJX14R5003SA42L**	●	3	34.5	250	50	42	2	21200	JOMU1407

* Refer to page L256, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

SPARE PARTS

Tool Holder Type	Clamp Screw *	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20D	MK1KS

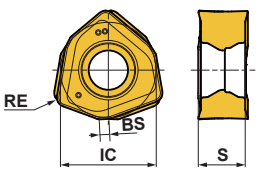
* Clamp Torque (N • m) : TS5R = 5.0

INSERTS

Workpiece Material		
	P	Steels
	M	Stainless Steels
	K	Cast Irons
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steels

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	Dimensions(mm) IC	S	BS	RE	Geometry
	NEW **JOMU140715ZZER-L**	M	E	●	●	●	●	●	●	●	●	●	14	6.58	1.3	1.5	
	JOMU140715ZZER-M	M	E	●	●	●	●	●	●	●	●	●	14	6.63	1.3	1.5	
	NEW **JOMU140715ZZER-R**	M	E	●	●	●					●	●	14	6.75	1.3	1.5	

Right hand insert only.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

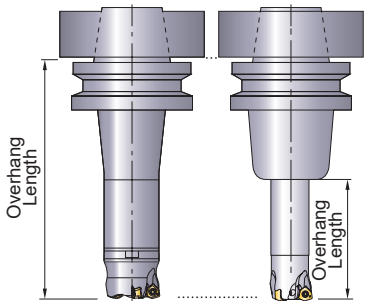
ISO13399	➤ L003	SPARE PARTS	➤ P001
HOW TO USE	➤ L257	TECHNICAL DATA	➤ Q001

RECOMMENDED CUTTING CONDITIONS

Correction Value According to Overhang Length

Please use by multiplying the recommended cutting conditions by the correction factor for the overhang length.

Type	DCX (mm)	Overhang Length (mm)	Correction Value		
			vc (m/min)	ap (mm)	fz (mm/t)
Shank Type	50	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	80%	80%	90%
Arbor Type	50—80	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
		6.0×DCX	70%	70%	40%
	≥100	200	100%	100%	100%
		300	85%	100%	90%
		400	80%	80%	80%



DCON=Connection Dia.

Cutting Speed (Dry Cutting)

	Workpiece Material	Characteristics	Cutting Speed (Priority Basis) vc (m/min)				
P			MP6130	MP6120	MC7020	VP15TF	VP30RT
	Mild Steels	≤180HB	140 (90—180)	150 (100—200)	220 (170—270)	150 (100—200)	120 (80—160)
	Carbon Steels Alloy Steels	180—280HB	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
	Carbon Steels Alloy Steels	280—350HB	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
	Alloy Tool Steels	≤350HB (Annealing)	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
	Pre-hardened Steels	35—45HRC	90 (50—130)	110 (70—150)	—	110 (70—150)	80 (40—120)
M			MP7130	MP7140	MC7020	VP30RT	
	Austenitic Stainless Steels	≤200HB	160 (130—200)	150 (120—180)	220 (170—270)	150 (120—180)	
	Austenitic Stainless Steels	>200HB	140 (100—200)	130 (80—180)	190 (140—240)	130 (80—180)	
	Ferritic and Martensitic Stainless Steels	≤200HB	150 (100—200)	130 (80—180)	220 (170—270)	130 (80—180)	
	Duplex Stainless Steels	≤280HB	130 (80—180)	110 (60—160)	180 (130—230)	110 (60—160)	
	Precipitation-Hardening Stainless Steel	<450HB	110 (60—160)	90 (50—130)	170 (120—220)	90 (50—130)	
K			VP15TF				
	Gray Cast Irons	≤350MPa	160 (120—200)				
	Ductile Cast Irons	≤450MPa	150 (100—200)				
	Ductile Cast Irons	≤800MPa	120 (80—160)				
S			MP9130	MP9120	VP15TF		
	Titanium Alloys	—	40 (30—60)	50 (30—65)	50 (30—65)		
	Heat Resistant Alloys	—	30 (20—40)	40 (20—50)	40 (20—50)		
H			VP15TF				
	Hardened Steels	40—55HRC	70 (40—100)				

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table above by 80% and the feed rate per tooth by 80%.

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	Depth of Cut **ap** (mm)	Breaker	Cutting Dia. Max. DCX=50, 52 Feed **fz**(mm/t)	Cutting Dia. Max. DCX≥63 Feed **fz**(mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	≤1.0	M,R	1.5(0.6—2.5)	1.7(0.6—2.8)	Dry
				L	1.2(0.4—2.0)	1.2(0.4—2.0)	
			≤1.5	M,R	1.3(0.6—2.0)	1.5(0.6—2.5)	
				L	1.0(0.4—1.8)	1.0(0.4—1.8)	
			≤2.0	M,R	1.2(0.6—2.0)	1.3(0.6—2.5)	
				L	0.8(0.4—1.7)	0.8(0.4—1.7)	
			≤2.5	M,R	0.8(0.3—1.5)	1.0(0.3—1.6)	
			≤3.0	M,R	0.4(0.2—1.0)	0.5(0.2—1.2)	
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤1.0	M,R	1.5(0.5—2.0)	1.7(0.5—2.5)	Dry
				L	1.0(0.3—1.7)	1.0(0.3—1.7)	
			≤1.5	M,R	1.2(0.5—1.7)	1.3(0.5—2.5)	
				L	0.8(0.3—1.5)	0.8(0.3—1.5)	
			≤2.0	M,R	1.0(0.5—1.5)	1.2(0.5—2.0)	
				L	0.7(0.3—1.2)	0.7(0.3—1.2)	
			≤2.5	M,R	0.7(0.3—1.2)	0.9(0.3—1.5)	
			≤3.0	M,R	0.3(0.2—0.8)	0.4(0.2—1.0)	
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	≤1.0	M,R	1.5(0.5—2.0)	1.7(0.5—2.5)	Dry
				L	1.0(0.3—1.7)	1.0(0.3—1.7)	
			≤1.5	M,R	1.2(0.5—1.7)	1.3(0.5—2.2)	
				L	0.8(0.3—1.5)	0.8(0.3—1.5)	
			≤2.0	M,R	1.0(0.5—1.5)	1.2(0.5—2.0)	
				L	0.7(0.3—1.2)	0.7(0.3—1.2)	
			≤2.5	M,R	0.7(0.3—1.2)	0.9(0.3—1.5)	
			≤3.0	M,R	0.3(0.2—0.8)	0.4(0.2—1.0)	
	Pre-hardened Steels	Hardness 35—45HRC	≤1.0	M,R	1.3(0.4—1.7)	1.5(0.4—2.0)	Dry
				L	0.7(0.3—1.2)	0.7(0.3—1.2)	
			≤1.5	M,R	1.0(0.4—1.5)	1.2(0.4—1.5)	
				L	0.6(0.3—1.0)	0.6(0.3—1.0)	
			≤2.0	M,R	0.8(0.4—1.2)	1.0(0.4—1.3)	
				L	0.5(0.3—0.8)	0.5(0.3—0.8)	
M	Austenitic Stainless Steels	—	≤1.0	L	0.8(0.3—1.2)	0.8(0.3—1.2)	Dry
				M	1.0(0.5—1.2)	1.0(0.5—1.2)	
			≤1.5	L	0.8(0.3—1.0)	0.8(0.3—1.0)	
				M	1.0(0.5—1.0)	1.0(0.5—1.0)	
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤1.0	L	0.8(0.3—1.2)	0.8(0.3—1.2)	Dry
				M	1.0(0.5—1.2)	1.0(0.5—1.2)	
			≤1.5	L	0.8(0.3—1.0)	0.8(0.3—1.0)	
				M	1.0(0.5—1.0)	1.0(0.5—1.0)	
	Duplex Stainless Steels	Hardness ≤280HB	≤1.0	L	0.6(0.3—1.0)	0.6(0.3—1.0)	Dry
				M	0.8(0.4—1.0)	0.8(0.4—1.0)	
			≤1.5	L	0.6(0.3—0.8)	0.6(0.3—0.8)	
				M	0.8(0.4—0.8)	0.8(0.4—0.8)	
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤1	L	0.6(0.3—1.0)	0.6(0.3—1.0)	Dry
				M	0.8(0.4—1.0)	0.8(0.4—1.0)	
			≤1.5	L	0.6(0.3—0.8)	0.6(0.3—0.8)	
				M	0.8(0.4—0.8)	0.8(0.4—0.8)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤1	M,R	1.7(0.6—2.5)	1.8(0.6—2.8)	Dry
				L	1.3(0.4—2.0)	1.3(0.4—2.0)	
			≤1.5	M,R	1.5(0.6—2.0)	1.7(0.6—2.5)	
				L	1.2(0.4—1.8)	1.2(0.4—1.8)	
			≤2	M,R	1.3(0.6—2.0)	1.5(0.6—2.5)	
				L	1.0(0.4—1.5)	1.0(0.4—1.5)	
			≤2.5	M,R	0.8(0.3—1.5)	1.0(0.3—1.6)	
			≤3	M,R	0.4(0.2—1.0)	0.5(0.2—1.2)	
	Ductile Cast Irons	Tensile Strength ≤450MPa	≤1	M,R	1.5(0.5—2.0)	1.7(0.5—2.5)	Dry
				L	1.2(0.3—2.0)	1.2(0.3—2.0)	
			≤1.5	M,R	1.3(0.5—1.8)	1.5(0.5—2.0)	
				L	1.0(0.3—1.7)	1.0(0.3—1.7)	
			≤2	M,R	1.2(0.5—1.8)	1.3(0.5—2.0)	
				L	0.8(0.3—1.5)	0.8(0.3—1.5)	
			≤2.5	M,R	0.7(0.3—1.2)	0.9(0.3—1.5)	
			≤3	M,R	0.3(0.2—0.8)	0.4(0.2—1.0)	
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤1	M,R	1.3(0.4—1.8)	1.5(0.4—2.0)	Dry
				L	1.0(0.3—1.7)	1.0(0.3—1.7)	
			≤1.5	M,R	1.2(0.4—1.5)	1.3(0.4—1.8)	
				L	0.8(0.3—1.5)	0.8(0.3—1.5)	
			≤2	M,R	1.0(0.4—1.5)	1.2(0.4—1.8)	
				L	0.7(0.3—1.2)	0.7(0.3—1.2)	
S	Titanium Alloys	—	≤1	L	0.3(0.2—0.6)	0.3(0.2—0.6)	Wet
			≤1.5	L	0.3(0.2—0.5)	0.3(0.2—0.5)	
			≤2	L	0.3(0.2—0.4)	0.3(0.2—0.4)	
	Heat Resistant Alloys	—	≤1	L,M,R	1.0(0.3—1.3)	1.0(0.3—1.3)	Wet
			≤1.5	L,M,R	0.8(0.3—1.2)	0.8(0.3—1.2)	
			≤2	L,M,R	0.7(0.3—1.2)	0.7(0.3—1.2)	
H	Hardened Steels	Hardness 40—55HRC	≤1	R,M	0.8(0.3—1.2)	0.8(0.3—1.2)	Dry
			≤1.5	R,M	0.6(0.3—1.0)	0.6(0.3—1.0)	
			≤2	R,M	0.5(0.3—0.8)	0.5(0.3—0.8)	

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, multiply the cutting speed listed in the table on page L253 by 80% and the feed rate per tooth listed in the table above by 80%.
Note 4) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

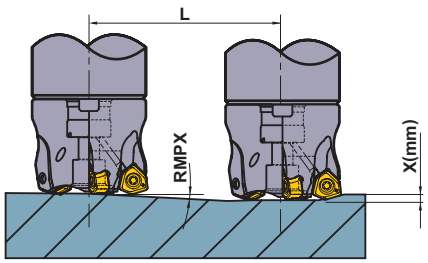
■ Selecting the Proper Breaker

	Workpiece Material	Characteristics	L Breaker		M Breaker		R Breaker	
			Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)
P	Mild Steels	Hardness ≤180HB	● ◐	≤2.0	● ◐	≤3.0	◐ ✣	≤3.0
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	≤2.0	● ◐	≤3.0	◐ ✣	≤3.0
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	≤1.5	● ◐	≤1.5	—	—
K	Ductile Cast Irons	Tensile Strength ≤450MPa	● ◐	≤2.0	● ◐	≤3.0	—	—
		Tensile Strength ≤800MPa	● ◐	≤2.0	● ◐	≤2.0	—	—

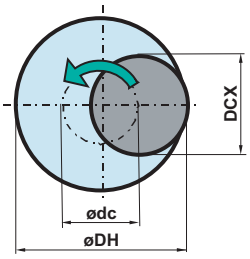
Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table on page L253 by 80% and the feed rate per tooth listed in the table above by 80%.
Note 5) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Maximum Capacities by Mode

■ Ramping



■ Helical Milling



● How to derive a locus of the centre of the tool.

ødc = øDH - DCX

Locus of the Centre of the Tool | Desired Hole Diameter | Cutting Diameter Maximum

Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)	Ramping			Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)	AZ (mm)
				RMPX	L (mm) Required Distance for X mm Depth		DH (mm)		DH (mm)	
					x = 1 (mm)	x = 2 (mm)	Min.	Max.	Min.	
WJX14R50	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14-050	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14R050	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14-052	52	36.5	2	4.1°	14.0	28.0	86	101	77	2.1
WJX14-063	63	47.5	2	3.0°	19.1	38.2	108	123	99	2.1
WJX14R063	63	47.5	2	3.0°	19.1	38.2	108	123	99	2.1
WJX14-066	66	50.4	2	2.8°	20.5	40.9	114	129	105	2.1
WJX14-080	80	64.4	2	2.1°	27.3	54.6	142	157	133	2.1
WJX14R080	80	64.4	2	2.1°	27.3	54.6	142	157	133	2.1
WJX14-100	100	84.4	2	1.5°	38.2	76.4	182	197	173	2.1
WJX14R100	100	84.4	2	1.5°	38.2	76.4	182	197	173	2.1
WJX14-125	125	109.4	2	1.2°	47.8	95.5	232	247	223	2.1
WJX14R125	125	109.4	2	1.2°	47.8	95.5	232	247	223	2.1
WJX14-160	160	144.4	2	0.8°	71.7	143.3	302	317	293	2.1
WJX14R160	160	144.4	2	0.8°	71.7	143.3	302	317	293	2.1

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

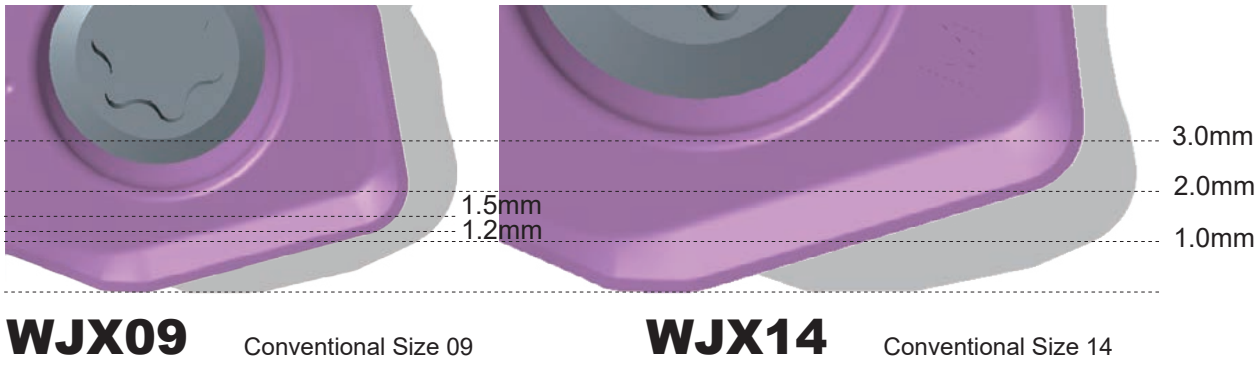
<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the centre of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at 0.2 mm/rev or less.

OPERATIONAL GUIDANCE

■ Depth of Cut

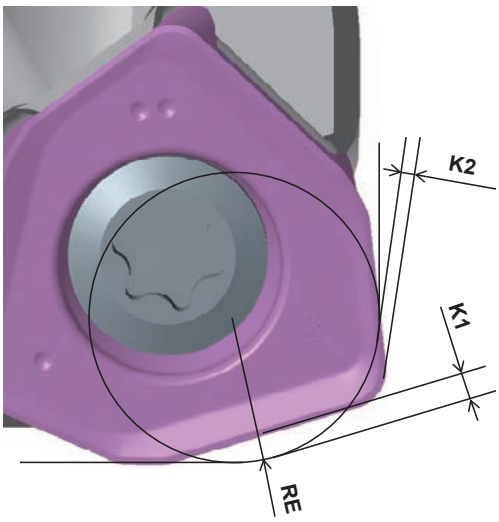
Refer to the following table for the maximum depth of cut of the WJX.
The straight cutting edge extending to the maximum depth of cut (APMX) allows for stable machining even at high depths of cut.
For face milling, lowering the feed rate will allow to exceed the APMX, up to depths of cut shown in the following table (when using the corner R).
For details on the feed rate, refer to the recommended cutting conditions on L247 and L254.

	WJX09	WJX14
High feed and multi-function machining (APMX)	ap=1.2mm	ap=2.0mm
Low feed and Face machining	ap=1.5mm	ap=3.0mm



■ Remaining Stock

For CAM, use CAD data (from online catalogues), or define as a radius milling cutter with reference to the following table.
The approximate radius RE, remaining stock K1, and over cutting amount K2 are as shown in the following table.



WJX09

RE (mm)	Remaining Stock K1 (mm)	Cutting Amount K2 (mm)
R2.0 (Recommendation)	0.93	0.00
R2.3	0.86	0.00
R3.0	0.70	0.13

WJX14

RE (mm)	Remaining Stock K1 (mm)	Cutting Amount K2 (mm)
R3.0 (Recommendation)	1.41	0.00
R3.2	1.37	0.00
R4.0	1.17	0.10
R5.0	0.92	0.39

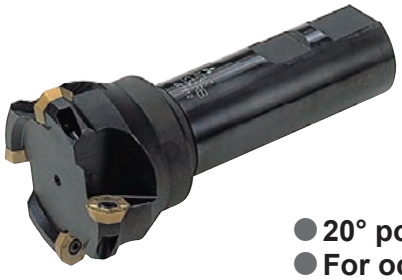
Depth of Cut ap (mm)	Remaining Stock H (mm)	
	WJX09	WJX14
0.5	0.02	–
1.0	0.07	0.05
1.5	–	0.08
2.0	–	0.12

MULTI-FUNCTIONAL MILLING

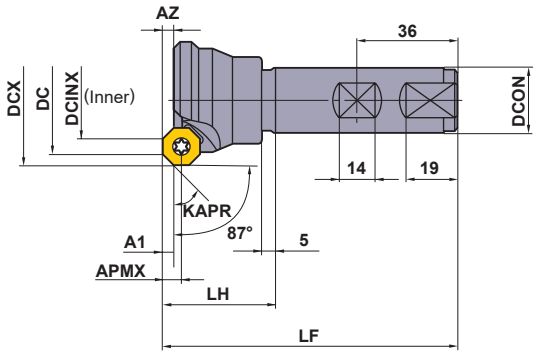
42° KAPR

OCTACUT

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel



- 20° positive insert.
- For octagonal and round type inserts.
- Multi-functional machining.



■SHANK TYPE

Right hand tool holder only.

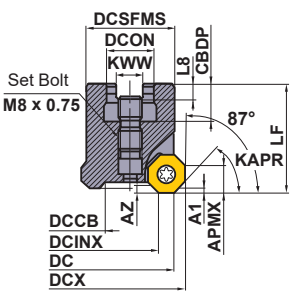
Order Number	Stock	Number of Teeth	Dimensions (mm)									*	F T	① ②
	R		DCX	DC	DCINX	LF	DCON	LH	A1	APMX	AZ	Clamp Screw	Wrench	Insert
OCTACUT322S32RB	●	2	32	23.6	13.1	125	32	45	2.5	7	3	CS350990T	TKY10F	①OEMX12T3○○○○ ②REMX12T3○○○○
OCTACUT403S32RB	●	3	40	31.7	21.2	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT504S32RB	●	4	50	41.9	31.4	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT634S32RB	●	4	63	54.9	44.5	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT503S32R	●	3	50	38.3	24.5	125	32	45	3	9	4	CS501290T	TKY25T	①OEMX1705○○○○ ②REMX1705○○○○
OCTACUT634S32R	●	4	63	51.4	37.6	125	32	45	3	9	4	CS501290T	TKY25T	

* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

● : Inventory maintained in Japan.

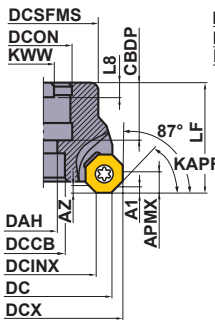


Fig.1



Small Insert Type
ø40
Standard Insert Type
ø50

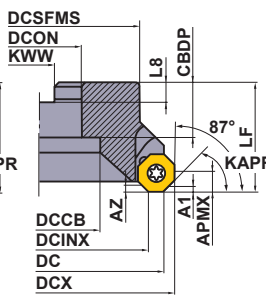
Fig.2



Small Insert Type
ø50
ø63
ø80

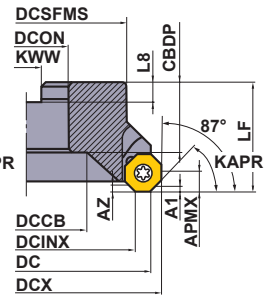
Standard Insert Type
ø63
ø80
ø100

Fig.3



Standard Insert Type
ø125

Fig.4



Standard Insert Type
ø160

■ARBOR TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											WT (kg)	Max. Depth of Cut (mm)			Fig.
	R		DCX	DC	DCINX	LF	DCON	CBDP	DAH	DCCB	KWW	DCSFMS	L8		A1	APMX	AZ	
OCTACUT0403ARB	●	3	40	31.7	21.2	40	16	18	—	19.47	8.4	33	5.6	0.4	2.5	7	3	1
OCTACUT0504ARB	●	4	50	41.9	31.4	50	22	20	11	16	10.4	42.5	6.3	0.5	2.5	7	3	2
OCTACUT0634ARB	●	4	63	54.9	44.5	50	22	20	11	16	10.4	44	6.3	0.7	2.5	7	3	2
OCTACUT0805CRB	●	5	80	71.9	61.5	50	25.4	26	13	20	9.5	53	6	1.2	2.5	7	3	2
OCTACUT0503AR	●	3	50	38.3	24.5	50	22	20	—	22.15	10.4	41	6.3	0.5	3	9	4	1
OCTACUT0634AR	●	4	63	51.4	37.6	50	22	20	11	16	10.4	44	6.3	0.7	3	9	4	2
OCTACUT0805CR	●	5	80	68.4	54.7	50	25.4	26	13	20	9.5	53	6	1.2	3	9	4	2
OCTACUT1006DR	●	6	100	88.5	74.7	63	31.75	32	17	45	12.7	70	8	1.6	3	9	4	2
OCTACUT1257ER	●	7	125	113.5	99.8	63	38.1	35	—	56	15.9	80	10	1.8	3	9	4	3
OCTACUT1608FR	●	8	160	148.5	134.8	63	50.8	38	—	88.7	19.1	120	11	3.6	3	9	4	4

SPARE PARTS

Tool Holder Number	*					
	Clamp Screw	Wrench	Wrench	Set Bolt	Set Bolt	Insert
OCTACUT0403ARB	CS350990T	TKY10F	—	HDS08030	—	①OEMX12T3○○○○ ②REMX12T3○○○○
OCTACUT0504ARB				—	BOES101	
OCTACUT0634ARB					—	
OCTACUT0805CRB						
OCTACUT0503AR	CS501290T	—	TKY25T	HDS10031	—	①OEMX1705○○○○ ②REMX1705○○○○
OCTACUT0634AR				—	BOES101	
OCTACUT0805CR					—	
OCTACUT1006DR					HSC16035	
OCTACUT1257ER					—	
OCTACUT1608FR						

* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



Fig.1

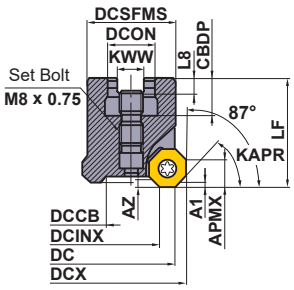


Fig.2

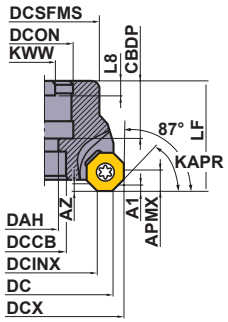


Fig.3

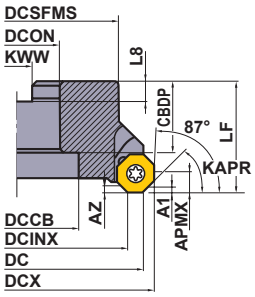


Fig.4

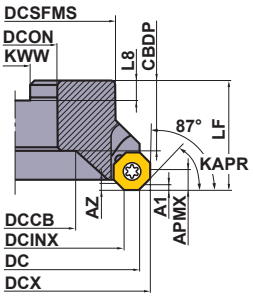
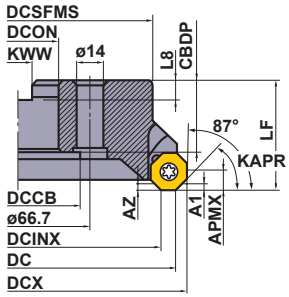


Fig.5



For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

■ARBOR TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											WT (kg)	Max. Depth of Cut (mm)			Fig.
	R		DCX	DC	DCINX	LF	DCON	CBDP	DAH	DCCB	KWW	DCSFMS	L8		A1	APMX	AZ	
OCTACUT0403ARB	●	3	40	31.7	21.2	40	16	18	—	19.47	8.4	33	5.6	0.4	2.5	7	3	1
OCTACUT0504ARB	●	4	50	41.9	31.4	50	22	20	11	16	10.4	42.5	6.3	0.5	2.5	7	3	2
OCTACUT0634ARB	●	4	63	54.9	44.5	50	22	20	11	16	10.4	44	6.3	0.7	2.5	7	3	2
OCTACUT0805ARB	●	5	80	71.9	61.5	50	27	23	13	20	12.4	53	7	1.2	2.5	7	3	2
OCTACUT0503AR	●	3	50	38.3	24.5	50	22	20	—	22.15	10.4	41	6.3	0.5	3	9	4	1
OCTACUT0634AR	●	4	63	51.4	37.6	50	22	20	11	16	10.4	44	6.3	0.7	3	9	4	2
OCTACUT0805AR	●	5	80	68.4	54.7	50	27	23	13	20	12.4	53	7	1.2	3	9	4	2
OCTACUT1006AR	●	6	100	88.5	74.7	50	32	32	—	45	14.4	70	8	1.6	3	9	4	3
OCTACUT1257BR	●	7	125	113.5	99.8	50	40	32	—	56	16.4	80	9	1.8	3	9	4	4
OCTACUT1608CR	●	8	160	148.5	134.8	50	40	29	—	88.7	16.4	120	9	3.6	3	9	4	5

L

INDEXABLE MILLING

SPARE PARTS

Tool Holder Number	* Clamp Screw	Wrench	Wrench	Set Bolt	Set Bolt	Insert
OCTACUT0403ARB	CS350990T	TKY10F	—	HDS08030	—	①OEMX12T3○○○○ ②REMX12T3○○○○
OCTACUT0504ARB				—	BOES101	
OCTACUT0634ARB					—	
OCTACUT0805ARB						
OCTACUT0503AR	CS501290T	—	TKY25T	HDS10031	—	①OEMX1705○○○○ ②REMX1705○○○○
OCTACUT0634AR				—	BOES101	
OCTACUT0805AR					—	
OCTACUT1608CR						

* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

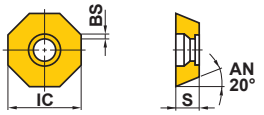
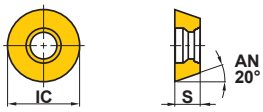
● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.) (Contains one CBN insert per case.)

INSERTS

Workpiece Material			Coated			Cermet			CBN *1		
	P	Steel	●	●		●					
	M	Stainless Steel	◕	◕		◕					
	K	Cast Iron		✱					●		
	H	Hardened Steel		◕					◕		

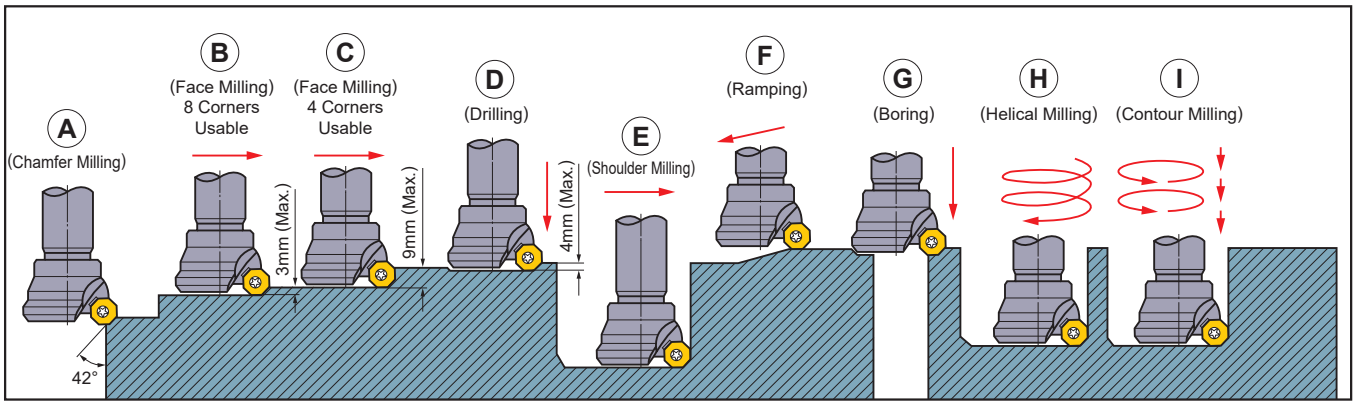
Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round **S :** Chamfer + Round **T :** Chamfer

Shape	Order Number		Class	Edge Preparation	F7030	VP15TF		NX4545			MB730			Dimensions (mm) IC	S	BS	Geometry
  ✱2 JS Breaker		**OEMX12T3ETR1**	M	T				●			▲			12.7	3.97	1.0	  ✱2 JS Breaker  ✱1 CBN Insert
		OEMX12T3ESR1	M	S	●									12.7	3.97	1.0	
	✱2	**OEMX12T3EER1-JS**	M	E	●									12.7	3.97	1.0	
		OEMX1705ETR1	M	T		●		●						17.0	5.0	1.4	
		OEMX1705ESR1	M	S	●									17.0	5.0	1.4	
	✱2	**OEMX1705EER1-JS**	M	E	●									17.0	5.0	1.4	
	✱2	**OEMX1705ETR1-JS**	M	T		●								17.0	5.0	1.4	
  ✱2 JS Breaker	✱2	**REMX12T3EN-JS**	M	E	●									12.95	4.17	—	  ✱2 JS Breaker
		REMX1705SN	M	S	●									17.25	5.2	—	
	✱2	**REMX1705EN-JS**	M	E	●									17.25	5.2	—	

✱2 Insert with breaker.

RECOMMENDED CUTTING CONDITIONS



This list of recommended cutting conditions is for cutters with diameter≤ϕ80. For cutters with diameter greater than ϕ80 increase cutting speed by around 10%.
Above sizes are for OEMX1705□□□□.

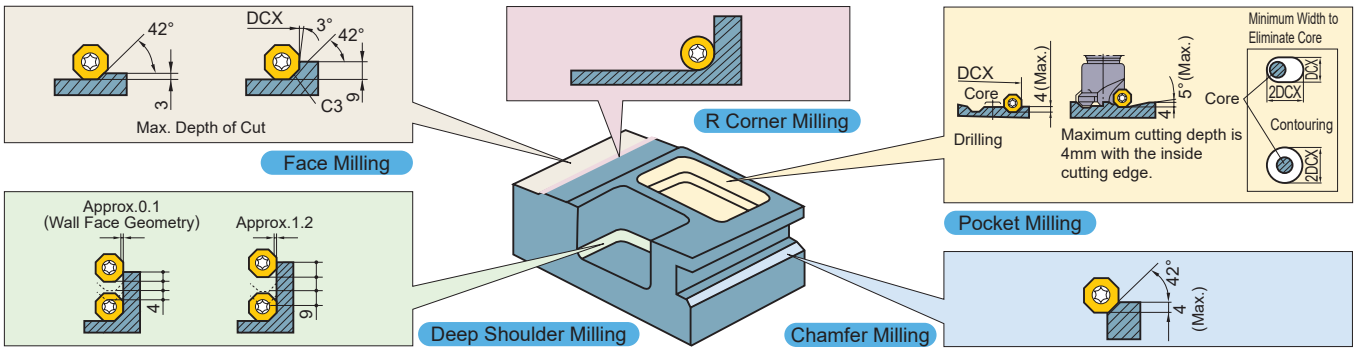
	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Cutting Mode	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**F7030**	240 (180—300)	A	0.2 (0.15—0.25)
					B	0.2 (0.15—0.25)
			VP15TF	180 (100—250)	C,E,F	0.2 (0.15—0.25)
					D,G,H,I	0.075 (0.05—0.1)
	Carbon Steel Alloy Steel	180—280HB	**F7030**	200 (140—240)	A	0.2 (0.15—0.25)
					B	0.2 (0.15—0.25)
			VP15TF	180 (100—250)	C,E,F	0.2 (0.15—0.25)
					D,G,H,I	0.075 (0.05—0.1)
		280—380HB	**F7030**	150 (100—170)	A	0.2 (0.15—0.25)
					B	0.2 (0.15—0.25)
			VP15TF	120 (80—160)	C,E,F	0.2 (0.15—0.25)
					D,G,H,I	0.075 (0.05—0.1)
	Pre-Hardened Steel	35—45HRC	**F7030**	130 (90—160)	A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
			VP15TF	120 (80—160)	C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
	High Alloy Steel	≤300HB	**F7030**	150 (100—170)	A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
			VP15TF	120 (80—160)	C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
M	Stainless Steel	≤270HB	**F7030**	200 (140—240)	A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
			VP15TF	150 (100—200)	C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.075 (0.05—0.1)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution
Note 1) This list of recommended cutting conditions is for flank wear of 0.3mm in 30 min. cutting time.
Note 2) More than 50mm shank length should be clamped in the milling chuck.
Note 3) Use step cutting when driling (0.5 mm steps are recommended).
Note 4) If chatter occurs, adjust the cutting speed.
Note 5) When using round inserts, make sure that the flat portion of the flank surface is secure against the insert seat wall.

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Cutting Mode	Feed per Tooth (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	160 (100—220)	A	0.3 (0.25—0.35)
					B	0.25 (0.2—0.3)
					C,E,F	0.15 (0.1—0.2)
					D,G,H,I	0.075 (0.05—0.1)
			MB730	1500 (1000—3000)	B (D.O.C 0.1—0.5mm)	0.15 (0.1—0.2)
	Ductile Cast Iron	Tensile Strength 360—500MPa	**VP15TF**	160 (100—220)	A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
	Ductile Cast Iron	Tensile Strength 500—800MPa	**VP15TF**	140 (90—190)	A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
H	Hardened Steel	45—60HRC	**VP15TF**	80 (50—100)	A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
					C,E,F	0.1 (0.05—0.12)
					D,G,H,I	0.05 (0.025—0.06)
			MB730	150 (100—200)	B (D.O.C 0.1—0.3mm)	0.15 (0.1—0.2)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution
Note 1) This list of recommended cutting conditions is for flank wear of 0.3mm in 30 min. cutting time.
Note 2) More than 50mm shank length should be clamped in the milling chuck.
Note 3) Use step cutting when driling (0.5 mm steps are recommended).
Note 4) If chatter occurs, adjust the cutting speed.
Note 5) When using round inserts, make sure that the flat portion of the flank surface is secure against the insert seat wall.

APPLICATION



Above sizes are for OEMX1705○○○○.

MULTI-FUNCTIONAL MILLING

ARP

P	M	K	N	S	H
	Stainless Steel			Heat Resistant Alloy	



- Run-out does not occur easily when changing sections.
- Solid clamping system.
- Standardized stock of extra fine pitch.

Fig.1

ø40
ø50
ø63
ø80

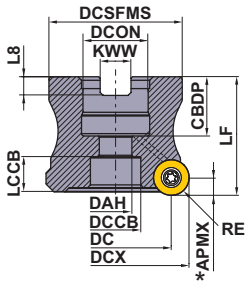
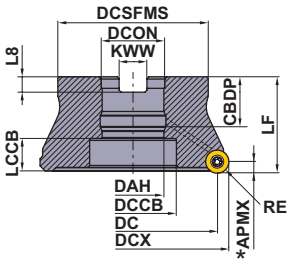
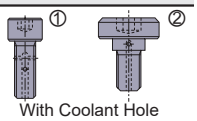


Fig.2

ø100



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
–	ϕ40	HSC08025H	①	 With Coolant Hole
–	ϕ50, ϕ63	HSC10030H		
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	MBA16033H	②	

■ ARBOR TYPE

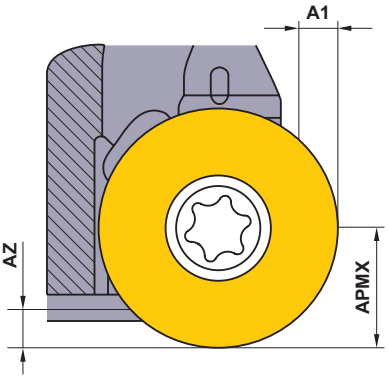
DCON = inch size, With Coolant Hole

DCX (mm)	Order Number	Stock R	RE (mm)	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	Max. Depth of Cut (mm) A1	AZ	RMPX	Fig.	Insert Type
80	**ARP6PR08008CA**	●	6	8	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP○T1248
80	**ARP6PR08009CA**	●	6	9	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP○T1248
100	**ARP6PR10009DA**	●	6	9	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP○T1248
100	**ARP6PR10011DA**	●	6	11	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP○T1248

DCON = mm size, With Coolant Hole

DCX (mm)	Order Number	Stock R	RE (mm)	Number of Teeth	Dimensions (mm) DC	LF	DCON	WT (kg)	Max. Depth of Cut (mm) A1	AZ	RMPX	Fig.	Insert Type
40	**ARP5P-040A05AR**	●	5	5	29.9	40	16	0.2	2.0	1.3	2.8°	1	RP○T1040
40	**ARP6P-040A04AR**	●	6	4	28	40	16	0.2	2.0	1.1	2.7°	1	RP○T1248
50	**ARP5P-050A06AR**	●	5	6	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP○T1040
50	**ARP5P-050A07AR**	●	5	7	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP○T1040
50	**ARP6P-050A05AR**	●	6	5	38	40	22	0.3	2.0	1.7	2.9°	1	RP○T1248
50	**ARP6P-050A06AR**	●	6	6	38	40	22	0.3	2.0	1.7	2.9°	1	RP○T1248
63	**ARP5P-063A07AR**	●	5	7	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP○T1040
63	**ARP5P-063A08AR**	●	5	8	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP○T1040
63	**ARP6P-063A06AR**	●	6	6	51	40	22	0.4	2.5	2.5	3.1°	1	RP○T1248
63	**ARP6P-063A07AR**	●	6	7	51	40	22	0.4	2.5	2.5	3.1°	1	RP○T1248
80	**ARP6P-080A08AR**	●	6	8	68	50	27	0.9	2.5	2.5	2.3°	1	RP○T1248
80	**ARP6P-080A09AR**	●	6	9	68	50	27	0.9	2.5	2.5	2.3°	1	RP○T1248
100	**ARP6P-100B09AR**	●	6	9	88	50	32	1.5	2.5	2.5	1.7°	2	RP○T1248
100	**ARP6P-100B11AR**	●	6	11	88	50	32	1.5	2.5	2.5	1.7°	2	RP○T1248

∗ For the maximum width of cut (APMX), Please refer to page L267.



● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Mounting Dimensions

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
40	**ARP5P-040A05AR**	16	18	9	14	14.0	34	8.4	5.6	1
40	**ARP6P-040A04AR**	16	18	9	13.4	13.9	34	8.4	5.6	1
50	**ARP5P-050A06AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP5P-050A07AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP6P-050A05AR**	22	20	11	17	11.9	45	10.4	6.3	1
50	**ARP6P-050A06AR**	22	20	11	17	11.9	45	10.4	6.3	1
63	**ARP5P-063A07AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP5P-063A08AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP6P-063A06AR**	22	20	11	17	11.9	50	10.4	6.3	1
63	**ARR6P-063A07AR**	22	20	11	17	11.9	50	10.4	6.3	1
80	**ARP6PR08008CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6PR08009CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6P-080A08AR**	27	23	13	20	14.9	56	12.4	7.0	1
80	**ARP6P-080A09AR**	27	23	13	20	14.9	56	12.4	7.0	1
100	**ARP6PR10009DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6PR10011DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6P-100B09AR**	32	26	45	32	16.9	78	14.4	8.0	2
100	**ARP6P-100B11AR**	32	26	45	32	16.9	78	14.4	8.0	2

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (N • m) : TPS351B=2.5,TPS4=3.5

	≤1Mpa (≤20 l/min)	←Standard→	≥5Mpa (≥30 l/min)	≥7Mpa (≥50 l/min)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.
Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



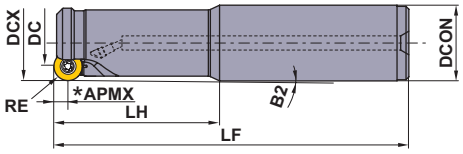


Fig.1

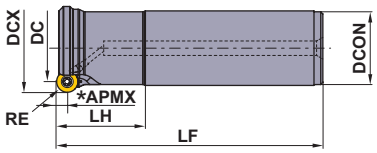


Fig.2

■SHANK TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock R	RE (mm)	Number of Teeth	Dimensions (mm) DC	LF	LH	DCON	B2	WT (kg)	Max. Depth of Cut (mm) A1	AZ	RMPX	Fig.	Insert Type
25	**ARP5PR2503SA25M**	●	5	3	15	140	60	25	1.10°	0.4	1.0	0.40	1.8°	1	RP○T1040
25	**ARP5PR2502SA25L**	●	5	2	15	180	80	25	0.80°	0.6	1.0	0.40	1.8°	1	RP○T1040
32	**ARP5PR3204SA32M**	●	5	4	22	150	70	32	0.92°	0.8	1.0	0.65	1.9°	1	RP○T1040
32	**ARP6PR3203SA32M**	●	6	3	20	150	70	32	0.51°	0.8	1.0	0.60	2.0°	1	RP○T1248
32	**ARP5PR3203SA32L**	●	5	3	22	200	120	32	0.94°	1.0	1.0	0.65	1.9°	1	RP○T1040
32	**ARP6PR3202SA32L**	●	6	2	20	200	120	32	0.52°	1.0	1.0	0.60	2.0°	1	RP○T1248
40	**ARP6PR4004SA32M**	●	6	4	28	150	50	32	–	0.9	2.5	1.15	2.7°	2	RP○T1248
40	**ARP6PR4003SA32L**	●	6	3	28	250	50	32	–	1.5	2.5	1.15	2.7°	2	RP○T1248
50	**ARP6PR5005SA42M**	●	6	5	38	150	50	42	–	1.5	2.5	1.70	2.9°	2	RP○T1248
50	**ARP6PR5004SA42L**	●	6	4	38	250	50	42	–	2.5	2.5	1.70	2.9°	2	RP○T1248

* For the maximum width of cut (APMX), Please refer to page L267.

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (N • m) : TPS351B=2.5,TPS4=3.5

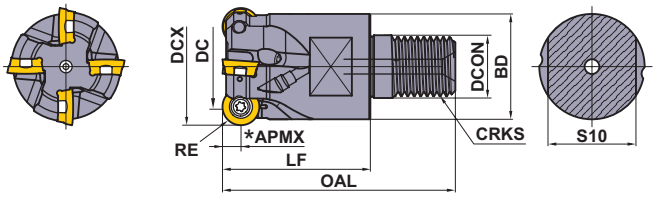
	≤1Mpa (≤20 l/min)	←Standard→	≥5Mpa (≥30 l/min)	≥7Mpa (≥50 l/min)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (N • m) : HSD0400H○○=1.5

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.
Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)





■SCREW-IN TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock R	RE (mm)	Number of Teeth	Dimensions (mm) DC	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	Max. Depth of Cut (mm) A1	AZ	RMPX	Insert Type
25	**ARP5PR2502AM1235**	●	5	2	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP○T1040
25	**ARP5PR2503AM1235**	●	5	3	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP○T1040
32	**ARP5PR3203AM1640**	●	5	3	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP○T1040
32	**ARP5PR3204AM1640**	●	5	4	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP○T1040
32	**ARP6PR3202AM1640**	●	6	2	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP○T1248
32	**ARP6PR3203AM1640**	●	6	3	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP○T1248
40	**ARP6PR4003AM1640**	●	6	3	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP○T1248
40	**ARP6PR4004AM1640**	●	6	4	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP○T1248

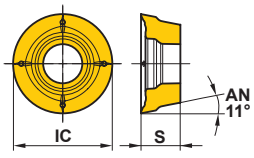
∗ For the maximum width of cut (APMX), Please refer to page L267.

Note 1) For screw-in type arbors, refer to page L341.

INSERTS

Workpiece Material		
	M	Stainless Steel
	S	Heat resistant Alloy, Titanium Alloy

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Cutter Type	Order Number	Type	Class	Edge Preparation	Coated MC7020	MP7130	MP9130	NEW MP9140	Dimensions (mm) IC	S	APMX 4 Seats	APMX 8 Seats	Geometry
	ARP5	**RPHT1040M0E4-L**	Low Resistance, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-L	Low Resistance	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-L1**	Low Resistance, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW **RPMT1040M0E4-L2**	Low Resistance, High Rigidity	M	E				●	10	3.97	5.0	–	
		RPHT1040M0E4-M	General, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-M	General Purpose	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-M1**	General, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW **RPMT1040M0E4-M2**	General, High Rigidity	M	E				●	10	3.97	5.0	–	
		RPHT1040M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-R	Reinforced Edge	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-R1**	Reinforced Edge, 8 Seats	M	E	●	●	●		10	3.97	5.0	1.4	
	ARP6	**RPHT1248M0E4-L**	Low Resistance, High Precision	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-L	Low Resistance	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-L1**	Low Resistance, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW **RPMT1248M0E4-L2**	Low Resistance, High Rigidity	M	E				●	12	4.76	6.0	–	
		RPHT1248M0E4-M	General, High Precision	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-M	General Purpose	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-M1**	General, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW **RPMT1248M0E4-M2**	General, High Rigidity	M	E				●	12	4.76	6.0	–	
		RPHT1248M0E4-R	Reinforced Edge	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-R	Reinforced Edge	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-R1**	Reinforced Edge, 8 Seats	M	E	●	●	●		12	4.76	6.0	1.7	

Note 1) 8 indexing face type inserts can also be used at the same depth of cut as the 4 face type insert.

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

	Workpiece Material	Hardness	Grade	**vc** (m/min)	**fz** (mm/t)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	220 (170—270)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Austenitic Stainless Steel	>200HB	**MC7020**	190 (140—240)	0.2 (0.1—0.35)
			MP7130	170 (120—220)	0.2 (0.1—0.35)
	Two-phase Stainless Steel	≤280HB	**MC7020**	180 (130—230)	0.2 (0.1—0.35)
			MP7130	160 (110—210)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steel	≤200HB	**MC7020**	240 (190—290)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	240 (190—290)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Hardened Stainless Steel	<450HB	**MC7020**	170 (120—220)	0.2 (0.1—0.35)
			MP7130	150 (100—200)	0.2 (0.1—0.35)

■ Wet cutting

	Workpiece Material	Hardness	Grade	**vc** (m/min)	**fz** (mm/t)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	150 (100—200)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Austenitic Stainless Steel	>200HB	**MC7020**	120 (70—170)	0.2 (0.1—0.35)
			MP7130	100 (80—150)	0.2 (0.1—0.35)
	Two-phase Stainless Steel	≤280HB	**MC7020**	120 (70—170)	0.2 (0.1—0.35)
			MP7130	100 (80—150)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steel	≤200HB	**MC7020**	170 (120—220)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	170 (120—220)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Hardened Stainless Steel	<450HB	**MC7020**	110 (60—160)	0.2 (0.1—0.35)
			MP7130	90 (50—140)	0.2 (0.1—0.35)
S	Titanium Alloy	—	**MP9130**	45 (30—55)	0.1 (0.05—0.15)
			MP9140	40 (30—50)	0.1 (0.05—0.15)
	Heat Resistant Alloy	—	**MP9130**	35 (15—45)	0.1 (0.05—0.15)
			MP9140	30 (15—40)	0.1 (0.05—0.15)

Note 1) Actual cutting conditions are estimated to avoid chatter vibration with high rigidity of a machine or workpiece.
Make appropriate adjustments when chatter and/or insert chipping occurs during cutting.
Use with lowered conditions when there is a big overhang and/or when pocket-cutting.
Note 2) The setting level for feeding 1 blade is ap = 2.5mm with ARP5 axial cutting. With ARP6, use ap = 3mm.
Use while matching the ap fluctuation and correction value F of the respective table.
Ex. Feed for the recommended 1 blade when ARP5,SUS304, MP7130,ap=1: 0.2 mm/t×1.5 (correction value F)=0.3 mm/t
Note 3) For grooving, use feed at the recommended 70% level. For ramping, drilling, and plunging, use 50% level.
Note 4) Internal coolant is recommended in titanium alloy and heat resistant alloy cutting.
It is more effective when a separately sold, coolant nozzle is used.

■ Correction level F feed amount for 1 blade, based on axial cutting ap fluctuation

Holder	ap=0.5mm	ap=1mm	ap=1.5mm	ap=2mm	ap=2.5mm	ap=3mm	ap=3.5mm	ap=4mm	ap=5mm	ap=6mm
ARP5	2.3	1.5	1.2	1.1	1.0	0.9	0.8	0.8	0.8	—
ARP6	2.5	1.7	1.3	1.1	1.0	1.0	0.9	0.9	0.8	0.8

Note 1) Tool body durability may weaken, when the amount of axial cutting exceeds ARP5=5mm and ARP6=6mm.

Depth of Cut and Width of Cut

Install Type	**DCX** (mm)	**RE** (mm)	Order Number	No.of Teeth	Depth of Cut **ap** (mm) *	Width of Cut **ae** (mm)
Arbor	40	5	**ARP5P-040A05AR**	5	≤2.5	≤1.0DCX
		6	**ARP6P-040A04AR**	4	≤3.5	≤1.0DCX
	50	5	**ARP5P-050A06AR**	6	≤2.5	≤1.0DCX
			ARP5P-050A07AR	7	≤1.5	≤1.0DCX
		6	**ARP6P-050A05AR**	5	≤3.5	≤1.0DCX
			ARP6P-050A06AR	6	≤2.5	≤1.0DCX
	63	5	**ARP5P-063A07AR**	7	≤2.5	≤0.75DCX
			ARP5P-063A08AR	8	≤1.5	≤0.75DCX
		6	**ARP6P-063A06AR**	6	≤3.5	≤0.75DCX
			ARP6P-063A07AR	7	≤2.5	≤0.75DCX
	80	6	**ARP6PR08008CA**	8	≤3.5	≤0.6DCX
			ARP6PR08009CA	9	≤2.5	≤0.6DCX
	100	6	**ARP6PR10009DA**	9	≤3.5	≤0.5DCX
			ARP6PR10011DA	11	≤2.5	≤0.5DCX
Screw-in	25	5	**ARP5PR2502AM1235**	2	≤2.5	≤1.0DCX
			ARP5PR2503AM1235	3	≤1.5	≤1.0DCX
	32	5	**ARP5PR3203AM1640**	3	≤2.5	≤1.0DCX
			ARP5PR3204AM1640	4	≤2.5	≤1.0DCX
		6	**ARP6PR3202AM1640**	2	≤3.5	≤1.0DCX
			ARP6PR3203AM1640	3	≤3.5	≤1.0DCX
	40	6	**ARP6PR4003AM1640**	3	≤3.5	≤1.0DCX
			ARP6PR4004AM1640	4	≤3.5	≤1.0DCX

Install Type	**DCX** (mm)	**RE** (mm)	Tool Holder Type	Depth of Cut **ap** (mm) *	Width of Cut **ae** (mm)
Shank	25	5	**ARP5PR25**	≤1.5	≤1.0DCX
	32	5	**ARP5PR32**	≤2.5	≤1.0DCX
		6	**ARP6PR32**	≤3.5	≤1.0DCX
	40	6	**ARP6PR40**	≤3.5	≤1.0DCX
	50	6	**ARP6PR50**	≤3.5	≤1.0DCX

* When using the 8 seat type, the specifications for depth of cut should be Max. 1.4 mm for ARP5 and 1.7 mm for ARP6.

MAXIMUM CAPACITIES BY MODE

Install Type	**DCX** (mm)	**RE** (mm)	Tool Holder Type	Ramping	Helical Drilling		Drilling Depth	Plunging
				RMPX	**DH max.** (mm)	**DH min.** (mm)	Maximum **AZ** (mm)	**AE1** (mm)
Arbor	40	5	**ARP5P-040A**	2.8°	70	78	1.30	2.0
		6	**ARP6P-040A**	2.7°	68	78	1.15	2.0
	50	5	**ARP5P-050A**	2.9°	90	98	1.85	2.0
		6	**ARP6P-050A**	2.9°	88	98	1.70	2.0
	63	5	**ARP5P-063A**	3.0°	116	124	2.50	2.5
		6	**ARP6P-063A**	3.1°	114	124	2.50	2.5
	80	6	**ARP6PR080**	2.3°	148	158	2.50	2.5
	100	6	**ARP6PR100**	1.7°	188	198	2.50	2.5
Shank	25	5	**ARP5PR25**	1.8°	40	48	0.40	1.0
	32	5	**ARP5PR32**	1.9°	54	62	0.65	1.0
		6	**ARP6PR32**	2.0°	52	62	0.60	1.0
	40	6	**ARP6PR40**	2.7°	68	78	1.15	2.5
	50	6	**ARP6PR50**	2.9°	88	98	1.70	2.5
Screw-in	25	5	**ARP5PR25**	1.8°	40	48	0.40	-
	32	5	**ARP5PR32**	1.9°	54	62	0.65	1.0
		6	**ARP6PR32**	2.0°	52	62	0.60	1.0
	40	6	**ARP6PR40**	2.7°	68	78	1.15	2.5

Note 1) When drilling, be careful of long scattered cutting chips

Note 2) When cutting helical holes, do not exceed the largest APMX cutting depth per one rotation.

Note 3) Calculate using the following formula for centre tool tracks and ϕdc when cutting helical holes : Centre tool tracks ϕdc=desired hole diameter ϕDH tool diameter ϕDCX

Note 4) For preventing trouble with cutting chip biting, especially when grooving, ramping, helical cutting, and drilling, thoroughly eliminate cutting chips with an air blower or the like.

Note 5) Small diameter cutters with a large number of teeth create smaller chips.
Pay attention to the depth of cut and feed rate as chip clogging may occur.

Note 6) When machining with a large diameter cutter with a large ae, the chips produced become long increasing the risk of chip clogging.
Please adjust the depth of cut ap and feed before use.

MULTI-FUNCTIONAL MILLING

ARX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel



- 15° positive, high tolerance M-class insert.
- Effective for various machining applications.

Fig.1

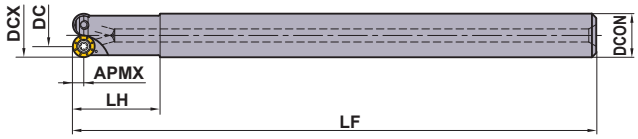


Fig.2 (Centre Cutting Edge Type)

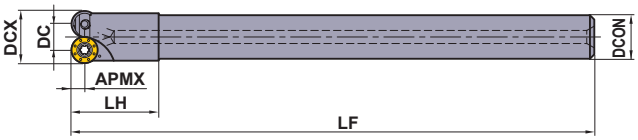
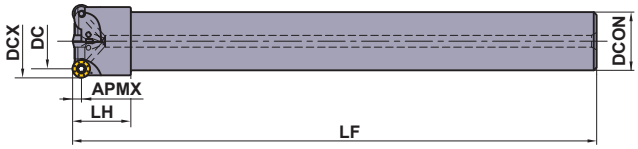


Fig.3 (Non-centre Cutting Edge Type (Multi-tooth))



■STEEL SHANK TYPE

With Coolant Hole

Right hand tool holder only.

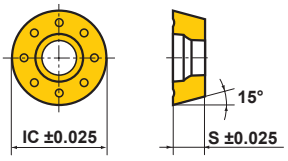
Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	✶1 Clamp Screw	Wrench	Insert
		R			DCX	DCON	DC	LF	LH					
Centre Cutting	ARX25R102SA10S	●	○	2	10	10	5	120	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10S	●	○	2	12	10	6	120	20	3.0	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12S	●	○	2	14	12	7	140	20	3.5	2	TPS22	TIP07FS	RDMW0724M0E
Non-centre Cutting (Multi-tooth)	ARX25R122SA10S	●	○	2	12	10	7	120	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX25R163SA16S	●	○	3	16	16	11	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R163SA16S	●	○	3	16	16	10	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R173SA16S	●	○	3	17	16	12	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R173SA16S	●	○	3	17	16	11	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R204SA20S	●	○	4	20	20	15	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R203SA20S	●	○	3	20	20	14	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R224SA20S	●	○	4	22	20	17	180	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R224SA20S	●	○	4	22	20	16	180	20	3.0	3	TPS22	TIP07FS	RDMW0620M0E
	ARX25R255SA20S	●	○	5	25	20	20	180	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R254SA20S	●	○	4	25	20	19	180	20	3.0	3	TPS22	TIP07FS	RDMW0620M0E

✶1 Clamp Torque (N • m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	●
H	Hardened Steel	●

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Coated MP8010	Coated VP15TF	Dimensions (mm) IC	S	Geometry
	RDMW0517M0E	●	●	5.0	1.70	
	RDMW0620M0E	●	●	6.0	1.99	
	RDMW0724M0E	●	●	7.0	2.38	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶



Fig.1

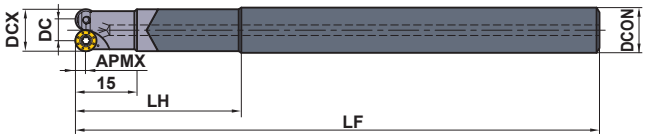


Fig.2

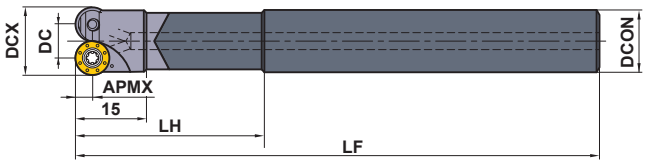
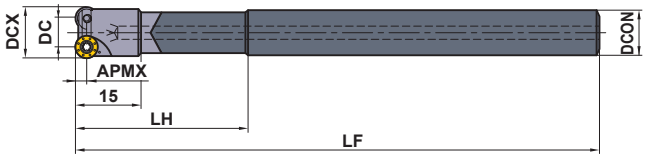


Fig.3



■CARBIDE SHANK TYPE

With Coolant Hole

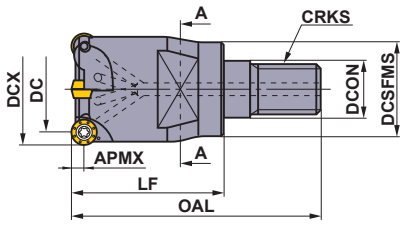
Right hand tool holder only.

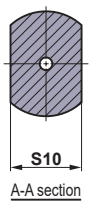
Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	*		
		R			DCX	DCON	DC	LF	LH			Clamp Screw	Wrench	Insert
Centre Cutting	**ARX25R102SA10LW**	●	○	2	10	10	5	150	40	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	●	○	2	12	10	6	150	40	3.0	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	●	○	2	14	12	7	170	40	3.5	2	TPS22	TIP07FS	RDMW0724M0E
Non-centre Cutting (Multi-tooth)	**ARX25R122SA10LW**	●	○	2	12	10	7	150	40	2.5	3	TPS20	TIP06F	RDMW0517M0E

∗ Clamp Torque (N • m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5









■SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg)	APMX (mm)	*		
	R			DCX	DCON	DC	DCSFMS	OAL	LF	S10	CRKS			Clamp Screw	Wrench	Insert
ARX25R163M08A30	●	○	3	16	8.5	11	14.7	48	30	10	M8	0.1	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	●	○	3	17	8.5	12	14.5	48	30	10	M8	0.1	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	●	○	4	20	10.5	15	18.6	49	30	14	M10	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	●	○	4	22	10.5	17	18.5	49	30	14	M10	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	●	○	5	25	12.5	20	23.6	57	35	19	M12	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	●	○	3	16	8.5	11	14.6	48	30	10	M8	0.1	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	●	○	3	17	8.5	12	14.5	48	30	10	M8	0.1	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	●	○	3	20	10.5	15	18.5	49	30	14	M10	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	●	○	4	22	10.5	17	18.5	49	30	14	M10	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	●	○	4	25	12.5	20	23.4	57	35	19	M12	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E

∗ Clamp Torque (N • m) : TPS20=0.5, TPS22=0.5

Note 1) For screw-in type arbors, refer to page L341.

ISO13399	➤ L003
ARBORS	➤ L341
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001

RECOMMENDED CUTTING CONDITIONS

Note 1) The cutting conditions below are a guide only.Please make adjustments according to the machining conditions.
Note 2) Please note the follows when machining the hardened steel by using MP8010.

- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Please note the setting of the depth of cut especially to prevent the fracture.
- The first recommended grade when machining hardened steel of less than 50HRC is VP15TF.

■SHOULDER MILLING • POCKET MILLING • RAMPING • COPYING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	ARX25R□□SA□□S ARX25R□□M□A□		ARX30R□□SA□□S ARX30R□□M□A□		ARX35R□□SA□□S	
					Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.2	≤0.7	≤0.2	≤1.0	≤0.2
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.2	≤0.4	≤0.2	≤0.5	≤0.2

Note 1) For ramping process, refer to cutting criteria by type.

■SLOT MILLING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	ARX25R□□SA□□S ARX25R□□M□A□		ARX30R□□SA□□S ARX30R□□M□A□		ARX35R□□SA□□S	
					Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

■PLUNGING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	ARX25R□□SA□□S ARX25R□□M□A□		ARX30R□□SA□□S ARX30R□□M□A□		ARX35R□□SA□□S	
					Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1

■HELICAL DRILLING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	ARX25R□□SA□□S ARX25R□□M□A□		ARX30R□□SA□□S ARX30R□□M□A□		ARX35R□□SA□□S	
					DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)	DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)	DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

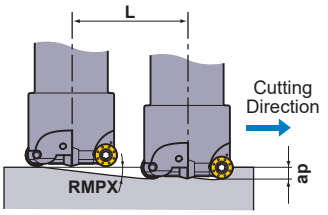
Note 1) For helical drilling, refer to the maximum capacities on page L273.

CUTTING MODE MAXIMUM CAPACITIES

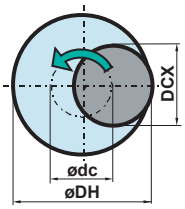
■ RAMPING

Finding a cutters' distance moved **"L"** when depth of cut reaches **"ap"** at a ramping angle of **"RMPX"**.

L=ap/tan RMPX (mm)



■ HELICAL DRILLING



- How to derive a locus of the centre of the tool.

ødc = øDH - DCX

ødc: Locus of the centre of the tool; øDH: Desired hole diameter; DCX: Cutting edge diameter

- For the depth of cut per cycle, refer to the cutting conditions for helical drilling.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	Tool Diameter **DCX** (mm)	Number of Teeth	Ramping			Helical Drilling	
				RMPX *1	**APMX** (mm) *2	Distance L at Depth of Cut of **ap** L (mm)	Min. Hole Diameter **DH min.** (mm)	Max. Hole Diameter **DH max.** (mm)
Centre Cutting	**ARX25R102SA10S**	10	2	90°	2.5	0	15	19
	ARX25R102SA10LW	10	2	90°	2.5	0	15	19
	ARX30R122SA10S	12	2	90°	3.0	0	18	23
	ARX30R122SA10LW	12	2	90°	3.0	0	18	23
	ARX35R142SA12S	14	2	90°	3.5	0	21	27
	ARX35R142SA12LW	14	2	90°	3.5	0	21	27
Non-centre Cutting (Multi-tooth)	**ARX25R122SA10S**	12	2	27.17°	2.5	4.87	19	23
	ARX25R122SA10LW	12	2	27.17°	2.5	4.87	19	23
	ARX25R163M08A30	16	3	13.70°	2.5	10.76	27	31
	ARX25R163SA16S	16	3	13.70°	2.5	10.26	27	31
	ARX30R163M08A30	16	3	21.25	3.0	7.71	26	31
	ARX30R163SA16S	16	3	21.25°	3.0	7.71	26	31
	ARX25R173M08A30	17	3	12.22°	2.5	11.54	29	33
	ARX25R173SA16S	17	3	12.22°	2.5	11.54	29	33
	ARX30R173M08A30	17	3	18.42°	3.0	9.01	28	33
	ARX30R173SA16S	17	3	18.42°	3.0	9.01	28	33
	ARX30R203M10A30	20	3	13.21°	3.0	12.78	34	39
	ARX30R203SA20S	20	3	13.21°	3.0	12.78	34	39
	ARX25R204M10A30	20	4	9.23°	2.5	15.38	35	39
	ARX25R204SA20S	20	4	9.23°	2.5	15.38	35	39
	ARX25R224M10A30	22	4	7.94°	2.5	17.92	39	43
	ARX25R224SA20S	22	4	7.94°	2.5	17.92	39	43
	ARX30R224M10A30	22	4	11.13°	3.0	15.25	38	43
	ARX30R224SA20S	22	4	11.13°	3.0	15.25	38	43
	ARX30R254M12A35	25	4	9.01°	3.0	18.92	44	49
	ARX30R254SA20S	25	4	9.01°	3.0	18.92	44	49
	ARX25R255M12A35	25	5	6.57°	2.5	21.71	45	49
	ARX25R255SA20S	25	5	6.57°	2.5	21.71	45	49

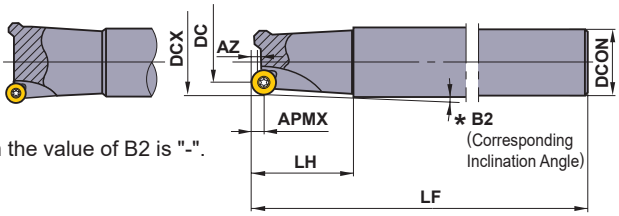
*1 RMPX : Max.Ramping Angle
*2 APMX : Max. Depth of Cut

MULTI-FUNCTIONAL MILLING

BRP

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel





When the value of B2 is "-".

*Please allow for an inclination angle of B2+1°

- 11°positive insert.
- Round shape insert with a strong cutting edge.
- Wide range of tools available.
- Suitable for mould machining.

■SHANK TYPE

Right hand tool holder only.

Cutting Edge R (APMX)	Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DCX	DC	LF	DCON	LH	AZ	B2	APMX	* Clamp Screw	Wrench	①② Insert
4	R	BRP4NR121S12	●	1	12	3.8	85	12	25	0.2	3.0°	4	CS250560T	TKY08F	①RPMW08T2M0◌ ②RPMT08T2M0E-JS
		BRP4NR161S16	●	1	16	7.8	85	16	25	1.0	3.0°	4	CS250560T	TKY08F	
		BRP4NR202S20	●	2	20	11.8	100	20	30	2.0	2.42°	4	CS250560T	TKY08F	
		BRP4NR253S25	●	3	25	16.8	115	25	35	2.0	2.03°	4	CS250560T	TKY08F	
	L	BRP4NR121LS12	●	1	12	3.8	150	12	70	0.2	0.95°	4	CS250560T	TKY08F	
		BRP4NR161LS16	●	1	16	7.8	150	16	70	1.0	0.95°	4	CS250560T	TKY08F	
		BRP4NR202LS20	●	2	20	11.8	180	20	100	2.0	0.65°	4	CS250560T	TKY08F	
		BRP4NR253LS25	●	3	25	16.8	180	25	100	2.0	0.65°	4	CS250560T	TKY08F	
	EL	BRP4NR202ELS20	●	2	20	11.8	250	20	130	2.0	0.5°	4	CS250560T	TKY08F	
		BRP4NR253ELS25	●	3	25	16.8	250	25	130	2.0	0.5°	4	CS250560T	TKY08F	
5	R	BRP5NR161S16	●	1	16	5.8	85	16	25	0.3	3.15°	5	CS350760T	TKY15F	①RPMW10T3M0◌ ②RPMT10T3M0E-JS
		BRP5NR201S20	●	1	20	9.8	100	20	30	1.2	2.52°	5	CS350760T	TKY15F	
		BRP5NR252S25	●	2	25	14.8	115	25	35	2.5	2.1°	5	CS350860T	TKY15F	
		BRP5NR323S32	●	3	32	21.8	125	32	45	2.5	1.57°	5	CS350860T	TKY15F	
	L	BRP5NR161LS16	●	1	16	5.8	150	16	70	0.3	0.97°	5	CS350760T	TKY15F	
		BRP5NR201LS20	●	1	20	9.8	180	20	100	1.2	0.67°	5	CS350760T	TKY15F	
		BRP5NR252LS25	●	2	25	14.8	180	25	100	2.5	0.67°	5	CS350860T	TKY15F	
		BRP5NR323LS32	●	3	32	21.8	200	32	120	2.5	0.55°	5	CS350860T	TKY15F	
	EL	BRP5NR252ELS25	●	2	25	14.8	250	25	130	2.5	0.5°	5	CS350860T	TKY15F	
		BRP5NR323ELS32	●	3	32	21.8	300	32	180	2.5	0.34°	5	CS350860T	TKY15F	

Note 1) **R :** Regular type **L :** Long type **EL :** Extra long type

* Clamp Torque (N • m) : CS250560T=1.0, CS350760T=3.5, CS350860T=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Cutting Edge R (APMX)	Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								*		① ②
			R		DCX	DC	LF	DCON	LH	AZ	B2	APMX	Clamp Screw	Wrench	Insert
6	R	**BRP6PR322S32**	●	2	32	19.8	125	32	45	4	1.62°	6	TS43	TKY15D	①RPMW1204M0□ ②RPMT1204M0E-JS
		BRP6PR403S32	●	3	40	27.9	125	32	45	4	—	6	TS43	TKY15D	
		BRP6PR504S32	●	4	50	37.8	150	32	50	4	—	6	TS43	TKY15D	
		BRP6PR504S42	●	4	50	37.8	150	42	50	4	—	6	TS43	TKY15D	
	L	**BRP6PR322LS32**	●	2	32	19.8	200	32	120	4	0.55°	6	TS43	TKY15D	
		BRP6PR403LS32	●	3	40	27.9	200	32	120	4	—	6	TS43	TKY15D	
		BRP6PR504LS32	●	4	50	37.8	250	32	150	4	—	6	TS43	TKY15D	
		BRP6PR504LS42	●	4	50	37.8	250	42	150	4	—	6	TS43	TKY15D	
	EL	**BRP6PR322ELS32**	●	2	32	19.8	300	32	50	4	1.43°	6	TS43	TKY15D	
		BRP6PR403ELS32	●	3	40	27.9	300	32	50	4	—	6	TS43	TKY15D	
		BRP6PR403ELS42	●	3	40	27.9	300	42	50	4	2.73°	6	TS43	TKY15D	
		BRP6PR504ELS42	●	4	50	37.8	300	42	50	4	—	6	TS43	TKY15D	
8	R	**BRP8PR402S32**	●	2	40	23.8	125	32	45	5.5	—	8	TS54	TKY25D	①RPMW1606M0□ ②RPMT1606M0E-JS
		BRP8PR503S32	●	3	50	33.8	150	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR503S42	●	3	50	33.8	150	42	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634S32	●	4	63	46.8	150	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634S42	●	4	63	46.8	150	42	50	5.5	—	8	TS54	TKY25D	
	L	**BRP8PR402LS32**	●	2	40	23.8	200	32	120	5.5	—	8	TS54	TKY25D	
		BRP8PR503LS32	●	3	50	33.8	250	32	150	5.5	—	8	TS54	TKY25D	
		BRP8PR503LS42	●	3	50	33.8	250	42	150	5.5	—	8	TS54	TKY25D	
		BRP8PR634LS32	●	4	63	46.8	250	32	150	5.5	—	8	TS54	TKY25D	
		BRP8PR634LS42	●	4	63	46.8	250	42	150	5.5	—	8	TS54	TKY25D	
	EL	**BRP8PR402ELS32**	●	2	40	23.8	300	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR402ELS42	●	2	40	23.8	300	42	50	5.5	2.87°	8	TS54	TKY25D	
		BRP8PR503ELS42	●	3	50	33.8	300	42	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634ELS42	●	4	63	46.8	300	42	50	5.5	—	8	TS54	TKY25D	

Note 1) **R :** Regular type **L :** Long type **EL :** Extra long type
∗ Clamp Torque (N • m) : TS43=3.5, TS54=7.5

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



Fig.1
ø40

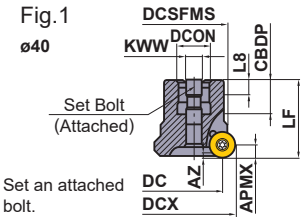
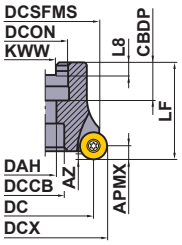
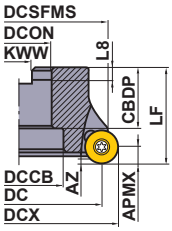


Fig.2
ø50
ø63
ø80



Right hand tool holder only.

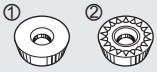
Fig.3
ø100



■ARBOR TYPE

Cutting Edge:R (APMX)	Order Number	Stock	Number of Teeth	Dimensions (mm)										WT (kg)	Max. Depth of Cut (mm)		Fig.
		R		DCX	DC	DCSFMS	LF	DCON	CBDP	DAH	DCCB	KWW	L8		APMX	AZ	
6	**BRP6P-040A03R**	●	3	40	27.9	33.3	40	16	18	—	—	8.4	5.6	0.4	6	4	1
	BRP6P-050A04R	●	4	50	37.8	43.1	50	22	20	11	17	10.4	6.3	0.5	6	4	2
	BRP6PR05004B	●	4	50	37.8	43.1	63	22.225	29	11	17	8.4	5	0.5	6	4	2
	BRP6P-063A05R	●	5	63	50.8	56.1	50	22	20	11	17	10.4	6.3	0.7	6	4	2
	BRP6PR06305B	●	5	63	50.8	56.1	63	22.225	29	11	17	8.4	5	0.7	6	4	2
	BRP6PR08006C	●	6	80	67.8	72.8	50	25.4	26	13	20	9.5	6	1.2	6	4	2
8	**BRP8P-063A04R**	●	4	63	46.8	54.5	50	22	20	11	17	10.4	6.3	0.7	8	5.5	2
	BRP8PR06304B	●	4	63	46.8	54.5	63	22.225	29	11	17	8.4	5	0.7	8	5.5	2
	BRP8PR08005C	●	5	80	63.8	70.9	50	25.4	26	13	20	9.5	6	1.2	8	5.5	2
	BRP8PR10006D	●	6	100	83.8	90.6	50	31.75	32	—	45	12.7	8	1.6	8	5.5	3

SPARE PARTS

Tool Holder Number	 * Clamp Screw	 Wrench	 Set Bolt	 Insert
BRP6P-040A03R	TS43	TKY15D	HDS08030	①RPMW1204M0○ ②RPMT1204M0E-JS
BRP6P-050A04R ı **BRP6P-R08006C**	TS43	TKY15D	—	
BRP8P	TS54	TKY25D	—	①RPMW1606M0○ ②RPMT1606M0E-JS

* Clamp Torque (N • m) : TS43=3.5, TS54=7.5

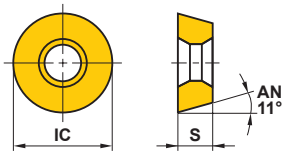
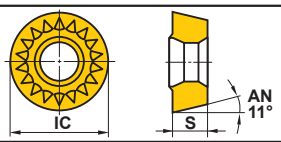
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	VP15TF			NX4545		UTi20T	
	P	Steel	●	●			●		●	
	M	Stainless Steel	●	●			●		●	
	K	Cast Iron		✣					✣	
	S	Heat resistant Alloy, Titanium Alloy		●						
	H	Hardened Steel		●					●	

Cutting Conditions (Guide) :
● : Stable Cutting ● : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **T :** Chamfer

Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated VP15TF	Cermet NX4545	Carbide UTi20T	Dimensions (mm) IC	Dimensions (mm) S	Geometry
	**RPMW08T2M0T**	M	T		●			8	2.78	
	RPMW10T3M0E	M	E	●		●		10	3.97	
	RPMW10T3M0T	M	T		●			10	3.97	
	RPMW1204M0E	M	E	●		●	●	12	4.76	
	RPMW1204M0T	M	T		●			12	4.76	
	RPMW1606M0E	M	E	●			●	16	6.35	
	RPMW1606M0T	M	T		●			16	6.35	
	**RPMT08T2M0E-JS**	M	E	●	●			8	2.78	
	RPMT10T3M0E-JS	M	E	●	●			10	3.97	
	RPMT1204M0E-JS	M	E	●	●		●	12	4.76	
	RPMT1606M0E-JS	M	E	●	●			16	6.35	

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED (m/min)

	Workpiece Material	Hardness	Coated		Carbide
			F7030	VP15TF	UTi20T
P	Mild Steel	≤180HB	**250 (200—300)**	250 (200—300)	150 (100—200)
P	Carbon Steel Alloy Steel	180—280HB	**180 (130—220)**	180 (130—220)	140 (100—170)
P	Carbon Steel Alloy Steel	280—380HB	**160 (110—190)**	160 (110—190)	100 (70—120)
P	Pre-Hardened Steel	35—45HRC	**120 (80—140)**	120 (80—140)	90 (60—100)
P	High Alloy Steel	300HB	**130 (90—160)**	130 (90—160)	100 (70—120)
M	Stainless Steel	≤260HB	**180 (130—220)**	180 (130—220)	140 (100—170)
K	Gray Cast Iron	Tensile Strength ≤350MPa	—	**170 (130—220)**	140 (100—170)
K	Ductile Cast Iron	Tensile Strength 360—500MPa	—	**140 (100—180)**	120 (80—140)
K	Ductile Cast Iron	Tensile Strength 500—800MPa	—	**110 (80—140)**	90 (70—110)
H	Hardened Steel	45—60HRC	—	**60 (50—100)**	60 (40—70)

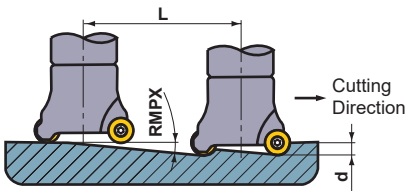
Note 1) Cutting speeds shown in bold type are for the recommended first choice grades.

■ FEED PER TOOTH (mm/t)

Type	Depth of Cut (mm)							
	1	2	3	4	5	6	7	8
BRP4	0.40	0.30	0.20	0.10	—	—	—	—
BRP5	0.40	0.35	0.30	0.20	0.10	—	—	—
BRP6	0.50	0.40	0.30	0.25	0.23	0.20	—	—
BRP8	0.60	0.50	0.45	0.40	0.33	0.30	0.25	0.20

RAMPING

■ RAMPING ANGLE AND MACHINING LENGTH



Formula to find cutting length "L" at maximum ramping angle.

$$L = \frac{d}{\tan RMPX} \text{ (mm)}$$

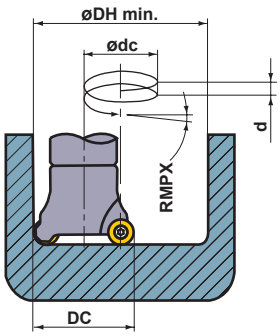
Type	Cutting Edge Diameter (ϕ)	Max. Ramping Angle RMPX	tan RMPX	Cutting Length L at Max. Ramping Angle L(mm)*				
				d=2mm	d=4mm	d=5mm	d=6mm (max.)	d=8mm (max.)
BRP4	12	5.02°	0.088	22	45	—	—	—
	16	12.2°	0.216	9	18	—	—	—
	20	14.52°	0.259	7	15	—	—	—
	25	8.8°	0.155	12	25	—	—	—
BRP5	16	4.52°	0.079	25	50	63	—	—
	20	11.4°	0.202	9	19	24	—	—
	25	14.4°	0.257	7	15	19	—	—
	32	8.37°	0.147	13	27	33	—	—
BRP6	32	15.91°	0.285	7	14	17	21	—
	40	10.29°	0.181	11	22	27	33	—
	50	7.12°	0.125	16	32	40	48	—
	63	5.08°	0.089	22	44	56	67	—
	80	3.69°	0.064	31	62	77	93	—
BRP8	40	18.86°	0.342	5	11	14	17	23
	50	11.91°	0.211	9	18	23	28	37
	63	8.01°	0.141	14	28	35	42	56
	80	5.60°	0.098	20	40	50	61	81
	100	4.13°	0.072	27	55	69	83	110

* "L" value is approximate rounded value.

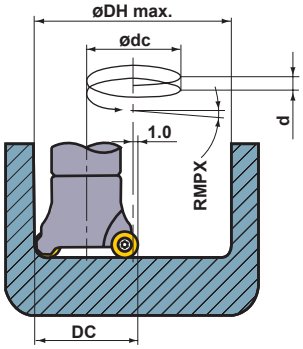
HELICAL DRILLING

■ RELATIONSHIP BETWEEN HOLE DIAMETER AND DEPTH OF CUT

Minimum Hole Diameter



Maximum Hole Diameter



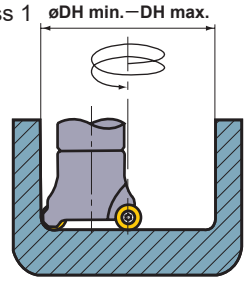
Type	Cutting Edge Diameter DC (mm)	∗1 øDH min.	∗2 ødc	Ramping Angle RMPX d=2mm	d=4mm	d=5mm	d=6mm	d=8mm	∗1 øDH max.	∗2 ødc	Ramping Angle RMPX d=2mm	d=4mm	d=5mm	d=6mm	d=8mm
BRP4	12	16	4	d=1mm,RMPX=4.55°					22	10	3.64°	—	—	—	—
	16	24	8	4.55°	9.10°	—	—	—	30	14	2.60°	5.20°	—	—	—
	20	32	12	3.04°	6.08°	—	—	—	38	18	2.03°	4.05°	—	—	—
	25	42	17	2.15°	4.29°	—	—	—	48	23	1.59°	3.17°	—	—	—
BRP5	16	22	6	d=1mm,RMPX=3.04°					30	14	2.60°	5.20°	6.50°	—	—
	20	30	10	3.64°	7.26°	9.10°	—	—	38	18	2.03°	4.05°	5.08°	—	—
	25	40	15	2.43°	4.85°	6.08°	—	—	48	23	1.59°	3.17°	3.98°	—	—
	32	54	22	1.66°	3.31°	4.15°	—	—	62	30	1.22°	2.43°	3.04°	—	—
BRP6	32	52	20	1.82°	3.64°	4.55°	5.45°	—	62	30	1.22°	2.43°	3.04°	3.64°	—
	40	68	28	1.30°	2.60°	3.25°	3.90°	—	78	38	0.96°	1.92°	2.40°	2.88°	—
	50	88	38	0.96°	1.92°	2.40°	2.88°	—	98	48	0.78°	1.52°	1.90°	2.28°	—
	63	114	51	0.72°	1.43°	1.79°	2.14°	—	124	61	0.60°	1.20°	1.49°	1.79°	—
	80	148	68	0.54°	1.07°	1.34°	1.61°	—	158	78	0.47°	0.94°	1.17°	1.40°	—
BRP8	40	64	24	1.52°	3.04°	3.79°	4.55°	6.06°	78	38	0.96°	1.92°	2.40°	2.88°	3.38°
	50	84	34	1.07°	2.14°	2.68°	3.22°	4.28°	98	48	0.76°	1.52°	1.90°	2.28°	3.04°
	63	110	47	0.78°	1.55°	1.94°	2.33°	3.10°	124	61	0.60°	1.20°	1.49°	1.79°	2.39°
	80	144	64	0.57°	1.14°	1.42°	1.71°	2.28°	158	78	0.47°	0.94°	1.17°	1.40°	1.87°
	100	184	84	0.43°	0.87°	1.09°	1.30°	1.74°	198	98	0.37°	0.74°	0.93°	1.12°	1.49°

∗1 DH=Hole Diameter : ϕ(mm)　∗2 dc=Tool Pass : ϕ(mm)

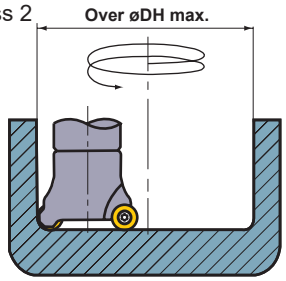
BRP4 DH min. (Minimum Hole Diameter)=(DC - 4)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=4(mm)
BRP5 DH min. (Minimum Hole Diameter)=(DC - 5)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=5(mm)
BRP6 DH min. (Minimum Hole Diameter)=(DC - 6)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=6(mm)
BRP8 DH min. (Minimum Hole Diameter)=(DC - 8)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=8(mm)
dc=(Tool Pass)**=DH-D**

◀Note▶ When machining a hole larger than DH max., first machine a pilot hole smaller than DH max. before enlarging to the required size as shown above.

Process 1 **øDH min.—DH max.**



Process 2 **Over øDH max.**



DEEP SHOULDER MILLING

90° KAPR

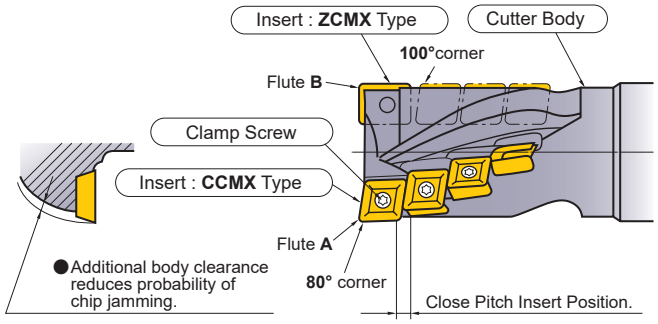
DCCC

P Steel | M Stainless Steel | K Cast Iron | N | S | H



● Different helical flute angles prevents chattering.

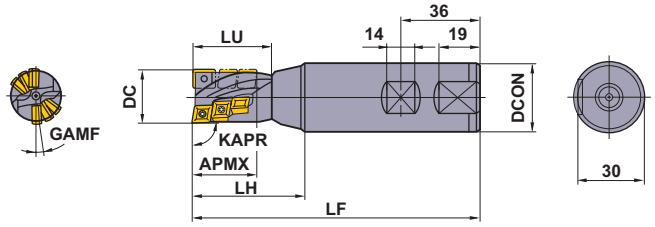
■ DESIGN FEATURES OF DCCC TYPE END MILL



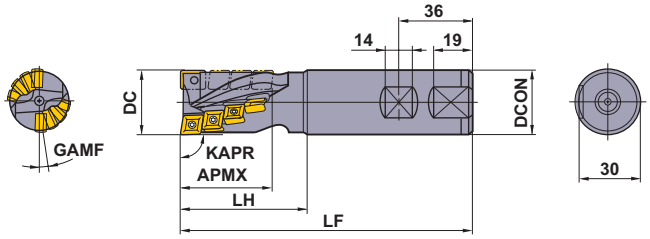
● Additional body clearance reduces probability of chip jamming.

● All 4 cutting edges of CCMX insert are utilized, 80° corners in flute "A" and 100° corners on flute "B".

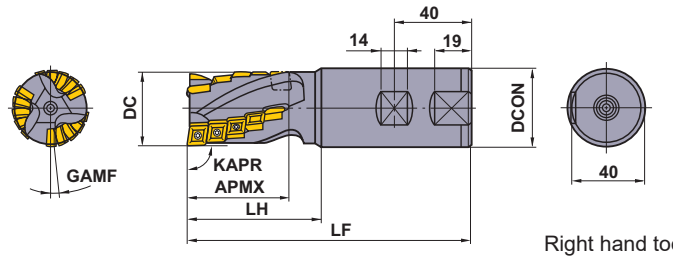
● ϕ25 2 flute



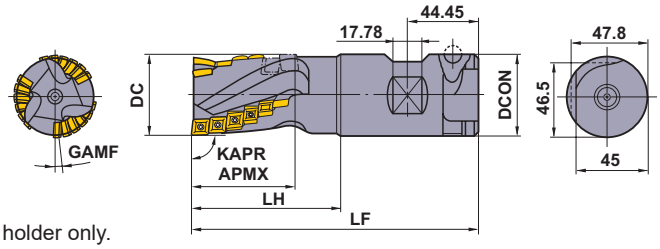
● ϕ32 2 flute



● ϕ40 3 flute



● ϕ50 (Combination Shank) 3 flute



Right hand tool holder only.

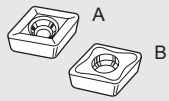
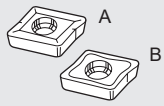
■ SHANK TYPE

DC (mm)	Order Number	Stock	Dimensions (mm)					GAMF	WT	No. of Teeth		Peripheral and Bottom		Bottom insert only	
			LF	DCON	LH	LU	APMX			Bottom	Total	Type	Number of Teeth	Type	Number of Teeth
25	DCCCR2506S32	●	130	32	50	36	27	8°	0.6	2	6	CCMX08	5	ZCMX08	1
25	DCCCR2510S32	●	150	32	70	56	44	8°	0.7	2	10	CCMX08	9	ZCMX08	1
32	DCCCR3208S32	●	140	32	60	–	43	8°36′	0.8	2	8	CCMX09	7	ZCMX09	1
32	DCCCR3212S32	●	160	32	80	–	63	8°36′	0.8	2	12	CCMX09	11	ZCMX09	1
40	DCCCR4015S42	●	150	42	70	–	53	5°31′	1.3	3	15	CCMX09	14	ZCMX09	1
40	DCCCR4024S42	●	180	42	100	–	83	5°31′	1.4	3	24	CCMX09	23	ZCMX09	1
50	DCCCR5018S508	●	175	50.8	90	–	63	5°51′	2.3	3	18	CCMX09	17	ZCMX09	1
50	DCCCR5027S508	●	205	50.8	120	–	93	5°51′	2.6	3	27	CCMX09	26	ZCMX09	1

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

SPARE PARTS

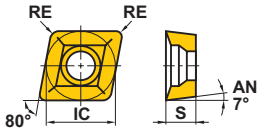
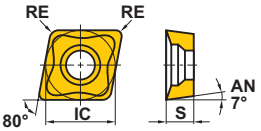
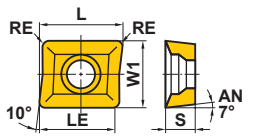
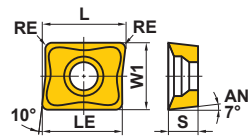
Tool Holder Number	 *				
	Clamp Screw	Wrench	Wrench	Insert	
				Peripheral and Bottom Insert	Bottom Insert (One Pocket Only)
DCCCR25	CS300890T	TKY08F	TKY08DS	CCMX083508EN-A	ZCMX083508ER-A
DCCCR32 **DCCCR40** **DCCCR50**	CS350990T	TKY10F	TKY10DS	CCMX09T308EN-A or B	ZCMX09T308ER-A or B

* Clamp Torque (N • m) : CS300890T=1.0, CS350990T=2.5

INSERTS

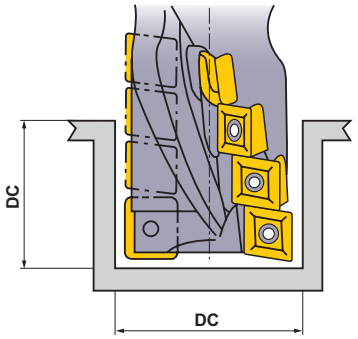
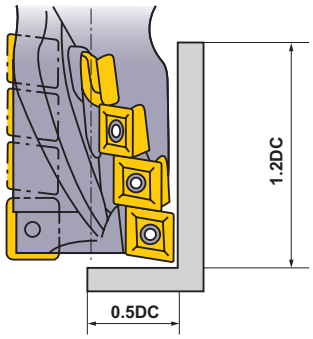
Workpiece Material								
	P	Steel	◐	◐	◐		◐	
	M	Stainless Steel	◐	◐	◐		◐	
	K	Cast Iron		✠			✠	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting
Edge Preparation : E : Round

Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated VP15TF	Coated UP20M		Carbide UTi20T		Dimensions (mm) L	LE	W1	IC	S	RE	Geometry
	**CCMX083508EN-A**	M	E	●		●		●		–	–	–	7.94	3.5	0.8	
	CCMX09T308EN-A	M	E	●	●	●		●		–	–	–	9.525	3.97	0.8	
Strong Cutting Edge Type 	**CCMX09T308EN-B**	M	E	●				●		–	–	–	9.525	3.97	0.8	
	**ZCMX083508ER-A**	M	E	●				●		11.0	8.5	7.94	–	3.5	0.8	
	ZCMX09T308ER-A	M	E	●	●	●		●		12.7	11.0	9.525	–	3.97	0.8	
Strong Cutting Edge Type 	**ZCMX09T308ER-B**	M	E	●		●		●		12.7	11.0	9.525	–	3.97	0.8	

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

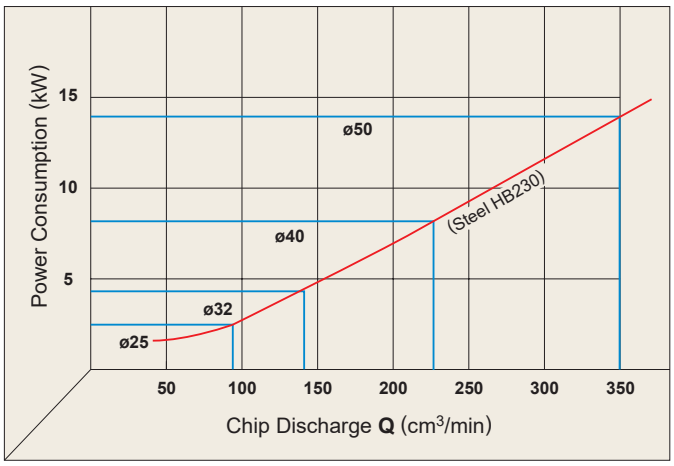
Cutting Mode	A : Slot Milling (APMX Short Type)	B : Shoulder Milling (APMX Short Type)
		

Workpiece Material		Hardness	Grade	Cutting Mode	Cutting Speed (m/min)	Table Feed (mm/min)			
						ϕ25	ϕ32	ϕ40	ϕ50
P	Mild Steel	≤180HB	**F7030**	A	200 (160—240)	120 (100—140)	120 (100—140)	120 (100—140)	120 (100—140)
			F7030	B	200 (160—240)	200 (180—220)	200 (180—220)	230 (200—250)	230 (200—250)
	Carbon Steel Alloy Steel	180—280HB	**F7030**	A	160 (130—180)	120 (100—140)	120 (100—140)	140 (120—150)	140 (120—150)
			F7030	B	160 (130—180)	150 (120—180)	150 (120—180)	180 (150—200)	180 (150—200)
		280—350HB	**F7030**	A	160 (130—180)	100 (80—120)	100 (80—120)	130 (100—150)	130 (100—150)
			F7030	B	160 (130—180)	120 (100—140)	120 (100—140)	150 (120—180)	150 (120—180)
M	Stainless Steel	≤200HB	**F7030**	A	80 (60—100)	70 (50—90)	70 (50—90)	70 (50—90)	70 (50—90)
			F7030	B	130 (100—160)	100 (80—120)	100 (80—120)	120 (100—140)	120 (100—140)
K	Cast Iron	Tensile Strength ≤450MPa	**UTI20T**	A	120 (100—140)	200 (180—220)	200 (180—220)	230 (200—250)	230 (200—250)
			UTI20T	B	120 (100—140)	230 (200—250)	230 (200—250)	260 (240—280)	260 (240—280)

- Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

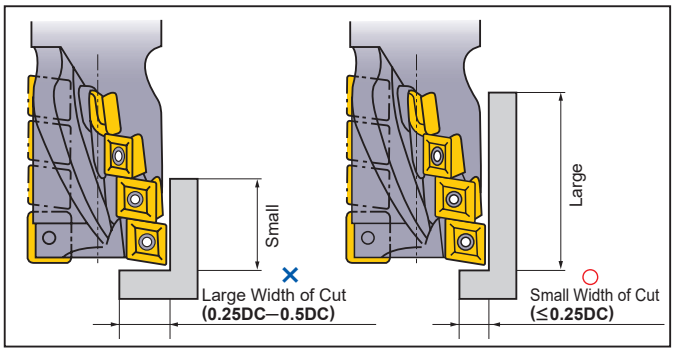
■POWER CONSUMPTION

- Please use the chart below for reference, please select the conditions that suits the machines power.
- Chip Discharge Q (cm^3/min)=Table Feed x Depth of Cut x Cutting Width÷1000



■FOR USE OF APMX LONG TYPE

- Since the overhang from the milling chuck is long, a large width of cut will cause chattering and tool breakage.
- Keep the width of cut small and the depth of cut in axial direction large. (See the following illustration.)
- For slot milling, keep the table feed at not more than half the value listed in the above table. (Use the APMX Short type as much as possible.)



DEEP SHOULDER MILLING

90° KAPR

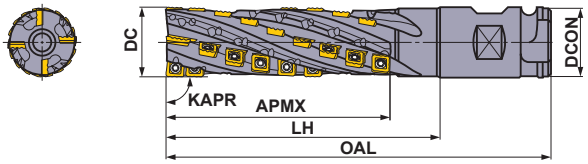
SPX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	

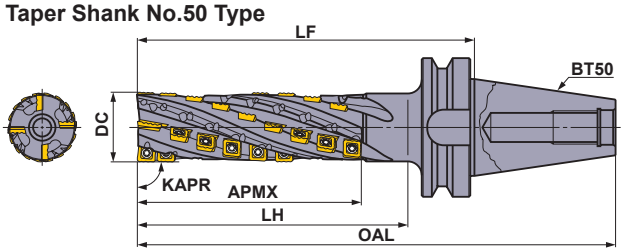


- Low cutting resistance due to the use of wavy inserts.
- Suitable for heavy cutting due to holder rigidity.

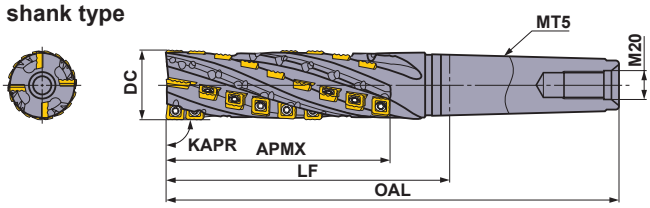
● Straight Shank Type (Combination Shank)



● 7/24 Taper Shank No.50 Type



● MT5 shank type



■SHANK TYPE

Right hand tool holder only.

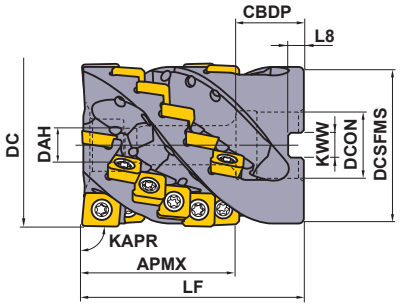
Type		Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)						Number of Insert		
												Bottom On-edge A	Bottom On-edge B	Peripheral
			R			DC	OAL	DCON	LH	LF	APMX	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
Straight Shank (Combination Shank)	Short Edge Type	SPX4R05016WNES	●	2	16	50	180	50.8	100	—	72	2	2	12
	Coarse Pitch	SPX4R05024WNS	●	2	24	50	220	50.8	140	—	110	2	2	20
		SPX4R05034WNM	●	2	34	50	270	50.8	190	—	157	2	2	30
7/24 Taper Shank (No. 50)	Short Edge Type	SPX4R05016BT50NES	●	2	16	50	249.8	—	100	148	72	2	2	12
	Coarse Pitch	SPX4R05024BT50NS	●	2	24	50	289.8	—	140	188	110	2	2	20
		SPX4R05034BT50NM	●	2	34	50	339.8	—	190	238	157	2	2	30
		SPX4R06324BT50NS	●	2	24	63	289.8	—	140	188	110	2	2	20
		SPX4R06334BT50NM	●	2	34	63	339.8	—	190	238	157	2	2	30
		SPX4R06344BT50NL	●	2	44	63	389.8	—	240	288	205	2	2	40
		SPX4R06356BT50NX	●	2	56	63	439.8	—	290	338	261	2	2	52
MT5 shank type		SPX4R05024MT5NS	●	2	24	50	279.5	—	—	150	110	2	2	20
		SPX4R05034MT5NM	●	2	34	50	329.5	—	—	200	157	2	2	30

● : Inventory maintained in Japan.

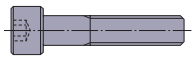
Scan here for product NEWS ▶

ISO13399	➤ L003
SPARE PARTS	➤ P001
TECHNICAL DATA	➤ Q001





Right hand tool holder only.

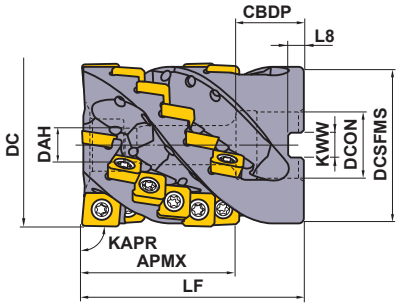
Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ63	HSC12070	
ϕ80	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)									Number of Insert		
													Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	**JPMX 140412-○○**	**MPMX 120412-○○**	**SPMX 120408-○○**
SPX4R06324CA058A	●	4	24	63	85	25.4	26	13	60	9.5	6	58	2	2	20
SPX4R08024DA058A	●	4	24	80	85	31.75	38	17	76.8	12.7	8	58	2	2	20

Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular centre-thru or side-thru arbors can't be used.

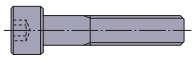




Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ63	HSC12070	
ϕ80	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)									Number of Insert		
													Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	**JPMX 140412-○○**	**MPMX 120412-○○**	**SPMX 120408-○○**
SPX4-063A24A058RA	●	4	24	63	85	27	28	13	60	12.4	7	58	2	2	20
SPX4-080A24A058RA	●	4	24	80	85	32	40	17	76.8	14.4	8	58	2	2	20

Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular centre-thru or side-thru arbors can't be used.

SPARE PARTS

Tool Holder Number	 *					
	Clamp Screw	Wrench	Anti-seize Lubricant	Insert		
				Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
SPX	TS55	TKY25D	MK1KS	JPMX140412-WH	MPMX120412-WH	SPMX120408-WH
				JPMX140412-JM	MPMX120412-JM	SPMX120408-JM

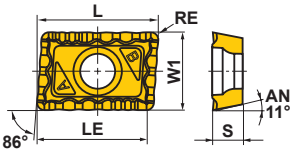
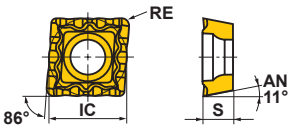
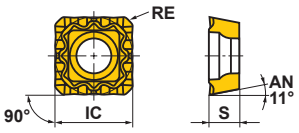
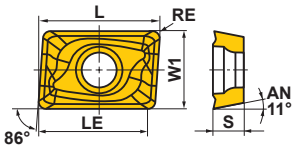
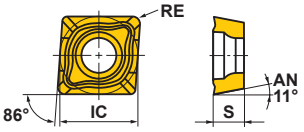
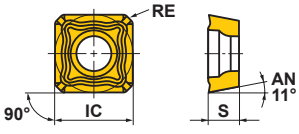
* Clamp Torque (N • m) : TS55=7.5

● : **Inventory maintained in Japan.**
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat resistant Alloy, Titanium Alloy	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Type		Shape	Order Number	Class	Coated				Dimensions (mm)						Geometry
					VP15TF	VP20RT			L	LE	W1	IC	S	RE	
Wavy cutting edge type (**WH** Breaker)	Bottom On-edge **A**		**JPMX190412-WH**	M	●	●			19.81	17.6	12.7	—	4.76	1.2	
			⁎ **JPMX140412-WH**	M	●	●			15.04	12.9	12.7	—	4.76	1.2	
	Bottom On-edge **B**		**MPMX120412-WH**	M	●	●			—	—	—	12.7	4.76	1.2	
	Peripheral		**SPMX120408-WH**	M	●	●			—	—	—	12.7	4.76	0.8	
Straight cutting edge type (**JM** Breaker)	Bottom On-edge **A**		**JPMX190412-JM**	M	●	●			19.81	17.6	12.7	—	4.83	1.2	
			⁎ **JPMX140412-JM**	M	●	●			15.04	12.9	12.7	—	4.79	1.2	
	Bottom On-edge **B**		**MPMX120412-JM**	M	●	●			—	—	—	12.7	4.79	1.2	
	Peripheral		**SPMX120408-JM**	M	●	●			—	—	—	12.7	4.80	0.8	

⁎ Only for use with a shell type holder.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS (SHANK TYPE)

■ CUTTING CONDITIONS FOR SHOULDER MILLING

Workpiece Material		Hardness	Grade	Breaker	Cutting Speed **vc** (m/min)	Cutting Width : **ae** (mm) Feed per Tooth : **fz** (mm/t)						
						ϕ50 (the last letter of order number for cutter body)			ϕ63 (the last letter of order number for cutter body)			
						S (APMX≤110)	**M** (APMX=157)	**L** (APMX=205)	**S** (APMX=110)	**M** (APMX=157)	**L** (APMX=205)	**X** (APMX=261)
P	Mild Steel	≤180HB	VP15TF	**WH**	120 (100−140)	≤10.0 0.15−0.25	≤5.0 0.15−0.25	≤2.5 0.10−0.20	≤12.5 0.15−0.25	≤10.0 0.15−0.25	≤5.0 0.15−0.25	≤2.5 0.10−0.20
				JM	120 (100−140)	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15	≤10.0 0.10−0.20	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15
	Carbon Steel Alloy Steel	180−350HB		**WH**	80 (70−120)	≤10.0 0.15−0.25	≤5.0 0.15−0.25	≤2.5 0.10−0.20	≤12.5 0.15−0.25	≤10.0 0.15−0.25	≤5.0 0.15−0.25	≤2.5 0.10−0.20
				JM	80 (70−120)	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15	≤10.0 0.10−0.20	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15
	Alloy Tool Steel	≤300HB		**WH**	80 (60−100)	≤10.0 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15	≤12.5 0.10−0.20	≤10.0 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15
				JM	80 (60−100)	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.05−0.10	≤10.0 0.10−0.15	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.05−0.10
M	Stainless Steel	≤200HB	VP20RT	**WH**	80 (60−100)	≤7.5 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10	≤10.0 0.08−0.15	≤7.5 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10
				JM	80 (60−100)	≤5.0 0.08−0.15	≤3.5 0.08−0.15	≤2.0 0.05−0.10	≤7.5 0.08−0.15	≤5.0 0.08−0.15	≤3.5 0.08−0.15	≤2.0 0.05−0.10
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	**WH**	100 (80−120)	≤10.0 0.15−0.40	≤5.0 0.15−0.35	≤2.5 0.10−0.30	≤12.5 0.15−0.40	≤10.0 0.15−0.40	≤5.0 0.15−0.35	≤2.5 0.10−0.30
				JM	100 (80−120)	≤7.5 0.10−0.25	≤5.0 0.10−0.25	≤2.5 0.05−0.20	≤10.0 0.10−0.25	≤7.5 0.10−0.25	≤5.0 0.10−0.25	≤2.5 0.05−0.20
	Ductile Cast Iron	Tensile Strength ≤800MPa		**WH**	80 (60−100)	≤10.0 0.15−0.35	≤5.0 0.15−0.30	≤2.5 0.10−0.25	≤12.5 0.15−0.35	≤10.0 0.15−0.35	≤5.0 0.15−0.30	≤2.5 0.10−0.25
				JM	80 (60−100)	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15	≤10.0 0.10−0.20	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.05−0.15
S	Ti Alloy	≤350HB	VP20RT	**WH**	40 (35−50)	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10	≤7.5 0.05−0.10	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10
				JM	40 (35−50)	≤3.5 0.05−0.10	≤2.5 0.05−0.10	≤1.5 0.05−0.10	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.5 0.05−0.10	≤1.5 0.05−0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

Note 2) If the contact angle between the tool and the workpiece exceeds 90°, such as when machining corners, reduce the cutting speed and table feed by about 10 to 20%, reduce the cutting width by about 50%, and if possible, add R to the centre trajectory of the tool for machining.

■ SLOT MILLING

Workpiece Material		Hardness	Grade	Breaker	Cutting Speed **vc** (m/min)	Depth of Cut : **ap** : (mm) Feed per Tooth : **fz** (mm/t)						
						ϕ50 (the last letter of order number for cutter body)			ϕ63 (the last letter of order number for cutter body)			
						S (APMX≤110)	**M** (APMX=157)	**L** (APMX=205)	**S** (APMX=110)	**M** (APMX=157)	**L** (APMX=205)	**X** (APMX=261)
P	Mild Steel	≤180HB	VP15TF	**WH**	60 (50−120)	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15	≤12.5 0.10−0.25	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15
				JM	60 (50−120)	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15	≤10.0 0.10−0.15	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15
	Carbon Steel Alloy Steel	180−350HB		**WH**	60 (50−100)	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15	≤12.5 0.10−0.25	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15
				JM	60 (50−100)	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15	≤10.0 0.10−0.15	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15
	Alloy Tool Steel	≤300HB		**WH**	50 (40−80)	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15	≤12.5 0.10−0.25	≤10.0 0.10−0.25	≤5.0 0.10−0.20	≤2.5 0.10−0.15
				JM	50 (40−80)	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15	≤10.0 0.10−0.15	≤7.5 0.10−0.15	≤5.0 0.10−0.15	≤2.5 0.10−0.15
M	Stainless Steel	≤200HB	VP20RT	**WH**	40 (35−80)	≤10.0 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10	≤12.5 0.08−0.15	≤10.0 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10
				JM	40 (35−80)	≤7.5 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10	≤10.0 0.08−0.15	≤7.5 0.08−0.15	≤5.0 0.08−0.15	≤2.5 0.05−0.10
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	**WH**	50 (40−80)	≤10.0 0.15−0.25	≤5.0 0.10−0.25	≤2.5 0.10−0.20	≤12.5 0.15−0.25	≤10.0 0.15−0.25	≤5.0 0.10−0.25	≤2.5 0.10−0.20
				JM	50 (40−80)	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.10−0.20	≤10.0 0.10−0.20	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.10−0.20
	Ductile Cast Iron	Tensile Strength ≤800MPa		**WH**	40 (35−80)	≤10.0 0.15−0.25	≤5.0 0.10−0.25	≤2.5 0.10−0.20	≤12.5 0.15−0.25	≤10.0 0.15−0.25	≤5.0 0.10−0.25	≤2.5 0.10−0.20
				JM	40 (35−80)	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.10−0.20	≤10.0 0.10−0.20	≤7.5 0.10−0.20	≤5.0 0.10−0.20	≤2.5 0.10−0.20
S	Ti Alloy	≤350HB	VP20RT	**WH**	35 (30−50)	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10	≤7.5 0.05−0.10	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10
				JM	35 (30−50)	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10	≤7.5 0.05−0.10	≤5.0 0.05−0.10	≤3.5 0.05−0.10	≤2.0 0.05−0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

Note 2) For slotting, please use high rigidity tools such as SPX4R05016WNES/BT50NES.

RECOMMENDED CUTTING CONDITIONS (SHELL TYPE)

■ SHOULDER MILLING

	Workpiece Material	Hardness	Grade Breaker	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF JM**	120 (100—140)	—0.5DC	—10	0.15—0.30
				120 (100—140)	0.5DC—	—10	0.15—0.25
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	120 (80—130)	—0.5DC	—10	0.15—0.30
				100 (80—120)	0.5DC—	—10	0.15—0.25
	Alloy Tool Steel	≤300HB	**VP15TF JM**	100 (60—110)	—0.5DC	—10	0.10—0.20
				80 (60—100)	0.5DC—	—10	0.10—0.15
M	Stainless Steel	≤200HB	**VP20RT JM**	140 (100—150)	—0.5DC	—10	0.10—0.25
				120 (100—140)	0.5DC—	—10	0.10—0.20
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	120 (80—130)	—0.5DC	—10	0.25—0.40
				100 (80—120)	0.5DC—	—10	0.25—0.40
			VP15TF JM	120 (80—130)	—0.5DC	—10	0.15—0.30
				100 (80—120)	0.5DC—	—10	0.15—0.25
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	100 (60—110)	—0.5DC	—10	0.20—0.35
				80 (60—110)	0.5DC—	—10	0.20—0.35
			VP15TF JM	100 (60—120)	—0.5DC	—10	0.15—0.30
				80 (60—120)	0.5DC—	—10	0.15—0.30
S	Ti Alloy	≤350HB	**VP20RT JM**	45 (35—50)	—0.5DC	—10	0.08—0.10
				40 (35—50)	0.5DC—	—10	0.08—0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

■ SLOT MILLING

	Workpiece Material	Hardness	Grade Breaker	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF JM**	120 (100—140)	—10	DC	0.15—0.25
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	100 (80—120)	—0.25DC	DC	0.15—0.25
	Alloy Tool Steel	≤300HB	**VP15TF JM**	80 (60—100)	—10	DC	0.10—0.20
M	Stainless Steel	≤200HB	**VP20RT JM**	100 (80—140)	—10	DC	0.10—0.15
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	80 (60—100)	—0.25DC	DC	0.10—0.25
				60 (50—100)	—0.6DC	DC	0.10—0.20
			VP15TF JM	80 (60—100)	—0.25DC	DC	0.10—0.20
				60 (50—100)	—0.6DC	DC	0.10—0.15
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	80 (60—100)	—0.25DC	DC	0.10—0.25
				60 (50—100)	—0.5DC	DC	0.10—0.20
			VP15TF JM	80 (60—100)	—0.25DC	DC	0.10—0.20
				60 (50—100)	—0.5DC	DC	0.10—0.15
S	Ti Alloy	≤350HB	**VP20RT JM**	40 (35—50)	—0.25DC	DC	0.06—0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

90° KAPR

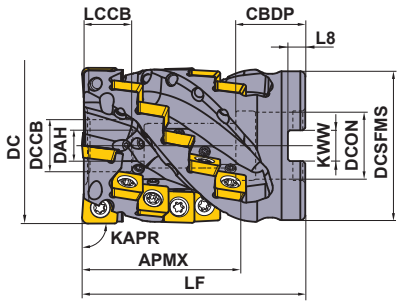
ASPX

NEW

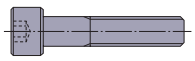
P | M | K | N | **S** | H

Heat Resistant Alloy





Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ50	HSC10070	
ϕ63	HSC12070	
ϕ80	HSC16080	

■ SHELL TYPE

With Coolant Hole : Shell type should be combined with a through coolant arbor.

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions (mm) LF	Dimensions (mm) DCON	**WT** (kg)	**APMX** (mm)
50	**ASPX4-050A03A054RA15**	●	3	15	85	22	0.6	54
63	**ASPX4-063A04A064RA24**	●	4	24	90	27	1.0	64
80	**ASPX4-080A05A075RA35**	●	5	35	100	32	2.0	75

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm) DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**ASPX4-050A03A054RA15**	22	21	10.5	17	14	47	10.4	6.3
63	**ASPX4-063A04A064RA24**	27	28	12.5	21	19	60	12.4	7
80	**ASPX4-080A05A075RA35**	32	28	16.5	27	20	76	14.4	8

SPARE PARTS

Tool Holder Type	Clamp Screw *	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Number of Insert JPGX	Number of Insert SPGX
ASPX4-050A	TS55	W10-S1	TKY25D	HSD04004H08	18	MK1KS	3	12
ASPX4-063A	TS55	W12-S1	TKY25D	HSD04004H08	28	MK1KS	4	20
ASPX4-080A	TS55	W16-S1	TKY25D	HSD04004H08	40	MK1KS	5	30

* Clamp Torque (N • m) : TS55 = 5.0

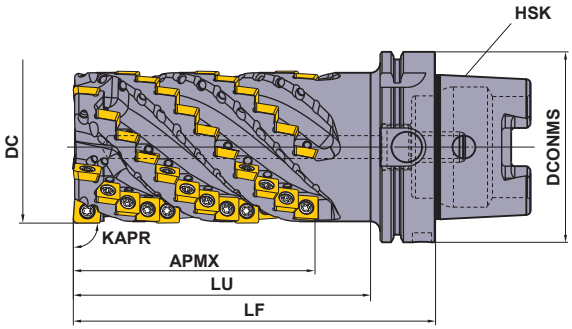
	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.
Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶





The standard type is right-handed (R) only.
The HSK shank type has a built-in movable coolant pipe for installation.

■HSK Shank Type

With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions (mm) LF	LU	DCONMS	HSK	APMX (mm)
80	**ASPX4R0805H100A127SA**	●	5	60	190	156	100	HSK-A100	127
80	**ASPX4R0805H125A127SA**	●	5	60	190	156	125	HSK-A125	127

SPARE PARTS

Tool Holder Type	Clamp Screw *	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Number of Insert JPGX	SPGX
ASPX4R0805H100A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55
ASPX4R0805H125A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55

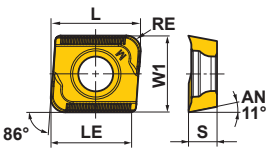
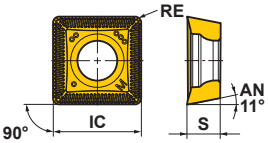
* Clamp Torque (N • m) : TS55 = 5.0

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material		
S	Heat resistant Alloy	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

Shape		Order Number	Class	Edge Preparation	Coated MP9140	Dimensions (mm) L	LE	W1	IC	S	RE	Geometry
Bottom	 2 Corner	**JPGX1404080PPER-JM**	G	E	●	15.12	13.4	12.7	—	4.8	0.8	
		JPGX1404120PPER-JM	G	E	●	15.06	13.3	12.7	—	4.8	1.2	
		JPGX1404160PPER-JM	G	E	●	15.00	13.3	12.7	—	4.8	1.6	
		JPGX1404240PPER-JM	G	E	●	14.88	13.2	12.7	—	4.8	2.4	
		JPGX1404320PPER-JM	G	E	●	14.72	13.1	12.7	—	4.8	3.2	
		JPGX1404400PPER-JM	G	E	●	14.64	13.0	12.7	—	4.8	4.0	
		JPGX1404500PPER-JM	G	E	●	14.49	13.0	12.7	—	4.8	5.0	
		JPGX1404635PPER-JM	G	E	●	14.29	12.9	12.7	—	4.8	6.35	
Peripheral	 4 Corner	**SPGX1204100PPER-JM**	G	E	●	—	—	—	12.7	4.8	1.0	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Cutting Width **ae** (mm)	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)
S	Ti Alloys Ti-6Al-4V,Ti-6Al-4V-ELI Ti-10V-2Fe-3Al Ti-5Al-5V-5Mo-3Cr etc.	ae≤0.5DC	60(50－80)	0.12(0.10－0.14)
		0.5DC<ae<0.8DC	50(40－60)	0.10(0.08－0.12)
		ae≥0.8DC	40(50－60)	0.08(0.06－0.10)

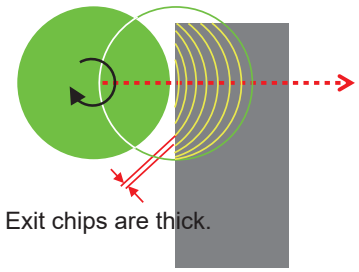
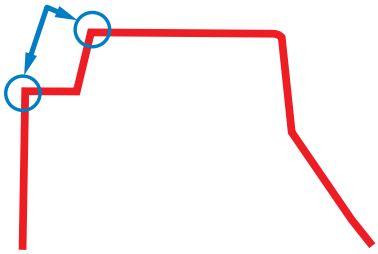
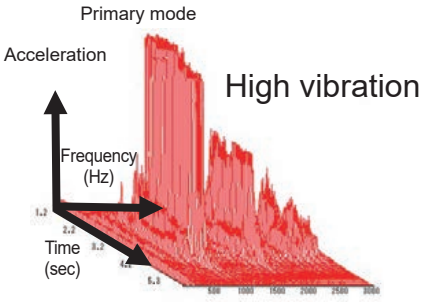
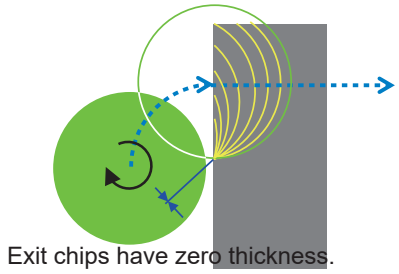
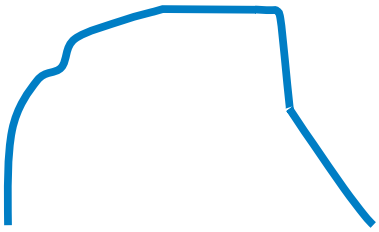
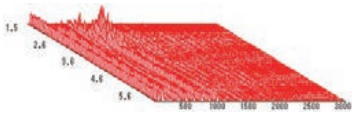
Note 1) The cutting performance depends on machine and clamping rigidity, as well as the supply and pressure of the coolant. Adjust as necessary.
Note 2) Use a machine and spindle size suitable for heavy machining of titanium alloys. (7/24 taper #50 or #60, or high rigidity HSK-A100 or A125, with an output of 15kW or higher and torque of 500 Nm or higher for a rotation speed of 500min^{-1} or less).
Caution, at high load cutting conditions the output power of the machine spindle may be exceeded.
Note 3) If chatter and vibration or machine overloading occur, it is recommended to reduce the depth of cut ap.
Note 4) The coolant system combines internal and external lubrication. It is recommended to supply coolant in ample quantities.
Note 5) A gradual roll feed into the workpiece and use of down cutting (climb milling) is recommended. (refer to page L291)

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

How to Use

■ Positive Effects of a Roll Into Cutting Approach

The roll into cutting approach can control sharp increases in cutting loads and prevent sudden chipping of inserts which is likely to occur at the start of machining.

Approach Method	Cutting Load Simulation	Image of Cutting Vibration Frequency
Direct Approach  	Cutting load increases suddenly. High risk of chipping. 	
Roll Into Cutting Approach  	Cutting load increases smoothly. 	Almost no vibration Primary mode 

Down cutting (climb milling) is recommended.

■ Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R3.2mm, please machine the cutter body with a radius form as shown in the table below.



Insert Corner R **RE** (mm)	Cutter Body Radius **R** (mm)
3.2	3.0
4.0	4.0
5.0	5.0
6.35	6.2

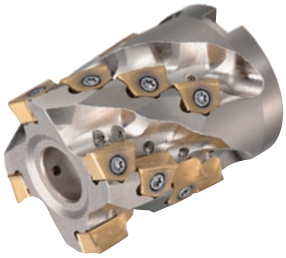
DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

90° KAPR

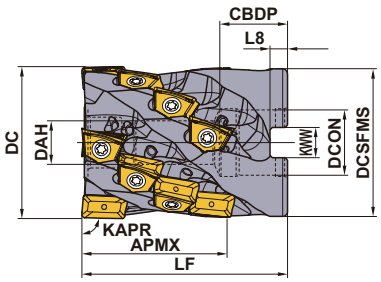
VFX5

P M K N **S** H

Heat Resistant Alloy



- Vertical inserts with high strength cutting edge.
- Screw-on type clamping.
- High efficiency milling of titanium alloys.



Right hand tool holder only.

■ SHELL TYPE

With Coolant Hole

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)								APMX (mm)	WT(kg)
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8		
VFX5-040A03A026R	▲	3	6	40	50	16	21	8.5	38.2	8.4	5.6	26	0.3
VFX5-040A03A038R	▲	3	9	40	60	16	21	8.5	38.2	8.4	5.6	38	0.4
VFX5-050X03A026R	▲	3	6	50	50	27	23	12.5	48.2	12.4	7.0	26	0.4
VFX5-050X03A038R	▲	3	9	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A026R	▲	4	8	50	50	22	21	10.5	48.2	10.4	6.3	26	0.5
VFX5-050A04A038R	▲	4	12	50	60	22	21	10.5	48.2	10.4	6.3	38	0.6
VFX5-050X04A038R	▲	4	12	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A050R	▲	4	16	50	70	22	21	10.5	48.2	10.4	6.3	50	0.7
VFX5-063A05A026R	▲	5	10	63	60	27	28	12.5	61	12.4	7.0	26	1.0
VFX5-063A05A063R	▲	5	25	63	85	27	28	12.5	61	12.4	7.0	63	1.4
VFX5-080A06A075R	▲	6	36	80	100	32	28	16.5	77.3	14.4	8.0	75	2.8

Scan here for product NEWS ▶

▲ : Inventory maintained in Japan. To be replaced by new products.

SPARE PARTS

Order Number	 ✶2				 ✶3				Number of Insert	
									End Cutting Edge	Peripheral ✶1 Cutting Edge
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	XNMU1607 ○○R-○○	XNMU1607 08R-○○
VFX5-040A03A026R	TS352	6	W8-S1	TKY10D	HSD04004H08	9	MK1KS	HSC08040	3	3
VFX5-040A03A038R	TS352	9	W8-S1	TKY10D	HSD04004H08	12	MK1KS	HSC08050	3	6
VFX5-050X03A026R	TS352	6	W12-S1	TKY10D	HSD04004H08	9	MK1KS	HSC12035	3	3
VFX5-050X03A038R	TS352	9	W12-S1	TKY10D	HSD04004H08	12	MK1KS	HSC12045	3	6
VFX5-050A04A026R	TS352	8	W10-S1	TKY10D	HSD04004H08	12	MK1KS	HSC10035	4	4
VFX5-050A04A038R	TS352	12	W10-S1	TKY10D	HSD04004H08	16	MK1KS	HSC10045	4	8
VFX5-050X04A038R	TS352	12	W12-S1	TKY10D	HSD04004H08	16	MK1KS	HSC12045	4	8
VFX5-050A04A050R	TS352	16	W10-S1	TKY10D	HSD04004H08	20	MK1KS	HSC10055	4	12
VFX5-063A05A026R	TS352	10	W12-S1	TKY10D	HSD04004H08	15	MK1KS	HSC12045	5	5
VFX5-063A05A063R	TS352	25	W12-S1	TKY10D	HSD04004H08	30	MK1KS	HSC12070	5	20
VFX5-080A06A075R	TS352	36	W16-S1	TKY10D	HSD04004H08	42	MK1KS	HSC16080	6	30

✶1 Only corner radius R0.8 can be used for the peripheral cutting edges except the end cutting edge.

✶2 Clamp Torque (N • m) : TS352=2.5

✶3 Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

✶ Clamp Torque (N • m) : HSD0400H○○=1.5

Note 1) The part number for a blank screw without a through nozzle is HSS04004.

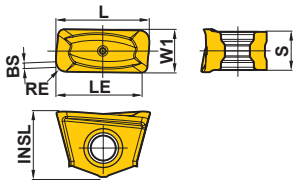
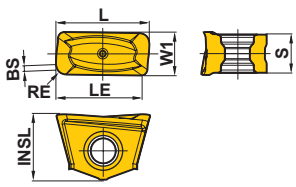
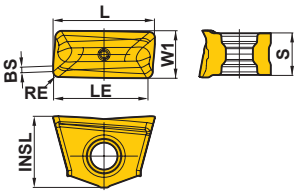
Note 2) Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material	S	Heat resistant Alloy, Titanium Alloy	✱			

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Stock	Coated	Dimensions (mm)							Geometry
		MP9130		L	LE	W1	INSL	S	BS	RE	
General Purpose 	**XNMU160708R-MS**	▲		16.0	13.4	7.0	11.1	6.5	1.0	0.8	
	XNMU160712R-MS	▲		16.0	13.8	7.0	11.1	6.5	1.0	1.2	
	XNMU160716R-MS	▲		16.0	13.8	7.0	11.1	6.5	1.0	1.6	
	XNMU160724R-MS	▲		16.0	13.8	7.0	11.1	6.5	1.0	2.4	
	✱1 **XNMU160732R-MS**	▲		17.3	14.4	7.0	11.1	6.5	—	3.2	
	✱1 **XNMU160740R-MS**	▲		18.9	15.2	7.0	11.1	6.5	—	4.0	
Cutting Edge Enhancement Type 	**XNMU160708R-HS**	▲		16.0	13.4	7.0	11.1	6.5	1.0	0.8	
Chip Processing Type 	**XNMU160708R-LS**	▲		16.0	13.4	7.0	11.1	6.5	1.0	0.8	

✱1 Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

VFX5

	Workpiece Material	Cutting Edge Diameter (mm)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (m/min)	Revolution **n** (min^{-1})	Depth of Cut **apmax** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Table Feed **vf** (mm/min)	Chip Removal Rate **Q** (cm^3/min)	Estimated Cutting Power (kW)	Expected Torque (Nm)	Tool Life Ratio (%)
S	Titanium Alloy (Ti-6Al-4V)	ϕ40	3	LS	40	318	38	40	0.10	95	145	6.5	194	40
			3	MS	50	398	38	24	0.10	119	109	4.5	109	60
			3	MS	60	477	38	16	0.10	143	87	3.5	69	80
			3	HS	60	477	38	8	0.12	172	52	2.3	45	100
		ϕ50	3	LS	40	255	38	50	0.10	76	145	6.5	242	40
			4	MS	50	318	50	30	0.10	127	191	7.9	237	60
			4	MS	60	382	50	20	0.10	153	153	6.0	151	80
			4	HS	60	382	50	10	0.12	183	92	3.9	98	100
		ϕ63	5	LS	40	202	60	63	0.10	101	382	16.8	793	40
			5	MS	50	253	60	38	0.10	126	286	11.8	447	60
			5	MS	60	303	60	25	0.10	152	229	9.0	285	80
			5	HS	60	303	60	13	0.12	182	138	5.9	185	100
		ϕ80	6	LS	40	159	75	80	0.10	95	573	25.0	1500	40
			6	MS	50	199	75	48	0.10	119	430	17.6	846	60
			6	MS	60	239	75	32	0.10	143	344	13.5	539	80
			6	HS	60	239	75	16	0.12	172	206	8.7	350	100
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr)	ϕ40	3	LS	25	199	38	40	0.08	48	73	3.4	161	30
			3	MS	25	199	38	24	0.08	48	44	1.9	92	50
			3	MS	30	239	38	16	0.10	72	44	1.8	74	70
			3	HS	30	239	38	8	0.10	72	22	1.0	41	90
		ϕ50	4	LS	25	159	50	50	0.08	51	127	5.8	350	30
			4	MS	25	159	50	30	0.08	51	76	3.4	201	50
			4	MS	30	191	50	20	0.10	76	76	3.2	160	70
			4	HS	30	191	50	10	0.10	76	38	1.8	89	90
		ϕ63	5	LS	25	126	60	63	0.08	51	191	8.7	658	30
			5	MS	25	126	60	38	0.08	51	115	5.0	378	50
			5	MS	30	152	60	25	0.10	76	115	4.8	301	70
			5	HS	30	152	60	13	0.10	76	57	2.6	167	90
		ϕ80	6	LS	25	99	75	80	0.08	48	286	13.0	1246	30
			6	MS	25	99	75	48	0.08	48	172	7.5	716	50
			6	MS	30	119	75	32	0.10	72	172	7.1	570	70
			6	HS	30	119	75	16	0.10	72	86	3.9	316	90

Note 1) Please note that machining performance varies depending to the conditions such as machine rigidity, work clamping rigidity, coolant supply system, pressure and flow volume etc.

Note 2) Internal coolant is recommended. Please use an FMH type arbor for through coolant. Using external coolant in combination with through coolant is even more effective.

Note 3) The tool life ratio shows the standard when ae = tool diameter × 20% is assumed to be 100 when shoulder cutting.

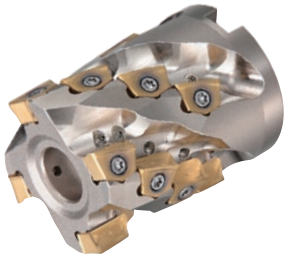
Note 4) The maximum depth of cut (apmax) varies according to the machine rigidity and power.

DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

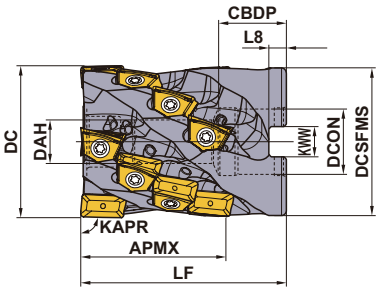
VFX6

P | M | K | N | **S** | H

Heat Resistant Alloy



- Vertical inserts with high strength cutting edge.
- Screw-on type clamping.
- High efficiency milling of titanium alloys.



Right hand tool holder only.

■ SHELL TYPE

With Coolant Hole

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)								APMX (mm)	WT(kg)
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8		
VFX6-063A04A031R	▲	4	8	63	60	27	28	12.5	61	12.4	7	31	0.9
VFX6-063A04A060R	▲	4	16	63	85	27	28	12.5	61	12.4	7	60	1.3
VFX6-080A05A031R	▲	5	10	80	60	32	28	16.5	77.3	14.4	8	31	1.5
VFX6-080A05A075R	▲	5	25	80	100	32	28	16.5	77.3	14.4	8	75	2.6
VFX6-100A06A031R	▲	6	12	100	65	40	30	20.5	96.6	16.4	9	31	2.7
VFX6-100A06A090R	▲	6	36	100	115	40	30	20.5	96.6	16.4	9	90	4.8

Scan here for product NEWS ▶

▲ : Inventory maintained in Japan. To be replaced by new products.

SPARE PARTS

Order Number	 ✶2				 ✶3				Number of Insert	
									End Cutting Edge	Peripheral Cutting Edge ✶1
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	XNMU1909 ○○R-○○	XNMU1909 12R-○○
VFX6-063A04A031R	TS450	8	W12-S1	TKY20T	HSD04004H08	12	MK1KS	HSC12045	4	4
VFX6-063A04A060R	TS450	16	W12-S1	TKY20T	HSD04004H08	20	MK1KS	HSC12070	4	12
VFX6-080A05A031R	TS450	10	W16-S1	TKY20T	HSD04004H08	15	MK1KS	HSC16040	5	5
VFX6-080A05A075R	TS450	25	W16-S1	TKY20T	HSD04004H08	30	MK1KS	HSC16080	5	20
VFX6-100A06A031R	TS450	12	W20-S1	TKY20T	HSD04004H08	18	MK1KS	HSC20040	6	6
VFX6-100A06A090R	TS450	36	W20-S1	TKY20T	HSD04004H08	42	MK1KS	HSC20090	6	30

✶1 Only corner radius R1.2 can be used for the peripheral cutting edges except the end cutting edge.

✶2 Clamp Torque (N • m) : TS450=5.0

✶3 Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

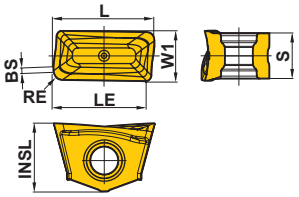
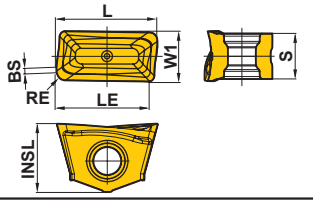
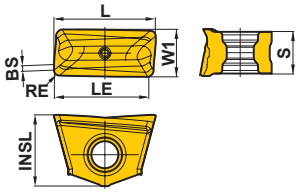
✶ Clamp Torque (N • m) : HSD0400H○○=1.5

Note 1) The part number for a blank screw without a through nozzle is HSS04004.

Note 2) Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm Corner radius 5.0: LF+1.5mm

ISO13399 ➢ L003
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

INSERTS

Workpiece Material	S	Heat resistant Alloy	✱				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting							
Shape	Order Number		Stock Coated MP9130				Dimensions (mm) L	LE	W1	INSL	S	BS	RE	Geometry
General Purpose 	XNMU190912R-MS		▲				19.1	16.5	9.5	12.7	8.5	1.0	1.2	
	XNMU190916R-MS		▲				19.1	16.5	9.5	12.7	8.5	1.0	1.6	
	XNMU190924R-MS		▲				19.1	16.6	9.5	12.7	8.5	1.0	2.4	
	✱1 XNMU190932R-MS		▲				20.2	17.1	9.5	12.7	8.5	—	3.2	
	✱1 XNMU190940R-MS		▲				21.8	17.8	9.5	12.7	8.5	—	4.0	
	✱1 XNMU190950R-MS		▲				21.8	17.8	9.5	12.7	8.5	—	5.0	
Cutting Edge Enhancement Type 	XNMU190912R-HS		▲				19.1	16.5	9.5	12.7	8.5	1.0	1.2	
Chip Processing Type 	XNMU190912R-LS		▲				19.1	16.5	9.5	12.7	8.5	1.0	1.2	

✱1 Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm Corner radius 5.0: LF+1.5mm

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

VFX6

Workpiece Material		Cutting Edge Diameter (mm)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (m/min)	Revolution **n** (min^{-1})	Depth of Cut **apmax** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Table Feed **vf** (mm/min)	Chip Removal Rate **Q** (cm^3/min)	Estimated Cutting Power (kW)	Expected Torque (Nm)	Tool Life Ratio (%)
S	Titanium Alloy (Ti-6Al-4V)	ϕ63	4	LS	40	202	60	63	0.10	81	306	13.4	634	40
			4	MS	50	253	60	38	0.10	101	229	9.5	357	60
			4	MS	60	303	60	25	0.10	121	183	7.2	228	80
			4	HS	60	303	60	13	0.12	146	110	4.7	148	100
		ϕ80	5	LS	40	159	75	80	0.10	80	477	20.8	1250	40
			5	MS	50	199	75	48	0.10	99	358	14.7	705	60
			5	MS	60	239	75	32	0.10	119	286	11.2	449	80
			5	HS	60	239	75	16	0.12	143	172	7.3	291	100
		ϕ100	6	LS	40	127	90	100	0.10	76	688	29.6	2218	40
			6	MS	50	159	90	60	0.10	95	516	20.9	1252	60
			6	MS	60	191	90	40	0.10	115	413	16.0	798	80
			6	HS	60	191	90	20	0.12	138	248	10.3	517	100
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr)	ϕ63	4	LS	25	126	60	63	0.08	40	153	7.0	527	30
			4	MS	25	126	60	38	0.08	40	92	4.0	303	50
			4	MS	30	152	60	25	0.10	61	92	3.8	241	70
			4	HS	30	152	60	13	0.10	61	46	2.1	133	80
		ϕ80	5	LS	25	99	75	80	0.08	40	239	10.8	1038	30
			5	MS	25	99	75	48	0.08	40	143	6.2	597	50
			5	MS	30	119	75	32	0.10	60	143	5.9	475	70
			5	HS	30	119	75	16	0.10	60	72	3.3	263	80
		ϕ100	6	LS	25	80	90	100	0.08	38	344	15.3	1841	30
			6	MS	25	80	90	60	0.08	38	206	8.8	1059	50
			6	MS	30	95	90	40	0.10	57	206	8.4	844	70
			6	HS	30	95	90	20	0.10	57	103	4.7	466	80

Note 1) Please note that machining performance varies depending to the conditions such as machine rigidity, work clamping rigidity, coolant supply system, pressure and flow volume etc.

Note 2) Internal coolant is recommended. Please use an FMH type arbor for through coolant. Using external coolant in combination with through coolant is even more effective.

Note 3) The tool life ratio shows the standard when ae = tool diameter × 20% is assumed to be 100 when shoulder cutting.

Note 4) The maximum depth of cut (apmax) varies according to the machine rigidity and power.

BALL NOSE END MILL

SRF/SRB

P	M	K	N	S	H
Steel		Cast Iron	Non-ferrous Metal		Hardened Steel



- S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills.
- Highly accurate corner radius tolerance allows for high precision finishing.
- Carbide shank type available.

Fig.1

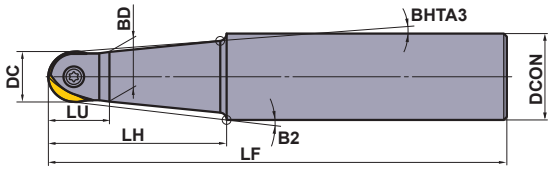


Fig.2

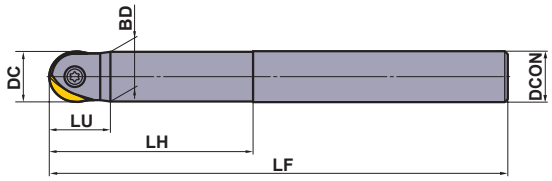
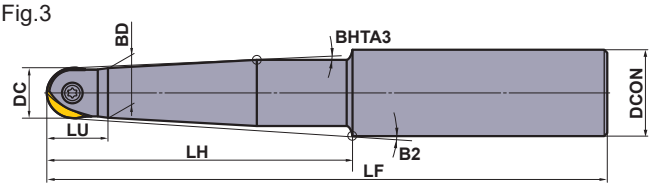


Fig.3



Right hand tool holder only.

■STEEL SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Fig.	*1	D T	
		R		RE*2	DC	DCON	LF	BD	LH	LU	B2	BHTA3		Clamp Screw	Wrench	Insert
Standard	SRFH10S12M	●	1	5	10	12	110	9.5	40	13	1.63°	1.5°	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S16M	●	1	6	12	16	120	11.5	50	15	2.6°	1.5°	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S20M	●	1	8	16	20	130	15.5	50	20	2.73	1.5°	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S25M	●	1	10	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32M	●	1	12.5	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32M	●	1	15	30	32	200	29.5	100	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30
	SRFH32S32M	●	1	16	32	32	200	31.5	100	35	—	—	2	RS8030T	TKY30T	SRFT32 SRBT32
Semi-long	SRFH10S12L	●	1	5	10	12	150	9.5	60	13	1.5°	1.5°	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S16L	●	1	6	12	16	160	11.5	70	15	1.78°	1.5°	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S20L	●	1	8	16	20	160	15.5	70	20	1.85°	1.5°	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S25L	●	1	10	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH20S20L80	●	1	10	20	20	180	19.5	80	24	—	—	2	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32L	●	1	12.5	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH25S25L100	●	1	12.5	25	25	200	24.5	100	30	—	—	2	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32L	●	1	15	30	32	230	29.5	130	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30
Long	SRFH20S25E	●	1	10	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH20S20E120	●	1	10	20	20	220	19.5	120	24	—	—	2	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32E	●	1	12.5	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH25S25E150	●	1	12.5	25	25	250	24.5	150	30	—	—	2	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32E	●	1	15	30	32	300	29.5	200	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30

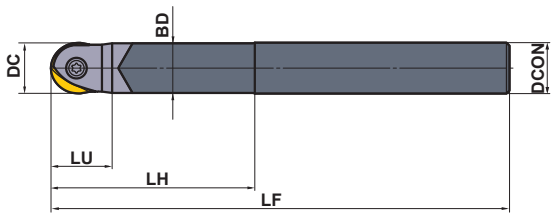
*1 Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0
*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Fig.1



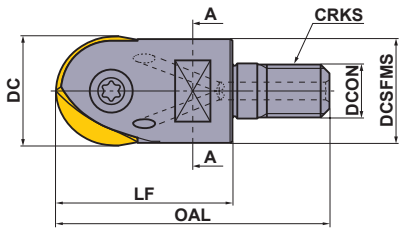
Right hand tool holder only.

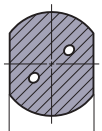
■CARBIDE SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							Fig.	*1	D T	
		R		RE*2	DC	DCON	LF	BD	LH	LU		Clamp Screw	Wrench	Insert
Standard	**SRFH10S10MW**	●	1	5	10	10	110	9.5	40	13	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S12MW	●	1	6	12	12	120	11.5	50	15	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S16MW	●	1	8	16	16	130	15.5	50	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S20MW	●	1	10	20	20	180	19.5	80	24	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S25MW	●	1	12.5	25	25	200	24.5	100	30	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32MW	●	1	15	30	32	230	29.5	130	35	1	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	32	231	29.5	131	36				SRFT32 SRBT32
Long	**SRFH10S10LW**	●	1	5	10	10	150	9.5	60	13	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S12LW	●	1	6	12	12	160	11.5	70	15	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S16LW	●	1	8	16	16	160	15.5	70	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH16S16EW	●	1	8	16	16	200	15.5	110	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S20LW	●	1	10	20	20	250	19.5	150	24	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S25LW	●	1	12.5	25	25	300	24.5	200	30	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32LW	●	1	15	30	32	350	29.5	250	35	1	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	32	351	29.5	251	36				SRFT32 SRBT32

Note 1) SRFH30S32MW and SRFH30S32LW tool bodies can use both inserts SRFT30 and SRFT32.
However the overall length sizes, LF and LH, differ respectively.
*1 Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0
*2 RE is shown for insert corner R.







A-A section

■SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg)	*1		
	R			RE *2	DC	DCON	DCSFMS	OAL	LF	S10	CRKS		Clamp Screw	Wrench	Insert
SRFH16AM0830	●	○	1	8	16	8.5	14.9	48	30	10	8	0.1	RS4015T	TKY15T	SRFT16 SRBT16
SRFH20AM1035	●	○	1	10	20	10.5	18.4	54	35	14	10	0.1	RS5020T	TKY20T	SRFT20 SRBT20
SRFH25AM1240	●	○	1	12.5	25	12.5	23.5	62	40	19	12	0.1	RS6025T	TKY25T	SRFT25 SRBT25
SRFH30AM1645	●	○	1	15	30	17	28.1	68	45	24	16	0.2	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	17	28.1	69	46	24	16	0.2			SRFT32 SRBT32

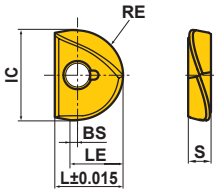
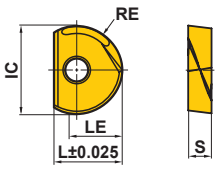
Note 1) SRFH30AM1645 tool body can use both inserts SRFT30 and SRFT32. However, the overall length sizes, OAL and LF, differ respectively.
Note 2) For screw-in type arbors, refer to page L341.
*1 Clamp Torque (N • m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0
*2 RE is shown for insert corner R.

ISO13399	➢ L003
ARBORS	➢ L341
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
H	Hardened Steel	

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Coated				Dimensions (mm)							Geometry
		EP6120	VP15TF	MP8010		IC	RE Corner R	RE Tolerance	L	LE	BS	S	
	SRFT10	●	●	●		10	5	±0.006	8.5	5.5	0.5	2.6	
	SRFT12	●	●	●		12	6	±0.006	10	6.5	0.5	3	
	SRFT16	●	●	●		16	8	±0.006	12	9	1	4	
	SRFT20	●	●	●		20	10	±0.006	15	11	1	5	
	SRFT25	●	●	●		25	12.5	±0.006	18.5	13.5	1	6	
	SRFT30	●	●	●		30	15	±0.006	22.5	16	1	7	
	SRFT32	●	●	●		32	16	±0.006	23.5	17	1	7	
	SRBT10		●			10	5	±0.02	8.5	5	—	2.6	
	SRBT12		●			12	6	±0.02	10	6	—	3	
	SRBT16		●			16	8	±0.025	12	8	—	4	
	SRBT20		●			20	10	±0.025	15	10	—	5	
	SRBT25		●			25	12.5	±0.035	18.5	12.5	—	6	
	SRBT30		●			30	15	±0.035	22.5	15	—	7	
	SRBT32		●			32	16	±0.035	23.5	16	—	7	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. It is recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.



● : Inventory maintained in Japan.
(Contains 2 inserts per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)
P	Mild Steel (ASTM A36, AISI 1010)	≤180HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140)	180—280HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Carbon Steel, Alloy Steel (AISI 4340)	280—350HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Pre-Hardened Steel (AISI P21, AISI P20 etc)	35—45HRC	**EP6120**	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
	Alloy Tool Steel	≤350HB	**EP6120**	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
K	Gray Cast Iron (FC300)	Tensile Strength ≤350MPa	**MP8010**	250 (80—450)	0.2 (0.1—0.3)	≤0.05DC
	Ductile Cast Iron (FCD450)	Tensile Strength ≤450MPa	**MP8010**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
N	Copper, Copper alloys	—	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
H	Hardened Steel	45—55HRC	**MP8010**	100 (60—120)	0.2 (0.1—0.3)	≤0.05DC
	Hardened Steel	55—65HRC	**MP8010**	80 (60—120)	0.2 (0.1—0.3)	≤0.01DC

Note 1) The above values are average condition values at actual cutting speeds. The values change slightly according to the state of a machine to be used and method of workholding. Adjust the values depending on an actual machine condition, referring to the above values.
Note 2) For end mills with a carbide shank, you will be able to set about 20% higher cutting conditions.
Note 3) Please note the following when machining hardened steel with MP8010.
- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Please note the setting of the depth of cut especially to prevent the fracture.

CUTTING SPEED FORMULAE

1. Employingθ° ➡ Calculate cutting speed at point P.
(Cutting speed at the cutting depth border for oblique machining)

Formula : Cutting Speed = $\frac{\pi \cdot DC \cdot \sin\theta \cdot n}{1000}$ (m/min)

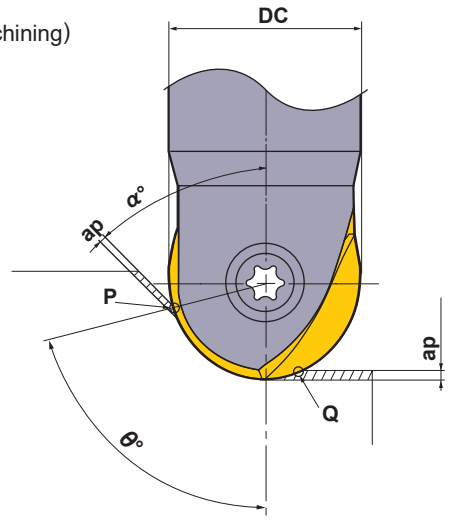
$$\theta° = \cos^{-1}\left(\frac{DC-2ap}{DC}\right)+90-\alpha$$

n : Spindle Speed (min^{-1})

2. Employing ap ➡ Calculate cutting speed at point Q.
(Cutting speed at the cutting depth border)

Formula : Cutting Speed = $\frac{2\pi n\sqrt{ap\,(DC-ap)}}{1000}$ (m/min)

n : Spindle Speed (min^{-1})
DC : Cutting Edge Diameter (mm)
ap : Depth of Cut (mm)



RADIUS END MILL

SUF

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel



- Highly accurate corner radius tolerance allows for high precision finishing.
- Seamless gash.

Fig.1

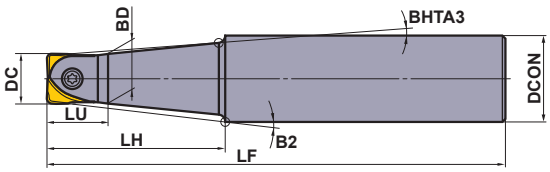


Fig.2

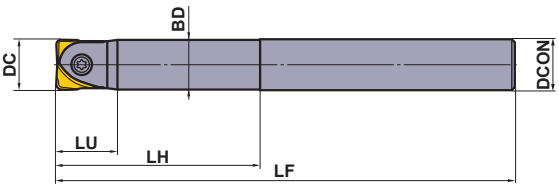
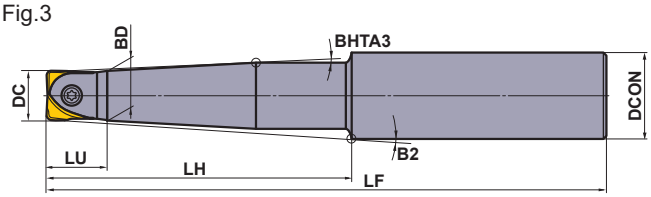


Fig.3



■STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Fig.	*	D T	
		R		DC	DCON	LF	BD	LH	LU	B2	BHTA3		Clamp Screw	Wrench	Insert
Standard	SRFH10S12M	●	1	10	12	110	9.5	40	13	1.63°	—	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S16M	●	1	12	16	120	11.5	50	15	2.60°	—	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S20M	●	1	16	20	130	15.5	50	20	2.73°	—	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S25M	●	1	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32M	●	1	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32M	●	1	30	32	200	29.5	100	35	—	—	2	RS8030T	TKY30T	SUFT30R○○
	SRFH32S32M	●	1	32	32	200	31.5	100	35	—	—	2	RS8030T	TKY30T	SUFT32R○○
Semi-long	SRFH10S12L	●	1	10	12	150	9.5	60	13	1.5°	—	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S16L	●	1	12	16	160	11.5	70	15	1.78°	—	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S20L	●	1	16	20	160	15.5	70	20	1.85°	—	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S25L	●	1	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	TKY20T	SUFT20R○○
	SRFH20S20L80	●	1	20	20	180	19.5	80	24	—	—	2	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32L	●	1	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	TKY25T	SUFT25R○○
	SRFH25S25L100	●	1	25	25	200	24.5	100	30	—	—	2	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32L	●	1	30	32	230	29.5	130	35	—	—	2	RS8030T	TKY30T	SUFT30R○○
Long	SRFH20S25E	●	1	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	TKY20T	SUFT20R○○
	SRFH20S20E120	●	1	20	20	220	19.5	120	24	—	—	2	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32E	●	1	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	TKY25T	SUFT25R○○
	SRFH25S25E150	●	1	25	25	250	24.5	150	30	—	—	2	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32E	●	1	30	32	300	29.5	200	35	—	—	2	RS8030T	TKY30T	SUFT30R○○

* Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

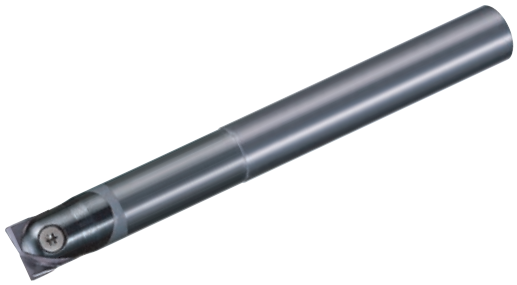
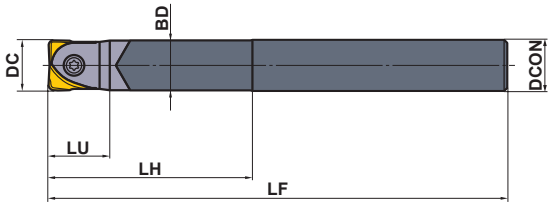


Fig.1



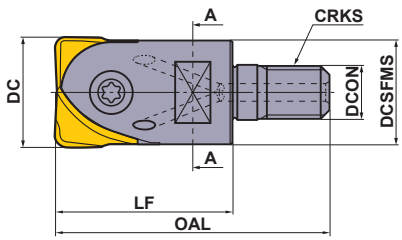
■CARBIDE SHANK TYPE

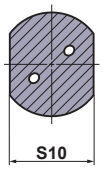
Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)						Fig.	*	D T	
		R		DC	DCON	LF	BD	LH	LU		Clamp Screw	Wrench	Insert
Standard	**SRFH10S10MW**	●	1	10	10	110	9.5	40	13	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S12MW	●	1	12	12	120	11.5	50	15	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S16MW	●	1	16	16	130	15.5	50	20	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S20MW	●	1	20	20	180	19.5	80	24	1	RS5020T	TKY20T	SUFT20R○○
	SRFH25S25MW	●	1	25	25	200	24.5	100	30	1	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32MW	●	1	30	32	230	29.5	130	35	1	RS8030T	TKY30T	SUFT30R○○
				32	32	231	29.5	131	36				SUFT32R○○
Long	**SRFH10S10LW**	●	1	10	10	150	9.5	60	13	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S12LW	●	1	12	12	160	11.5	70	15	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S16LW	●	1	16	16	160	15.5	70	20	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S20LW	●	1	20	20	250	19.5	150	24	1	RS5020T	TKY20T	SUFT20R○○
	SRFH25S25LW	●	1	25	25	300	24.5	200	30	1	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32LW	●	1	30	32	350	29.5	250	35	1	RS8030T	TKY30T	SUFT30R○○
				32	32	351	29.5	251	36				SUFT32R○○

Note 1) SRFH30S32MW and SRFH30S32LW tool body can use both inserts SUFT30R○○ and SUFT32R○○.
However the overall length sizes, LF and LH, differ respectively.
∗ Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0







■SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)							WT (kg)	*		
	R			DC	DCON	DCSFMS	OAL	LF	S10	CRKS		Clamp Screw	Wrench	Insert
SRFH16AM0830	●	○	1	16	8.5	14.9	48	30	10	8	0.1	RS4015T	TKY15T	SUFT16R○○
SRFH20AM1035	●	○	1	20	10.5	18.4	54	35	14	10	0.1	RS5020T	TKY20T	SUFT20R○○
SRFH25AM1240	●	○	1	25	12.5	23.5	62	40	19	12	0.1	RS6025T	TKY25T	SUFT25R○○
SRFH30AM1645	●	○	1	30	17	28.1	68	45	24	16	0.2	RS8030T	TKY30T	SUFT30R○○
				32	17	28.1	69	46	24	16				SUFT32R○○

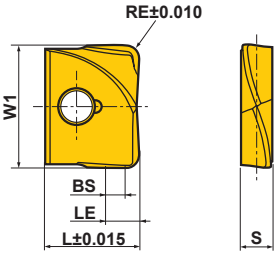
Note 1) SRFH30AM1645 tool body can use both inserts SUFT30R○○ and SUFT32R○○.
However the overall length sizes, OAL and LF, differ respectively.
Note 2) For screw-in type arbors, refer to page L341.
∗ Clamp Torque (N • m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

ISO13399	➢ L003
ARBORS	➢ L341
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	H	Hardened Steel

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Coated				Dimensions (mm)						Geometry
		MP8010	VP15TF			W1	RE	BS	LE	L	S	
	**SUFT10R05**	●	●			10	0.5	1	1.5	8.5	2.6	
	SUFT10R10	●	●			10	1	1	2	8.5	2.6	
	SUFT10R20	●	●			10	2	1	3	8.5	2.6	
	SUFT12R05	●	●			12	0.5	1.2	1.7	10	3	
	SUFT12R10	●	●			12	1	1.2	2.2	10	3	
	SUFT12R20	●	●			12	2	1.2	3.2	10	3	
	SUFT12R30	●	●			12	3	1.2	4.2	10	3	
	SUFT16R05	●	●			16	0.5	1.6	2.1	12	4	
	SUFT16R10	●	●			16	1	1.6	2.6	12	4	
	SUFT16R15	●	●			16	1.5	1.6	3.1	12	4	
	SUFT16R20	●	●			16	2	1.6	3.6	12	4	
	SUFT16R30	●	●			16	3	1.6	4.6	12	4	
	SUFT20R05	●	●			20	0.5	2	2.5	15	5	
	SUFT20R10	●	●			20	1	2	3	15	5	
	SUFT20R15	●	●			20	1.5	2	3.5	15	5	
	SUFT20R20	●	●			20	2	2	4	15	5	
	SUFT20R30	●	●			20	3	2	5	15	5	
	SUFT25R05	●	●			25	0.5	2.5	3	18.5	6	
	SUFT25R10	●	●			25	1	2.5	3.5	18.5	6	
	SUFT25R20	●	●			25	2	2.5	4.5	18.5	6	
	SUFT25R30	●	●			25	3	2.5	5.5	18.5	6	
	SUFT30R05	●	●			30	0.5	3	3.5	22.5	7	
	SUFT30R10	●	●			30	1	3	4	22.5	7	
	SUFT30R20	●	●			30	2	3	5	22.5	7	
	SUFT30R30	●	●			30	3	3	6	22.5	7	
	SUFT32R05	●	●			32	0.5	3.2	3.7	23.5	7	
	SUFT32R10	●	●			32	1	3.2	4.2	23.5	7	
	SUFT32R20	●	●			32	2	3.2	5.2	23.5	7	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. You are recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.



● : **Inventory maintained in Japan.**
(Contains 2 inserts per case.)

RECOMMENDED CUTTING CONDITIONS

■SHOULDER MILLING(When small width of cut.*)

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	200 (80—300)	≤0.05DC	≤0.05DC	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	**VP15TF**	150 (80—200)	≤0.05DC	≤0.05DC	0.15 (≤0.3)
	Alloy Tool Steel	180—380HB	**VP15TF**	150 (80—200)	≤0.05DC	≤0.05DC	0.15 (≤0.3)
M	Stainless Steel	≤270HB	**VP15TF**	150 (100—200)	≤0.05DC	≤0.05DC	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MP8010**	250 (180—450)	≤0.05DC	≤0.1DC	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80—300)	≤0.05DC	≤0.1DC	0.3 (≤0.4)
H	Hardened Steel	45—55HRC	**MP8010**	100 (80—120)	≤0.05DC	≤0.02DC	0.1 (≤0.2)
	Hardened Steel	55—65HRC	**MP8010**	80 (60—100)	≤0.05DC	≤0.02DC	0.1 (≤0.2)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

■SLOTTING•SHOULDER MILLING(When large width of cut.*)

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	200 (80—300)	≤0.02DC	≤DC	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	**VP15TF**	150 (80—200)	≤0.02DC	≤DC	0.15 (≤0.3)
	Alloy Tool Steel	180—380HB	**VP15TF**	150 (80—200)	≤0.02DC	≤DC	0.15 (≤0.3)
M	Stainless Steel	≤270HB	**VP15TF**	150 (100—200)	≤0.02DC	≤DC	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MP8010**	250 (180—450)	≤0.03DC	≤DC	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80—300)	≤0.03DC	≤DC	0.3 (≤0.4)
H	Hardened Steel	45—55HRC	**MP8010**	100 (80—120)	≤0.01DC	≤DC	0.1 (≤0.2)
	Hardened Steel	55—65HRC	**MP8010**	70 (60—80)	≤0.01DC	≤DC	0.1 (≤0.2)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

Note 1) This cutting condition is the standard condition when using the steel standard shank type. If it is occurred vibration or chipping on the cutting edge, please decrease the cutting condition as width of cut, depth of cut and feed per tooth depending on the situation.

Note 2) The value of cutting speed is stood at the peripheral diameter of the tool. Please calculate the spindle speed of tool in the following expressions.

Spindle speed of cutting tool $n(min^{-1})$=1000×Cutting speed vc ÷Diameter of cutting tool DC÷3.14

Note 3) Please note the following when machining hardened steel with MP8010.

- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Please note the setting of the depth of cut especially to prevent the fracture.

BALL NOSE END MILL

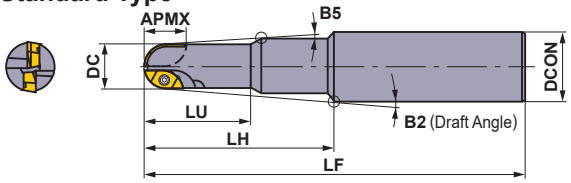
SRM2

P Steel | M Stainless Steel | K Cast Iron | N | S | H Hardened Steel

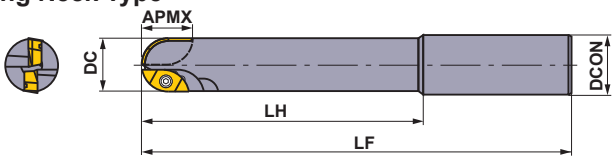


- Suitable for roughing to semi-finishing of small and medium moulds.
- High rigidity body design.
- Low resistance chipbreaker.
- Through coolant hole type.

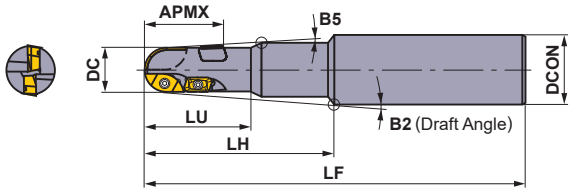
● Standard Type



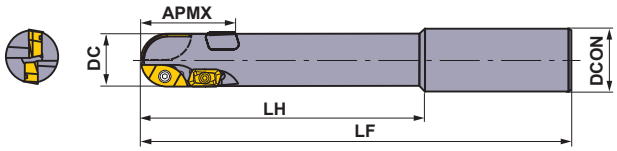
● Long Neck Type



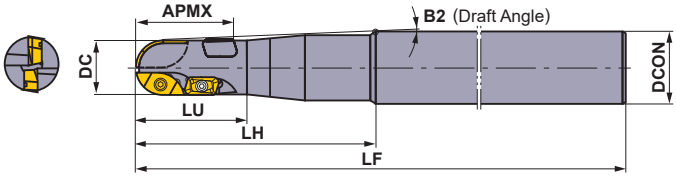
● Long Cutting Edge Type



● Long Neck Cutting Edge Type



● Extra Long Cutting Edge Type



Right hand tool holder only.

Type	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm) RE *2	DC	DCON	LF	LH	LU	APMX	B2	B5	*1 Clamp Screw Inner, Outer	*1 Clamp Screw Peripheral	Wrench D Inner, Outer	Wrench T F Peripheral	Insert Inner	Insert Outer	Insert Peripheral
Standard	SRM2160SNM	●	–	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2160SAM	●	○	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2200SNM	●	–	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2200SAM	●	○	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2250SNM	●	–	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2250SAM	●	○	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2300SNM	●	–	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–
	SRM2300SAM	●	○	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–

*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)									*1	*1	D T F				
		R			RE *2	DC	DCON	LF	LH	LU	APMX	B2	B5	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
														Clamp Screw		Wrench		Insert		
Long Cutting Edge	**SRM2200SNL**	●	–	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SAL	●	○	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNL	●	–	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SAL	●	○	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNL	●	–	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SAL	●	○	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
Long Neck	**SRM2160SNF**	●	–	2	8	16	16	150	70	–	12	–	–	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2160SAF	●	○	2	8	16	16	150	70	–	12	–	–	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2200SNF	●	–	2	10	20	20	180	100	–	14	–	–	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2200SAF	●	○	2	10	20	20	180	100	–	14	–	–	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2250SNF	●	–	2	12.5	25	25	200	120	–	19	–	–	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2250SAF	●	○	2	12.5	25	25	200	120	–	19	–	–	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2300SNF	●	–	2	15	30	32	230	150	–	24	–	–	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–
	SRM2300SAF	●	○	2	15	30	32	230	150	–	24	–	–	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–
Long Neck Cutting Edge	**SRM2200SNLF**	●	–	4	10	20	20	180	100	–	30	–	–	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SALF	●	○	4	10	20	20	180	100	–	30	–	–	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNLF	●	–	4	12.5	25	25	200	120	–	37	–	–	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SALF	●	○	4	12.5	25	25	200	120	–	37	–	–	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNLF	●	–	4	15	30	32	230	150	–	44	–	–	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SALF	●	○	4	15	30	32	230	150	–	44	–	–	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
Extra Long Cutting Edge	**SRM2200SNLL**	●	–	4	10	20	25	250	120	35	30	1.5°	–	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SALL	●	○	4	10	20	25	250	120	35	30	1.5°	–	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNLL	●	–	4	12.5	25	32	300	170	37	37	1.5°	–	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SALL	●	○	4	12.5	25	32	300	170	37	37	1.5°	–	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNLL	●	–	4	15	30	32	350	100	50	44	1.5°	–	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SALL	●	○	4	15	30	32	350	100	50	44	1.5°	–	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2

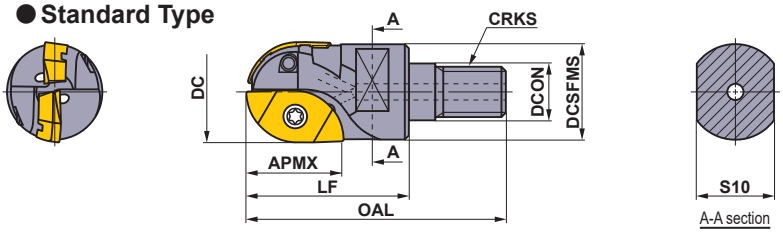
*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

*2 RE is shown for insert corner R.

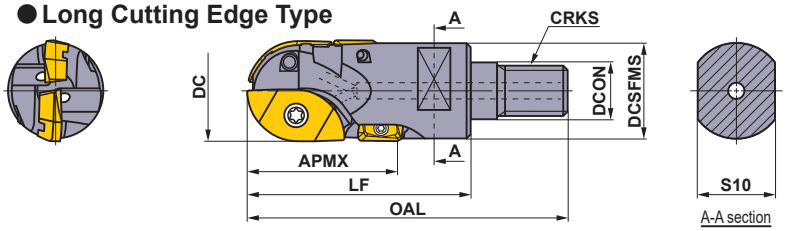
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



● Standard Type



● Long Cutting Edge Type



■SCREW-IN TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Coolant Hole	Dimensions (mm) RE *2	DC	DCON	DCSFMS	OAL	LF	S10	CRKS	APMX	WT (kg)	*1 Inner, Outer Clamp Screw	*1 Peripheral Clamp Screw	Wrench	Inner Insert	Outer Insert	Peripheral Insert
Standard	**SRM2160AM08S30**	●	○	8	16	8.5	14.6	48	30	10	M8	12	0.1	TS25H	—	TKY08D	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200AM10S35	●	○	10	20	10.5	18.6	54	35	14	M10	14	0.1	TS32	—	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250AM12S40	●	○	12.5	25	12.5	23.5	62	40	19	M12	19	0.2	TS43	—	TKY15T	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300AM16S45	●	○	15	30	17	28.3	68	45	24	M16	24	0.2	TS55	—	TKY25T	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2320AM16S45	●	○	16	32	17	30.0	68	45	24	M16	24	0.2	TS55	—	TKY25T	SRG32C SRM32C-M	SRG32E SRM32E-M	—
Long Cutting Edge	**SRM2200AM10L45**	●	○	10	20	10.5	18.6	64	45	14	M10	30	0.2	TS32	TS25	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250AM12L55	●	○	12.5	25	12.5	23.5	77	55	19	M12	37	0.3	TS43	TS25	TKY15T TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300AM16L60	●	○	15	30	17	28.3	83	60	24	M16	44	0.3	TS55	TS43	TKY25T TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2320AM16L60	●	○	16	32	17	29.0	83	60	24	M16	44	0.3	TS55	TS43	TKY25T TKY15F	SRG32C SRM32C-M	SRG32E SRM32E-M	APMT1604 PDER-□2

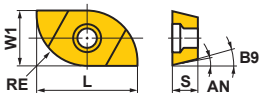
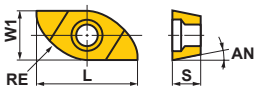
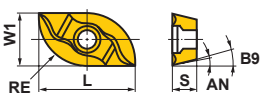
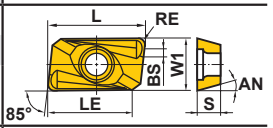
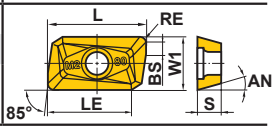
Note 1) For screw-in type arbors, refer to page L341.
*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5
*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions :
● : Stable Cutting ◕ : General Cutting ✱ : Unstable Cutting

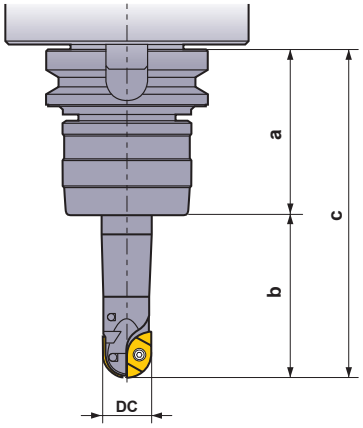
Type	Shape	Order Number	Class	Coated F7030	Coated MP6120	Coated MP9120	Coated VP15TF	RE	L	LE	W1	S	BS	AN	B9	Geometry
Inner	Strong Cutting Edge Type 	**SRG16C**	G		●	●	●	8	16	—	8.2	3.5	—	11°	—	
		SRG20C	G		●	●	●	10	19	—	10.2	4.6	—	10°	18°	
		SRG25C	G		●	●	●	12.5	24	—	12.8	5.5	—	10°	18°	
		SRG30C	G		●	●	●	15	28	—	15.3	7	—	10°	18°	
		SRG32C	G		●	●	●	16	28	—	16.3	7	—	10°	18°	
Outer	Strong Cutting Edge Type 	**SRG16E**	G		●	●	●	8	13.5	—	6.7	3.5	—	11°	—	
		SRG20E	G		●	●	●	10	15.5	—	8.5	4.6	—	9°	—	
		SRG25E	G		●	●	●	12.5	20.5	—	10.2	5.5	—	9°	—	
		SRG30E	G		●	●	●	15	25.2	—	12.2	7	—	9°	—	
		SRG32E	G		●	●	●	16	26.1	—	13.1	7	—	9°	—	
Inner	Low Resistance Type 	**SRM16C-M**	M		●	●	●	8	16	—	8.2	3.5	—	11°	—	
		SRM20C-M	M		●	●	●	10	19	—	10.2	4.6	—	10°	18°	
		SRM25C-M	M		●	●	●	12.5	24	—	12.8	5.5	—	10°	18°	
		SRM30C-M	M		●	●	●	15	28	—	15.3	7	—	10°	18°	
		SRM32C-M	M		●	●	●	16	28	—	16.3	7	—	10°	18°	
Outer	Low Resistance Type 	**SRM16E-M**	M		●	●	●	8	13.5	—	6.7	3.5	—	11°	—	
		SRM20E-M	M		●	●	●	10	15.5	—	8.5	4.6	—	9°	—	
		SRM25E-M	M		●	●	●	12.5	20.5	—	10.2	5.5	—	9°	—	
		SRM30E-M	M		●	●	●	15	25.2	—	12.2	7	—	9°	—	
		SRM32E-M	M		●	●	●	16	26.1	—	13.1	7	—	9°	—	
Peripheral	Strong Cutting Edge Type 	**APMT1135PDER-H2**	M	●			●	0.8	11.25	9	6.35	3.5	1.2	11°	—	
		APMT1604PDER-H2	M	●			●	0.8	17.11	14	9.525	4.76	1.4	11°	—	
	Low Resistance Type 	**APMT1135PDER-M2**	M	●			●	0.8	11.18	9	6.35	3.5	1.2	11°	—	
		APMT1604PDER-M2	M	●			●	0.8	17.10	14	9.525	4.76	1.4	11°	—	

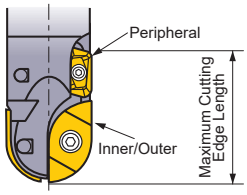
(Low-resistance inner or outer inserts are precision M class type.)
✱1 Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

SRM2 Ø16—Ø32





(Long Cutting Edge)

Tool Overhang

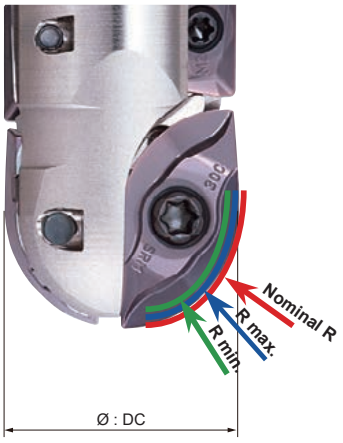
The recommended cutting conditions are chosen based on deflection, vibration and surface finish when using a BT50 arbor under the conditions below -**"a"**, a length from a gauge line to the arbor end face and **"b"**, neck length (tool overhang from the arbor).

Cutting Edge Diameter:DC	Type	a	b	c
16	Standard	105	50	155
	Long Neck		70	175
	Extra Long		—	—
20	Standard		70	175
	Long Neck		100	205
	Extra Long		150	255
25	Standard		80	185
	Long Neck		120	225
	Extra Long		200	305
30	Standard		100	205
	Long Neck		150	255
	Extra Long		250	355

Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5DC. The peripheral insert's main purpose is to remove the small un-machined portions of the pre-machined surface above the main cutting edge. Please refer to recommended cutting conditions for recommended depth of cut **ap**.

■ Radius tolerance and other dimensions with an insert mounted in the body



Radial tolerance

Cutting Edge Diameter DC	Nominal R	Tolerance	R min.	R max.
16	8	G	7.925	7.975
		M	7.910	7.970
20	10	G	9.925	9.975
		M	9.910	9.970
25	12.5	G	12.425	12.475
		M	12.410	12.470
30	15	G	14.925	14.975
		M	14.910	14.970

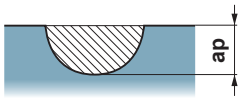
Dimensions with an insert mounted in the body

Cutting Edge Diameter DC	Tolerance	DC min.	DC max.
16	G	15.800	16.000
	M	15.770	15.990
20	G	19.800	20.000
	M	19.770	19.990
25	G	24.800	25.000
	M	24.770	24.990
30	G	29.800	30.000
	M	29.770	29.990

M : Precision M class

■SLOT MILLING

Cutting Mode



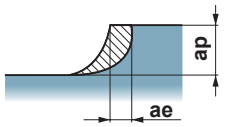
N : Revolution (min^{-1})
F : Table Feed (mm/min)

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	ϕ16			ϕ20			ϕ25			ϕ30		
						N	F	ap	N	F	ap	N	F	ap	N	F	ap
P	Carbon Steel Alloy Steel	180–280HB	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	382	6	2546	306	8	2037	489	12.5	1698	407	15
					Long Neck	3183	382	4	2546	306	4	2037	489	6	1698	407	7.5
					Extra Long	–	–	–	2546	306	2	2037	489	4	1698	407	3
		280–350HB	140 (120–160)	**MP6120 VP15TF** Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	428	12.5	1485	357	15
					Long Neck	2785	334	4	2228	267	4	1783	428	6	1485	357	7.5
					Extra Long	–	–	–	2228	267	2	1783	428	4	1485	357	3
	Pre-Hardened Steel	35–45HRC	120 (100–160)	**MP6120 VP15TF** Low Resistance Type	Standard	2387	286	6	1910	229	8	1528	367	12.5	1273	306	15
					Long Neck	2387	286	4	1910	229	4	1528	367	6	1273	306	7.5
					Extra Long	–	–	–	1910	229	2	1528	367	4	1273	306	3
	Alloy Tool Steel	≤350HB	140 (120–160)	**MP6120 VP15TF** Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	535	10	1485	594	12
					Long Neck	2785	334	4	2228	267	4	1783	535	5	1485	594	4.5
					Extra Long	–	–	–	2228	267	2	1783	535	2.5	1485	594	1.5
M	Stainless Steel	≤270HB	200 (100–250)	**VP15TF** Low Resistance Type	Standard	3979	477	4	3183	382	5	2546	764	6	2122	849	7.5
					Long Neck	3979	477	3	3183	382	3	2546	611	4	2122	637	4.5
					Extra Long	–	–	–	3183	382	1.5	2546	509	1.5	2122	509	1.5
K	Gray Cast Iron	≤350MPa	200 (150–300)	**VP15TF** Low Resistance Type	Standard	3979	796	6	3183	637	8	2546	1019	12.5	2122	849	15
					Long Neck	3979	796	4	3183	637	4	2546	1019	7.5	2122	849	4.5
					Extra Long	–	–	–	3183	637	2	2546	1019	4	2122	849	3
	Ductile Cast Iron	≤500MPa	180 (150–240)	**VP15TF** Low Resistance Type	Standard	3581	716	6	2865	573	8	2292	917	12.5	1910	764	15
					Long Neck	3581	716	4	2865	573	4	2292	917	7.5	1910	764	4.5
					Extra Long	–	–	–	2865	573	2	2292	917	4	1910	764	1.5
	Ductile Cast Iron	≤800MPa	160 (150–250)	**VP15TF** Low Resistance Type	Standard	3183	637	6	2546	509	8	2037	815	12.5	1698	679	15
					Long Neck	3183	637	4	2546	509	4	2037	815	7.5	1698	679	4.5
					Extra Long	–	–	–	2546	509	2	2037	815	4	1698	679	1.5
H	Hardened Steel	45–50HRC	100 (60–120)	**VP15TF** Strong Cutting Edge Type	Standard	1989	239	4	1591	191	4	1273	255	6	1061	212	7.5
					Long Neck	1989	239	2	1591	191	2	1273	255	4	1061	212	3
					Extra Long	–	–	–	1591	191	1	1273	255	2.5	1061	212	1.5
	Hardened Steel	50–60HRC	60 (40–100)	**VP15TF** Strong Cutting Edge Type	Standard	1194	143	4	955	115	4	764	153	6	637	127	7.5
					Long Neck	1194	143	2	955	115	2	764	153	4	637	127	3
					Extra Long	–	–	–	955	115	1	764	153	2.5	637	127	1.5
S	Titanium Alloy	≤350HB	50 (30-60)	**MP9120**	Standard	995	100	4	796	80	4	637	64	6	531	53	7.5
					Long Neck	995	100	2	796	80	2	637	64	4	531	53	3
					Extra Long	–	–	–	796	80	1	637	64	2.5	531	53	1.5
	Heat Resistant Alloy	–	40 (30-60)	**MP9120**	Standard	796	80	4	637	64	4	510	51	6	425	43	7.5
					Long Neck	796	80	2	637	64	2	510	51	4	425	43	3
					Extra Long	–	–	–	637	64	1	510	51	2.5	425	43	1.5

RECOMMENDED CUTTING CONDITIONS

■SHOULDER MILLING (Cutting Depth : Small)

Cutting Mode

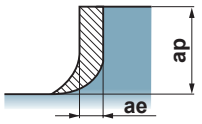


N : Revolution (min^{-1})
F : Table Feed (mm/min)

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	ϕ16				ϕ20				ϕ25				ϕ30			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	200 (160–250)	**MP6120 VP15TF** Low Resistance Type	Standard	3979	796	4	6	3183	955	5	8	2546	1273	6	10	2122	1273	7.5	10
					Long Neck	3979	637	4	4	3183	637	5	6	2546	1273	6	7.5	2122	1273	7.5	7.5
					Extra Long	—	—	—	—	3183	382	5	4	2546	1019	6	5	2122	637	7.5	3
		280–350HB	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5
					Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	5	1698	407	7.5	3
	Pre-Hardened Steel	35–45HRC	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	679	7.5	7.5
					Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	5	1698	509	7.5	3
	Alloy Tool Steel	≤350HB	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5
					Extra Long	—	—	—	—	2546	306	5	4	2037	489	6	2.5	1698	407	7.5	1.5
M	Stainless Steel	≤270HB	200 (100–250)	**VP15TF** Low Resistance Type	Standard	3979	477	4	6	3183	509	5	8	2546	764	6	10	2122	849	7.5	10
					Long Neck	3979	477	4	4	3183	382	5	6	2546	611	6	7.5	2122	849	7.5	7.5
					Extra Long	—	—	—	—	3183	382	5	4	2546	509	6	5	2122	424	7.5	1.5
K	Gray Cast Iron	≤350MPa	200 (150–300)	**VP15TF** Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1485	7.5	10
					Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1485	7.5	6
					Extra Long	—	—	—	—	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3
	Ductile Cast Iron	≤500MPa	200 (150–280)	**VP15TF** Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1273	7.5	10
					Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1273	7.5	6
					Extra Long	—	—	—	—	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3
	Ductile Cast Iron	≤800MPa	180 (150–250)	**VP15TF** Low Resistance Type	Standard	3581	1432	4	8	2865	1433	5	10	2292	1375	6	10	1910	1146	7.5	10
					Long Neck	3581	1074	4	6	2865	1146	5	8	2292	1375	6	10	1910	1146	7.5	6
					Extra Long	—	—	—	—	2865	860	5	6	2292	1146	6	7.5	1910	955	7.5	3
H	Hardened Steel	45–50HRC	100 (60–120)	**VP15TF** Strong Cutting Edge Type	Standard	1989	239	4	4	1591	191	5	5	1273	255	6	7.5	1061	212	7.5	3
					Long Neck	1989	239	4	2	1591	191	5	3	1273	255	6	4	1061	212	7.5	1.5
					Extra Long	—	—	—	—	1591	191	5	2	1273	204	6	1.5	1061	170	7.5	1
	Hardened Steel	50–60HRC	60 (40–100)	**VP15TF** Strong Cutting Edge Type	Standard	1194	143	4	4	955	115	5	5	764	153	6	7.5	637	127	7.5	3
					Long Neck	1194	143	4	2	955	115	5	3	764	153	6	4	637	127	7.5	1.5
					Extra Long	—	—	—	—	955	115	5	2	764	122	6	1.5	637	102	7.5	1
S	Titanium Alloy	≤350HB	50 (30-60)	**MP9120**	Standard	995	299	4	4	796	239	4	5	637	191	6	7.5	531	159	7.5	3
					Long Neck	995	299	2	2	796	239	2	3	637	191	4	4	531	159	3	1.5
					Extra Long	—	—	—	—	796	239	1	2	637	191	2.5	1.5	531	159	1.5	1
	Heat Resistant Alloy	—	40 (30-60)	**MP9120**	Standard	796	239	4	4	637	191	4	5	510	153	6	7.5	425	128	7.5	3
					Long Neck	796	239	2	2	637	191	2	3	510	153	4	4	425	128	3	1.5
					Extra Long	—	—	—	—	637	191	1	2	510	153	2.5	1.5	425	128	1.5	1

■ SHOULDER MILLING (Cutting Depth : Large)

Cutting Mode



N : Revolution (min^{-1})
F : Table Feed (mm/min)

Note 1) Machining Stainless Steels

When up-cut milling stainless steels at large depths and widths of cut, the machined surface is liable to have burrs and welding due to chip jamming. For stainless steels, down-cutting (climb milling) is recommended.

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	ϕ16				ϕ20				ϕ25				ϕ30			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	200 (160–250)	**MP6120 VP15TF** Low Resistance Type	Standard	3979	637	8	4	3183	764	10	4	2546	1273	12.5	5	2122	1273	15	4.5
					Long Neck	3979	477	8	3	3183	509	10	3	2546	1019	12.5	4	2122	849	15	3
					Extra Long	—	—	—	—	3183	382	10	2	2546	764	12.5	2.5	2122	849	15	1.5
		280–350HB	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5
	Pre-Hardened Steel	35–45HRC	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5
	Alloy Tool Steel	≤350HB	160 (120–200)	**MP6120 VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	2.5	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	1.5	1698	407	15	1.5
M	Stainless Steel	≤270HB	200 (100–250)	**VP15TF** Low Resistance Type	Standard	3979	477	8	4	3183	509	10	4	2546	764	12.5	10	2122	849	15	10
					Long Neck	3979	477	8	3	3183	382	10	3	2546	611	12.5	4	2122	509	15	4.5
					Extra Long	—	—	—	—	3183	382	10	2	2546	489	12.5	1.5	2122	340	15	1.5
K	Gray Cast Iron	≤350MPa	200 (150–300)	**VP15TF** Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1485	15	10
					Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	1061	15	4.5
					Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	1.5	2122	849	15	3
	Ductile Cast Iron	≤500MPa	200 (150–280)	**VP15TF** Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1273	15	10
					Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	849	15	4.5
					Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	5	2122	849	15	1.5
	Ductile Cast Iron	≤800MPa	180 (150–250)	**VP15TF** Low Resistance Type	Standard	3581	1074	8	8	2865	1146	10	8	2292	1146	12.5	10	1910	1146	15	10
					Long Neck	3581	859	8	5	2865	860	10	4	2292	1146	12.5	7.5	1910	764	15	4.5
					Extra Long	—	—	—	—	2865	688	10	2	2292	917	12.5	5	1910	764	15	1.5
H	Hardened Steel	45–50HRC	100 (60–120)	**VP15TF** Strong Cutting Edge Type	Standard	1989	239	8	2	1591	191	10	3	1273	255	12.5	4	1061	212	15	3
					Long Neck	1989	239	8	1	1591	191	10	2	1273	204	12.5	1.5	1061	106	15	1.5
					Extra Long	—	—	—	—	1591	191	10	1	—	—	—	—	—	—	—	—
	Hardened Steel	50–60HRC	60 (40–100)	**VP15TF** Strong Cutting Edge Type	Standard	1194	143	8	2	955	115	10	3	764	153	12.5	4	637	127	15	3
					Long Neck	1194	143	8	1	955	115	10	2	764	122	12.5	1.5	637	64	15	1.5
					Extra Long	—	—	—	—	955	115	10	1	—	—	—	—	—	—	—	—
S	Titanium Alloy	≤350HB	50 (30-60)	**MP9120**	Standard	995	199	4	2	796	159	4	3	637	127	6	4	531	106	7.5	3
					Long Neck	995	199	2	1	796	159	2	2	637	127	4	1.5	531	106	3	1.5
					Extra Long	—	—	—	—	796	159	1	1	637	127	2.5	—	531	106	1.5	—
	Heat Resistant Alloy	—	40 (30-60)	**MP9120**	Standard	796	159	4	2	637	127	4	3	510	102	6	4	425	85	7.5	3
					Long Neck	796	159	2	1	637	127	2	2	510	102	4	1.5	425	85	3	1.5
					Extra Long	—	—	—	—	637	127	1	1	510	102	2.5	—	425	85	1.5	—

BALL NOSE END MILL

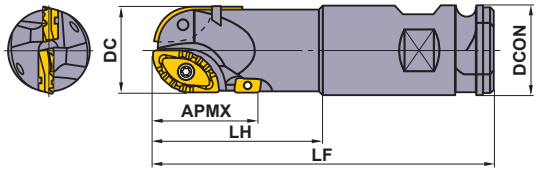
SRM2 ø40 ø50

P Steel | M | K Cast Iron | N | S | H

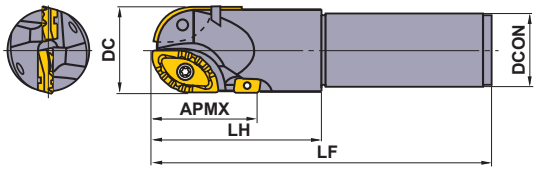


- Best for roughing of moulds.
- Low resistance chipbreaker.
- Highly rigid body.

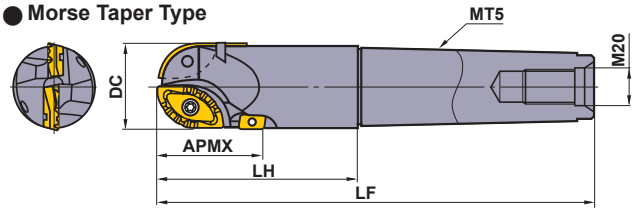
● Combination Type



● Straight Type



● Morse Taper Type



Right hand tool holder only.

Type		Order Number	Stock	Number of Flutes	Dimensions (mm)						*1 Inner, Outer	*1 Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
			R		*2 RE	DC	DCON	LF	LH	APMX	Clamp Screw		Wrench		Insert		
Combination	Standard	SRM2400WNLS	●	2	20	40	50.8	200	120	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLS	●	2	25	50	50.8	200	120	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2400WNLM	●	2	20	40	50.8	250	170	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLM	●	2	25	50	50.8	250	170	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Extra Long	SRM2500WNLL	●	2	25	50	50.8	300	220	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
		SRM2500WNLX	●	2	25	50	50.8	350	270	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Straight	Standard	SRM2400SNLS	●	2	20	40	42	200	100	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLS	●	2	25	50	42	200	100	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2400SNLM	●	2	20	40	42	250	150	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLM	●	2	25	50	42	250	100	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Morse Taper	Standard	SRM2500MNLS	●	2	25	50	—	256	120	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	SRM2500MNLM	●	2	25	50	—	286	150	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2

*1 Clamp Torque (N • m) : TS43=6.0, TS6=10.0, TS6S=10.0

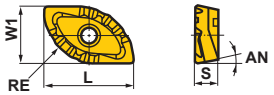
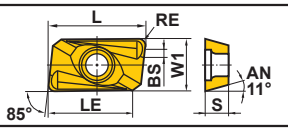
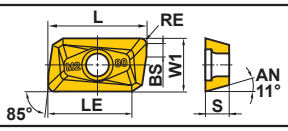
*2 RE is shown for insert corner R.

Scan here for product NEWS ▶

● : Inventory maintained in Japan.

(Contains 10 pieces per case.)(The inserts marked *2 contain 2 inserts per case.)

INSERTS

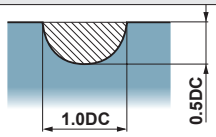
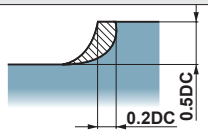
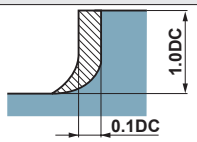
Workpiece Material			Coated				Dimensions (mm)							Geometry
Type	Shape	Order Number	Class	F7030	VP15TF	VP20RT	VP30RT	RE	L	LE	W1	S	BS	AN	
Inner		*2 **SRG40C**	G		●	●	●	20	36	—	20.5	8.0	—	11°	
		*2 **SRG50C**	G		●	●	●	25	40	—	26	8.5	—	11°	
Outer		*2 **SRG40E**	G		●	●	●	20	32	—	16.6	8.0	—	11°	
		*2 **SRG50E**	G		●	●	●	25	35.8	—	20	8.5	—	11°	
*1 Peripheral	Strong Cutting Edge Type 	**APMT1604PDER-H2**	M	●	●			0.8	11.71	14	9.525	4.76	1.4	11°	
	Low Resistance Type 	**APMT1604PDER-M2**	M	●	●			0.8	17.10	14	9.525	4.76	1.4	11°	

Workpiece Material		
P	Steel	
K	Cast Iron	

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

(Low-resistance inner or outer inserts are precision M class type.)
*1 Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

RECOMMENDED CUTTING CONDITIONS

Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)
			

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	Cutting Mode
P	Alloy Tool Steel	≤250HB	**VP20RT VP30RT**	160 (120—200)	0.12 (0.08—0.2)	A
					0.2 (0.1—0.4)	B
					0.15 (0.1—0.3)	C
	Alloy Tool Steel	≤250HB	**VP20RT VP30RT**	200 (160—250)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.4)	B
					0.2 (0.1—0.4)	C
	Cast Tool Steel	≤235HB	**VP20RT**	200 (160—250)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.4)	B
					0.2 (0.1—0.4)	C
	Cast Tool Steel	≤230HB	**VP15TF VP20RT**	200 (160—300)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.45)	B
					0.2 (0.1—0.4)	C
K	Ductile Cast Iron	Tensile Strength ≤540MPa	**VP15TF VP20RT**	200 (160—300)	0.25 (0.1—0.4)	A
					0.35 (0.1—0.45)	B
					0.25 (0.1—0.45)	C
	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF VP20RT**	200 (160—300)	0.25 (0.1—0.4)	A
					0.35 (0.1—0.45)	B
					0.25 (0.1—0.4)	C

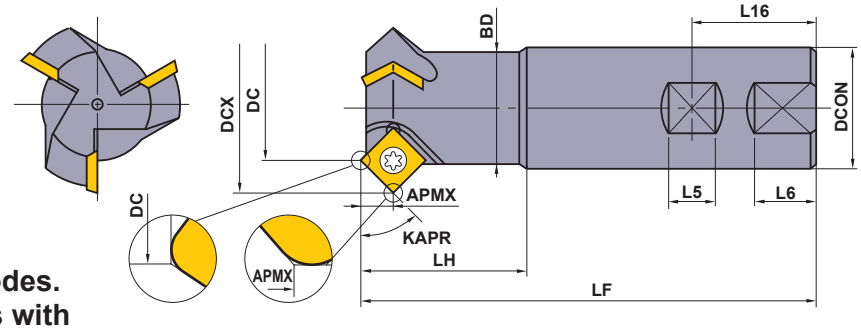
CHAMFER MILLING

60° KAPR 45° KAPR 30° KAPR R

CESP,CFSP,CGSP

P Steel | M | K Cast Iron | N | S | H





- Covers 5 cutting modes.
- Excellent sharpness with 11° positive inserts.
- 30°, 45° and 60°chamfer series.

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											*	R F	
	R		KAPR	DC	DCX	LF	DCON	BD	LH	L16	L5	L6	APMX	Clamp Screw	Wrench	Insert
CESPR081S20	●	1	60°	8	19.6	110	20	19.5	40	25	11	—	10.2	TS52	TKY25R	SPMW1203○○
CESPR161S20	●	1	60°	16	27.8	110	20	19.5	40	25	11	—	10.2	TS5	TKY25R	SPMW1203○○
CESPR323S32	●	3	60°	32	43.8	125	32	31.5	45	36	14	19	10.2	TS5	TKY25R	SPMW1203○○
CFSPR041S16S	●	1	45°	4	15.7	85	16	14.4	25	24	10	—	5.9	TS4	TKY15F	SPMW0903○○
CFSPR041S16L	●	1	45°	4	15.7	110	16	14.4	50	24	10	—	5.9	TS4	TKY15F	SPMW0903○○
CFSPR081S20	●	1	45°	8	24.6	110	20	19.5	40	25	11	—	8.3	TS5	TKY25R	SPMW1203○○
CFSPR161S20	●	1	45°	16	32.6	110	20	19.5	40	25	11	—	8.3	TS5	TKY25R	SPMW1203○○
CFSPR323S32	●	3	45°	32	48.6	125	32	31.5	45	36	14	19	8.3	TS5	TKY25R	SPMW1203○○
CGSPR081S20	●	1	30°	8	28.4	110	20	19.5	40	25	11	—	5.9	TS5	TKY25R	SPMW1203○○
CGSPR161S20	●	1	30°	16	36.4	110	20	19.5	40	25	11	—	5.9	TS5	TKY25R	SPMW1203○○
CGSPR323S32	●	3	30°	32	52.4	125	32	31.5	45	36	14	19	5.9	TS5	TKY25R	SPMW1203○○

* Clamp Torque (N • m) : TS4=3.5, TS5=7.5, TS52=7.5

L

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

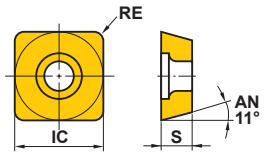
INSERTS

Workpiece Material			Coated				Cermet		Carbide		Dimensions (mm)			Geometry
Shape	Order Number	Class	Edge Preparation	VP15TF	UP20M		NX2525	NX4545	UTi20T	HTi10	IC	S	RE	
	SPMW090304	M	E*	●	●		●	●	●	●	9.525	3.18	0.4	
	SPMW090308	M	E*	●	●		●	●	●	●	9.525	3.18	0.8	
	SPMW120304	M	E*	●	●		●	●	●	●	12.7	3.18	0.4	
	SPMW120308	M	E*	●	●		●	●	●	●	12.7	3.18	0.8	

P Steel
K Cast Iron

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting





* NX2525 and NX4545 insert honing is "T" type.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	
					Chamfer Milling	Face Milling
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	80 (60—100)	0.4	0.15
			UP20M	130 (100—160)	0.4	0.2
			NX4545	130 (100—160)	0.4	0.2
		280—350HB	**UTi20T**	80 (60—100)	0.3	0.15
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (85—120)	0.5	0.25
			HTi10	100 (85—120)	0.5	0.25

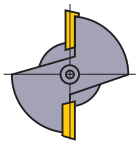
● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

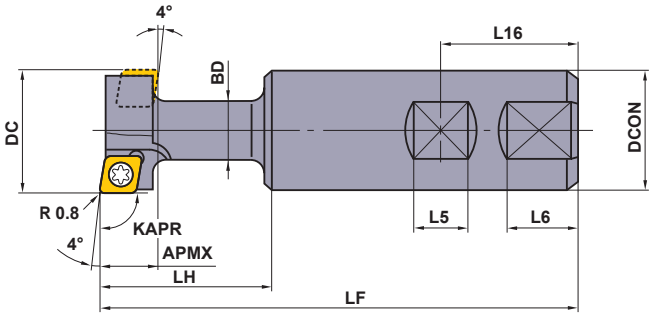
T-SLOT MILLING

TSMP

P Steel | M | K Cast Iron | N | S | H







- T-groove order number 14, 18 and 22 are available.
- 86° rhombic shape 11° positive insert.
- Shoulder milling and inversed spot facing are also possible.

Right hand tool holder only.

Order Number	T Slot Nomenclature	Stock	Number of Teeth	Dimensions (mm)									*	D R	
		R		DC	LF	DCON	BD	LH	L16	L5	L6	APMX	Clamp Screw	Wrench	Insert
TSMPR252S25	14	●	2	25	112	25	12.5	33.2	32	12	17	11	TS3	TKY08D	MPMW070308
TSMPR322S32	18	●	2	32	120	32	16	41.2	36	14	19	14	TS4	TKY15R	MPMW090308
TSMPR402S32	22	●	2	40	130	32	20	51.2	36	14	19	18	TS5	TKY25R	MPMW120408

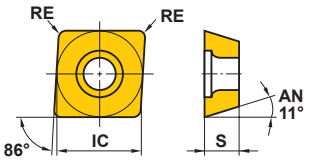
* Clamp Torque (N • m) : TS3=1.0, TS4=3.5, TS5=7.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			
	P	Steel	
	K	Cast Iron	

Cutting Conditions :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	Carbide UTi20T	Dimensions (mm) IC	S	RE	Geometry
	**MPMW070308**	M	●	7.94	3.18	0.8	
	MPMW090308	M	●	9.525	3.18	0.8	
	MPMW120408	M	●	12.7	4.76	0.8	

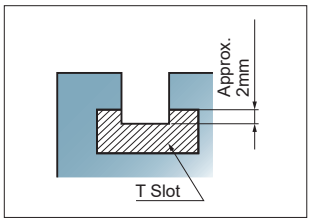
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	130 (100—160)	0.15 (0.1—0.2)
		280—350HB	**UTi20T**	80 (60—100)	0.1 (0.05—0.15)
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (80—120)	0.15 (0.1—0.2)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

■ CAUTION FOR USE

- When T slot machining steel, the workpiece must be machined as shown in the drawing to ensure smooth chip evacuation.
- Slots to be machined must be free from chips for smooth machining.

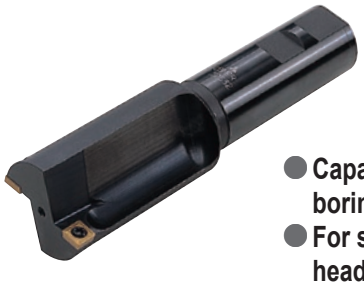


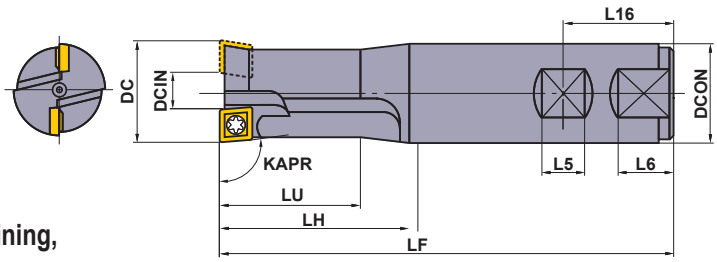
SPOT MILLING

94° KAPR

CBJP,CBMP

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			





- Capable of spot facing machining, boring and interpolation.
- For seat machining of hexagon socket head bolt (M8-M30).
- 86°rhombic shape 11°positive insert.

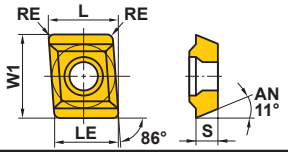
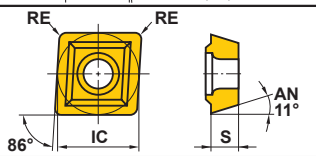
Right hand tool holder only.

Order Number	For Bolt Size	Stock	Number of Teeth	Dimensions (mm)									*	D R	
		R		DC	DCIN	LF	DCON	LH	LU	L16	L5	L6	Clamp Screw	Wrench	Insert
CBJPR141S25	M8	●	1	14	3.1	108	25	28	21	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR172S25	M10	●	2	17.5	5.3	115	25	35	26	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR202S25	M12	●	2	20	7.8	120	25	40	30	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR232S25	M14	●	2	23	10.8	126	25	46	34.5	32	12	17	TS3	TKY08D	JPMT060204-E
CBMPR262S32	M16	●	2	26	8.5	132	32	52	39	36	14	19	TS4	TKY15R	MPMT090308
CBMPR292S32	M18	●	2	29	11.5	138	32	58	43.5	36	14	19	TS4	TKY15R	MPMT090308
CBMPR322S32	M20	●	2	32	14.5	144	32	64	59	36	14	19	TS4	TKY15R	MPMT090308
CBMPR352S32	M22	●	2	35	17.5	150	32	70	70	36	14	19	TS4	TKY15R	MPMT090308
CBMPR392S32	M24	●	2	39	21.5	158	32	78	78	36	14	19	TS4	TKY15R	MPMT090308
CBMPR432S32	M27	●	2	43	25.5	166	32	86	86	36	14	19	TS4	TKY15R	MPMT090308
CBMPR482S32	M30	●	2	48	30.5	176	32	96	96	36	14	19	TS4	TKY15R	MPMT090308

* Clamp Torque (N • m) : TS3=1.0, TS4=3.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material																
	P	Steel		◐	◐			●		Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting						
	M	Stainless Steel		◐	◐			○								
	K	Cast Iron		✣				✣								
Cutter Type	Shape	Order Number	Class	Coated VP15TF	Coated UP20M			Carbide UTi20T		Dimensions (mm) L	LE	W1	IC	S	RE	Geometry
CBJP		**JPMT060204-E**	M	●	●			●		7.0	6.0	7.94	—	2.38	0.4	
CBMP		**MPMT090308**	M	●	●			●		—	—	—	9.525	3.18	0.8	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	CBJP Cutting Speed (m/min)	CBJP Feed (mm/rev)	CBMP Cutting Speed (m/min)	CBMP Feed (mm/rev)
P	Mild Steel	≤180HB	**VP15TF**	180 (100—200)	0.16 (0.12—0.2)	180 (100—200)	0.225 (0.15—0.3)
	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	180 (100—200)	0.2 (0.15—0.25)	180 (100—200)	0.275 (0.2—0.35)
		280—350HB	**VP15TF**	120 (80—160)	0.16 (0.12—0.2)	120 (80—160)	0.225 (0.15—0.3)
M	Stainless Steel	≤200HB	**VP15TF**	150 (100—200)	0.16 (0.12—0.2)	150 (100—200)	0.225 (0.15—0.3)
K	Cast Iron	Tensile Strength ≤450MPa	**VP15TF**	160 (100—220)	0.3 (0.2—0.4)	160 (100—220)	0.35 (0.2—0.5)

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC) ●Spindle feed (mm/min) = Feed rate x Tool spindle speed
Note 1) CBJPR141S25 use feed per revolution 50 % of this table, because only 1 insert on the body.

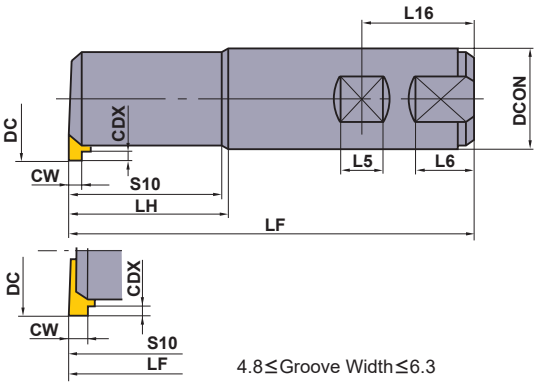
SLOT MILLING

KSMG

P Steel | M | K Cast Iron | N | S | H







- Side face grooving tool for machining centres.
- The minimum cutting diameter is ϕ25mm for internal grooving.
- For groove widths of 1.25mm—6.0mm.

4.8≤Groove Width≤6.3

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)							Geometry of Groove		DC (mm)	Insert Number
	R		LF	DCON	LH	S10	L16	L5	L6	CW	CDX		
KSMGR25S25	●	1	115	25	40	36.5	32	12	17	1.25	1.2	25	MGTL33○○○
										1.45	1.5		
										1.5≤CW≤4.0	3.0		
KSMGR40S32	●	1	130	32	50	49	36	14	19	1.25	1.2	40	MGTL43○○○
										1.45	1.5		
										1.5≤CW≤2.3	3.0		
										2.5≤CW≤4.7	4.5		
			131.6	32	51.6	50.6	36	14	19	5.0≤CW≤6.0	4.5	40	MGTL44○○○
KSMGR40S32L	●	1	180	32	100	99	36	14	19	1.25	1.2	40	MGTL43○○
										1.45	1.5		
										1.5≤CW≤2.3	3.0		
										2.5≤CW≤4.7	4.5		
			181.6	32	101.6	100.6	36	14	19	5.0≤CW≤6.0	4.5	40	MGTL44○○○

SPARE PARTS

Tool Holder Number				 *	 F R
	Clamp Lever	Spring	Lever Pin	Clamp Screw	Wrench
KSMGR25S25	LLCL13S	HLS2	—	LLCS105	HKY20F
KSMGR40S32	LLCL24	—	LLP14	LLCS108	HKY30R
KSMGR40S32L	LLCL24	—	LLP14	LLCS108	HKY30R

* Clamp Torque (N • m) : LLCS105=1.5, LLCS108=3.3

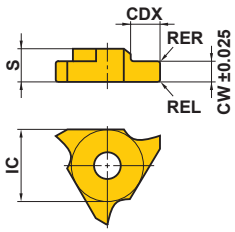
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material					
	P	Steel	●	●	●
	K	Cast Iron		●	✱

Cutting Conditions :
● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Order Number	Grooving Width	Stock			Dimensions (mm)				Geometry
		Coated	Cermet	Carbide					
		VP20MF	NX2525	UTi20T	IC	S	RER/L	CDX	
	CW	L	L	L					
MGTL33125	1.25	●		●	9.525	4.76	0.2	1.2	**MGTL...**
MGTL33145	1.45	●		●	9.525	4.76	0.2	1.5	
MGTL33150	1.5	●	●	●	9.525	4.76	0.2	3	
MGTL33175	1.75	●	●	●	9.525	4.76	0.2	3	
MGTL33200	2	●	●	●	9.525	4.76	0.2	3	
MGTL33230	2.3	●		●	9.525	4.76	0.2	3	
MGTL33250	2.5	●	●	●	9.525	4.76	0.3	3	
MGTL33270	2.7	●		●	9.525	4.76	0.3	3	
MGTL33280	2.8	●		●	9.525	4.76	0.3	3	
MGTL33300	3	●	●	●	9.525	4.76	0.3	3	
MGTL33320	3.2	●			9.525	4.76	0.3	3	
MGTL33330	3.3	●		●	9.525	4.76	0.3	3	
MGTL33350	3.5	●		●	9.525	4.76	0.3	3	
MGTL33400	4	●	●	●	9.525	4.76	0.3	3	
MGTL43125	1.25	●	●	●	12.7	4.76	0.2	1.2	
MGTL43145	1.45	●	●	●	12.7	4.76	0.2	1.5	
MGTL43150	1.5	●	●	●	12.7	4.76	0.2	3	
MGTL43175	1.75	●	●	●	12.7	4.76	0.2	3	
MGTL43200	2	●	●	●	12.7	4.76	0.2	3	
MGTL43230	2.3	●	●	●	12.7	4.76	0.2	3	
MGTL43250	2.5	●	●	●	12.7	4.76	0.3	4.5	
MGTL43260	2.6	●		●	12.7	4.76	0.3	4.5	
MGTL43270	2.7	●		●	12.7	4.76	0.3	4.5	
MGTL43280	2.8	●	●	●	12.7	4.76	0.3	4.5	
MGTL43300	3	●	●	●	12.7	4.76	0.3	4.5	
MGTL43320	3.2			●	12.7	4.76	0.3	4.5	
MGTL43330	3.3	●	●	●	12.7	4.76	0.3	4.5	
MGTL43350	3.5	●	●	●	12.7	4.76	0.3	4.5	
MGTL43400	4	●		●	12.7	4.76	0.3	4.5	
MGTL43420	4.2	●		●	12.7	4.76	0.4	4.5	
MGTL43430	4.3	●		●	12.7	4.76	0.4	4.5	
MGTL43450	4.5	●	●	●	12.7	4.76	0.4	4.5	
MGTL43470	4.7	●	●	●	12.7	4.76	0.4	4.5	
MGTL44500	5	●		●	12.7	6.35	0.4	4.5	
MGTL44600	6			●	12.7	6.35	0.4	4.5	



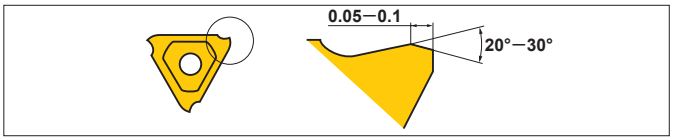
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**NX2525 UTi20T**	130 (120—150)	0.225 (0.1—0.35)
			VP20MF	160 (120—200)	0.225 (0.1—0.35)
	Carbon Steel Alloy Steel	180—280HB	**NX2525 UTi20T**	110 (100—120)	0.2 (0.1—0.30)
			VP20MF	120 (100—140)	0.2 (0.1—0.30)
		280—350HB	**UTi20T**	110 (100—120)	0.175 (0.1—0.25)
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (80—125)	0.225 (0.1—0.35)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

■HONING OF CUTTING EDGE

Supplementary honing when steel cutting gives longer tool life.
Use a diamond file for best results.



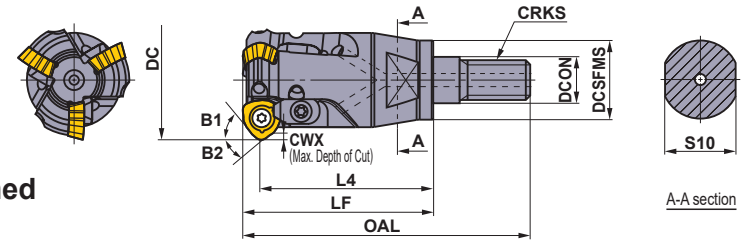
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

VERTICAL FEED MILLING

PMC

P Steel | M | K Cast Iron | N | S | H





- For under-cutting trimed part of press mould.
- 2 directional cutting with large overhang.

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)											WT (kg)	Insert	Shank Arbor
	R			DC	DCON	DCSFMS	OAL	LF	L4	S10	CRKS	CWX	B1	B2			
PMC08R252AM1035	●	○	2	25	10.5	18	58.7	39.7	35	14	M10	1.5	40.5°	35°	0.1	JOM○080320 ZZSR-○○	SC20M10S ○○○○W
PMC09R323AM1245	●	○	3	32	12.5	21	72.5	50.5	45	19	M12	3	40.5°	35°	0.2	JDM○09T320 ZDSR-○○	SC25M12S ○○○○W
PMC12R403AM1645	●	○	3	40	17	29	74.4	51.4	45	24	M16	3.5	42°	35°	0.3	JDM○120420 ZDSR-○○	SC32M16S ○○○○W

Note1) For screw-in type arbors, refer to pages L341.

SPARE PARTS

Order Number	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Anti-seize Lubricant
PMC08R252AM1035	TS33	AMS3	AJS3010T10	ASS2	TKY08D TKY10R	MK1KS
PMC09R323AM1245	TS351	AMS3	AJS3010T10	ASS2	TKY10D	MK1KS
PMC12R403AM1645	TS43	AMS4	AJS4012T15	ASS2	TKY15D	MK1KS

* Clamp Torque (N • m) : TS33=1.5, TS351=2.5, TS43=3.5, AJS3010T10=2.5, AJS4012T15=3.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

INSERTS

Workpiece Material			Coated			Dimensions (mm)						
			Class	FH7020	VP15TF	VP30RT	AN	IC	S	BS	RE	PMC holder
Shape	Order Number											Geometry
	P	Steel										
	K	Cast Iron										
Partial Profile **FT** Breaker	**JOMW080320ZZSR-FT**		M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035
	JDMW09T320ZDSR-FT		M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245
	JDMW120420ZDSR-FT		M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645
Strong Cutting Edge Type **ST** Breaker	**JDMT120420ZDSR-ST**		M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645
JM Breaker	**JOMT080320ZZSR-JM**		M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035
	JDMT09T320ZDSR-JM		M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245
	JDMT120420ZDSR-JM		M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Breaker	Diameter (mm)	Number of Teeth	Cutting Speed (m/min)	Feed per Tooth (mm/t)	Width of Cut (mm)	Pick Feed (mm)
P	Carbon Steel Alloy Steel	≤180HB	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5
	Alloy Tool Steel Hardening Tool Steel for Cold Work Dies	≤300HB	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.55	—1.5	—5
					ø32	3	180 (150—200)	—0.5	—1.2	—3
					ø25	2	180 (150—200)	—0.5	—1.0	—3
	Alloy Tool Steel	≤300HB	**VP15TF**	**FT**	ø40	3	200 (100—300)	—0.55	—1.5	—5
					ø32	3	150 (80—200)	—0.5	—1.2	—3
					ø25	2	150 (80—200)	—0.5	—1.0	—3
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5

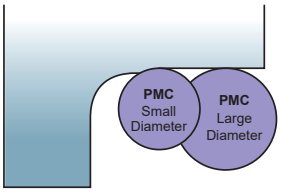
● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

Note 1) The above cutting conditions are general guide lines. Adjustments maybe necessary depending on machine rigidity, workpiece geometry and clamping.
Note 2) A carbide shank extension is recommended to prevent vibrations.

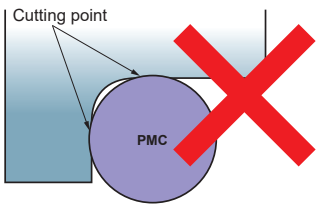
NOTES ON MACHINING METHODS

● How to choose an appropriate diameter tool.

Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.



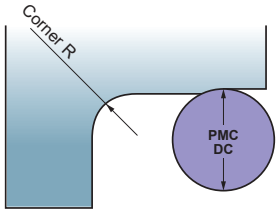
Top View of Machining



Top View of Machining

● Relation of the cutter diameter and corner R size of workpiece

A guide for the smallest possible workpiece radius that can be machined is from 0.6—0.7 x diameter of the tool.



Top View of Machining

Tool diameter **DC**(mm)	Corner R (mm)
ϕ25	R≥17.5
ϕ32	R≥22
ϕ40	R≥24

*Adjust cutting conditions according to the set up.
*Smaller workpiece corner radii (only >0.5 x cutter &) may be possible by reducing the width of cut, speed and pick feed.

VERTICAL FEED MILLING

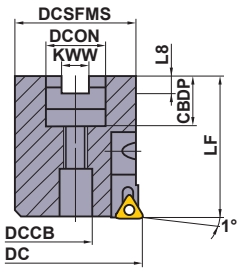
PMF

P	M	K	N	S	H
Steel		Cast Iron			

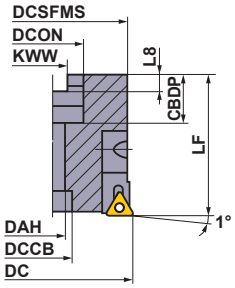


- 2 directional cutting with large overhang.
- Excellent straightness.
- Excellent wall accuracy.

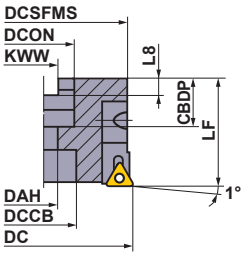
ø50



ø63



ø80



Right hand tool holder only.

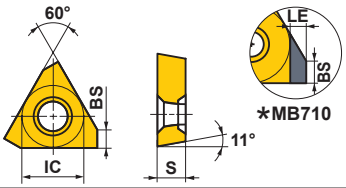
Order Number	Stock	Number of Teeth	Dimensions (mm)									Cartridge	Clamp Screw *	Radial Screw	Set Bolt (Cartridge) *	Wrench	Wrench	Set Bolt ①②	Insert
	R		DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	DCSFMS								
PMF05004A22R	●	4	50	63	22	20	—	12	10.4	6.3	48	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R HKY50R	①HDS10031	TPEW 1303 ZP○R2
PMF06306A22R	●	6	63	63	22	20	11	18	10.4	6.3	60	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC10050	
PMF08008A27R	●	8	80	50	27	23	13.5	30	12.4	7	75	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC12035	

* Clamp Torque (N • m) : TS254=1.0, HBH06012=8.5

INSERTS

Workpiece Material										
	P	Steel	C	C						
	K	Cast Iron	C	C			C			

Cutting Conditions : ● : Stable Cutting C : General Cutting C : Unstable Cutting

Shape	Order Number	Class	Coated				CBN		Dimensions (mm)				Geometry
			VP15TF	AP10H			MB710		IC	LE	S	BS	
	TPEW1303ZPER2	E	●	●					7.94	—	3.18	2	
	* TPEW1303ZPTR2	E					▲		7.94	1.5	3.18	2	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.) (Contains one CBN insert per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	250 (150—350)	0.1 (0.05—0.15)
		280—380HB	**VP15TF**	200 (100—300)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**AP10H**	350 (200—500)	0.1 (0.05—0.15)
			MB710	1500 (1000—2000)	

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Ductile Cast Iron	Tensile Strength 360—500MPa	**AP10H**	250 (150—350)	0.1 (0.05—0.15)
			MB710	1000 (800—1200)	
	Ductile Cast Iron	Tensile Strength 500—800MPa	**AP10H**	200 (100—300)	0.1 (0.05—0.15)
			MB710	1000 (800—1200)	

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

Note 1) Recommended radial depth of cut is 0.1mm.

Note 2) 2 directional vertical cutting is recommended for efficiency.

Note 3) For crossfeed cutting, the feed per tooth should be reduced to less than 0.05(mm/t).

ISO13399 ➤ L003
SPARE PARTS ➤ P001

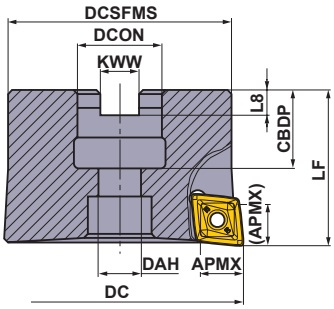
VERTICAL FEED MILLING

PMR

P Steel | M | K Cast Iron | N | S | H

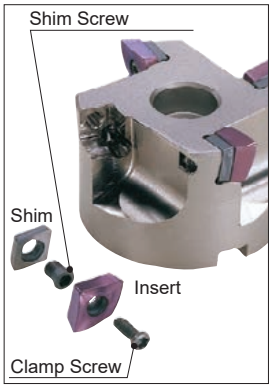


- 1 directional cutting with large overhang.
- Horizontal feed cutting and oblique cutting are also possible.
- Unique shape of curved edge gives high rigidity and low resistance.



Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Insert
Metric	**PMR405003A22R**	●	3	50	40	22	20	11	45	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR406304A22R	●	4	63	40	22	20	11	57	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR408005A27R	●	5	80	50	27	23	13	73	12.4	7	11	CPMT1205ZPEN-M2/3
Inch	**PMR405003BR**	●	3	50	40	22.225	19	11	45	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR406304BR	●	4	63	40	22.225	19	11	57	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR408005DR	●	5	80	63	31.75	32	17	73	12.7	8	11	CPMT1205ZPEN-M2/3



SPARE PARTS

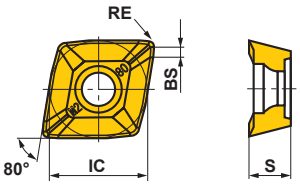
Tool Holder Number	 Shim	 * Shim Screw	 * Clamp Screw	 Wrench (Insert)	 Wrench (Shim)	 Set Bolt
PMR405003A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005A27R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC12035
PMR405003BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005DR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC16040

* Clamp Torque (N • m) : TPS35=3.5, WCS503507H=5.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			Coated	Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting
	P	Steel	◐	
	K	Cast Iron	✠	

Shape	Order Number	Class	Coated VP15TF	Dimensions (mm) IC	S	BS	RE	Geometry
	**CPMT1205ZPEN-M2**	M	●	12.7	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	●	12.7	5.56	1.4	1.2	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	pf (mm)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	180 (150—200)	0.2 (0.1—0.3)	≤0.5DC
		280—380HB				
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	180 (150—200)	0.2 (0.1—0.3)	≤0.5DC
	Ductile Cast Iron	Tensile Strength 360—500MPa	**VP15TF**	150 (120—170)	0.2 (0.1—0.3)	≤0.5DC
		Tensile Strength 500—800MPa	**VP15TF**	120 (100—150)	0.2 (0.1—0.3)	≤0.5DC

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution
Note 1) The above conditions are suitable for general machining purposes, it is possible to use conditions that are different from the above.
Note 2) For horizontal feed machining, please reduce the feed rate by about 20—40%.
Note 3) If chatter or abnormal noises occur, adjust the depth of cut and cutting speed.

ISO13399 ➤ L003
SPARE PARTS ➤ P001

BORING CUTTER

35° KAPR

BMR

Support for special designs

P | M | **K** | N | S | H

Cast Iron



Body with Peripheral Cutting Edge Run-out Regulator

With peripheral cutting edge regulating function for possible use of economical M-class inserts.

* Cutter bodies are only available through special orders.

High Clamping Rigidity

High feed machining possible with improved fracture resistance.

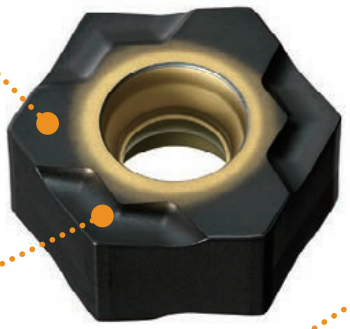
Double Positive Breaker

Reduced cutting resistance. Supports open deck work. Effective finished surface due to wiper edge.

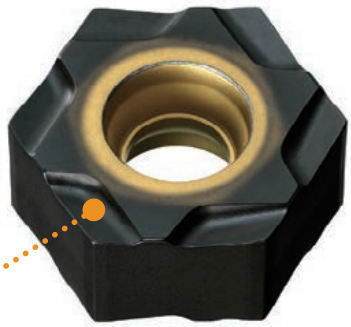
12-Corner Type with Right Hand

Economical 12-corner type that preserves comparable insert rigidity of the 6-corner type by securing the seating surface directly below where the cutting force is absorbed.

Double-sided 6-corner type (No hand)



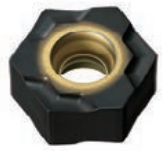
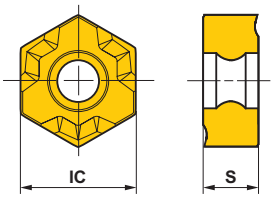
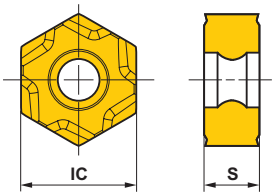
Double-sided 12-corner type (Right hand only)



Scan here for product NEWS ▶

INSERTS

Workpiece Material			Cutting Conditions (Guide) : ● : Stable Cutting ◔ : General Cutting ✤ : Unstable Cutting
	K	Cast Iron	◔

Shape	Order Number	Coated MC5015	Hand	Cutting edge	Dimensions (mm) IC	Dimensions (mm) S	Geometry
	**HNMX1206EN06-R**	▲	–	6	12.7	6.0	
	**HNMX1206ER12-R**	▲	R	12	12.7	6.0	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)	Cutting depth **ae** (mm)
K	Gray Cast Iron	≤350MPa	**MC5015**	200 (150—250)	0.2 (0.1—0.25)	≤3.0

✱ With feed per cutter, settings are set small for finished surface roughness and large for ideal product life.

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

QUICK CHANGE TYPE

<HIGH FEED CUTTING FOR CAST IRON>

90° KAPR

F

FP490

P | M | **K** | N | S | H

Cast Iron

Table Regarding Special Designs



- 11°positive insert.
- Suitable for cast iron finishing.
- Multi insert design.
- For high feed cutting.
- Easy tool exchange.

Fig.1
Q type (Small Diameter)
ø80
ø100
ø125
ø160

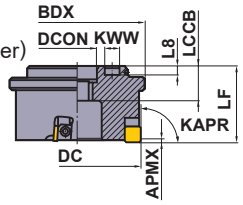


Fig.2
Q type (Large Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

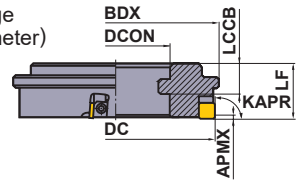
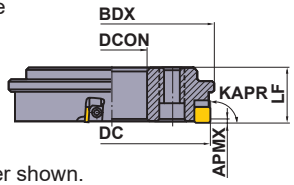


Fig.3
T type
ø250
ø315
ø355
ø400



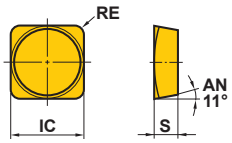
Right hand tool holder shown.

Type	Order Number	Number of Teeth	Dimensions (mm) DC	BDX	LF	DCON	LCCB	KWW	L8	WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
Quick Change Q Type	**FP490R/L0308Q**	8	80	85	50	25.4	26	10.8	7	1.5	0.5	Q Typeϕ80—ϕ160	1
	FP490R/L0410Q	10	100	105	63	31.75	29	12.8	7	2.8	0.5		1
	FP490R/L0514Q	14	125	130	63	38.1	29	15.8	7	4.2	0.5		1
	FP490R/L0618Q	18	160	165	63	50.8	29	18.8	7	6.7	0.5		1
	FP490R/L0822Q	22	200	205	45	125	25	—	—	5.5	0.5	Q Typeϕ200—ϕ500	2
	FP490R/L1028Q	28	250	255	45	175	25	—	—	8.0	0.5		2
	FP490R/L1236Q	36	315	320	45	240	25	—	—	10.7	0.5		2
	FP490R/L1440Q	40	355	360	45	280	25	—	—	12.2	0.5		2
	FP490R/L1646Q	46	400	405	45	325	25	—	—	13.8	0.5		2
	FP490R/L2056Q	56	500	505	45	425	25	—	—	17.8	0.5		2
Quick Change T Type	**FP490R/L1028T**	28	250	260	45	110	—	—	—	9.8	0.5	T Typeϕ250—ϕ400	3
	FP490R/L1236T	36	315	325	45	175	—	—	—	12.1	0.5		3
	FP490R/L1440T	40	355	365	45	215	—	—	—	14.1	0.5		3
	FP490R/L1646T	46	400	410	45	260	—	—	—	15.4	0.5		3

Note 1) These are produced to order only.

INSERTS

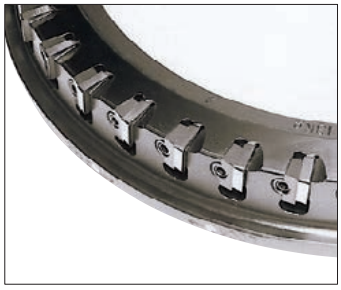
Workpiece Material					Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
K	Cast Iron	◐	●		

Shape	Order Number	Class	Carbide HTi10	Carbide HTi05T	Dimensions (mm) IC	S	RE	Geometry
	**SPEN424A**	E	●	●	12.7	3.18	1.6	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤350MPa	**HTi05T**	125 (100—150)	0.2 (0.1—0.3)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)
=Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number	Wedge	Clamp Screw *	Wrench	Wrench (Sold Separately)	Hexagonal Head (Sold Separately)
FP490R/L0308Q - FP490R/L1646T	CWS42SPR/L	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N • m) : LS14=7.8

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

QUICK CHANGE TYPE
<HIGH FEED CUTTING FOR CAST IRON>

90° KAPR F

FP590

P M **K** N S H

Cast Iron

Table Regarding Special Designs



- 11°positive insert.
- Suitable for cast iron finishing.
- Multi insert design.
- For high feed cutting.
- Easy tool exchange.

Fig.1
Q type
(Small
Diameter)
ø125
ø160

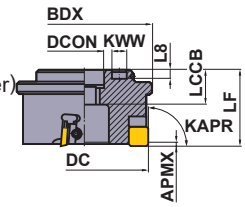


Fig.2
Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

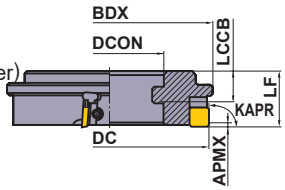
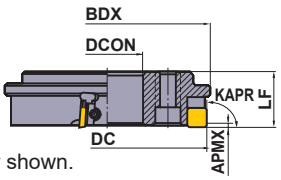


Fig.3
T type
ø250
ø315
ø355
ø400



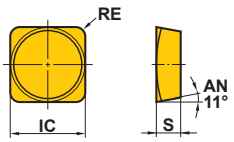
Right hand tool holder shown.

Type	Order Number	Number of Teeth	Dimensions(mm) DC	BDX	LF	DCON	LCCB	KWW	L8	WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
Quick Change Q Type	**FP590R/L0514Q**	14	125	135	63	38.1	29	15.8	7	4.2	0.5	Q Typeϕ125—ϕ160	1
	FP590R/L0618Q	18	160	170	63	50.8	29	18.8	7	6.7	0.5		1
	FP590R/L0822Q	22	200	210	45	125	25	—	—	5.5	0.5	Q Typeϕ200—ϕ500	2
	FP590R/L1028Q	28	250	260	45	175	25	—	—	8.0	0.5		2
	FP590R/L1236Q	36	315	325	45	240	25	—	—	10.7	0.5		2
	FP590R/L1440Q	40	355	365	45	280	25	—	—	12.2	0.5		2
	FP590R/L1646Q	46	400	410	45	325	25	—	—	13.8	0.5		2
	FP590R/L2056Q	56	500	510	45	425	25	—	—	17.8	0.5		2
Quick Change T Type	**FP590R/L1028T**	28	250	260	45	110	—	—	—	9.8	0.5	T Typeϕ250—ϕ400	3
	FP590R/L1236T	36	315	325	45	175	—	—	—	12.1	0.5		3
	FP590R/L1440T	40	355	365	45	215	—	—	—	14.1	0.5		3
	FP590R/L1646T	46	400	410	45	260	—	—	—	15.4	0.5		3

Note 1) These are produced to order only.

INSERTS

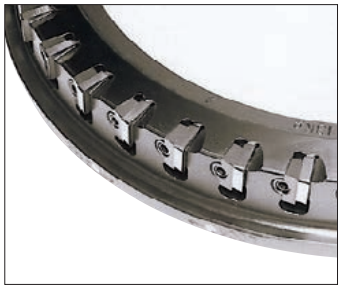
Workpiece Material	K	Cast Iron	◐		Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	Carbide HTi05T		Dimensions (mm) IC	S	RE	Geometry
	**SPEN535A**	E	●		15.875	4.76	2.0	

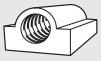
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤350MPa	**HTi05T**	125 (100—150)	0.2 (0.1—0.3)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)
=Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number	 Wedge	 * Clamp Screw	 Wrench	 Wrench (Sold Separately)	 Hexagonal Head (Sold Separately)
FP590R/L0514Q - FP590R/L1646T	CWS5	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N • m) : LS14=7.8

L

INDEXABLE MILLING

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

QUICK CHANGE TYPE
<FINISHING FOR ALUMINIUM ALLOY>

86° KAPR PF

FE404

P M K **N** S H

Non-ferrous Metal

Table Regarding Special Designs



- 21°positive insert.
- High rake and relief angle.
- Multi insert design.
- Suitable for light alloy machining.
- Easy tool exchange.

Fig.1
Q type (Small Diameter)
ø100
ø125
ø160

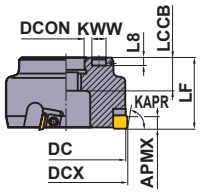


Fig.2
Q type (Large Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

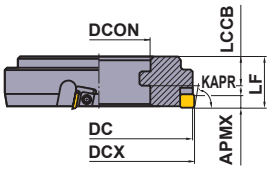
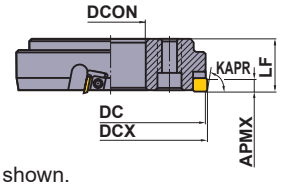


Fig.3
T type
ø250
ø315
ø355
ø400



Right hand tool holder shown.

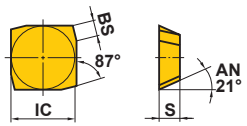
Type	Order Number	Number of Teeth	Dimensions(mm)							WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
			DC	DCX	LF	DCON	LCCB	KWW	L8				
Quick Change Q Type	**FE404R/L0408Q**	8	100	102	63	31.75	29	12.8	7	3.2	9	Q Typeϕ100—ϕ160	1
	FE404R/L0510Q	10	125	127	63	38.1	29	15.8	7	4.7	9		1
	FE404R/L0612Q	12	160	162	63	50.8	29	18.8	7	7.6	9		1
	FE404R/L0816Q	16	200	202	45	125	25	—	—	6.1	9	Q Typeϕ200—ϕ500	2
	FE404R/L1020Q	20	250	252	45	175	25	—	—	7.8	9		2
	FE404R/L1224Q	24	315	317	45	240	25	—	—	10.2	9		2
	FE404R/L1428Q	28	355	357	45	280	25	—	—	11.8	9		2
	FE404R/L1632Q	32	400	402	45	325	25	—	—	13.3	9		2
	FE404R/L2040Q	40	500	502	45	425	25	—	—	16.2	9		2
Quick Change T Type	**FE404R/L1020T**	20	250	251	45	110	—	—	—	9.9	9	T Typeϕ250—ϕ400	3
	FE404R/L1224T	24	315	316	45	175	—	—	—	12.2	9		3
	FE404R/L1428T	28	335	356	45	215	—	—	—	13.7	9		3
	FE404R/L1632T	32	400	401	45	260	—	—	—	16.2	9		3

Note 1) These are produced to order only.

INSERTS

Workpiece Material	N	Non-ferrous Metal

Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

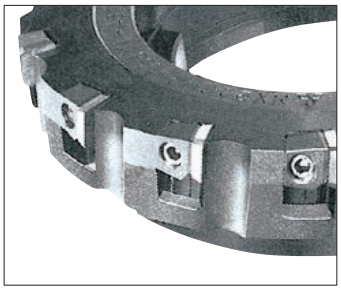
Shape	Order Number	Class	Carbide HTi10	Dimensions (mm) IC	S	BS	Geometry
	**SEA42C10GR**	A	▲	12.70	3.18	2.4	
	SEA42C10GL	A	▲	12.70	3.18	2.4	

Note 1) Use R at a right hand body and L at a left hand body.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Silicon (%)	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
N	Aluminium Alloy	≤10	**HTi10**	700 (400—1000)	0.15 (0.05—0.25)
		≥10	**HTi10**	400 (200—600)	0.15 (0.05—0.25)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
● Table Feed (mm/min)
=Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number	Wedge	Clamp Screw *	Wrench	Wrench (Sold Separately)	Hexagonal Head (Sold Separately)
FE404R/L0408Q ı **FE404R/L1632T**	CWS42SER/L	LS10	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N • m) : LS10=8.2

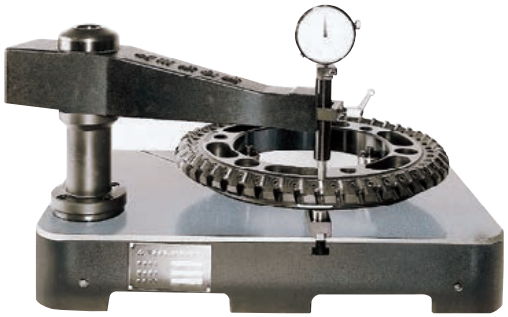
▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

ISO13399	➢ L003
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001

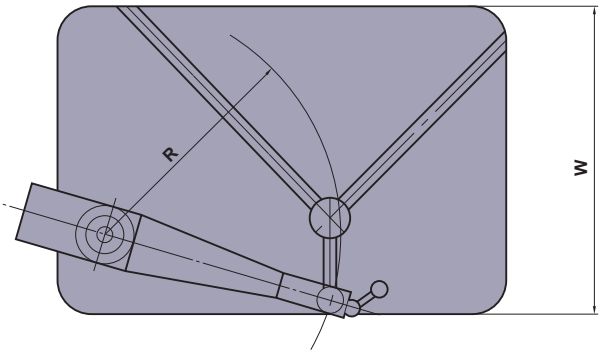
SETTING FIXTURE

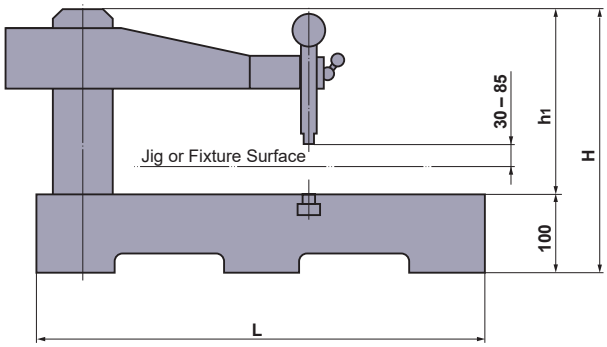
FEATURES OF SETTING FIXTURE

- Compact design.
- Easy set up operation.
- Insert is adjusted from the cutting edge point therefore run-out accuracy is high.



SETTING FIXTURE STANDARD

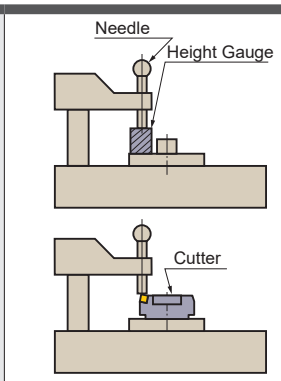




Order Number	R	L	W	H	h1	Cutter Diameter
SEF500	315	600	400	347	247	—ϕ500
SEF700	400	800	500	360	260	ϕ315—ϕ700

Note 1) Please specify the order number when ordering.
Note 2) Please contact us regarding special spare parts order.

Method of Insert Setting for One Piece Type.

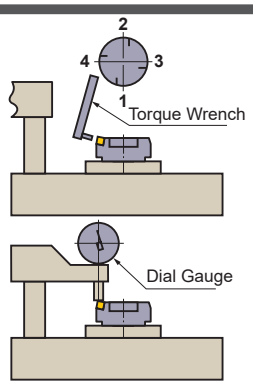


①Set the needle using a height gauge which is the same height as the cutter.

②Move the needle to the insert.

③Slide the insert to the point where it touches the needle. Tighten all the inserts lightly. (Use torque wrench.) (1—2N • m)

*Screwing the inserts too tightly results in lower accuracy.



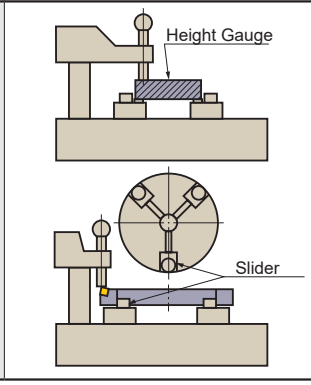
④After temporary tightening, use a torque wrench to tighten firmly. (Use torque wrench.) (8 N • m)

⑤Screw the inserts tightly according to the picture shown on the left.

⑥Check run-out of all the inserts with a dial gauge.

*For general milling, ≤10μm is the standard. For finishing,set the insert run-out at≤5μm.

Method of Insert Setting for Two Piece Type.



①Set the height gauge at the same height as the cutter on the liners of slider, then set the needle.

②Put the cutter on the liners of the slider and move the rollers of the slider to the installation holes.

③Make sure that the three rollers are free, then fix the sliders.

*Process of tightening the inserts is the same as the one piece type.

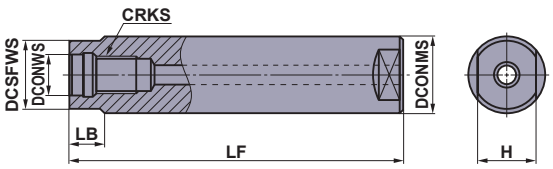
●Note

1. After machining, dust off chips on the cutter with air before loosening the wedge.
2. When loosening clamp screws, avoid using a damaged wrench.
3. Alien substances attached to inserts lowers run-out accuracy and damages the cutter body. Therefore, they need to be cleaned throughly.
4. After all the inserts are taken out, clean the cutter body with oil or strong air blower.
5. Use a torque wrench or special wrench for tightening the clamp screws.

ARBORS

■STRAIGHT SHANK ARBOR





Through coolant compatible

Type	Order Number	Stock	Dimensions (mm)						
			DCONWS	DCONMS	DCSFWS	LF	LB	H	CRKS
STEEL SHANK TYPE	**SC16M08S100S**	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200L	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120S	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220L	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125S	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245L	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140S	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280L	●	17.0	32	28.5	280	15	24	M16
CARBIDE SHANK TYPE	**SC16M08S100SW**	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200LW	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120SW	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220LW	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125SW	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245LW	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140SW	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280LW	●	17.0	32	28.5	280	15	24	M16

HOW TO INSTALL THE SCREW-IN HEAD

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.



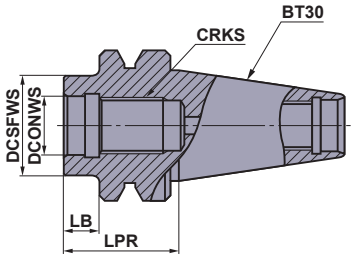
Screw Size	Recommended Torque (N • m)	Wrench Size (mm)
M8	23	10
M10	46	14
M12	80	19
M16	90	24

●Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
●Do not handle the cutting tools with bare hands as this may cause injuries.

● : **Inventory maintained in Japan.**

■BT30 SHANK ARBOR



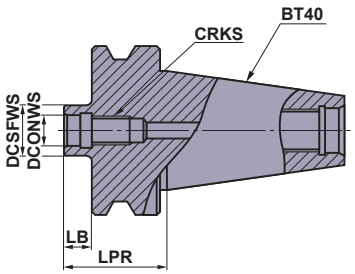


Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S10-BT30	●	8.5	14.5	32	10	M8
SC20M10S10-BT30	●	10.5	18.5	32	10	M10
SC25M12S10-BT30	●	12.5	23.5	32	10	M12
SC32M16S10-BT30	●	17.0	28.5	32	10	M16

■BT40 SHANK ARBOR



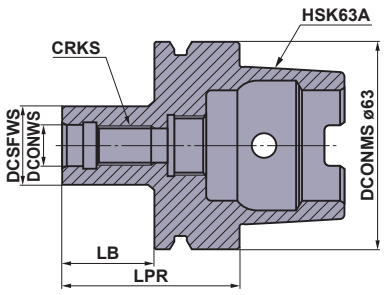


Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S10-BT40	●	8.5	14.5	37	10	M8
SC20M10S10-BT40	●	10.5	18.5	37	10	M10
SC25M12S10-BT40	●	12.5	23.5	37	10	M12
SC32M16S10-BT40	●	17.0	28.5	37	10	M16

■HSK63A SHANK ARBOR





Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S22-HSK63A	●	8.5	14.5	48	22	M8
SC20M10S24-HSK63A	●	10.5	18.5	50	24	M10
SC25M12S27-HSK63A	●	12.5	23.5	53	27	M12
SC32M16S28-HSK63A	●	17.0	28.5	54	28	M16

Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

● : Inventory maintained in Japan.

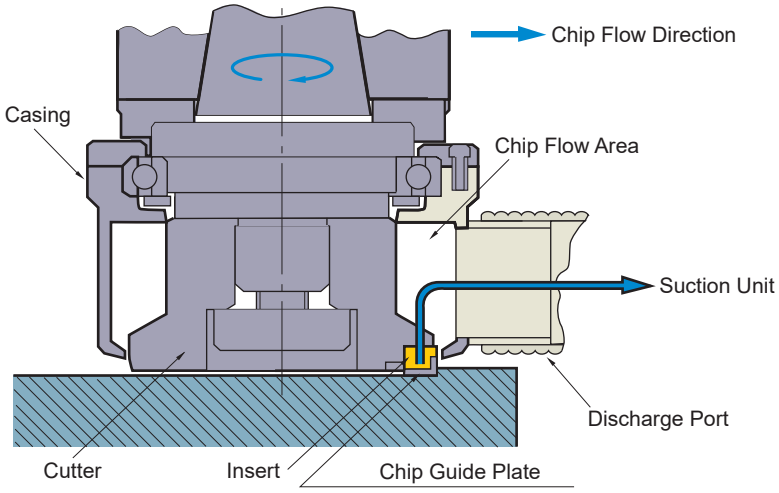
TECHNICAL DATA ➢ Q001

Qing SYSTEM

STRUCTURE CHIP COLLECTION METHOD

STRUCTURE

- **Automatic continuous intake of chips while machining.**
- **Eliminates chip handing problems.**



1
Cutting is performed by a face mill.

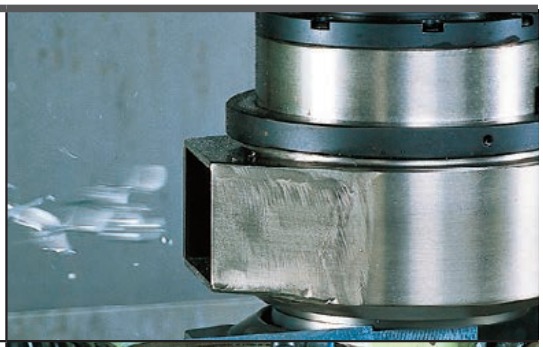
2
Chips are directed into the casing by way of the chip guide plate.

3
Chips are expelled via the discharge port.

■CHIP COLLECTION METHOD

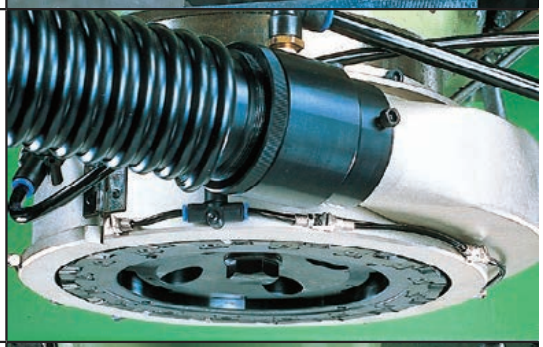
Self Expulsion Type QMC

①Chips are discharged towards the chip conveyor because of the centrifugal force created by the cutter.
②Installation with an ATC(auto tool changer) on machining centres is possible.
③Since there is no need for air or a dust collector, this method provides the lowest initial investment and running costs.
④Chips cannot be transported (carried) directly over long distances.
⑤High-speed bearing required to suit high-speed machining.



Double Air Type QWA

①Chip recovery using compressed air (factory air).
②Since air is also injected into the casing interior, wet cutting is also possible.
③Achieves the same suction capabilities as a dust collector, thereby enabling low equipment costs.
④Wet cutting is not recommended.



Vacuum Machine Type QSV

①Chip collection by use of a suction machine.
②Chip collection efficiency is high.
③Special equipment is required, such as a mist collector for wet cutting.

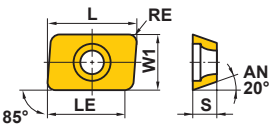
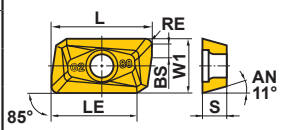
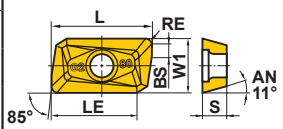
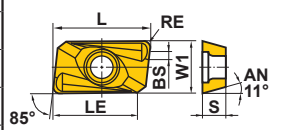
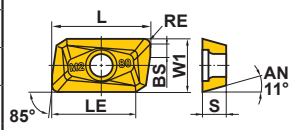
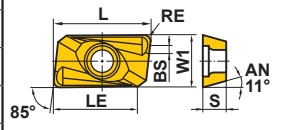
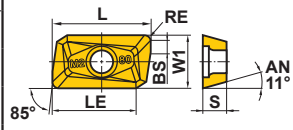
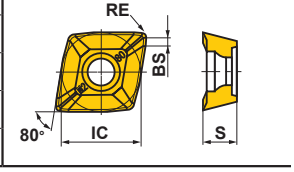


ROTATING INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✠ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

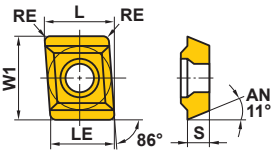
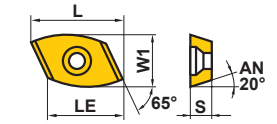
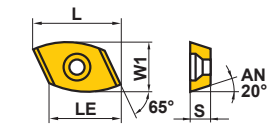
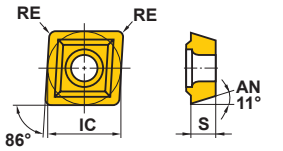
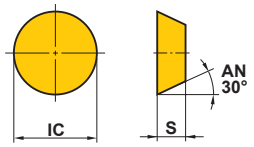
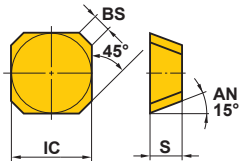
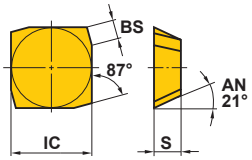
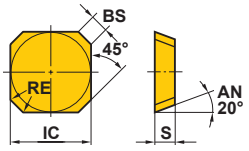
Shape	Order Number	Class	Edge Preparation	Coated			Cermet		Carbide		Dimensions (mm)							Geometry
				F7030	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	L	LE	W1	S	BS	RE	
BAE	AEMW150304ER	M	E			●	●		●		—	16.696	15.2	9.525	3.18	—	0.4	
	AEMW150308ER	M	E			●	●		●		—	16.623	14.8	9.525	3.18	—	0.8	
	AEMW19T304ER	M	E			●	●		●		—	20.161	18.4	12.7	3.97	—	0.4	
	AEMW19T308ER	M	E			●	●		●		—	20.088	18.0	12.7	3.97	—	0.8	
BAP300 BAP300 Long cutting edge	APGT1135PDFR-G2	G	F							●	—	11.3	9.7	6.35	3.5	1.2	0.8	
BAP400	APGT1604PDFR-G2	G	F							●	—	17.02	14	9.525	4.76	1.4	0.8	
BAP300 BAP300 Long cutting edge SRM2	APMT1135PDER-H1	M	E	●	●		●	●		●	—	11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-H2	M	E	●	●		●	●		●	—	11.25	9	6.35	3.5	1.2	0.8	
	APMT1135PDER-H3	M	E	●							—	11.26	9	6.35	3.5	0.8	1.2	
	APMT1135PDER-H4	M	E	●							—	11.24	9	6.35	3.5	0.4	1.6	
	APMT1135PDER-H6	M	E	●							—	11.10	9	6.35	3.5	0.4	2.4	
BAP300 BAP300 Long cutting edge SRM2	APMT1135PDER-M0	M	E	●							—	11.25	9	6.35	3.5	1.8	0.2	
	APMT1135PDER-M1	M	E	●							—	11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-M2	M	E	●	●			●			—	11.18	9	6.35	3.5	1.2	0.8	
BAP400 SRM2 SRM2ϕ40 ϕ50	APMT1604PDER-H1	M	E	●							—	17.02	14	9.525	4.76	1.7	0.4	
	APMT1604PDER-H2	M	E	●	●		●	●		●	—	17.11	14	9.525	4.76	1.4	0.8	
	APMT1604PDER-H4	M	E	●							—	17.06	14	9.525	4.76	0.4	1.6	
	APMT1604PDER-H6	M	E	●							—	16.93	14	9.525	4.76	0.4	2.4	
	APMT1604PDER-H8	M	E	●							—	16.79	14	9.525	4.76	0.4	3.2	
BAP400 SRM2 SRM2ϕ40 ϕ50	APMT1604PDER-M2	M	E	●	●			●			—	17.10	14	9.525	4.76	1.4	0.8	
PMR	CPMT1205ZPEN-M2	M	E		●						12.7	—	—	—	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	E		●						12.7	—	—	—	5.56	1.4	1.2	
	CPMT1906ZPEN-M2	M	E		●						19.05	—	—	—	6.35	1.4	0.8	
	CPMT1906ZPEN-M3	M	E		●						19.05	—	—	—	6.35	1.4	1.2	

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✲ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

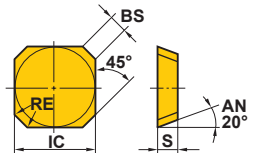
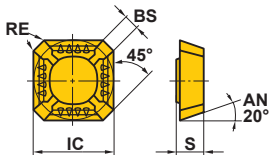
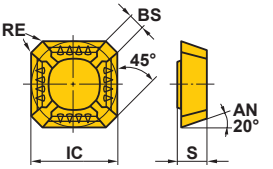
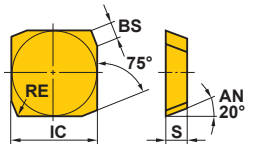
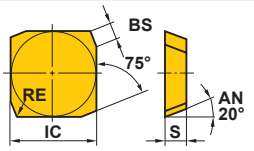
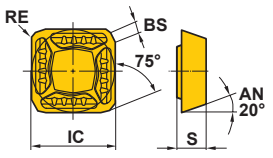
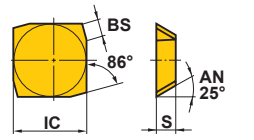
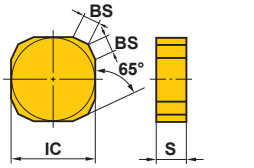
Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	IC	L	LE	W1	S	BS	RE	Geometry
CBJP TAB	**JPMT060204-E**	M	E			●	●			●		—	7.0	6.0	7.94	2.38	—	0.4	
MG245 MG345 MG445	**MGEEW1035AFTR**	E	T				●	●		●	●	—	14.3	9.3	9	3.5	—	—	
	MGEEW1242AFTR	E	T				●	●		●	●	—	17.0	11.2	10.5	4.2	—	—	
	MGEEW1650AFTR	E	T				●	●		●	●	—	21.8	14.9	13	5	—	—	
																			This figure is for outer insert (E).
MG200 MG300 MG400	**MGEEW1035PFTR**	E	T				●	●		●	●	—	14.3	9.3	9	3.5	—	—	
	MGEEW1242PFTR	E	T				●	●		●	●	—	17.0	11.2	10.5	4.2	—	—	
	MGEEW1650PFTR	E	T				●			●	●	—	21.8	14.9	13	5	—	—	
CBMP ECMP TAB	**MPMT070308**	M	E				●			●		7.94	—	—	—	3.18	—	0.8	
	MPMT090308	M	E			●	●			●		9.525	—	—	—	3.18	—	0.8	
	MPMT120408	M	E				●			●		12.7	—	—	—	4.76	—	0.8	
SG20	**RGEN2004M0EN**	E	E			●						20	—	—	—	4.76	—	—	
	RGEN2004M0SN	E	S	●			●			●	●	20	—	—	—	4.76	—	—	
FMSD	**SDEN1203AEN**	E	T						▲			12.7	—	—	—	3.18	1.2	—	
FE404 E404	**SEA42C10GR**	A	F								▲	12.7	—	—	—	3.18	2.4	—	
	SEA42C10GL	A	F								▲	12.7	—	—	—	3.18	2.4	—	
SE445 LSE445	**SECN1203AFTN1**	C	T						●			12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFFN1	E	F								●	12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFEN1	E	E			●						12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFTN1	E	T					●	●			12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFSN1	E	S	●	●							12.7	—	—	—	3.18	1.4	1.0	

ROTATING INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

Shape	Order Number	Class	Edge Preparation	Coated F7030	Coated MC5020	Coated VP15TF	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	Dimensions (mm) IC	S	BS	RE	Geometry
SE545	SEEN1504AFEN1	E	E			●					15.875	4.76	1.4	1.0	
	SEEN1504AFTN1	E	T				●	●			15.875	4.76	1.4	1.0	
	SEEN1504AFSN1	E	S	●	●						15.875	4.76	1.4	1.0	
SE445 LSE445	SEER1203AFEN-JS	E	E	●	●	●					12.7	3.18	1.4	1.0	
SE545	SEER1504AFEN-JS	E	E	●	●						15.875	4.76	1.4	1.0	
SE415 QSE415	SEEN1203EFFR1	E	F							●	12.7	3.18	1.4	1.0	 Right hand insert shown.
	SEEN1203EFER1	E	E			●					12.7	3.18	1.4	1.0	
	SEEN1203EFTR1	E	T				●	●			12.7	3.18	1.4	1.0	
	SEEN1203EFSR1	E	S	●	●						12.7	3.18	1.4	1.0	
SE515	SECN1504EFTR1	C	T					●			15.875	4.76	1.4	1.0	 Right hand insert shown.
	SEEN1504EFER1	E	E			●					15.875	4.76	1.4	1.0	
	SEEN1504EFTR1	E	T					●			15.875	4.76	1.4	1.0	
	SEEN1504EFSR1	E	S	●							15.875	4.76	1.4	1.0	
SE415 QSE415	SEER1203EFER-JS	E	E	●	●						12.7	3.18	1.4	1.0	
BF407 QBF407	SFAN1203ZFFR2	A	F							●	12.7	3.175	2.4	—	
	SFAN1203ZFFL2	A	F							●	12.7	3.175	2.4	—	
	SFCN1203ZFFR2	C	F							●	12.7	3.175	2.4	—	
	SFCN1203ZFFL2	C	F							□	12.7	3.175	2.4	—	
BN425 DN	SNC43B2G	C	F							●	12.7	4.8	2	—	
	SNC43B2S	C	T *1					●	●		12.7	4.8	2	—	

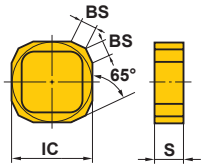
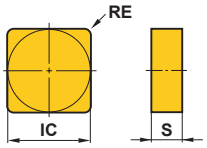
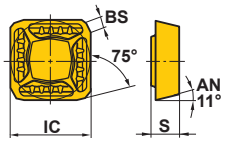
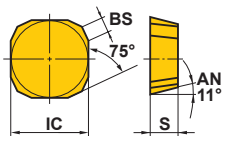
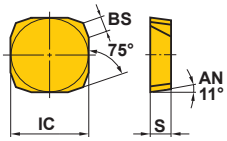
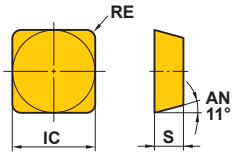
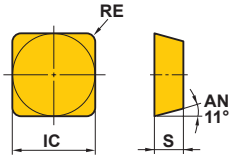
*1 Grade UTi20T is "E".

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **T** : Chamfer

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE	
BN425 DN 	**SNMF43B2G**	M	E		●							12.7	4.8	2	—	
	**SNMN120408**	M	E		●							12.7	4.76	—	0.8	
	SNMN120412	M	E		●							12.7	4.76	—	1.2	
FBP415 	**SPER1203EEER-JS**	E	E		●							12.7	3.18	1.4	—	
Corner Angle 15° 	**SPEN1203EDR**	E	T	▲				▲	▲			12.7	3.18	1.4	—	 Right hand insert shown.
FBP415 	**SPEN1203EEER1**	E	E		●						●	12.7	3.175	1.4	—	 Right hand insert shown.
	SPEN1203EEEL1	E	E		●						●	12.7	3.175	1.4	—	
	SPNN1203EEER1	N	E		●						●	12.7	3.18	1.3	—	
	SPNN1203EEEL1	N	E								●	12.7	3.18	1.3	—	
S400 	**SPMN120304**	M	E*1			●				●	●	12.7	3.18	—	0.4	
	SPMN120304T	M	T					●				12.7	3.18	—	0.4	
	SPMN120308	M	E*1	●		●	●			●	●	12.7	3.18	—	0.8	
	SPMN120312	M	E*1	●		●				●	●	12.7	3.18	—	1.2	
	SPMN120408	M	E*1		●					●	●	12.7	4.76	—	0.8	
	SPMN120412	M	E		●					●		12.7	4.76	—	1.2	
	SPGN120304	G	E*1					●		●	●	12.7	3.18	—	0.4	
	SPGN120308	G	E*1				●	●		●	●	12.7	3.18	—	0.8	
	SPGN120312	G	F								●	12.7	3.18	—	1.2	
S500 	**SPMN150408**	M	E							●		15.875	4.76	—	0.8	
	SPMN150412	M	E							●		15.875	4.76	—	1.2	
	SPGN150404	G	E							●		15.875	4.76	—	0.4	
	SPGN150408	G	F								●	15.875	4.76	—	0.8	

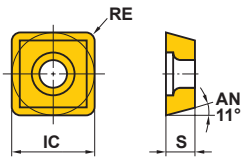
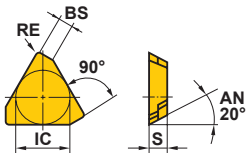
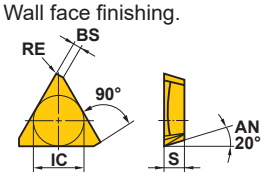
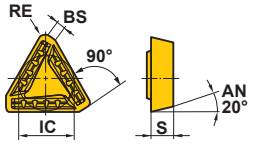
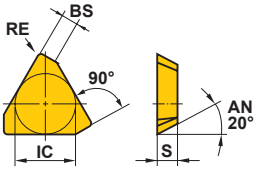
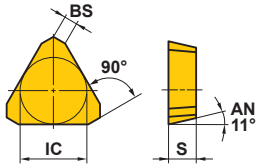
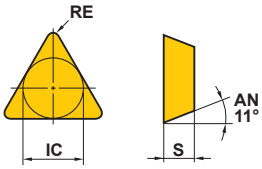
*1 Grade HTi10 is "F".

ROTATING INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloy, Titanium Alloy
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✲ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE	
TBE1	SPMT120408-A	M	E				▲			▲		12.7	4.76	—	0.8	
NSE300 SE300	TEEN1603PEFR1	E	F								●	9.525	3.175	1.4	0.4	
	TEEN1603PEER1	E	E			●					●	9.525	3.175	1.4	0.4	
	TEEN1603PETR1	E	T				●	●	●	●		9.525	3.175	1.4	0.4	
	TEEN1603PESR1	E	S	●	●							9.525	3.175	1.4	0.4	
NSE300 SE300	TECN1603PEFR1W	C	F								●	9.525	3.175	1.4	0.4	Wall face finishing. 
	TECN1603PEER1W	C	E								●	9.525	3.175	1.4	0.4	
	TECN1603PETR1W	C	T					●	●	●		9.525	3.175	1.4	0.4	
NSE300 NSE400	TEER1603PEER-JS	E	E	●						●		9.525	3.175	1.4	0.4	
	TEER2204PEER-JS	E	E	●						●		12.7	4.76	1.4	1.0	
NSE400 SE400	TECN2204PEFR1	C	F								●	12.7	4.76	1.4	1.0	
	TECN2204PEER1	C	E								●	12.7	4.76	1.4	1.0	
	TECN2204PETR1	C	T					●	●	●		12.7	4.76	1.4	1.0	
	TEEN2204PEFR1	E	F								●	12.7	4.76	1.4	1.0	
	TEEN2204PEER1	E	E			●					●	12.7	4.76	1.4	1.0	
	TEEN2204PETR1	E	T				●	●	●	●		12.7	4.76	1.4	1.0	
	TEEN2204PESR1	E	S	●	●							12.7	4.76	1.4	1.0	Right hand insert shown.
Corner Angle 0°	TPEN1603PPR	E	T	▲				▲				9.525	3.18	1.2	—	
	TPEN2204PDR	E	E	▲								12.7	4.76	1.4	—	
11°Positive	TPMN160304	M	E*1	●		●	●	●		●	●	9.525	3.18	—	0.4	
	TPMN160308	M	E*2	●		●	●	●		●	●	9.525	3.18	—	0.8	
	TPMN160312	M	E*1				●				●	9.525	3.18	—	1.2	
	TPMN220404	M	E							●		12.7	4.76	—	0.4	
	TPMN220408	M	E*1	●		●	●			●	●	12.7	4.76	—	0.8	
	TPMN220412	M	E*1	●		●				●	●	12.7	4.76	—	1.2	

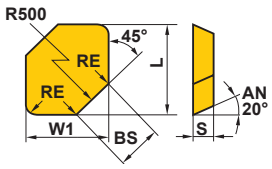
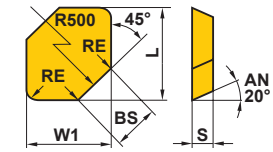
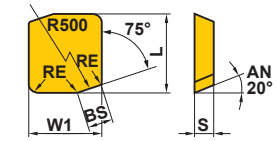
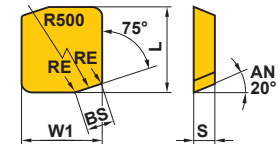
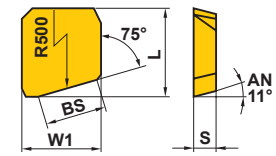
*1 Grade HTi10 is "F".
*2 Grade HTi10 is "F", Grade NX2525 is "T".

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

WIPER INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
Edge Preparation :
E : Round **T :** Chamfer

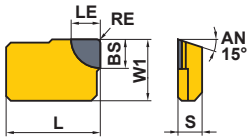
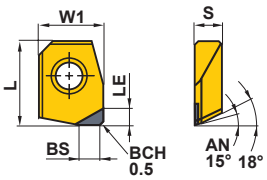
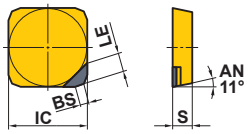
Shape	Order Number	Class	Edge Preparation	Cermet NX2525	Carbide HTi05T	Dimensions (mm) L	W1	S	BS	RE	Geometry
SE445 LSE445	**WEC42AFTR5C**	C	T	●		15.33	12.7	3.18	5	1.0	
SE545	**WEC53AFER5C**	C	E		●	18.505	15.875	4.76	5	1.0	
	WEC53AFTR5C	C	T	●		18.505	15.875	4.76	5	1.0	
SE415	**WEC42EFER5C**	C	E		●	13.728	12.7	3.18	5	1.0	
	WEC42EFTR5C	C	T	●		13.728	12.7	3.18	5	1.0	
SE515	**WEC53EFTR5C**	C	T	●		16.903	15.875	4.76	5	1.0	
FBP415 QBP415	**WPC42EEER10C**	C	E		●	15.163	12.7	3.175	10	—	
	WPC42EEEL10C	C	E		●	15.163	12.7	3.175	10	—	

Right hand insert shown.

CBN & PCD INSERTS

Workpiece Material			CBN		PCD
	K	Cast Iron	◐	◐	◐
	N	Non-ferrous Metal			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

Shape	Order Number	Class	CBN MB710	CBN MB730	PCD MD220	L	W1	IC	S	BS	LE	RE	Geometry
AF5000 	LDCN190412R	C		▲		19.05	12.7	—	4.76	4.3	6.0	1.2	
V10000 	NP-GDCW1240PDFR2	C			●	12	9.5	—	4	2	2	—	
FBP415 	SPEN1203EETR1	E	▲			—	—	12.7	3.175	1.4	3	—	

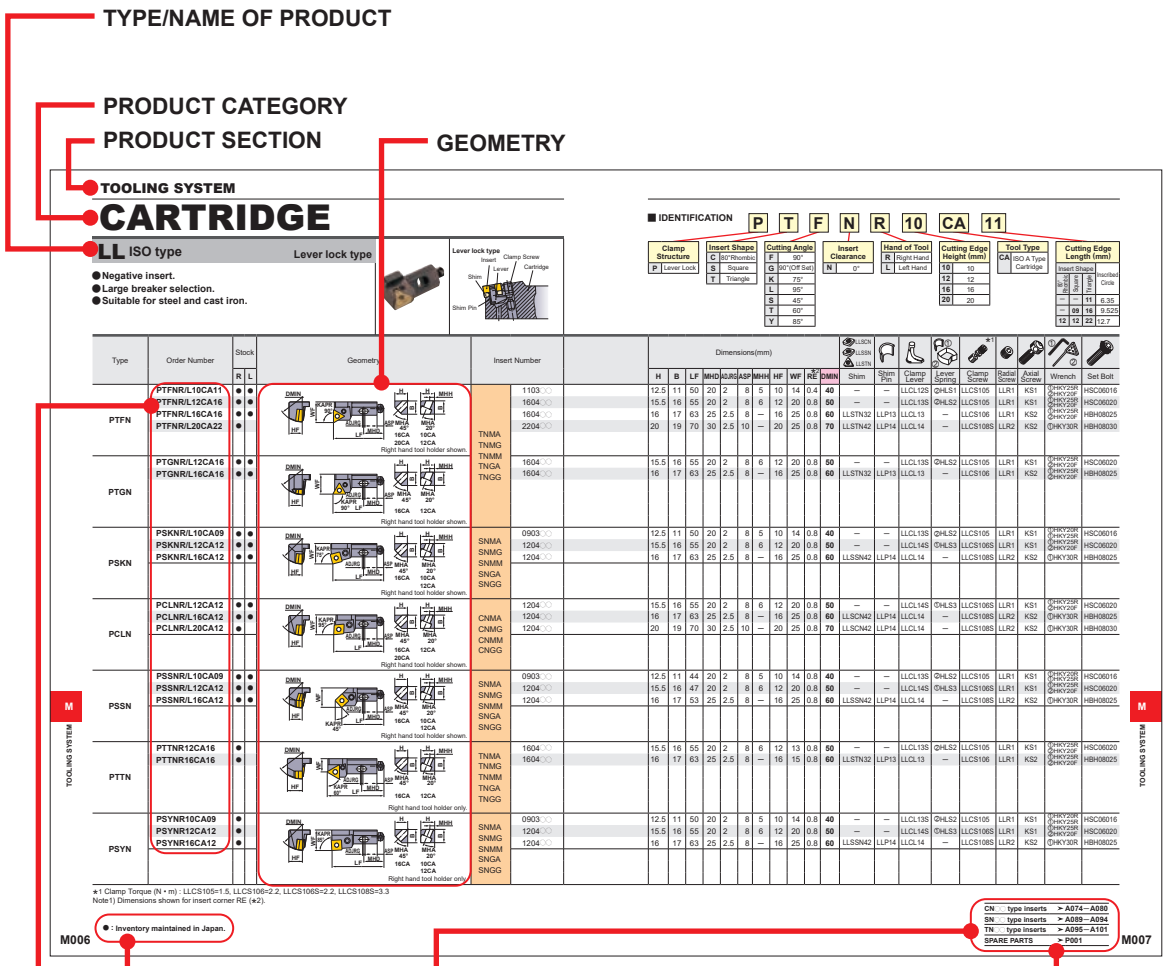
● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one piece per case.)

Memo

HOW TO READ THE STANDARD OF TOOLING SYSTEM

●How this section page is organised

①Organised by product series. (Refer to the index on the next page.)



●To Order : Please specify

①order number and hand of tool (right/left).

MILLING TOOLS

TOOLING SYSTEM

VALVE FINISHER ····· M002

CARTRIDGE

- LL TYPE CARTRIDGE ····· M006
- BC TYPE CARTRIDGE ····· M008
- SS TYPE CARTRIDGE ····· M010

BORING UNIT ····· M012

MI TYPE BORING BARS ····· M017

QUICK CHANGE TOOLING SYSTEM

- CLASSIFICATION OF QUICK CHANGE SYSTEM ····· M018
- FACE MILL ····· M019
- FACE MILLING ADAPTER ····· M020
- SIDE CUTTER ····· M022
- BORING TOOL ····· M023

MODULAR TOOLING SYSTEM

- ABS® License KOMET® ····· M024
- HSK SYSTEM ····· M028



*Arranged by Alphabetical order

M026 **ABS○○-ES-M**
M026 **ABS○○○-ES-M**
M026 **ABS○○-ES-M1**
M026 **ABS○○○-ES-M1**
M026 **ABS○○-ES-M3**
M026 **ABS○○○-ES-M3**
M027 **ABS○○-ES-M4**
M027 **ABS○○○-ES-M4**
M025 **ABS○○-FS-W**
M025 **ABS○○○-FS-W**
M026 **ABS○○M**
M026 **ABS○○○M**
M025 **ABS○○W**
M025 **ABS○○○W**
M008 **CSKPR○○CA○○**
M008 **CSSPR10CA09**
M012 **FA○-FA○○○○**
M012 **FA○-FA○○○○S**
M012 **FV○-FV○○○○**
M012 **FV○-FV○○○○S**
M029 **HSK-○○○M**
M029 **HSK-○○○○M**
M002 **HVF06-HSK63A○○○○○**
M002 **HVS060519**
M006 **PCLNR/L○○CA○○**
M006 **PSKNR/L○○CA○○**
M006 **PSSNR/L○○CA○○**
M006 **PSYNR○○CA○○**
M006 **PTFNR/L○○CA○○**
M006 **PTGNR/L○○CA○○**
M006 **PTTNR○○CA○○**
M023 **QB○○○○○○○**
M021 **QFA○○○○○○**
M020 **QFA○○○○○B○R/L**
M020 **QFA○○○○○N○R/L**
M021 **QFB○○○○○○R/L**
M027 **SBA○○-ES-M**
M027 **SBA○○○-ES-M**
M027 **SBA○○-ES-M1**
M027 **SBA○○○-ES-M1**
M017 **SBR○○○**
M010 **SSKPR○○CA○○**
M010 **SSSPR○○CA○○**
M010 **SSYPR○○CA○○**
M010 **STFPR/L○○CA○○**
M010 **STGPR○○CA○○**
M010 **STTPR○○CA○○**

VALVE FINISHER



Fig.1

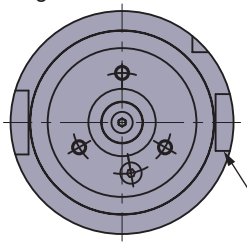
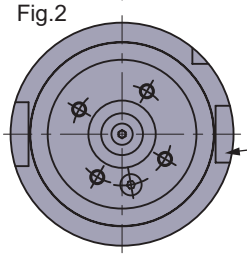
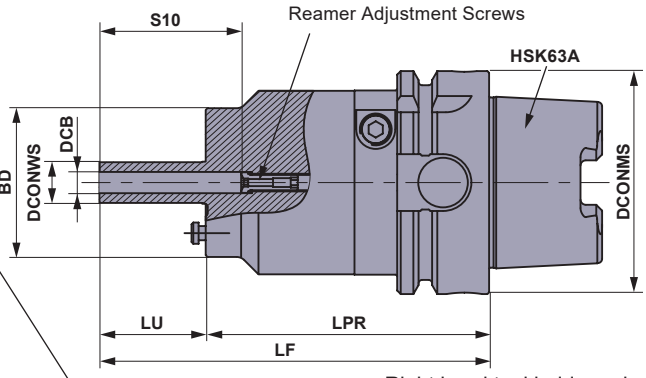


Fig.2





Right hand tool holder only.

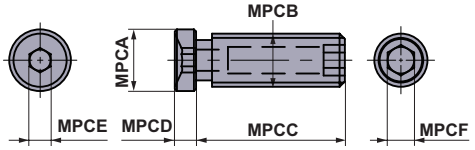
∗ The Mitsubishi Materials tool holder (Patent held in Japan) is manufactured under license by NT TOOL CORPORATION.

■Tool Holder

Order Number	Stock	Dimensions(mm)								Coolant Hole (Hole)	WT (kg)	Installation	Balance Accuracy
		BD	DCONWS	DCB	S10	LF	LU	LPR	DCONMS				
HVF06-HSK63A110A3	●	42	11.5	6	40	110	30	80	63	Fig.1 (3 Hole)	1.5	HSK63A (With Coolant Pipe)	G2.5 (5000min^{-1})
HVF06-HSK63A110A4	●	42	11.5	6	40	110	30	80	63	Fig.2 (4 Hole)	1.5		
HVF06-HSK63A180A3	●	42	11.5	6	40	180	30	150	63	Fig.1 (3 Hole)	2.6		
HVF06-HSK63A180A4	●	42	11.5	6	40	180	30	150	63	Fig.2 (4 Hole)	2.6		

∗ A variety of other tool holders, such as BT shanks with their distinctive double face contact, can be mounted as well.

Spare Parts (Reamer Adjustment Screws)

Geometry	Order Number	Stock	Dimensions (mm)					
			MPCA	MPCB	MPCC	MPCD	MPCE	MPCF
	**HVS060519**	●	5.8	M5×0.8	17	2	2	2.5

Reamer adjustment screws can be operated using a wrench from both the reamer insertion hole side and the mounting side.
The reamer adjustment screw is an accessory (1 piece), which can also be additionally purchased as a stand-alone item.
A hexagon socket set screw (M4) is included with the tool holder. It should be used as a stopper when discharging coolant with the use of an external oil supply.

● : **Inventory maintained in Japan.**

Produced-to-Order Products

Please inquire with our Sales Department regarding production.

For Valve Guide Hole Reaming

Compatible Reamer Range : ≤ **ø6** (Guide Hole Diameter)



RT9005

Optimization and strengthening of the hard phase (WC) particle diameter and bonded phase (Co) have improved the wear resistance and fracture resistance, for the creation of a unique cemented carbide.

EF05

An ultra-high hardness, ultra micro-particle cemented carbide that contains specialized components. Just as with RT9005, its wear resistance and fracture resistance have been improved.

Coating (TiN)

The hard coating with smooth surface properties can maintain an excellent finished surface over extended periods of time.

For Seat Surface Machining

Compatible Head Range : **ø20** ≤ Head Diameter < **ø35**
(Seat Hole : 45°-Surface Gauge Diameter)

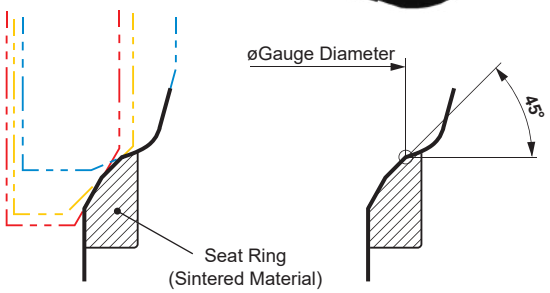
Tool Bits : 3 types





MB4120

Fine CBN particles increase cutting edge toughness. Optimization of the sintering conditions strengthens adhesion between fine CBN particles. This increases both fracture and wear resistance, workpiece stability and allows for a longer tool life.



● The seat surface is composed of 3 faces at different angles (Cutting with 3 types of edges).

Relationship between number of head cutting edge grooves and tool holders

* HVF06-HSK63A110A○ : Suitable for cases with no processing beyond the angle plate
* HVF06-HSK63A180A○ : Suitable for cases with processing beyond the angle plate

Order Number	Coolant Hole (Hole)	Number of Cutting Edge Grooves on Head			
		1	2	3	4
HVF06-HSK63A110A3	**3**	○	×	○	×
HVF06-HSK63A180A3	**3**	○	×	○	×
HVF06-HSK63A110A4	**4**	○	○	×	○
HVF06-HSK63A180A4	**4**	○	○	×	○

○ = Suitable × = Unsuitable

* Hexagon socket set screws (M4) are included as separately-packaged accessories.

Important! Install screws in any unused coolant holes.

RECOMMENDED CUTTING CONDITIONS

■ For Valve Guide Hole Reaming

Workpiece Material	Reamer Material			Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)
	Grade	Hardness (HRA)	Bending Strength (Gpa)		
Steel-based Sintered Alloy	**RT9005**	92.2	2.0	40 — 60	0.03 — 0.05
Cast Iron	**EF05**	94.0	2.5		

■ Seat Surface Machining

Workpiece Material	Priority	CBN Material for Bits	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)
Sintered Alloy	1	**MB4120**	60 — 120	0.05 — 0.10
	2	**MB835**		

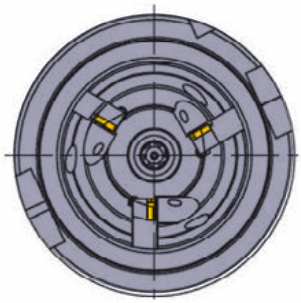
* Select materials in accordance with seat material characteristics.

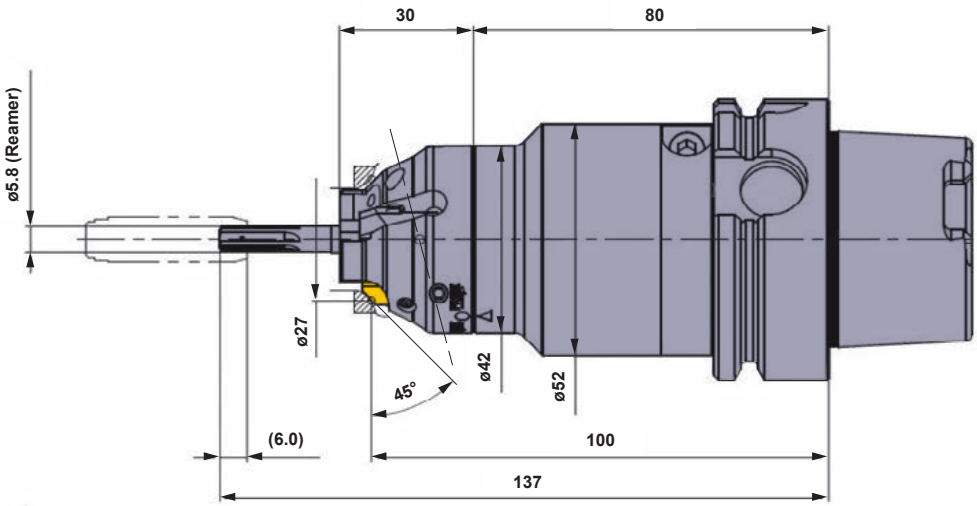
Setup Reference Diagram

(When Tool Holder : HVF06-HSK63A110A3 is suitable)

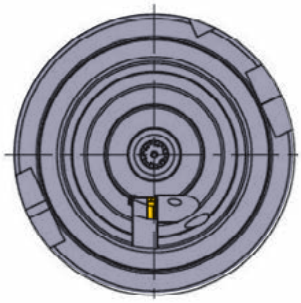
(mm)

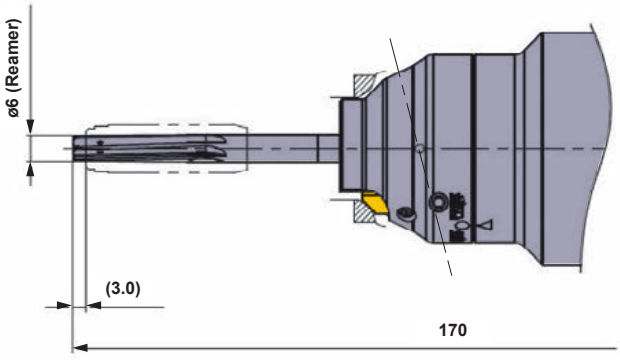
Rough Processing





Finish Processing





Procedure

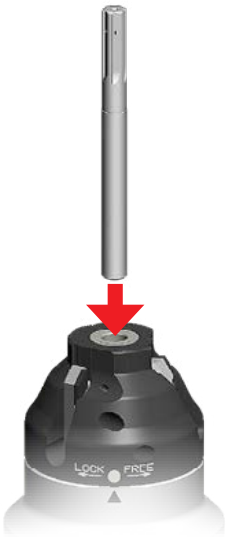
STEP 1

Mount the head on the tool holder.



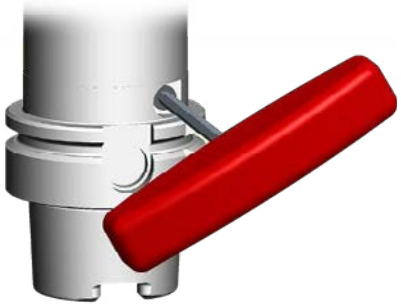
STEP 2

Attach the reamer.



STEP 3

Tightening and removing screws follow opposite procedures from the usual.



During use, line up the markings on the head and tool holder to secure them in place. When mounting and removing them, turn them to the side marked “FREE”.



Secured Position



Mounting / Removal Position

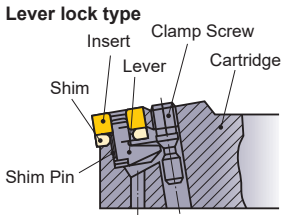


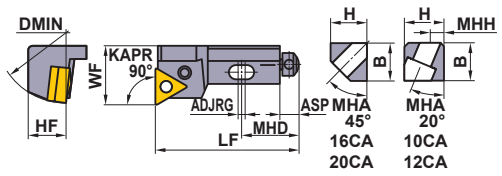
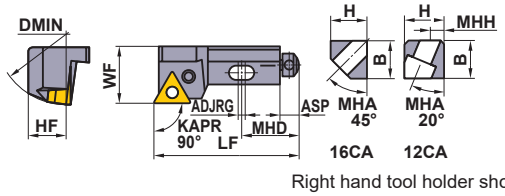
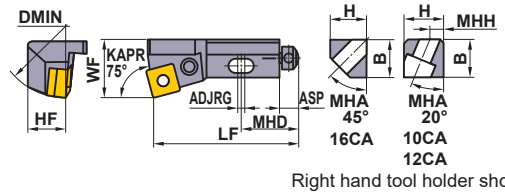
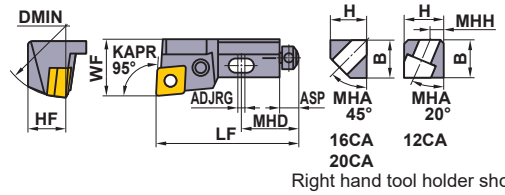
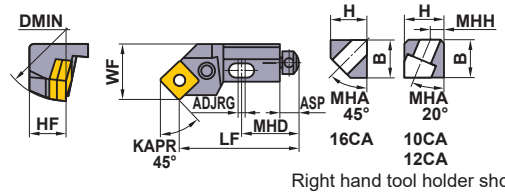
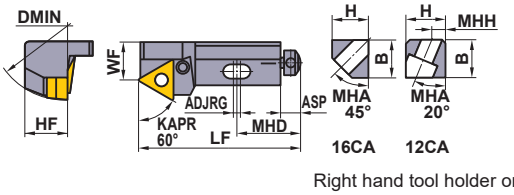
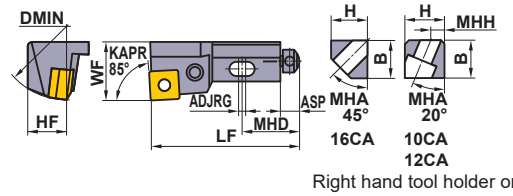
CARTRIDGE

LL ISO type — Lever lock type

- Negative insert.
- Large breaker selection.
- Suitable for steel and cast iron.





Type	Order Number	Stock R	Stock L	Geometry	Insert Number	
PTFN	PTFNR/L10CA11	●	●		TNMA TNMG TNMM TNGA TNGG	1103○○
	PTFNR/L12CA16	●	●			1604○○
	PTFNR/L16CA16	●	●			1604○○
	PTFNR/L20CA22	●				2204○○
PTGN	PTGNR/L12CA16	●	●			1604○○
	PTGNR/L16CA16	●	●			1604○○
PSKN	PSKNR/L10CA09	●	●		SNMA SNMG SNMM SNGA SNGG	0903○○
	PSKNR/L12CA12	●	●			1204○○
	PSKNR/L16CA12	●	●			1204○○
PCLN	PCLNR/L12CA12	●	●		CNMA CNMG CNMM CNGG	1204○○
	PCLNR/L16CA12	●	●			1204○○
	PCLNR/L20CA12	●				1204○○
PSSN	PSSNR/L10CA09	●	●		SNMA SNMG SNMM SNGA SNGG	0903○○
	PSSNR/L12CA12	●	●			1204○○
	PSSNR/L16CA12	●	●			1204○○
PTTN	PTTNR12CA16	●			TNMA TNMG TNMM TNGA TNGG	1604○○
	PTTNR16CA16	●				1604○○
PSYN	PSYNR12CA12	●			SNMA SNMG SNMM SNGA SNGG	0903○○
	PSYNR16CA12	●				1204○○

Right hand tool holder shown.

Right hand tool holder shown.

Right hand tool holder shown.

Right hand tool holder shown.

Right hand tool holder only.

Right hand tool holder only.

∗1 Clamp Torque (N • m) : LLCS105=1.5, LLCS106=2.2, LLCS106S=2.2, LLCS108S=3.3
Note1) Dimensions shown for insert corner RE (∗2).

● : Inventory maintained in Japan.

■ IDENTIFICATION

P T F N R 10 CA 11

Clamp Structure	
P	Lever Lock

Insert Shape	
C	80°Rhombic
S	Square
T	Triangle

Cutting Angle	
F	90°
G	90°(Off Set)
K	75°
L	95°
S	45°
T	60°
Y	85°

Insert Clearance	
N	0°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
10	10
12	12
16	16
20	20

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)			
Insert Shape			Inscribed Circle
80° Rhombic	Square	Triangle	
—	—	11	6.35
—	09	16	9.525
12	12	22	12.7

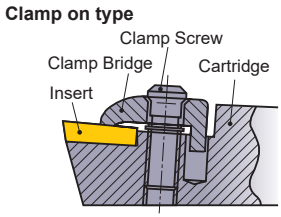
Dimensions(mm)											LLSCN LLSSN LLSTN	Shim Pin	Clamp Lever	①② Lever Spring	*1 Clamp Screw	Radial Screw	Axial Screw	①② Wrench	Set Bolt
H	B	LF	MHD	ADJRG	ASP	MHH	HF	WF	*2 RE	DMIN	Shim								
12.5	11	50	20	2	8	5	10	14	0.4	**40**	—	—	LLCL12S	②HLS1	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	25	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
20	19	70	30	2.5	10	—	20	25	0.8	**70**	LLSTN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08030
15.5	16	55	20	2	8	6	12	20	0.8	**50**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	25	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
12.5	11	50	20	2	8	5	10	14	0.8	**40**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	—	—	LLCL14S	①HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
15.5	16	55	20	2	8	6	12	20	0.8	**50**	—	—	LLCL14S	①HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	25	0.8	**60**	LLSCN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
20	19	70	30	2.5	10	—	20	25	0.8	**70**	LLSCN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08030
12.5	11	44	20	2	8	5	10	14	0.8	**40**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	47	20	2	8	6	12	20	0.8	**50**	—	—	LLCL14S	①HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	53	25	2.5	8	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025
15.5	16	55	20	2	8	6	12	13	0.8	**50**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	15	0.8	**60**	LLSTN32	LLP13	LLCL13	—	LLCS106	LLR1	KS2	①HKY25R ②HKY20F	HBH08025
12.5	11	50	20	2	8	5	10	14	0.8	**40**	—	—	LLCL13S	②HLS2	LLCS105	LLR1	KS1	①HKY20R ①HKY25R	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	—	—	LLCL14S	①HLS3	LLCS106S	LLR1	KS1	①HKY25R ②HKY20F	HSC06020
16	17	63	25	2.5	8	—	16	25	0.8	**60**	LLSSN42	LLP14	LLCL14	—	LLCS108S	LLR2	KS2	①HKY30R	HBH08025

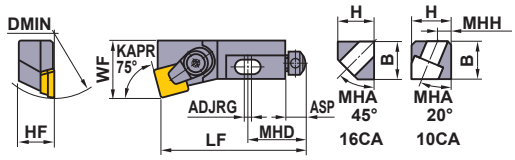
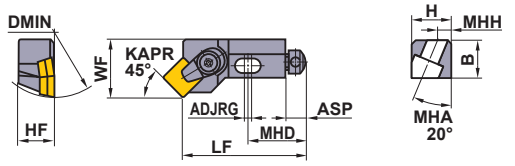
CN□□ type inserts ➤ A074—A080
SN□□ type inserts ➤ A089—A094
TN□□ type inserts ➤ A095—A101
SPARE PARTS ➤ P001

CARTRIDGE

BC ISO type — Clamp on type

- 11°positive insert.
- Suitable for steel, cast iron, aluminium alloys and copper alloys.



Type	Order Number	Stock R	Geometry	Insert Number	
CSKP	CSKPR10CA09	●	 Right hand tool holder only.	SPMN SPMR SPGN	0903○○
	CSKPR16CA12	●			1203○○
CSSP	CSSPR10CA09	●	 Right hand tool holder only.		0903○○

∗1 Clamp Torque (N • m) : BC4L=2.5, BC6=5.0
∗2 Dimensions shown for insert corner RE0.8.

● : Inventory maintained in Japan.

■ IDENTIFICATION

C S K P R 10 CA 09

Clamp Structure	
C	Clamp On

Insert Shape	
S	Square

Cutting Angle	
K	75°
S	45°

Insert Clearance	
P	11°

Hand of Tool	
R	Right Hand

Cutting Edge Height (mm)	
10	10
16	16

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)	
Insert Shape: Square	Inscribed Circle
09	9.525
12	12.7

Dimensions(mm)															 *1		
H	B	LF	MHD	ADJRG	ASP	MHH	HF	WF	RE *2	DMIN	Shim	Shim Pin	Radial Screw	Axial Screw	Clamp Set	Wrench	Set Bolt
12.5	11	50	20	2	8	5	10	14	0.8	**38**	—	—	TSS05006	KS1	BC4L	TKY10R	HSC06016
16	17	63	25	2	8	—	16	25	0.8	**55**	PS42	BCP251	TSS06010	KS2	BC6	TKY20R	HBH08025
12.5	11	44	20	2	8	5	10	14	0.8	**38**	—	—	TSS05006	KS1	BC4L	TKY10R	HSC06016

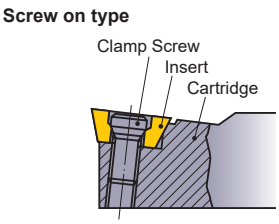
SP○○ type inserts ➤ A155
SPARE PARTS ➤ P001

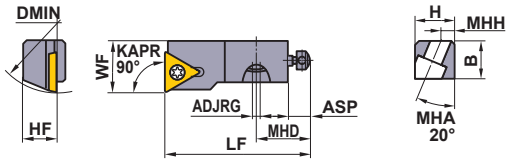
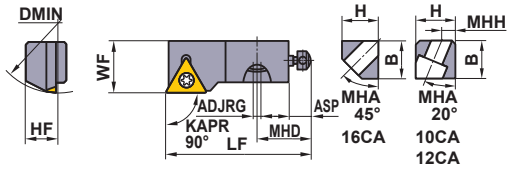
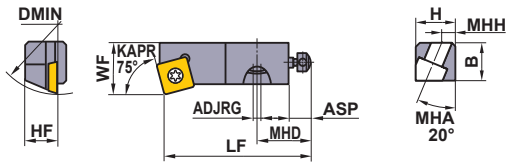
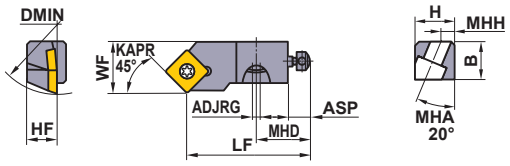
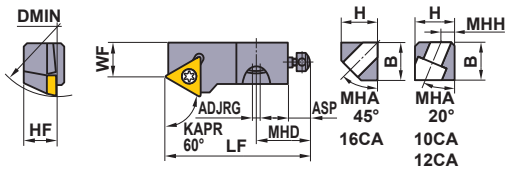
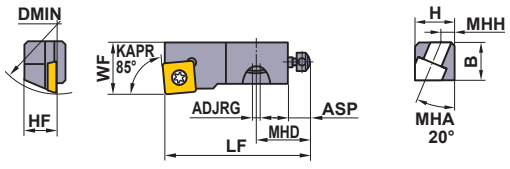
CARTRIDGE

SS ISO type — Screw on type

- 11°positive insert.
- Suitable for steel, cast iron, aluminium alloys and copper alloys.





Type	Order Number	Stock R	Stock L	Geometry	Insert Number	
STFP	STFPR/L10CA11	●	●	 Right hand tool holder shown.	TPMX TPGX TPMT TPGX	1103○○ 1603○○
	STFPR/L12CA16	●	●			
STGP	STGPR10CA11	●		 Right hand tool holder only.	TPMX TPGX TPMT TPGX	1103○○ 1603○○ 1603○○
	STGPR12CA16	●				
	STGPR16CA16	●				
SSKP	SSKPR10CA09	●		 Right hand tool holder only.	SPMT SPGX	0903○○ 1203○○
	SSKPR12CA12	●				
SSSP	SSSPR10CA09	●		 Right hand tool holder only.		0903○○ 1203○○
	SSSPR12CA12	●				
STTP	STTPR10CA11	●		 Right hand tool holder only.	TPMX TPGX TPMT TPGX	1103○○ 1603○○ 1603○○
	STTPR12CA16	●				
	STTPR16CA16	●				
SSYP	SSYPR10CA09	●		 Right hand tool holder only.	SPMT SPGX	0903○○ 1203○○
	SSYPR12CA12	●				

∗1 Clamp Torque (N • m) : CS300890T=1.0, TS4=3.5, TS5=7.5
Note1) Dimensions shown for insert corner RE (∗2).

● : Inventory maintained in Japan.

■ IDENTIFICATION

S T F P R 10 CA 11

Clamp Structure	
S	Screw On

Insert Shape	
S	Square
T	Triangle

Cutting Angle	
F	90°
G	90°(Off Set)
K	75°
S	45°
T	60°
Y	85°

Insert Clearance	
P	11°

Hand of Tool	
R	Right Hand
L	Left Hand

Cutting Edge Height (mm)	
10	10
12	12
16	16

Tool Type	
CA	ISO A Type Cartridge

Cutting Edge Length (mm)		
Insert Shape		Inscribed Circle
Square	Triangle	
—	11	6.35
09	16	9.525
12	22	12.7

Dimensions(mm)											*1				
H	B	LF	MHD	ADJRG	ASP	MHH	HF	WF	RE *2	DMIN	Clamp Screw	Radial Screw	Axial Screw	Wrench	Set Bolt
12.5	11	50	20	2	8	5	10	14	0.4	**35**	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
12.5	11	50	20	2	8	5	10	14	0.4	**35**	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
16	17	63	25	2	8	—	16	25	0.8	**55**	TS4	TSS06012	KS2	TKY15F TKY20F	HBH08025
12.5	11	50	20	2	8	5	10	14	0.8	**35**	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020
12.5	11	44	20	2	8	5	10	14	0.8	**35**	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	47	20	2	8	6	12	20	0.8	**50**	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020
12.5	11	50	20	2	8	5	10	9	0.4	**35**	CS300890T	TSS05006	KS1	TKY08F TKY10F	HSC06016
15.5	16	55	20	2	8	6	12	13	0.8	**50**	TS4	TSS06010	KS1	TKY15F TKY20F	HSC06020
16	17	63	25	2	8	—	16	15	0.8	**55**	TS4	TSS06012	KS2	TKY15F TKY20F	HBH08025
12.5	11	50	20	2	8	5	10	14	0.8	**35**	TS4	TSS05006	KS1	TKY10F TKY15F	HSC06016
15.5	16	55	20	2	8	6	12	20	0.8	**50**	TS5	TSS06010	KS1	TKY20F TKY25F	HSC06020

SP○○ type inserts ➤A134
TP○○ type inserts ➤A139—A141
SPARE PARTS ➤P001

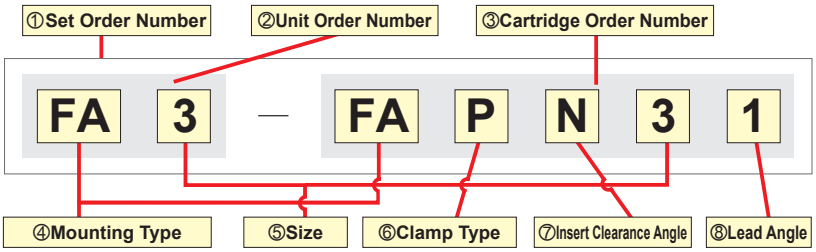
BORING UNIT

FA,FV

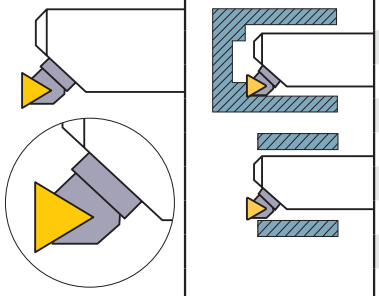
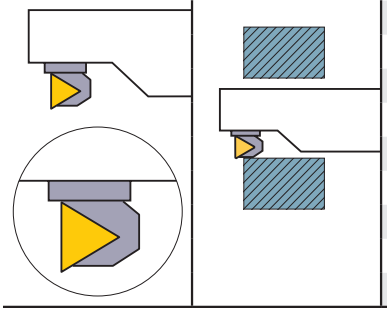


- Precision finish boring unit.
- Facilitates precision adjustment.
- High accuracy.

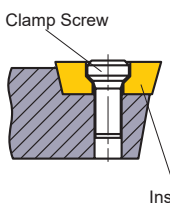
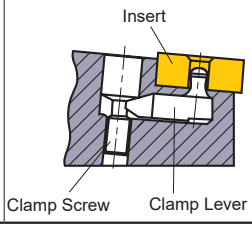
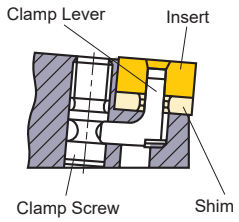
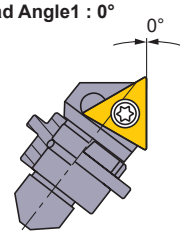
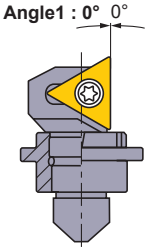
■IDENTIFICATION



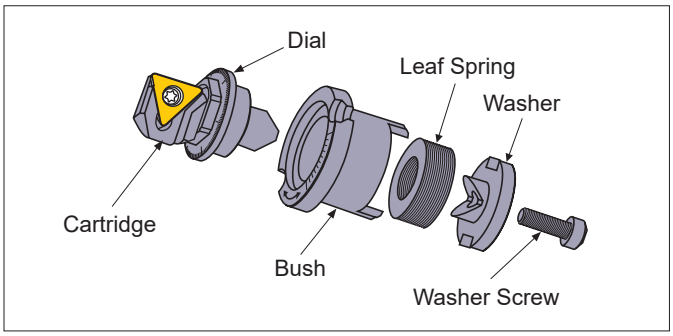
* Sets are delivered with unit and cartridge assembled.

④Mounting Type	Cutting Mode	①Set Order Number *	Stock	②Unit Order Number	Stock	③Cartridge Order Number	Stock	⑤Size		⑥Clamp Type		⑦Insert Clearance Angle	
								Symbol	Min. Cutting Diameter (mm)	Symbol	Type	Symbol	Angle
FA Type (Angular Type)		**FA0-FASC01**	●	**FA0**	●	**FASC01**	●	0	19	S	Screw On	C	7
		FA0-FASC01S	●	**FA0**	●	**FASC01S**	●	0	19	S	Screw On	C	7
		FA1-FASP11	●	**FA1**	●	**FASP11**	●	1	25	S	Screw On	P	11
		FA1-FASP11S	●	**FA1**	●	**FASP11S**	●	1	25	S	Screw On	P	11
		FA2-FASP21	●	**FA2**	●	**FASP21**	●	2	36	S	Screw On	P	11
		FA2-FASP21S	●	**FA2**	●	**FASP21S**	●	2	36	S	Screw On	P	11
		FA2-FAPN21	●	**FA2**	●	**FAPN21**	●	2	36	P	Lever Lock	N	0
		FA3-FASP31	●	**FA3**	●	**FASP31**	●	3	47	S	Screw On	P	11
		FA3-FASP31S	●	**FA3**	●	**FASP31S**	●	3	47	S	Screw On	P	11
		FA3-FAPN31	●	**FA3**	●	**FAPN31**	●	3	47	P	Lever Lock	N	0
		FA4-FAPN41	●	**FA4**	●	**FAPN41**	●	4	73	P	Lever Lock	N	0
FV Type (Vertical Type)		**FV0-FVSC01**	●	**FV0**	●	**FVSC01**	●	0	19	S	Screw On	C	7
		FV0-FVSC01S	●	**FV0**	●	**FVSC01S**	●	0	19	S	Screw On	C	7
		FV1-FVSP11	●	**FV1**	●	**FVSP11**	●	1	25	S	Screw On	P	11
		FV1-FVSP11S	●	**FV1**	●	**FVSP11S**	●	1	25	S	Screw On	P	11
		FV2-FVSP21	●	**FV2**	●	**FVSP21**	●	2	36	S	Screw On	P	11
		FV2-FVSP21S	●	**FV2**	●	**FVSP21S**	●	2	36	S	Screw On	P	11
		FV2-FVPN21	●	**FV2**	●	**FVPN21**	●	2	36	P	Lever Lock	N	0
		FV3-FVSP31	●	**FV3**	●	**FVSP31**	●	3	47	S	Screw On	P	11
		FV3-FVSP31S	●	**FV3**	●	**FVSP31S**	●	3	47	S	Screw On	P	11
		FV3-FVPN31	●	**FV3**	●	**FVPN31**	●	3	47	P	Lever Lock	N	0
		FV4-FVPN41	●	**FV4**	●	**FVPN41**	●	4	73	P	Lever Lock	N	0

* "S" at the end of the order number indicates left hand tool.

⑥Cartridge Clamp Structure			⑧Lead Angle	
S (Screw-on Type)	**P** (Lever Lock Type)	**P** (Lever Lock Type with Shim)	**FA**	**FV**
Applicable Size : 0,1,2,3	**Applicable Size : 2,3**	**Applicable Size : 4**	**Lead Angle1 : 0°**	**Lead Angle1 : 0°** 0°
				

● : Inventory maintained in Japan.



BORING UNIT SPARE PARTS

Unit Order Number	Washer Screw	Unit Screw	Wrench	Bush	Washer	Leaf Spring
FA0	HSC02006	S1	HKY15R	The parts above are not sold separately as accuracy can only be guaranteed by having the complete set. Please contact us for questions about parts replacement.		
FV0	HSC02006	S1	HKY15R			
FA1	HSC02506	HY-A1	HKY20R			
FV1	HSC02506	HY-V1	HKY20R			
FA2	HSC03010	HY2	HKY20R,HKY25R			
FV2	HSC03010	HY2	HS-N2,HKY25R			
FA3	HSC04012	HY3	HKY20R,HKY30R			
FV3	HSC04012	HY3	HKY20R,HKY30R			
FA4	HSC05016	HY4	HKY30R,HKY40R			
FV4	HSC05016	HY4	HKY30R,HKY40R			

CARTRIDGE SPARE PARTS

Cartridge ∗1	Clamp Lever	Lever Spring	Clamp Screw ∗3	Shim	Shim Pin	Spanner ∗2	Wrench	Applicable Insert	
FASC01(S)	—	—	① TS2	—	—	HR00	① TKY06F	TCGT..L-F	060102
FVSC01(S)	—	—	① TS2	—	—	HR00	① TKY06F	TCGW	060104
FASP11(S)	—	—	① CS250T	—	—	HR12	① TKY08F	TPGX	090204
FVSP11(S)	—	—	① CS250T	—	—	HR12	① TKY08F	TPGX..L/R	
FASP21(S)	—	—	① CS300890T	—	—	HR12	① TKY08F	TPMX..L/R	110304
FVSP21(S)	—	—	① CS300890T	—	—	HR12	① TKY08F		110308
FAPN21	LLCL12S	HLS1	② LLCS103	—	—	HR12	② HKY20F	TNGA	110304
FVPN21	LLCL12S	HLS1	② LLCS103	—	—	HR12	② HKY20F	TNGG..L/R	110308
FASP31(S)	—	—	① CS300890T	—	—	HR34	① TKY08F	TPGX	110304
FVSP31(S)	—	—	① CS300890T	—	—	HR34	① TKY08F	TPGX..L/R TPMX..L/R	110308
FAPN31	LLCL12S	HLS1	② LLCS103	—	—	HR34	② HKY20F	TNGA	110304
FVPN31	LLCL12S	HLS1	② LLCS103	—	—	HR34	② HKY20F	TNGG..L/R	110308
FAPN41	LLCL13	—	② LLCS106	LLSTN32	LLP13	HR34	② HKY25F		160404 160408 160412
FVPN41	LLCL13	—	② LLCS106	LLSTN32	LLP13	HR34	② HKY25F		

Note 1) Use left hand inserts in the cartridge for right hand cutting and right hand inserts in the cartridge for left hand cutting.
∗1 "S" at the end of the cartridge number indicates left hand.
∗2 A spanner is only provided when ordered with a set.
∗3 Clamp Torque (N • m) : TS2=0.6, CS250T=1.0, CS300890T=1.0, LLCS103=1.5, LLCS106=2.2

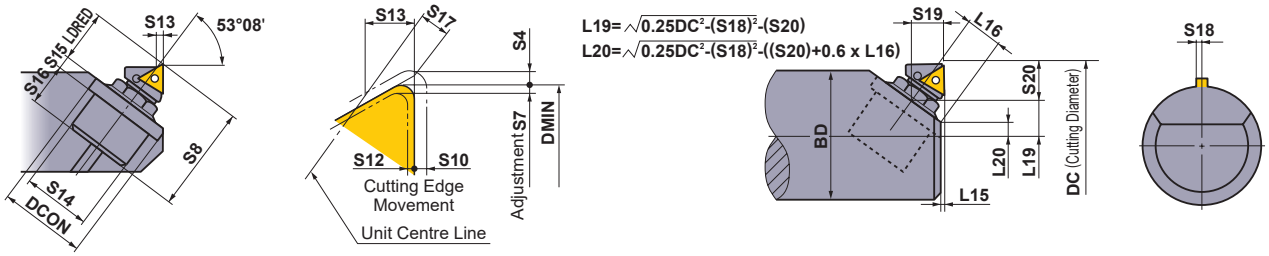
INSERTS

Finish Cutting			Medium Cutting	Flat Top	
TCGT..L/R-F	TPGX..L/R	TPMX..L	TNGG..L/R	TPGX	TNGA
(06) ➲A135	(09,11) ➲A140	(09,11) ➲A140	(11,16) ➲A099	(09,11) ➲A141	(11,16) ➲A101

BORING UNIT

MAIN DIMENSIONS

●FA TYPE (ANGULAR TYPE)



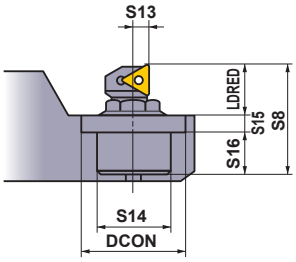
Clockwise (right hand) tool shown.
Minimum cutting diameters (DMIN) correspond to RE0.2 (0 type) and RE0.4 (1—4 type).

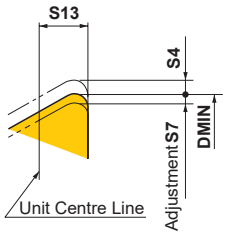
Unit : mm

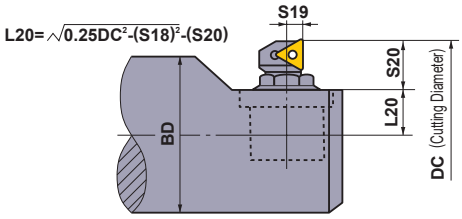
∗1 Set Order Number	∗2 RE	DMIN	Adjustment		Dimensions (mm)														BD
			S4	S7	LDRED	S8	S10	S12	S13	S14	DCON	S15	S16	S17	S18	S19	S20	L15	L16	Max.
FA0-FASC01(S)	0.2	19	0.32	0.16	9.0	19.9	0.30	0.12	1.5	11.11	15.06	2.7	8.2	1.11	1.2	6.4	6.5	1.0	6.8	DC-2
	0.4	19	0.32	0.16	8.8	19.7	0.30	0.12	1.6	11.11	15.06	2.7	8.2	1.11	1.2	6.4	6.4	1.0	6.8	DC-2
FA1-FASP11(S)	0.4	25	0.5	0.3	11.7	23.9	0.38	0.23	0.8	15.08	19.05	3.2	9.0	0.46	1.0	7.6	9.1	0.9	8.4	DC-2
FA2-FASP21(S)	0.4	36	0.7	0.4	14.9	33.4	0.53	0.30	1.1	19.05	24.58	4.0	14.5	0.7	1.2	9.7	11.5	0.8	11.1	DC-2
	0.8	36	0.7	0.4	14.5	33.0	0.53	0.30	1.3	19.05	24.58	4.0	14.5	0.7	1.2	9.7	11.2	0.8	11.1	DC-2
FA2-FAPN21	0.4	36	0.7	0.4	14.9	33.4	0.53	0.30	1.1	19.05	24.58	4.0	14.5	0.7	2.75	9.7	11.5	0.8	11.1	DC-2
	0.8	36	0.7	0.4	14.5	33.0	0.53	0.30	1.3	19.05	24.58	4.0	14.5	0.7	2.75	9.7	11.2	0.8	11.1	DC-2
FA3-FASP31(S)	0.4	47	1.0	0.6	18.35	42.85	0.75	0.45	0.9	22.225	31.75	4.8	19.7	0.54	1.9	11.7	14.4	1.2	13.1	DC-3
	0.8	47	1.0	0.6	17.95	42.45	0.75	0.45	1.1	22.225	31.75	4.8	19.7	0.54	1.9	11.7	14.1	1.2	13.1	DC-3
FA3-FAPN31	0.4	47	1.0	0.6	18.35	42.85	0.75	0.45	0.9	22.225	31.75	4.8	19.7	0.54	3.21	11.7	14.4	1.2	13.1	DC-3
	0.8	47	1.0	0.6	17.95	42.45	0.75	0.45	1.1	22.225	31.75	4.8	19.7	0.54	3.21	11.7	14.1	1.2	13.1	DC-3
FA4-FAPN41	0.4	73	1.5	0.7	28.0	65.4	1.13	0.53	1.3	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.9	1.3	20.5	DC-3
	0.8	73	1.5	0.7	27.6	65.0	1.13	0.53	1.5	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.6	1.3	20.5	DC-3
	1.2	73	1.5	0.7	27.2	64.6	1.13	0.53	1.7	31.75	46.02	6.4	31.0	0.86	5.2	17.7	21.3	1.3	20.5	DC-3

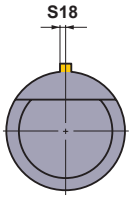
∗1 "S" at the end of the order number indicates left hand tool.
∗2 Dimensions shown for insert corner RE 0.2, 0.4, 0.8, and 1.2.

●FV TYPE (VERTICAL TYPE)









Clockwise (right hand) tool shown.
Minimum cutting diameters (DMIN) correspond to RE0.2 (0 type) and RE0.4 (1—4 type).

Unit : mm

∗1 Set Order Number	∗2 RE	DMIN	Adjustment		Dimensions (mm)										BD
			S4	S7	LDRED	S8	S13	S14	DCON	S15	S16	S18	S19	S20	Max.
FV0-FVSC01(S)	0.2	19	0.4	0.2	7.6	18.5	2.6	11.11	15.06	2.7	8.2	1.2	2.6	7.6	DC-2
	0.4	19	0.4	0.2	7.4	18.3	2.6	11.11	15.06	2.7	8.2	1.2	2.6	7.4	DC-2
FV1-FVSP11(S)	0.4	25	0.7	0.3	10.8	23.0	3.6	15.08	20.62	3.2	9.0	1.0	3.6	10.8	DC-2
FV2-FVSP21(S)	0.4	36	0.8	0.6	13.8	32.3	4.0	19.05	24.58	4.0	14.5	1.2	4.0	13.8	DC-2
	0.8	36	0.8	0.6	13.5	32.0	4.0	19.05	24.58	4.0	14.5	1.2	4.0	13.5	DC-2
FV2-FVPN21	0.4	36	0.8	0.6	13.8	32.3	4.0	19.05	24.58	4.0	14.5	2.1	4.0	13.8	DC-2
	0.8	36	0.8	0.6	13.5	32.0	4.0	19.05	24.58	4.0	14.5	2.1	4.0	13.5	DC-2
FV3-FVSP31(S)	0.4	47	1.3	0.7	16.7	41.2	4.8	22.225	31.75	4.8	19.7	1.9	4.8	16.7	DC-3
	0.8	47	1.3	0.7	16.4	40.9	4.8	22.225	31.75	4.8	19.7	1.9	4.8	16.4	DC-3
FV3-FVPN31	0.4	47	1.3	0.7	16.7	41.2	4.8	22.225	31.75	4.8	19.7	3.21	4.8	16.7	DC-3
	0.8	47	1.3	0.7	16.4	40.9	4.8	22.225	31.75	4.8	19.7	3.21	4.8	16.4	DC-3
FV4-FVPN41	0.4	73	1.8	1.0	25.0	62.4	7.1	31.75	46.02	6.4	31.0	5.2	7.1	25.0	DC-3
	0.8	73	1.8	1.0	24.7	62.1	7.1	31.75	46.02	6.4	31.0	5.2	7.1	24.7	DC-3
	1.2	73	1.8	1.0	24.4	61.8	7.1	31.75	46.02	6.4	31.0	5.2	7.1	24.4	DC-3

∗1 "S" at the end of the order number indicates left hand tool.
∗2 Dimensions shown for insert corner RE 0.2, 0.4, 0.8, and 1.2.

BORING UNIT

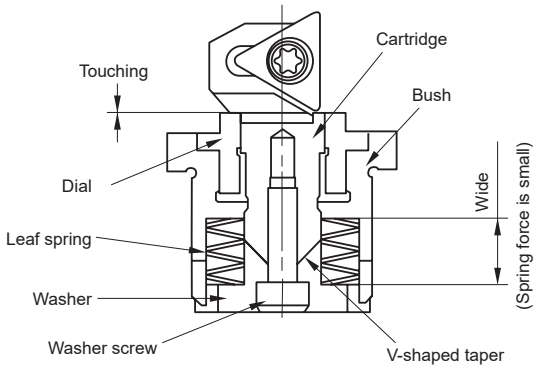
HI-BORE INSTALLATION GUIDE

■ASSEMBLY PRECAUTIONS

The cartridge, dial screw and thrust face must be cleaned and a lubricant such as Never seez applied before use.
Please ensure that the unit is free from dust during assembly as this may affect the accuracy of adjustment.
(Torque adjustability and thrust face condition may deteriorate.)

■HOW TO ASSEMBLE CARTRIDGE

①The space between the bush and the washer is large which means that the spring force is small, therefore the torque required to turn the screw is low.
②Tighten the washer screw until the washer and V shaped taper touch.

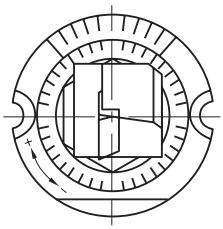


■RECOMMENDED WASHER SCREW TORQUE

Hi-bore size	Screw size	Recommended torque	
		N•m	kgf•m
Type 0	M2	0.49	0.05
Type 1	M2.5	0.98	0.10
Type 2	M3	2.25	0.23
Type 3	M4	5.19	0.53
Type 4	M5	10.29	1.05

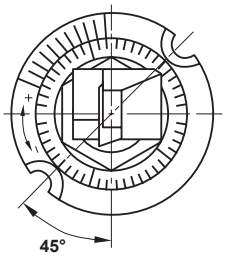
■CARTRIDGE INSTALLATION

Angular type (FA type)



When installing the cartridge the cutting edge should be positioned towards the chamfering on the bush as shown.

Vertical type (FV type)



When installing the cartridge the cutting edge should be placed at 45° to the locating screws as shown.

■DIMENSIONAL ADJUSTMENT



- Dial scale FV type 50 divisions
  FA type 40 divisions
- 1 division on the inner scale corresponds to a radius increase of 0.01mm.
- Turn the dial clockwise to extend the Hi-bore and increase the hole diameter.

■CAUTIONS

Please exchange the consumable parts such as the clamping levers ahead of time.
Moreover, please request the overhaul to the manufacturer when accuracy has decreased.

MI TYPE BORING BARS



■ IDENTIFICATION

S	B	R	1	08
①	②	③	④	⑤

①Clamp Type

S	Screw On Type

②Boring Bar Name

③Shank Shape

R	Round Shank

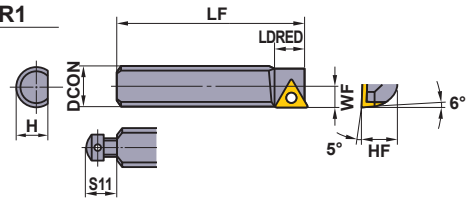
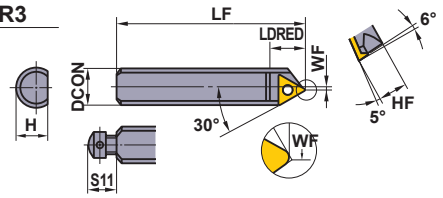
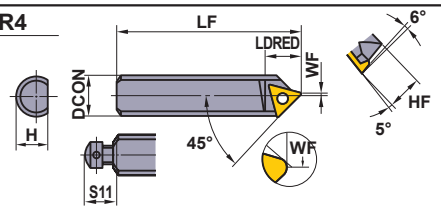
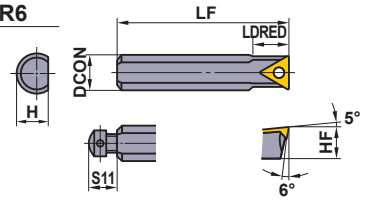
④Lead Angle

1	0°
3	30°
4	45°
6	90°

⑤Shank Size (mm)

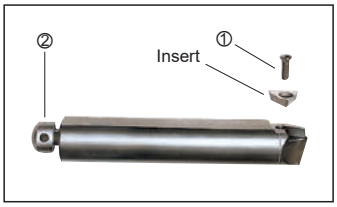
08	8
10	10
12	12
16	16

STANDARD HOLDER

Geometry	Order Number	Stock For Clockwise	Insert Number *1		Dimensions (mm) H	DCON	LF	LDRED	S11	HF	WF	RE *2
SBR1 	SBR108	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	9	—	7	3.5	0.4
	SBR110	●		0902○○	9	10	50	11	—	8	4.5	0.4
	SBR112	●		1103○○	10	12	60	12	7	10	5.0	0.4
SBR3 	SBR308	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	10	—	7	0.7	0.4
	SBR310	●		0902○○	9	10	50	12	—	8	1.0	0.4
	SBR312	●		1103○○	10	12	60	13	7	10	1.0	0.4
SBR4 	SBR408	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	10	—	7	0.5	0.4
	SBR410	●		0902○○	9	10	50	12	—	8	1.0	0.4
	SBR412	●		1103○○	10	12	60	13	7	10	1.0	0.4
	SBR416	●		1103○○	14	16	80	13	9	14	0	0.8
SBR6 	SBR608	●	TPGX TPGX...L TPMX...L	0802○○	7	8	35	8.5	—	7	—	0.4
	SBR610	●		0902○○	8	10	50	10	—	8	—	0.4
	SBR612	●		1103○○	10	12	60	11	7	10	—	0.4

∗1 When using an insert with a breaker, please use a left hand insert.
Note1) Dimensions shown for insert corner RE (∗2).

SPARE PARTS



Order Number		①Clamp Screw	②Pre-Set Screw	Wrench
SBR1 — SBR6	08	CS200T	—	TKY06F
	10	CS250T	—	TKY08F
	12	CS300890T	KS1S	TKY08F
	16	CS300890T	KS2S	TKY08F

∗ Clamp Torque (N • m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

● : Inventory maintained in Japan.

TP○○ type inserts ➤A139—A141
SPARE PARTS ➤P001

CLASSIFICATION OF QUICK CHANGE MODULAR TOOLING SYSTEM

Mitsubishi's quick change system is a must for improving efficiency in mass production lines.

- Shorten tool change times and increase machine efficiency.
- Reduce tool weight. Thus, tool change is safer and easier.
- Improve cutting edge accuracy.



QF1000 (Two Piece)



QF2000 (Small Diameter)



QF2000 (Large Diameter)



QC TYPE ADAPTER FOR PIN MILLING CUTTER



QS2000 (Arbor for Side Cutter)

Face Mill and Pin Milling Cutter



QB2000 • QB3000



QB4000

Boring Tool

MITSUBISHI's QUICK CHANGE SYSTEM



ABS License KOMET®



HSK

Connecting System

Special Tooling



SPQH (Spring)



SPQS (Spring+Oil pressure)



Setting Fixture

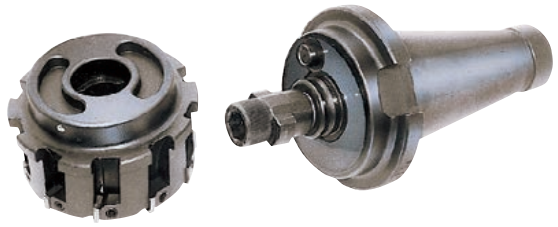


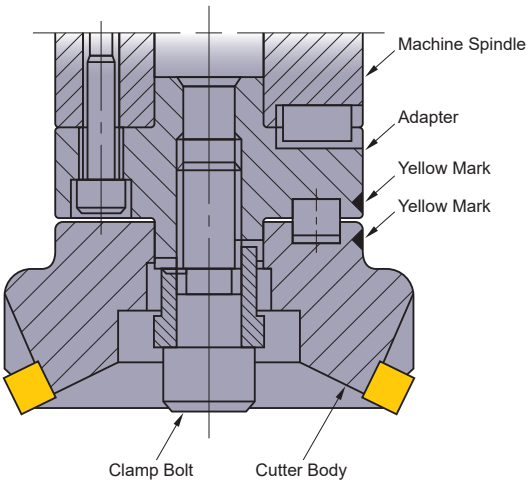
Setting Gauge

FACE MILL

QF2000 (SINGLE BOLT MOUNTING TYPE)

●One Piece Type (≤ϕ160)

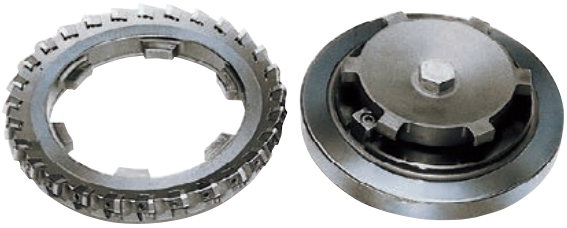


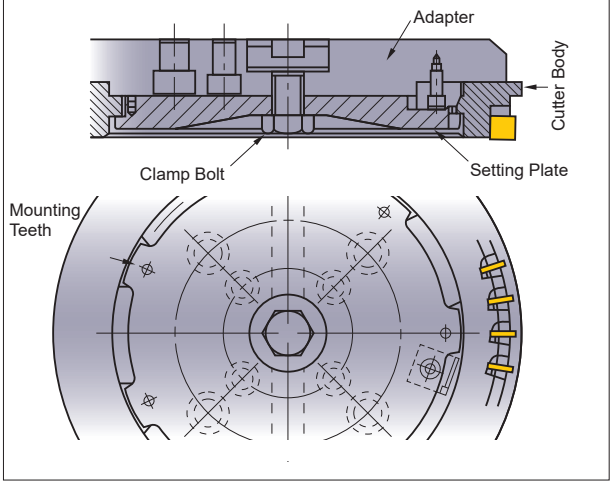


■FEATURES

1. Simply turning a clamp bolt fixed to the adapter a few times enables cutter exchange.
2. The cutter needs to be turned 90° before removal. This prevents the cutter from falling free.
3. Applicable to both face milling and boring tools.
4. Cutter exchange time is less than 1 min.

●Two Piece Type (≥ϕ200)





■FEATURES

1. Internal diameter of the cutter body has 4—6 mounting teeth. The adapter has the same mounting teeth and a single clamp bolt for installation.
2. The cutter needs to be turned 15° before removal. This prevents the cutter from falling free.
3. Cutter exchange time is less than 1 min.

QF1000 (GOURD SHAPED HOLE TYPE)

●One Piece Type (O Type ϕ200)



●Two Piece Type (T Type ≥ϕ250)



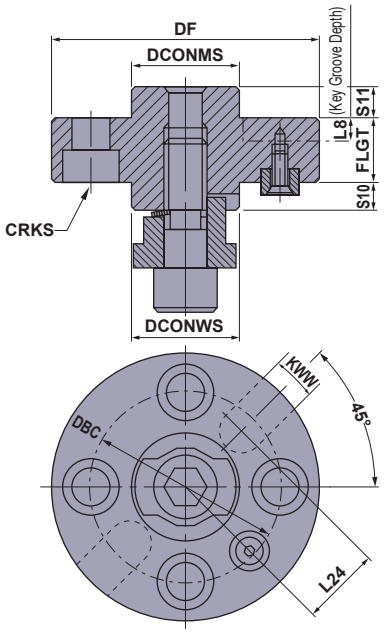
■FEATURES

1. Gourd shaped hole type is employed. Turning 4—6 bolts enables cutter exchange.
2. The cutter needs to be turned 15° before removal. This prevents the cutter from falling free.
3. Cutters with ≥Ø250 are made up of 2 parts. Thus, weight at the time of installation is reduced and safety is improved.
4. Standard adapters facilitate installation of cutters with the same diameter and different insert shapes.
5. Cutter exchange time is less than 3—5 min.

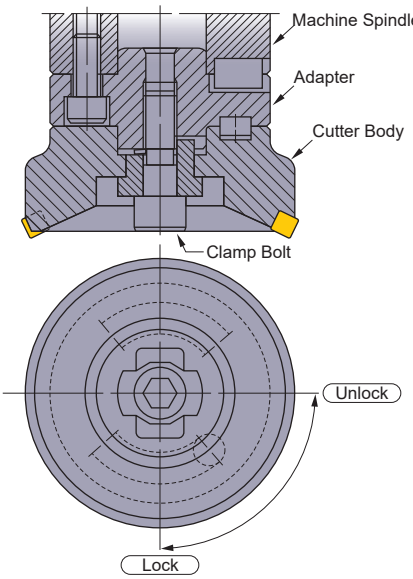
FACE MILLING ADAPTER

Q TYPE (SINGLE BOLT TYPE) ϕ80—ϕ160

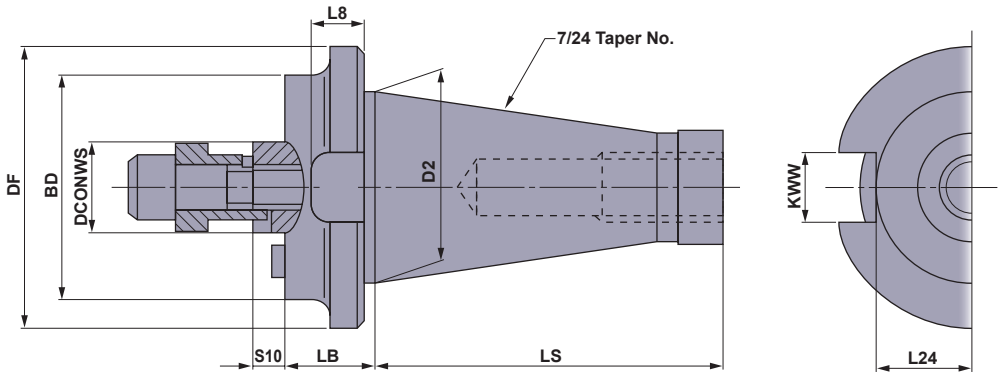
●Standard



●Installed Condition



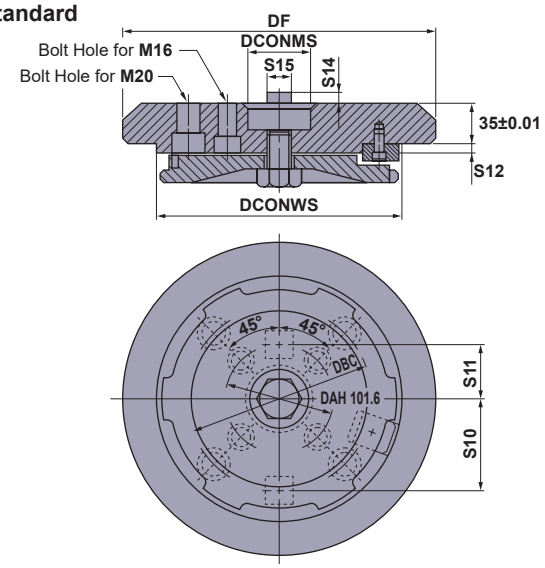
Order Number	Cutter Diameter (DC)	Cutter Dimensions (mm)			Machine Dimensions (mm)								Tool Weight
		DF	DCONWS	FLGT	DCONMS	DBC	CRKS	KWW	L8	L24	S10	S11	(kg)
QFA08025BCR/L	80	70	25.4	25	25.4	45	M12	9.5	7	18.4	13	15	0.8
QFA10025BDR/L	100	80	31.75	25	31.75	55	M16	12.7	8	23.2	13	15	1.2
QFA12530BER/L	125	100	38.1	30	38.1	70	M20	15.9	10	28	13	15	2.1
QFA16030BFR/L	160	125	50.8	30	50.8	85	M20	19	11	36	13	15	3.2



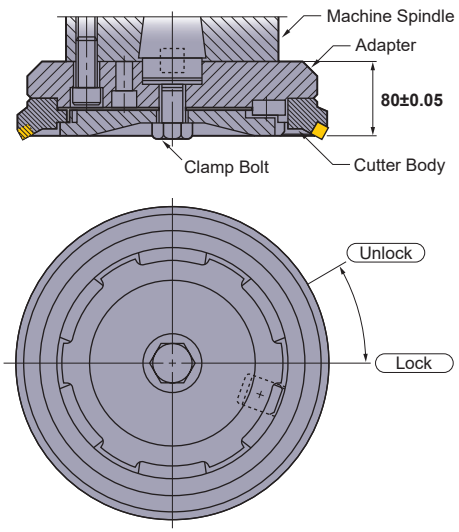
Order Number	Cutter Diameter (DC)	Cutter Dimensions (mm)			Machine Dimensions (mm)								Tool Weight
		BD	DCONWS	LB	DF	No.	D2	LS	KWW	L8	L24	S10	(kg)
QFA08025N4R/L	80	70	25.4	25	70	40	44.45	93.4	16.1	16	22.5	13	1.4
QFA10025N4R/L	100	80	31.75	25	80	40	44.45	93.4	16.1	16	22.5	13	1.7
QFA12530N4R/L	125	100	38.1	30	100	40	44.45	93.4	16.1	16	22.5	13	2.7
QFA16030N4R/L	160	125	50.8	30	125	40	44.45	93.4	16.1	16	22.5	13	3.8
QFA08025N5R/L	80	70	25.4	25	100	50	69.85	126.8	25.7	19	35.3	13	3.2
QFA10025N5R/L	100	80	31.75	25	100	50	69.85	126.8	25.7	19	35.3	13	3.4
QFA12530N5R/L	125	100	38.1	30	100	50	69.85	126.8	25.7	19	35.3	13	4.0
QFA16030N5R/L	160	125	50.8	30	125	50	69.85	126.8	25.7	19	35.3	13	5.1

Q TYPE (SINGLE BOLT TYPE) ϕ200—ϕ500

● **Standard**



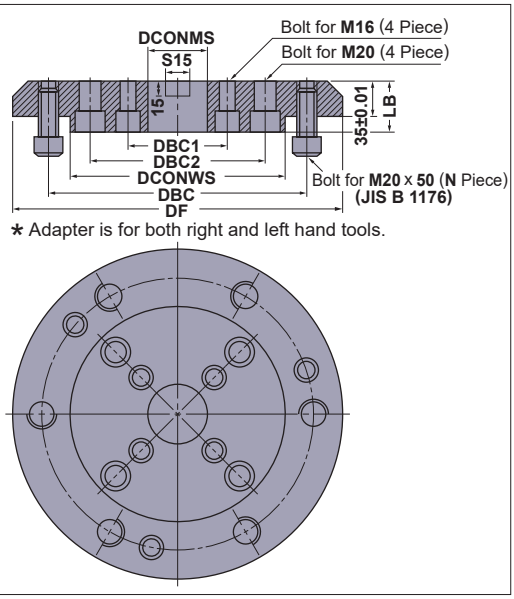
● **Installed Condition**



Order Number	Cutter Diameter (DC)	Cutter Dimensions (mm)		Machine Dimensions (mm)							Tool Weight (kg)
		DCONWS	DF	DCONMS	DBC	S10	S11	S12	S14	S15	
QFB20035KR/L	200	125	190	47.625	—	—	50.8	10	11	25.4	9
QFB25035KR/L	250	175	240	47.625	—	—	50.8	10	11	25.4	16
QFB31535PR/L	315	240	305	47.625	177.8	88.9	50.8	10	11	25.4	28
QFB35535PR/L	355	280	345	47.625	177.8	88.9	50.8	10	11	25.4	37
QFB40035PR/L	400	325	390	47.625	177.8	88.9	50.8	10	11	25.4	49
QFB50035PR/L	500	425	490	47.625	177.8	88.9	50.8	10	11	25.4	83

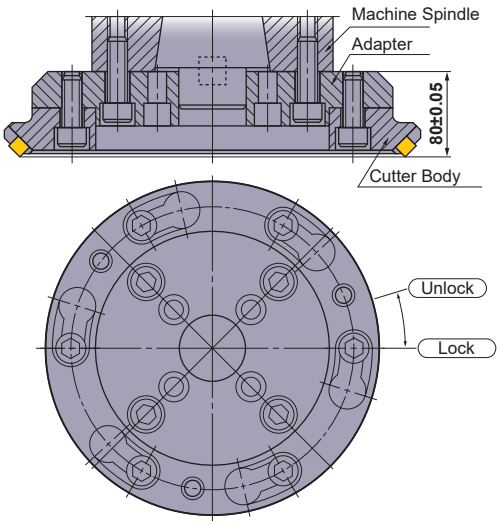
T TYPE (SIX BOLT TYPE) ϕ250—ϕ400

● **Standard**



* Adapter is for both right and left hand tools.

● **Installed Condition**



Order Number	Cutter Diameter (DC)	Cutter Dimensions (mm)					Machine Dimensions (mm)				Tool Weight (kg)
		DCONWS	DBC	DF	LB	N	DCONMS	DBC1	DBC2	S15	
QFA25035K	250	110	155	230	45	4	47.625	101.6	—	25.4	9
QFA31535P	315	175	220	295	50	6	47.625	101.6	177.8	25.4	16
QFA35535P	355	215	260	335	50	6	47.625	101.6	177.8	25.4	22
QFA40035P	400	260	305	380	50	6	47.625	101.6	177.8	25.4	29

SIDE CUTTER

QC TYPE ADAPTER FOR PIN MILLING CUTTER

●Cutter Body



●Adapter Body



■FEATURES

1. Makes installation of Pin millng cutter easy, quick, and accurate.
2. Clamping the entire periphery of the cutter body improves rigidity and lateral run-out of the cutting edges.
3. Facilitates stable heavy cutting such as counter weight cutting and prevents sudden insert fracture.

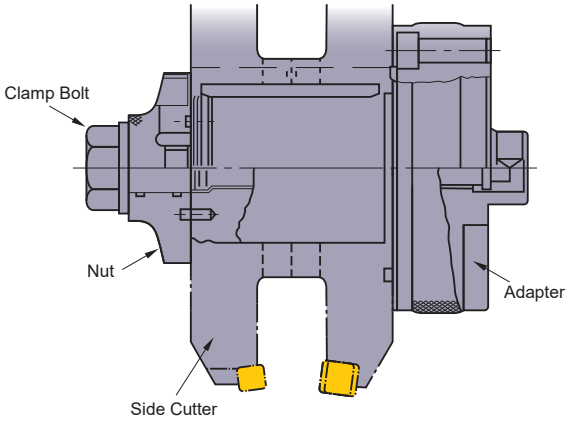
QS2000 (INSTALLATION METHOD FOR SIDE CUTTER)

●Appearance



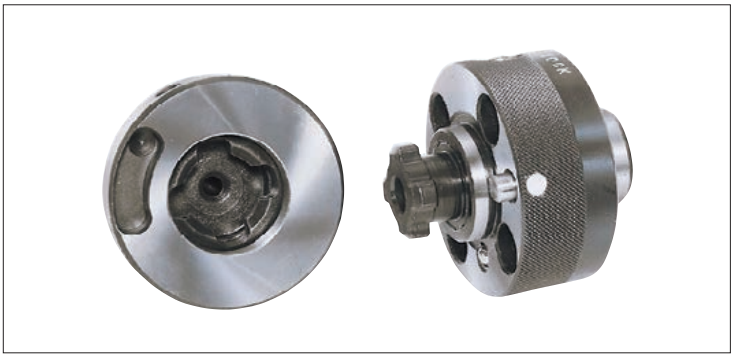
■FEATURES

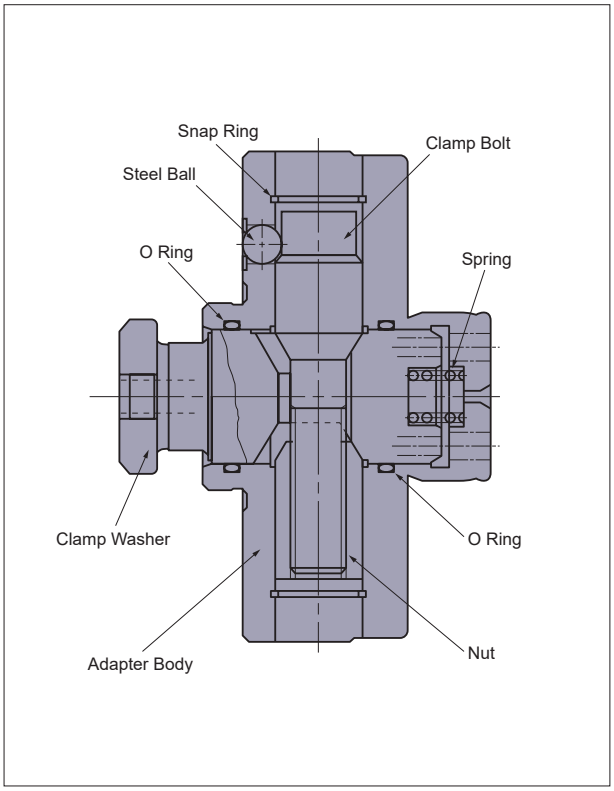
1. Turning the bolt a few times turns nut 45° and enables installation and detachment of the cutter.
2. Installation and detachment of the cutter is possible without taking the bolt and nut off the adapter.
3. The cutter is a solid type. Thus, the rigidity is high.
4. Cutter exchange time is less than 1 min.



BORING TOOL

QB4000 TYPE (SIDE CLAMP TYPE)

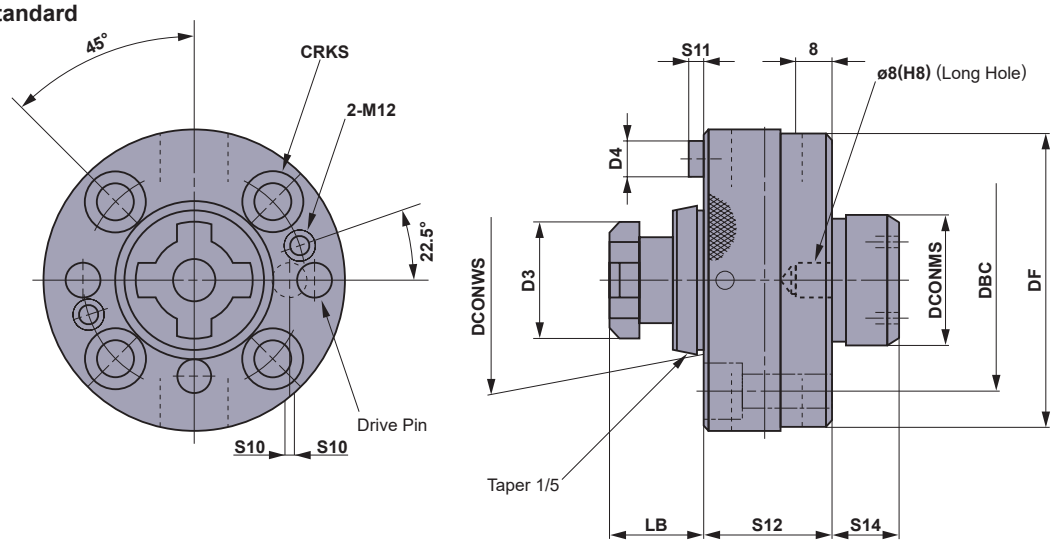




FEATURES

1. Tightening the clamp bolt (or clamp nut) draws the clamp washer in and securely holds the boring head.
2. The clamp washer has mounting teeth at the end. Turning the clamp washer 45° enables installation and detachment of the boring head.
3. Both 1/5 taper and cutter locating faces support the boring head. Thus, clamp rigidity and installation repeatability accuracy are high (2—3μm).
4. A side clamp structure is employed. Thus, a spindle turning stopper is unnecessary. This structure prevents the boring head from falling free.
5. Insert location close to the adapter body allows for convenient head exchange.
6. Suitable for a wide range of boring, from small to large diameters.
7. Head exchange time is less than 1 min.

●Installation Standard



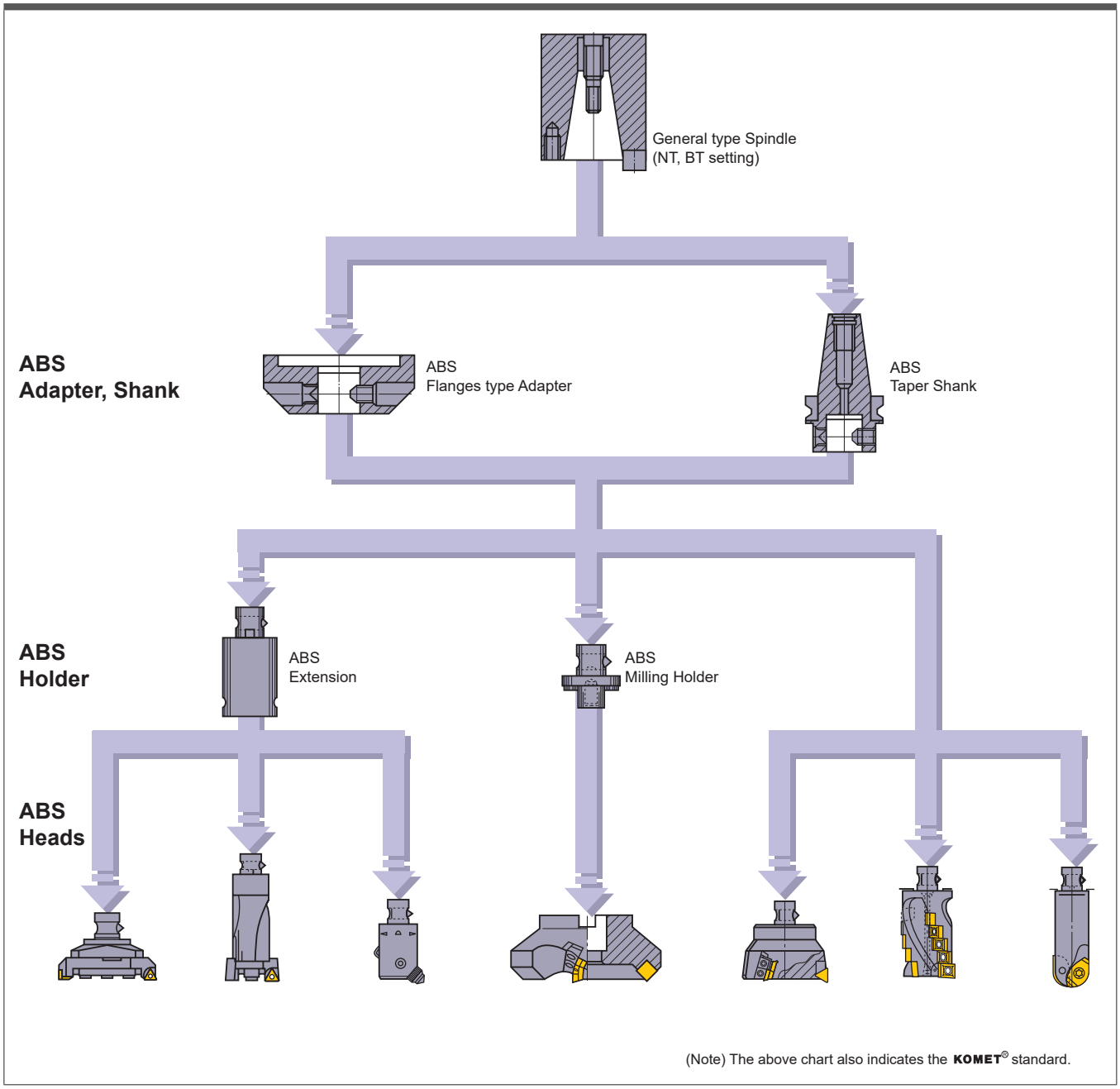
Order Number	Dimensions(mm)											
	DCONWS	DCONMS	DF	D3	DBC	CRKS	LB	D4	S10	S11	S12	S14
QB4350070	35	30	70	28	52	M8	22	8	0.5	5	30	15
QB4350088	35	30	88	28	70	M8	22	8	0.5	5	30	15
QB4400098	40	30	98	34	80	M8	24	8	0.5	5	30	15
QB4400118	40	30	118	34	90	M10	24	10	0.5	5	30	15
QB4500138	50	40	138	42	110	M12	30	12	0.5	5	30	15

ABS® License KOMET®

ABS SYSTEM CHARACTERISTIC

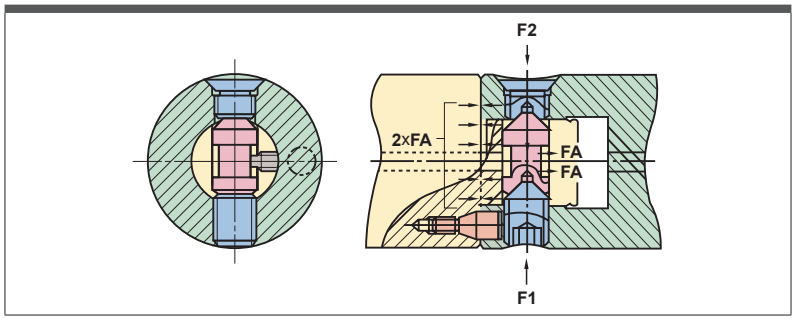
- High rigidity and high coupling strength.
  The taper wedge effects produced by the clamping screw, the taper screw, and the slide pin enable strong and firm coupling between the head and the adapter.
- As the cutting torque acts as torsion force on the axis, 50—80 % improvement is achieved for the clamping strength in the coupled portion axis direction.
- High accuracy is guaranteed.
  An attachment repeat accuracy of 2—3μm is constantly maintained in the coupled portion.
- From small (ϕ20) diameter to large diameter (ϕ200), a wide range of tooling is possible.
- Internal passage of the coolant (air) is possible without modifications to standard machinary.
- Tool head extensions are easy through the use of extension pieces.
- Through the use of reducers, tool head diameters are easily set.

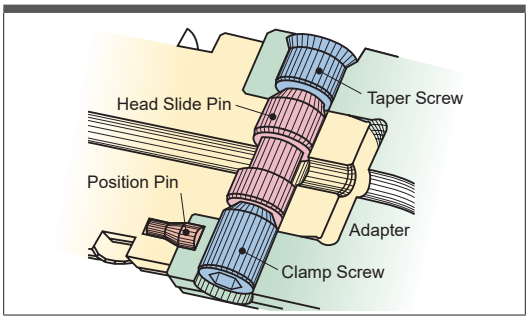
ABS SYSTEM MECHANISM



(Note) The above chart also indicates the KOMET® standard.

ABS SYSTEM COMPONENT

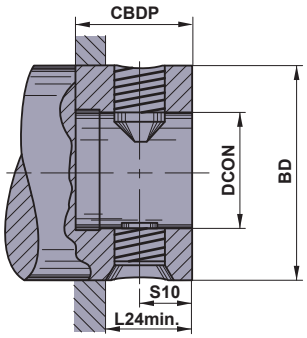




When the force F1 presses on the clamping screw, the slide pin moves in the radial direction and impinges on the taper screw, generation the reaction force F2. Since the centres of the clamping screw, the taper screw, and the slide pin are eccentric, a taper connection is made at sites separated by a 180° phase, with the clamping screw and the slide pin on the taper right impingement portion, and the slide pin and taper pin on the taper left impingement portion. The result is that, a vector analysis of those forces shows, as depicted in the diagram above, that the slides move in an identical direction, and the coupling force FA is doubled and transmitted accordingly. Further, cutting resistance generated during cutting becomes torsion stress and is transmitted accordingly. The forces F1 and F2 generated with the clamping screw and taper screw are expanded, and the coupling (jointing) force FA becomes as even greater force, and is generated accordingly.

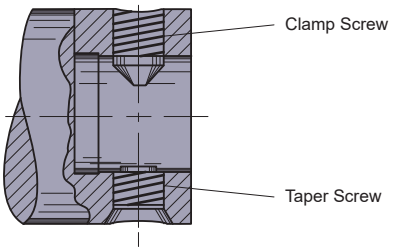
* This system is licensed from KOMET© of Germany. (JP Patent NO.1328669)

ABS SYSTEM SETTING STANDARDS Adapter Dimensions



Order Number	Dimensions(mm)				
	BD	DCON	CBDP	L24	S10
ABS25W	25	13	22	13	8.3
ABS32W	32	16	25	16	10.3
ABS40W	40	20	30	18.5	11.3
ABS50W	50	28	34	22	13.3
ABS63W	63	34	41	28	17.4
ABS80W	80	46	48	34	20.4
ABS100W	100	56	58	40.5	24.4
ABS125W	125	70	76	51	30.5

●Parts for Adapter

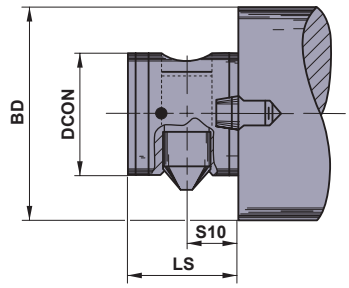


* Pack Order Number	Stock	Clamp Screw	Taper Screw
ABS25-FS-W	●	ABS25-F1	ABS25-F2
ABS32-FS-W	●	ABS32-F1	ABS32-F2
ABS40-FS-W	●	ABS40-F1	ABS40-F2
ABS50-FS-W	●	ABS50-F1	ABS50-F2
ABS63-FS-W	●	ABS63-F1	ABS63-F2
ABS80-FS-W	●	ABS80-F1	ABS80-F2
ABS100-FS-W	●	ABS100-F1	ABS100-F2
ABS125-FS-W	●	ABS125-F1	ABS125-F2

* An order of the above type of screw and pin needs to be included in the set. Please use a "Pack Order Number" for your order.

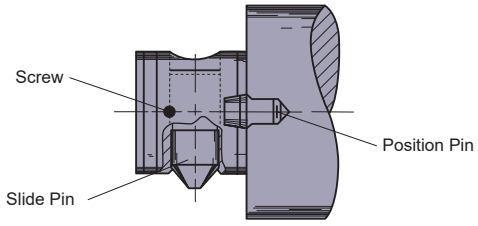
● : **Inventory maintained in Japan.**

●Head Dimensions



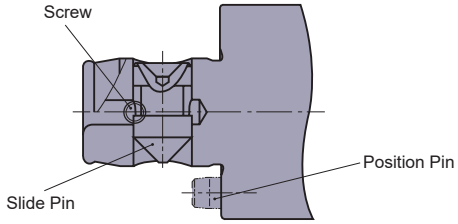
Order Number	Dimensions(mm)			
	BD	DCON	LS	S10
ABS25M	25	13	20	8
ABS32M	32	16	23	10
ABS40M	40	20	26	11
ABS50M	50	28	31	13
ABS63M	63	34	38	17
ABS80M	80	46	43	20
ABS100M	100	56	55	24
ABS125M	125	70	70	30

●Parts for Head



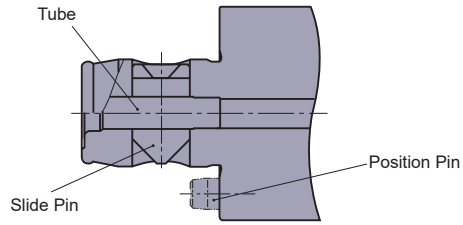
Pack Order Number *	Stock	Slide Pin	Position Pin	Screw
ABS25-ES-M	●	ABS25-E3	ABS25-E4	ABS25-E5
ABS32-ES-M	●	ABS32-E3	ABS32-E4	ABS32-E5
ABS40-ES-M	●	ABS40-E3	ABS40-E4	ABS40-E5
ABS50-ES-M	●	ABS50-E3	ABS50-E4	ABS50-E5
ABS63-ES-M	●	ABS63-E3	ABS63-E4	ABS63-E5
ABS80-ES-M	●	ABS80-E3	ABS80-E4	ABS80-E5
ABS100-ES-M	●	ABS100-E3	ABS100-E4	ABS100-E5
ABS125-ES-M	●	ABS125-E3	ABS125-E4	ABS125-E5

●Parts for Head [For Fine Boring]



Pack Order Number *	Stock	Slide Pin	Position Pin	Screw
ABS25-ES-M1	●	ABS25-E3	ABS25-E4.1	ABS25-E5
ABS32-ES-M1	●	ABS32-E3	ABS32-E4.1	ABS32-E5
ABS40-ES-M1	●	ABS40-E3	ABS40-E4.1	ABS40-E5
ABS50-ES-M1	●	ABS50-E3	ABS50-E4.1	ABS50-E5
ABS63-ES-M1	●	ABS63-E3	ABS63-E4.1	ABS63-E5
ABS80-ES-M1	●	ABS80-E3	ABS80-E4.1	ABS80-E5
ABS100-ES-M1	●	ABS100-E3	ABS100-E4.1	ABS100-E5

●Parts for Head [For Coolant Hole Type]

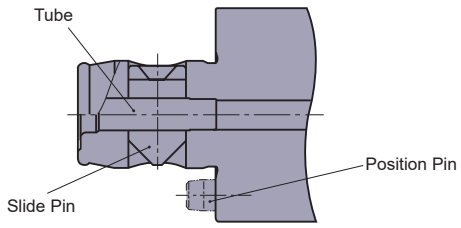


Pack Order Number *	Stock	Slide Pin	Position Pin	Tube
ABS25-ES-M3	●	ABS25-E3.2	ABS25-E4	ABS25-E6
ABS32-ES-M3	●	ABS32-E3.2	ABS32-E4	ABS32-E6
ABS40-ES-M3	●	ABS40-E3.2	ABS40-E4	ABS40-E6
ABS50-ES-M3	●	ABS50-E3.2	ABS50-E4	ABS50-E6
ABS63-ES-M3	●	ABS63-E3.2	ABS63-E4	ABS63-E6
ABS80-ES-M3	●	ABS80-E3.2	ABS80-E4	ABS80-E6
ABS100-ES-M3	●	ABS100-E3.2	ABS100-E4	ABS100-E6
ABS125-ES-M3	●	ABS125-E3.2	ABS125-E4	ABS125-E6

* An order of the above type of screw, pin and tube needs to be included in the set. Please use a "Pack Order Number" for your order.

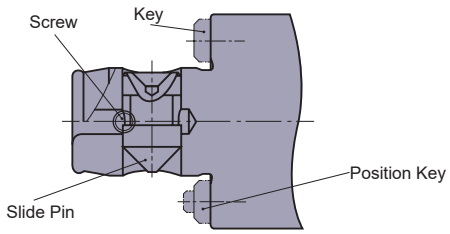
● : **Inventory maintained in Japan.**

●Parts for Head [For Fine Boring with Coolant Hole]



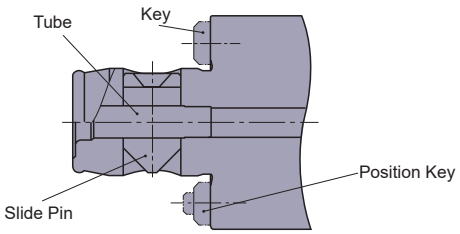
* Pack Order Number	Stock	Slide Pin	Position Pin	Tube
ABS25-ES-M4	●	ABS25-E3.2	ABS25-E4.1	ABS25-E6
ABS32-ES-M4	●	ABS32-E3.2	ABS32-E4.1	ABS32-E6
ABS40-ES-M4	●	ABS40-E3.2	ABS40-E4.1	ABS40-E6
ABS50-ES-M4	●	ABS50-E3.2	ABS50-E4.1	ABS50-E6
ABS63-ES-M4	●	ABS63-E3.2	ABS63-E4.1	ABS63-E6
ABS80-ES-M4	●	ABS80-E3.2	ABS80-E4.1	ABS80-E6
ABS100-ES-M4	●	ABS100-E3.2	ABS100-E4.1	ABS100-E6

●Parts for Head [For Key Type]



* Pack Order Number	Stock	Slide Pin	Key	Position Key	Screw
SBA25-ES-M	●	ABS25-E3	SBA25-E4	SBA25-E4.1	ABS25-E5
SBA32-ES-M	●	ABS32-E3	SBA32-E4	SBA32-E4.1	ABS32-E5
SBA40-ES-M	●	ABS40-E3	SBA40-E4	SBA40-E4.1	ABS40-E5
SBA50-ES-M	●	ABS50-E3	SBA50-E4	SBA50-E4.1	ABS50-E5
SBA63-ES-M	●	ABS63-E3	SBA63-E4	SBA63-E4.1	ABS63-E5
SBA80-ES-M	●	ABS80-E3	SBA80-E4	SBA80-E4.1	ABS80-E5
SBA100-ES-M	●	ABS100-E3	SBA100-E4	SBA100-E4.1	ABS100-E5
SBA125-ES-M	●	ABS125-E3	SBA125-E4	SBA125-E4.1	ABS125-E5

●Parts for Head [For Key Type with Coolant Hole]



* Pack Order Number	Stock	Slide Pin	Key	Position Key	Tube
SBA25-ES-M1	●	ABS25-E3.2	SBA25-E4	SBA25-E4.1	ABS25-E6
SBA32-ES-M1	●	ABS32-E3.2	SBA32-E4	SBA32-E4.1	ABS32-E6
SBA40-ES-M1	●	ABS40-E3.2	SBA40-E4	SBA40-E4.1	ABS40-E6
SBA50-ES-M1	●	ABS50-E3.2	SBA50-E4	SBA50-E4.1	ABS50-E6
SBA63-ES-M1	●	ABS63-E3.2	SBA63-E4	SBA63-E4.1	ABS63-E6
SBA80-ES-M1	●	ABS80-E3.2	SBA80-E4	SBA80-E4.1	ABS80-E6
SBA100-ES-M1	●	ABS100-E3.2	SBA100-E4	SBA100-E4.1	ABS100-E6
SBA125-ES-M1	●	ABS125-E3.2	SBA125-E4	SBA125-E4.1	ABS125-E6

* An order of the above type of screw, pin and tube needs to be included in the set. Please use a "Pack Order Number" for your order.

HSK SYSTEM

FEATURES OF THE HSK SYSTEM

●Suitable for high-speed machining.

When the taper hole is slightly seperated during high-speed machining due to centrifugal force, the taper axis is continuously in contact with the taper hole because of elastic deformation. Thus, 2 face holding is maintained.

●Guaranteed high accuracy.

Installation repeatability of 2μm is guaranteed.

●High rigidity.

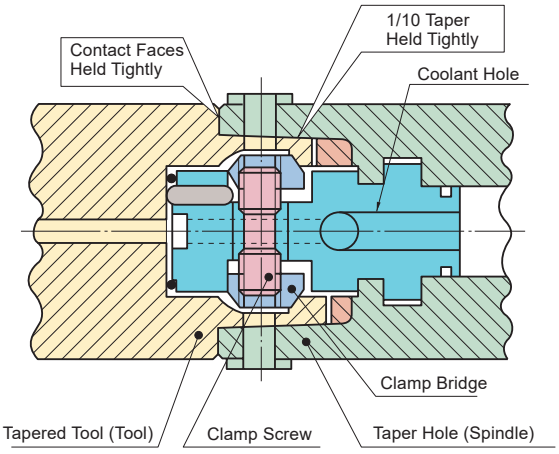
High rigidity in the radial and thrust direction due to the 2 face holding system.

●Easy installation.

Detachable support structure ensures separation of the tool even when the tool has undergone thermal expansion.

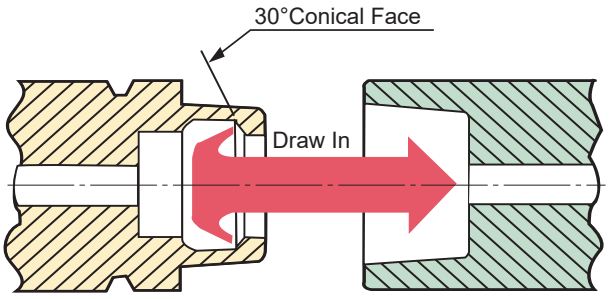
●Coolant system selection.

Centre coolant and anglar flow coolant type.



* HSK stands for **H**ohle (Hollow) **S**chaft (axis) **K**egel (taper) in German.

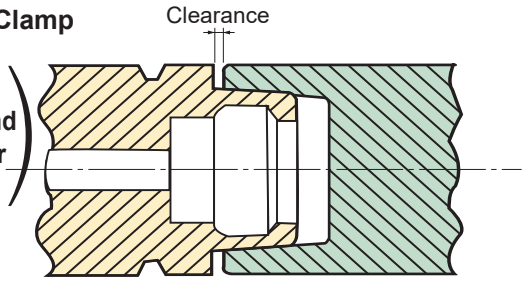
HSK CLAMPING METHOD



●The 30°conical face of the taper axis is pulled in the direction of the tapered hole to clamp.

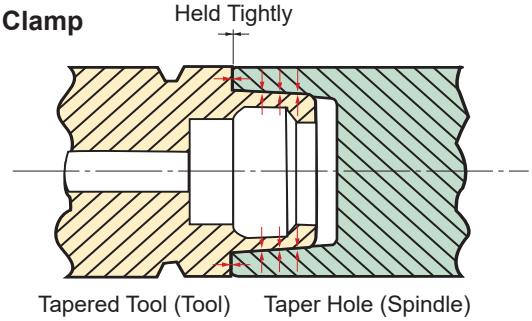
●Temporary Clamp Position

(The spindle taper face and the tool taper face contact.)



●Temporary clamp position has a clearance between the spindle and the tool contact faces.
●Taper clamping force increases as the diameter increases.

●Permanent Clamp Position



●Hollow thin taper axis holds the taper faces and the contact faces tightly due to pressurized elastic deformation.

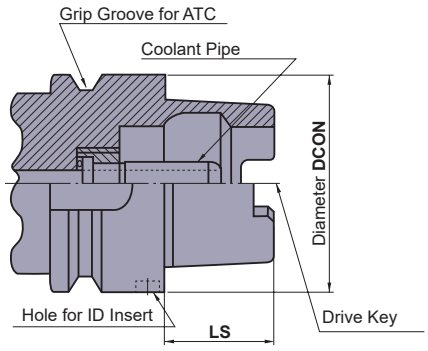
HSK SYSTEM FORM

There are various HSK types.
Mitsubishi Materials produces A, B, C, and D types of taper axis (tool size) and C and D types (manual operation) of taper hole (spindle side).

Type	Application	Tapered Tool (Tool)	Tapered Hole (Spindle)
A Type	Automatic tool change (ATC), centre coolant (mainly milling tools)	☐	
B Type	Automatic tool change (ATC), angular flow coolant (mainly turning tools)	☐	
C Type	Manual tool change, centre coolant (mainly milling tools)	☐	☐
D Type	Manual tool change, angular flow coolant (mainly turing tools)	☐	☐

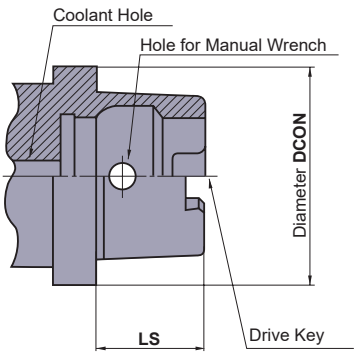
☐ **: Non stock, produced to order only.**

Automatic Tool Change — **A Type** (Centre Coolant Type) — Milling Tool



Order Number	Dimensions (mm)	
	DCON	**LS**
HSK-A32M	32	16
HSK-A40M	40	20
HSK-A50M	50	25
HSK-A63M	63	32
HSK-A80M	80	40
HSK-A100M	100	50

Manual Tool Change — **C Type** (Centre Coolant Type) — Milling Tool

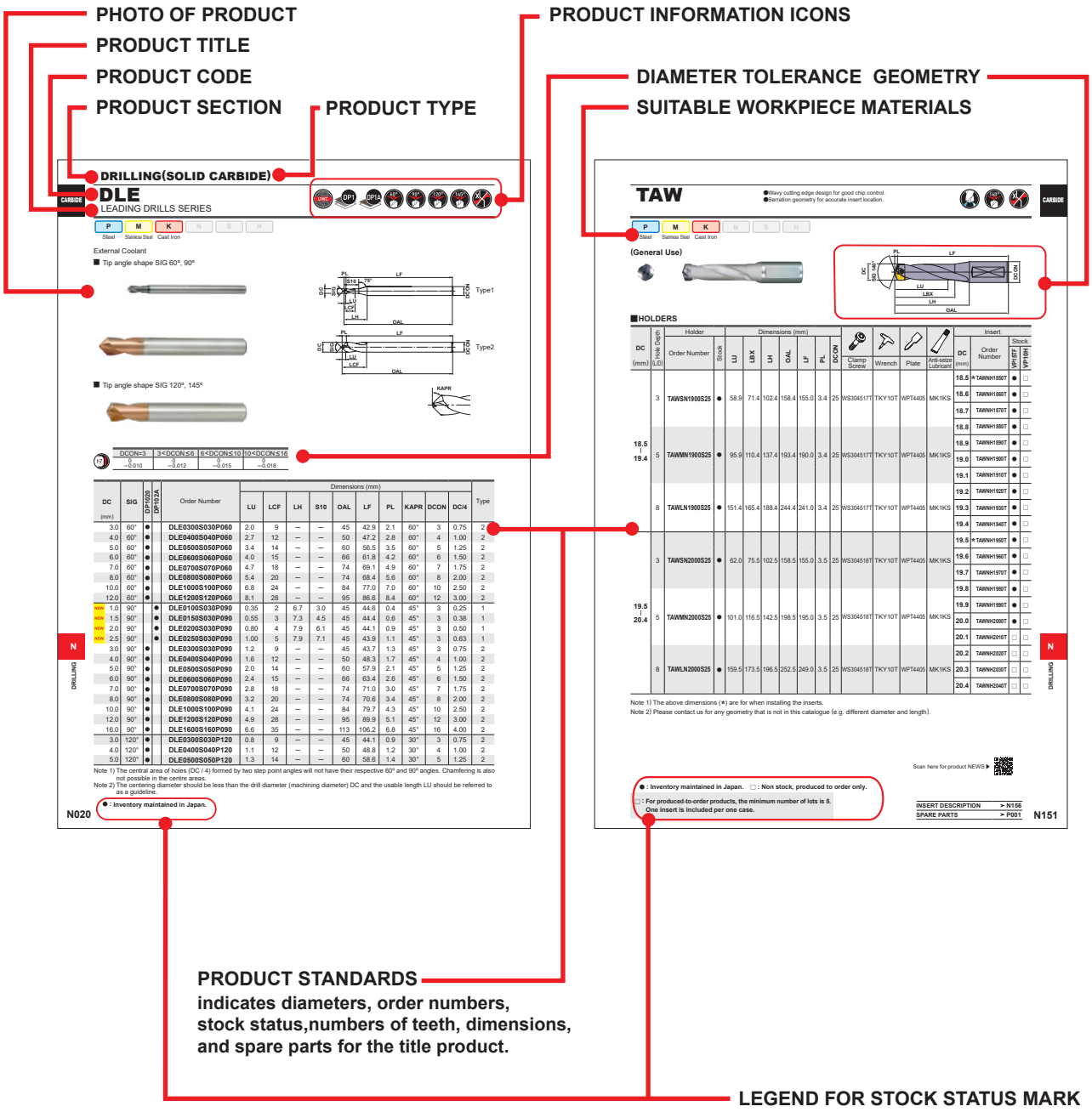


Order Number	Dimensions (mm)	
	DCON	**LS**
HSK-C32M	32	16
HSK-C40M	40	20
HSK-C50M	50	25
HSK-C63M	63	32
HSK-C80M	80	40
HSK-C100M	100	50

HOW TO READ THE STANDARD OF DRILLING TOOLS

●How this section page is organised

①Arranged in order of solid carbide drills, indexable type drills, brazed type drills and high-speed steel drills.



●To Order : For solid-carbide or brazed drills, please specify ①order number and ②grade.
For indexable type drills, please specify ①order number for the drill.
For indexable type drill inserts, please specify ①insert number and ②insert grade.

DRILLING

IDENTIFICATION ····· N002
GUIDE FOR ISO13399 SYMBOLS ····· N002
SYMBOL DESCRIPTIONS ····· N003
PRODUCT INTRODUCTION ····· N004
DRILLS SELECTION CHART ····· N006
APPLICATION RANGE ····· N016
OPERATIONAL GUIDANCE ····· N018
TIPS FOR USING LONG TYPE DRILLS ··· N019

DRILL STANDARD

SOLID CARBIDE

LEADING DRILLS SERIES ····· N020
SOLID CARBIDE FLAT BOTTOM DRILLS ··· N025
NEW DWAE DRILLS ····· N030
NEW TRISTART DRILL SERIES ····· N038
WSTAR DRILLS ····· N046
NEW DSA DRILLS ····· N075
WSTAR DRILLS (FOR MACHINING OF STAINLESS STEEL) ··· N082
WSTAR DRILLS (FOR DIE & MOULD MACHINING) ··· N088
WSTAR DRILLS (FOR MACHINING OF ALUMINIUM ALLOYS) ··· N098
MAE/MAS DRILLS ····· N104
DRILLS FOR COMPOSITE MATERIALS ··· N112
MSE DRILLS ····· N119
WSTAR DRILLS (MWS) ····· N122
MZE DRILLS ····· N130
SOLID GUN DRILL ····· N136
FOR NON-FERROUS MATERIALS ··· N140
DRILL FOR HARD, BRITTLE MATERIALS ··· N142

EXCHANGEABLE HEAD

WSTAR INSERT DRILLS ····· N144

INDEXABLE TYPE

MVX TYPE DRILLS ····· N160
TAF TYPE DRILLS ····· N171
JUST FIT SLEEVE ····· N177

BRAZED TYPE

GUN DRILL • GUN REAMER ···· N180

HIGH-SPEED STEEL SOLID TYPE

NEW HSS (HIGH SPEED STEEL) DRILLS ··· N182
HSS MILLING SHANK DRILLS ··· N184
VIOLET COATED PRECISION DRILLS ··· N188
VIOLET DRILLS ····· N208
STRAIGHT SHANK DRILLS ····· N210
TAPER SHANK DRILLS ····· N229
TRIANGULAR SHANK DRILLS ··· N243

*Arranged in Alphabetical order

N243 **3KD**
N142 **DCBSS**
N140 **DCSSM**
N140 **DCSSS**
N020 **DLE**
N080 **DSAE**
N075 **DSAS**
N038 **DVAS**
N030 **DWAE**
N228 **EPSS**
N182 **GKCD**
N210 **GSD**
N229 **GTD**
N241 **GTTD**
N222 **GWSL**
N220 **GWSS**
N240 **GWTS**
N177 **JFS**
N218 **KSD**
N234 **KTD**
N225 **LSD**
N236 **LTD**
N108 **MAE**
N104 **MAS**
N113 **MCA**
N117 **MCAH**
N112 **MCC**
N116 **MCCH**
N114 **MCT**
N115 **MCW**
N025 **MFE**
N137 **MGD**
N136 **MGS**
N088 **MHS**
N082 **MMS**
N098 **MNS**
N119 **MSE**
N118 **MSP**
N068 **MVE**
N046 **MVS**
N160 **MVX**
N122 **MWS**
N130 **MZE**
N212 **SD**
N214 **SD** (1/100 Straight)
N215 **SDLS**
N186 **SEPDM**
N184 **SEPDS**
N144 **STAW**
N171 **TAF**
N151 **TAW**
N230 **TD**
N242 **TTD**
N197 **VAPDJ**
N193 **VAPDM**
N202 **VAPDMSUS**
N188 **VAPDS**
N206 **VAPDSCB**
N199 **VAPDSSUS**
N208 **VSD**



IDENTIFICATION

PRODUCT CODE OF DRILLS

MV **S** **0300** **X** **S**

Applications	Coolant	Diameter	L/D	Type of Shank
DVA : General Purpose **DWA** : Swiss-Type Automatic and Small CNC Lathes **DSA** : For Heat Resistant Super Alloys **MV** : General Purpose **MF** : Solid Carbide Flat Bottom **MG** : Micro Solid Carbide Gun Drill **MS** : For Small Diameter Machining **MN** : For Machining of Aluminium Alloys **MH** : For Die & Mould Machining **MM** : For Machining of Stainless Steel **MC** : For Composite Materials **DL** : For Centering and Chamfering **MA** : For Aluminium Cast Iron High Precision Hole Machining	**E** : External Coolant **S** : Internal Coolant	**ex.** 0050 → ϕ0.5 0300 → ϕ3.0	**S** : 2D **M** : 3D **L** : 5D (MAE, MAS : 6D) **X＊＊D** : ＊＊D **X** : 12D	**A** : Straight Shank **B** : Integral Shank **S＊＊＊** : Shank Diameter

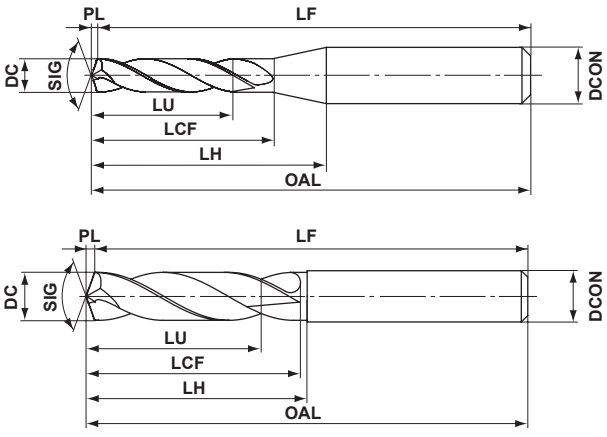
＊Other special types can be ordered.

VC **S** **S** **S** **D0300** **＊＊＊**

Product Name	Applications	Type of Shank	Flute Length	Diameter	Others
DC : Diamond Coated Drills **VA** : Violet Coated Precision Drills (High Grade, High-Speed Steel) **SE** : SE High Precision Drill (High-Speed Steel) **V** : Violet Drills **G** : Tin Coated Drills (High-Speed Steel) **E** : Co-Hss Drills **None**: High-Speed Steel	**SD** : General-purpose Straight Drill **TD** : General-purpose **PD** : For High precision Machining **T** : For Steel Frame **W** : For Deep Hole	**S** : Straight **T** : Taper **3K** : Triangular **6K** : Hexagonal	**S** : Short **M** : Medium **J** : Semi Long **L** : Long	**ex.** D0050 → ϕ0.5 D0300 → ϕ3.0	**A＊＊＊** : Overall Length **M＊** : Taper Size

＊Other special types can be ordered.

GUIDE FOR ISO13399 SYMBOLS



Symbol	Content
DC	Cutting diameter
SIG	Point angle
LU	Usable length
LCF	Length chip flute
LH	Reduced body diameter length
OAL	Overall length
LF	Functional length
PL	Point length
DCON	Connection diameter

＊There are exceptions other than those listed above. For more details, please refer to the technical data (page Q002).

SYMBOL DESCRIPTIONS

Tool Material



Ultra Micro-Grain Carbide
Ultra micro-grain carbide is used as the substrate material.



High Grade High Alloy HSS
High grade high alloy HSS is used as the substrate material.



Cobalt High-Speed Steel
Cobalt high-speed steel is used as the substrate material.



D-STH Cobalt High-Speed Steel
Cobalt high-speed steel is used as the substrate material with D-STH.



High-Speed Steel
High-speed steel is used as the substrate material.

Web Thinning



X Web Thinning
X web thinning is used at the drill point.



Z Web Thinning
Z web thinning is used at the drill point.



XR Web Thinning
XR web thinning is used at the drill point.



C Web Thinning
C web thinning is used at the drill point.



S Web Thinning
S web thinning is used at the drill point.



N Web Thinning
N web thinning is used at the drill point.

Tolerance



Drill Diameter Tolerance



Shank Diameter Tolerance

Coolant Hole



Coolant Hole

Coating



Diamond Coating
Pure Diamond high performance coating excelling in film adhesion to the substrate.



Violet Coating
Increased tool life of 2—3 times that of TiN coated products.



TiN Coating
Increased tool life of 2—3 times that of uncoated products.



PVD Coating
DP102A is a PVD coated cemented carbide grade specialized for small diameter drills, with greatly improved wear resistance.



PVD Coating
Exhibits outstanding wear resistance with a wide range of workpiece materials including mild steel, carbon steel, alloy steel, stainless steel, cast iron-based materials, and aluminium alloys.



PVD Coating
An ultra micro-grain cemented carbide optimal for stainless steel, and a PVD coating with outstanding heat resistance and lubricity.



PVD Coating
New grade with increased hardness that exhibits both high wear and fracture resistance, leading to longer tool life when machining heat resistant alloys.



MIRACLE Coating
The original Miracle (Al,Ti)N coating.
Also suitable for dry cutting.



CVD Diamond Coating
Unique multi-layer micro-grain diamond crystal control technology drastically improves wear resistance and smoothness.

Angle



Point Angle (SIG)
Indicates drill point angle the tip.
*The icon shown is only an example.

PRODUCT INTRODUCTION

NEW

Solid Carbide TRISTAR Drill Series DVAS Mini Size

FAST, RELIABLE and ACCURATE
New standards enabled by the Five Technologies.

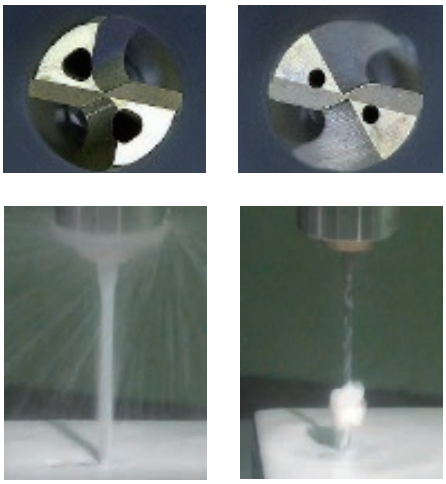
TRISTAR Drill Series

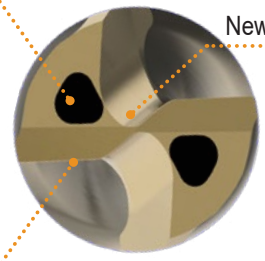


Advanced Coolant Hole Geometry

TRI-Cooling is optimal for small-diameter drills and can achieve more than double the conventional coolant discharge volume. This can dramatically improve chip discharge and heat dissipation, contributing greatly to tool life stability.

Comparison of amount of coolant discharge





New XR Point Thinning

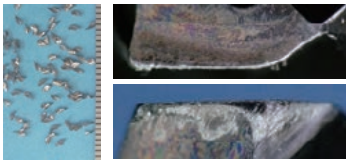
The new point thinning breaks chips into the optimum shape for a streamlined flow and achieves a much lower cutting resistance.

DVAS Conventional Product

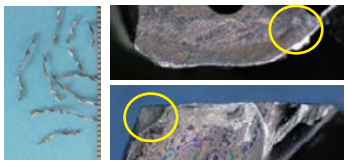
Tough and Sharp Cutting Edge Design

The straight cutting edge and thinned point are connected with a smooth curved geometry that significantly improves fracture resistance. The geometry of the rake angles and lands also improves wear and chip disposal.

Large crater wear and fracture of the outer edge.



DVAS

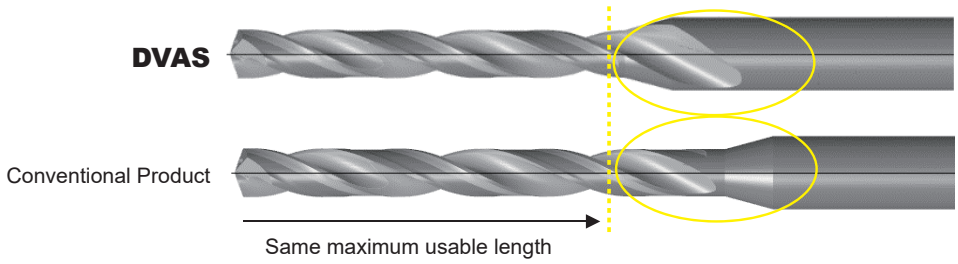


Conventional Product

<Cutting Conditions>
Workpiece Material : SCM440
Tool : DC=ø2mm, L/D=20
Cutting Speed : vc= 50m/min
Feed : fr= 0.06mm/rev
Cutting Mode : Wet cutting, water-soluble coolant, 2MPa

Unique Flute Form for Greater Rigidity

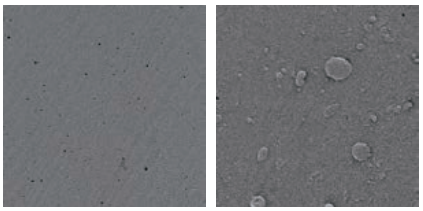
The short drill is designed for high rigidity and good chip evacuation by minimizing the neck length.



New Coated Grade **DP1120**

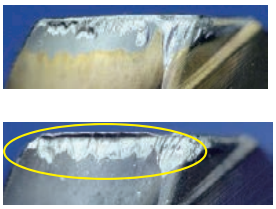
The outstanding surface smoothness prevents chip clogging which reduces breakage.
In addition, the excellent crater wear resistance maintains cutting edge sharpness which allows for a longer tool life.

Enlarged view of the flute surface.



DVAS Conventional Product

DVAS

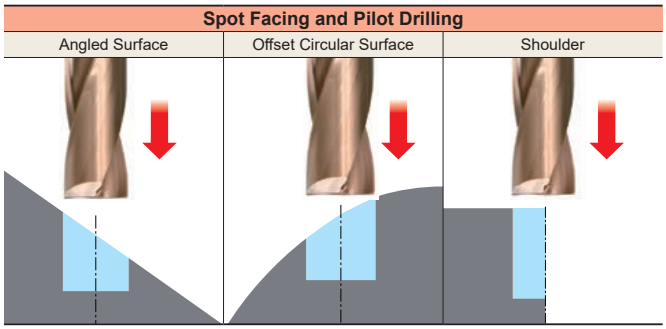


Conventional Product Large crater wear

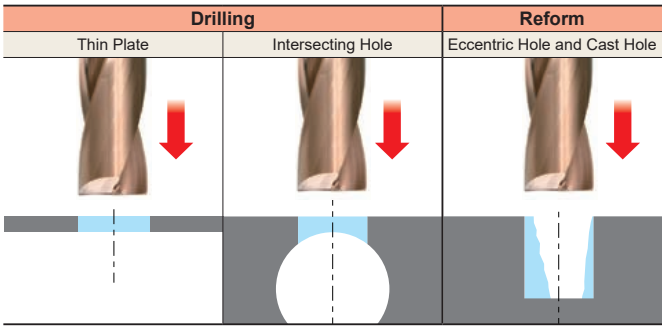
<Cutting Conditions>
Tool : DC=ø2mm, L/D=20
Cutting Speed : vc= 50m/min
Feed : fr= 0.06mm/rev
Cutting Mode : Wet cutting, water-soluble coolant, 2MPa
Number of Drilling : 500 holes

MFE Series Solid Carbide Flat Bottom Drills

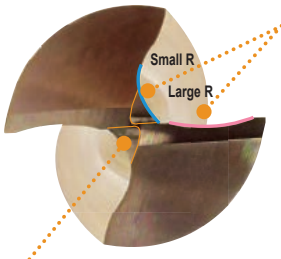
High Efficiency Drilling in Various Types of Machining



High efficiency counter boring in various types of machining with excellent chipping resistance.



Low cutting force provides less burr.
Excellent performance in correction of eccentric holes and cast holes due to its high position accuracy.



New Groove Geometry

The combination of different radius sizes provides a strong cutting edge and excellent chip control.

New “Z” Thinning with Lower Thrust Force

New "Z" thinning geometry expands the space for chip discharge allowing for excellent chip evacuation and achieves a lower thrust force.

*Drills with a diameter of DC<3mm have a different thinning shape.

Gash Land

A gash land (0ºrake) creates a stronger corner that provides excellent chipping resistance.



ZERO-μ Surface

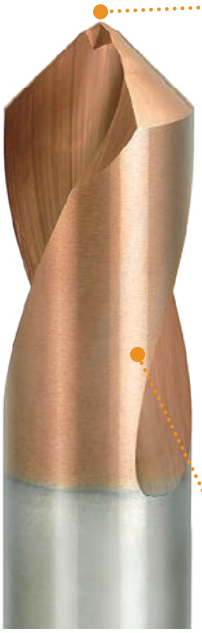
Smooth surface clearance provides reduced deflection and excellent position accuracy.

NEW

DLE / GKCD Solid Drills for Centering and Chamfering

Leading Drill Series

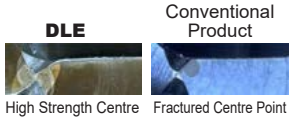
DLE



Two-Step Point Angles 60º, 90º

Two-step point angles ensure strength at the centre and prevent sudden fracturing.

*The central area will not have a 60º, 90º hole bottom.



Single-Step Point Angles 120º, 145º

Single-step point angle provides accuracy and good entry for the drill during the process of machining the hole.



Coated Grade **DP1020**

DP1020 grade offers excellent wear resistance and reduced friction for longer tool life over a wide range of applications.

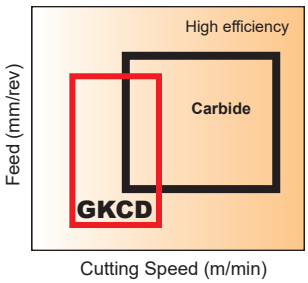
GKCD

HSS Cobalt material is used for its excellent heat, wear and chipping resistance and is ideal for use over a wide range of materials, from carbon to stainless steel. It also achieves an excellent cost performance ratio on low feed and low speed applications.

Point Angle SIG 60º 90º 120º



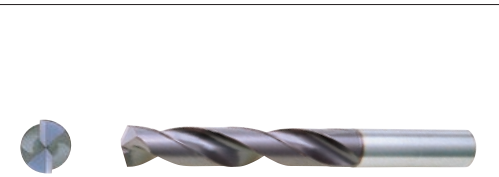
Different cutting conditions with carbide



DRILL SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
For Small Diameter	NEW DVAS…X02	ϕ1.0 −ϕ2.9	2	Internal	DP1	◎	◎	○	○	◎			N038
	NEW DVAS…X07		7	Internal	DP1	◎	◎	○	○	◎			N039
	NEW DVAS…X12		12	Internal	DP1	◎	◎	○	○	◎			
	NEW DVAS…X20		20	Internal	DP1	◎	◎	○	○	◎			
	NEW DVAS…X25		25	Internal	DP1	◎	◎	○	○	◎			
	NEW DVAS…X30		30	Internal	DP1	◎	◎	○	○	◎			
	NEW DVAS…X40		40	Internal	DP1	◎	◎	○	○	◎			
	NEW DVAS…X50	ϕ1.0, 1.5, 2.0, 2.5	50	Internal	DP1	◎	◎	○	○	◎			
	MVS...X02	ϕ1.0 −ϕ2.9	2	Internal	DP1	◎	◎	◎	○	○			N046
	MVS...X07		7	Internal	DP1	◎	◎	◎	○	○			N048
	MVS...X12		12	Internal	DP1	◎	◎	◎	○	○			
	MVS...X20		20	Internal	DP1	◎	◎	◎	○	○			
	MVS...X25		25	Internal	DP1	◎	◎	◎	○	○			
	MVS...X30		30	Internal	DP1	◎	◎	◎	○	○			
	MWS…SB	ϕ0.5 −ϕ2.95	1	Internal	VP	◎	◎	◎	○	○			N122
	MWS…LB	ϕ0.5 −ϕ2.9	5	Internal	VP	◎	◎	◎	○	○			
	MWS…XB		12	Internal	VP	◎	◎	◎	○	○			
	MWS…X20DB	ϕ1.0 −ϕ2.95	20	Internal	VP	◎	◎	◎	○	○			N122

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
For Small Diameter	MWS…X25DB	ϕ1.0 −ϕ2.95	25	Internal	VP	◎	◎	◎	○	○			N122
	MWS…X30DB		30	Internal	VP	◎	◎	◎	○	○			
	MZE…SB	ϕ1.0 −ϕ1.9	2	External	VP	◎	○	◎	○	○	○		N130
	MZE…SA	ϕ2.0 −ϕ2.9	2	External	VP	◎	○	◎	○	○	○		
	MZE…MA		3	External	VP	◎	○	◎	○	○	○		
General Drilling	MVE...X02	ϕ3.0 −ϕ20.0	2	External	DP1	◎	○	◎	○	○	○		N068
	MVE...X03		3	External	DP1	◎	○	◎	○	○	○		
	MVS...X02...PL	ϕ3.0 −ϕ14.0	2	Internal	DP1	◎	◎	◎	○	○			N046
	MVS...X03	ϕ3.0 −ϕ20.0	3	Internal	DP1	◎	◎	◎	○	○			N050
	MVS...X05		5	Internal	DP1	◎	◎	◎	○	○			
	MVS...X08	ϕ3.0 −ϕ16.0	8	Internal	DP1	◎	◎	◎	○	○			
	MVS...X10	ϕ3.0 −ϕ14.0	10	Internal	DP1	◎	◎	◎	○	○			
	MVS...X15		15	Internal	DP1	◎	◎	◎	○	○			
	MVS...X20		20	Internal	DP1	◎	◎	◎	○	○			
	MVS...X25	ϕ3.0 −ϕ12.0	25	Internal	DP1	◎	◎	◎	○	○			
	MVS...X30	ϕ3.0 −ϕ10.0	30	Internal	DP1	◎	◎	◎	○	○			
	MVS...X35		35	Internal	DP1	◎	◎	◎	○	○			
	MVS...X40	ϕ3.0 −ϕ9.0	40	Internal	DP1	◎	◎	◎	○	○			

DRILL SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
General Drilling	MZE...SA	φ3.0 –φ20.0	2	External	VP	◎	○	◎	○	○	○		N130
	MZE...MA		3	External	VP	◎	○	◎	○	○	○		
For Heat Resistant Super Alloys	NEW DSAS…X03	φ3.0 –φ12.0	3	Internal	DP9					◎			N075
	NEW DSAS…X05		5	Internal	DP9					◎			
	NEW DSAE…X03		3	External	DP9					◎			N080
For Machining of Stainless Steel	MMS...X3DB	φ3.0 –φ20.0	3	Internal	DP7		◎						N082
	MMS...X5DB		5	Internal	DP7		◎						
For Die & Mould Machining	MHS	φ0.95 –φ12.0	1 –30	Internal	VP	○	○			○	◎		N088
For Machining of Aluminium Alloys	MNS...LB	φ3.0 –φ14.0	5	Internal	–				◎				N098
	MNS...X10DB		10	Internal	–				◎				
	MNS...X20DB		20	Internal	–				◎				
	MNS...X30DB	φ3.0 –φ10.0	30	Internal	–				◎				
Aluminium Alloys, Cast Iron	MAE...MB	φ3.0 –φ16.0	3	External	–			○	◎				N108
	MAS...MB		3	Internal	–			○	◎				N104
	MAS...LB		6	Internal	–			○	◎				

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
Composite Materials	**MCC**	ϕ4.76 –ϕ11.14	3	External	DD	CFRP							**N112**
	MCA	ϕ6.38 –ϕ9.55	5	Internal	DD	CFRP+Al							**N113**
	MCT		5	Internal	–	CFRP+Ti							**N114**
	MCW		5	Internal	DD	CFRP, CFRTP, CFRP+Al, CFRP+Ti							**N115**
	MCCH	ϕ2.5 –ϕ9.55	2 –15	External	–	CFRP							**N116**
	MCAH		3 –15	External	–	CFRP+Al							**N117**
Swiss-Type Automatic and Small CNC Lathes	NEW **DWAE…X02**	ϕ1.0 –ϕ2.9	2	External	DP1A	◎	◎	◎				DC<2.0 DC≥2.0	**N030**
	NEW **DWAE…X04**		4	External	DP1A	◎	◎	◎					
	NEW **DWAE…X02**	ϕ3.0 –ϕ14.0	2	External	DP1A	◎	◎	◎					**N031**
	NEW **DWAE…X04**		4	External	DP1A	◎	◎	◎					
For Centering and Chamfering	NEW **DLE…P090**	ϕ1.0 –ϕ2.5	–	External	DP1A	◎	◎	◎				SIG 90°	**N020**
	DLE…P060	ϕ3.0 –ϕ12.0	–	External	DP1	◎	◎	◎					
	DLE…P090	ϕ3.0 –ϕ16.0	–	External	DP1	◎	◎	◎				SIG 60°, 90°	
	DLE…P120	ϕ3.0 –ϕ12.0	–	External	DP1	◎	◎	◎					
	NEW **DLE…P145**		–	External	DP1	◎	◎	◎				SIG 120°, 145°	

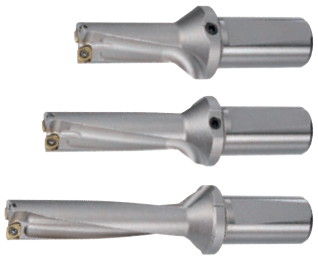
DRILL SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

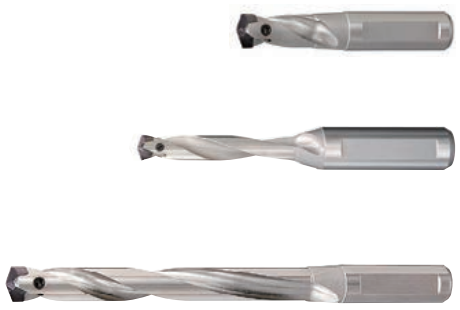
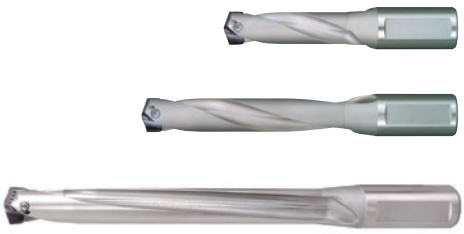
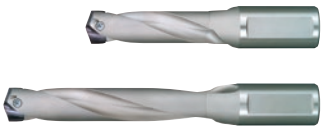
Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
Solid Carbide Flat Bottom	MFE	ϕ0.75 –ϕ2.95	2	External	DP1A	◎	◎	◎	○				N025
		ϕ3.0 –ϕ20.0	2	External	DP1	◎	◎	◎	○				N026
For Small Diameter Machining	MSE	ϕ0.1 –ϕ0.99	–	External	VP	◎	○	◎	○	○			N119
	MSP0300SB	–	–	External	VP	◎	○	◎	○	○		 ∗MSE is for guide hole drilling.	N118
Deep Hole Drilling	MGS	ϕ0.7 –ϕ3.0	–80	Internal	–	◎	◎	◎	◎				N136
For Non-ferrous Materials	DCSSS	ϕ0.2 –ϕ2.0	–	External	DC				○				N140
	DCSSM	ϕ2.1 –ϕ3.0	–	External	DC				○				N140
For Hard Brittle Materials	DCBSS	ϕ0.05 –ϕ3.0	–	External	DC	Hard brittle materials such as ceramics							N142

INDEXABLE DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
General Drilling	MVX...X2	ϕ14.0 –ϕ63.0	2	Internal	–	◎	○	◎	○		○		N160
	MVX...X3		3	Internal	–	◎	○	◎	○		○		
	MVX...X4		4	Internal	–	◎	○	◎	○		○		
	MVX...X5		5	Internal	–	◎	○	◎	○		○		
	MVX...X6	ϕ17.0 –ϕ43.0	6	Internal	–	◎	○	◎	○		○		

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
General Drilling	TAFS	ϕ12.0 −ϕ56.0	2	Internal	–	◎	◎	◎					N171
	TAFM		3	Internal	–	◎	◎	◎					
	TAFL	ϕ16.0 −ϕ34.0	4	Internal	–	◎	◎	◎					

EXCHANGEABLE-HEAD DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
General Drilling	STAWSS	ϕ10.0 −ϕ18.4	1.5	Internal	–	◎	○	◎					N144
	STAWSN		3	Internal	–	◎	○	◎					
	STAWMN		5	Internal	–	◎	○	◎					
	STAWLN		8	Internal	–	◎	○	◎					
	TAWSN	ϕ18.5 −ϕ30.4	3	Internal	–	◎	○	◎					N151
	TAWMN		5	Internal	–	◎	○	◎					
	TAWLN		8	Internal	–	◎	○	◎					
For Bridge Construction	TAWSB	ϕ24.5 −ϕ26.7	3	Internal	–	◎							N159
	TAWMB		5	Internal	–	◎							

BRAZED GUN REAMER

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
Finish Drilling	GUN REAMER	ϕ6.0 −ϕ30.0	–	Internal	–	○	○	○	○				N180
	GUN REAMER With Diamond Compound	ϕ6.0 −ϕ30.3	–	Internal	–				◎				N181

DRILL SELECTION CHART HSS

Drill Type	Applications	Product Code (Series Title)	Size Range	Tool Material	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
Leading Drills	For Centering and Chamfering	NEW GKCD	ϕ3.0 –ϕ20.0	Cobalt High-Speed Steel	External	G	◎	○	○				SIG 60°, 90°, 120°	N182
Violet Coated Drills	General, High Precision	VAPDS	ϕ0.5 –ϕ13.0	High Grade, High-Speed Steel	External	V	◎	○	○					N188
		VAPDM	ϕ0.5 –ϕ32.0		External	V	◎	○	○					N193
		VAPDJ	ϕ1.0 –ϕ10.0		External	V	◎	○	○					N197
	General, High Precision Steel	VAPDSSUS	ϕ0.5 –ϕ20.0	Cobalt High-Speed Steel	External	V	○	◎	○	○	○			N199
		VAPDMSUS	ϕ0.5 –ϕ13.0		External	V	○	◎	○	○	○			N202
	Spot Milling	VAPDSCB	ϕ2.0 –ϕ32.0	High Grade, High-Speed Steel	External	V	◎	○	○	○				N206
Violet Drill	General Drilling	VSD	ϕ0.5 –ϕ13.0	High-Speed Steel	External	V	◎	○	○	○				N208
SE High Precision Drill	General Drilling	SEPDS	ϕ0.5 –ϕ4.0	D-STH Cobalt High-Speed Steel	External	–	◎	○	◎	◎	○			N184
		SEPDM	ϕ0.5 –ϕ4.0		External	–	◎	○	◎	◎	○			N186
Straight Shank Drill	General Drilling	GSD	ϕ0.5 –ϕ13.0	High-Speed Steel	External	G	◎	○	○	○				N210
		SD	ϕ0.2 –ϕ17.5		External	–	◎	○	○	○				N212
		SD (1/100 Straight)	ϕ0.25 –ϕ5.95		External	–	◎	○	○	○				N214
	General, Long Shank	SDLS	ϕ1.0 –ϕ10.0	High-Speed Steel	External	–	◎	○	○	○				N215
	General Drilling	KSD	ϕ1.0 –ϕ13.0	Cobalt High-Speed Steel	External	–	◎	◎	○	○				N218

Drill Type	Applications	Product Code (Series Title)	Size Range	Tool Material	Coolant	Coating	Workpiece Material P Steel	Workpiece Material M Stainless Steel	Workpiece Material K Cast Iron	Workpiece Material N Non-ferrous Metal	Workpiece Material S Heat Resistant Alloy	Workpiece Material H Hardened Steel	Shape	Page
Straight Shank Drill	Deep Hole Drilling	GWSS	ϕ1.0 –ϕ13.0	Cobalt High-Speed Steel	External	G	◎	○	○	○				N220
		GWSL	ϕ2.0 –ϕ13.0	Cobalt High-Speed Steel	External	G	◎	○	○	○				N222
		LSD	ϕ1.0 –ϕ13.0	High-Speed Steel	External	–	○	○	○	○				N225
	Sheet Steel	EPSS	ϕ2.0 –ϕ13.0	High-Speed Steel	External	–	○	○	○	○				N228
Taper Shank Drill	General Drilling	GTD	ϕ6.0 –ϕ40.0	High-Speed Steel	External	G	◎	○	○	○				N229
		TD	ϕ3.0 –ϕ75.0	High-Speed Steel	External	–	◎	○	○	○				N230
		KTD	ϕ5.0 –ϕ50.0	Cobalt High-Speed Steel	External	–	◎	○	○	○				N234
	Deep Hole Drilling	GWTS	ϕ6.0 –ϕ32.0	Cobalt High-Speed Steel	External	G	◎	○	○	○				N240
		LTD	ϕ6.0 –ϕ40.0	High-Speed Steel	External	–	○		○	○				N236
	For Steel Frame	GTTD	ϕ18.0 –ϕ26.0	High-Speed Steel	External	G	◎							N241
		TTD	ϕ17.0 –ϕ32.0	High-Speed Steel	External	–	○							N242
Triangular Shank Drill	For General-purpose Electric Drills	3KD	ϕ7.0 –ϕ26.0	High-Speed Steel	External	–	○		○	○				N243

Memo

Memo

APPLICATION RANGE

1st Recommenedation P M K N S H

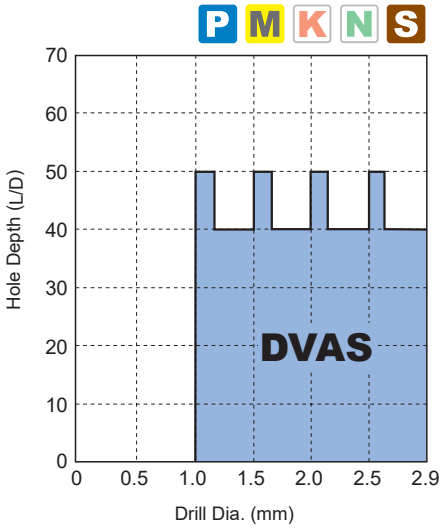
2nd Recommenedation P M K N S H

■Carbide Solid Drills

DVAS Mini Size NEW

For Small Diameters





MVE/MVS

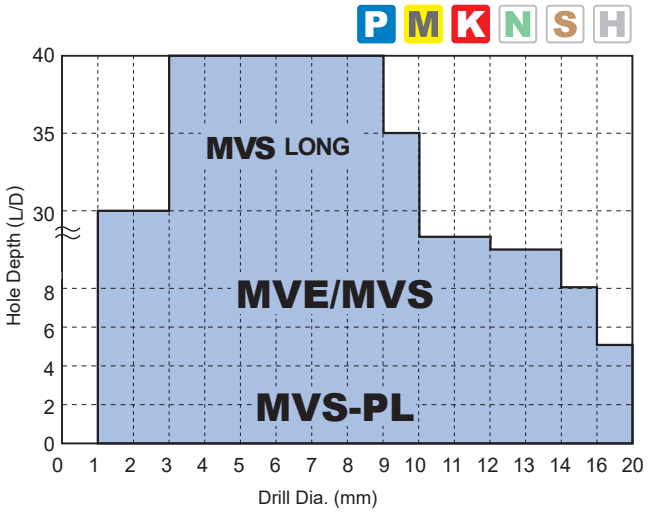
General Drilling



MVE



MVS



DSAE/DSAS NEW

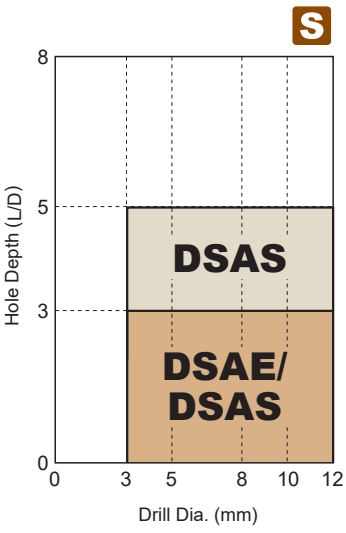
For Heat Resistant Super Alloys



DSAE



DSAS



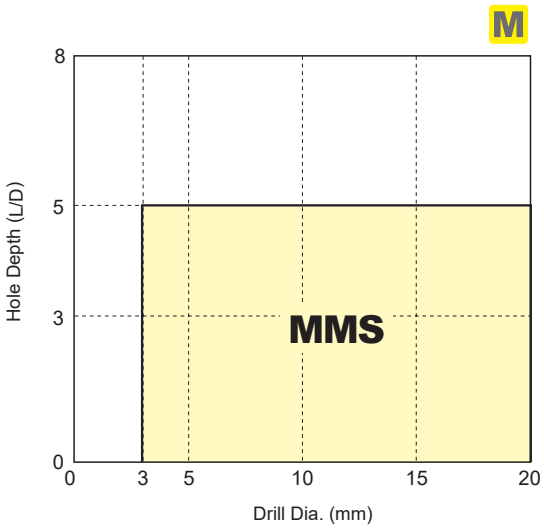
1st Recommenedation P M K N S H

2nd Recommenedation P M K N S H

MMS

For Machining of Stainless Steel

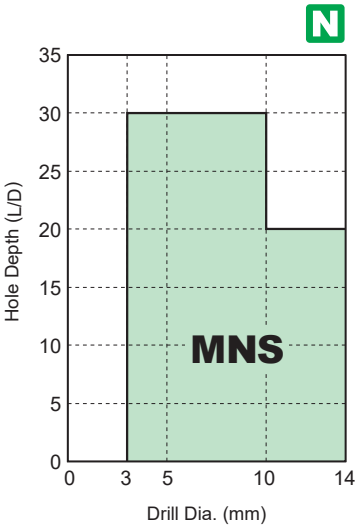




MNS

For Machining of Aluminium Alloys

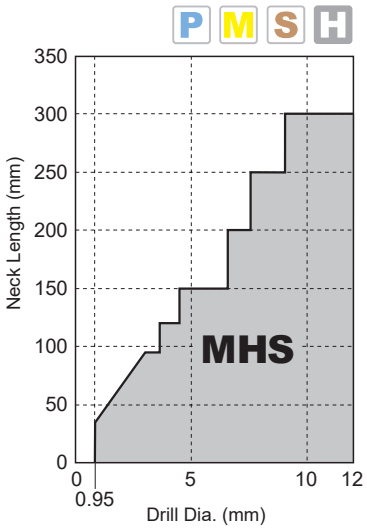




MHS

For Die & Mould Machining

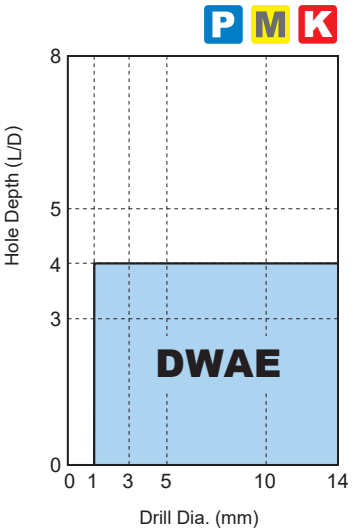




DWAE NEW

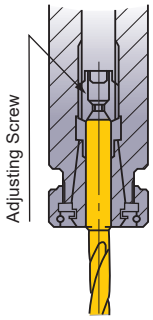
Swiss-Type Automatic and Small CNC Lathes





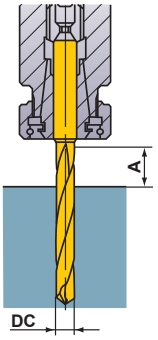
OPERATIONAL GUIDANCE

Securing the Drill



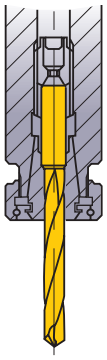
Thrust bearing type collet chuck holds the drill securely.

Drill Length



Ensure that the Dimension A is DC x 1.5 or more (when DC < 3mm, DC x 2.0 or more).

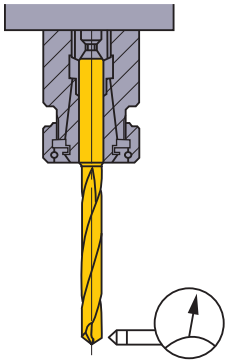
Drill Length



NG

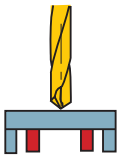
Do not clamp on the flutes.

Installation Tolerance

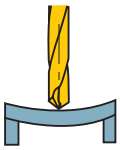


Run-out ≤ 0.03mm

Thin Workpiece

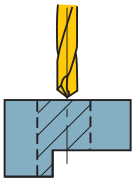


OK
Support if bending occurs



NG
Bending occurs

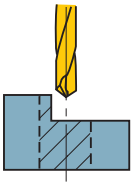
Interrupted Cutting



Machining is Possible

OK

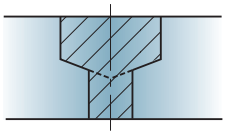
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

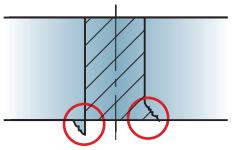
①Counter boring with an end mill prior to drilling required.

Stepped Holes



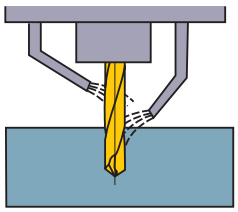
①Divide the two processes.
②Drill the thicker part first.
*Tools for counter boring and chamfering can be produced to order.

Burring and Workpiece Chipping



Decrease the feed rate at the end of through cutting.

Coolant Type (External)

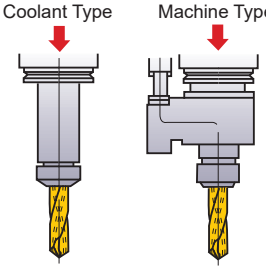


Two coolant positions, at the end and at the centre are ideal.

Through Coolant Type (Internal)

Spindles Through Coolant Type

Revolving Coolant Machine Type



Less than ø3mm : 1.5MPa-7MP
More than ø3mm : 0.5MPa-7MPa
More than 3MPa is recommended.

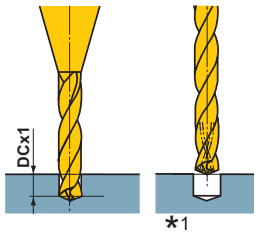
Coolant Handling

<When using internal coolant>

1) Small particles of swarf will jam in the coolant hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Exchanging the coolant regularly is recommended.

Drill Installation



①Drill pilot hole of about DCx1 (DC being drill diameter) using a drill with the shortest groove length.
②Insert a drill with a coolant hole into the pilot hole and begin machining.
Depending on the type of machining, step machining or inching may be performed.

*1 Please check each product's page for pilot drills for drilling pilot holes.

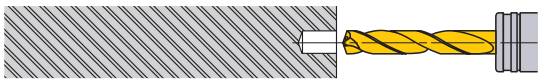
■ NOTES ON USE (For DC<3mm)

Please use a fine mesh filter (mesh≤5μm) for coolant to prevent jamming in the coolant hole.
When deep hole drilling with a long type drill, it is recommended to drill a pilot hole before beginning.
(Otherwise, centrifugal forces may cause drill breakage.)

TIPS FOR USING LONG TYPE DRILLS

FLAT FACE DRILLING ●Drilling a blind hole

1. Machining a Pilot Hole



①Use recommended pilot drills when drilling pilot holes.
*Please check each product's page for pilot drills.
②It is essential for the pilot hole to have good accuracy.
③Drill depth : Approx DC×1–2. (Adjust the pilot hole depth according to the length of the long type drill.)
*When L/D=50, the depth of the hole is DCx7

2. Deep hole drilling (incorporating pilot hole)



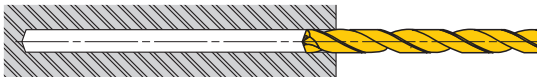
①Insert drill into the pilot hole at low speeds. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Insert the drill until around 0.5mm to 1mm short of the bottom of the pilot hole. (Make sure that the shoulder of the cutting edge is safely inserted.)

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction



①After drilling, lower the cutting revolution about 0.5—1mm short of the hole end. (Cutting speed of around 20—30m/min)
②Retract the drill to the starting point of the pilot hole at a feed rate of 3000mm/min.
③Extract the drill according to the same conditions as when inserting the drill into the pilot hole.

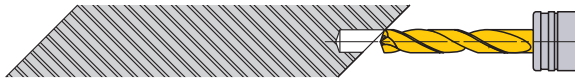
INTERRUPED DRILLING ●Drilling and breaking through on irregular faces or angles

1. Spot facing



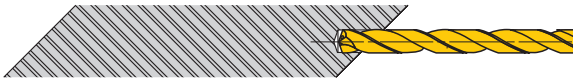
①When drilling a deep hole on an inclined surface, it is recommended to use a MFE drill or end mill for drilling the pilot hole.
②It is essential for the pilot hole to have good accuracy.
③Drill depth : Approx DC×1.

2. Machining a Pilot Hole



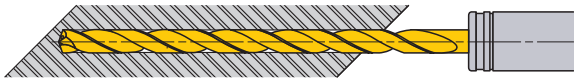
①Use recommended pilot drills when drilling pilot holes.
*Please check each product's page for pilot drills.
②It is essential for the pilot hole to have good accuracy.
③Drill depth : Approx DC×1–2. (Adjust the pilot hole depth according to the length of the long type drill.)
*When L/D=50, the depth of the hole is DCx7

3. Deep hole drilling (incorporating pilot hole)



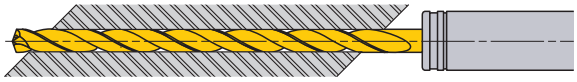
①Insert drill into the pilot hole at low speeds. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Insert the drill until around 0.5mm to 1mm short of the bottom of the pilot hole.

4. Drill the deep hole



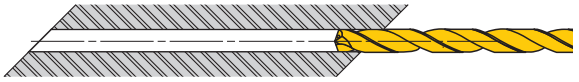
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Lower the feed rate when inserting the drill.

6. Drill retraction



①Finally clear the hole at a feed rate of 0.2—0.3mm/rev. (Revolution of around 1000min^{-1})
②Retract the drill to the starting point of the pilot hole at a feed rate of 3000mm/min.

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{1000} \ (m/min)$$

vc (m/min): Cutting Speed
π (3.14) : Pi
DC (mm) : Drill Diameter
n (min^{-1}): Main Axis Spindle Speed

■FEED OF THE MAIN SPINDLE (vf)

$$vf = fr \cdot n \ (mm/min)$$

vf (mm/min) : Feed Speed of the Main Spindle (Z axis)
fr (mm/rev) : Feed per Revolution
n (min^{-1}) : Main Axis Spindle Speed

DLE

LEADING DRILLS SERIES

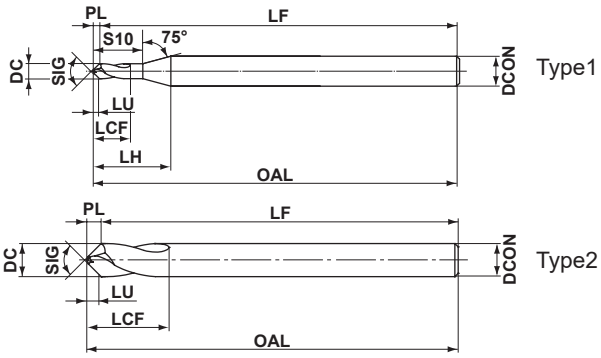
P Steel | M Stainless Steel | K Cast Iron | N | S | H

External Coolant

■ Tip angle shape SIG 60º, 90º

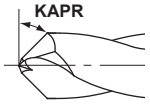






■ Tip angle shape SIG 120º, 145º





h7	DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤16
	0 −0.010	0 −0.012	0 −0.015	0 −0.018

DC (mm)	SIG	DP1020	DP102A	Order Number	Dimensions (mm) LU	LCF	LH	S10	OAL	LF	PL	KAPR	DCON	DC/4	Type
3.0	60°	●		**DLE0300S030P060**	2.0	9	—	—	45	42.9	2.1	60°	3	0.75	2
4.0	60°	●		**DLE0400S040P060**	2.7	12	—	—	50	47.2	2.8	60°	4	1.00	2
5.0	60°	●		**DLE0500S050P060**	3.4	14	—	—	60	56.5	3.5	60°	5	1.25	2
6.0	60°	●		**DLE0600S060P060**	4.0	15	—	—	66	61.8	4.2	60°	6	1.50	2
7.0	60°	●		**DLE0700S070P060**	4.7	18	—	—	74	69.1	4.9	60°	7	1.75	2
8.0	60°	●		**DLE0800S080P060**	5.4	20	—	—	74	68.4	5.6	60°	8	2.00	2
10.0	60°	●		**DLE1000S100P060**	6.8	24	—	—	84	77.0	7.0	60°	10	2.50	2
12.0	60°	●		**DLE1200S120P060**	8.1	28	—	—	95	86.6	8.4	60°	12	3.00	2
NEW 1.0	90°		●	**DLE0100S030P090**	0.35	2	6.7	3.0	45	44.6	0.4	45°	3	0.25	1
NEW 1.5	90°		●	**DLE0150S030P090**	0.55	3	7.3	4.5	45	44.4	0.6	45°	3	0.38	1
NEW 2.0	90°		●	**DLE0200S030P090**	0.80	4	7.9	6.1	45	44.1	0.9	45°	3	0.50	1
NEW 2.5	90°		●	**DLE0250S030P090**	1.00	5	7.9	7.1	45	43.9	1.1	45°	3	0.63	1
3.0	90°	●		**DLE0300S030P090**	1.2	9	—	—	45	43.7	1.3	45°	3	0.75	2
4.0	90°	●		**DLE0400S040P090**	1.6	12	—	—	50	48.3	1.7	45°	4	1.00	2
5.0	90°	●		**DLE0500S050P090**	2.0	14	—	—	60	57.9	2.1	45°	5	1.25	2
6.0	90°	●		**DLE0600S060P090**	2.4	15	—	—	66	63.4	2.6	45°	6	1.50	2
7.0	90°	●		**DLE0700S070P090**	2.8	18	—	—	74	71.0	3.0	45°	7	1.75	2
8.0	90°	●		**DLE0800S080P090**	3.2	20	—	—	74	70.6	3.4	45°	8	2.00	2
10.0	90°	●		**DLE1000S100P090**	4.1	24	—	—	84	79.7	4.3	45°	10	2.50	2
12.0	90°	●		**DLE1200S120P090**	4.9	28	—	—	95	89.9	5.1	45°	12	3.00	2
16.0	90°	●		**DLE1600S160P090**	6.6	35	—	—	113	106.2	6.8	45°	16	4.00	2
3.0	120°	●		**DLE0300S030P120**	0.8	9	—	—	45	44.1	0.9	30°	3	0.75	2
4.0	120°	●		**DLE0400S040P120**	1.1	12	—	—	50	48.8	1.2	30°	4	1.00	2
5.0	120°	●		**DLE0500S050P120**	1.3	14	—	—	60	58.6	1.4	30°	5	1.25	2

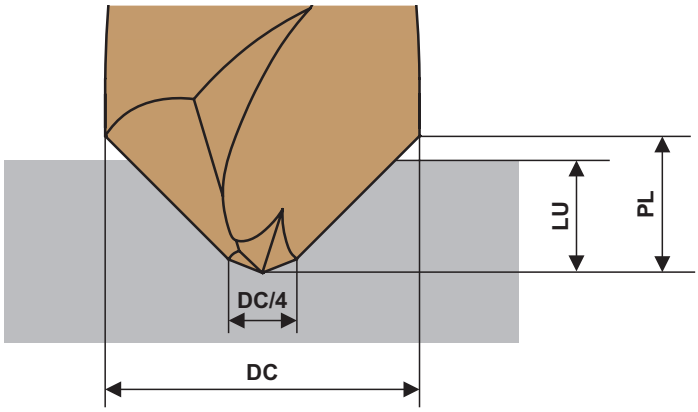
Note 1) The central area of holes (DC / 4) formed by two step point angles will not have their respective 60º and 90º angles. Chamfering is also not possible in the centre areas.

Note 2) The centering diameter should be less than the drill diameter (machining diameter) DC and the usable length LU should be referred to as a guideline.

● : **Inventory maintained in Japan.**

DC (mm)	SIG	DP1020	DP102A	Order Number	Dimensions (mm)										Type
					LU	LCF	LH	S10	OAL	LF	PL	KAPR	DCON	DC/4	
6.0	120°	●		**DLE0600S060P120**	1.6	15	—	—	66	64.3	1.7	30°	6	1.50	2
7.0	120°	●		**DLE0700S070P120**	1.9	18	—	—	74	72.0	2.0	30°	7	1.75	2
8.0	120°	●		**DLE0800S080P120**	2.2	20	—	—	74	71.7	2.3	30°	8	2.00	2
10.0	120°	●		**DLE1000S100P120**	2.8	24	—	—	84	81.1	2.9	30°	10	2.50	2
12.0	120°	●		**DLE1200S120P120**	3.3	28	—	—	95	91.5	3.5	30°	12	3.00	2
3.0	145°	●		**DLE0300S030P145**	0.4	9	—	—	45	44.5	0.5	17.5°	3	0.75	2
4.0	145°	●		**DLE0400S040P145**	0.5	12	—	—	50	49.4	0.6	17.5°	4	1.00	2
5.0	145°	●		**DLE0500S050P145**	0.7	14	—	—	60	59.2	0.8	17.5°	5	1.25	2
6.0	145°	●		**DLE0600S060P145**	0.8	15	—	—	66	65.1	0.9	17.5°	6	1.50	2
7.0	145°	●		**DLE0700S070P145**	1.0	18	—	—	74	72.9	1.1	17.5°	7	1.75	2
8.0	145°	●		**DLE0800S080P145**	1.1	20	—	—	74	72.7	1.3	17.5°	8	2.00	2
NEW 10.0	145°	●		**DLE1000S100P145**	1.4	24	—	—	84	82.4	1.6	17.5°	10	2.50	2
NEW 12.0	145°	●		**DLE1200S120P145**	1.7	28	—	—	95	93.1	1.9	17.5°	12	3.00	2

Note 1) The centering diameter should be less than the drill diameter (machining diameter) DC and the usable length LU should be referred to as a guideline.

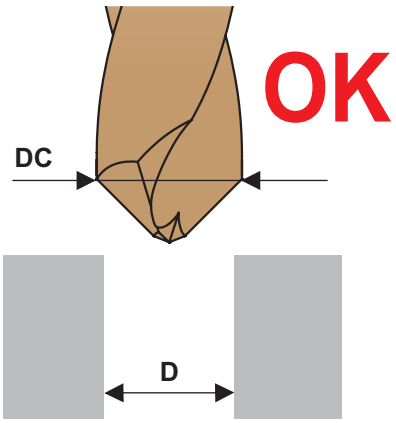


DLE
LEADING DRILL SERIES

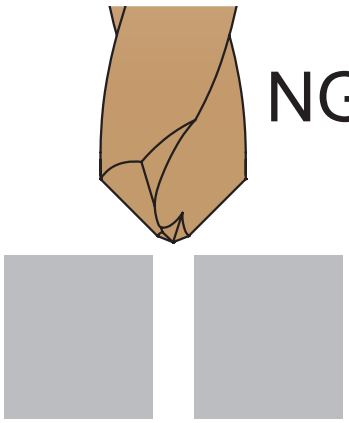
Drill Diameter Selection

When Chamfering

Select a tool diameter (DC) that is larger than the pilot hole diameter (D) and less than twice the pilot hole diameter.

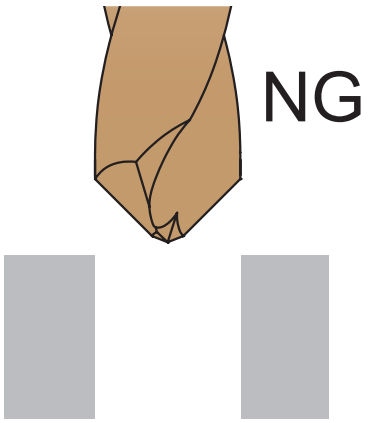


Example) When pilot hole diameter D is 5mm:
Drill diameter **DC** should be greater than 6 mm but less than 10 mm. Select a **DC** of 6 mm, 7 mm, or 8 mm.



If DC is equal to or greater than 2D:

If the tool diameter (DC) is too large (2D or larger) compared to the diameter of the pilot hole (D), the tool cannot be used for chamfering.

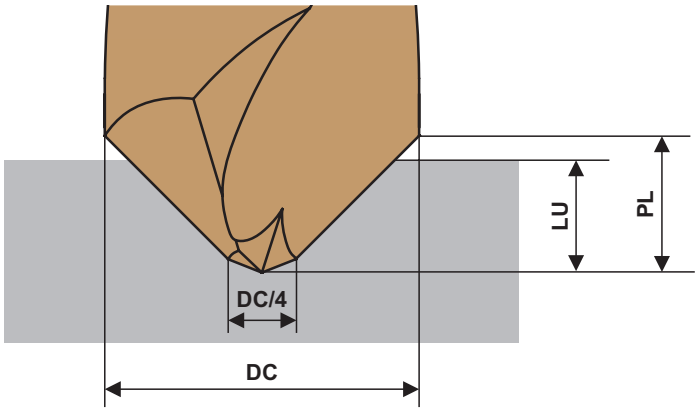


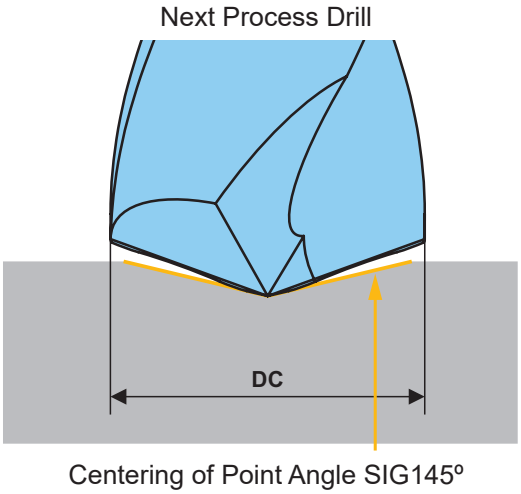
If DC is a drill diameter equal to D:

Use a leading drill with a tool diameter larger than the pilot hole diameter D, or use it for contour milling.

When Centering

The centering diameter cannot be used for machining a pilot hole diameter that is the same as the tool diameter (DC). Use the LU length in the standard table as a guide instead.
The central area of holes (**DC/4**) formed by two step point angles will not have their respective 60º and 90º angles. Chamfering is also not possible in the centre areas.
Select a centering drill with a larger point angle than the final hole drill, if making initial contact with the centre is desired.





Centering of Point Angle SIG145º

Point Angle SIG 60°

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) JIS SS400, S10C etc.		Carbon Steel, Alloy Steel (180—280HB) JIS S45C, SCM440 etc.		Carbon Steel, Alloy Steel (280—350HB) JIS SNCM439 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
3.0	7900	0.05(0.03—0.07)	6800	0.05 (0.03—0.07)	6300	0.04 (0.02—0.06)
4.0	5900	0.05(0.03—0.07)	5100	0.05 (0.03—0.07)	4700	0.04 (0.02—0.06)
5.0	5000	0.06(0.04—0.08)	4400	0.06 (0.04—0.08)	4100	0.05 (0.03—0.07)
6.0	4200	0.06(0.04—0.08)	3700	0.06 (0.04—0.08)	3400	0.05 (0.03—0.07)
7.0	3600	0.07(0.04—0.09)	3100	0.07 (0.04—0.09)	2900	0.05 (0.03—0.07)
8.0	3100	0.07(0.04—0.09)	2700	0.07 (0.04—0.09)	2500	0.05 (0.03—0.07)
10.0	2700	0.08(0.04—0.10)	2300	0.08 (0.04—0.10)	2200	0.06 (0.03—0.08)
12.0	2200	0.08(0.04—0.10)	1900	0.08 (0.04—0.10)	1800	0.06 (0.03—0.08)

Workpiece Material	Austenitic Stainless Steel (≤200HB) JIS SUS304, SUS316 etc.		Gray Cast Iron (≤350MPa) JIS FC300 etc.		Ductile Cast Iron (≤450MPa) JIS FCD450 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
3.0	1500	0.03 (0.01—0.05)	7900	0.05 (0.03—0.07)	5800	0.05 (0.03—0.07)
4.0	1100	0.03 (0.01—0.05)	5900	0.05 (0.03—0.07)	4300	0.05 (0.03—0.07)
5.0	1200	0.04 (0.02—0.06)	5000	0.06 (0.04—0.08)	3800	0.06 (0.04—0.08)
6.0	1000	0.04 (0.02—0.06)	4200	0.06 (0.04—0.08)	3100	0.06 (0.04—0.08)
7.0	900	0.04 (0.02—0.06)	3600	0.07 (0.04—0.09)	2700	0.06 (0.04—0.08)
8.0	790	0.04 (0.02—0.06)	3100	0.07 (0.04—0.09)	2300	0.06 (0.04—0.08)
10.0	630	0.04 (0.02—0.06)	2700	0.08 (0.04—0.10)	1900	0.07 (0.04—0.09)
12.0	530	0.04 (0.02—0.06)	2200	0.08 (0.04—0.10)	1500	0.07 (0.04—0.09)

Note 1) Select a tool diameter (DC) that is larger than the pilot hole diameter (D) and less than twice the pilot hole diameter.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the dwell time or reduce the revolutions.
Note 5) When centering, please do not exceed the **LU** (usable length).

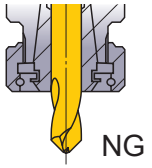
■ OPERATIONAL GUIDANCE

Securing the Drill



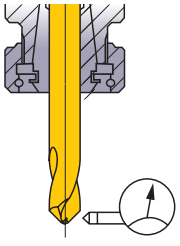
Collet chuck holds the drill securely.

Drill Length



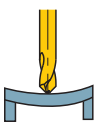
Do not clamp on the flutes.

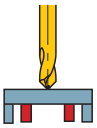
Installation Tolerance



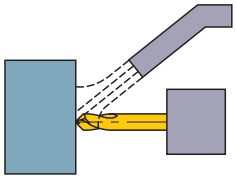
Run-out ≤ 0.03mm

Thin Workpiece





Coolant Method



Coolant positions, at the end at the centre are ideal.

DLE

LEADING DRILL SERIES

Point Angle SIG 90°, 120° and 145°

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) JIS SS400, S10C etc.		Carbon Steel, Alloy Steel (180—280HB) JIS S45C, SCM440 etc.		Carbon Steel, Alloy Steel (280—350HB) JIS SNCM439 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	9500	0.02 (0.01—0.03)	6300	0.02 (0.01—0.03)	4700	0.02 (0.01—0.03)
1.5	9500	0.02 (0.01—0.03)	7400	0.02 (0.01—0.03)	6300	0.02 (0.01—0.03)
2.0	9500	0.04 (0.03—0.05)	7900	0.04 (0.03—0.05)	7100	0.04 (0.03—0.05)
2.5	9500	0.04 (0.03—0.05)	8200	0.04 (0.03—0.05)	7600	0.04 (0.03—0.05)
3.0	7900	0.06 (0.04—0.08)	6800	0.06 (0.04—0.08)	6300	0.05 (0.03—0.07)
4.0	5900	0.06 (0.04—0.08)	5100	0.06 (0.04—0.08)	4700	0.05 (0.03—0.07)
5.0	5000	0.07 (0.05—0.09)	4400	0.07 (0.05—0.09)	4100	0.06 (0.04—0.08)
6.0	4200	0.07 (0.05—0.09)	3700	0.07 (0.05—0.09)	3400	0.06 (0.04—0.08)
7.0	3600	0.08 (0.05—0.10)	3100	0.08 (0.05—0.10)	2900	0.06 (0.04—0.08)
8.0	3100	0.08 (0.05—0.10)	2700	0.08 (0.05—0.10)	2500	0.06 (0.04—0.08)
10.0	2700	0.09 (0.05—0.11)	2300	0.09 (0.05—0.11)	2200	0.07 (0.04—0.09)
12.0	2200	0.09 (0.05—0.11)	1900	0.09 (0.05—0.11)	1800	0.07 (0.04—0.09)
16.0	1700	0.12 (0.10—0.14)	1500	0.12 (0.10—0.14)	1400	0.08 (0.06—0.10)

Workpiece Material	Austenitic Stainless Steel (≤200HB) JIS SUS304, SUS316 etc.		Gray Cast Iron (≤350MPa) JIS FC300 etc.		Ductile Cast Iron (≤450MPa) JIS FCD450 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	6300	0.01 (0.005—0.015)	9500	0.02 (0.01—0.03)	3100	0.02 (0.01—0.03)
1.5	4200	0.01 (0.005—0.015)	9500	0.02 (0.01—0.03)	5300	0.02 (0.01—0.03)
2.0	3100	0.04 (0.03—0.05)	9500	0.04 (0.03—0.05)	6300	0.04 (0.03—0.05)
2.5	2500	0.04 (0.03—0.05)	9500	0.04 (0.03—0.05)	7000	0.04 (0.03—0.05)
3.0	2100	0.04 (0.02—0.06)	7900	0.06 (0.04—0.08)	5800	0.06 (0.04—0.08)
4.0	1600	0.04 (0.02—0.06)	5900	0.06 (0.04—0.08)	4300	0.06 (0.04—0.08)
5.0	1200	0.06 (0.04—0.08)	5000	0.07 (0.05—0.09)	3800	0.07 (0.05—0.09)
6.0	1000	0.06 (0.04—0.08)	4200	0.07 (0.05—0.09)	3100	0.07 (0.05—0.09)
7.0	900	0.06 (0.04—0.08)	3600	0.08 (0.05—0.10)	2700	0.07 (0.05—0.09)
8.0	790	0.06 (0.04—0.08)	3100	0.08 (0.05—0.10)	2300	0.07 (0.05—0.09)
10.0	630	0.06 (0.04—0.08)	2700	0.09 (0.05—0.11)	1900	0.08 (0.05—0.10)
12.0	530	0.06 (0.04—0.08)	2200	0.09 (0.05—0.11)	1500	0.08 (0.05—0.10)
16.0	390	0.08 (0.06—0.10)	1700	0.12 (0.10—0.14)	1100	0.11 (0.09—0.13)

Note 1) Select a tool diameter (DC) that is larger than the pilot hole diameter (D) and less than twice the pilot hole diameter.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the dwell time or reduce the revolutions.
Note 5) When centering, please do not exceed the **LU** (usable length).

MFE for Small Diameter
SOLID CARBIDE FLAT BOTTOM DRILLS

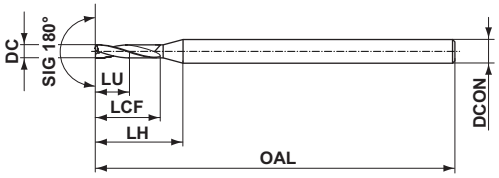
- Sharp cutting edges with long tool life
- Combination of different radius sizes provides strong cutting edge and excellent chip control

UWC DP1A 180° XR

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		

External Coolant





Type1

0.75≤DC≤2.95	
$^{0}_{-0.014}$	
DCON=3	DCON=4
$^{0}_{-0.006}$	$^{0}_{-0.008}$

DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm) LU	LCF	LH	OAL	DCON	Type
0.75	2	●	MFE0075X02S030	1.5	3.0	7.7	45	3	1
0.80	2	●	MFE0080X02S030	1.6	3.2	7.8	45	3	1
0.85	2	●	MFE0085X02S030	1.7	3.4	7.9	45	3	1
0.90	2	●	MFE0090X02S030	1.8	3.6	8.0	45	3	1
0.95	2	●	MFE0095X02S030	1.9	3.8	8.1	45	3	1
1.00	2	●	MFE0100X02S030	2.0	4.0	8.2	45	3	1
1.05	2	●	MFE0105X02S030	2.1	4.2	8.3	45	3	1
1.10	2	●	MFE0110X02S030	2.2	4.4	8.4	45	3	1
1.15	2	●	MFE0115X02S030	2.3	4.6	8.6	45	3	1
1.20	2	●	MFE0120X02S030	2.4	4.8	8.7	45	3	1
1.25	2	●	MFE0125X02S030	2.5	5.0	8.8	45	3	1
1.30	2	●	MFE0130X02S030	2.6	5.2	8.9	45	3	1
1.35	2	●	MFE0135X02S030	2.7	5.4	9.0	45	3	1
1.40	2	●	MFE0140X02S030	2.8	5.6	9.1	45	3	1
1.45	2	●	MFE0145X02S030	2.9	5.8	9.2	45	3	1
1.50	2	●	MFE0150X02S030	3.0	6.0	9.3	45	3	1
1.55	2	●	MFE0155X02S030	3.1	6.2	9.4	45	3	1
1.60	2	●	MFE0160X02S030	3.2	6.4	9.5	45	3	1
1.65	2	●	MFE0165X02S030	3.3	6.6	9.6	45	3	1
1.70	2	●	MFE0170X02S030	3.4	6.8	9.7	45	3	1
1.75	2	●	MFE0175X02S030	3.5	7.0	9.8	45	3	1
1.80	2	●	MFE0180X02S030	3.6	7.2	9.9	45	3	1
1.85	2	●	MFE0185X02S030	3.7	7.4	10.0	45	3	1
1.90	2	●	MFE0190X02S030	3.8	7.6	10.2	45	3	1
1.95	2	●	MFE0195X02S030	3.9	7.8	10.3	45	3	1
2.00	2	●	MFE0200X02S040	4.0	8.0	12.2	50	4	1
2.05	2	●	MFE0205X02S040	4.1	8.2	12.3	50	4	1
2.10	2	●	MFE0210X02S040	4.2	8.4	12.4	50	4	1
2.15	2	●	MFE0215X02S040	4.3	8.6	12.6	50	4	1
2.20	2	●	MFE0220X02S040	4.4	8.8	12.7	50	4	1
2.25	2	●	MFE0225X02S040	4.5	9.0	12.8	50	4	1
2.30	2	●	MFE0230X02S040	4.6	9.2	12.9	50	4	1
2.35	2	●	MFE0235X02S040	4.7	9.4	13.0	50	4	1
2.40	2	●	MFE0240X02S040	4.8	9.6	13.1	50	4	1
2.45	2	●	MFE0245X02S040	4.9	9.8	13.2	50	4	1
2.50	2	●	MFE0250X02S040	5.0	10.0	13.3	50	4	1
2.55	2	●	MFE0255X02S040	5.1	10.2	13.4	50	4	1
2.60	2	●	MFE0260X02S040	5.2	10.4	13.5	50	4	1
2.65	2	●	MFE0265X02S040	5.3	10.6	13.6	50	4	1
2.70	2	●	MFE0270X02S040	5.4	10.8	13.7	50	4	1
2.75	2	●	MFE0275X02S040	5.5	11.0	13.8	50	4	1
2.80	2	●	MFE0280X02S040	5.6	11.2	13.9	50	4	1
2.85	2	●	MFE0285X02S040	5.7	11.4	14.0	50	4	1
2.90	2	●	MFE0290X02S040	5.8	11.6	14.2	50	4	1
2.95	2	●	MFE0295X02S040	5.9	11.8	14.3	50	4	1

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

MFE

SOLID CARBIDE FLAT BOTTOM DRILLS

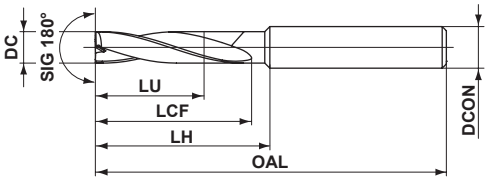
- Sharp cutting edges with long tool life
- Combination of different radius sizes provides strong cutting edge and excellent chip control

UWC DP1 180° X

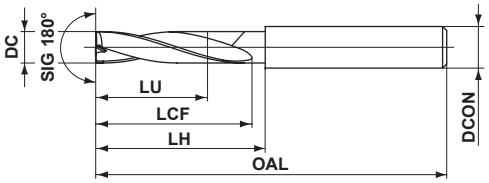
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		

External Coolant





Type1



Type2

3≤DC≤6	6 < DC≤10	10 < DC≤18	18 < DC≤20
0 −0.012	0 −0.015	0 −0.018	0 −0.021
DCON=6	DCON=8, 10	DCON=12, 14, 16, 18	DCON=20
0 −0.008	0 −0.009	0 −0.011	0 −0.013

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	DCON	Type
3.0	2	●	MFE0300X02S060	6.0	12	19.6	55	6	1
3.1	2	●	MFE0310X02S060	6.2	14	21.4	55	6	1
3.2	2	●	MFE0320X02S060	6.4	14	21.2	55	6	1
3.3	2	●	MFE0330X02S060	6.6	14	21.0	55	6	1
3.4	2	●	MFE0340X02S060	6.8	14	20.9	55	6	1
3.5	2	●	MFE0350X02S060	7.0	14	20.7	55	6	1
3.6	2	●	MFE0360X02S060	7.2	16	22.5	55	6	1
3.7	2	●	MFE0370X02S060	7.4	16	22.3	55	6	1
3.8	2	●	MFE0380X02S060	7.6	16	22.1	55	6	1
3.9	2	●	MFE0390X02S060	7.8	16	21.9	55	6	1
4.0	2	●	MFE0400X02S060	8.0	16	21.7	55	6	1
4.1	2	●	MFE0410X02S060	8.2	18	23.5	62	6	1
4.2	2	●	MFE0420X02S060	8.4	18	23.4	62	6	1
4.3	2	●	MFE0430X02S060	8.6	18	23.2	62	6	1
4.4	2	●	MFE0440X02S060	8.8	18	23.0	62	6	1
4.5	2	●	MFE0450X02S060	9.0	18	22.8	62	6	1
4.6	2	●	MFE0460X02S060	9.2	20	23.7	62	6	1
4.7	2	●	MFE0470X02S060	9.4	20	23.7	62	6	1
4.8	2	●	MFE0480X02S060	9.6	20	23.6	62	6	1
4.9	2	●	MFE0490X02S060	9.8	20	23.6	62	6	1
5.0	2	●	MFE0500X02S060	10.0	20	23.5	62	6	1
5.1	2	●	MFE0510X02S060	10.2	22	25.5	62	6	1
5.2	2	●	MFE0520X02S060	10.4	22	25.4	62	6	1
5.3	2	●	MFE0530X02S060	10.6	22	25.4	62	6	1
5.4	2	●	MFE0540X02S060	10.8	22	25.3	62	6	1
5.5	2	●	MFE0550X02S060	11.0	22	25.3	62	6	1
5.6	2	●	MFE0560X02S060	11.2	24	27.2	62	6	1
5.7	2	●	MFE0570X02S060	11.4	24	27.2	62	6	1
5.8	2	●	MFE0580X02S060	11.6	24	27.1	62	6	1
5.9	2	●	MFE0590X02S060	11.8	24	27.1	62	6	1

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm)					Type
				LU	LCF	LH	OAL	DCON	
6.0	2	●	MFE0600X02S060	12.0	24	27.0	62	6	1
6.1	2	●	MFE0610X02S070	12.2	26	29.5	74	7	1
6.1	2	●	MFE0610X02S080	12.2	26	30.0	74	8	1
6.2	2	●	MFE0620X02S070	12.4	26	29.4	74	7	1
6.2	2	●	MFE0620X02S080	12.4	26	29.9	74	8	1
6.3	2	●	MFE0630X02S070	12.6	26	29.4	74	7	1
6.3	2	●	MFE0630X02S080	12.6	26	29.9	74	8	1
6.4	2	●	MFE0640X02S070	12.8	26	29.3	74	7	1
6.4	2	●	MFE0640X02S080	12.8	26	29.8	74	8	1
6.5	2	●	MFE0650X02S070	13.0	26	29.3	74	7	1
6.5	2	●	MFE0650X02S080	13.0	26	29.8	74	8	1
6.6	2	●	MFE0660X02S070	13.2	28	31.2	74	7	1
6.6	2	●	MFE0660X02S080	13.2	28	31.7	74	8	1
6.7	2	●	MFE0670X02S070	13.4	28	31.2	74	7	1
6.7	2	●	MFE0670X02S080	13.4	28	31.7	74	8	1
6.8	2	●	MFE0680X02S070	13.6	28	31.1	74	7	1
6.8	2	●	MFE0680X02S080	13.6	28	31.6	74	8	1
6.9	2	●	MFE0690X02S070	13.8	28	31.1	74	7	1
6.9	2	●	MFE0690X02S080	13.8	28	31.6	74	8	1
7.0	2	●	MFE0700X02S070	14.0	28	31.0	74	7	1
7.0	2	●	MFE0700X02S080	14.0	28	31.5	74	8	1
7.1	2	●	MFE0710X02S080	14.2	30	33.5	74	8	1
7.2	2	●	MFE0720X02S080	14.4	30	33.4	74	8	1
7.3	2	●	MFE0730X02S080	14.6	30	33.4	74	8	1
7.4	2	●	MFE0740X02S080	14.8	30	33.3	74	8	1
7.5	2	●	MFE0750X02S080	15.0	30	33.3	74	8	1
7.6	2	●	MFE0760X02S080	15.2	32	35.2	74	8	1
7.7	2	●	MFE0770X02S080	15.4	32	35.2	74	8	1
7.8	2	●	MFE0780X02S080	15.6	32	35.1	74	8	1
7.9	2	●	MFE0790X02S080	15.8	32	35.1	74	8	1
8.0	2	●	MFE0800X02S080	16.0	32	35.0	74	8	1
8.1	2	●	MFE0810X02S100	16.2	34	38.0	84	10	1
8.2	2	●	MFE0820X02S100	16.4	34	37.9	84	10	1
8.3	2	●	MFE0830X02S100	16.6	34	37.9	84	10	1
8.4	2	●	MFE0840X02S100	16.8	34	37.8	84	10	1
8.5	2	●	MFE0850X02S100	17.0	34	37.8	84	10	1
8.6	2	●	MFE0860X02S100	17.2	36	39.7	84	10	1
8.7	2	●	MFE0870X02S100	17.4	36	39.7	84	10	1
8.8	2	●	MFE0880X02S100	17.6	36	39.6	84	10	1
8.9	2	●	MFE0890X02S100	17.8	36	39.6	84	10	1
9.0	2	●	MFE0900X02S100	18.0	36	39.5	84	10	1
9.1	2	●	MFE0910X02S100	18.2	38	41.5	84	10	1
9.2	2	●	MFE0920X02S100	18.4	38	41.4	84	10	1
9.3	2	●	MFE0930X02S100	18.6	38	41.4	84	10	1
9.4	2	●	MFE0940X02S100	18.8	38	41.3	84	10	1
9.5	2	●	MFE0950X02S100	19.0	38	41.3	84	10	1
9.6	2	●	MFE0960X02S100	19.2	40	43.2	84	10	1
9.7	2	●	MFE0970X02S100	19.4	40	43.2	84	10	1

MFE

SOLID CARBIDE FLAT BOTTOM DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm)					Type
				LU	LCF	LH	OAL	DCON	
9.8	2	●	**MFE0980X02S100**	19.6	40	43.1	84	10	1
9.9	2	●	**MFE0990X02S100**	19.8	40	43.1	84	10	1
10.0	2	●	**MFE1000X02S100**	20.0	40	43.0	84	10	1
10.1	2	●	**MFE1010X02S120**	20.2	42	46.0	95	12	1
10.2	2	●	**MFE1020X02S120**	20.4	42	45.9	95	12	1
10.3	2	●	**MFE1030X02S120**	20.6	42	45.9	95	12	1
10.4	2	●	**MFE1040X02S120**	20.8	42	45.8	95	12	1
10.5	2	●	**MFE1050X02S120**	21.0	42	45.8	95	12	1
10.6	2	●	**MFE1060X02S120**	21.2	44	47.7	95	12	1
10.7	2	●	**MFE1070X02S120**	21.4	44	47.7	95	12	1
10.8	2	●	**MFE1080X02S120**	21.6	44	47.6	95	12	1
10.9	2	●	**MFE1090X02S120**	21.8	44	47.6	95	12	1
11.0	2	●	**MFE1100X02S120**	22.0	44	47.5	95	12	1
11.1	2	●	**MFE1110X02S120**	22.2	46	49.5	95	12	1
11.2	2	●	**MFE1120X02S120**	22.4	46	49.4	95	12	1
11.3	2	●	**MFE1130X02S120**	22.6	46	49.4	95	12	1
11.4	2	●	**MFE1140X02S120**	22.8	46	49.3	95	12	1
11.5	2	●	**MFE1150X02S120**	23.0	46	49.3	95	12	1
11.6	2	●	**MFE1160X02S120**	23.2	48	51.2	95	12	1
11.7	2	●	**MFE1170X02S120**	23.4	48	51.2	95	12	1
11.8	2	●	**MFE1180X02S120**	23.6	48	51.1	95	12	1
11.9	2	●	**MFE1190X02S120**	23.8	48	51.1	95	12	1
12.0	2	●	**MFE1200X02S120**	24.0	48	51.0	95	12	1
12.5	2	●	**MFE1250X02S140**	25.0	50	53.0	102	14	2
13.0	2	●	**MFE1300X02S140**	26.0	52	55.0	102	14	2
13.5	2	●	**MFE1350X02S140**	27.0	54	57.0	102	14	2
14.0	2	●	**MFE1400X02S140**	28.0	56	59.0	102	14	2
14.5	2	●	**MFE1450X02S160**	29.0	58	61.0	111	16	2
15.0	2	●	**MFE1500X02S160**	30.0	60	63.0	111	16	2
15.5	2	●	**MFE1550X02S160**	31.0	62	65.0	111	16	2
16.0	2	●	**MFE1600X02S160**	32.0	64	67.0	111	16	2
16.5	2	●	**MFE1650X02S180**	33.0	66	69.0	119	18	2
17.0	2	●	**MFE1700X02S180**	34.0	68	71.0	119	18	2
17.5	2	●	**MFE1750X02S180**	35.0	70	73.0	119	18	2
18.0	2	●	**MFE1800X02S180**	36.0	72	75.0	119	18	2
18.5	2	●	**MFE1850X02S200**	37.0	74	77.0	127	20	2
19.0	2	●	**MFE1900X02S200**	38.0	76	79.0	127	20	2
19.5	2	●	**MFE1950X02S200**	39.0	78	81.0	127	20	2
20.0	2	●	**MFE2000X02S200**	40.0	80	83.0	127	20	2

● : **Inventory maintained in Japan.**

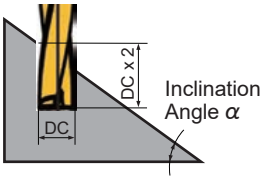
ISO13399 ➢ N002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc		Carbon Steel, Alloy Steel (180−280HB) AISI 1045, AISI 4140 etc		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc	
Dia. **DC** (mm)	Hole Depth (L/D)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)
0.75	≤2	23300	0.030 (0.010−0.050)	19000	0.030 (0.010−0.050)	16900	0.030 (0.010−0.050)
1.0	≤2	17500	0.030 (0.010−0.050)	14300	0.030 (0.010−0.050)	12700	0.030 (0.010−0.050)
1.5	≤2	12200	0.035 (0.015−0.055)	10000	0.035 (0.015−0.055)	8400	0.035 (0.015−0.050)
2.0	≤2	9500	0.040 (0.020−0.060)	7900	0.040 (0.020−0.060)	6700	0.040 (0.020−0.060)
2.5	≤2	7900	0.050 (0.030−0.070)	6600	0.050 (0.030−0.070)	5700	0.050 (0.030−0.070)
3.0	≤2	7900	0.060 (0.040−0.080)	7900	0.060 (0.040−0.080)	6800	0.060 (0.040−0.080)
4.0	≤2	5900	0.080 (0.060−0.100)	5900	0.080 (0.060−0.100)	5100	0.080 (0.060−0.100)
5.0	≤2	4700	0.100 (0.080−0.130)	4700	0.100 (0.080−0.130)	4100	0.100 (0.080−0.130)
6.0	≤2	3900	0.130 (0.100−0.150)	3900	0.130 (0.100−0.150)	3400	0.130 (0.100−0.150)
8.0	≤2	2900	0.150 (0.130−0.170)	2900	0.150 (0.130−0.170)	2500	0.150 (0.130−0.170)
10.0	≤2	2300	0.170 (0.150−0.200)	2300	0.170 (0.150−0.200)	2000	0.170 (0.150−0.200)
12.0	≤2	1900	0.200 (0.170−0.250)	1900	0.200 (0.170−0.250)	1700	0.200 (0.170−0.250)
16.0	≤2	1400	0.250 (0.200−0.300)	1400	0.250 (0.200−0.300)	1200	0.250 (0.200−0.300)
20.0	≤2	1100	0.300 (0.250−0.350)	1100	0.300 (0.250−0.350)	1000	0.300 (0.250−0.350)

Workpiece Material		Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc		Gray Cast Iron (≤350MPa) No 45 B etc		Ductile Cast Iron (≤450MPa) 60-40-8 etc	
Dia. **DC** (mm)	Hole Depth (L/D)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)
0.75	≤2	10600	0.007 (0.003−0.011)	23300	0.030 (0.010−0.050)	16900	0.010 (0.005−0.015)
1.0	≤2	7900	0.007 (0.003−0.011)	17500	0.030 (0.010−0.050)	12700	0.010 (0.005−0.015)
1.5	≤2	5300	0.010 (0.005−0.015)	12200	0.035 (0.015−0.055)	10000	0.020 (0.010−0.030)
2.0	≤2	4700	0.015 (0.010−0.020)	9500	0.040 (0.020−0.060)	8700	0.030 (0.015−0.045)
2.5	≤2	3800	0.015 (0.010−0.020)	7900	0.050 (0.030−0.070)	7300	0.045 (0.025−0.065)
3.0	≤2	3100	0.020 (0.010−0.030)	7900	0.060 (0.040−0.080)	6800	0.050 (0.040−0.060)
4.0	≤2	2300	0.030 (0.020−0.040)	5900	0.080 (0.060−0.100)	5500	0.060 (0.050−0.080)
5.0	≤2	1900	0.040 (0.030−0.050)	4700	0.100 (0.080−0.120)	4400	0.080 (0.060−0.100)
6.0	≤2	1500	0.050 (0.040−0.060)	3900	0.120 (0.100−0.140)	3700	0.100 (0.080−0.120)
8.0	≤2	1100	0.060 (0.050−0.080)	2900	0.140 (0.120−0.160)	2700	0.120 (0.100−0.150)
10.0	≤2	950	0.080 (0.060−0.100)	2300	0.160 (0.140−0.180)	2200	0.150 (0.120−0.180)
12.0	≤2	790	0.100 (0.080−0.120)	1900	0.180 (0.160−0.200)	1800	0.180 (0.150−0.200)
16.0	≤2	590	0.120 (0.100−0.150)	1400	0.200 (0.180−0.240)	1300	0.200 (0.180−0.250)
20.0	≤2	470	0.150 (0.120−0.200)	1100	0.240 (0.200−0.280)	1100	0.250 (0.200−0.300)

Workpiece Material		Aluminium Alloys (Si<5%)	
Dia. **DC** (mm)	Hole Depth (L/D)	Revolution (min^{-1})	Flat Surface α=0° Feed rate (Min.−Max.) (mm/rev)
0.75	≤2	42400	0.020 (0.010−0.030)
1.0	≤2	31800	0.020 (0.010−0.030)
1.5	≤2	21200	0.020 (0.010−0.030)
2.0	≤2	17500	0.050 (0.030−0.070)
2.5	≤2	14000	0.060 (0.040−0.090)
3.0	≤2	11600	0.060 (0.040−0.090)
4.0	≤2	8700	0.080 (0.060−0.100)
5.0	≤2	7000	0.100 (0.080−0.130)
6.0	≤2	5800	0.130 (0.100−0.160)
8.0	≤2	4300	0.160 (0.130−0.200)
10.0	≤2	3500	0.200 (0.160−0.240)
12.0	≤2	2900	0.240 (0.200−0.280)
16.0	≤2	2100	0.280 (0.240−0.320)
20.0	≤2	1700	0.320 (0.280−0.360)



Note 1) The recommended hole depth is DCx2. This should be the depth from the uppermost surface of the workpiece material when machining on an angled surface. (Refer to diagram)

Note 2) The cutting table above assumes drilling on a flat surface.

For hole drilling on an angled surface, adjust the feed rate in accordance with the inclination angle.

When the inclination angle α is 30° or less, adjust the feed rate to 70% or lower as a guideline.

When the inclination angle α is greater than 30°, adjust the feed rate to 50% or lower as a guideline.

Note 3) This product is a tool intended for hole drilling. It cannot be used for cross-feed machining or helical machining.

DWAE NEW Mini Size

WSTAR DRILLS

- External coolant type carbide drill with ideal tool length for Swiss-type automatic and small CNC lathes.
- Low cutting resistance design provides for highly stable drilling even in situations where rigidity of workpiece material and or clamping is difficult to secure.

UWC | DP1A | 135° | XR (DC<2.0) | X (DC≥2.0)

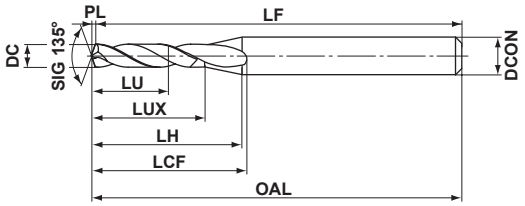
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

External Coolant


DC<2.0


DC≥2.0





Type1

DC≤3	
0 −0.014	

DCON=3	DCON=4
0 −0.006	0 −0.008

DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm) LU	LUX	LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	●	DWAE0100X02S030	2.2	5.0	7.7	8.7	45	44.8	0.2	3	1
1.0	4	●	DWAE0100X04S030	4.2	7.0	9.9	10.7	45	44.8	0.2	3	1
1.1	2	●	DWAE0110X02S030	2.4	5.4	8.1	8.9	45	44.8	0.2	3	1
1.1	4	●	DWAE0110X04S030	4.6	7.6	10.5	11.1	45	44.8	0.2	3	1
1.2	2	●	DWAE0120X02S030	2.6	5.8	8.5	9.2	45	44.8	0.2	3	1
1.2	4	●	DWAE0120X04S030	5.0	8.2	11.1	11.6	45	44.8	0.2	3	1
1.3	2	●	DWAE0130X02S030	2.9	6.3	9.0	9.5	45	44.7	0.3	3	1
1.3	4	●	DWAE0130X04S030	5.5	8.9	11.9	12.1	45	44.7	0.3	3	1
1.4	2	●	DWAE0140X02S030	3.1	6.7	9.4	9.7	45	44.7	0.3	3	1
1.4	4	●	DWAE0140X04S030	5.9	9.5	12.5	12.5	45	44.7	0.3	3	1
1.5	2	●	DWAE0150X02S030	3.3	7.1	9.8	9.9	45	44.7	0.3	3	1
1.5	4	●	DWAE0150X04S030	6.3	10.1	13.1	12.9	45	44.7	0.3	3	1
1.6	2	●	DWAE0160X02S030	3.5	7.5	10.2	10.1	45	44.7	0.3	3	1
1.6	4	●	DWAE0160X04S030	6.7	10.7	13.7	13.3	45	44.7	0.3	3	1
1.7	2	●	DWAE0170X02S030	3.8	8.0	10.7	10.4	45	44.6	0.4	3	1
1.7	4	●	DWAE0170X04S030	7.2	11.4	14.4	13.8	45	44.6	0.4	3	1
1.8	2	●	DWAE0180X02S030	4.0	8.4	11.1	10.6	45	44.6	0.4	3	1
1.8	4	●	DWAE0180X04S030	7.6	12.0	15.1	14.2	45	44.6	0.4	3	1
1.9	2	●	DWAE0190X02S030	4.2	8.8	11.5	10.9	45	44.6	0.4	3	1
1.9	4	●	DWAE0190X04S030	8.0	12.6	15.7	14.7	45	44.6	0.4	3	1
2.0	2	●	DWAE0200X02S040	4.4	9.2	12.8	12.9	50	49.6	0.4	4	1
2.0	4	●	DWAE0200X04S040	8.4	13.2	17.2	16.9	50	49.6	0.4	4	1
2.1	2	●	DWAE0210X02S040	4.6	9.6	13.2	13.1	50	49.6	0.4	4	1
2.1	4	●	DWAE0210X04S040	8.8	13.8	17.8	17.3	50	49.6	0.4	4	1
2.2	2	●	DWAE0220X02S040	4.9	10.1	13.7	13.5	50	49.5	0.5	4	1
2.2	4	●	DWAE0220X04S040	9.3	14.5	18.5	17.9	50	49.5	0.5	4	1
2.3	2	●	DWAE0230X02S040	5.1	10.5	14.1	13.7	50	49.5	0.5	4	1
2.3	4	●	DWAE0230X04S040	9.7	15.1	19.2	18.3	50	49.5	0.5	4	1
2.4	2	●	DWAE0240X02S040	5.3	10.9	14.5	13.9	50	49.5	0.5	4	1
2.4	4	●	DWAE0240X04S040	10.1	15.7	19.8	18.7	50	49.5	0.5	4	1
2.5	2	●	DWAE0250X02S040	5.5	11.3	14.9	14.1	50	49.5	0.5	4	1
2.5	4	●	DWAE0250X04S040	10.5	16.3	20.4	19.1	50	49.5	0.5	4	1
2.6	2	●	DWAE0260X02S040	5.7	11.7	15.3	14.3	50	49.5	0.5	4	1
2.6	4	●	DWAE0260X04S040	10.9	16.9	21.0	19.5	50	49.5	0.5	4	1
2.7	2	●	DWAE0270X02S040	6.0	12.2	15.8	14.6	50	49.4	0.6	4	1
2.7	4	●	DWAE0270X04S040	11.4	17.6	21.7	20.0	50	49.4	0.6	4	1
2.8	2	●	DWAE0280X02S040	6.2	12.6	16.2	14.8	50	49.4	0.6	4	1
2.8	4	●	DWAE0280X04S040	11.8	18.2	22.4	20.4	50	49.4	0.6	4	1
2.9	2	●	DWAE0290X02S040	6.4	13.0	16.6	15.1	50	49.4	0.6	4	1
2.9	4	●	DWAE0290X04S040	12.2	18.8	23.0	20.9	50	49.4	0.6	4	1

● : Inventory maintained in Japan.

DWAE NEW

WSTAR DRILLS

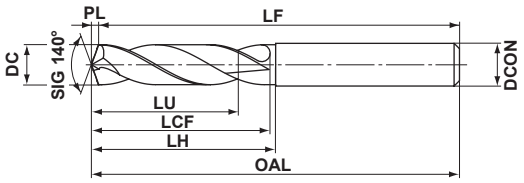
- External coolant type carbide drill with ideal tool length for Swiss-type automatic and small CNC lathes.
- Low cutting resistance design provides for highly stable drilling even in situations where rigidity of workpiece material and or clamping is difficult to secure.

UWC | DP1A | 140° | Z

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

External Coolant





Type1

DC=3	3<DC≤6	6<DC≤10	10<DC≤14
0 −0.014	0 −0.018	0 −0.022	0 −0.027
DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤14
0 −0.006	0 −0.008	0 −0.009	0 −0.011

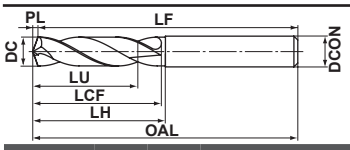
DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	2	●	DWAE0300X02S030	6.5	12.5	14.5	45.5	45	0.5	3	1
3.0	4	●	DWAE0300X04S030	12.5	21.5	23.5	55.5	55	0.5	3	1
3.1	2	●	DWAE0310X02S040	6.8	12.6	14.6	55.6	55	0.6	4	1
3.1	4	●	DWAE0310X04S040	13.0	21.6	23.6	60.6	60	0.6	4	1
3.2	2	●	DWAE0320X02S040	7.0	13.6	15.6	55.6	55	0.6	4	1
3.2	4	●	DWAE0320X04S040	13.4	22.6	24.6	60.6	60	0.6	4	1
3.3	2	●	DWAE0330X02S040	7.2	13.6	15.6	55.6	55	0.6	4	1
3.3	4	●	DWAE0330X04S040	13.8	23.6	25.6	60.6	60	0.6	4	1
3.4	2	●	DWAE0340X02S040	7.4	13.6	15.6	55.6	55	0.6	4	1
3.4	4	●	DWAE0340X04S040	14.2	23.6	25.6	60.6	60	0.6	4	1
3.5	2	●	DWAE0350X02S040	7.6	14.6	16.6	55.6	55	0.6	4	1
3.5	4	●	DWAE0350X04S040	14.6	24.6	26.6	60.6	60	0.6	4	1
3.6	2	●	DWAE0360X02S040	7.9	14.7	16.7	55.7	55	0.7	4	1
3.6	4	●	DWAE0360X04S040	15.1	25.7	27.7	60.7	60	0.7	4	1
3.7	2	●	DWAE0370X02S040	8.1	14.7	16.7	55.7	55	0.7	4	1
3.7	4	●	DWAE0370X04S040	15.5	25.7	27.7	60.7	60	0.7	4	1
3.8	2	●	DWAE0380X02S040	8.3	15.7	17.7	55.7	55	0.7	4	1
3.8	4	●	DWAE0380X04S040	15.9	26.7	28.7	60.7	60	0.7	4	1
3.9	2	●	DWAE0390X02S040	8.5	15.7	17.7	55.7	55	0.7	4	1
3.9	4	●	DWAE0390X04S040	16.3	27.7	29.7	60.7	60	0.7	4	1
4.0	2	●	DWAE0400X02S040	8.7	15.7	17.7	55.7	55	0.7	4	1
4.0	4	●	DWAE0400X04S040	16.7	27.7	29.7	60.7	60	0.7	4	1
4.1	2	●	DWAE0410X02S050	8.9	16.7	18.7	62.7	62	0.7	5	1
4.1	4	●	DWAE0410X04S050	17.1	28.7	30.7	80.7	80	0.7	5	1
4.2	2	●	DWAE0420X02S050	9.2	16.8	18.8	62.8	62	0.8	5	1
4.2	4	●	DWAE0420X04S050	17.6	29.8	31.8	80.8	80	0.8	5	1
4.3	2	●	DWAE0430X02S050	9.4	17.8	19.8	62.8	62	0.8	5	1
4.3	4	●	DWAE0430X04S050	18.0	30.8	32.8	80.8	80	0.8	5	1
4.4	2	●	DWAE0440X02S050	9.6	17.8	19.8	62.8	62	0.8	5	1
4.4	4	●	DWAE0440X04S050	18.4	30.8	32.8	80.8	80	0.8	5	1

DWAE NEW

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
4.5	2	●	DWAE0450X02S050	9.8	17.8	19.8	62.8	62	0.8	5	1
4.5	4	●	DWAE0450X04S050	18.8	31.8	33.8	80.8	80	0.8	5	1
4.6	2	●	DWAE0460X02S050	10.0	18.8	20.8	62.8	62	0.8	5	1
4.6	4	●	DWAE0460X04S050	19.2	32.8	34.8	80.8	80	0.8	5	1
4.7	2	●	DWAE0470X02S050	10.3	18.9	20.9	62.9	62	0.9	5	1
4.7	4	●	DWAE0470X04S050	19.7	32.9	34.9	80.9	80	0.9	5	1
4.8	2	●	DWAE0480X02S050	10.5	18.9	20.9	62.9	62	0.9	5	1
4.8	4	●	DWAE0480X04S050	20.1	33.9	35.9	80.9	80	0.9	5	1
4.9	2	●	DWAE0490X02S050	10.7	19.9	21.9	62.9	62	0.9	5	1
4.9	4	●	DWAE0490X04S050	20.5	34.9	36.9	80.9	80	0.9	5	1
5.0	2	●	DWAE0500X02S050	10.9	19.9	21.9	62.9	62	0.9	5	1
5.0	4	●	DWAE0500X04S050	20.9	34.9	36.9	80.9	80	0.9	5	1
5.1	2	●	DWAE0510X02S060	11.1	21.9	23.9	66.9	66	0.9	6	1
5.1	4	●	DWAE0510X04S060	21.3	35.9	37.9	80.9	80	0.9	6	1
5.2	2	●	DWAE0520X02S060	11.3	21.9	23.9	66.9	66	0.9	6	1
5.2	4	●	DWAE0520X04S060	21.7	36.9	38.9	80.9	80	0.9	6	1
5.3	2	●	DWAE0530X02S060	11.6	22.0	24.0	67.0	66	1.0	6	1
5.3	4	●	DWAE0530X04S060	22.2	37.0	39.0	81.0	80	1.0	6	1
5.4	2	●	DWAE0540X02S060	11.8	22.0	24.0	67.0	66	1.0	6	1
5.4	4	●	DWAE0540X04S060	22.6	38.0	40.0	81.0	80	1.0	6	1
5.5	2	●	DWAE0550X02S060	12.0	22.0	24.0	67.0	66	1.0	6	1
5.5	4	●	DWAE0550X04S060	23.0	39.0	41.0	81.0	80	1.0	6	1
5.6	2	●	DWAE0560X02S060	12.2	24.0	26.0	67.0	66	1.0	6	1
5.6	4	●	DWAE0560X04S060	23.4	39.0	41.0	81.0	80	1.0	6	1
5.7	2	●	DWAE0570X02S060	12.4	24.0	26.0	67.0	66	1.0	6	1
5.7	4	●	DWAE0570X04S060	23.8	39.0	41.0	81.0	80	1.0	6	1
5.8	2	●	DWAE0580X02S060	12.7	24.1	26.1	67.1	66	1.1	6	1
5.8	4	●	DWAE0580X04S060	24.3	41.1	43.1	81.1	80	1.1	6	1
5.9	2	●	DWAE0590X02S060	12.9	24.1	26.1	67.1	66	1.1	6	1
5.9	4	●	DWAE0590X04S060	24.7	41.1	43.1	81.1	80	1.1	6	1
6.0	2	●	DWAE0600X02S060	13.1	24.1	26.1	67.1	66	1.1	6	1
6.0	4	●	DWAE0600X04S060	25.1	42.1	44.1	81.1	80	1.1	6	1
6.1	2	●	DWAE0610X02S070	13.3	26.1	28.1	75.1	74	1.1	7	1
6.1	4	●	DWAE0610X04S070	25.5	44.1	46.1	84.1	83	1.1	7	1
6.2	2	●	DWAE0620X02S070	13.5	26.1	28.1	75.1	74	1.1	7	1
6.2	4	●	DWAE0620X04S070	25.9	44.1	46.1	84.1	83	1.1	7	1
6.3	2	●	DWAE0630X02S070	13.7	26.1	28.1	75.1	74	1.1	7	1
6.3	4	●	DWAE0630X04S070	26.3	44.1	46.1	84.1	83	1.1	7	1
6.4	2	●	DWAE0640X02S070	14.0	26.2	28.2	75.2	74	1.2	7	1
6.4	4	●	DWAE0640X04S070	26.8	44.2	46.2	84.2	83	1.2	7	1
6.5	2	●	DWAE0650X02S070	14.2	26.2	28.2	75.2	74	1.2	7	1
6.5	4	●	DWAE0650X04S070	27.2	44.2	46.2	84.2	83	1.2	7	1
6.6	2	●	DWAE0660X02S070	14.4	28.2	30.2	75.2	74	1.2	7	1
6.6	4	●	DWAE0660X04S070	27.6	46.2	48.2	84.2	83	1.2	7	1

● : Inventory maintained in Japan.



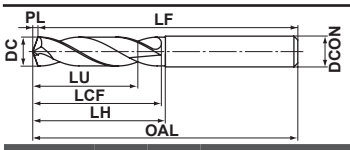
DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
6.7	2	●	**DWAE0670X02S070**	14.6	28.2	30.2	75.2	74	1.2	7	1
6.7	4	●	**DWAE0670X04S070**	28.0	46.2	48.2	84.2	83	1.2	7	1
6.8	2	●	**DWAE0680X02S070**	14.8	28.2	30.2	75.2	74	1.2	7	1
6.8	4	●	**DWAE0680X04S070**	28.4	46.2	48.2	84.2	83	1.2	7	1
6.9	2	●	**DWAE0690X02S070**	15.1	28.3	30.3	75.3	74	1.3	7	1
6.9	4	●	**DWAE0690X04S070**	28.9	46.3	48.3	84.3	83	1.3	7	1
7.0	2	●	**DWAE0700X02S070**	15.3	28.3	30.3	75.3	74	1.3	7	1
7.0	4	●	**DWAE0700X04S070**	29.3	46.3	48.3	84.3	83	1.3	7	1
7.1	2	●	**DWAE0710X02S080**	15.5	29.3	31.3	80.3	79	1.3	8	1
7.1	4	●	**DWAE0710X04S080**	29.7	51.3	53.3	91.3	90	1.3	8	1
7.2	2	●	**DWAE0720X02S080**	15.7	29.3	31.3	80.3	79	1.3	8	1
7.2	4	●	**DWAE0720X04S080**	30.1	51.3	53.3	91.3	90	1.3	8	1
7.3	2	●	**DWAE0730X02S080**	15.9	29.3	31.3	80.3	79	1.3	8	1
7.3	4	●	**DWAE0730X04S080**	30.5	51.3	53.3	91.3	90	1.3	8	1
7.4	2	●	**DWAE0740X02S080**	16.1	29.3	31.3	80.3	79	1.3	8	1
7.4	4	●	**DWAE0740X04S080**	30.9	51.3	53.3	91.3	90	1.3	8	1
7.5	2	●	**DWAE0750X02S080**	16.4	29.4	31.4	80.4	79	1.4	8	1
7.5	4	●	**DWAE0750X04S080**	31.4	51.4	53.4	91.4	90	1.4	8	1
7.6	2	●	**DWAE0760X02S080**	16.6	31.4	33.4	80.4	79	1.4	8	1
7.6	4	●	**DWAE0760X04S080**	31.8	53.4	55.4	91.4	90	1.4	8	1
7.7	2	●	**DWAE0770X02S080**	16.8	31.4	33.4	80.4	79	1.4	8	1
7.7	4	●	**DWAE0770X04S080**	32.2	53.4	55.4	91.4	90	1.4	8	1
7.8	2	●	**DWAE0780X02S080**	17.0	31.4	33.4	80.4	79	1.4	8	1
7.8	4	●	**DWAE0780X04S080**	32.6	53.4	55.4	91.4	90	1.4	8	1
7.9	2	●	**DWAE0790X02S080**	17.2	31.4	33.4	80.4	79	1.4	8	1
7.9	4	●	**DWAE0790X04S080**	33.0	53.4	55.4	91.4	90	1.4	8	1
8.0	2	●	**DWAE0800X02S080**	17.5	31.5	33.5	80.5	79	1.5	8	1
8.0	4	●	**DWAE0800X04S080**	33.5	53.5	55.5	91.5	90	1.5	8	1
8.1	2	●	**DWAE0810X02S090**	17.7	33.5	35.5	85.5	84	1.5	9	1
8.1	4	●	**DWAE0810X04S090**	33.9	57.5	59.5	99.5	98	1.5	9	1
8.2	2	●	**DWAE0820X02S090**	17.9	33.5	35.5	85.5	84	1.5	9	1
8.2	4	●	**DWAE0820X04S090**	34.3	57.5	59.5	99.5	98	1.5	9	1
8.3	2	●	**DWAE0830X02S090**	18.1	33.5	35.5	85.5	84	1.5	9	1
8.3	4	●	**DWAE0830X04S090**	34.7	57.5	59.5	99.5	98	1.5	9	1
8.4	2	●	**DWAE0840X02S090**	18.3	33.5	35.5	85.5	84	1.5	9	1
8.4	4	●	**DWAE0840X04S090**	35.1	57.5	59.5	99.5	98	1.5	9	1
8.5	2	●	**DWAE0850X02S090**	18.5	33.5	35.5	85.5	84	1.5	9	1
8.5	4	●	**DWAE0850X04S090**	35.5	57.5	59.5	99.5	98	1.5	9	1
8.6	2	●	**DWAE0860X02S090**	18.8	34.6	36.6	85.6	84	1.6	9	1
8.6	4	●	**DWAE0860X04S090**	36.0	61.6	63.6	99.6	98	1.6	9	1
8.7	2	●	**DWAE0870X02S090**	19.0	34.6	36.6	85.6	84	1.6	9	1
8.7	4	●	**DWAE0870X04S090**	36.4	61.6	63.6	99.6	98	1.6	9	1
8.8	2	●	**DWAE0880X02S090**	19.2	34.6	36.6	85.6	84	1.6	9	1
8.8	4	●	**DWAE0880X04S090**	36.8	61.6	63.6	99.6	98	1.6	9	1

DWAE NEW

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
8.9	2	●	DWAE0890X02S090	19.4	34.6	36.6	85.6	84	1.6	9	1
8.9	4	●	DWAE0890X04S090	37.2	61.6	63.6	99.6	98	1.6	9	1
9.0	2	●	DWAE0900X02S090	19.6	34.6	36.6	85.6	84	1.6	9	1
9.0	4	●	DWAE0900X04S090	37.6	61.6	63.6	99.6	98	1.6	9	1
9.1	2	●	DWAE0910X02S100	19.9	36.7	38.7	90.7	89	1.7	10	1
9.1	4	●	DWAE0910X04S100	38.1	63.7	65.7	106.7	105	1.7	10	1
9.2	2	●	DWAE0920X02S100	20.1	36.7	38.7	90.7	89	1.7	10	1
9.2	4	●	DWAE0920X04S100	38.5	63.7	65.7	106.7	105	1.7	10	1
9.3	2	●	DWAE0930X02S100	20.3	36.7	38.7	90.7	89	1.7	10	1
9.3	4	●	DWAE0930X04S100	38.9	63.7	65.7	106.7	105	1.7	10	1
9.4	2	●	DWAE0940X02S100	20.5	36.7	38.7	90.7	89	1.7	10	1
9.4	4	●	DWAE0940X04S100	39.3	63.7	65.7	106.7	105	1.7	10	1
9.5	2	●	DWAE0950X02S100	20.7	36.7	38.7	90.7	89	1.7	10	1
9.5	4	●	DWAE0950X04S100	39.7	63.7	65.7	106.7	105	1.7	10	1
9.6	2	●	DWAE0960X02S100	20.9	37.7	39.7	90.7	89	1.7	10	1
9.6	4	●	DWAE0960X04S100	40.1	66.7	68.7	106.7	105	1.7	10	1
9.7	2	●	DWAE0970X02S100	21.2	37.8	39.8	90.8	89	1.8	10	1
9.7	4	●	DWAE0970X04S100	40.6	66.8	68.8	106.8	105	1.8	10	1
9.8	2	●	DWAE0980X02S100	21.4	37.8	39.8	90.8	89	1.8	10	1
9.8	4	●	DWAE0980X04S100	41.0	66.8	68.8	106.8	105	1.8	10	1
9.9	2	●	DWAE0990X02S100	21.6	37.8	39.8	90.8	89	1.8	10	1
9.9	4	●	DWAE0990X04S100	41.4	66.8	68.8	106.8	105	1.8	10	1
10.0	2	●	DWAE1000X02S100	21.8	37.8	39.8	90.8	89	1.8	10	1
10.0	4	●	DWAE1000X04S100	41.8	66.8	68.8	106.8	105	1.8	10	1
10.1	2	●	DWAE1010X02S110	22.0	40.8	42.8	101.8	100	1.8	11	1
10.1	4	●	DWAE1010X04S110	42.2	71.8	73.8	115.8	114	1.8	11	1
10.2	2	●	DWAE1020X02S110	22.3	40.9	42.9	101.9	100	1.9	11	1
10.2	4	●	DWAE1020X04S110	42.7	71.9	73.9	115.9	114	1.9	11	1
10.3	2	●	DWAE1030X02S110	22.5	40.9	42.9	101.9	100	1.9	11	1
10.3	4	●	DWAE1030X04S110	43.1	71.9	73.9	115.9	114	1.9	11	1
10.4	2	●	DWAE1040X02S110	22.7	40.9	42.9	101.9	100	1.9	11	1
10.4	4	●	DWAE1040X04S110	43.5	71.9	73.9	115.9	114	1.9	11	1
10.5	2	●	DWAE1050X02S110	22.9	40.9	42.9	101.9	100	1.9	11	1
10.5	4	●	DWAE1050X04S110	43.9	71.9	73.9	115.9	114	1.9	11	1
10.6	2	●	DWAE1060X02S110	23.1	41.9	43.9	101.9	100	1.9	11	1
10.6	4	●	DWAE1060X04S110	44.3	72.9	74.9	115.9	114	1.9	11	1
10.7	2	●	DWAE1070X02S110	23.3	41.9	43.9	101.9	100	1.9	11	1
10.7	4	●	DWAE1070X04S110	44.7	72.9	74.9	115.9	114	1.9	11	1
10.8	2	●	DWAE1080X02S110	23.6	42.0	44.0	102.0	100	2.0	11	1
10.8	4	●	DWAE1080X04S110	45.2	73.0	75.0	116.0	114	2.0	11	1
10.9	2	●	DWAE1090X02S110	23.8	42.0	44.0	102.0	100	2.0	11	1
10.9	4	●	DWAE1090X04S110	45.6	73.0	75.0	116.0	114	2.0	11	1
11.0	2	●	DWAE1100X02S110	24.0	42.0	44.0	102.0	100	2.0	11	1
11.0	4	●	DWAE1100X04S110	46.0	73.0	75.0	116.0	114	2.0	11	1

● : Inventory maintained in Japan.



DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
11.1	2	●	**DWAE1110X02S120**	24.2	45.0	47.0	102.0	100	2.0	12	1
11.1	4	●	**DWAE1110X04S120**	46.4	77.0	79.0	123.0	121	2.0	12	1
11.2	2	●	**DWAE1120X02S120**	24.4	45.0	47.0	102.0	100	2.0	12	1
11.2	4	●	**DWAE1120X04S120**	46.8	77.0	79.0	123.0	121	2.0	12	1
11.3	2	●	**DWAE1130X02S120**	24.7	45.1	47.1	102.1	100	2.1	12	1
11.3	4	●	**DWAE1130X04S120**	47.3	77.1	79.1	123.1	121	2.1	12	1
11.4	2	●	**DWAE1140X02S120**	24.9	45.1	47.1	102.1	100	2.1	12	1
11.4	4	●	**DWAE1140X04S120**	47.7	77.1	79.1	123.1	121	2.1	12	1
11.5	2	●	**DWAE1150X02S120**	25.1	45.1	47.1	102.1	100	2.1	12	1
11.5	4	●	**DWAE1150X04S120**	48.1	77.1	79.1	123.1	121	2.1	12	1
11.6	2	●	**DWAE1160X02S120**	25.3	47.1	49.1	102.1	100	2.1	12	1
11.6	4	●	**DWAE1160X04S120**	48.5	79.1	81.1	123.1	121	2.1	12	1
11.7	2	●	**DWAE1170X02S120**	25.5	47.1	49.1	102.1	100	2.1	12	1
11.7	4	●	**DWAE1170X04S120**	48.9	79.1	81.1	123.1	121	2.1	12	1
11.8	2	●	**DWAE1180X02S120**	25.7	47.1	49.1	102.1	100	2.1	12	1
11.8	4	●	**DWAE1180X04S120**	49.3	79.1	81.1	123.1	121	2.1	12	1
11.9	2	●	**DWAE1190X02S120**	26.0	47.2	49.2	102.2	100	2.2	12	1
11.9	4	●	**DWAE1190X04S120**	49.8	79.2	81.2	123.2	121	2.2	12	1
12.0	2	●	**DWAE1200X02S120**	26.2	47.2	49.2	102.2	100	2.2	12	1
12.0	4	●	**DWAE1200X04S120**	50.2	79.2	81.2	123.2	121	2.2	12	1
12.1	2	●	**DWAE1210X02S130**	26.4	49.2	51.2	102.2	100	2.2	13	1
12.1	4	●	**DWAE1210X04S130**	50.6	82.2	84.2	139.2	137	2.2	13	1
12.2	2	●	**DWAE1220X02S130**	26.6	49.2	51.2	102.2	100	2.2	13	1
12.2	4	●	**DWAE1220X04S130**	51.0	82.2	84.2	139.2	137	2.2	13	1
12.3	2	●	**DWAE1230X02S130**	26.8	49.2	51.2	102.2	100	2.2	13	1
12.3	4	●	**DWAE1230X04S130**	51.4	82.2	84.2	139.2	137	2.2	13	1
12.4	2	●	**DWAE1240X02S130**	27.1	49.3	51.3	102.3	100	2.3	13	1
12.4	4	●	**DWAE1240X04S130**	51.9	82.3	84.3	139.3	137	2.3	13	1
12.5	2	●	**DWAE1250X02S130**	27.3	49.3	51.3	102.3	100	2.3	13	1
12.5	4	●	**DWAE1250X04S130**	52.3	82.3	84.3	139.3	137	2.3	13	1
12.6	2	●	**DWAE1260X02S130**	27.5	52.3	54.3	102.3	100	2.3	13	1
12.6	4	●	**DWAE1260X04S130**	52.7	84.3	86.3	139.3	137	2.3	13	1
12.7	2	●	**DWAE1270X02S130**	27.7	52.3	54.3	102.3	100	2.3	13	1
12.7	4	●	**DWAE1270X04S130**	53.1	84.3	86.3	139.3	137	2.3	13	1
12.8	2	●	**DWAE1280X02S130**	27.9	52.3	54.3	102.3	100	2.3	13	1
12.8	4	●	**DWAE1280X04S130**	53.5	84.3	86.3	139.3	137	2.3	13	1
12.9	2	●	**DWAE1290X02S130**	28.1	52.3	54.3	102.3	100	2.3	13	1
12.9	4	●	**DWAE1290X04S130**	53.9	84.3	86.3	139.3	137	2.3	13	1
13.0	2	●	**DWAE1300X02S130**	28.4	52.4	54.4	102.4	100	2.4	13	1
13.0	4	●	**DWAE1300X04S130**	54.4	84.4	86.4	139.4	137	2.4	13	1
13.1	2	●	**DWAE1310X02S140**	28.6	55.4	57.4	102.4	100	2.4	14	1
13.1	4	●	**DWAE1310X04S140**	54.8	92.4	94.4	149.4	147	2.4	14	1
13.2	2	●	**DWAE1320X02S140**	28.8	55.4	57.4	102.4	100	2.4	14	1
13.2	4	●	**DWAE1320X04S140**	55.2	92.4	94.4	149.4	147	2.4	14	1

DWAE NEW

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
13.3	2	●	**DWAE1330X02S140**	29.0	55.4	57.4	102.4	100	2.4	14	1
13.3	4	●	**DWAE1330X04S140**	55.6	92.4	94.4	149.4	147	2.4	14	1
13.4	2	●	**DWAE1340X02S140**	29.2	55.4	57.4	102.4	100	2.4	14	1
13.4	4	●	**DWAE1340X04S140**	56.0	92.4	94.4	149.4	147	2.4	14	1
13.5	2	●	**DWAE1350X02S140**	29.5	55.5	57.5	102.5	100	2.5	14	1
13.5	4	●	**DWAE1350X04S140**	56.5	92.5	94.5	149.5	147	2.5	14	1
13.6	2	●	**DWAE1360X02S140**	29.7	57.5	59.5	102.5	100	2.5	14	1
13.6	4	●	**DWAE1360X04S140**	56.9	97.5	99.5	149.5	147	2.5	14	1
13.7	2	●	**DWAE1370X02S140**	29.9	57.5	59.5	102.5	100	2.5	14	1
13.7	4	●	**DWAE1370X04S140**	57.3	97.5	99.5	149.5	147	2.5	14	1
13.8	2	●	**DWAE1380X02S140**	30.1	57.5	59.5	102.5	100	2.5	14	1
13.8	4	●	**DWAE1380X04S140**	57.7	97.5	99.5	149.5	147	2.5	14	1
13.9	2	●	**DWAE1390X02S140**	30.3	57.5	59.5	102.5	100	2.5	14	1
13.9	4	●	**DWAE1390X04S140**	58.1	97.5	99.5	149.5	147	2.5	14	1
14.0	2	●	**DWAE1400X02S140**	30.5	57.5	59.5	102.5	100	2.5	14	1
14.0	4	●	**DWAE1400X04S140**	58.5	97.5	99.5	149.5	147	2.5	14	1

● : Inventory maintained in Japan.

ISO13399 ➤ N002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) JIS SS400, S10C,etc				Carbon Steel, Alloy Steel (180—250HB) JIS S45C, SCM440 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	30	9500	0.03 (0.02—0.04)	285	30	9500	0.03 (0.02—0.04)	285
1.5	30	6300	0.05 (0.03—0.06)	315	30	6300	0.05 (0.03—0.06)	315
2.0	55	8700	0.06 (0.04—0.08)	520	55	8700	0.06 (0.04—0.08)	520
2.5	55	7000	0.08 (0.05—0.10)	560	55	7000	0.08 (0.05—0.10)	560
3.0	65	6800	0.09 (0.07—0.11)	610	60	6300	0.09 (0.07—0.11)	565
4.0	70	5500	0.12 (0.09—0.14)	660	65	5100	0.12 (0.09—0.14)	610
5.0	70	4400	0.15 (0.11—0.18)	660	65	4100	0.15 (0.11—0.18)	615
6.0	80	4200	0.18 (0.14—0.21)	755	75	3900	0.18 (0.14—0.21)	700
7.0	80	3600	0.21 (0.16—0.25)	755	75	3400	0.21 (0.16—0.25)	715
8.0	85	3300	0.23 (0.18—0.28)	760	80	3100	0.23 (0.18—0.28)	715
10.0	90	2800	0.27 (0.21—0.32)	755	85	2700	0.27 (0.21—0.32)	730
12.0	95	2500	0.28 (0.22—0.34)	700	90	2300	0.28 (0.22—0.34)	645
14.0	95	2100	0.29 (0.23—0.35)	610	90	2000	0.29 (0.23—0.35)	580

Workpiece Material	Carbon Steel, Alloy Steel (280—350HB) JIS SNCM439 etc				Austenitic Stainless Steel (≤200HB) Ferritic, Precipitation-Hardening Stainless Steel (>200HB) JIS SUS304, SUS316 JIS SUS431, SUS420J2 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	25	7900	0.02 (0.01—0.03)	160	30	9500	0.02 (0.01—0.03)	190
1.5	25	5300	0.04 (0.02—0.05)	210	30	6300	0.04 (0.02—0.05)	250
2.0	50	7900	0.05 (0.03—0.07)	395	35	5500	0.04 (0.02—0.06)	220
2.5	50	6300	0.07 (0.04—0.09)	440	35	4400	0.06 (0.03—0.08)	265
3.0	55	5800	0.08 (0.06—0.09)	465	40	4200	0.07 (0.04—0.10)	295
4.0	60	4700	0.11 (0.08—0.13)	515	40	3100	0.08 (0.05—0.10)	250
5.0	60	3800	0.13 (0.10—0.16)	495	40	2500	0.10 (0.05—0.15)	250
6.0	70	3700	0.16 (0.12—0.19)	590	40	2100	0.11 (0.06—0.15)	230
7.0	70	3100	0.18 (0.14—0.22)	560	40	1800	0.12 (0.06—0.18)	215
8.0	75	2900	0.21 (0.16—0.25)	610	40	1500	0.13 (0.06—0.20)	195
10.0	80	2500	0.24 (0.20—0.28)	600	40	1200	0.14 (0.08—0.20)	170
12.0	85	2200	0.25 (0.20—0.30)	550	40	1000	0.18 (0.10—0.25)	180
14.0	85	1900	0.25 (0.20—0.30)	475	40	900	0.18 (0.10—0.25)	160

Workpiece Material	Gray Cast Iron (≤350MPa) JIS FC300 etc				Ductile Cast Iron (≤450MPa) JIS FCD450 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	30	9500	0.03 (0.02—0.04)	285	25	7900	0.02 (0.01—0.03)	160
1.5	30	6300	0.05 (0.03—0.06)	315	25	5300	0.04 (0.02—0.05)	210
2.0	55	8700	0.06 (0.04—0.08)	520	50	7900	0.05 (0.03—0.07)	395
2.5	55	7000	0.08 (0.05—0.10)	560	50	6300	0.07 (0.04—0.09)	440
3.0	65	6800	0.09 (0.07—0.11)	610	55	5800	0.09 (0.05—0.12)	520
4.0	70	5500	0.12 (0.09—0.14)	660	60	4700	0.12 (0.07—0.17)	565
5.0	70	4400	0.15 (0.11—0.18)	660	60	3800	0.14 (0.08—0.20)	530
6.0	80	4200	0.18 (0.14—0.21)	755	70	3700	0.15 (0.10—0.20)	555
7.0	80	3600	0.21 (0.16—0.25)	755	70	3100	0.18 (0.12—0.23)	560
8.0	85	3300	0.23 (0.18—0.28)	760	75	2900	0.20 (0.15—0.25)	580
10.0	90	2800	0.27 (0.21—0.32)	755	80	2500	0.23 (0.18—0.28)	575
12.0	95	2500	0.28 (0.22—0.34)	700	85	2200	0.25 (0.20—0.30)	550
14.0	95	2100	0.29 (0.23—0.35)	610	85	1900	0.25 (0.20—0.30)	475

Note 1) The above cutting conditions are when water-soluble coolant is used. For stainless steel, water-insoluble coolant is recommended.
Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication (excluding the recommended cutting conditions of for stainless steel).
Note 3) Check the condition of chips and perform step machining if necessary. * Reference of step length:DC×0.2—DC×1.0
Note 4) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 5) Machining depths exceeding flute length (LU) are not recommended.
Note 6) Clamp the drill so that the drill runout is within 0.03mm.
Note 7) Do not clamp the flute part of the drill.

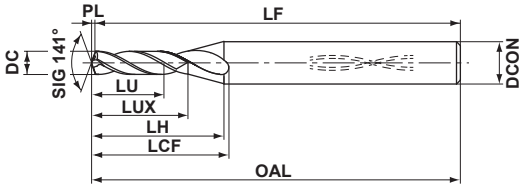
DRILLING(SOLID CARBIDE)

DVAS NEW Pilot Drills Mini Size
TRISTAR Drills

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S Heat Resistant Alloy | H

Internal Coolant





Type1

DC<3	0.006 −0.004
DCON=4	0 −0.008

DC (mm)	Hole Depth (L/D)	DP1120	Order Number	Dimensions (mm) LU	LUX	LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	●	DVAS0100X02S040	2.2	3.2	8.6	8.8	50	49.8	0.2	4	1
1.1	2	●	DVAS0110X02S040	2.4	3.5	9.0	8.9	50	49.8	0.2	4	1
1.2	2	●	DVAS0120X02S040	2.6	3.9	9.4	9.0	50	49.8	0.2	4	1
1.3	2	●	DVAS0130X02S040	2.8	4.2	9.9	9.2	50	49.8	0.2	4	1
1.4	2	●	DVAS0140X02S040	3.0	4.5	10.3	9.3	50	49.8	0.2	4	1
1.5	2	●	DVAS0150X02S040	3.3	4.8	10.7	9.4	50	49.7	0.3	4	1
1.6	2	●	DVAS0160X02S040	3.5	5.1	11.1	9.6	50	49.7	0.3	4	1
1.7	2	●	DVAS0170X02S040	3.7	5.5	11.6	9.7	50	49.7	0.3	4	1
1.8	2	●	DVAS0180X02S040	3.9	5.8	12.0	9.8	50	49.7	0.3	4	1
1.9	2	●	DVAS0190X02S040	4.1	6.1	12.4	10.0	50	49.7	0.3	4	1
2.0	2	●	DVAS0200X02S040	4.4	6.4	12.9	10.1	50	49.6	0.4	4	1
2.1	2	●	DVAS0210X02S040	4.6	6.7	13.3	10.2	50	49.6	0.4	4	1
2.2	2	●	DVAS0220X02S040	4.8	7.0	13.7	10.3	50	49.6	0.4	4	1
2.3	2	●	DVAS0230X02S040	5.0	7.4	14.1	10.5	55	54.6	0.4	4	1
2.4	2	●	DVAS0240X02S040	5.2	7.7	14.6	10.6	55	54.6	0.4	4	1
2.5	2	●	DVAS0250X02S040	5.5	8.0	15.0	10.7	55	54.6	0.4	4	1
2.6	2	●	DVAS0260X02S040	5.7	8.3	15.4	10.9	55	54.5	0.5	4	1
2.7	2	●	DVAS0270X02S040	5.9	8.6	15.8	11.0	55	54.5	0.5	4	1
2.8	2	●	DVAS0280X02S040	6.1	8.9	16.3	11.1	55	54.5	0.5	4	1
2.9	2	●	DVAS0290X02S040	6.3	9.3	16.7	11.3	55	54.5	0.5	4	1

● : Inventory maintained in Japan.

DVAS NEW Mini Size
TRISTAR Drills

- Large coolant holes reduce tool damage due to the improved cooling effect thereby greatly improving tool life.
- Tough, sharp cutting edge design.

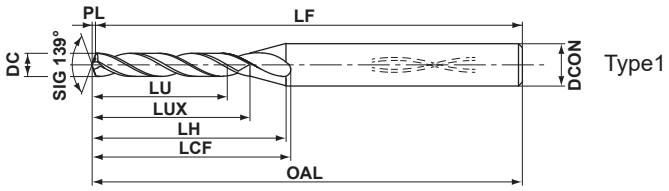
UWC DP1 139° XR

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

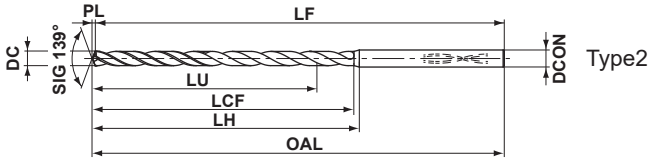
Internal Coolant



DC<3 0 −0.010
DCON=4 0 −0.008



Type1



Type2

Note 1) Use the DVAS pilot drill for drilling of guide holes.

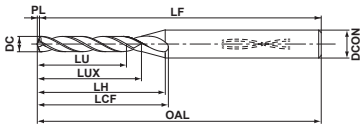
DC (mm)	Hole Depth (L/D)	DP1120	Order Number	Dimensions (mm) LU	LUX	LCF	LH	OAL	LF	PL	DCON	Type
1.0	7	●	DVAS0100X07S040	7.2	8.2	13.6	13.8	55	54.8	0.2	4	1
1.0	12	●	DVAS0100X12S040	12.2	13.2	18.6	18.8	58	57.8	0.2	4	1
1.0	20	●	DVAS0100X20S040	20.2	–	23.2	28.8	67	66.8	0.2	4	2
1.0	25	●	DVAS0100X25S040	25.2	–	28.2	33.8	73	72.8	0.2	4	2
1.0	30	●	DVAS0100X30S040	30.2	–	33.2	38.8	79	78.8	0.2	4	2
1.0	40	●	DVAS0100X40S040	40.2	–	43.2	48.8	90	89.8	0.2	4	2
1.0	50	●	DVAS0100X50S040	50.2	–	53.2	58.8	102	101.8	0.2	4	2
1.1	7	●	DVAS0110X07S040	7.9	9.1	14.5	14.4	55	54.8	0.2	4	1
1.1	12	●	DVAS0110X12S040	13.4	14.6	20.0	19.9	58	57.8	0.2	4	1
1.1	20	●	DVAS0110X20S040	22.2	–	25.5	30.9	67	66.8	0.2	4	2
1.1	25	●	DVAS0110X25S040	27.7	–	31.0	36.4	73	72.8	0.2	4	2
1.1	30	●	DVAS0110X30S040	33.2	–	36.5	41.9	79	78.8	0.2	4	2
1.1	40	●	DVAS0110X40S040	44.2	–	47.5	52.9	90	89.8	0.2	4	2
1.2	7	●	DVAS0120X07S040	8.6	9.9	15.4	15.0	55	54.8	0.2	4	1
1.2	12	●	DVAS0120X12S040	14.6	15.9	21.4	21.0	60	59.8	0.2	4	1
1.2	20	●	DVAS0120X20S040	24.2	–	27.8	33.0	71	70.8	0.2	4	2
1.2	25	●	DVAS0120X25S040	30.2	–	33.8	39.0	77	76.8	0.2	4	2
1.2	30	●	DVAS0120X30S040	36.2	–	39.8	45.0	84	83.8	0.2	4	2
1.2	40	●	DVAS0120X40S040	48.2	–	51.8	57.0	97	96.8	0.2	4	2
1.3	7	●	DVAS0130X07S040	9.3	10.7	16.4	15.7	55	54.8	0.2	4	1
1.3	12	●	DVAS0130X12S040	15.8	17.2	22.9	22.2	60	59.8	0.2	4	1
1.3	20	●	DVAS0130X20S040	26.2	–	30.1	35.2	71	70.8	0.2	4	2
1.3	25	●	DVAS0130X25S040	32.7	–	36.6	41.7	77	76.8	0.2	4	2
1.3	30	●	DVAS0130X30S040	39.2	–	43.1	48.2	84	83.8	0.2	4	2
1.3	40	●	DVAS0130X40S040	52.2	–	56.1	61.2	97	96.8	0.2	4	2
1.4	7	●	DVAS0140X07S040	10.1	11.5	17.3	16.3	55	54.7	0.3	4	1
1.4	12	●	DVAS0140X12S040	17.1	18.5	24.3	23.3	63	62.7	0.3	4	1
1.4	20	●	DVAS0140X20S040	28.3	–	32.5	37.3	75	74.7	0.3	4	2
1.4	25	●	DVAS0140X25S040	35.3	–	39.5	44.3	82	81.7	0.3	4	2
1.4	30	●	DVAS0140X30S040	42.3	–	46.5	51.3	90	89.7	0.3	4	2
1.4	40	●	DVAS0140X40S040	56.3	–	60.5	65.3	105	104.7	0.3	4	2
1.5	7	●	DVAS0150X07S040	10.8	12.3	18.2	16.9	55	54.7	0.3	4	1
1.5	12	●	DVAS0150X12S040	18.3	19.8	25.7	24.4	63	62.7	0.3	4	1
1.5	20	●	DVAS0150X20S040	30.3	–	34.8	39.4	75	74.7	0.3	4	2
1.5	25	●	DVAS0150X25S040	37.8	–	42.3	46.9	82	81.7	0.3	4	2
1.5	30	●	DVAS0150X30S040	45.3	–	49.8	54.4	90	89.7	0.3	4	2

DVAS NEW Mini Size

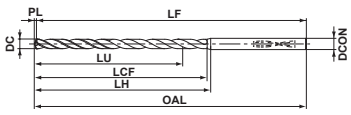
TRISTAR Drills

DC (mm)	Hole Depth (L/D)	DP1120	Order Number	Dimensions (mm)								Type
				LU	LUX	LCF	LH	OAL	LF	PL	DCON	
1.5	40	●	DVAS0150X40S040	60.3	–	64.8	69.4	105	104.7	0.3	4	2
1.5	50	●	DVAS0150X50S040	75.3	–	79.8	84.4	120	119.7	0.3	4	2
1.6	7	●	DVAS0160X07S040	11.5	13.1	19.2	17.6	57	56.7	0.3	4	1
1.6	12	●	DVAS0160X12S040	19.5	21.1	27.2	25.6	66	65.7	0.3	4	1
1.6	20	●	DVAS0160X20S040	32.3	–	37.1	41.6	79	78.7	0.3	4	2
1.6	25	●	DVAS0160X25S040	40.3	–	45.1	49.6	88	87.7	0.3	4	2
1.6	30	●	DVAS0160X30S040	48.3	–	53.1	57.6	99	98.7	0.3	4	2
1.6	40	●	DVAS0160X40S040	64.3	–	69.1	73.6	113	112.7	0.3	4	2
1.7	7	●	DVAS0170X07S040	12.2	14.0	20.1	18.2	57	56.7	0.3	4	1
1.7	12	●	DVAS0170X12S040	20.7	22.5	28.6	26.7	66	65.7	0.3	4	1
1.7	20	●	DVAS0170X20S040	34.3	–	39.4	43.7	79	78.7	0.3	4	2
1.7	25	●	DVAS0170X25S040	42.8	–	47.9	52.2	88	87.7	0.3	4	2
1.7	30	●	DVAS0170X30S040	51.3	–	56.4	60.7	99	98.7	0.3	4	2
1.7	40	●	DVAS0170X40S040	68.3	–	73.4	77.7	113	112.7	0.3	4	2
1.8	7	●	DVAS0180X07S040	12.9	14.8	21.0	18.8	59	58.7	0.3	4	1
1.8	12	●	DVAS0180X12S040	21.9	23.8	30.0	27.8	69	68.7	0.3	4	1
1.8	20	●	DVAS0180X20S040	36.3	–	41.7	45.8	84	83.7	0.3	4	2
1.8	25	●	DVAS0180X25S040	45.3	–	50.7	54.8	94	93.7	0.3	4	2
1.8	30	●	DVAS0180X30S040	54.3	–	59.7	63.8	104	103.7	0.3	4	2
1.8	40	●	DVAS0180X40S040	72.3	–	77.7	81.8	123	122.7	0.3	4	2
1.9	7	●	DVAS0190X07S040	13.7	15.6	21.9	19.5	59	58.6	0.4	4	1
1.9	12	●	DVAS0190X12S040	23.2	25.1	31.4	29.0	69	68.6	0.4	4	1
1.9	20	●	DVAS0190X20S040	38.4	–	44.1	48.0	84	83.6	0.4	4	2
1.9	25	●	DVAS0190X25S040	47.9	–	53.6	57.5	94	93.6	0.4	4	2
1.9	30	●	DVAS0190X30S040	57.4	–	63.1	67.0	104	103.6	0.4	4	2
1.9	40	●	DVAS0190X40S040	76.4	–	82.1	86.0	123	122.6	0.4	4	2
2.0	7	●	DVAS0200X07S040	14.4	16.4	22.9	20.1	62	61.6	0.4	4	1
2.0	12	●	DVAS0200X12S040	24.4	26.4	32.9	30.1	73	72.6	0.4	4	1
2.0	20	●	DVAS0200X20S040	40.4	–	46.4	50.1	91	90.6	0.4	4	2
2.0	25	●	DVAS0200X25S040	50.4	–	56.4	60.1	102	101.6	0.4	4	2
2.0	30	●	DVAS0200X30S040	60.4	–	66.4	70.1	113	112.6	0.4	4	2
2.0	40	●	DVAS0200X40S040	80.4	–	86.4	90.1	136	135.6	0.4	4	2
2.0	50	●	DVAS0200X50S040	100.4	–	106.4	110.1	158	157.6	0.4	4	2
2.1	7	●	DVAS0210X07S040	15.1	17.2	23.8	20.7	62	61.6	0.4	4	1
2.1	12	●	DVAS0210X12S040	25.6	27.7	34.3	31.2	73	72.6	0.4	4	1
2.1	20	●	DVAS0210X20S040	42.4	–	48.7	52.2	91	90.6	0.4	4	2
2.1	25	●	DVAS0210X25S040	52.9	–	59.2	62.7	102	101.6	0.4	4	2
2.1	30	●	DVAS0210X30S040	63.4	–	69.7	73.2	113	112.6	0.4	4	2
2.1	40	●	DVAS0210X40S040	84.4	–	90.7	94.2	136	135.6	0.4	4	2
2.2	7	●	DVAS0220X07S040	15.8	18.1	24.7	21.4	62	61.6	0.4	4	1
2.2	12	●	DVAS0220X12S040	26.8	29.1	35.7	32.4	73	72.6	0.4	4	1
2.2	20	●	DVAS0220X20S040	44.4	–	51.0	54.4	91	90.6	0.4	4	2
2.2	25	●	DVAS0220X25S040	55.4	–	62.0	65.4	102	101.6	0.4	4	2
2.2	30	●	DVAS0220X30S040	66.4	–	73.0	76.4	113	112.6	0.4	4	2
2.2	40	●	DVAS0220X40S040	88.4	–	95.0	98.4	136	135.6	0.4	4	2
2.3	7	●	DVAS0230X07S040	16.5	18.9	25.7	22.0	65	64.6	0.4	4	1
2.3	12	●	DVAS0230X12S040	28.0	30.4	37.2	33.5	78	77.6	0.4	4	1
2.3	20	●	DVAS0230X20S040	46.4	–	53.3	56.5	98	97.6	0.4	4	2

● : Inventory maintained in Japan.



Type1



Type2

DC (mm)	Hole Depth (L/D)	DP1120	Order Number	Dimensions (mm)								Type
				LU	LUX	LCF	LH	OAL	LF	PL	DCON	
2.3	25	●	**DVAS0230X25S040**	57.9	–	64.8	68.0	111	110.6	0.4	4	2
2.3	30	●	**DVAS0230X30S040**	69.4	–	76.3	79.5	124	123.6	0.4	4	2
2.3	40	●	**DVAS0230X40S040**	92.4	–	99.3	102.5	150	149.6	0.4	4	2
2.4	7	●	**DVAS0240X07S040**	17.2	19.7	26.6	22.6	65	64.6	0.4	4	1
2.4	12	●	**DVAS0240X12S040**	29.2	31.7	38.6	34.6	78	77.6	0.4	4	1
2.4	20	●	**DVAS0240X20S040**	48.4	–	55.6	58.6	98	97.6	0.4	4	2
2.4	25	●	**DVAS0240X25S040**	60.4	–	67.6	70.6	111	110.6	0.4	4	2
2.4	30	●	**DVAS0240X30S040**	72.4	–	79.6	82.6	124	123.6	0.4	4	2
2.4	40	●	**DVAS0240X40S040**	96.4	–	103.6	106.6	150	149.6	0.4	4	2
2.5	7	●	**DVAS0250X07S040**	18.0	20.5	27.5	23.3	65	64.5	0.5	4	1
2.5	12	●	**DVAS0250X12S040**	30.5	33.0	40.0	35.8	78	77.5	0.5	4	1
2.5	20	●	**DVAS0250X20S040**	50.5	–	58.0	60.8	98	97.5	0.5	4	2
2.5	25	●	**DVAS0250X25S040**	63.0	–	70.5	73.3	111	110.5	0.5	4	2
2.5	30	●	**DVAS0250X30S040**	75.5	–	83.0	85.8	124	123.5	0.5	4	2
2.5	40	●	**DVAS0250X40S040**	100.5	–	108.0	110.8	150	149.5	0.5	4	2
2.5	50	●	**DVAS0250X50S040**	125.5	–	133.0	135.8	176	175.5	0.5	4	2
2.6	7	●	**DVAS0260X07S040**	18.7	21.3	28.4	23.9	65	64.5	0.5	4	1
2.6	12	●	**DVAS0260X12S040**	31.7	34.3	41.4	36.9	78	77.5	0.5	4	1
2.6	20	●	**DVAS0260X20S040**	52.5	–	60.3	62.9	98	97.5	0.5	4	2
2.6	25	●	**DVAS0260X25S040**	65.5	–	73.3	75.9	111	110.5	0.5	4	2
2.6	30	●	**DVAS0260X30S040**	78.5	–	86.3	88.9	124	123.5	0.5	4	2
2.6	40	●	**DVAS0260X40S040**	104.5	–	112.3	114.9	150	149.5	0.5	4	2
2.7	7	●	**DVAS0270X07S040**	19.4	22.2	29.4	24.5	68	67.5	0.5	4	1
2.7	12	●	**DVAS0270X12S040**	32.9	35.7	42.9	38.0	83	82.5	0.5	4	1
2.7	20	●	**DVAS0270X20S040**	54.5	–	62.6	65.0	107	106.5	0.5	4	2
2.7	25	●	**DVAS0270X25S040**	68.0	–	76.1	78.5	122	121.5	0.5	4	2
2.7	30	●	**DVAS0270X30S040**	81.5	–	89.6	92.0	137	136.5	0.5	4	2
2.7	40	●	**DVAS0270X40S040**	108.5	–	116.6	119.0	167	166.5	0.5	4	2
2.8	7	●	**DVAS0280X07S040**	20.1	23.0	30.3	25.2	68	67.5	0.5	4	1
2.8	12	●	**DVAS0280X12S040**	34.1	37.0	44.3	39.2	83	82.5	0.5	4	1
2.8	20	●	**DVAS0280X20S040**	56.5	–	64.9	67.2	107	106.5	0.5	4	2
2.8	25	●	**DVAS0280X25S040**	70.5	–	78.9	81.2	122	121.5	0.5	4	2
2.8	30	●	**DVAS0280X30S040**	84.5	–	92.9	95.2	137	136.5	0.5	4	2
2.8	40	●	**DVAS0280X40S040**	112.5	–	120.9	123.2	167	166.5	0.5	4	2
2.9	7	●	**DVAS0290X07S040**	20.8	23.8	31.2	25.8	68	67.5	0.5	4	1
2.9	12	●	**DVAS0290X12S040**	35.3	38.3	45.7	40.3	83	82.5	0.5	4	1
2.9	20	●	**DVAS0290X20S040**	58.5	–	67.2	69.3	107	106.5	0.5	4	2
2.9	25	●	**DVAS0290X25S040**	73.0	–	81.7	83.8	122	121.5	0.5	4	2
2.9	30	●	**DVAS0290X30S040**	87.5	–	96.2	98.3	137	136.5	0.5	4	2
2.9	40	●	**DVAS0290X40S040**	116.5	–	125.2	127.3	167	166.5	0.5	4	2

DVAS NEW Mini Size

TRISTAR Drills

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel Carbon Steel, Alloy Steel JIS SS400, S10C, S45C, SCM440 etc			Ferritic Stainless Steel Ferritic and Martensitic Stainless Steel Austenitic Stainless Steel, Precipitation-Hardening Stainless Steel JIS SUS410, SUS420J2, SUS304, SUS316, SUS630 etc		
Dia. **DC** (mm)	Hole Depth **(L/D)**	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)
1.0	**2–30**	65(30—100)	20700	0.035(0.020—0.050)	60(20—100)	19100	0.025(0.010—0.040)
1.0	**40, 50**	65(30—100)	20700	0.030(0.020—0.040)	60(20—100)	19100	0.020(0.010—0.030)
1.5	**2–30**	65(30—100)	13800	0.053(0.030—0.075)	60(20—100)	12700	0.038(0.015—0.060)
1.5	**40, 50**	65(30—100)	13800	0.045(0.030—0.060)	60(20—100)	12700	0.030(0.015—0.045)
2.0	**2–30**	70(40—100)	11100	0.070(0.040—0.100)	60(20—100)	9500	0.050(0.020—0.080)
2.0	**40, 50**	70(40—100)	11100	0.060(0.040—0.080)	60(20—100)	9500	0.040(0.020—0.060)
2.5	**2–30**	70(40—100)	8900	0.088(0.050—0.125)	60(20—100)	7600	0.063(0.025—0.100)
2.5	**40, 50**	70(40—100)	8900	0.075(0.050—0.100)	60(20—100)	7600	0.050(0.025—0.075)
2.9	**2–30**	70(40—100)	7700	0.102(0.058—0.145)	60(20—100)	6600	0.073(0.029—0.116)
2.9	**40, 50**	70(40—100)	7700	0.087(0.058—0.116)	60(20—100)	6600	0.058(0.029—0.087)

Workpiece Material		Cast Iron Ductile Cast Iron JIS FC300, FCD450 etc			Aluminium Alloys JIS A5052, A6061, A7075		
Dia. **DC** (mm)	Hole Depth **(L/D)**	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)
1.0	**2–30**	70(40—100)	22300	0.035(0.020—0.050)	140(100—180)	31800	0.040(0.020—0.060)
1.0	**40, 50**	70(40—100)	22300	0.030(0.020—0.040)	140(100—180)	31800	0.035(0.020—0.050)
1.5	**2–30**	70(40—100)	14900	0.053(0.030—0.075)	140(100—180)	21200	0.060(0.030—0.090)
1.5	**40, 50**	70(40—100)	14900	0.045(0.030—0.060)	140(100—180)	21200	0.053(0.030—0.075)
2.0	**2–30**	70(40—100)	11100	0.070(0.040—0.100)	140(100—180)	15900	0.080(0.040—0.120)
2.0	**40, 50**	70(40—100)	11100	0.060(0.040—0.080)	140(100—180)	15900	0.070(0.040—0.100)
2.5	**2–30**	70(40—100)	8900	0.088(0.050—0.125)	140(100—180)	12700	0.100(0.050—0.150)
2.5	**40, 50**	70(40—100)	8900	0.075(0.050—0.100)	140(100—180)	12700	0.088(0.050—0.125)
2.9	**2–30**	70(40—100)	7700	0.102(0.058—0.145)	140(100—180)	11000	0.116(0.058—0.174)
2.9	**40, 50**	70(40—100)	7700	0.087(0.058—0.116)	140(100—180)	11000	0.102(0.058—0.145)

Workpiece Material		Heat Resistant Alloys Inconel718 etc			Titanium Alloys Ti-6Al-4V etc		
Dia. **DC** (mm)	Hole Depth **(L/D)**	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)
1.0	**2–30**	30(10—50)	9500	0.015(0.010—0.020)	30(20—40)	9500	0.020(0.010—0.030)
1.0	**40, 50**	30(10—50)	9500	0.015(0.010—0.020)	30(20—40)	9500	0.020(0.010—0.030)
1.5	**2–30**	30(10—50)	6400	0.023(0.015—0.030)	30(20—40)	6400	0.030(0.015—0.045)
1.5	**40, 50**	30(10—50)	6400	0.023(0.015—0.030)	30(20—40)	6400	0.030(0.015—0.045)
2.0	**2–30**	30(10—50)	4800	0.030(0.020—0.040)	30(20—40)	4800	0.040(0.020—0.060)
2.0	**40, 50**	30(10—50)	4800	0.030(0.020—0.040)	30(20—40)	4800	0.040(0.020—0.060)
2.5	**2–30**	30(10—50)	3800	0.038(0.025—0.050)	30(20—40)	3800	0.050(0.025—0.075)
2.5	**40, 50**	30(10—50)	3800	0.038(0.025—0.050)	30(20—40)	3800	0.050(0.025—0.075)
2.9	**2–30**	30(10—50)	3300	0.044(0.029—0.058)	30(20—40)	3300	0.058(0.029—0.087)
2.9	**40, 50**	30(10—50)	3300	0.044(0.029—0.058)	30(20—40)	3300	0.058(0.029—0.087)

Note 1) These recommended conditions are only when using internal coolant.
Note 2) Check the condition of chips and perform step machining if necessary. ✱ Reference of step length:DC×0.2—DC×1.0
Note 3) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 4) Machining depths exceeding flute length (LU) are not recommend.
Note 5) Clamp the drill so that the drill runout is within 0.003mm.
Note 6) Do not clamp the flute part of the drill.

Workpiece Material		Cobalt Chrome Alloys T7402-2, ASTM F1537, F799 etc		
Dia. **DC** (mm)	Hole Depth **(L/D)**	Cutting Speed (Min.—Max.) (m/min)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)
1.0	**2–30**	60(30—90)	19100	0.020(0.010—0.030)
1.0	**40, 50**	60(30—90)	19100	0.020(0.010—0.030)
1.5	**2–30**	60(30—90)	12700	0.030(0.015—0.045)
1.5	**40, 50**	60(30—90)	12700	0.030(0.015—0.045)
2.0	**2–30**	60(30—90)	9500	0.040(0.020—0.060)
2.0	**40, 50**	60(30—90)	9500	0.040(0.020—0.060)
2.5	**2–30**	60(30—90)	7600	0.050(0.025—0.075)
2.5	**40, 50**	60(30—90)	7600	0.050(0.025—0.075)
2.9	**2–30**	60(30—90)	6600	0.058(0.029—0.087)
2.9	**40, 50**	60(30—90)	6600	0.058(0.029—0.087)

Note 1) These recommended conditions are only when using internal coolant.
Note 2) Check the condition of chips and perform step machining if necessary. * Reference of step length:DC×0.2—DC×1.0
Note 3) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 4) Machining depths exceeding flute length (LU) are not recommend.
Note 5) Clamp the drill so that the drill runout is within 0.003mm.
Note 6) Do not clamp the flute part of the drill.

Tips for drilling a deep hole exceeding L/D = 40

Workpiece rotation method: small lathes, automatic lathes, etc.

(1) Face countersink (DLE drill is recommended)



(2) Drill the pilot hole to a depth of approx. 3D (DVAS drill is recommended)



(3) Drill the deep hole using DVAS○○○○X50S040.



Tool rotation method: Machining centres, composite machines, etc.

(1) Drill the pilot hole to a depth of approx. 3D (DVAS drill is recommended)



(2) Drill a pilot hole using DC x 7 as a guideline.
If the need for stable machining is important, adjust the prepared hole depth to over DC x 7 as appropriate.



(3) Drill the deep hole using DVAS○○○○X50S040.

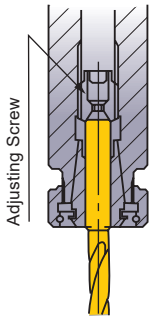


DVAS NEW Mini Size

TRISTAR Drills

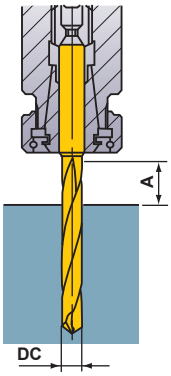
OPERATIONAL GUIDANCE

Drill Holding



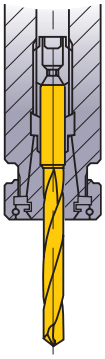
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

Drill Installation



NG

Do not clamp on the flutes.

Coolant Pressure

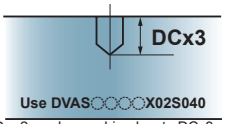
Adjust the coolant pressure according to the type and concentration of coolant.

Drill Dia. DC	Water-soluble	Water-insoluble
DC<2mm	≥ 3MPa	≥ 7MPa
DC<3mm	≥ 2MPa	≥ 5MPa

Drill Installation

For deep hole drilling, refer to the figure below.

L/D≤40



*L/D = 2 can be machined up to DCx3 when drilling pilot holes.

L/D>40

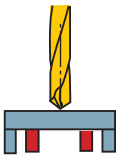


Coolant Handling

Small particles of swarf will jam in the coolant hole of small diameter drills.
Always use a fine mesh filter as a preventive measure.

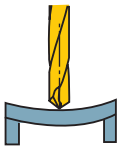
Drill Dia. DC	Fine Mesh Filter
DC<2mm	≤ 10μm
DC<3mm	≤ 20μm

Thin Workpiece



Support if bending occurs

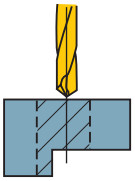
OK



Bending occurs

NG

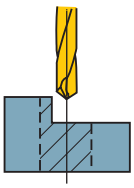
Interrupted Cutting



One Process

OK

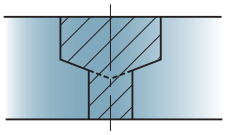
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

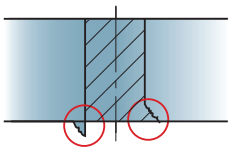
①Spot face with an end mill prior to drilling.

Stepped Holes



①Divide the two processes.
②Drill the larger hole first.
*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



Decrease the feed rate at the end of through cutting.

Memo

DRILLING(SOLID CARBIDE)

MVS Pilot Drill

WSTAR DRILLS

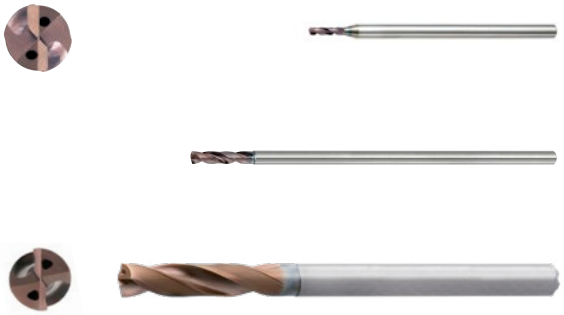
● For machining pilot holes.

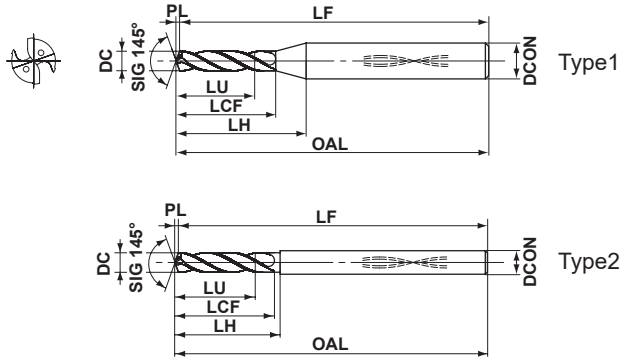
UWC DP1 145° X Z

DC<3 DC≥3

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

Internal Coolant





1≤DC≤2.9	DC=3	3<DC≤6	6<DC≤10	10<DC≤14
+0.014 0	0 −0.014	0 −0.018	0 −0.022	0 −0.027
	DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤14
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	●	MVS0100X02S030	2.2	5.2	8.9	55.2	55	0.2	3	1
1.1	2	●	MVS0110X02S030	2.4	5.6	9.1	55.2	55	0.2	3	1
1.2	2	●	MVS0120X02S030	2.6	6.2	9.6	55.2	55	0.2	3	1
1.3	2	●	MVS0130X02S030	2.8	6.6	9.8	55.2	55	0.2	3	1
1.4	2	●	MVS0140X02S030	3.0	7.2	10.2	55.2	55	0.2	3	1
1.5	2	●	MVS0150X02S030	3.2	7.6	10.4	55.2	55	0.2	3	1
1.6	2	●	MVS0160X02S030	3.5	8.3	10.9	68.3	68	0.3	3	1
1.7	2	●	MVS0170X02S030	3.7	8.7	11.1	68.3	68	0.3	3	1
1.8	2	●	MVS0180X02S030	3.9	9.3	11.5	68.3	68	0.3	3	1
1.9	2	●	MVS0190X02S030	4.1	9.7	11.8	68.3	68	0.3	3	1
2.0	2	●	MVS0200X02S030	4.3	10.3	12.2	68.3	68	0.3	3	1
2.1	2	●	MVS0210X02S030	4.5	10.7	12.4	74.3	74	0.3	3	1
2.2	2	●	MVS0220X02S030	4.7	11.3	12.8	74.3	74	0.3	3	1
2.3	2	●	MVS0230X02S030	5.0	11.8	13.1	74.4	74	0.4	3	1
2.4	2	●	MVS0240X02S030	5.2	12.4	13.5	74.4	74	0.4	3	1
2.5	2	●	MVS0250X02S030	5.4	12.8	13.7	74.4	74	0.4	3	1
2.6	2	●	MVS0260X02S030	5.6	13.4	13.4	81.4	81	0.4	3	2
2.7	2	●	MVS0270X02S030	5.8	13.8	13.8	81.4	81	0.4	3	2
2.8	2	●	MVS0280X02S030	6.0	14.4	14.4	81.4	81	0.4	3	2
2.9	2	●	MVS0290X02S030	6.3	14.9	14.9	81.5	81	0.5	3	2
3.0	2	●	MVS0300X02S030PL	6.5	16.5	16.5	55.5	55	0.5	3	2
3.1	2	●	MVS0310X02S040PL	6.7	18.5	20.5	55.5	55	0.5	4	1
3.2	2	●	MVS0320X02S040PL	6.9	18.5	20.5	55.5	55	0.5	4	1
3.3	2	●	MVS0330X02S040PL	7.1	18.5	20.5	55.5	55	0.5	4	1
3.4	2	●	MVS0340X02S040PL	7.3	18.5	20.5	55.5	55	0.5	4	1
3.5	2	●	MVS0350X02S040PL	7.6	18.5	20.6	55.6	55	0.6	4	1

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.6	2	●	MVS0360X02S040PL	7.8	20.6	20.6	55.6	55	0.6	4	1
3.7	2	●	MVS0370X02S040PL	8.0	20.6	20.6	55.6	55	0.6	4	1
3.8	2	●	MVS0380X02S040PL	8.2	20.6	20.6	55.6	55	0.6	4	1
3.9	2	●	MVS0390X02S040PL	8.4	20.6	20.6	55.6	55	0.6	4	1
4.0	2	●	MVS0400X02S040PL	8.6	20.6	20.6	55.6	55	0.6	4	2
4.1	2	●	MVS0410X02S050PL	8.8	22.6	24.6	62.6	62	0.6	5	1
4.2	2	●	MVS0420X02S050PL	9.1	22.7	24.7	62.7	62	0.7	5	1
4.3	2	●	MVS0430X02S050PL	9.3	22.7	24.7	62.7	62	0.7	5	1
4.4	2	●	MVS0440X02S050PL	9.5	22.7	24.7	62.7	62	0.7	5	1
4.5	2	●	MVS0450X02S050PL	9.7	22.7	24.7	62.7	62	0.7	5	1
4.6	2	●	MVS0460X02S050PL	9.9	24.7	24.7	62.7	62	0.7	5	2
4.7	2	●	MVS0470X02S050PL	10.1	24.7	24.7	62.7	62	0.7	5	2
4.8	2	●	MVS0480X02S050PL	10.4	24.8	24.8	62.8	62	0.8	5	2
4.9	2	●	MVS0490X02S050PL	10.6	24.8	24.8	62.8	62	0.8	5	2
5.0	2	●	MVS0500X02S050PL	10.8	24.8	24.8	62.8	62	0.8	5	2
5.1	2	●	MVS0510X02S060PL	11.0	26.8	28.8	66.8	66	0.8	6	2
5.2	2	●	MVS0520X02S060PL	11.2	26.8	28.8	66.8	66	0.8	6	2
5.3	2	●	MVS0530X02S060PL	11.4	26.8	28.8	66.8	66	0.8	6	2
5.4	2	●	MVS0540X02S060PL	11.7	26.9	28.9	66.9	66	0.9	6	2
5.5	2	●	MVS0550X02S060PL	11.9	26.9	28.9	66.9	66	0.9	6	2
5.6	2	●	MVS0560X02S060PL	12.1	28.9	28.9	66.9	66	0.9	6	2
5.7	2	●	MVS0570X02S060PL	12.3	28.9	28.9	66.9	66	0.9	6	2
5.8	2	●	MVS0580X02S060PL	12.5	28.9	28.9	66.9	66	0.9	6	2
5.9	2	●	MVS0590X02S060PL	12.7	28.9	28.9	66.9	66	0.9	6	2
6.0	2	●	MVS0600X02S060PL	12.9	28.9	28.9	66.9	66	0.9	6	2
6.1	2	●	MVS0610X02S070PL	13.2	32.0	35.0	75.0	74	1.0	7	2

Note 1) The coolant hole of ø5mm or less will have a round shape.

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
6.2	2	●	MVS0620X02S070PL	13.4	32.0	35.0	75.0	74	1.0	7	2
6.3	2	●	MVS0630X02S070PL	13.6	32.0	35.0	75.0	74	1.0	7	2
6.4	2	●	MVS0640X02S070PL	13.8	32.0	35.0	75.0	74	1.0	7	2
6.5	2	●	MVS0650X02S070PL	14.0	32.0	35.0	75.0	74	1.0	7	2
6.6	2	●	MVS0660X02S070PL	14.2	35.0	35.0	75.0	74	1.0	7	2
6.7	2	●	MVS0670X02S070PL	14.5	35.1	35.1	75.1	74	1.1	7	2
6.8	2	●	MVS0680X02S070PL	14.7	35.1	35.1	75.1	74	1.1	7	2
6.9	2	●	MVS0690X02S070PL	14.9	35.1	35.1	75.1	74	1.1	7	2
7.0	2	●	MVS0700X02S070PL	15.1	35.1	35.1	75.1	74	1.1	7	2
7.1	2	●	MVS0710X02S080PL	15.3	35.1	38.1	80.1	79	1.1	8	2
7.2	2	●	MVS0720X02S080PL	15.5	35.1	38.1	80.1	79	1.1	8	2
7.3	2	●	MVS0730X02S080PL	15.8	35.2	38.2	80.2	79	1.2	8	2
7.4	2	●	MVS0740X02S080PL	16.0	35.2	38.2	80.2	79	1.2	8	2
7.5	2	●	MVS0750X02S080PL	16.2	35.2	38.2	80.2	79	1.2	8	2
7.6	2	●	MVS0760X02S080PL	16.4	38.2	38.2	80.2	79	1.2	8	2
7.7	2	●	MVS0770X02S080PL	16.6	38.2	38.2	80.2	79	1.2	8	2
7.8	2	●	MVS0780X02S080PL	16.8	38.2	38.2	80.2	79	1.2	8	2
7.9	2	●	MVS0790X02S080PL	17.0	38.2	38.2	80.2	79	1.2	8	2
8.0	2	●	MVS0800X02S080PL	17.3	38.3	38.3	80.3	79	1.3	8	2
8.1	2	●	MVS0810X02S090PL	17.5	38.3	41.3	85.3	84	1.3	9	2
8.2	2	●	MVS0820X02S090PL	17.7	38.3	41.3	85.3	84	1.3	9	2
8.3	2	●	MVS0830X02S090PL	17.9	38.3	41.3	85.3	84	1.3	9	2
8.4	2	●	MVS0840X02S090PL	18.1	38.3	41.3	85.3	84	1.3	9	2
8.5	2	●	MVS0850X02S090PL	18.3	38.3	41.3	85.3	84	1.3	9	2
8.6	2	●	MVS0860X02S090PL	18.6	41.4	41.4	85.4	84	1.4	9	2
8.7	2	●	MVS0870X02S090PL	18.8	41.4	41.4	85.4	84	1.4	9	2
8.8	2	●	MVS0880X02S090PL	19.0	41.4	41.4	85.4	84	1.4	9	2
8.9	2	●	MVS0890X02S090PL	19.2	41.4	41.4	85.4	84	1.4	9	2
9.0	2	●	MVS0900X02S090PL	19.4	41.4	41.4	85.4	84	1.4	9	2
9.1	2	●	MVS0910X02S100PL	19.6	41.4	44.4	90.4	89	1.4	10	2
9.2	2	●	MVS0920X02S100PL	19.9	41.5	44.5	90.5	89	1.5	10	2
9.3	2	●	MVS0930X02S100PL	20.1	41.5	44.5	90.5	89	1.5	10	2
9.4	2	●	MVS0940X02S100PL	20.3	41.5	44.5	90.5	89	1.5	10	2
9.5	2	●	MVS0950X02S100PL	20.5	41.5	44.5	90.5	89	1.5	10	2
9.6	2	●	MVS0960X02S100PL	20.7	44.5	44.5	90.5	89	1.5	10	2
9.7	2	●	MVS0970X02S100PL	20.9	44.5	44.5	90.5	89	1.5	10	2
9.8	2	●	MVS0980X02S100PL	21.1	44.5	44.5	90.5	89	1.5	10	2
9.9	2	●	MVS0990X02S100PL	21.4	44.6	44.6	90.6	89	1.6	10	2
10.0	2	●	MVS1000X02S100PL	21.6	44.6	44.6	90.6	89	1.6	10	2
10.1	2	●	MVS1010X02S110PL	21.8	44.6	47.6	96.6	95	1.6	11	2
10.2	2	●	MVS1020X02S110PL	22.0	44.6	47.6	96.6	95	1.6	11	2
10.3	2	●	MVS1030X02S110PL	22.2	44.6	47.6	96.6	95	1.6	11	2
10.4	2	●	MVS1040X02S110PL	22.4	44.6	47.6	96.6	95	1.6	11	2
10.5	2	●	MVS1050X02S110PL	22.7	44.7	47.7	96.7	95	1.7	11	2
10.6	2	●	MVS1060X02S110PL	22.9	48.7	48.7	96.7	95	1.7	11	2
10.7	2	●	MVS1070X02S110PL	23.1	48.7	48.7	96.7	95	1.7	11	2
10.8	2	●	MVS1080X02S110PL	23.3	48.7	48.7	96.7	95	1.7	11	2
10.9	2	●	MVS1090X02S110PL	23.5	48.7	48.7	96.7	95	1.7	11	2
11.0	2	●	MVS1100X02S110PL	23.7	48.7	48.7	96.7	95	1.7	11	2
11.1	2	●	MVS1110X02S120PL	23.9	48.7	51.7	96.7	95	1.7	12	2
11.2	2	●	MVS1120X02S120PL	24.2	48.8	51.8	96.8	95	1.8	12	2
11.3	2	●	MVS1130X02S120PL	24.4	48.8	51.8	96.8	95	1.8	12	2
11.4	2	●	MVS1140X02S120PL	24.6	48.8	51.8	96.8	95	1.8	12	2
11.5	2	●	MVS1150X02S120PL	24.8	48.8	51.8	96.8	95	1.8	12	2
11.6	2	●	MVS1160X02S120PL	25.0	48.8	48.8	96.8	95	1.8	12	2
11.7	2	●	MVS1170X02S120PL	25.2	48.8	48.8	96.8	95	1.8	12	2
11.8	2	●	MVS1180X02S120PL	25.5	48.9	48.9	96.9	95	1.9	12	2
11.9	2	●	MVS1190X02S120PL	25.7	48.9	48.9	96.9	95	1.9	12	2
12.0	2	●	MVS1200X02S120PL	25.9	48.9	48.9	96.9	95	1.9	12	2
12.1	2	●	MVS1210X02S130PL	26.1	52.9	55.9	103.9	102	1.9	13	2
12.2	2	●	MVS1220X02S130PL	26.3	52.9	55.9	103.9	102	1.9	13	2
12.3	2	●	MVS1230X02S130PL	26.5	52.9	55.9	103.9	102	1.9	13	2
12.4	2	●	MVS1240X02S130PL	26.8	53.0	56.0	104.0	102	2.0	13	2
12.5	2	●	MVS1250X02S130PL	27.0	53.0	56.0	104.0	102	2.0	13	2
12.6	2	●	MVS1260X02S130PL	27.2	53.0	53.0	104.0	102	2.0	13	2
12.7	2	●	MVS1270X02S130PL	27.4	53.0	53.0	104.0	102	2.0	13	2
12.8	2	●	MVS1280X02S130PL	27.6	53.0	53.0	104.0	102	2.0	13	2
12.9	2	●	MVS1290X02S130PL	27.8	53.0	53.0	104.0	102	2.0	13	2
13.0	2	●	MVS1300X02S130PL	28.0	53.0	53.0	104.0	102	2.0	13	2
13.1	2	●	MVS1310X02S140PL	28.3	56.1	59.1	109.1	107	2.1	14	2
13.2	2	●	MVS1320X02S140PL	28.5	56.1	59.1	109.1	107	2.1	14	2
13.3	2	●	MVS1330X02S140PL	28.7	56.1	59.1	109.1	107	2.1	14	2
13.4	2	●	MVS1340X02S140PL	28.9	56.1	59.1	109.1	107	2.1	14	2
13.5	2	●	MVS1350X02S140PL	29.1	56.1	59.1	109.1	107	2.1	14	2
13.6	2	●	MVS1360X02S140PL	29.3	56.1	56.1	109.1	107	2.1	14	2
13.7	2	●	MVS1370X02S140PL	29.6	56.2	56.2	109.2	107	2.2	14	2
13.8	2	●	MVS1380X02S140PL	29.8	56.2	56.2	109.2	107	2.2	14	2
13.9	2	●	MVS1390X02S140PL	30.0	56.2	56.2	109.2	107	2.2	14	2
14.0	2	●	MVS1400X02S140PL	30.2	56.2	56.2	109.2	107	2.2	14	2

Note 1) The coolant hole of ø5mm or less will have a round shape.

DRILLING(SOLID CARBIDE)

MVS for small diameter
WSTAR DRILLS

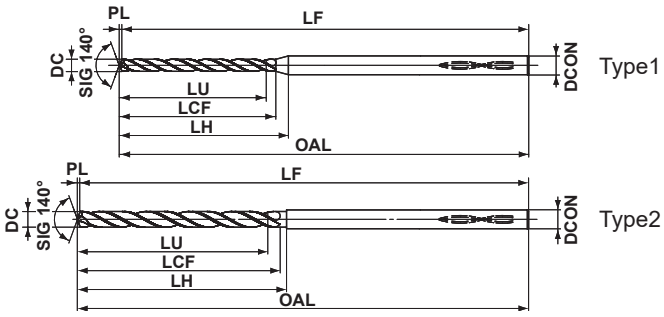
- Linear tooth profile improves both chip discharge and cutting edge strength.
- Double margin specifications offer optimum balance and high precision with small drills.



P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

Internal Coolant





1≤DC≤2.9
$^{0}_{-0.014}$
DCON=3
$^{0}_{-0.006}$

Note 1) Use the MVS pilot drill (N046 page) for drilling guide holes.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.0	7	●	MVS0100X07S030	7.2	10.2	14.2	55.2	55	0.2	3	1
1.0	12	●	MVS0100X12S030	12.2	15.2	19.2	55.2	55	0.2	3	1
1.0	20	●	MVS0100X20S030	20.2	24.2	28.2	60.2	60	0.2	3	1
1.0	25	●	MVS0100X25S030	25.2	28.2	32.2	66.2	66	0.2	3	1
1.0	30	●	MVS0100X30S030	30.2	33.2	37.2	72.2	72	0.2	3	1
1.1	7	●	MVS0110X07S030	7.9	11.2	15.2	55.2	55	0.2	3	1
1.1	12	●	MVS0110X12S030	13.4	17.2	21.2	55.2	55	0.2	3	1
1.1	20	●	MVS0110X20S030	22.2	25.2	29.2	60.2	60	0.2	3	1
1.1	25	●	MVS0110X25S030	27.7	31.2	34.2	66.2	66	0.2	3	1
1.1	30	●	MVS0110X30S030	33.2	36.2	40.2	72.2	72	0.2	3	1
1.2	7	●	MVS0120X07S030	8.6	12.2	15.2	55.2	55	0.2	3	1
1.2	12	●	MVS0120X12S030	14.6	18.2	21.2	55.2	55	0.2	3	1
1.2	20	●	MVS0120X20S030	24.2	28.2	31.2	60.2	60	0.2	3	1
1.2	25	●	MVS0120X25S030	30.2	34.2	37.2	66.2	66	0.2	3	1
1.2	30	●	MVS0120X30S030	36.2	40.2	43.2	72.2	72	0.2	3	1
1.3	7	●	MVS0130X07S030	9.3	13.2	16.2	55.2	55	0.2	3	1
1.3	12	●	MVS0130X12S030	15.8	20.2	23.2	55.2	55	0.2	3	1
1.3	20	●	MVS0130X20S030	26.2	30.2	33.2	68.2	68	0.2	3	1
1.3	25	●	MVS0130X25S030	32.7	36.2	40.2	74.2	74	0.2	3	1
1.3	30	●	MVS0130X30S030	39.2	43.2	46.2	82.2	82	0.2	3	1
1.4	7	●	MVS0140X07S030	10.1	14.3	17.3	55.3	55	0.3	3	1
1.4	12	●	MVS0140X12S030	17.1	21.3	24.3	55.3	55	0.3	3	1
1.4	20	●	MVS0140X20S030	28.3	32.3	35.3	68.3	68	0.3	3	1
1.4	25	●	MVS0140X25S030	35.3	39.3	42.3	74.3	74	0.3	3	1
1.4	30	●	MVS0140X30S030	42.3	46.3	49.3	82.3	82	0.3	3	1
1.5	7	●	MVS0150X07S030	10.8	15.3	18.3	55.3	55	0.3	3	1
1.5	12	●	MVS0150X12S030	18.3	23.3	26.3	55.3	55	0.3	3	1
1.5	20	●	MVS0150X20S030	30.3	35.3	37.3	68.3	68	0.3	3	1
1.5	25	●	MVS0150X25S030	37.8	42.3	45.3	74.3	74	0.3	3	1
1.5	30	●	MVS0150X30S030	45.3	50.3	52.3	82.3	82	0.3	3	1

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.6	7	●	MVS0160X07S030	11.5	16.3	19.3	68.3	68	0.3	3	1
1.6	12	●	MVS0160X12S030	19.5	24.3	27.3	68.3	68	0.3	3	1
1.6	20	●	MVS0160X20S030	32.3	37.3	39.3	78.3	78	0.3	3	1
1.6	25	●	MVS0160X25S030	40.3	45.3	47.3	86.3	86	0.3	3	1
1.6	30	●	MVS0160X30S030	48.3	53.3	55.3	95.3	95	0.3	3	1
1.7	7	●	MVS0170X07S030	12.2	17.3	19.3	68.3	68	0.3	3	1
1.7	12	●	MVS0170X12S030	20.7	26.3	28.3	68.3	68	0.3	3	1
1.7	20	●	MVS0170X20S030	34.3	39.3	42.3	78.3	78	0.3	3	1
1.7	25	●	MVS0170X25S030	42.8	48.3	50.3	86.3	86	0.3	3	1
1.7	30	●	MVS0170X30S030	51.3	56.3	59.3	95.3	95	0.3	3	1
1.8	7	●	MVS0180X07S030	12.9	18.3	20.3	68.3	68	0.3	3	1
1.8	12	●	MVS0180X12S030	21.9	27.3	29.3	68.3	68	0.3	3	1
1.8	20	●	MVS0180X20S030	36.3	41.3	44.3	84.3	84	0.3	3	1
1.8	25	●	MVS0180X25S030	45.3	50.3	53.3	94.3	94	0.3	3	1
1.8	30	●	MVS0180X30S030	54.3	59.3	62.3	102.3	102	0.3	3	1
1.9	7	●	MVS0190X07S030	13.6	19.3	21.3	68.3	68	0.3	3	1
1.9	12	●	MVS0190X12S030	23.1	29.3	31.3	68.3	68	0.3	3	1
1.9	20	●	MVS0190X20S030	38.3	44.3	46.3	84.3	84	0.3	3	1
1.9	25	●	MVS0190X25S030	47.8	53.3	55.3	94.3	94	0.3	3	1
1.9	30	●	MVS0190X30S030	57.3	63.3	65.3	102.3	102	0.3	3	1
2.0	7	●	MVS0200X07S030	14.4	20.4	22.4	68.4	68	0.4	3	1
2.0	12	●	MVS0200X12S030	24.4	30.4	32.4	68.4	68	0.4	3	1
2.0	20	●	MVS0200X20S030	40.4	46.4	48.4	84.4	84	0.4	3	1
2.0	25	●	MVS0200X25S030	50.4	56.4	58.4	94.4	94	0.4	3	1
2.0	30	●	MVS0200X30S030	60.4	66.4	68.4	102.4	102	0.4	3	1
2.1	7	●	MVS0210X07S030	15.1	21.4	23.4	74.4	74	0.4	3	1
2.1	12	●	MVS0210X12S030	25.6	32.4	34.4	74.4	74	0.4	3	1
2.1	20	●	MVS0210X20S030	42.4	48.4	50.4	94.4	94	0.4	3	1
2.1	25	●	MVS0210X25S030	52.9	59.4	60.4	107.4	107	0.4	3	1
2.1	30	●	MVS0210X30S030	63.4	69.4	71.4	118.4	118	0.4	3	1

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
2.2	7	●	MVS0220X07S030	15.8	22.4	23.4	74.4	74	0.4	3	1
2.2	12	●	MVS0220X12S030	26.8	33.4	34.4	74.4	74	0.4	3	1
2.2	20	●	MVS0220X20S030	44.4	51.4	52.4	94.4	94	0.4	3	1
2.2	25	●	MVS0220X25S030	55.4	62.4	63.4	107.4	107	0.4	3	1
2.2	30	●	MVS0220X30S030	66.4	73.4	74.4	118.4	118	0.4	3	1
2.3	7	●	MVS0230X07S030	16.5	23.4	24.4	74.4	74	0.4	3	1
2.3	12	●	MVS0230X12S030	28.0	35.4	36.4	74.4	74	0.4	3	1
2.3	20	●	MVS0230X20S030	46.4	53.4	54.4	94.4	94	0.4	3	1
2.3	25	●	MVS0230X25S030	57.9	64.4	66.4	107.4	107	0.4	3	1
2.3	30	●	MVS0230X30S030	69.4	76.4	77.4	118.4	118	0.4	3	1
2.4	7	●	MVS0240X07S030	17.2	24.4	25.4	74.4	74	0.4	3	1
2.4	12	●	MVS0240X12S030	29.2	36.4	37.4	74.4	74	0.4	3	1
2.4	20	●	MVS0240X20S030	48.4	55.4	56.4	94.4	94	0.4	3	1
2.4	25	●	MVS0240X25S030	60.4	67.4	68.4	107.4	107	0.4	3	1
2.4	30	●	MVS0240X30S030	72.4	79.4	80.4	118.4	118	0.4	3	1
2.5	7	●	MVS0250X07S030	18.0	25.5	26.5	74.5	74	0.5	3	1
2.5	12	●	MVS0250X12S030	30.5	38.5	39.5	74.5	74	0.5	3	1
2.5	20	●	MVS0250X20S030	50.5	58.5	59.5	94.5	94	0.5	3	1
2.5	25	●	MVS0250X25S030	63.0	70.5	71.5	107.5	107	0.5	3	1
2.5	30	●	MVS0250X30S030	75.5	83.5	84.5	118.5	118	0.5	3	1
2.6	7	●	MVS0260X07S030	18.7	26.5	26.5	81.5	81	0.5	3	2
2.6	12	●	MVS0260X12S030	31.7	39.5	39.5	81.5	81	0.5	3	2
2.6	20	●	MVS0260X20S030	52.5	60.5	60.5	103.5	103	0.5	3	2
2.6	25	●	MVS0260X25S030	65.5	73.5	73.5	117.5	117	0.5	3	2
2.6	30	●	MVS0260X30S030	78.5	86.5	86.5	132.5	132	0.5	3	2
2.7	7	●	MVS0270X07S030	19.4	27.5	27.5	81.5	81	0.5	3	2
2.7	12	●	MVS0270X12S030	32.9	41.5	41.5	81.5	81	0.5	3	2
2.7	20	●	MVS0270X20S030	54.5	62.5	62.5	103.5	103	0.5	3	2
2.7	25	●	MVS0270X25S030	68.0	76.5	76.5	117.5	117	0.5	3	2
2.7	30	●	MVS0270X30S030	81.5	89.5	89.5	132.5	132	0.5	3	2
2.8	7	●	MVS0280X07S030	20.1	28.5	28.5	81.5	81	0.5	3	2
2.8	12	●	MVS0280X12S030	34.1	42.5	42.5	81.5	81	0.5	3	2
2.8	20	●	MVS0280X20S030	56.5	64.5	64.5	103.5	103	0.5	3	2
2.8	25	●	MVS0280X25S030	70.5	78.5	78.5	117.5	117	0.5	3	2
2.8	30	●	MVS0280X30S030	84.5	92.5	92.5	132.5	132	0.5	3	2
2.9	7	●	MVS0290X07S030	20.8	29.5	29.5	81.5	81	0.5	3	2
2.9	12	●	MVS0290X12S030	35.3	44.5	44.5	81.5	81	0.5	3	2
2.9	20	●	MVS0290X20S030	58.5	67.5	67.5	103.5	103	0.5	3	2
2.9	25	●	MVS0290X25S030	73.0	81.5	81.5	117.5	117	0.5	3	2
2.9	30	●	MVS0290X30S030	87.5	96.5	96.5	132.5	132	0.5	3	2

DRILLING(SOLID CARBIDE)

MVS

WSTAR DRILLS

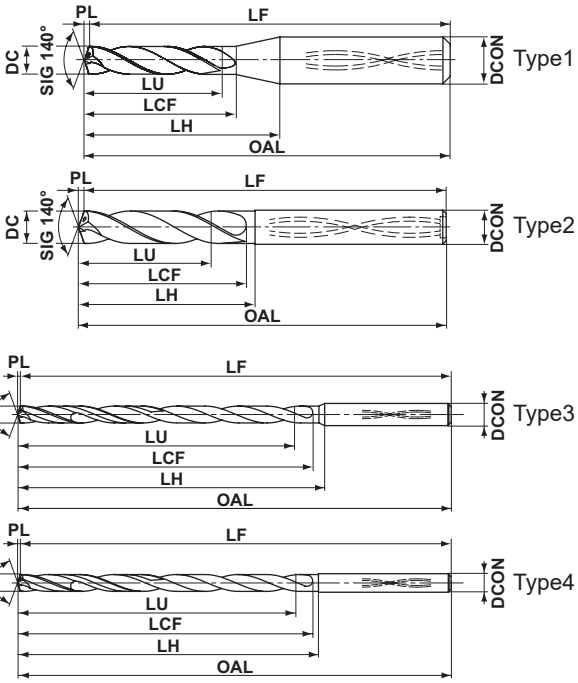
- PVD coated carbide grade DP1020 achieves long life with wide range of workpiece materials.
- Unique coolant supply technology, TRI-cooling offers high machining efficiency.



P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

Internal Coolant





L/D	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
3,5,8	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
L/D≥10	−0.017 −0.031	−0.025 −0.043	−0.033 −0.055	−0.041 −0.068	–
	DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤18	18<DCON≤20
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

Note 1) Use the MVS pilot drill (N046 page) for drilling guide holes.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	MVS0300X03S030	9.5	21.5	21.5	72.5	72	0.5	3	2
3.0	3	●	MVS0300X03S060	9.5	21.5	24.7	72.5	72	0.5	6	1
3.0	5	●	MVS0300X05S030	15.5	28.5	28.5	81.5	81	0.5	3	2
3.0	5	●	MVS0300X05S060	15.5	28.5	31.7	81.5	81	0.5	6	1
3.0	8	●	MVS0300X08S030	24.5	35.5	35.5	81.5	81	0.5	3	2
3.0	8	●	MVS0300X08S060	24.5	35.5	38.7	81.5	81	0.5	6	1
3.0	10	●	MVS0300X10S030	30.5	39.5	42.5	90.5	90	0.5	3	3
3.0	15	●	MVS0300X15S030	45.5	54.5	57.5	105.5	105	0.5	3	3
3.0	20	●	MVS0300X20S030	60.5	69.5	72.5	120.5	120	0.5	3	3
3.0	25	●	MVS0300X25S030	75.5	84.5	87.5	135.5	135	0.5	3	3
3.0	30	●	MVS0300X30S030	90.5	99.5	102.5	150.5	150	0.5	3	3
3.0	35	●	MVS0300X35S030	105.5	115.5	118.5	166.5	166	0.5	3	3
3.0	40	●	MVS0300X40S030	120.5	130.5	133.5	181.5	181	0.5	3	3
3.1	3	●	MVS0310X03S040	9.9	21.6	23.6	76.6	76	0.6	4	2
3.1	3	●	MVS0310X03S060	9.9	21.6	24.7	76.6	76	0.6	6	1
3.1	5	●	MVS0310X05S040	16.1	32.6	32.6	87.6	87	0.6	4	2
3.1	5	●	MVS0310X05S060	16.1	32.6	35.7	87.6	87	0.6	6	1
3.1	8	●	MVS0310X08S040	25.4	41.6	41.6	87.6	87	0.6	4	2
3.1	8	●	MVS0310X08S060	25.4	41.6	44.7	87.6	87	0.6	6	1
3.1	10	●	MVS0310X10S040	31.6	46.6	49.6	97.6	97	0.6	4	3
3.1	15	●	MVS0310X15S040	47.1	63.6	66.6	114.6	114	0.6	4	3
3.1	20	●	MVS0310X20S040	62.6	81.6	84.6	132.6	132	0.6	4	3

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.1	25	●	MVS0310X25S040	78.1	98.6	101.6	149.6	149	0.6	4	3
3.1	30	●	MVS0310X30S040	93.6	116.6	119.6	167.6	167	0.6	4	3
3.1	35	□	MVS0310X35S040	109.1	134.6	137.6	185.6	185	0.6	4	3
3.1	40	□	MVS0310X40S040	124.6	150.6	153.6	201.6	201	0.6	4	3
3.2	3	●	MVS0320X03S040	10.2	21.6	23.6	76.6	76	0.6	4	2
3.2	3	●	MVS0320X03S060	10.2	21.6	24.6	76.6	76	0.6	6	1
3.2	5	●	MVS0320X05S040	16.6	32.6	32.6	87.6	87	0.6	4	2
3.2	5	●	MVS0320X05S060	16.6	32.6	35.6	87.6	87	0.6	6	1
3.2	8	●	MVS0320X08S040	26.2	41.6	41.6	87.6	87	0.6	4	2
3.2	8	●	MVS0320X08S060	26.2	41.6	44.6	87.6	87	0.6	6	1
3.2	10	●	MVS0320X10S040	32.6	46.6	49.6	97.6	97	0.6	4	3
3.2	15	●	MVS0320X15S040	48.6	63.6	66.6	114.6	114	0.6	4	3
3.2	20	●	MVS0320X20S040	64.6	81.6	84.6	132.6	132	0.6	4	3
3.2	25	●	MVS0320X25S040	80.6	98.6	101.6	149.6	149	0.6	4	3
3.2	30	●	MVS0320X30S040	96.6	116.6	119.6	167.6	167	0.6	4	3
3.2	35	□	MVS0320X35S040	112.6	134.6	137.6	185.6	185	0.6	4	3
3.2	40	□	MVS0320X40S040	128.6	150.6	153.6	201.6	201	0.6	4	3
3.3	3	●	MVS0330X03S040	10.5	21.6	23.6	76.6	76	0.6	4	2
3.3	3	●	MVS0330X03S060	10.5	21.6	24.5	76.6	76	0.6	6	1
3.3	5	●	MVS0330X05S040	17.1	32.6	32.6	87.6	87	0.6	4	2
3.3	5	●	MVS0330X05S060	17.1	32.6	35.5	87.6	87	0.6	6	1
3.3	8	●	MVS0330X08S040	27.0	41.6	41.6	87.6	87	0.6	4	2

Note 1) The coolant hole of ø5mm or less will have a round shape. (L/D=3,5,8 is ø6mm or less)

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For made-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.3	8	●	MVS0330X08S060	27.0	41.6	44.5	87.6	87	0.6	6	1
3.3	10	●	MVS0330X10S040	33.6	46.6	49.6	97.6	97	0.6	4	3
3.3	15	●	MVS0330X15S040	50.1	63.6	66.6	114.6	114	0.6	4	3
3.3	20	●	MVS0330X20S040	66.6	81.6	84.6	132.6	132	0.6	4	3
3.3	25	●	MVS0330X25S040	83.1	98.6	101.6	149.6	149	0.6	4	3
3.3	30	●	MVS0330X30S040	99.6	116.6	119.6	167.6	167	0.6	4	3
3.3	35	□	MVS0330X35S040	116.1	134.6	137.6	185.6	185	0.6	4	3
3.3	40	□	MVS0330X40S040	132.6	150.6	153.6	201.6	201	0.6	4	3
3.4	3	●	MVS0340X03S040	10.8	21.6	23.6	76.6	76	0.6	4	2
3.4	3	●	MVS0340X03S060	10.8	21.6	24.4	76.6	76	0.6	6	1
3.4	5	●	MVS0340X05S040	17.6	32.6	32.6	87.6	87	0.6	4	2
3.4	5	●	MVS0340X05S060	17.6	32.6	35.4	87.6	87	0.6	6	1
3.4	8	●	MVS0340X08S040	27.8	41.6	41.6	87.6	87	0.6	4	2
3.4	8	●	MVS0340X08S060	27.8	41.6	44.4	87.6	87	0.6	6	1
3.4	10	●	MVS0340X10S040	34.6	46.6	49.6	97.6	97	0.6	4	3
3.4	15	●	MVS0340X15S040	51.6	63.6	66.6	114.6	114	0.6	4	3
3.4	20	●	MVS0340X20S040	68.6	81.6	84.6	132.6	132	0.6	4	3
3.4	25	●	MVS0340X25S040	85.6	98.6	101.6	149.6	149	0.6	4	3
3.4	30	●	MVS0340X30S040	102.6	116.6	119.6	167.6	167	0.6	4	3
3.4	35	□	MVS0340X35S040	119.6	134.6	137.6	185.6	185	0.6	4	3
3.4	40	□	MVS0340X40S040	136.6	150.6	153.6	201.6	201	0.6	4	3
3.5	3	●	MVS0350X03S040	11.1	21.6	23.6	76.6	76	0.6	4	2
3.5	3	●	MVS0350X03S060	11.1	21.6	24.3	76.6	76	0.6	6	1
3.5	5	●	MVS0350X05S040	18.1	32.6	32.6	87.6	87	0.6	4	2
3.5	5	●	MVS0350X05S060	18.1	32.6	35.3	87.6	87	0.6	6	1
3.5	8	●	MVS0350X08S040	28.6	41.6	41.6	87.6	87	0.6	4	2
3.5	8	●	MVS0350X08S060	28.6	41.6	44.3	87.6	87	0.6	6	1
3.5	10	●	MVS0350X10S040	35.6	46.6	49.6	97.6	97	0.6	4	3
3.5	15	●	MVS0350X15S040	53.1	63.6	66.6	114.6	114	0.6	4	3
3.5	20	●	MVS0350X20S040	70.6	81.6	84.6	132.6	132	0.6	4	3
3.5	25	●	MVS0350X25S040	88.1	98.6	101.6	149.6	149	0.6	4	3
3.5	30	●	MVS0350X30S040	105.6	116.6	119.6	167.6	167	0.6	4	3
3.5	35	●	MVS0350X35S040	123.1	134.6	137.6	185.6	185	0.6	4	3
3.5	40	●	MVS0350X40S040	140.6	150.6	153.6	201.6	201	0.6	4	3
3.6	3	●	MVS0360X03S040	11.5	23.7	23.7	80.7	80	0.7	4	2
3.6	3	●	MVS0360X03S060	11.5	23.7	26.3	80.7	80	0.7	6	1
3.6	5	●	MVS0360X05S040	18.7	36.7	36.7	92.7	92	0.7	4	2
3.6	5	●	MVS0360X05S060	18.7	36.7	39.3	92.7	92	0.7	6	1
3.6	8	●	MVS0360X08S040	29.5	46.7	46.7	92.7	92	0.7	4	2
3.6	8	●	MVS0360X08S060	29.5	46.7	49.3	92.7	92	0.7	6	1
3.6	10	●	MVS0360X10S040	36.7	52.7	55.7	103.7	103	0.7	4	3
3.6	15	●	MVS0360X15S040	54.7	72.7	75.7	123.7	123	0.7	4	3
3.6	20	●	MVS0360X20S040	72.7	92.7	95.7	143.7	143	0.7	4	3
3.6	25	●	MVS0360X25S040	90.7	112.7	115.7	163.7	163	0.7	4	3
3.6	30	●	MVS0360X30S040	108.7	132.7	135.7	183.7	183	0.7	4	3
3.6	35	□	MVS0360X35S040	126.7	152.7	155.7	203.7	203	0.7	4	3
3.6	40	□	MVS0360X40S040	144.7	172.7	175.7	223.7	223	0.7	4	3
3.7	3	●	MVS0370X03S040	11.8	23.7	23.7	80.7	80	0.7	4	2
3.7	3	●	MVS0370X03S060	11.8	23.7	26.2	80.7	80	0.7	6	1
3.7	5	●	MVS0370X05S040	19.2	36.7	36.7	92.7	92	0.7	4	2
3.7	5	●	MVS0370X05S060	19.2	36.7	39.2	92.7	92	0.7	6	1
3.7	8	●	MVS0370X08S040	30.3	46.7	46.7	92.7	92	0.7	4	2
3.7	8	●	MVS0370X08S060	30.3	46.7	49.2	92.7	92	0.7	6	1
3.7	10	●	MVS0370X10S040	37.7	52.7	55.7	103.7	103	0.7	4	3
3.7	15	●	MVS0370X15S040	56.2	72.7	75.7	123.7	123	0.7	4	3
3.7	20	●	MVS0370X20S040	74.7	92.7	95.7	143.7	143	0.7	4	3
3.7	25	●	MVS0370X25S040	93.2	112.7	115.7	163.7	163	0.7	4	3
3.7	30	●	MVS0370X30S040	111.7	132.7	135.7	183.7	183	0.7	4	3
3.7	35	□	MVS0370X35S040	130.2	152.7	155.7	203.7	203	0.7	4	3
3.7	40	□	MVS0370X40S040	148.7	172.7	175.7	223.7	223	0.7	4	3
3.8	3	●	MVS0380X03S040	12.1	23.7	23.7	80.7	80	0.7	4	2
3.8	3	●	MVS0380X03S060	12.1	23.7	26.1	80.7	80	0.7	6	1
3.8	5	●	MVS0380X05S040	19.7	36.7	36.7	92.7	92	0.7	4	2
3.8	5	●	MVS0380X05S060	19.7	36.7	39.1	92.7	92	0.7	6	1
3.8	8	●	MVS0380X08S040	31.1	46.7	46.7	92.7	92	0.7	4	2
3.8	8	●	MVS0380X08S060	31.1	46.7	49.1	92.7	92	0.7	6	1
3.8	10	●	MVS0380X10S040	38.7	52.7	55.7	103.7	103	0.7	4	3
3.8	15	●	MVS0380X15S040	57.7	72.7	75.7	123.7	123	0.7	4	3
3.8	20	●	MVS0380X20S040	76.7	92.7	95.7	143.7	143	0.7	4	3
3.8	25	●	MVS0380X25S040	95.7	112.7	115.7	163.7	163	0.7	4	3
3.8	30	●	MVS0380X30S040	114.7	132.7	135.7	183.7	183	0.7	4	3
3.8	35	□	MVS0380X35S040	133.7	152.7	155.7	203.7	203	0.7	4	3
3.8	40	□	MVS0380X40S040	152.7	172.7	175.7	223.7	223	0.7	4	3
3.9	3	●	MVS0390X03S040	12.4	23.7	23.7	80.7	80	0.7	4	2
3.9	3	●	MVS0390X03S060	12.4	23.7	26.0	80.7	80	0.7	6	1
3.9	5	●	MVS0390X05S040	20.2	36.7	36.7	92.7	92	0.7	4	2
3.9	5	●	MVS0390X05S060	20.2	36.7	39.0	92.7	92	0.7	6	1
3.9	8	●	MVS0390X08S040	31.9	46.7	46.7	92.7	92	0.7	4	2
3.9	8	●	MVS0390X08S060	31.9	46.7	49.0	92.7	92	0.7	6	1
3.9	10	●	MVS0390X10S040	39.7	52.7	55.7	103.7	103	0.7	4	3
3.9	15	●	MVS0390X15S040	59.2	72.7	75.7	123.7	123	0.7	4	3
3.9	20	●	MVS0390X20S040	78.7	92.7	95.7	143.7	143	0.7	4	3
3.9	25	●	MVS0390X25S040	98.2	112.7	115.7	163.7	163	0.7	4	3
3.9	30	●	MVS0390X30S040	117.7	132.7	135.7	183.7	183	0.7	4	3
3.9	35	□	MVS0390X35S040	137.2	152.7	155.7	203.7	203	0.7	4	3
3.9	40	□	MVS0390X40S040	156.7	172.7	175.7	223.7	223	0.7	4	3
4.0	3	●	MVS0400X03S040	12.7	23.7	23.7	80.7	80	0.7	4	2
4.0	3	●	MVS0400X03S060	12.7	23.7	25.8	80.7	80	0.7	6	1
4.0	5	●	MVS0400X05S040	20.7	36.7	36.7	92.7	92	0.7	4	2
4.0	5	●	MVS0400X05S060	20.7	36.7	38.8	92.7	92	0.7	6	1
4.0	8	●	MVS0400X08S040	32.7	46.7	46.7	92.7	92	0.7	4	2
4.0	8	●	MVS0400X08S060	32.7	46.7	48.8	92.7	92	0.7	6	1
4.0	10	●	MVS0400X10S040	40.7	52.7	55.7	103.7	103	0.7	4	3
4.0	15	●	MVS0400X15S040	60.7	72.7	75.7	123.7	123	0.7	4	3
4.0	20	●	MVS0400X20S040	80.7	92.7	95.7	143.7	143	0.7	4	3
4.0	25	●	MVS0400X25S040	100.7	112.7	115.7	163.7	163	0.7	4	3

MVS

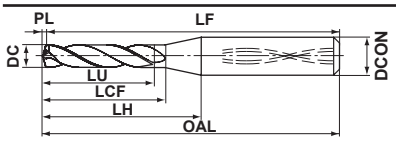
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
4.0	30	●	MVS0400X30S040	120.7	132.7	135.7	183.7	183	0.7	4	3
4.0	35	●	MVS0400X35S040	140.7	152.7	155.7	203.7	203	0.7	4	3
4.0	40	●	MVS0400X40S040	160.7	172.7	175.7	223.7	223	0.7	4	3
4.1	3	●	MVS0410X03S050	13.0	25.7	25.7	86.7	86	0.7	5	2
4.1	3	●	MVS0410X03S060	13.0	25.7	27.7	86.7	86	0.7	6	1
4.1	5	●	MVS0410X05S050	21.2	40.7	40.7	100.7	100	0.7	5	2
4.1	5	●	MVS0410X05S060	21.2	40.7	42.7	100.7	100	0.7	6	1
4.1	8	●	MVS0410X08S050	33.5	52.7	52.7	100.7	100	0.7	5	2
4.1	8	●	MVS0410X08S060	33.5	52.7	54.7	100.7	100	0.7	6	1
4.1	10	●	MVS0410X10S050	41.7	59.7	62.7	112.7	112	0.7	5	3
4.1	15	●	MVS0410X15S050	62.2	81.7	84.7	134.7	134	0.7	5	3
4.1	20	●	MVS0410X20S050	82.7	104.7	107.7	157.7	157	0.7	5	3
4.1	25	●	MVS0410X25S050	103.2	126.7	129.7	179.7	179	0.7	5	3
4.1	30	●	MVS0410X30S050	123.7	149.7	152.7	202.7	202	0.7	5	3
4.1	35	□	MVS0410X35S050	144.2	171.7	174.7	224.7	224	0.7	5	3
4.1	40	□	MVS0410X40S050	164.7	195.7	198.7	248.7	248	0.7	5	3
4.2	3	●	MVS0420X03S050	13.4	25.8	25.8	86.8	86	0.8	5	2
4.2	3	●	MVS0420X03S060	13.4	25.8	27.7	86.8	86	0.8	6	1
4.2	5	●	MVS0420X05S050	21.8	40.8	40.8	100.8	100	0.8	5	2
4.2	5	●	MVS0420X05S060	21.8	40.8	42.7	100.8	100	0.8	6	1
4.2	8	●	MVS0420X08S050	34.4	52.8	52.8	100.8	100	0.8	5	2
4.2	8	●	MVS0420X08S060	34.4	52.8	54.7	100.8	100	0.8	6	1
4.2	10	●	MVS0420X10S050	42.8	59.8	62.8	112.8	112	0.8	5	3
4.2	15	●	MVS0420X15S050	63.8	81.8	84.8	134.8	134	0.8	5	3
4.2	20	●	MVS0420X20S050	84.8	104.8	107.8	157.8	157	0.8	5	3
4.2	25	●	MVS0420X25S050	105.8	126.8	129.8	179.8	179	0.8	5	3
4.2	30	●	MVS0420X30S050	126.8	149.8	152.8	202.8	202	0.8	5	3
4.2	35	□	MVS0420X35S050	147.8	171.8	174.8	224.8	224	0.8	5	3
4.2	40	□	MVS0420X40S050	168.8	195.8	198.8	248.8	248	0.8	5	3
4.3	3	●	MVS0430X03S050	13.7	25.8	25.8	86.8	86	0.8	5	2
4.3	3	●	MVS0430X03S060	13.7	25.8	27.6	86.8	86	0.8	6	1
4.3	5	●	MVS0430X05S050	22.3	40.8	40.8	100.8	100	0.8	5	2
4.3	5	●	MVS0430X05S060	22.3	40.8	42.6	100.8	100	0.8	6	1
4.3	8	●	MVS0430X08S050	35.2	52.8	52.8	100.8	100	0.8	5	2
4.3	8	●	MVS0430X08S060	35.2	52.8	54.6	100.8	100	0.8	6	1
4.3	10	●	MVS0430X10S050	43.8	59.8	62.8	112.8	112	0.8	5	3
4.3	15	●	MVS0430X15S050	65.3	81.8	84.8	134.8	134	0.8	5	3
4.3	20	●	MVS0430X20S050	86.8	104.8	107.8	157.8	157	0.8	5	3
4.3	25	●	MVS0430X25S050	108.3	126.8	129.8	179.8	179	0.8	5	3
4.3	30	●	MVS0430X30S050	129.8	149.8	152.8	202.8	202	0.8	5	3
4.3	35	□	MVS0430X35S050	151.3	171.8	174.8	224.8	224	0.8	5	3
4.3	40	□	MVS0430X40S050	172.8	195.8	198.8	248.8	248	0.8	5	3
4.4	3	●	MVS0440X03S050	14.0	25.8	25.8	86.8	86	0.8	5	2
4.4	3	●	MVS0440X03S060	14.0	25.8	27.5	86.8	86	0.8	6	1
4.4	5	●	MVS0440X05S050	22.8	40.8	40.8	100.8	100	0.8	5	2
4.4	5	●	MVS0440X05S060	22.8	40.8	42.5	100.8	100	0.8	6	1
4.4	8	●	MVS0440X08S050	36.0	52.8	52.8	100.8	100	0.8	5	2
4.4	8	●	MVS0440X08S060	36.0	52.8	54.5	100.8	100	0.8	6	1
4.4	10	●	MVS0440X10S050	44.8	59.8	62.8	112.8	112	0.8	5	3
4.4	15	●	MVS0440X15S050	66.8	81.8	84.8	134.8	134	0.8	5	3
4.4	20	●	MVS0440X20S050	88.8	104.8	107.8	157.8	157	0.8	5	3
4.4	25	●	MVS0440X25S050	110.8	126.8	129.8	179.8	179	0.8	5	3
4.4	30	●	MVS0440X30S050	132.8	149.8	152.8	202.8	202	0.8	5	3
4.4	35	□	MVS0440X35S050	154.8	171.8	174.8	224.8	224	0.8	5	3
4.4	40	□	MVS0440X40S050	176.8	195.8	198.8	248.8	248	0.8	5	3
4.5	3	●	MVS0450X03S050	14.3	25.8	25.8	86.8	86	0.8	5	2
4.5	3	●	MVS0450X03S060	14.3	25.8	27.4	86.8	86	0.8	6	1
4.5	5	●	MVS0450X05S050	23.3	40.8	40.8	100.8	100	0.8	5	2
4.5	5	●	MVS0450X05S060	23.3	40.8	42.4	100.8	100	0.8	6	1
4.5	8	●	MVS0450X08S050	36.8	52.8	52.8	100.8	100	0.8	5	2
4.5	8	●	MVS0450X08S060	36.8	52.8	54.4	100.8	100	0.8	6	1
4.5	10	●	MVS0450X10S050	45.8	59.8	62.8	112.8	112	0.8	5	3
4.5	15	●	MVS0450X15S050	68.3	81.8	84.8	134.8	134	0.8	5	3
4.5	20	●	MVS0450X20S050	90.8	104.8	107.8	157.8	157	0.8	5	3
4.5	25	●	MVS0450X25S050	113.3	126.8	129.8	179.8	179	0.8	5	3
4.5	30	●	MVS0450X30S050	135.8	149.8	152.8	202.8	202	0.8	5	3
4.5	35	●	MVS0450X35S050	158.3	171.8	174.8	224.8	224	0.8	5	3
4.5	40	●	MVS0450X40S050	180.8	195.8	198.8	248.8	248	0.8	5	3
4.6	3	●	MVS0460X03S050	14.6	28.3	28.3	90.8	90	0.8	5	2
4.6	3	●	MVS0460X03S060	14.6	28.3	31.3	90.8	90	0.8	6	2
4.6	5	●	MVS0460X05S050	23.8	44.8	44.8	105.8	105	0.8	5	2
4.6	5	●	MVS0460X05S060	23.8	44.8	47.8	105.8	105	0.8	6	2
4.6	8	●	MVS0460X08S050	37.6	57.8	57.8	105.8	105	0.8	5	2
4.6	8	●	MVS0460X08S060	37.6	57.8	60.8	105.8	105	0.8	6	2
4.6	10	●	MVS0460X10S050	46.8	65.8	68.8	118.8	118	0.8	5	4
4.6	15	●	MVS0460X15S050	69.8	90.8	93.8	143.8	143	0.8	5	4
4.6	20	●	MVS0460X20S050	92.8	115.8	118.8	168.8	168	0.8	5	4
4.6	25	●	MVS0460X25S050	115.8	140.8	143.8	193.8	193	0.8	5	4
4.6	30	●	MVS0460X30S050	138.8	165.8	168.8	218.8	218	0.8	5	4
4.6	35	□	MVS0460X35S050	161.8	190.8	193.8	243.8	243	0.8	5	4
4.6	40	□	MVS0460X40S050	184.8	215.8	218.8	268.8	268	0.8	5	4
4.7	3	●	MVS0470X03S050	15.0	28.4	28.4	90.9	90	0.9	5	2
4.7	3	●	MVS0470X03S060	15.0	28.4	31.4	90.9	90	0.9	6	2
4.7	5	●	MVS0470X05S050	24.4	44.9	44.9	105.9	105	0.9	5	2
4.7	5	●	MVS0470X05S060	24.4	44.9	47.9	105.9	105	0.9	6	2
4.7	8	●	MVS0470X08S050	38.5	57.9	57.9	105.9	105	0.9	5	2
4.7	8	●	MVS0470X08S060	38.5	57.9	60.9	105.9	105	0.9	6	2
4.7	10	●	MVS0470X10S050	47.9	65.9	68.9	118.9	118	0.9	5	4
4.7	15	●	MVS0470X15S050	71.4	90.9	93.9	143.9	143	0.9	5	4
4.7	20	●	MVS0470X20S050	94.9	115.9	118.9	168.9	168	0.9	5	4
4.7	25	●	MVS0470X25S050	118.4	140.9	143.9	193.9	193	0.9	5	4
4.7	30	●	MVS0470X30S050	141.9	165.9	168.9	218.9	218	0.9	5	4
4.7	35	□	MVS0470X35S050	165.4	190.9	193.9	243.9	243	0.9	5	4
4.7	40	□	MVS0470X40S050	188.9	215.9	218.9	268.9	268	0.9	5	4
4.8	3	●	MVS0480X03S050	15.3	28.4	28.4	90.9	90	0.9	5	2
4.8	3	●	MVS0480X03S060	15.3	28.4	31.4	90.9	90	0.9	6	2

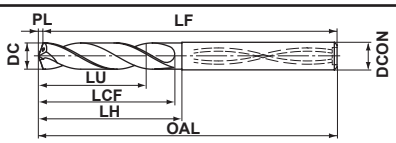
Note 1) The coolant hole of ø5mm or less will have a round shape. (L/D=3,5,8 is ø6mm or less)

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For made-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
4.8	5	●	MVS0480X05S050	24.9	44.9	44.9	105.9	105	0.9	5	2
4.8	5	●	MVS0480X05S060	24.9	44.9	47.9	105.9	105	0.9	6	2
4.8	8	●	MVS0480X08S050	39.3	57.9	57.9	105.9	105	0.9	5	2
4.8	8	●	MVS0480X08S060	39.3	57.9	60.9	105.9	105	0.9	6	2
4.8	10	●	MVS0480X10S050	48.9	65.9	68.9	118.9	118	0.9	5	4
4.8	15	●	MVS0480X15S050	72.9	90.9	93.9	143.9	143	0.9	5	4
4.8	20	●	MVS0480X20S050	96.9	115.9	118.9	168.9	168	0.9	5	4
4.8	25	●	MVS0480X25S050	120.9	140.9	143.9	193.9	193	0.9	5	4
4.8	30	●	MVS0480X30S050	144.9	165.9	168.9	218.9	218	0.9	5	4
4.8	35	□	MVS0480X35S050	168.9	190.9	193.9	243.9	243	0.9	5	4
4.8	40	□	MVS0480X40S050	192.9	215.9	218.9	268.9	268	0.9	5	4
4.9	3	●	MVS0490X03S050	15.6	28.4	28.4	90.9	90	0.9	5	2
4.9	3	●	MVS0490X03S060	15.6	28.4	31.4	90.9	90	0.9	6	2
4.9	5	●	MVS0490X05S050	25.4	44.9	44.9	105.9	105	0.9	5	2
4.9	5	●	MVS0490X05S060	25.4	44.9	47.9	105.9	105	0.9	6	2
4.9	8	●	MVS0490X08S050	40.1	57.9	57.9	105.9	105	0.9	5	2
4.9	8	●	MVS0490X08S060	40.1	57.9	60.9	105.9	105	0.9	6	2
4.9	10	●	MVS0490X10S050	49.9	65.9	68.9	118.9	118	0.9	5	4
4.9	15	●	MVS0490X15S050	74.4	90.9	93.9	143.9	143	0.9	5	4
4.9	20	●	MVS0490X20S050	98.9	115.9	118.9	168.9	168	0.9	5	4
4.9	25	●	MVS0490X25S050	123.4	140.9	143.9	193.9	193	0.9	5	4
4.9	30	●	MVS0490X30S050	147.9	165.9	168.9	218.9	218	0.9	5	4
4.9	35	□	MVS0490X35S050	172.4	190.9	193.9	243.9	243	0.9	5	4
4.9	40	□	MVS0490X40S050	196.9	215.9	218.9	268.9	268	0.9	5	4
5.0	3	●	MVS0500X03S050	15.9	28.4	28.4	90.9	90	0.9	5	2
5.0	3	●	MVS0500X03S060	15.9	28.4	31.4	90.9	90	0.9	6	2
5.0	5	●	MVS0500X05S050	25.9	44.9	44.9	105.9	105	0.9	5	2
5.0	5	●	MVS0500X05S060	25.9	44.9	47.9	105.9	105	0.9	6	2
5.0	8	●	MVS0500X08S050	40.9	57.9	57.9	105.9	105	0.9	5	2
5.0	8	●	MVS0500X08S060	40.9	57.9	60.9	105.9	105	0.9	6	2
5.0	10	●	MVS0500X10S050	50.9	65.9	68.9	118.9	118	0.9	5	4
5.0	15	●	MVS0500X15S050	75.9	90.9	93.9	143.9	143	0.9	5	4
5.0	20	●	MVS0500X20S050	100.9	115.9	118.9	168.9	168	0.9	5	4
5.0	25	●	MVS0500X25S050	125.9	140.9	143.9	193.9	193	0.9	5	4
5.0	30	●	MVS0500X30S050	150.9	165.9	168.9	218.9	218	0.9	5	4
5.0	35	●	MVS0500X35S050	175.9	190.9	193.9	243.9	243	0.9	5	4
5.0	40	●	MVS0500X40S050	200.9	215.9	218.9	268.9	268	0.9	5	4
5.1	3	●	MVS0510X03S060	16.2	28.4	30.9	82.9	82	0.9	6	2
5.1	5	●	MVS0510X05S060	26.4	44.9	48.9	100.9	100	0.9	6	2
5.1	8	●	MVS0510X08S060	41.7	61.9	66.9	118.9	118	0.9	6	2
5.1	10	●	MVS0510X10S060	51.9	72.9	75.9	127.9	127	0.9	6	4
5.1	15	●	MVS0510X15S060	77.4	99.9	102.9	154.9	154	0.9	6	4
5.1	20	●	MVS0510X20S060	102.9	127.9	130.9	182.9	182	0.9	6	4
5.1	25	●	MVS0510X25S060	128.4	154.9	157.9	209.9	209	0.9	6	4
5.1	30	●	MVS0510X30S060	153.9	182.9	185.9	237.9	237	0.9	6	4
5.1	35	□	MVS0510X35S060	179.4	209.9	212.9	264.9	264	0.9	6	4
5.1	40	□	MVS0510X40S060	204.9	240.9	243.9	295.9	295	0.9	6	4
5.2	3	●	MVS0520X03S060	16.5	28.4	30.9	82.9	82	0.9	6	2
5.2	5	●	MVS0520X05S060	26.9	44.9	48.9	100.9	100	0.9	6	2
5.2	8	●	MVS0520X08S060	42.5	61.9	66.9	118.9	118	0.9	6	2
5.2	10	●	MVS0520X10S060	52.9	72.9	75.9	127.9	127	0.9	6	4
5.2	15	●	MVS0520X15S060	78.9	99.9	102.9	154.9	154	0.9	6	4
5.2	20	●	MVS0520X20S060	104.9	127.9	130.9	182.9	182	0.9	6	4
5.2	25	●	MVS0520X25S060	130.9	154.9	157.9	209.9	209	0.9	6	4
5.2	30	●	MVS0520X30S060	156.9	182.9	185.9	237.9	237	0.9	6	4
5.2	35	□	MVS0520X35S060	182.9	209.9	212.9	264.9	264	0.9	6	4
5.2	40	□	MVS0520X40S060	208.9	240.9	243.9	295.9	295	0.9	6	4
5.3	3	●	MVS0530X03S060	16.9	28.5	31.0	83.0	82	1.0	6	2
5.3	5	●	MVS0530X05S060	27.5	45.0	49.0	101.0	100	1.0	6	2
5.3	8	●	MVS0530X08S060	43.4	62.0	67.0	119.0	118	1.0	6	2
5.3	10	●	MVS0530X10S060	54.0	73.0	76.0	128.0	127	1.0	6	4
5.3	15	●	MVS0530X15S060	80.5	100.0	103.0	155.0	154	1.0	6	4
5.3	20	●	MVS0530X20S060	107.0	128.0	131.0	183.0	182	1.0	6	4
5.3	25	●	MVS0530X25S060	133.5	155.0	158.0	210.0	209	1.0	6	4
5.3	30	●	MVS0530X30S060	160.0	183.0	186.0	238.0	237	1.0	6	4
5.3	35	□	MVS0530X35S060	186.5	210.0	213.0	265.0	264	1.0	6	4
5.3	40	□	MVS0530X40S060	213.0	241.0	244.0	296.0	295	1.0	6	4
5.4	3	●	MVS0540X03S060	17.2	28.5	31.0	83.0	82	1.0	6	2
5.4	5	●	MVS0540X05S060	28.0	45.0	49.0	101.0	100	1.0	6	2
5.4	8	●	MVS0540X08S060	44.2	62.0	67.0	119.0	118	1.0	6	2
5.4	10	●	MVS0540X10S060	55.0	73.0	76.0	128.0	127	1.0	6	4
5.4	15	●	MVS0540X15S060	82.0	100.0	103.0	155.0	154	1.0	6	4
5.4	20	●	MVS0540X20S060	109.0	128.0	131.0	183.0	182	1.0	6	4
5.4	25	●	MVS0540X25S060	136.0	155.0	158.0	210.0	209	1.0	6	4
5.4	30	●	MVS0540X30S060	163.0	183.0	186.0	238.0	237	1.0	6	4
5.4	35	□	MVS0540X35S060	190.0	210.0	213.0	265.0	264	1.0	6	4
5.4	40	□	MVS0540X40S060	217.0	241.0	244.0	296.0	295	1.0	6	4
5.5	3	●	MVS0550X03S060	17.5	28.5	31.0	83.0	82	1.0	6	2
5.5	5	●	MVS0550X05S060	28.5	45.0	49.0	101.0	100	1.0	6	2
5.5	8	●	MVS0550X08S060	45.0	62.0	67.0	119.0	118	1.0	6	2
5.5	10	●	MVS0550X10S060	56.0	73.0	76.0	128.0	127	1.0	6	4
5.5	15	●	MVS0550X15S060	83.5	100.0	103.0	155.0	154	1.0	6	4
5.5	20	●	MVS0550X20S060	111.0	128.0	131.0	183.0	182	1.0	6	4
5.5	25	●	MVS0550X25S060	138.5	155.0	158.0	210.0	209	1.0	6	4
5.5	30	●	MVS0550X30S060	166.0	183.0	186.0	238.0	237	1.0	6	4
5.5	35	●	MVS0550X35S060	193.5	210.0	213.0	265.0	264	1.0	6	4
5.5	40	●	MVS0550X40S060	221.0	241.0	244.0	296.0	295	1.0	6	4
5.6	3	●	MVS0560X03S060	17.8	31.0	31.0	83.0	82	1.0	6	2
5.6	5	●	MVS0560X05S060	29.0	49.0	49.0	101.0	100	1.0	6	2
5.6	8	●	MVS0560X08S060	45.8	67.0	67.0	119.0	118	1.0	6	2
5.6	10	●	MVS0560X10S060	57.0	79.0	82.0	134.0	133	1.0	6	4
5.6	15	●	MVS0560X15S060	85.0	109.0	112.0	164.0	163	1.0	6	4
5.6	20	●	MVS0560X20S060	113.0	139.0	142.0	194.0	193	1.0	6	4
5.6	25	●	MVS0560X25S060	141.0	169.0	172.0	224.0	223	1.0	6	4
5.6	30	●	MVS0560X30S060	169.0	199.0	202.0	254.0	253	1.0	6	4
5.6	35	□	MVS0560X35S060	197.0	229.0	232.0	284.0	283	1.0	6	4

MVS

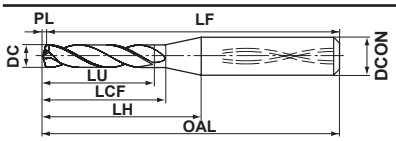
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
5.6	40	□	MVS0560X40S060	225.0	261.0	264.0	316.0	315	1.0	6	4
5.7	3	●	MVS0570X03S060	18.1	31.0	31.0	83.0	82	1.0	6	2
5.7	5	●	MVS0570X05S060	29.5	49.0	49.0	101.0	100	1.0	6	2
5.7	8	●	MVS0570X08S060	46.6	67.0	67.0	119.0	118	1.0	6	2
5.7	10	●	MVS0570X10S060	58.0	79.0	82.0	134.0	133	1.0	6	4
5.7	15	●	MVS0570X15S060	86.5	109.0	112.0	164.0	163	1.0	6	4
5.7	20	●	MVS0570X20S060	115.0	139.0	142.0	194.0	193	1.0	6	4
5.7	25	●	MVS0570X25S060	143.5	169.0	172.0	224.0	223	1.0	6	4
5.7	30	●	MVS0570X30S060	172.0	199.0	202.0	254.0	253	1.0	6	4
5.7	35	□	MVS0570X35S060	200.5	229.0	232.0	284.0	283	1.0	6	4
5.7	40	□	MVS0570X40S060	229.0	261.0	264.0	316.0	315	1.0	6	4
5.8	3	●	MVS0580X03S060	18.5	31.1	31.1	83.1	82	1.1	6	2
5.8	5	●	MVS0580X05S060	30.1	49.1	49.1	101.1	100	1.1	6	2
5.8	8	●	MVS0580X08S060	47.5	67.1	67.1	119.1	118	1.1	6	2
5.8	10	●	MVS0580X10S060	59.1	79.1	82.1	134.1	133	1.1	6	4
5.8	15	●	MVS0580X15S060	88.1	109.1	112.1	164.1	163	1.1	6	4
5.8	20	●	MVS0580X20S060	117.1	139.1	142.1	194.1	193	1.1	6	4
5.8	25	●	MVS0580X25S060	146.1	169.1	172.1	224.1	223	1.1	6	4
5.8	30	●	MVS0580X30S060	175.1	199.1	202.1	254.1	253	1.1	6	4
5.8	35	□	MVS0580X35S060	204.1	229.1	232.1	284.1	283	1.1	6	4
5.8	40	□	MVS0580X40S060	233.1	261.1	264.1	316.1	315	1.1	6	4
5.9	3	●	MVS0590X03S060	18.8	31.1	31.1	83.1	82	1.1	6	2
5.9	5	●	MVS0590X05S060	30.6	49.1	49.1	101.1	100	1.1	6	2
5.9	8	●	MVS0590X08S060	48.3	67.1	67.1	119.1	118	1.1	6	2
5.9	10	●	MVS0590X10S060	60.1	79.1	82.1	134.1	133	1.1	6	4
5.9	15	●	MVS0590X15S060	89.6	109.1	112.1	164.1	163	1.1	6	4
5.9	20	●	MVS0590X20S060	119.1	139.1	142.1	194.1	193	1.1	6	4
5.9	25	●	MVS0590X25S060	148.6	169.1	172.1	224.1	223	1.1	6	4
5.9	30	●	MVS0590X30S060	178.1	199.1	202.1	254.1	253	1.1	6	4
5.9	35	□	MVS0590X35S060	207.6	229.1	232.1	284.1	283	1.1	6	4
5.9	40	□	MVS0590X40S060	237.1	261.1	264.1	316.1	315	1.1	6	4
6.0	3	●	MVS0600X03S060	19.1	31.1	31.1	83.1	82	1.1	6	2
6.0	5	●	MVS0600X05S060	31.1	49.1	49.1	101.1	100	1.1	6	2
6.0	8	●	MVS0600X08S060	49.1	67.1	67.1	119.1	118	1.1	6	2
6.0	10	●	MVS0600X10S060	61.1	79.1	82.1	134.1	133	1.1	6	4
6.0	15	●	MVS0600X15S060	91.1	109.1	112.1	164.1	163	1.1	6	4
6.0	20	●	MVS0600X20S060	121.1	139.1	142.1	194.1	193	1.1	6	4
6.0	25	●	MVS0600X25S060	151.1	169.1	172.1	224.1	223	1.1	6	4
6.0	30	●	MVS0600X30S060	181.1	199.1	202.1	254.1	253	1.1	6	4
6.0	35	●	MVS0600X35S060	211.1	229.1	232.1	284.1	283	1.1	6	4
6.0	40	●	MVS0600X40S060	241.1	261.1	264.1	316.1	315	1.1	6	4
6.1	3	●	MVS0610X03S070	19.4	33.6	36.1	89.1	88	1.1	7	2
6.1	3	●	MVS0610X03S080	19.4	33.6	36.1	89.1	88	1.1	8	2
6.1	5	●	MVS0610X05S070	31.6	53.1	57.1	110.1	109	1.1	7	2
6.1	5	●	MVS0610X05S080	31.6	53.1	57.1	110.1	109	1.1	8	2
6.1	8	●	MVS0610X08S070	49.9	73.1	78.1	131.1	130	1.1	7	2
6.1	8	●	MVS0610X08S080	49.9	73.1	78.1	131.1	130	1.1	8	2
6.1	10	●	MVS0610X10S070	62.1	86.1	89.1	142.1	141	1.1	7	4
6.1	15	●	MVS0610X15S070	92.6	118.1	121.1	174.1	173	1.1	7	4
6.1	20	●	MVS0610X20S070	123.1	151.1	154.1	207.1	206	1.1	7	4
6.1	25	●	MVS0610X25S070	153.6	183.1	186.1	239.1	238	1.1	7	4
6.1	30	●	MVS0610X30S070	184.1	216.1	219.1	272.1	271	1.1	7	4
6.1	35	□	MVS0610X35S070	214.6	248.1	253.1	306.1	305	1.1	7	4
6.1	40	□	MVS0610X40S070	245.1	281.1	284.1	337.1	336	1.1	7	4
6.2	3	●	MVS0620X03S070	19.7	33.6	36.1	89.1	88	1.1	7	2
6.2	3	●	MVS0620X03S080	19.7	33.6	36.1	89.1	88	1.1	8	2
6.2	5	●	MVS0620X05S070	32.1	53.1	57.1	110.1	109	1.1	7	2
6.2	5	●	MVS0620X05S080	32.1	53.1	57.1	110.1	109	1.1	8	2
6.2	8	●	MVS0620X08S070	50.7	73.1	78.1	131.1	130	1.1	7	2
6.2	8	●	MVS0620X08S080	50.7	73.1	78.1	131.1	130	1.1	8	2
6.2	10	●	MVS0620X10S070	63.1	86.1	89.1	142.1	141	1.1	7	4
6.2	15	●	MVS0620X15S070	94.1	118.1	121.1	174.1	173	1.1	7	4
6.2	20	●	MVS0620X20S070	125.1	151.1	154.1	207.1	206	1.1	7	4
6.2	25	●	MVS0620X25S070	156.1	183.1	186.1	239.1	238	1.1	7	4
6.2	30	●	MVS0620X30S070	187.1	216.1	219.1	272.1	271	1.1	7	4
6.2	35	□	MVS0620X35S070	218.1	248.1	253.1	306.1	305	1.1	7	4
6.2	40	□	MVS0620X40S070	249.1	281.1	284.1	337.1	336	1.1	7	4
6.3	3	●	MVS0630X03S070	20.0	33.6	36.1	89.1	88	1.1	7	2
6.3	3	●	MVS0630X03S080	20.0	33.6	36.1	89.1	88	1.1	8	2
6.3	5	●	MVS0630X05S070	32.6	53.1	57.1	110.1	109	1.1	7	2
6.3	5	●	MVS0630X05S080	32.6	53.1	57.1	110.1	109	1.1	8	2
6.3	8	●	MVS0630X08S070	51.5	73.1	78.1	131.1	130	1.1	7	2
6.3	8	●	MVS0630X08S080	51.5	73.1	78.1	131.1	130	1.1	8	2
6.3	10	●	MVS0630X10S070	64.1	86.1	89.1	142.1	141	1.1	7	4
6.3	15	●	MVS0630X15S070	95.6	118.1	121.1	174.1	173	1.1	7	4
6.3	20	●	MVS0630X20S070	127.1	151.1	154.1	207.1	206	1.1	7	4
6.3	25	●	MVS0630X25S070	158.6	183.1	186.1	239.1	238	1.1	7	4
6.3	30	●	MVS0630X30S070	190.1	216.1	219.1	272.1	271	1.1	7	4
6.3	35	□	MVS0630X35S070	221.6	248.1	253.1	306.1	305	1.1	7	4
6.3	40	□	MVS0630X40S070	253.1	281.1	284.1	337.1	336	1.1	7	4
6.4	3	●	MVS0640X03S070	20.4	33.7	36.2	89.2	88	1.2	7	2
6.4	3	●	MVS0640X03S080	20.4	33.7	36.2	89.2	88	1.2	8	2
6.4	5	●	MVS0640X05S070	33.2	53.2	57.2	110.2	109	1.2	7	2
6.4	5	●	MVS0640X05S080	33.2	53.2	57.2	110.2	109	1.2	8	2
6.4	8	●	MVS0640X08S070	52.4	73.2	78.2	131.2	130	1.2	7	2
6.4	8	●	MVS0640X08S080	52.4	73.2	78.2	131.2	130	1.2	8	2
6.4	10	●	MVS0640X10S070	65.2	86.2	89.2	142.2	141	1.2	7	4
6.4	15	●	MVS0640X15S070	97.2	118.2	121.2	174.2	173	1.2	7	4
6.4	20	●	MVS0640X20S070	129.2	151.2	154.2	207.2	206	1.2	7	4
6.4	25	●	MVS0640X25S070	161.2	183.2	186.2	239.2	238	1.2	7	4
6.4	30	●	MVS0640X30S070	193.2	216.2	219.2	272.2	271	1.2	7	4
6.4	35	□	MVS0640X35S070	225.2	248.2	253.2	306.2	305	1.2	7	4
6.4	40	□	MVS0640X40S070	257.2	281.2	284.2	337.2	336	1.2	7	4
6.5	3	●	MVS0650X03S070	20.7	33.7	36.2	89.2	88	1.2	7	2
6.5	3	●	MVS0650X03S080	20.7	33.7	36.2	89.2	88	1.2	8	2
6.5	5	●	MVS0650X05S070	33.7	53.2	57.2	110.2	109	1.2	7	2

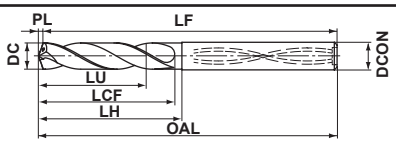
Note 1) The coolant hole of ø5mm or less will have a round shape. (L/D=3,5,8 is ø6mm or less)

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For made-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
6.5	5	●	MVS0650X05S080	33.7	53.2	57.2	110.2	109	1.2	8	2
6.5	8	●	MVS0650X08S070	53.2	73.2	78.2	131.2	130	1.2	7	2
6.5	8	●	MVS0650X08S080	53.2	73.2	78.2	131.2	130	1.2	8	2
6.5	10	●	MVS0650X10S070	66.2	86.2	89.2	142.2	141	1.2	7	4
6.5	15	●	MVS0650X15S070	98.7	118.2	121.2	174.2	173	1.2	7	4
6.5	20	●	MVS0650X20S070	131.2	151.2	154.2	207.2	206	1.2	7	4
6.5	25	●	MVS0650X25S070	163.7	183.2	186.2	239.2	238	1.2	7	4
6.5	30	●	MVS0650X30S070	196.2	216.2	219.2	272.2	271	1.2	7	4
6.5	35	●	MVS0650X35S070	228.7	248.2	253.2	306.2	305	1.2	7	4
6.5	40	●	MVS0650X40S070	261.2	281.2	284.2	337.2	336	1.2	7	4
6.6	3	●	MVS0660X03S070	21.0	36.2	36.2	89.2	88	1.2	7	2
6.6	3	●	MVS0660X03S080	21.0	36.2	38.2	89.2	88	1.2	8	2
6.6	5	●	MVS0660X05S070	34.2	57.2	57.2	110.2	109	1.2	7	2
6.6	5	●	MVS0660X05S080	34.2	57.2	59.2	110.2	109	1.2	8	2
6.6	8	●	MVS0660X08S070	54.0	78.2	78.2	131.2	130	1.2	7	2
6.6	8	●	MVS0660X08S080	54.0	78.2	80.2	131.2	130	1.2	8	2
6.6	10	●	MVS0660X10S070	67.2	92.2	95.2	148.2	147	1.2	7	4
6.6	15	●	MVS0660X15S070	100.2	127.2	130.2	183.2	182	1.2	7	4
6.6	20	●	MVS0660X20S070	133.2	162.2	165.2	218.2	217	1.2	7	4
6.6	25	●	MVS0660X25S070	166.2	197.2	200.2	253.2	252	1.2	7	4
6.6	30	●	MVS0660X30S070	199.2	232.2	235.2	288.2	287	1.2	7	4
6.6	35	□	MVS0660X35S070	232.2	267.2	270.2	323.2	322	1.2	7	4
6.6	40	□	MVS0660X40S070	265.2	301.2	304.2	357.2	356	1.2	7	4
6.7	3	●	MVS0670X03S070	21.3	36.2	36.2	89.2	88	1.2	7	2
6.7	3	●	MVS0670X03S080	21.3	36.2	38.2	89.2	88	1.2	8	2
6.7	5	●	MVS0670X05S070	34.7	57.2	57.2	110.2	109	1.2	7	2
6.7	5	●	MVS0670X05S080	34.7	57.2	59.2	110.2	109	1.2	8	2
6.7	8	●	MVS0670X08S070	54.8	78.2	78.2	131.2	130	1.2	7	2
6.7	8	●	MVS0670X08S080	54.8	78.2	80.2	131.2	130	1.2	8	2
6.7	10	●	MVS0670X10S070	68.2	92.2	95.2	148.2	147	1.2	7	4
6.7	15	●	MVS0670X15S070	101.7	127.2	130.2	183.2	182	1.2	7	4
6.7	20	●	MVS0670X20S070	135.2	162.2	165.2	218.2	217	1.2	7	4
6.7	25	●	MVS0670X25S070	168.7	197.2	200.2	253.2	252	1.2	7	4
6.7	30	●	MVS0670X30S070	202.2	232.2	235.2	288.2	287	1.2	7	4
6.7	35	□	MVS0670X35S070	235.7	267.2	270.2	323.2	322	1.2	7	4
6.7	40	□	MVS0670X40S070	269.2	301.2	304.2	357.2	356	1.2	7	4
6.8	3	●	MVS0680X03S070	21.6	36.2	36.2	89.2	88	1.2	7	2
6.8	3	●	MVS0680X03S080	21.6	36.2	38.2	89.2	88	1.2	8	2
6.8	5	●	MVS0680X05S070	35.2	57.2	57.2	110.2	109	1.2	7	2
6.8	5	●	MVS0680X05S080	35.2	57.2	59.2	110.2	109	1.2	8	2
6.8	8	●	MVS0680X08S070	55.6	78.2	78.2	131.2	130	1.2	7	2
6.8	8	●	MVS0680X08S080	55.6	78.2	80.2	131.2	130	1.2	8	2
6.8	10	●	MVS0680X10S070	69.2	92.2	95.2	148.2	147	1.2	7	4
6.8	15	●	MVS0680X15S070	103.2	127.2	130.2	183.2	182	1.2	7	4
6.8	20	●	MVS0680X20S070	137.2	162.2	165.2	218.2	217	1.2	7	4
6.8	25	●	MVS0680X25S070	171.2	197.2	200.2	253.2	252	1.2	7	4
6.8	30	●	MVS0680X30S070	205.2	232.2	235.2	288.2	287	1.2	7	4
6.8	35	□	MVS0680X35S070	239.2	267.2	270.2	323.2	322	1.2	7	4
6.8	40	□	MVS0680X40S070	273.2	301.2	304.2	357.2	356	1.2	7	4
6.9	3	●	MVS0690X03S070	22.0	36.3	36.3	89.3	88	1.3	7	2
6.9	3	●	MVS0690X03S080	22.0	36.3	38.3	89.3	88	1.3	8	2
6.9	5	●	MVS0690X05S070	35.8	57.3	57.3	110.3	109	1.3	7	2
6.9	5	●	MVS0690X05S080	35.8	57.3	59.3	110.3	109	1.3	8	2
6.9	8	●	MVS0690X08S070	56.5	78.3	78.3	131.3	130	1.3	7	2
6.9	8	●	MVS0690X08S080	56.5	78.3	80.3	131.3	130	1.3	8	2
6.9	10	●	MVS0690X10S070	70.3	92.3	95.3	148.3	147	1.3	7	4
6.9	15	●	MVS0690X15S070	104.8	127.3	130.3	183.3	182	1.3	7	4
6.9	20	●	MVS0690X20S070	139.3	162.3	165.3	218.3	217	1.3	7	4
6.9	25	●	MVS0690X25S070	173.8	197.3	200.3	253.3	252	1.3	7	4
6.9	30	●	MVS0690X30S070	208.3	232.3	235.3	288.3	287	1.3	7	4
6.9	35	□	MVS0690X35S070	242.8	267.3	270.3	323.3	322	1.3	7	4
6.9	40	□	MVS0690X40S070	277.3	301.3	304.3	357.3	356	1.3	7	4
7.0	3	●	MVS0700X03S070	22.3	36.3	36.3	89.3	88	1.3	7	2
7.0	3	●	MVS0700X03S080	22.3	36.3	38.3	89.3	88	1.3	8	2
7.0	5	●	MVS0700X05S070	36.3	57.3	57.3	110.3	109	1.3	7	2
7.0	5	●	MVS0700X05S080	36.3	57.3	59.3	110.3	109	1.3	8	2
7.0	8	●	MVS0700X08S070	57.3	78.3	78.3	131.3	130	1.3	7	2
7.0	8	●	MVS0700X08S080	57.3	78.3	80.3	131.3	130	1.3	8	2
7.0	10	●	MVS0700X10S070	71.3	92.3	95.3	148.3	147	1.3	7	4
7.0	15	●	MVS0700X15S070	106.3	127.3	130.3	183.3	182	1.3	7	4
7.0	20	●	MVS0700X20S070	141.3	162.3	165.3	218.3	217	1.3	7	4
7.0	25	●	MVS0700X25S070	176.3	197.3	200.3	253.3	252	1.3	7	4
7.0	30	●	MVS0700X30S070	211.3	232.3	235.3	288.3	287	1.3	7	4
7.0	35	●	MVS0700X35S070	246.3	267.3	270.3	323.3	322	1.3	7	4
7.0	40	●	MVS0700X40S070	281.3	301.3	304.3	357.3	356	1.3	7	4
7.1	3	●	MVS0710X03S080	22.6	38.8	41.3	95.3	94	1.3	8	2
7.1	5	●	MVS0710X05S080	36.8	61.3	65.3	119.3	118	1.3	8	2
7.1	8	●	MVS0710X08S080	58.1	84.3	89.3	143.3	142	1.3	8	2
7.1	10	●	MVS0710X10S080	72.3	99.3	102.3	156.3	155	1.3	8	4
7.1	15	●	MVS0710X15S080	107.8	136.3	139.3	193.3	192	1.3	8	4
7.1	20	●	MVS0710X20S080	143.3	174.3	177.3	231.3	230	1.3	8	4
7.1	25	●	MVS0710X25S080	178.8	211.3	214.3	268.3	267	1.3	8	4
7.1	30	●	MVS0710X30S080	214.3	249.3	252.3	306.3	305	1.3	8	4
7.1	35	□	MVS0710X35S080	249.8	286.3	289.3	343.3	342	1.3	8	4
7.1	40	□	MVS0710X40S080	285.3	321.3	324.3	378.3	377	1.3	8	4
7.2	3	●	MVS0720X03S080	22.9	38.8	41.3	95.3	94	1.3	8	2
7.2	5	●	MVS0720X05S080	37.3	61.3	65.3	119.3	118	1.3	8	2
7.2	8	●	MVS0720X08S080	58.9	84.3	89.3	143.3	142	1.3	8	2
7.2	10	●	MVS0720X10S080	73.3	99.3	102.3	156.3	155	1.3	8	4
7.2	15	●	MVS0720X15S080	109.3	136.3	139.3	193.3	192	1.3	8	4
7.2	20	●	MVS0720X20S080	145.3	174.3	177.3	231.3	230	1.3	8	4
7.2	25	●	MVS0720X25S080	181.3	211.3	214.3	268.3	267	1.3	8	4
7.2	30	●	MVS0720X30S080	217.3	249.3	252.3	306.3	305	1.3	8	4
7.2	35	□	MVS0720X35S080	253.3	286.3	289.3	343.3	342	1.3	8	4
7.2	40	□	MVS0720X40S080	289.3	321.3	324.3	378.3	377	1.3	8	4
7.3	3	●	MVS0730X03S080	23.2	38.8	41.3	95.3	94	1.3	8	2

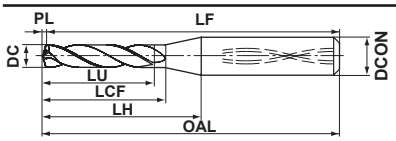
MVS

WSTAR DRILLS

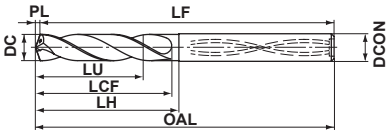
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
7.3	5	●	MVS0730X05S080	37.8	61.3	65.3	119.3	118	1.3	8	2
7.3	8	●	MVS0730X08S080	59.7	84.3	89.3	143.3	142	1.3	8	2
7.3	10	●	MVS0730X10S080	74.3	99.3	102.3	156.3	155	1.3	8	4
7.3	15	●	MVS0730X15S080	110.8	136.3	139.3	193.3	192	1.3	8	4
7.3	20	●	MVS0730X20S080	147.3	174.3	177.3	231.3	230	1.3	8	4
7.3	25	●	MVS0730X25S080	183.8	211.3	214.3	268.3	267	1.3	8	4
7.3	30	●	MVS0730X30S080	220.3	249.3	252.3	306.3	305	1.3	8	4
7.3	35	□	MVS0730X35S080	256.8	286.3	289.3	343.3	342	1.3	8	4
7.3	40	□	MVS0730X40S080	293.3	321.3	324.3	378.3	377	1.3	8	4
7.4	3	●	MVS0740X03S080	23.5	38.8	41.3	95.3	94	1.3	8	2
7.4	5	●	MVS0740X05S080	38.3	61.3	65.3	119.3	118	1.3	8	2
7.4	8	●	MVS0740X08S080	60.5	84.3	89.3	143.3	142	1.3	8	2
7.4	10	●	MVS0740X10S080	75.3	99.3	102.3	156.3	155	1.3	8	4
7.4	15	●	MVS0740X15S080	112.3	136.3	139.3	193.3	192	1.3	8	4
7.4	20	●	MVS0740X20S080	149.3	174.3	177.3	231.3	230	1.3	8	4
7.4	25	●	MVS0740X25S080	186.3	211.3	214.3	268.3	267	1.3	8	4
7.4	30	●	MVS0740X30S080	223.3	249.3	252.3	306.3	305	1.3	8	4
7.4	35	□	MVS0740X35S080	260.3	286.3	289.3	343.3	342	1.3	8	4
7.4	40	□	MVS0740X40S080	297.3	321.3	324.3	378.3	377	1.3	8	4
7.5	3	●	MVS0750X03S080	23.9	38.9	41.4	95.4	94	1.4	8	2
7.5	5	●	MVS0750X05S080	38.9	61.4	65.4	119.4	118	1.4	8	2
7.5	8	●	MVS0750X08S080	61.4	84.4	89.4	143.4	142	1.4	8	2
7.5	10	●	MVS0750X10S080	76.4	99.4	102.4	156.4	155	1.4	8	4
7.5	15	●	MVS0750X15S080	113.9	136.4	139.4	193.4	192	1.4	8	4
7.5	20	●	MVS0750X20S080	151.4	174.4	177.4	231.4	230	1.4	8	4
7.5	25	●	MVS0750X25S080	188.9	211.4	214.4	268.4	267	1.4	8	4
7.5	30	●	MVS0750X30S080	226.4	249.4	252.4	306.4	305	1.4	8	4
7.5	35	●	MVS0750X35S080	263.9	286.4	289.4	343.4	342	1.4	8	4
7.5	40	●	MVS0750X40S080	301.4	321.4	324.4	378.4	377	1.4	8	4
7.6	3	●	MVS0760X03S080	24.2	41.4	41.4	95.4	94	1.4	8	2
7.6	5	●	MVS0760X05S080	39.4	65.4	65.4	119.4	118	1.4	8	2
7.6	8	●	MVS0760X08S080	62.2	89.4	89.4	143.4	142	1.4	8	2
7.6	10	●	MVS0760X10S080	77.4	105.4	108.4	162.4	161	1.4	8	4
7.6	15	●	MVS0760X15S080	115.4	145.4	148.4	202.4	201	1.4	8	4
7.6	20	●	MVS0760X20S080	153.4	185.4	188.4	242.4	241	1.4	8	4
7.6	25	●	MVS0760X25S080	191.4	225.4	228.4	282.4	281	1.4	8	4
7.6	30	●	MVS0760X30S080	229.4	265.4	268.4	322.4	321	1.4	8	4
7.6	35	□	MVS0760X35S080	267.4	305.4	308.4	362.4	361	1.4	8	4
7.6	40	□	MVS0760X40S080	305.4	341.4	344.4	398.4	397	1.4	8	4
7.7	3	●	MVS0770X03S080	24.5	41.4	41.4	95.4	94	1.4	8	2
7.7	5	●	MVS0770X05S080	39.9	65.4	65.4	119.4	118	1.4	8	2
7.7	8	●	MVS0770X08S080	63.0	89.4	89.4	143.4	142	1.4	8	2
7.7	10	●	MVS0770X10S080	78.4	105.4	108.4	162.4	161	1.4	8	4
7.7	15	●	MVS0770X15S080	116.9	145.4	148.4	202.4	201	1.4	8	4
7.7	20	●	MVS0770X20S080	155.4	185.4	188.4	242.4	241	1.4	8	4
7.7	25	●	MVS0770X25S080	193.9	225.4	228.4	282.4	281	1.4	8	4
7.7	30	●	MVS0770X30S080	232.4	265.4	268.4	322.4	321	1.4	8	4
7.7	35	□	MVS0770X35S080	270.9	305.4	308.4	362.4	361	1.4	8	4
7.7	40	□	MVS0770X40S080	309.4	341.4	344.4	398.4	397	1.4	8	4
7.8	3	●	MVS0780X03S080	24.8	41.4	41.4	95.4	94	1.4	8	2
7.8	5	●	MVS0780X05S080	40.4	65.4	65.4	119.4	118	1.4	8	2
7.8	8	●	MVS0780X08S080	63.8	89.4	89.4	143.4	142	1.4	8	2
7.8	10	●	MVS0780X10S080	79.4	105.4	108.4	162.4	161	1.4	8	4
7.8	15	●	MVS0780X15S080	118.4	145.4	148.4	202.4	201	1.4	8	4
7.8	20	●	MVS0780X20S080	157.4	185.4	188.4	242.4	241	1.4	8	4
7.8	25	●	MVS0780X25S080	196.4	225.4	228.4	282.4	281	1.4	8	4
7.8	30	●	MVS0780X30S080	235.4	265.4	268.4	322.4	321	1.4	8	4
7.8	35	□	MVS0780X35S080	274.4	305.4	308.4	362.4	361	1.4	8	4
7.8	40	□	MVS0780X40S080	313.4	341.4	344.4	398.4	397	1.4	8	4
7.9	3	●	MVS0790X03S080	25.1	41.4	41.4	95.4	94	1.4	8	2
7.9	5	●	MVS0790X05S080	40.9	65.4	65.4	119.4	118	1.4	8	2
7.9	8	●	MVS0790X08S080	64.6	89.4	89.4	143.4	142	1.4	8	2
7.9	10	●	MVS0790X10S080	80.4	105.4	108.4	162.4	161	1.4	8	4
7.9	15	●	MVS0790X15S080	119.9	145.4	148.4	202.4	201	1.4	8	4
7.9	20	●	MVS0790X20S080	159.4	185.4	188.4	242.4	241	1.4	8	4
7.9	25	●	MVS0790X25S080	198.9	225.4	228.4	282.4	281	1.4	8	4
7.9	30	●	MVS0790X30S080	238.4	265.4	268.4	322.4	321	1.4	8	4
7.9	35	□	MVS0790X35S080	277.9	305.4	308.4	362.4	361	1.4	8	4
7.9	40	□	MVS0790X40S080	317.4	341.4	344.4	398.4	397	1.4	8	4
8.0	3	●	MVS0800X03S080	25.5	41.5	41.5	95.5	94	1.5	8	2
8.0	5	●	MVS0800X05S080	41.5	65.5	65.5	119.5	118	1.5	8	2
8.0	8	●	MVS0800X08S080	65.5	89.5	89.5	143.5	142	1.5	8	2
8.0	10	●	MVS0800X10S080	81.5	105.5	108.5	162.5	161	1.5	8	4
8.0	15	●	MVS0800X15S080	121.5	145.5	148.5	202.5	201	1.5	8	4
8.0	20	●	MVS0800X20S080	161.5	185.5	188.5	242.5	241	1.5	8	4
8.0	25	●	MVS0800X25S080	201.5	225.5	228.5	282.5	281	1.5	8	4
8.0	30	●	MVS0800X30S080	241.5	265.5	268.5	322.5	321	1.5	8	4
8.0	35	●	MVS0800X35S080	281.5	305.5	308.5	362.5	361	1.5	8	4
8.0	40	●	MVS0800X40S080	321.5	341.5	344.5	398.5	397	1.5	8	4
8.1	3	●	MVS0810X03S090	25.8	44.0	46.5	101.5	100	1.5	9	2
8.1	3	●	MVS0810X03S100	25.8	44.0	46.5	101.5	100	1.5	10	2
8.1	5	●	MVS0810X05S090	42.0	69.5	73.5	128.5	127	1.5	9	2
8.1	5	●	MVS0810X05S100	42.0	69.5	73.5	128.5	127	1.5	10	2
8.1	8	●	MVS0810X08S090	66.3	95.5	100.5	155.5	154	1.5	9	2
8.1	8	●	MVS0810X08S100	66.3	95.5	100.5	155.5	154	1.5	10	2
8.1	10	●	MVS0810X10S090	82.5	112.5	115.5	170.5	169	1.5	9	4
8.1	15	●	MVS0810X15S090	123.0	154.5	157.5	212.5	211	1.5	9	4
8.1	20	●	MVS0810X20S090	163.5	197.5	200.5	255.5	254	1.5	9	4
8.1	25	●	MVS0810X25S090	204.0	239.5	242.5	297.5	296	1.5	9	4
8.1	30	●	MVS0810X30S090	244.5	282.5	285.5	340.5	339	1.5	9	4
8.1	35	□	MVS0810X35S090	285.0	324.5	327.5	382.5	381	1.5	9	4
8.1	40	□	MVS0810X40S090	325.5	366.5	369.5	424.5	423	1.5	9	4
8.2	3	●	MVS0820X03S090	26.1	44.0	46.5	101.5	100	1.5	9	2
8.2	3	●	MVS0820X03S100	26.1	44.0	46.5	101.5	100	1.5	10	2
8.2	5	●	MVS0820X05S090	42.5	69.5	73.5	128.5	127	1.5	9	2
8.2	5	●	MVS0820X05S100	42.5	69.5	73.5	128.5	127	1.5	10	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.2	8	●	MVS0820X08S090	67.1	95.5	100.5	155.5	154	1.5	9	2
8.2	8	●	MVS0820X08S100	67.1	95.5	100.5	155.5	154	1.5	10	2
8.2	10	●	MVS0820X10S090	83.5	112.5	115.5	170.5	169	1.5	9	4
8.2	15	●	MVS0820X15S090	124.5	154.5	157.5	212.5	211	1.5	9	4
8.2	20	●	MVS0820X20S090	165.5	197.5	200.5	255.5	254	1.5	9	4
8.2	25	●	MVS0820X25S090	206.5	239.5	242.5	297.5	296	1.5	9	4
8.2	30	●	MVS0820X30S090	247.5	282.5	285.5	340.5	339	1.5	9	4
8.2	35	□	MVS0820X35S090	288.5	324.5	327.5	382.5	381	1.5	9	4
8.2	40	□	MVS0820X40S090	329.5	366.5	369.5	424.5	423	1.5	9	4
8.3	3	●	MVS0830X03S090	26.4	44.0	46.5	101.5	100	1.5	9	2
8.3	3	●	MVS0830X03S100	26.4	44.0	46.5	101.5	100	1.5	10	2
8.3	5	●	MVS0830X05S090	43.0	69.5	73.5	128.5	127	1.5	9	2
8.3	5	●	MVS0830X05S100	43.0	69.5	73.5	128.5	127	1.5	10	2
8.3	8	●	MVS0830X08S090	67.9	95.5	100.5	155.5	154	1.5	9	2
8.3	8	●	MVS0830X08S100	67.9	95.5	100.5	155.5	154	1.5	10	2
8.3	10	●	MVS0830X10S090	84.5	112.5	115.5	170.5	169	1.5	9	4
8.3	15	●	MVS0830X15S090	126.0	154.5	157.5	212.5	211	1.5	9	4
8.3	20	●	MVS0830X20S090	167.5	197.5	200.5	255.5	254	1.5	9	4
8.3	25	●	MVS0830X25S090	209.0	239.5	242.5	297.5	296	1.5	9	4
8.3	30	●	MVS0830X30S090	250.5	282.5	285.5	340.5	339	1.5	9	4
8.3	35	□	MVS0830X35S090	292.0	324.5	327.5	382.5	381	1.5	9	4
8.3	40	□	MVS0830X40S090	333.5	366.5	369.5	424.5	423	1.5	9	4
8.4	3	●	MVS0840X03S090	26.7	44.0	46.5	101.5	100	1.5	9	2
8.4	3	●	MVS0840X03S100	26.7	44.0	46.5	101.5	100	1.5	10	2
8.4	5	●	MVS0840X05S090	43.5	69.5	73.5	128.5	127	1.5	9	2
8.4	5	●	MVS0840X05S100	43.5	69.5	73.5	128.5	127	1.5	10	2
8.4	8	●	MVS0840X08S090	68.7	95.5	100.5	155.5	154	1.5	9	2
8.4	8	●	MVS0840X08S100	68.7	95.5	100.5	155.5	154	1.5	10	2
8.4	10	●	MVS0840X10S090	85.5	112.5	115.5	170.5	169	1.5	9	4
8.4	15	●	MVS0840X15S090	127.5	154.5	157.5	212.5	211	1.5	9	4
8.4	20	●	MVS0840X20S090	169.5	197.5	200.5	255.5	254	1.5	9	4
8.4	25	●	MVS0840X25S090	211.5	239.5	242.5	297.5	296	1.5	9	4
8.4	30	●	MVS0840X30S090	253.5	282.5	285.5	340.5	339	1.5	9	4
8.4	35	□	MVS0840X35S090	295.5	324.5	327.5	382.5	381	1.5	9	4
8.4	40	□	MVS0840X40S090	337.5	366.5	369.5	424.5	423	1.5	9	4
8.5	3	●	MVS0850X03S090	27.0	44.0	46.5	101.5	100	1.5	9	2
8.5	3	●	MVS0850X03S100	27.0	44.0	46.5	101.5	100	1.5	10	2
8.5	5	●	MVS0850X05S090	44.0	69.5	73.5	128.5	127	1.5	9	2
8.5	5	●	MVS0850X05S100	44.0	69.5	73.5	128.5	127	1.5	10	2
8.5	8	●	MVS0850X08S090	69.5	95.5	100.5	155.5	154	1.5	9	2
8.5	8	●	MVS0850X08S100	69.5	95.5	100.5	155.5	154	1.5	10	2
8.5	10	●	MVS0850X10S090	86.5	112.5	115.5	170.5	169	1.5	9	4
8.5	15	●	MVS0850X15S090	129.0	154.5	157.5	212.5	211	1.5	9	4
8.5	20	●	MVS0850X20S090	171.5	197.5	200.5	255.5	254	1.5	9	4
8.5	25	●	MVS0850X25S090	214.0	239.5	242.5	297.5	296	1.5	9	4
8.5	30	●	MVS0850X30S090	256.5	282.5	285.5	340.5	339	1.5	9	4
8.5	35	●	MVS0850X35S090	299.0	324.5	327.5	382.5	381	1.5	9	4
8.5	40	●	MVS0850X40S090	341.5	366.5	369.5	424.5	423	1.5	9	4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.6	3	●	MVS0860X03S090	27.4	46.6	46.6	101.6	100	1.6	9	2
8.6	3	●	MVS0860X03S100	27.4	46.6	48.6	101.6	100	1.6	10	2
8.6	5	●	MVS0860X05S090	44.6	73.6	73.6	128.6	127	1.6	9	2
8.6	5	●	MVS0860X05S100	44.6	73.6	75.6	128.6	127	1.6	10	2
8.6	8	●	MVS0860X08S090	70.4	100.6	100.6	155.6	154	1.6	9	2
8.6	8	●	MVS0860X08S100	70.4	100.6	102.6	155.6	154	1.6	10	2
8.6	10	●	MVS0860X10S090	87.6	118.6	121.6	176.6	175	1.6	9	4
8.6	15	●	MVS0860X15S090	130.6	163.6	166.6	221.6	220	1.6	9	4
8.6	20	●	MVS0860X20S090	173.6	208.6	211.6	266.6	265	1.6	9	4
8.6	25	●	MVS0860X25S090	216.6	253.6	256.6	311.6	310	1.6	9	4
8.6	30	●	MVS0860X30S090	259.6	298.6	301.6	356.6	355	1.6	9	4
8.6	35	□	MVS0860X35S090	302.6	343.6	346.6	401.6	400	1.6	9	4
8.6	40	□	MVS0860X40S090	345.6	391.6	394.6	449.6	448	1.6	9	4
8.7	3	●	MVS0870X03S090	27.7	46.6	46.6	101.6	100	1.6	9	2
8.7	3	●	MVS0870X03S100	27.7	46.6	48.6	101.6	100	1.6	10	2
8.7	5	●	MVS0870X05S090	45.1	73.6	73.6	128.6	127	1.6	9	2
8.7	5	●	MVS0870X05S100	45.1	73.6	75.6	128.6	127	1.6	10	2
8.7	8	●	MVS0870X08S090	71.2	100.6	100.6	155.6	154	1.6	9	2
8.7	8	●	MVS0870X08S100	71.2	100.6	102.6	155.6	154	1.6	10	2
8.7	10	●	MVS0870X10S090	88.6	118.6	121.6	176.6	175	1.6	9	4
8.7	15	●	MVS0870X15S090	132.1	163.6	166.6	221.6	220	1.6	9	4
8.7	20	●	MVS0870X20S090	175.6	208.6	211.6	266.6	265	1.6	9	4
8.7	25	●	MVS0870X25S090	219.1	253.6	256.6	311.6	310	1.6	9	4
8.7	30	●	MVS0870X30S090	262.6	298.6	301.6	356.6	355	1.6	9	4
8.7	35	□	MVS0870X35S090	306.1	343.6	346.6	401.6	400	1.6	9	4
8.7	40	□	MVS0870X40S090	349.6	391.6	394.6	449.6	448	1.6	9	4
8.8	3	●	MVS0880X03S090	28.0	46.6	46.6	101.6	100	1.6	9	2
8.8	3	●	MVS0880X03S100	28.0	46.6	48.6	101.6	100	1.6	10	2
8.8	5	●	MVS0880X05S090	45.6	73.6	73.6	128.6	127	1.6	9	2
8.8	5	●	MVS0880X05S100	45.6	73.6	75.6	128.6	127	1.6	10	2
8.8	8	●	MVS0880X08S090	72.0	100.6	100.6	155.6	154	1.6	9	2
8.8	8	●	MVS0880X08S100	72.0	100.6	102.6	155.6	154	1.6	10	2
8.8	10	●	MVS0880X10S090	89.6	118.6	121.6	176.6	175	1.6	9	4
8.8	15	●	MVS0880X15S090	133.6	163.6	166.6	221.6	220	1.6	9	4
8.8	20	●	MVS0880X20S090	177.6	208.6	211.6	266.6	265	1.6	9	4
8.8	25	●	MVS0880X25S090	221.6	253.6	256.6	311.6	310	1.6	9	4
8.8	30	●	MVS0880X30S090	265.6	298.6	301.6	356.6	355	1.6	9	4
8.8	35	□	MVS0880X35S090	309.6	343.6	346.6	401.6	400	1.6	9	4
8.8	40	□	MVS0880X40S090	353.6	391.6	394.6	449.6	448	1.6	9	4
8.9	3	●	MVS0890X03S090	28.3	46.6	46.6	101.6	100	1.6	9	2
8.9	3	●	MVS0890X03S100	28.3	46.6	48.6	101.6	100	1.6	10	2
8.9	5	●	MVS0890X05S090	46.1	73.6	73.6	128.6	127	1.6	9	2
8.9	5	●	MVS0890X05S100	46.1	73.6	75.6	128.6	127	1.6	10	2
8.9	8	●	MVS0890X08S090	72.8	100.6	100.6	155.6	154	1.6	9	2
8.9	8	●	MVS0890X08S100	72.8	100.6	102.6	155.6	154	1.6	10	2
8.9	10	●	MVS0890X10S090	90.6	118.6	121.6	176.6	175	1.6	9	4
8.9	15	●	MVS0890X15S090	135.1	163.6	166.6	221.6	220	1.6	9	4
8.9	20	●	MVS0890X20S090	179.6	208.6	211.6	266.6	265	1.6	9	4

MVS

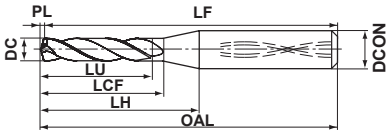
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.9	25	●	MVS0890X25S090	224.1	253.6	256.6	311.6	310	1.6	9	4
8.9	30	●	MVS0890X30S090	268.6	298.6	301.6	356.6	355	1.6	9	4
8.9	35	□	MVS0890X35S090	313.1	343.6	346.6	401.6	400	1.6	9	4
8.9	40	□	MVS0890X40S090	357.6	391.6	394.6	449.6	448	1.6	9	4
9.0	3	●	MVS0900X03S090	28.6	46.6	46.6	101.6	100	1.6	9	2
9.0	3	●	MVS0900X03S100	28.6	46.6	48.6	101.6	100	1.6	10	2
9.0	5	●	MVS0900X05S090	46.6	73.6	73.6	128.6	127	1.6	9	2
9.0	5	●	MVS0900X05S100	46.6	73.6	75.6	128.6	127	1.6	10	2
9.0	8	●	MVS0900X08S090	73.6	100.6	100.6	155.6	154	1.6	9	2
9.0	8	●	MVS0900X08S100	73.6	100.6	102.6	155.6	154	1.6	10	2
9.0	10	●	MVS0900X10S090	91.6	118.6	121.6	176.6	175	1.6	9	4
9.0	15	●	MVS0900X15S090	136.6	163.6	166.6	221.6	220	1.6	9	4
9.0	20	●	MVS0900X20S090	181.6	208.6	211.6	266.6	265	1.6	9	4
9.0	25	●	MVS0900X25S090	226.6	253.6	256.6	311.6	310	1.6	9	4
9.0	30	●	MVS0900X30S090	271.6	298.6	301.6	356.6	355	1.6	9	4
9.0	35	●	MVS0900X35S090	316.6	343.6	346.6	401.6	400	1.6	9	4
9.0	40	●	MVS0900X40S090	361.6	391.6	394.6	449.6	448	1.6	9	4
9.1	3	●	MVS0910X03S100	29.0	49.2	51.7	107.7	106	1.7	10	2
9.1	5	●	MVS0910X05S100	47.2	77.7	81.7	137.7	136	1.7	10	2
9.1	8	●	MVS0910X08S100	74.5	106.7	111.7	167.7	166	1.7	10	2
9.1	10	●	MVS0910X10S100	92.7	125.7	128.7	183.7	182	1.7	10	4
9.1	15	●	MVS0910X15S100	138.2	172.7	175.7	230.7	229	1.7	10	4
9.1	20	●	MVS0910X20S100	183.7	220.7	223.7	278.7	277	1.7	10	4
9.1	25	●	MVS0910X25S100	229.2	267.7	270.7	325.7	324	1.7	10	4
9.1	30	●	MVS0910X30S100	274.7	315.7	318.7	373.7	372	1.7	10	4
9.1	35	□	MVS0910X35S100	320.2	362.7	365.7	420.7	419	1.7	10	4
9.2	3	●	MVS0920X03S100	29.3	49.2	51.7	107.7	106	1.7	10	2
9.2	5	●	MVS0920X05S100	47.7	77.7	81.7	137.7	136	1.7	10	2
9.2	8	●	MVS0920X08S100	75.3	106.7	111.7	167.7	166	1.7	10	2
9.2	10	●	MVS0920X10S100	93.7	125.7	128.7	183.7	182	1.7	10	4
9.2	15	●	MVS0920X15S100	139.7	172.7	175.7	230.7	229	1.7	10	4
9.2	20	●	MVS0920X20S100	185.7	220.7	223.7	278.7	277	1.7	10	4
9.2	25	●	MVS0920X25S100	231.7	267.7	270.7	325.7	324	1.7	10	4
9.2	30	●	MVS0920X30S100	277.7	315.7	318.7	373.7	372	1.7	10	4
9.2	35	□	MVS0920X35S100	323.7	362.7	365.7	420.7	419	1.7	10	4
9.3	3	●	MVS0930X03S100	29.6	49.2	51.7	107.7	106	1.7	10	2
9.3	5	●	MVS0930X05S100	48.2	77.7	81.7	137.7	136	1.7	10	2
9.3	8	●	MVS0930X08S100	76.1	106.7	111.7	167.7	166	1.7	10	2
9.3	10	●	MVS0930X10S100	94.7	125.7	128.7	183.7	182	1.7	10	4
9.3	15	●	MVS0930X15S100	141.2	172.7	175.7	230.7	229	1.7	10	4
9.3	20	●	MVS0930X20S100	187.7	220.7	223.7	278.7	277	1.7	10	4
9.3	25	●	MVS0930X25S100	234.2	267.7	270.7	325.7	324	1.7	10	4
9.3	30	●	MVS0930X30S100	280.7	315.7	318.7	373.7	372	1.7	10	4
9.3	35	□	MVS0930X35S100	327.2	362.7	365.7	420.7	419	1.7	10	4
9.4	3	●	MVS0940X03S100	29.9	49.2	51.7	107.7	106	1.7	10	2
9.4	5	●	MVS0940X05S100	48.7	77.7	81.7	137.7	136	1.7	10	2
9.4	8	●	MVS0940X08S100	76.9	106.7	111.7	167.7	166	1.7	10	2
9.4	10	●	MVS0940X10S100	95.7	125.7	128.7	183.7	182	1.7	10	4

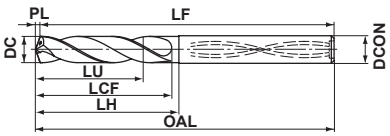
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
9.4	15	●	MVS0940X15S100	142.7	172.7	175.7	230.7	229	1.7	10	4
9.4	20	●	MVS0940X20S100	189.7	220.7	223.7	278.7	277	1.7	10	4
9.4	25	●	MVS0940X25S100	236.7	267.7	270.7	325.7	324	1.7	10	4
9.4	30	●	MVS0940X30S100	283.7	315.7	318.7	373.7	372	1.7	10	4
9.4	35	□	MVS0940X35S100	330.7	362.7	365.7	420.7	419	1.7	10	4
9.5	3	●	MVS0950X03S100	30.2	49.2	51.7	107.7	106	1.7	10	2
9.5	5	●	MVS0950X05S100	49.2	77.7	81.7	137.7	136	1.7	10	2
9.5	8	●	MVS0950X08S100	77.7	106.7	111.7	167.7	166	1.7	10	2
9.5	10	●	MVS0950X10S100	96.7	125.7	128.7	183.7	182	1.7	10	4
9.5	15	●	MVS0950X15S100	144.2	172.7	175.7	230.7	229	1.7	10	4
9.5	20	●	MVS0950X20S100	191.7	220.7	223.7	278.7	277	1.7	10	4
9.5	25	●	MVS0950X25S100	239.2	267.7	270.7	325.7	324	1.7	10	4
9.5	30	●	MVS0950X30S100	286.7	315.7	318.7	373.7	372	1.7	10	4
9.5	35	●	MVS0950X35S100	334.2	362.7	365.7	420.7	419	1.7	10	4
9.6	3	●	MVS0960X03S100	30.5	51.7	51.7	107.7	106	1.7	10	2
9.6	5	●	MVS0960X05S100	49.7	81.7	81.7	137.7	136	1.7	10	2
9.6	8	●	MVS0960X08S100	78.5	111.7	111.7	167.7	166	1.7	10	2
9.6	10	●	MVS0960X10S100	97.7	131.7	134.7	189.7	188	1.7	10	4
9.6	15	●	MVS0960X15S100	145.7	181.7	184.7	239.7	238	1.7	10	4
9.6	20	●	MVS0960X20S100	193.7	231.7	234.7	289.7	288	1.7	10	4
9.6	25	●	MVS0960X25S100	241.7	281.7	284.7	339.7	338	1.7	10	4
9.6	30	●	MVS0960X30S100	289.7	331.7	334.7	389.7	388	1.7	10	4
9.6	35	□	MVS0960X35S100	337.7	381.7	384.7	439.7	438	1.7	10	4
9.7	3	●	MVS0970X03S100	30.9	51.8	51.8	107.8	106	1.8	10	2
9.7	5	●	MVS0970X05S100	50.3	81.8	81.8	137.8	136	1.8	10	2
9.7	8	●	MVS0970X08S100	79.4	111.8	111.8	167.8	166	1.8	10	2
9.7	10	●	MVS0970X10S100	98.8	131.8	134.8	189.8	188	1.8	10	4
9.7	15	●	MVS0970X15S100	147.3	181.8	184.8	239.8	238	1.8	10	4
9.7	20	●	MVS0970X20S100	195.8	231.8	234.8	289.8	288	1.8	10	4
9.7	25	●	MVS0970X25S100	244.3	281.8	284.8	339.8	338	1.8	10	4
9.7	30	●	MVS0970X30S100	292.8	331.8	334.8	389.8	388	1.8	10	4
9.7	35	□	MVS0970X35S100	341.3	381.8	384.8	439.8	438	1.8	10	4
9.8	3	●	MVS0980X03S100	31.2	51.8	51.8	107.8	106	1.8	10	2
9.8	5	●	MVS0980X05S100	50.8	81.8	81.8	137.8	136	1.8	10	2
9.8	8	●	MVS0980X08S100	80.2	111.8	111.8	167.8	166	1.8	10	2
9.8	10	●	MVS0980X10S100	99.8	131.8	134.8	189.8	188	1.8	10	4
9.8	15	●	MVS0980X15S100	148.8	181.8	184.8	239.8	238	1.8	10	4
9.8	20	●	MVS0980X20S100	197.8	231.8	234.8	289.8	288	1.8	10	4
9.8	25	●	MVS0980X25S100	246.8	281.8	284.8	339.8	338	1.8	10	4
9.8	30	●	MVS0980X30S100	295.8	331.8	334.8	389.8	388	1.8	10	4
9.8	35	□	MVS0980X35S100	344.8	381.8	384.8	439.8	438	1.8	10	4
9.9	3	●	MVS0990X03S100	31.5	51.8	51.8	107.8	106	1.8	10	2
9.9	5	●	MVS0990X05S100	51.3	81.8	81.8	137.8	136	1.8	10	2
9.9	8	●	MVS0990X08S100	81.0	111.8	111.8	167.8	166	1.8	10	2
9.9	10	●	MVS0990X10S100	100.8	131.8	134.8	189.8	188	1.8	10	4
9.9	15	●	MVS0990X15S100	150.3	181.8	184.8	239.8	238	1.8	10	4
9.9	20	●	MVS0990X20S100	199.8	231.8	234.8	289.8	288	1.8	10	4
9.9	25	●	MVS0990X25S100	249.3	281.8	284.8	339.8	338	1.8	10	4

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
9.9	30	●	MVS0990X30S100	298.8	331.8	334.8	389.8	388	1.8	10	4
9.9	35	□	MVS0990X35S100	348.3	381.8	384.8	439.8	438	1.8	10	4
10.0	3	●	MVS1000X03S100	31.8	51.8	51.8	107.8	106	1.8	10	2
10.0	5	●	MVS1000X05S100	51.8	81.8	81.8	137.8	136	1.8	10	2
10.0	8	●	MVS1000X08S100	81.8	111.8	111.8	167.8	166	1.8	10	2
10.0	10	●	MVS1000X10S100	101.8	131.8	134.8	189.8	188	1.8	10	4
10.0	15	●	MVS1000X15S100	151.8	181.8	184.8	239.8	238	1.8	10	4
10.0	20	●	MVS1000X20S100	201.8	231.8	234.8	289.8	288	1.8	10	4
10.0	25	●	MVS1000X25S100	251.8	281.8	284.8	339.8	338	1.8	10	4
10.0	30	●	MVS1000X30S100	301.8	331.8	334.8	389.8	388	1.8	10	4
10.0	35	●	MVS1000X35S100	351.8	381.8	384.8	439.8	438	1.8	10	4
10.1	3	●	MVS1010X03S110	32.1	54.3	56.8	117.8	116	1.8	11	2
10.1	3	●	MVS1010X03S120	32.1	54.3	56.8	117.8	116	1.8	12	2
10.1	5	●	MVS1010X05S110	52.3	85.8	89.8	150.8	149	1.8	11	2
10.1	5	●	MVS1010X05S120	52.3	85.8	89.8	150.8	149	1.8	12	2
10.1	8	●	MVS1010X08S110	82.6	117.8	122.8	183.8	182	1.8	11	2
10.1	8	●	MVS1010X08S120	82.6	117.8	122.8	183.8	182	1.8	12	2
10.1	10	●	MVS1010X10S110	102.8	138.8	141.8	202.8	201	1.8	11	4
10.1	15	●	MVS1010X15S110	153.3	190.8	193.8	254.8	253	1.8	11	4
10.1	20	●	MVS1010X20S110	203.8	243.8	246.8	307.8	306	1.8	11	4
10.1	25	●	MVS1010X25S110	254.3	295.8	298.8	359.8	358	1.8	11	4
10.2	3	●	MVS1020X03S110	32.5	54.4	56.9	117.9	116	1.9	11	2
10.2	3	●	MVS1020X03S120	32.5	54.4	56.9	117.9	116	1.9	12	2
10.2	5	●	MVS1020X05S110	52.9	85.9	89.9	150.9	149	1.9	11	2
10.2	5	●	MVS1020X05S120	52.9	85.9	89.9	150.9	149	1.9	12	2
10.2	8	●	MVS1020X08S110	83.5	117.9	122.9	183.9	182	1.9	11	2
10.2	8	●	MVS1020X08S120	83.5	117.9	122.9	183.9	182	1.9	12	2
10.2	10	●	MVS1020X10S110	103.9	138.9	141.9	202.9	201	1.9	11	4
10.2	15	●	MVS1020X15S110	154.9	190.9	193.9	254.9	253	1.9	11	4
10.2	20	●	MVS1020X20S110	205.9	243.9	246.9	307.9	306	1.9	11	4
10.2	25	●	MVS1020X25S110	256.9	295.9	298.9	359.9	358	1.9	11	4
10.3	3	●	MVS1030X03S110	32.8	54.4	56.9	117.9	116	1.9	11	2
10.3	3	●	MVS1030X03S120	32.8	54.4	56.9	117.9	116	1.9	12	2
10.3	5	●	MVS1030X05S110	53.4	85.9	89.9	150.9	149	1.9	11	2
10.3	5	●	MVS1030X05S120	53.4	85.9	89.9	150.9	149	1.9	12	2
10.3	8	●	MVS1030X08S110	84.3	117.9	122.9	183.9	182	1.9	11	2
10.3	8	●	MVS1030X08S120	84.3	117.9	122.9	183.9	182	1.9	12	2
10.3	10	●	MVS1030X10S110	104.9	138.9	141.9	202.9	201	1.9	11	4
10.3	15	●	MVS1030X15S110	156.4	190.9	193.9	254.9	253	1.9	11	4
10.3	20	●	MVS1030X20S110	207.9	243.9	246.9	307.9	306	1.9	11	4
10.3	25	●	MVS1030X25S110	259.4	295.9	298.9	359.9	358	1.9	11	4
10.4	3	●	MVS1040X03S110	33.1	54.4	56.9	117.9	116	1.9	11	2
10.4	3	●	MVS1040X03S120	33.1	54.4	56.9	117.9	116	1.9	12	2
10.4	5	●	MVS1040X05S110	53.9	85.9	89.9	150.9	149	1.9	11	2
10.4	5	●	MVS1040X05S120	53.9	85.9	89.9	150.9	149	1.9	12	2
10.4	8	●	MVS1040X08S110	85.1	117.9	122.9	183.9	182	1.9	11	2
10.4	8	●	MVS1040X08S120	85.1	117.9	122.9	183.9	182	1.9	12	2
10.4	10	●	MVS1040X10S110	105.9	138.9	141.9	202.9	201	1.9	11	4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
10.4	15	●	MVS1040X15S110	157.9	190.9	193.9	254.9	253	1.9	11	4
10.4	20	●	MVS1040X20S110	209.9	243.9	246.9	307.9	306	1.9	11	4
10.4	25	●	MVS1040X25S110	261.9	295.9	298.9	359.9	358	1.9	11	4
10.5	3	●	MVS1050X03S110	33.4	54.4	56.9	117.9	116	1.9	11	2
10.5	3	●	MVS1050X03S120	33.4	54.4	56.9	117.9	116	1.9	12	2
10.5	5	●	MVS1050X05S110	54.4	85.9	89.9	150.9	149	1.9	11	2
10.5	5	●	MVS1050X05S120	54.4	85.9	89.9	150.9	149	1.9	12	2
10.5	8	●	MVS1050X08S110	85.9	117.9	122.9	183.9	182	1.9	11	2
10.5	8	●	MVS1050X08S120	85.9	117.9	122.9	183.9	182	1.9	12	2
10.5	10	●	MVS1050X10S110	106.9	138.9	141.9	202.9	201	1.9	11	4
10.5	15	●	MVS1050X15S110	159.4	190.9	193.9	254.9	253	1.9	11	4
10.5	20	●	MVS1050X20S110	211.9	243.9	246.9	307.9	306	1.9	11	4
10.5	25	●	MVS1050X25S110	264.4	295.9	298.9	359.9	358	1.9	11	4
10.6	3	●	MVS1060X03S110	33.7	56.9	56.9	117.9	116	1.9	11	2
10.6	3	●	MVS1060X03S120	33.7	56.9	57.9	117.9	116	1.9	12	2
10.6	5	●	MVS1060X05S110	54.9	89.9	89.9	150.9	149	1.9	11	2
10.6	5	●	MVS1060X05S120	54.9	89.9	90.9	150.9	149	1.9	12	2
10.6	8	●	MVS1060X08S110	86.7	122.9	122.9	183.9	182	1.9	11	2
10.6	8	●	MVS1060X08S120	86.7	122.9	123.9	183.9	182	1.9	12	2
10.6	10	●	MVS1060X10S110	107.9	144.9	147.9	208.9	207	1.9	11	4
10.6	15	●	MVS1060X15S110	160.9	199.9	202.9	263.9	262	1.9	11	4
10.6	20	●	MVS1060X20S110	213.9	254.9	257.9	318.9	317	1.9	11	4
10.6	25	●	MVS1060X25S110	266.9	309.9	312.9	373.9	372	1.9	11	4
10.7	3	●	MVS1070X03S110	34.0	56.9	56.9	117.9	116	1.9	11	2
10.7	3	●	MVS1070X03S120	34.0	56.9	57.9	117.9	116	1.9	12	2
10.7	5	●	MVS1070X05S110	55.4	89.9	89.9	150.9	149	1.9	11	2
10.7	5	●	MVS1070X05S120	55.4	89.9	90.9	150.9	149	1.9	12	2
10.7	8	●	MVS1070X08S110	87.5	122.9	122.9	183.9	182	1.9	11	2
10.7	8	●	MVS1070X08S120	87.5	122.9	123.9	183.9	182	1.9	12	2
10.7	10	●	MVS1070X10S110	108.9	144.9	147.9	208.9	207	1.9	11	4
10.7	15	●	MVS1070X15S110	162.4	199.9	202.9	263.9	262	1.9	11	4
10.7	20	●	MVS1070X20S110	215.9	254.9	257.9	318.9	317	1.9	11	4
10.7	25	●	MVS1070X25S110	269.4	309.9	312.9	373.9	372	1.9	11	4
10.8	3	●	MVS1080X03S110	34.4	57.0	57.0	118.0	116	2.0	11	2
10.8	3	●	MVS1080X03S120	34.4	57.0	58.0	118.0	116	2.0	12	2
10.8	5	●	MVS1080X05S110	56.0	90.0	90.0	151.0	149	2.0	11	2
10.8	5	●	MVS1080X05S120	56.0	90.0	91.0	151.0	149	2.0	12	2
10.8	8	●	MVS1080X08S110	88.4	123.0	123.0	184.0	182	2.0	11	2
10.8	8	●	MVS1080X08S120	88.4	123.0	124.0	184.0	182	2.0	12	2
10.8	10	●	MVS1080X10S110	110.0	145.0	148.0	209.0	207	2.0	11	4
10.8	15	●	MVS1080X15S110	164.0	200.0	203.0	264.0	262	2.0	11	4
10.8	20	●	MVS1080X20S110	218.0	255.0	258.0	319.0	317	2.0	11	4
10.8	25	●	MVS1080X25S110	272.0	310.0	313.0	374.0	372	2.0	11	4
10.9	3	●	MVS1090X03S110	34.7	57.0	57.0	118.0	116	2.0	11	2
10.9	3	●	MVS1090X03S120	34.7	57.0	58.0	118.0	116	2.0	12	2
10.9	5	●	MVS1090X05S110	56.5	90.0	90.0	151.0	149	2.0	11	2
10.9	5	●	MVS1090X05S120	56.5	90.0	91.0	151.0	149	2.0	12	2
10.9	8	●	MVS1090X08S110	89.2	123.0	123.0	184.0	182	2.0	11	2

MVS

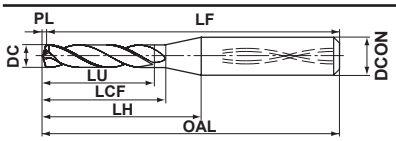
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
10.9	8	●	MVS1090X08S120	89.2	123.0	124.0	184.0	182	2.0	12	2
10.9	10	●	MVS1090X10S110	111.0	145.0	148.0	209.0	207	2.0	11	4
10.9	15	●	MVS1090X15S110	165.5	200.0	203.0	264.0	262	2.0	11	4
10.9	20	●	MVS1090X20S110	220.0	255.0	258.0	319.0	317	2.0	11	4
10.9	25	●	MVS1090X25S110	274.5	310.0	313.0	374.0	372	2.0	11	4
11.0	3	●	MVS1100X03S110	35.0	57.0	57.0	118.0	116	2.0	11	2
11.0	3	●	MVS1100X03S120	35.0	57.0	58.0	118.0	116	2.0	12	2
11.0	5	●	MVS1100X05S110	57.0	90.0	90.0	151.0	149	2.0	11	2
11.0	5	●	MVS1100X05S120	57.0	90.0	91.0	151.0	149	2.0	12	2
11.0	8	●	MVS1100X08S110	90.0	123.0	123.0	184.0	182	2.0	11	2
11.0	8	●	MVS1100X08S120	90.0	123.0	124.0	184.0	182	2.0	12	2
11.0	10	●	MVS1100X10S110	112.0	145.0	147.0	209.0	207	2.0	11	4
11.0	15	●	MVS1100X15S110	167.0	200.0	203.0	264.0	262	2.0	11	4
11.0	20	●	MVS1100X20S110	222.0	255.0	258.0	319.0	317	2.0	11	4
11.0	25	●	MVS1100X25S110	277.0	310.0	313.0	374.0	372	2.0	11	4
11.1	3	●	MVS1110X03S120	35.3	59.5	62.0	124.0	122	2.0	12	2
11.1	5	●	MVS1110X05S120	57.5	94.0	98.0	160.0	158	2.0	12	2
11.1	8	●	MVS1110X08S120	90.8	129.0	134.0	196.0	194	2.0	12	2
11.1	10	●	MVS1110X10S120	113.0	152.0	155.0	217.0	215	2.0	12	4
11.1	15	●	MVS1110X15S120	168.5	209.0	212.0	274.0	272	2.0	12	4
11.1	20	●	MVS1110X20S120	224.0	267.0	270.0	332.0	330	2.0	12	4
11.1	25	●	MVS1110X25S120	279.5	324.0	327.0	389.0	387	2.0	12	4
11.2	3	●	MVS1120X03S120	35.6	59.5	62.0	124.0	122	2.0	12	2
11.2	5	●	MVS1120X05S120	58.0	94.0	98.0	160.0	158	2.0	12	2
11.2	8	●	MVS1120X08S120	91.6	129.0	134.0	196.0	194	2.0	12	2
11.2	10	●	MVS1120X10S120	114.0	152.0	155.0	217.0	215	2.0	12	4
11.2	15	●	MVS1120X15S120	170.0	209.0	212.0	274.0	272	2.0	12	4
11.2	20	●	MVS1120X20S120	226.0	267.0	270.0	332.0	330	2.0	12	4
11.2	25	●	MVS1120X25S120	282.0	324.0	327.0	389.0	387	2.0	12	4
11.3	3	●	MVS1130X03S120	36.0	59.6	62.1	124.1	122	2.1	12	2
11.3	5	●	MVS1130X05S120	58.6	94.1	98.1	160.1	158	2.1	12	2
11.3	8	●	MVS1130X08S120	92.5	129.1	134.1	196.1	194	2.1	12	2
11.3	10	●	MVS1130X10S120	115.1	152.1	155.1	217.1	215	2.1	12	4
11.3	15	●	MVS1130X15S120	171.6	209.1	212.1	274.1	272	2.1	12	4
11.3	20	●	MVS1130X20S120	228.1	267.1	270.1	332.1	330	2.1	12	4
11.3	25	●	MVS1130X25S120	284.6	324.1	327.1	389.1	387	2.1	12	4
11.4	3	●	MVS1140X03S120	36.3	59.6	62.1	124.1	122	2.1	12	2
11.4	5	●	MVS1140X05S120	59.1	94.1	98.1	160.1	158	2.1	12	2
11.4	8	●	MVS1140X08S120	93.3	129.1	134.1	196.1	194	2.1	12	2
11.4	10	●	MVS1140X10S120	116.1	152.1	155.1	217.1	215	2.1	12	4
11.4	15	●	MVS1140X15S120	173.1	209.1	212.1	274.1	272	2.1	12	4
11.4	20	●	MVS1140X20S120	230.1	267.1	270.1	332.1	330	2.1	12	4
11.4	25	●	MVS1140X25S120	287.1	324.1	327.1	389.1	387	2.1	12	4
11.5	3	●	MVS1150X03S120	36.6	59.6	62.1	124.1	122	2.1	12	2
11.5	5	●	MVS1150X05S120	59.6	94.1	98.1	160.1	158	2.1	12	2
11.5	8	●	MVS1150X08S120	94.1	129.1	134.1	196.1	194	2.1	12	2
11.5	10	●	MVS1150X10S120	117.1	152.1	155.1	217.1	215	2.1	12	4
11.5	15	●	MVS1150X15S120	174.6	209.1	212.1	274.1	272	2.1	12	4

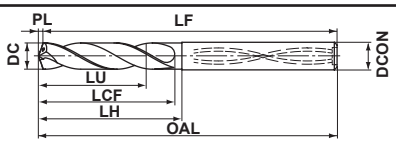
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
11.5	20	●	MVS1150X20S120	232.1	267.1	270.1	332.1	330	2.1	12	4
11.5	25	●	MVS1150X25S120	289.6	324.1	327.1	389.1	387	2.1	12	4
11.6	3	●	MVS1160X03S120	36.9	62.1	62.1	124.1	122	2.1	12	2
11.6	5	●	MVS1160X05S120	60.1	98.1	98.1	160.1	158	2.1	12	2
11.6	8	●	MVS1160X08S120	94.9	134.1	134.1	196.1	194	2.1	12	2
11.6	10	●	MVS1160X10S120	118.1	158.1	161.1	223.1	221	2.1	12	4
11.6	15	●	MVS1160X15S120	176.1	218.1	221.1	283.1	281	2.1	12	4
11.6	20	●	MVS1160X20S120	234.1	278.1	281.1	343.1	341	2.1	12	4
11.6	25	●	MVS1160X25S120	292.1	338.1	341.1	403.1	401	2.1	12	4
11.7	3	●	MVS1170X03S120	37.2	62.1	62.1	124.1	122	2.1	12	2
11.7	5	●	MVS1170X05S120	60.6	98.1	98.1	160.1	158	2.1	12	2
11.7	8	●	MVS1170X08S120	95.7	134.1	134.1	196.1	194	2.1	12	2
11.7	10	●	MVS1170X10S120	119.1	158.1	161.1	223.1	221	2.1	12	4
11.7	15	●	MVS1170X15S120	177.6	218.1	221.1	283.1	281	2.1	12	4
11.7	20	●	MVS1170X20S120	236.1	278.1	281.1	343.1	341	2.1	12	4
11.7	25	●	MVS1170X25S120	294.6	338.1	341.1	403.1	401	2.1	12	4
11.8	3	●	MVS1180X03S120	37.5	62.1	62.1	124.1	122	2.1	12	2
11.8	5	●	MVS1180X05S120	61.1	98.1	98.1	160.1	158	2.1	12	2
11.8	8	●	MVS1180X08S120	96.5	134.1	134.1	196.1	194	2.1	12	2
11.8	10	●	MVS1180X10S120	120.1	158.1	161.1	223.1	221	2.1	12	4
11.8	15	●	MVS1180X15S120	179.1	218.1	221.1	283.1	281	2.1	12	4
11.8	20	●	MVS1180X20S120	238.1	278.1	281.1	343.1	341	2.1	12	4
11.8	25	●	MVS1180X25S120	297.1	338.1	341.1	403.1	401	2.1	12	4
11.9	3	●	MVS1190X03S120	37.9	62.2	62.2	124.2	122	2.2	12	2
11.9	5	●	MVS1190X05S120	61.7	98.2	98.2	160.2	158	2.2	12	2
11.9	8	●	MVS1190X08S120	97.4	134.2	134.2	196.2	194	2.2	12	2
11.9	10	●	MVS1190X10S120	121.2	158.2	161.2	223.2	221	2.2	12	4
11.9	15	●	MVS1190X15S120	180.7	218.2	221.2	283.2	281	2.2	12	4
11.9	20	●	MVS1190X20S120	240.2	278.2	281.2	343.2	341	2.2	12	4
11.9	25	●	MVS1190X25S120	299.7	338.2	341.2	403.2	401	2.2	12	4
12.0	3	●	MVS1200X03S120	38.2	62.2	62.2	124.2	122	2.2	12	2
12.0	5	●	MVS1200X05S120	62.2	98.2	98.2	160.2	158	2.2	12	2
12.0	8	●	MVS1200X08S120	98.2	134.2	134.2	196.2	194	2.2	12	2
12.0	10	●	MVS1200X10S120	122.2	158.2	161.2	223.2	221	2.2	12	4
12.0	15	●	MVS1200X15S120	182.2	218.2	221.2	283.2	281	2.2	12	4
12.0	20	●	MVS1200X20S120	242.2	278.2	281.2	343.2	341	2.2	12	4
12.0	25	●	MVS1200X25S120	302.2	338.2	341.2	403.2	401	2.2	12	4
12.1	3	●	MVS1210X03S130	38.5	64.7	67.2	130.2	128	2.2	13	2
12.1	3	□	MVS1210X03S140	38.5	64.7	67.2	130.2	128	2.2	14	2
12.1	5	●	MVS1210X05S130	62.7	102.2	106.2	169.2	167	2.2	13	2
12.1	5	□	MVS1210X05S140	62.7	102.2	106.2	169.2	167	2.2	14	2
12.1	8	□	MVS1210X08S130	99.0	140.2	145.2	208.2	206	2.2	13	2
12.1	8	□	MVS1210X08S140	99.0	140.2	145.2	208.2	206	2.2	14	2
12.1	10	□	MVS1210X10S130	123.2	165.2	168.2	231.2	229	2.2	13	4
12.1	15	□	MVS1210X15S130	183.7	227.2	230.2	293.2	291	2.2	13	4
12.1	20	□	MVS1210X20S130	244.2	290.2	293.2	356.2	354	2.2	13	4
12.2	3	●	MVS1220X03S130	38.8	64.7	67.2	130.2	128	2.2	13	2
12.2	3	□	MVS1220X03S140	38.8	64.7	67.2	130.2	128	2.2	14	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
12.2	5	●	MVS1220X05S130	63.2	102.2	106.2	169.2	167	2.2	13	2
12.2	5	□	MVS1220X05S140	63.2	102.2	106.2	169.2	167	2.2	14	2
12.2	8	□	MVS1220X08S130	99.8	140.2	145.2	208.2	206	2.2	13	2
12.2	8	□	MVS1220X08S140	99.8	140.2	145.2	208.2	206	2.2	14	2
12.2	10	□	MVS1220X10S130	124.2	165.2	168.2	231.2	229	2.2	13	4
12.2	15	□	MVS1220X15S130	185.2	227.2	230.2	293.2	291	2.2	13	4
12.2	20	□	MVS1220X20S130	246.2	290.2	293.2	356.2	354	2.2	13	4
12.3	3	●	MVS1230X03S130	39.1	64.7	67.2	130.2	128	2.2	13	2
12.3	3	□	MVS1230X03S140	39.1	64.7	67.2	130.2	128	2.2	14	2
12.3	5	●	MVS1230X05S130	63.7	102.2	106.2	169.2	167	2.2	13	2
12.3	5	□	MVS1230X05S140	63.7	102.2	106.2	169.2	167	2.2	14	2
12.3	8	□	MVS1230X08S130	100.6	140.2	145.2	208.2	206	2.2	13	2
12.3	8	□	MVS1230X08S140	100.6	140.2	145.2	208.2	206	2.2	14	2
12.3	10	□	MVS1230X10S130	125.2	165.2	168.2	231.2	229	2.2	13	4
12.3	15	□	MVS1230X15S130	186.7	227.2	230.2	293.2	291	2.2	13	4
12.3	20	□	MVS1230X20S130	248.2	290.2	293.2	356.2	354	2.2	13	4
12.4	3	●	MVS1240X03S130	39.5	64.8	67.3	130.3	128	2.3	13	2
12.4	3	□	MVS1240X03S140	39.5	64.8	67.3	130.3	128	2.3	14	2
12.4	5	●	MVS1240X05S130	64.3	102.3	106.3	169.3	167	2.3	13	2
12.4	5	□	MVS1240X05S140	64.3	102.3	106.3	169.3	167	2.3	14	2
12.4	8	□	MVS1240X08S130	101.5	140.3	145.3	208.3	206	2.3	13	2
12.4	8	□	MVS1240X08S140	101.5	140.3	145.3	208.3	206	2.3	14	2
12.4	10	□	MVS1240X10S130	126.3	165.3	168.3	231.3	229	2.3	13	4
12.4	15	□	MVS1240X15S130	188.3	227.3	230.3	293.3	291	2.3	13	4
12.4	20	□	MVS1240X20S130	250.3	290.3	293.3	356.3	354	2.3	13	4
12.5	3	●	MVS1250X03S130	39.8	64.8	67.3	130.3	128	2.3	13	2
12.5	3	□	MVS1250X03S140	39.8	64.8	67.3	130.3	128	2.3	14	2
12.5	5	●	MVS1250X05S130	64.8	102.3	106.3	169.3	167	2.3	13	2
12.5	5	□	MVS1250X05S140	64.8	102.3	106.3	169.3	167	2.3	14	2
12.5	8	●	MVS1250X08S130	102.3	140.3	145.3	208.3	206	2.3	13	2
12.5	8	□	MVS1250X08S140	102.3	140.3	145.3	208.3	206	2.3	14	2
12.5	10	●	MVS1250X10S130	127.3	165.3	168.3	231.3	229	2.3	13	4
12.5	15	●	MVS1250X15S130	189.8	227.3	230.3	293.3	291	2.3	13	4
12.5	20	●	MVS1250X20S130	252.3	290.3	293.3	356.3	354	2.3	13	4
12.6	3	●	MVS1260X03S130	40.1	67.3	67.3	130.3	128	2.3	13	2
12.6	3	□	MVS1260X03S140	40.1	67.3	67.3	130.3	128	2.3	14	2
12.6	5	●	MVS1260X05S130	65.3	106.3	106.3	169.3	167	2.3	13	2
12.6	5	□	MVS1260X05S140	65.3	106.3	106.3	169.3	167	2.3	14	2
12.6	8	□	MVS1260X08S130	103.1	145.3	145.3	208.3	206	2.3	13	2
12.6	8	□	MVS1260X08S140	103.1	145.3	145.3	208.3	206	2.3	14	2
12.6	10	□	MVS1260X10S130	128.3	171.3	174.3	237.3	235	2.3	13	4
12.6	15	□	MVS1260X15S130	191.3	236.3	239.3	302.3	300	2.3	13	4
12.6	20	□	MVS1260X20S130	254.3	301.3	304.3	367.3	365	2.3	13	4
12.7	3	●	MVS1270X03S130	40.4	67.3	67.3	130.3	128	2.3	13	2
12.7	3	□	MVS1270X03S140	40.4	67.3	67.3	130.3	128	2.3	14	2
12.7	5	●	MVS1270X05S130	65.8	106.3	106.3	169.3	167	2.3	13	2
12.7	5	□	MVS1270X05S140	65.8	106.3	106.3	169.3	167	2.3	14	2
12.7	8	□	MVS1270X08S130	103.9	145.3	145.3	208.3	206	2.3	13	2
12.7	8	□	MVS1270X08S140	103.9	145.3	145.3	208.3	206	2.3	14	2
12.7	10	□	MVS1270X10S130	129.3	171.3	174.3	237.3	235	2.3	13	4
12.7	15	□	MVS1270X15S130	192.8	236.3	239.3	302.3	300	2.3	13	4
12.7	20	□	MVS1270X20S130	256.3	301.3	304.3	367.3	365	2.3	13	4
12.8	3	●	MVS1280X03S130	40.7	67.3	67.3	130.3	128	2.3	13	2
12.8	3	□	MVS1280X03S140	40.7	67.3	67.3	130.3	128	2.3	14	2
12.8	5	●	MVS1280X05S130	66.3	106.3	106.3	169.3	167	2.3	13	2
12.8	5	□	MVS1280X05S140	66.3	106.3	106.3	169.3	167	2.3	14	2
12.8	8	□	MVS1280X08S130	104.7	145.3	145.3	208.3	206	2.3	13	2
12.8	8	□	MVS1280X08S140	104.7	145.3	145.3	208.3	206	2.3	14	2
12.8	10	□	MVS1280X10S130	130.3	171.3	174.3	237.3	235	2.3	13	4
12.8	15	□	MVS1280X15S130	194.3	236.3	239.3	302.3	300	2.3	13	4
12.8	20	□	MVS1280X20S130	258.3	301.3	304.3	367.3	365	2.3	13	4
12.9	3	●	MVS1290X03S130	41.0	67.3	67.3	130.3	128	2.3	13	2
12.9	3	□	MVS1290X03S140	41.0	67.3	67.3	130.3	128	2.3	14	2
12.9	5	●	MVS1290X05S130	66.8	106.3	106.3	169.3	167	2.3	13	2
12.9	5	□	MVS1290X05S140	66.8	106.3	106.3	169.3	167	2.3	14	2
12.9	8	□	MVS1290X08S130	105.5	145.3	145.3	208.3	206	2.3	13	2
12.9	8	□	MVS1290X08S140	105.5	145.3	145.3	208.3	206	2.3	14	2
12.9	10	□	MVS1290X10S130	131.3	171.3	174.3	237.3	235	2.3	13	4
12.9	15	□	MVS1290X15S130	195.8	236.3	239.3	302.3	300	2.3	13	4
12.9	20	□	MVS1290X20S130	260.3	301.3	304.3	367.3	365	2.3	13	4
13.0	3	●	MVS1300X03S130	41.4	67.4	67.4	130.4	128	2.4	13	2
13.0	3	□	MVS1300X03S140	41.4	67.4	67.4	130.4	128	2.4	14	2
13.0	5	●	MVS1300X05S130	67.4	106.4	106.4	169.4	167	2.4	13	2
13.0	5	□	MVS1300X05S140	67.4	106.4	106.4	169.4	167	2.4	14	2
13.0	8	●	MVS1300X08S130	106.4	145.4	145.4	208.4	206	2.4	13	2
13.0	8	□	MVS1300X08S140	106.4	145.4	145.4	208.4	206	2.4	14	2
13.0	10	●	MVS1300X10S130	132.4	171.4	174.4	237.4	235	2.4	13	4
13.0	15	●	MVS1300X15S130	197.4	236.4	239.4	302.4	300	2.4	13	4
13.0	20	●	MVS1300X20S130	262.4	301.4	304.4	367.4	365	2.4	13	4
13.1	3	●	MVS1310X03S140	41.7	69.9	72.4	136.4	134	2.4	14	2
13.1	5	●	MVS1310X05S140	67.9	110.4	114.4	178.4	176	2.4	14	2
13.1	8	□	MVS1310X08S140	107.2	151.4	156.4	220.4	218	2.4	14	2
13.1	10	□	MVS1310X10S140	133.4	178.4	181.4	245.4	243	2.4	14	4
13.1	15	□	MVS1310X15S140	198.9	245.4	248.4	312.4	310	2.4	14	4
13.1	20	□	MVS1310X20S140	264.4	313.4	316.4	380.4	378	2.4	14	4
13.2	3	●	MVS1320X03S140	42.0	69.9	72.4	136.4	134	2.4	14	2
13.2	5	●	MVS1320X05S140	68.4	110.4	114.4	178.4	176	2.4	14	2
13.2	8	□	MVS1320X08S140	108.0	151.4	156.4	220.4	218	2.4	14	2
13.2	10	□	MVS1320X10S140	134.4	178.4	181.4	245.4	243	2.4	14	4
13.2	15	□	MVS1320X15S140	200.4	245.4	248.4	312.4	310	2.4	14	4
13.2	20	□	MVS1320X20S140	266.4	313.4	316.4	380.4	378	2.4	14	4
13.3	3	●	MVS1330X03S140	42.3	69.9	72.4	136.4	134	2.4	14	2
13.3	5	●	MVS1330X05S140	68.9	110.4	114.4	178.4	176	2.4	14	2
13.3	8	□	MVS1330X08S140	108.8	151.4	156.4	220.4	218	2.4	14	2
13.3	10	□	MVS1330X10S140	135.4	178.4	181.4	245.4	243	2.4	14	4
13.3	15	□	MVS1330X15S140	201.9	245.4	248.4	312.4	310	2.4	14	4

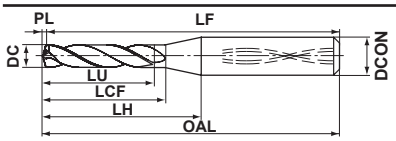
MVS

WSTAR DRILLS

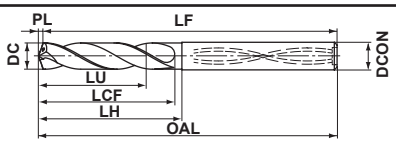
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
13.3	20	□	MVS1330X20S140	268.4	313.4	316.4	380.4	378	2.4	14	4
13.4	3	●	MVS1340X03S140	42.6	69.9	72.4	136.4	134	2.4	14	2
13.4	5	●	MVS1340X05S140	69.4	110.4	114.4	178.4	176	2.4	14	2
13.4	8	□	MVS1340X08S140	109.6	151.4	156.4	220.4	218	2.4	14	2
13.4	10	□	MVS1340X10S140	136.4	178.4	181.4	245.4	243	2.4	14	4
13.4	15	□	MVS1340X15S140	203.4	245.4	248.4	312.4	310	2.4	14	4
13.4	20	□	MVS1340X20S140	270.4	313.4	316.4	380.4	378	2.4	14	4
13.5	3	●	MVS1350X03S140	43.0	70.0	72.5	136.5	134	2.5	14	2
13.5	5	●	MVS1350X05S140	70.0	110.5	114.5	178.5	176	2.5	14	2
13.5	8	●	MVS1350X08S140	110.5	151.5	156.5	220.5	218	2.5	14	2
13.5	10	●	MVS1350X10S140	137.5	178.5	181.5	245.5	243	2.5	14	4
13.5	15	●	MVS1350X15S140	205.0	245.5	248.5	312.5	310	2.5	14	4
13.5	20	●	MVS1350X20S140	272.5	313.5	316.5	380.5	378	2.5	14	4
13.6	3	●	MVS1360X03S140	43.3	72.5	72.5	136.5	134	2.5	14	2
13.6	5	●	MVS1360X05S140	70.5	114.5	114.5	178.5	176	2.5	14	2
13.6	8	□	MVS1360X08S140	111.3	156.5	156.5	220.5	218	2.5	14	2
13.6	10	□	MVS1360X10S140	138.5	184.5	187.5	251.5	249	2.5	14	4
13.6	15	□	MVS1360X15S140	206.5	254.5	257.5	321.5	319	2.5	14	4
13.6	20	□	MVS1360X20S140	274.5	324.5	327.5	391.5	389	2.5	14	4
13.7	3	●	MVS1370X03S140	43.6	72.5	72.5	136.5	134	2.5	14	2
13.7	5	●	MVS1370X05S140	71.0	114.5	114.5	178.5	176	2.5	14	2
13.7	8	□	MVS1370X08S140	112.1	156.5	156.5	220.5	218	2.5	14	2
13.7	10	□	MVS1370X10S140	139.5	184.5	187.5	251.5	249	2.5	14	4
13.7	15	□	MVS1370X15S140	208.0	254.5	257.5	321.5	319	2.5	14	4
13.7	20	□	MVS1370X20S140	276.5	324.5	327.5	391.5	389	2.5	14	4
13.8	3	●	MVS1380X03S140	43.9	72.5	72.5	136.5	134	2.5	14	2
13.8	5	●	MVS1380X05S140	71.5	114.5	114.5	178.5	176	2.5	14	2
13.8	8	□	MVS1380X08S140	112.9	156.5	156.5	220.5	218	2.5	14	2
13.8	10	□	MVS1380X10S140	140.5	184.5	187.5	251.5	249	2.5	14	4
13.8	15	□	MVS1380X15S140	209.5	254.5	257.5	321.5	319	2.5	14	4
13.8	20	□	MVS1380X20S140	278.5	324.5	327.5	391.5	389	2.5	14	4
13.9	3	●	MVS1390X03S140	44.2	72.5	72.5	136.5	134	2.5	14	2
13.9	5	●	MVS1390X05S140	72.0	114.5	114.5	178.5	176	2.5	14	2
13.9	8	□	MVS1390X08S140	113.7	156.5	156.5	220.5	218	2.5	14	2
13.9	10	□	MVS1390X10S140	141.5	184.5	187.5	251.5	249	2.5	14	4
13.9	15	□	MVS1390X15S140	211.0	254.5	257.5	321.5	319	2.5	14	4
13.9	20	□	MVS1390X20S140	280.5	324.5	327.5	391.5	389	2.5	14	4
14.0	3	●	MVS1400X03S140	44.5	72.5	72.5	136.5	134	2.5	14	2
14.0	5	●	MVS1400X05S140	72.5	114.5	114.5	178.5	176	2.5	14	2
14.0	8	●	MVS1400X08S140	114.5	156.5	156.5	220.5	218	2.5	14	2
14.0	10	●	MVS1400X10S140	142.5	184.5	187.5	251.5	249	2.5	14	4
14.0	15	●	MVS1400X15S140	212.5	254.5	257.5	321.5	319	2.5	14	4
14.0	20	●	MVS1400X20S140	282.5	324.5	327.5	391.5	389	2.5	14	4
14.1	3	●	MVS1410X03S150	44.9	75.1	77.6	142.6	140	2.6	15	2
14.1	3	□	MVS1410X03S160	44.9	75.1	77.6	142.6	140	2.6	16	2
14.1	5	●	MVS1410X05S150	73.1	118.6	122.6	187.6	185	2.6	15	2
14.1	5	□	MVS1410X05S160	73.1	118.6	122.6	187.6	185	2.6	16	2
14.1	8	□	MVS1410X08S150	115.4	162.6	167.6	227.6	225	2.6	15	2
14.1	8	□	MVS1410X08S160	115.4	162.6	167.6	227.6	225	2.6	16	2
14.2	3	●	MVS1420X03S150	45.2	75.1	77.6	142.6	140	2.6	15	2
14.2	3	□	MVS1420X03S160	45.2	75.1	77.6	142.6	140	2.6	16	2
14.2	5	●	MVS1420X05S150	73.6	118.6	122.6	187.6	185	2.6	15	2
14.2	5	□	MVS1420X05S160	73.6	118.6	122.6	187.6	185	2.6	16	2
14.2	8	●	MVS1420X08S150	116.2	162.6	167.6	227.6	225	2.6	15	2
14.2	8	□	MVS1420X08S160	116.2	162.6	167.6	227.6	225	2.6	16	2
14.3	3	●	MVS1430X03S150	45.5	75.1	77.6	142.6	140	2.6	15	2
14.3	3	□	MVS1430X03S160	45.5	75.1	77.6	142.6	140	2.6	16	2
14.3	5	●	MVS1430X05S150	74.1	118.6	122.6	187.6	185	2.6	15	2
14.3	5	□	MVS1430X05S160	74.1	118.6	122.6	187.6	185	2.6	16	2
14.3	8	□	MVS1430X08S150	117.0	162.6	167.6	227.6	225	2.6	15	2
14.3	8	□	MVS1430X08S160	117.0	162.6	167.6	227.6	225	2.6	16	2
14.4	3	●	MVS1440X03S150	45.8	75.1	77.6	142.6	140	2.6	15	2
14.4	3	□	MVS1440X03S160	45.8	75.1	77.6	142.6	140	2.6	16	2
14.4	5	●	MVS1440X05S150	74.6	118.6	122.6	187.6	185	2.6	15	2
14.4	5	□	MVS1440X05S160	74.6	118.6	122.6	187.6	185	2.6	16	2
14.4	8	□	MVS1440X08S150	117.8	162.6	167.6	227.6	225	2.6	15	2
14.4	8	□	MVS1440X08S160	117.8	162.6	167.6	227.6	225	2.6	16	2
14.5	3	●	MVS1450X03S150	46.1	75.1	77.6	142.6	140	2.6	15	2
14.5	3	□	MVS1450X03S160	46.1	75.1	77.6	142.6	140	2.6	16	2
14.5	5	●	MVS1450X05S150	75.1	118.6	122.6	187.6	185	2.6	15	2
14.5	5	□	MVS1450X05S160	75.1	118.6	122.6	187.6	185	2.6	16	2
14.5	8	●	MVS1450X08S150	118.6	162.6	167.6	227.6	225	2.6	15	2
14.5	8	□	MVS1450X08S160	118.6	162.6	167.6	227.6	225	2.6	16	2
14.6	3	●	MVS1460X03S150	46.5	77.7	77.7	142.7	140	2.7	15	2
14.6	3	□	MVS1460X03S160	46.5	77.7	77.7	142.7	140	2.7	16	2
14.6	5	●	MVS1460X05S150	75.7	122.7	122.7	187.7	185	2.7	15	2
14.6	5	□	MVS1460X05S160	75.7	122.7	122.7	187.7	185	2.7	16	2
14.6	8	□	MVS1460X08S150	119.5	167.7	167.7	227.7	225	2.7	15	2
14.6	8	□	MVS1460X08S160	119.5	167.7	167.7	227.7	225	2.7	16	2
14.7	3	●	MVS1470X03S150	46.8	77.7	77.7	142.7	140	2.7	15	2
14.7	3	□	MVS1470X03S160	46.8	77.7	77.7	142.7	140	2.7	16	2
14.7	5	●	MVS1470X05S150	76.2	122.7	122.7	187.7	185	2.7	15	2
14.7	5	□	MVS1470X05S160	76.2	122.7	122.7	187.7	185	2.7	16	2
14.7	8	□	MVS1470X08S150	120.3	167.7	167.7	227.7	225	2.7	15	2
14.7	8	□	MVS1470X08S160	120.3	167.7	167.7	227.7	225	2.7	16	2
14.8	3	●	MVS1480X03S150	47.1	77.7	77.7	142.7	140	2.7	15	2
14.8	3	□	MVS1480X03S160	47.1	77.7	77.7	142.7	140	2.7	16	2
14.8	5	●	MVS1480X05S150	76.7	122.7	122.7	187.7	185	2.7	15	2
14.8	5	□	MVS1480X05S160	76.7	122.7	122.7	187.7	185	2.7	16	2
14.8	8	□	MVS1480X08S150	121.1	167.7	167.7	227.7	225	2.7	15	2
14.8	8	□	MVS1480X08S160	121.1	167.7	167.7	227.7	225	2.7	16	2
14.9	3	●	MVS1490X03S150	47.4	77.7	77.7	142.7	140	2.7	15	2
14.9	3	□	MVS1490X03S160	47.4	77.7	77.7	142.7	140	2.7	16	2
14.9	5	●	MVS1490X05S150	77.2	122.7	122.7	187.7	185	2.7	15	2
14.9	5	□	MVS1490X05S160	77.2	122.7	122.7	187.7	185	2.7	16	2
14.9	8	□	MVS1490X08S150	121.9	167.7	167.7	227.7	225	2.7	15	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
14.9	8	□	MVS1490X08S160	121.9	167.7	167.7	227.7	225	2.7	16	2
15.0	3	●	MVS1500X03S150	47.7	77.7	77.7	142.7	140	2.7	15	2
15.0	3	□	MVS1500X03S160	47.7	77.7	77.7	142.7	140	2.7	16	2
15.0	5	●	MVS1500X05S150	77.7	122.7	122.7	187.7	185	2.7	15	2
15.0	5	□	MVS1500X05S160	77.7	122.7	122.7	187.7	185	2.7	16	2
15.0	8	●	MVS1500X08S150	122.7	167.7	167.7	227.7	225	2.7	15	2
15.0	8	□	MVS1500X08S160	122.7	167.7	167.7	227.7	225	2.7	16	2
15.1	3	●	MVS1510X03S160	48.0	80.2	82.7	147.7	145	2.7	16	2
15.1	5	●	MVS1510X05S160	78.2	126.7	130.7	195.7	193	2.7	16	2
15.1	8	□	MVS1510X08S160	123.5	173.7	183.7	243.7	241	2.7	16	2
15.2	3	●	MVS1520X03S160	48.4	80.3	82.8	147.8	145	2.8	16	2
15.2	5	●	MVS1520X05S160	78.8	126.8	130.8	195.8	193	2.8	16	2
15.2	8	□	MVS1520X08S160	124.4	173.8	183.8	243.8	241	2.8	16	2
15.3	3	●	MVS1530X03S160	48.7	80.3	82.8	147.8	145	2.8	16	2
15.3	5	●	MVS1530X05S160	79.3	126.8	130.8	195.8	193	2.8	16	2
15.3	8	□	MVS1530X08S160	125.2	173.8	183.8	243.8	241	2.8	16	2
15.4	3	●	MVS1540X03S160	49.0	80.3	82.8	147.8	145	2.8	16	2
15.4	5	●	MVS1540X05S160	79.8	126.8	130.8	195.8	193	2.8	16	2
15.4	8	□	MVS1540X08S160	126.0	173.8	183.8	243.8	241	2.8	16	2
15.5	3	●	MVS1550X03S160	49.3	80.3	82.8	147.8	145	2.8	16	2
15.5	5	●	MVS1550X05S160	80.3	126.8	130.8	195.8	193	2.8	16	2
15.5	8	●	MVS1550X08S160	126.8	173.8	183.8	243.8	241	2.8	16	2
15.6	3	●	MVS1560X03S160	49.6	82.8	82.8	147.8	145	2.8	16	2
15.6	5	●	MVS1560X05S160	80.8	130.8	130.8	195.8	193	2.8	16	2
15.6	8	□	MVS1560X08S160	127.6	178.8	183.8	243.8	241	2.8	16	2
15.7	3	●	MVS1570X03S160	50.0	82.9	82.9	147.9	145	2.9	16	2
15.7	5	●	MVS1570X05S160	81.4	130.9	130.9	195.9	193	2.9	16	2
15.7	8	□	MVS1570X08S160	128.5	178.9	183.9	243.9	241	2.9	16	2
15.8	3	●	MVS1580X03S160	50.3	82.9	82.9	147.9	145	2.9	16	2
15.8	5	●	MVS1580X05S160	81.9	130.9	130.9	195.9	193	2.9	16	2
15.8	8	□	MVS1580X08S160	129.3	178.9	183.9	243.9	241	2.9	16	2
15.9	3	●	MVS1590X03S160	50.6	82.9	82.9	147.9	145	2.9	16	2
15.9	5	●	MVS1590X05S160	82.4	130.9	130.9	195.9	193	2.9	16	2
15.9	8	□	MVS1590X08S160	130.1	178.9	183.9	243.9	241	2.9	16	2
16.0	3	●	MVS1600X03S160	50.9	82.9	82.9	147.9	145	2.9	16	2
16.0	5	●	MVS1600X05S160	82.9	130.9	130.9	195.9	193	2.9	16	2
16.0	8	●	MVS1600X08S160	130.9	178.9	183.9	243.9	241	2.9	16	2
16.1	3	□	MVS1610X03S170	51.2	85.4	87.9	152.9	150	2.9	17	2
16.1	3	□	MVS1610X03S180	51.2	85.4	87.9	152.9	150	2.9	18	2
16.1	5	□	MVS1610X05S170	83.4	134.9	138.9	203.9	201	2.9	17	2
16.1	5	□	MVS1610X05S180	83.4	134.9	138.9	203.9	201	2.9	18	2
16.2	3	□	MVS1620X03S170	51.5	85.4	87.9	152.9	150	2.9	17	2
16.2	3	□	MVS1620X03S180	51.5	85.4	87.9	152.9	150	2.9	18	2
16.2	5	□	MVS1620X05S170	83.9	134.9	138.9	203.9	201	2.9	17	2
16.2	5	□	MVS1620X05S180	83.9	134.9	138.9	203.9	201	2.9	18	2
16.3	3	□	MVS1630X03S170	51.9	85.5	88.0	153.0	150	3.0	17	2
16.3	3	□	MVS1630X03S180	51.9	85.5	88.0	153.0	150	3.0	18	2
16.3	5	□	MVS1630X05S170	84.5	135.0	139.0	204.0	201	3.0	17	2
16.3	5	□	MVS1630X05S180	84.5	135.0	139.0	204.0	201	3.0	18	2
16.4	3	□	MVS1640X03S170	52.2	85.5	88.0	153.0	150	3.0	17	2
16.4	3	□	MVS1640X03S180	52.2	85.5	88.0	153.0	150	3.0	18	2
16.4	5	□	MVS1640X05S170	85.0	135.0	139.0	204.0	201	3.0	17	2
16.4	5	□	MVS1640X05S180	85.0	135.0	139.0	204.0	201	3.0	18	2
16.5	3	●	MVS1650X03S170	52.5	85.5	88.0	153.0	150	3.0	17	2
16.5	3	□	MVS1650X03S180	52.5	85.5	88.0	153.0	150	3.0	18	2
16.5	5	●	MVS1650X05S170	85.5	135.0	139.0	204.0	201	3.0	17	2
16.5	5	□	MVS1650X05S180	85.5	135.0	139.0	204.0	201	3.0	18	2
16.6	3	□	MVS1660X03S170	52.8	88.0	88.0	153.0	150	3.0	17	2
16.6	3	□	MVS1660X03S180	52.8	88.0	88.0	153.0	150	3.0	18	2
16.6	5	□	MVS1660X05S170	86.0	139.0	139.0	204.0	201	3.0	17	2
16.6	5	□	MVS1660X05S180	86.0	139.0	139.0	204.0	201	3.0	18	2
16.7	3	□	MVS1670X03S170	53.1	88.0	88.0	153.0	150	3.0	17	2
16.7	3	□	MVS1670X03S180	53.1	88.0	88.0	153.0	150	3.0	18	2
16.7	5	□	MVS1670X05S170	86.5	139.0	139.0	204.0	201	3.0	17	2
16.7	5	□	MVS1670X05S180	86.5	139.0	139.0	204.0	201	3.0	18	2
16.8	3	□	MVS1680X03S170	53.5	88.1	88.1	153.1	150	3.1	17	2
16.8	3	□	MVS1680X03S180	53.5	88.1	88.1	153.1	150	3.1	18	2
16.8	5	□	MVS1680X05S170	87.1	139.1	139.1	204.1	201	3.1	17	2
16.8	5	□	MVS1680X05S180	87.1	139.1	139.1	204.1	201	3.1	18	2
16.9	3	□	MVS1690X03S170	53.8	88.1	88.1	153.1	150	3.1	17	2
16.9	3	□	MVS1690X03S180	53.8	88.1	88.1	153.1	150	3.1	18	2
16.9	5	□	MVS1690X05S170	87.6	139.1	139.1	204.1	201	3.1	17	2
16.9	5	□	MVS1690X05S180	87.6	139.1	139.1	204.1	201	3.1	18	2
17.0	3	●	MVS1700X03S170	54.1	88.1	88.1	153.1	150	3.1	17	2
17.0	3	□	MVS1700X03S180	54.1	88.1	88.1	153.1	150	3.1	18	2
17.0	5	●	MVS1700X05S170	88.1	139.1	139.1	204.1	201	3.1	17	2
17.0	5	□	MVS1700X05S180	88.1	139.1	139.1	204.1	201	3.1	18	2
17.1	3	□	MVS1710X03S180	54.4	90.6	93.1	158.1	155	3.1	18	2
17.1	5	□	MVS1710X05S180	88.6	143.1	147.1	212.1	209	3.1	18	2
17.2	3	□	MVS1720X03S180	54.7	90.6	93.1	158.1	155	3.1	18	2
17.2	5	□	MVS1720X05S180	89.1	143.1	147.1	212.1	209	3.1	18	2
17.3	3	□	MVS1730X03S180	55.0	90.6	93.1	158.1	155	3.1	18	2
17.3	5	□	MVS1730X05S180	89.6	143.1	147.1	212.1	209	3.1	18	2
17.4	3	□	MVS1740X03S180	55.4	90.7	93.2	158.2	155	3.2	18	2
17.4	5	□	MVS1740X05S180	90.2	143.2	147.2	212.2	209	3.2	18	2
17.5	3	●	MVS1750X03S180	55.7	90.7	93.2	158.2	155	3.2	18	2
17.5	5	●	MVS1750X05S180	90.7	143.2	147.2	212.2	209	3.2	18	2
17.6	3	□	MVS1760X03S180	56.0	93.2	93.2	158.2	155	3.2	18	2
17.6	5	□	MVS1760X05S180	91.2	147.2	147.2	212.2	209	3.2	18	2
17.7	3	□	MVS1770X03S180	56.3	93.2	93.2	158.2	155	3.2	18	2
17.7	5	□	MVS1770X05S180	91.7	147.2	147.2	212.2	209	3.2	18	2
17.8	3	□	MVS1780X03S180	56.6	93.2	93.2	158.2	155	3.2	18	2
17.8	5	□	MVS1780X05S180	92.2	147.2	147.2	212.2	209	3.2	18	2
17.9	3	□	MVS1790X03S180	57.0	93.3	93.3	158.3	155	3.3	18	2
17.9	5	□	MVS1790X05S180	92.8	147.3	147.3	212.3	209	3.3	18	2
18.0	3	●	MVS1800X03S180	57.3	93.3	93.3	158.3	155	3.3	18	2

MVS

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
18.0	5	●	MVS1800X05S180	93.3	147.3	147.3	212.3	209	3.3	18	2
18.1	3	□	MVS1810X03S190	57.6	95.8	98.3	163.3	160	3.3	19	2
18.1	3	□	MVS1810X03S200	57.6	95.8	98.3	163.3	160	3.3	20	2
18.1	5	□	MVS1810X05S190	93.8	151.3	155.3	220.3	217	3.3	19	2
18.1	5	□	MVS1810X05S200	93.8	151.3	155.3	220.3	217	3.3	20	2
18.2	3	□	MVS1820X03S190	57.9	95.8	98.3	163.3	160	3.3	19	2
18.2	3	□	MVS1820X03S200	57.9	95.8	98.3	163.3	160	3.3	20	2
18.2	5	□	MVS1820X05S190	94.3	151.3	155.3	220.3	217	3.3	19	2
18.2	5	□	MVS1820X05S200	94.3	151.3	155.3	220.3	217	3.3	20	2
18.3	3	□	MVS1830X03S190	58.2	95.8	98.3	163.3	160	3.3	19	2
18.3	3	□	MVS1830X03S200	58.2	95.8	98.3	163.3	160	3.3	20	2
18.3	5	□	MVS1830X05S190	94.8	151.3	155.3	220.3	217	3.3	19	2
18.3	5	□	MVS1830X05S200	94.8	151.3	155.3	220.3	217	3.3	20	2
18.4	3	□	MVS1840X03S190	58.5	95.8	98.3	163.3	160	3.3	19	2
18.4	3	□	MVS1840X03S200	58.5	95.8	98.3	163.3	160	3.3	20	2
18.4	5	□	MVS1840X05S190	95.3	151.3	155.3	220.3	217	3.3	19	2
18.4	5	□	MVS1840X05S200	95.3	151.3	155.3	220.3	217	3.3	20	2
18.5	3	●	MVS1850X03S190	58.9	95.9	98.4	163.4	160	3.4	19	2
18.5	3	□	MVS1850X03S200	58.9	95.9	98.4	163.4	160	3.4	20	2
18.5	5	●	MVS1850X05S190	95.9	151.4	155.4	220.4	217	3.4	19	2
18.5	5	□	MVS1850X05S200	95.9	151.4	155.4	220.4	217	3.4	20	2
18.6	3	□	MVS1860X03S190	59.2	98.4	98.4	163.4	160	3.4	19	2
18.6	3	□	MVS1860X03S200	59.2	98.4	98.4	163.4	160	3.4	20	2
18.6	5	□	MVS1860X05S190	96.4	155.4	155.4	220.4	217	3.4	19	2
18.6	5	□	MVS1860X05S200	96.4	155.4	155.4	220.4	217	3.4	20	2
18.7	3	□	MVS1870X03S190	59.5	98.4	98.4	163.4	160	3.4	19	2
18.7	3	□	MVS1870X03S200	59.5	98.4	98.4	163.4	160	3.4	20	2
18.7	5	□	MVS1870X05S190	96.9	155.4	155.4	220.4	217	3.4	19	2
18.7	5	□	MVS1870X05S200	96.9	155.4	155.4	220.4	217	3.4	20	2
18.8	3	□	MVS1880X03S190	59.8	98.4	98.4	163.4	160	3.4	19	2
18.8	3	□	MVS1880X03S200	59.8	98.4	98.4	163.4	160	3.4	20	2
18.8	5	□	MVS1880X05S190	97.4	155.4	155.4	220.4	217	3.4	19	2
18.8	5	□	MVS1880X05S200	97.4	155.4	155.4	220.4	217	3.4	20	2
18.9	3	□	MVS1890X03S190	60.1	98.4	98.4	163.4	160	3.4	19	2
18.9	3	□	MVS1890X03S200	60.1	98.4	98.4	163.4	160	3.4	20	2
18.9	5	□	MVS1890X05S190	97.9	155.4	155.4	220.4	217	3.4	19	2
18.9	5	□	MVS1890X05S200	97.9	155.4	155.4	220.4	217	3.4	20	2
19.0	3	●	MVS1900X03S190	60.5	98.5	98.5	163.5	160	3.5	19	2
19.0	3	□	MVS1900X03S200	60.5	98.5	98.5	163.5	160	3.5	20	2
19.0	5	●	MVS1900X05S190	98.5	155.5	155.5	220.5	217	3.5	19	2
19.0	5	□	MVS1900X05S200	98.5	155.5	155.5	220.5	217	3.5	20	2
19.1	3	□	MVS1910X03S200	60.8	101.0	103.5	168.5	165	3.5	20	2
19.1	5	□	MVS1910X05S200	99.0	159.5	163.5	228.5	225	3.5	20	2
19.2	3	□	MVS1920X03S200	61.1	101.0	103.5	168.5	165	3.5	20	2
19.2	5	□	MVS1920X05S200	99.5	159.5	163.5	228.5	225	3.5	20	2
19.3	3	□	MVS1930X03S200	61.4	101.0	103.5	168.5	165	3.5	20	2
19.3	5	□	MVS1930X05S200	100.0	159.5	163.5	228.5	225	3.5	20	2
19.4	3	□	MVS1940X03S200	61.7	101.0	103.5	168.5	165	3.5	20	2
19.4	5	□	MVS1940X05S200	100.5	159.5	163.5	228.5	225	3.5	20	2
19.5	3	●	MVS1950X03S200	62.0	101.0	103.5	168.5	165	3.5	20	2
19.5	5	●	MVS1950X05S200	101.0	159.5	163.5	228.5	225	3.5	20	2
19.6	3	□	MVS1960X03S200	62.4	103.6	103.6	168.6	165	3.6	20	2
19.6	5	□	MVS1960X05S200	101.6	163.6	163.6	228.6	225	3.6	20	2
19.7	3	□	MVS1970X03S200	62.7	103.6	103.6	168.6	165	3.6	20	2
19.7	5	□	MVS1970X05S200	102.1	163.6	163.6	228.6	225	3.6	20	2
19.8	3	□	MVS1980X03S200	63.0	103.6	103.6	168.6	165	3.6	20	2
19.8	5	□	MVS1980X05S200	102.6	163.6	163.6	228.6	225	3.6	20	2
19.9	3	□	MVS1990X03S200	63.3	103.6	103.6	168.6	165	3.6	20	2
19.9	5	□	MVS1990X05S200	103.1	163.6	163.6	228.6	225	3.6	20	2
20.0	3	●	MVS2000X03S200	63.6	103.6	103.6	168.6	165	3.6	20	2
20.0	5	●	MVS2000X05S200	103.6	163.6	163.6	228.6	225	3.6	20	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, AISI 4140 etc		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc	
Dia. **DC** (mm)	**L/D**	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	**2DC*,7DC**	15900	0.04 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
1.0	**12DC - 30DC**	15900	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5	**2DC*,7DC**	10600	0.05 (0.03—0.08)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
1.5	**12DC - 30DC**	10600	0.05 (0.02—0.07)	8400	0.05 (0.03—0.08)	6300	0.05 (0.02—0.08)
2.0	**2DC*,7DC**	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
2.0	**12DC - 30DC**	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5	**2DC*,7DC**	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
2.5	**12DC - 30DC**	7600	0.09 (0.06—0.13)	6300	0.08 (0.05—0.13)	6300	0.08 (0.05—0.13)
3.0	**2DC***	9500	0.17 (0.10—0.24)	9500	0.17 (0.10—0.24)	7400	0.15 (0.09—0.22)
3.0	**3DC - 8DC**	9500	0.10 (0.06—0.13)	9500	0.10 (0.06—0.13)	7400	0.10 (0.06—0.13)
3.0	**10DC - 30DC**	9500	0.17 (0.10—0.24)	9500	0.17 (0.10—0.24)	8400	0.15 (0.09—0.22)
3.0	**35DC,40DC**	7400	0.14 (0.08—0.19)	7400	0.14 (0.08—0.19)	6300	0.13 (0.07—0.18)
4.0	**2DC***	7900	0.20 (0.12—0.30)	7100	0.20 (0.12—0.30)	6300	0.18 (0.11—0.27)
4.0	**3DC - 8DC**	7900	0.12 (0.08—0.16)	7100	0.12 (0.08—0.16)	6300	0.11 (0.07—0.14)
4.0	**10DC - 30DC**	7100	0.20 (0.12—0.30)	7100	0.20 (0.12—0.30)	6300	0.18 (0.11—0.27)
4.0	**35DC,40DC**	5900	0.16 (0.10—0.24)	5900	0.16 (0.10—0.24)	5100	0.15 (0.09—0.22)
5.0	**2DC***	6300	0.25 (0.15—0.35)	5700	0.25 (0.15—0.35)	5000	0.22 (0.14—0.32)
5.0	**3DC - 8DC**	6300	0.15 (0.10—0.20)	5700	0.15 (0.10—0.20)	5000	0.14 (0.09—0.18)
5.0	**10DC - 30DC**	5700	0.25 (0.15—0.35)	5700	0.25 (0.15—0.35)	5000	0.22 (0.14—0.32)
5.0	**35DC,40DC**	4700	0.20 (0.12—0.28)	4700	0.20 (0.12—0.28)	4100	0.18 (0.11—0.24)
6.0	**2DC***	5500	0.27 (0.17—0.37)	5000	0.27 (0.17—0.37)	4700	0.24 (0.15—0.33)
6.0	**3DC - 8DC**	5800	0.20 (0.13—0.26)	5300	0.20 (0.13—0.26)	4700	0.18 (0.11—0.24)
6.0	**10DC - 30DC**	5300	0.27 (0.17—0.37)	4700	0.27 (0.17—0.37)	4200	0.24 (0.15—0.33)
6.0	**35DC,40DC**	4500	0.22 (0.14—0.30)	3900	0.22 (0.14—0.30)	3700	0.20 (0.12—0.26)
8.0	**2DC***	4700	0.30 (0.20—0.40)	4300	0.30 (0.20—0.40)	3900	0.27 (0.18—0.36)
8.0	**3DC - 8DC**	4700	0.23 (0.18—0.28)	4300	0.23 (0.18—0.28)	3900	0.21 (0.16—0.25)
8.0	**10DC - 30DC**	4300	0.30 (0.20—0.40)	3900	0.30 (0.20—0.40)	3500	0.27 (0.18—0.36)
8.0	**35DC,40DC**	3300	0.24 (0.16—0.32)	3100	0.24 (0.16—0.32)	2700	0.22 (0.14—0.29)
10.0	**2DC***	4100	0.32 (0.22—0.42)	3800	0.32 (0.22—0.42)	3100	0.29 (0.20—0.38)
10.0	**3DC - 8DC**	4100	0.27 (0.22—0.32)	3800	0.27 (0.22—0.32)	3500	0.23 (0.19—0.27)
10.0	**10DC - 30DC**	3500	0.32 (0.22—0.42)	3100	0.32 (0.22—0.42)	2800	0.29 (0.20—0.38)
10.0	**35DC**	2800	0.26 (0.18—0.34)	2500	0.26 (0.18—0.34)	2200	0.24 (0.16—0.30)
12.0	**2DC***	3700	0.34 (0.24—0.44)	3400	0.34 (0.24—0.44)	3000	0.30 (0.22—0.40)
12.0	**3DC - 8DC**	3700	0.30 (0.26—0.34)	3400	0.30 (0.26—0.34)	3100	0.25 (0.22—0.29)
12.0	**10DC - 25DC**	3400	0.34 (0.24—0.44)	3100	0.34 (0.24—0.44)	2600	0.30 (0.22—0.40)
16.0	**3DC - 8DC**	3100	0.33 (0.27—0.38)	2700	0.33 (0.27—0.38)	2500	0.28 (0.23—0.33)
20.0	**3DC,5DC**	2500	0.35 (0.30—0.40)	2200	0.35 (0.30—0.40)	2000	0.30 (0.26—0.34)

*For machining pilot holes

MVS

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc		Gray Cast Iron (≤350MPa) No 45 B etc		Ductile Cast Iron (≤450MPa) 60-40-8 etc	
Dia. **DC** (mm)	**L/D**	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	**2DC*,7DC**	9500	0.03 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
1.0	**12DC - 30DC**	9500	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5	**2DC*,7DC**	6300	0.05 (0.03—0.07)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
1.5	**12DC - 30DC**	6300	0.05 (0.02—0.08)	8400	0.05 (0.02—0.08)	6300	0.05 (0.02—0.08)
2.0	**2DC*,7DC**	4700	0.06 (0.04—0.08)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
2.0	**12DC - 30DC**	4700	0.06 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5	**2DC*,7DC**	5000	0.08 (0.05—0.10)	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
2.5	**12DC - 30DC**	3800	0.08 (0.05—0.12)	6300	0.09 (0.06—0.13)	6300	0.08 (0.05—0.12)
3.0	**2DC***	4200	0.08 (0.05—0.10)	9000	0.19 (0.11—0.26)	9000	0.17 (0.10—0.24)
3.0	**3DC - 8DC**	4200	0.08 (0.06—0.10)	9500	0.10 (0.06—0.13)	9000	0.10 (0.06—0.13)
3.0	**10DC - 30DC**	4200	0.08 (0.05—0.09)	8400	0.19 (0.11—0.26)	8400	0.17 (0.10—0.24)
3.0	**35DC,40DC**	2900	0.06 (0.04—0.07)	7400	0.15 (0.09—0.21)	7460	0.14 (0.08—0.19)
4.0	**2DC***	3100	0.08 (0.06—0.10)	7900	0.22 (0.13—0.33)	7100	0.20 (0.12—0.30)
4.0	**3DC - 8DC**	3100	0.09 (0.06—0.11)	7900	0.12 (0.08—0.16)	7100	0.12 (0.08—0.16)
4.0	**10DC - 30DC**	3100	0.08 (0.06—0.10)	7100	0.22 (0.13—0.33)	7100	0.20 (0.12—0.30)
4.0	**35DC,40DC**	2300	0.07 (0.05—0.08)	5900	0.18 (0.10—0.26)	5900	0.16 (0.10—0.24)
5.0	**2DC***	2500	0.10 (0.07—0.12)	6300	0.28 (0.16—0.39)	5700	0.25 (0.15—0.35)
5.0	**3DC - 8DC**	2500	0.11 (0.08—0.14)	6300	0.15 (0.10—0.20)	5700	0.15 (0.10—0.20)
5.0	**10DC - 30DC**	2500	0.10 (0.07—0.12)	5700	0.28 (0.07—0.39)	5700	0.25 (0.15—0.35)
5.0	**35DC,40DC**	1900	0.08 (0.06—0.10)	4700	0.22 (0.06—0.31)	4700	0.20 (0.12—0.28)
6.0	**2DC***	2300	0.12 (0.08—0.16)	5500	0.30 (0.19—0.41)	5000	0.27 (0.17—0.37)
6.0	**3DC - 8DC**	2600	0.13 (0.09—0.18)	5800	0.20 (0.13—0.26)	5000	0.20 (0.13—0.26)
6.0	**10DC - 30DC**	2600	0.12 (0.08—0.14)	5300	0.30 (0.19—0.41)	4700	0.27 (0.17—0.37)
6.0	**35DC,40DC**	2100	0.10 (0.06—0.13)	4500	0.24 (0.15—0.33)	4200	0.22 (0.14—0.30)
8.0	**2DC***	1900	0.14 (0.10—0.17)	4700	0.33 (0.22—0.44)	3900	0.30 (0.20—0.40)
8.0	**3DC - 8DC**	1900	0.15 (0.10—0.19)	4700	0.25 (0.18—0.31)	3900	0.23 (0.18—0.28)
8.0	**10DC - 30DC**	1900	0.14 (0.10—0.17)	4300	0.33 (0.22—0.44)	3900	0.30 (0.20—0.40)
8.0	**35DC,40DC**	1500	0.11 (0.08—0.14)	3300	0.26 (0.17—0.35)	3100	0.24 (0.16—0.32)
10.0	**2DC***	1500	0.15 (0.12—0.18)	4100	0.35 (0.24—0.46)	3100	0.32 (0.22—0.42)
10.0	**3DC - 8DC**	1500	0.16 (0.12—0.20)	4100	0.29 (0.22—0.35)	3100	0.27 (0.22—0.32)
10.0	**10DC - 30DC**	1500	0.15 (0.12—0.18)	3500	0.35 (0.24—0.46)	3100	0.32 (0.22—0.42)
10.0	**35DC**	1200	0.12 (0.10—0.14)	2800	0.28 (0.19—0.37)	2500	0.26 (0.18—0.34)
12.0	**2DC***	1400	0.17 (0.14—0.19)	3700	0.37 (0.26—0.48)	3000	0.34 (0.24—0.44)
12.0	**3DC - 8DC**	1500	0.18 (0.15—0.21)	3700	0.32 (0.26—0.37)	3000	0.30 (0.26—0.34)
12.0	**10DC - 25DC**	1500	0.17 (0.14—0.19)	3400	0.37 (0.26—0.48)	2900	0.34 (0.24—0.44)
16.0	**3DC - 8DC**	1100	0.19 (0.15—0.24)	3100	0.35 (0.28—0.42)	2500	0.33 (0.28—0.38)
20.0	**3DC,5DC**	900	0.21 (0.15—0.26)	2500	0.37 (0.30—0.44)	2300	0.35 (0.30—0.40)

*For machining pilot holes

Workpiece Material		Aluminium Alloys (Si<5%)		Heat Resistant Alloys Inconel718 etc	
Dia. **DC** (mm)	**L/D**	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	**2DC*,7DC**	19000	0.05 (0.03 — 0.08)	3100	0.02 (0.01—0.03)
1.0	**12DC - 30DC**	15900	0.05 (0.03 — 0.08)	3100	0.02 (0.01—0.03)
1.5	**2DC*,7DC**	16900	0.07 (0.05 — 0.12)	2100	0.03 (0.02—0.04)
1.5	**12DC - 30DC**	14800	0.07 (0.05 — 0.12)	2100	0.03 (0.02—0.04)
2.0	**2DC*,7DC**	14300	0.10 (0.06 — 0.15)	2300	0.04 (0.03—0.05)
2.0	**12DC - 30DC**	12700	0.10 (0.06 — 0.15)	2300	0.04 (0.03—0.05)
2.5	**2DC*,7DC**	12700	0.13 (0.08 — 0.20)	1900	0.05 (0.04—0.06)
2.5	**12DC - 30DC**	11400	0.13 (0.08 — 0.20)	1900	0.05 (0.04—0.06)
3.0	**2DC***	11600	0.23 (0.10 — 0.35)	2100	0.07 (0.05—0.09)
3.0	**3DC - 8DC**	12700	0.23 (0.10 — 0.35)	2100	0.07 (0.05—0.09)
3.0	**10DC - 30DC**	10600	0.23 (0.10 — 0.35)	2100	0.07 (0.05—0.09)
3.0	**35DC,40DC**	7900	0.18 (0.08 — 0.28)	1400	0.06 (0.04—0.07)
4.0	**2DC***	9500	0.24 (0.12 — 0.35)	1500	0.09 (0.06—0.11)
4.0	**3DC - 8DC**	9500	0.24 (0.12 — 0.35)	1500	0.09 (0.06—0.11)
4.0	**10DC - 30DC**	7900	0.24 (0.12 — 0.35)	1500	0.09 (0.06—0.11)
4.0	**35DC,40DC**	6300	0.19 (0.10 — 0.28)	1100	0.07 (0.05—0.09)
5.0	**2DC***	7600	0.25 (0.15 — 0.35)	1200	0.11 (0.08—0.14)
5.0	**3DC - 8DC**	7600	0.25 (0.15 — 0.35)	1200	0.11 (0.08—0.14)
5.0	**10DC - 30DC**	7000	0.25 (0.15 — 0.35)	1200	0.11 (0.08—0.14)
5.0	**35DC,40DC**	5000	0.20 (0.12 — 0.28)	900	0.09 (0.06—0.11)
6.0	**2DC***	7400	0.35 (0.20 — 0.50)	1300	0.13 (0.09—0.16)
6.0	**3DC - 8DC**	7900	0.35 (0.20 — 0.50)	1300	0.13 (0.09—0.16)
6.0	**10DC - 30DC**	6300	0.35 (0.20 — 0.50)	1000	0.13 (0.09—0.16)
6.0	**35DC,40DC**	5300	0.28 (0.16 — 0.40)	700	0.10 (0.07—0.13)
8.0	**2DC***	5900	0.35 (0.20 — 0.50)	900	0.14 (0.11—0.16)
8.0	**3DC - 8DC**	5900	0.35 (0.20 — 0.50)	900	0.14 (0.11—0.17)
8.0	**10DC - 30DC**	5100	0.35 (0.20 — 0.50)	700	0.14 (0.11—0.16)
8.0	**35DC,40DC**	3900	0.28 (0.16 — 0.40)	500	0.11 (0.09—0.13)
10.0	**2DC***	4700	0.50 (0.20 — 0.80)	700	0.15 (0.12—0.17)
10.0	**3DC - 8DC**	4700	0.50 (0.20 — 0.80)	700	0.15 (0.12—0.18)
10.0	**10DC - 30DC**	4100	0.50 (0.20 — 0.80)	600	0.15 (0.12—0.17)
10.0	**35DC**	3300	0.40 (0.16 — 0.64)	400	0.12 (0.10—0.14)
12.0	**2DC***	4200	0.50 (0.20 — 0.80)	600	0.16 (0.13—0.18)
12.0	**3DC - 8DC**	4200	0.50 (0.20 — 0.80)	600	0.16 (0.13—0.19)
12.0	**10DC - 25DC**	3700	0.50 (0.20 — 0.80)	500	0.16 (0.13—0.18)
16.0	**3DC - 8DC**	3100	0.60 (0.20 — 1.00)	400	0.18 (0.14—0.21)
20.0	**3DC,5DC**	2700	0.60 (0.20 — 1.00)	400	0.19 (0.15—0.22)

*For machining pilot holes

DRILLING(SOLID CARBIDE)

MVE

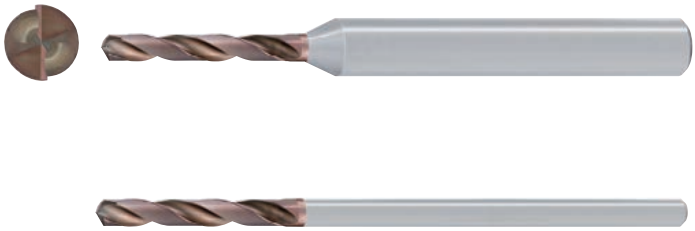
WSTAR DRILLS

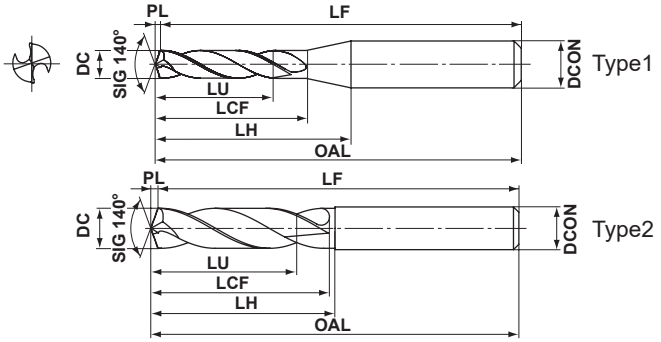
- PVD coated carbide grade DP1020 achieves long life with wide range of workpiece materials.
- The unique wavy cutting edge provides excellent sharpness and rigidity and helps to control wear at the periphery.

UWC | DP1 | 140° | X

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

External Coolant





DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤18	18<DCON≤20
0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	2	●	MVE0300X02S030	6.5	16.5	16.5	55.5	55	0.5	3	2
3.0	2	●	MVE0300X02S060	6.5	16.5	19.7	55.5	55	0.5	6	1
3.0	3	●	MVE0300X03S030	9.5	21.5	21.5	60.5	60	0.5	3	2
3.0	3	●	MVE0300X03S060	9.5	21.5	24.7	60.5	60	0.5	6	1
3.1	2	●	MVE0310X02S040	6.8	18.6	20.6	55.6	55	0.6	4	2
3.1	2	●	MVE0310X02S060	6.8	18.6	21.7	55.6	55	0.6	6	1
3.1	3	●	MVE0310X03S040	9.9	24.6	26.6	60.6	60	0.6	4	2
3.1	3	●	MVE0310X03S060	9.9	24.6	27.7	60.6	60	0.6	6	1
3.2	2	●	MVE0320X02S040	7.0	18.6	20.6	55.6	55	0.6	4	2
3.2	2	●	MVE0320X02S060	7.0	18.6	21.6	55.6	55	0.6	6	1
3.2	3	●	MVE0320X03S040	10.2	24.6	26.6	60.6	60	0.6	4	2
3.2	3	●	MVE0320X03S060	10.2	24.6	27.6	60.6	60	0.6	6	1
3.3	2	●	MVE0330X02S040	7.2	18.6	20.6	55.6	55	0.6	4	2
3.3	2	●	MVE0330X02S060	7.2	18.6	21.5	55.6	55	0.6	6	1
3.3	3	●	MVE0330X03S040	10.5	24.6	26.6	60.6	60	0.6	4	2
3.3	3	●	MVE0330X03S060	10.5	24.6	27.5	60.6	60	0.6	6	1
3.4	2	●	MVE0340X02S040	7.4	18.6	20.6	55.6	55	0.6	4	2
3.4	2	●	MVE0340X02S060	7.4	18.6	21.4	55.6	55	0.6	6	1
3.4	3	●	MVE0340X03S040	10.8	24.6	26.6	60.6	60	0.6	4	2
3.4	3	●	MVE0340X03S060	10.8	24.6	27.4	60.6	60	0.6	6	1
3.5	2	●	MVE0350X02S040	7.6	18.6	20.6	55.6	55	0.6	4	2
3.5	2	●	MVE0350X02S060	7.6	18.6	21.3	55.6	55	0.6	6	1
3.5	3	●	MVE0350X03S040	11.1	24.6	26.6	60.6	60	0.6	4	2
3.5	3	●	MVE0350X03S060	11.1	24.6	27.3	60.6	60	0.6	6	1
3.6	2	●	MVE0360X02S040	7.9	20.7	20.7	55.7	55	0.7	4	2
3.6	2	●	MVE0360X02S060	7.9	20.7	23.3	55.7	55	0.7	6	1
3.6	3	●	MVE0360X03S040	11.5	27.7	27.7	60.7	60	0.7	4	2
3.6	3	●	MVE0360X03S060	11.5	27.7	30.3	60.7	60	0.7	6	1
3.7	2	●	MVE0370X02S040	8.1	20.7	20.7	55.7	55	0.7	4	2
3.7	2	●	MVE0370X02S060	8.1	20.7	23.2	55.7	55	0.7	6	1
3.7	3	●	MVE0370X03S040	11.8	27.7	27.7	60.7	60	0.7	4	2
3.7	3	●	MVE0370X03S060	11.8	27.7	30.2	60.7	60	0.7	6	1

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.8	2	●	MVE0380X02S040	8.3	20.7	20.7	55.7	55	0.7	4	2
3.8	2	●	MVE0380X02S060	8.3	20.7	23.1	55.7	55	0.7	6	1
3.8	3	●	MVE0380X03S040	12.1	27.7	27.7	60.7	60	0.7	4	2
3.8	3	●	MVE0380X03S060	12.1	27.7	30.1	60.7	60	0.7	6	1
3.9	2	●	MVE0390X02S040	8.5	20.7	20.7	55.7	55	0.7	4	2
3.9	2	●	MVE0390X02S060	8.5	20.7	23.0	55.7	55	0.7	6	1
3.9	3	●	MVE0390X03S040	12.4	27.7	27.7	60.7	60	0.7	4	2
3.9	3	●	MVE0390X03S060	12.4	27.7	30.0	60.7	60	0.7	6	1
4.0	2	●	MVE0400X02S040	8.7	20.7	20.7	55.7	55	0.7	4	2
4.0	2	●	MVE0400X02S060	8.7	20.7	22.8	55.7	55	0.7	6	1
4.0	3	●	MVE0400X03S040	12.7	27.7	27.7	60.7	60	0.7	4	2
4.0	3	●	MVE0400X03S060	12.7	27.7	29.8	60.7	60	0.7	6	1
4.1	2	●	MVE0410X02S050	8.9	22.7	24.7	62.7	62	0.7	5	2
4.1	2	●	MVE0410X02S060	8.9	22.7	24.7	62.7	62	0.7	6	1
4.1	3	●	MVE0410X03S050	13.0	29.7	31.7	68.7	68	0.7	5	2
4.1	3	●	MVE0410X03S060	13.0	29.7	31.7	68.7	68	0.7	6	1
4.2	2	●	MVE0420X02S050	9.2	22.8	24.8	62.8	62	0.8	5	2
4.2	2	●	MVE0420X02S060	9.2	22.8	24.7	62.8	62	0.8	6	1
4.2	3	●	MVE0420X03S050	13.4	29.8	31.8	68.8	68	0.8	5	2
4.2	3	●	MVE0420X03S060	13.4	29.8	31.7	68.8	68	0.8	6	1
4.3	2	●	MVE0430X02S050	9.4	22.8	24.8	62.8	62	0.8	5	2
4.3	2	●	MVE0430X02S060	9.4	22.8	24.6	62.8	62	0.8	6	1
4.3	3	●	MVE0430X03S050	13.7	29.8	31.8	68.8	68	0.8	5	2
4.3	3	●	MVE0430X03S060	13.7	29.8	31.6	68.8	68	0.8	6	1
4.4	2	●	MVE0440X02S050	9.6	22.8	24.8	62.8	62	0.8	5	2
4.4	2	●	MVE0440X02S060	9.6	22.8	24.5	62.8	62	0.8	6	1
4.4	3	●	MVE0440X03S050	14.0	29.8	31.8	68.8	68	0.8	5	2
4.4	3	●	MVE0440X03S060	14.0	29.8	31.5	68.8	68	0.8	6	1
4.5	2	●	MVE0450X02S050	9.8	22.8	24.8	62.8	62	0.8	5	2
4.5	2	●	MVE0450X02S060	9.8	22.8	24.4	62.8	62	0.8	6	1
4.5	3	●	MVE0450X03S050	14.3	29.8	31.8	68.8	68	0.8	5	2
4.5	3	●	MVE0450X03S060	14.3	29.8	31.4	68.8	68	0.8	6	1

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
4.6	2	●	MVE0460X02S050	10.0	24.8	24.8	62.8	62	0.8	5	2
4.6	2	●	MVE0460X02S060	10.0	24.8	27.8	62.8	62	0.8	6	2
4.6	3	●	MVE0460X03S050	14.6	32.8	32.8	68.8	68	0.8	5	2
4.6	3	●	MVE0460X03S060	14.6	32.8	35.8	68.8	68	0.8	6	2
4.7	2	●	MVE0470X02S050	10.3	24.9	24.9	62.9	62	0.9	5	2
4.7	2	●	MVE0470X02S060	10.3	24.9	27.9	62.9	62	0.9	6	2
4.7	3	●	MVE0470X03S050	15.0	32.9	32.9	68.9	68	0.9	5	2
4.7	3	●	MVE0470X03S060	15.0	32.9	35.9	68.9	68	0.9	6	2
4.8	2	●	MVE0480X02S050	10.5	24.9	24.9	62.9	62	0.9	5	2
4.8	2	●	MVE0480X02S060	10.5	24.9	27.9	62.9	62	0.9	6	2
4.8	3	●	MVE0480X03S050	15.3	32.9	32.9	68.9	68	0.9	5	2
4.8	3	●	MVE0480X03S060	15.3	32.9	35.9	68.9	68	0.9	6	2
4.9	2	●	MVE0490X02S050	10.7	24.9	24.9	62.9	62	0.9	5	2
4.9	2	●	MVE0490X02S060	10.7	24.9	27.9	62.9	62	0.9	6	2
4.9	3	●	MVE0490X03S050	15.6	32.9	32.9	68.9	68	0.9	5	2
4.9	3	●	MVE0490X03S060	15.6	32.9	35.9	68.9	68	0.9	6	2
5.0	2	●	MVE0500X02S050	10.9	24.9	24.9	62.9	62	0.9	5	2
5.0	2	●	MVE0500X02S060	10.9	24.9	27.9	62.9	62	0.9	6	2
5.0	3	●	MVE0500X03S050	15.9	32.9	32.9	68.9	68	0.9	5	2
5.0	3	●	MVE0500X03S060	15.9	32.9	35.9	68.9	68	0.9	6	2
5.1	2	●	MVE0510X02S060	11.1	26.9	28.9	66.9	66	0.9	6	2
5.1	3	●	MVE0510X03S060	16.2	34.9	36.9	74.9	74	0.9	6	2
5.2	2	●	MVE0520X02S060	11.3	26.9	28.9	66.9	66	0.9	6	2
5.2	3	●	MVE0520X03S060	16.5	34.9	36.9	74.9	74	0.9	6	2
5.3	2	●	MVE0530X02S060	11.6	27.0	29.0	67.0	66	1.0	6	2
5.3	3	●	MVE0530X03S060	16.9	35.0	37.0	75.0	74	1.0	6	2
5.4	2	●	MVE0540X02S060	11.8	27.0	29.0	67.0	66	1.0	6	2
5.4	3	●	MVE0540X03S060	17.2	35.0	37.0	75.0	74	1.0	6	2
5.5	2	●	MVE0550X02S060	12.0	27.0	29.0	67.0	66	1.0	6	2
5.5	3	●	MVE0550X03S060	17.5	35.0	37.0	75.0	74	1.0	6	2
5.6	2	●	MVE0560X02S060	12.2	29.0	29.0	67.0	66	1.0	6	2
5.6	3	●	MVE0560X03S060	17.8	37.0	37.0	75.0	74	1.0	6	2
5.7	2	●	MVE0570X02S060	12.4	29.0	29.0	67.0	66	1.0	6	2
5.7	3	●	MVE0570X03S060	18.1	37.0	37.0	75.0	74	1.0	6	2
5.8	2	●	MVE0580X02S060	12.7	29.1	29.1	67.1	66	1.1	6	2
5.8	3	●	MVE0580X03S060	18.5	37.1	37.1	75.1	74	1.1	6	2
5.9	2	●	MVE0590X02S060	12.9	29.1	29.1	67.1	66	1.1	6	2
5.9	3	●	MVE0590X03S060	18.8	37.1	37.1	75.1	74	1.1	6	2
6.0	2	●	MVE0600X02S060	13.1	29.1	29.1	67.1	66	1.1	6	2
6.0	3	●	MVE0600X03S060	19.1	37.1	37.1	75.1	74	1.1	6	2
6.1	2	●	MVE0610X02S070	13.3	32.1	35.1	75.1	74	1.1	7	2
6.1	2	●	MVE0610X02S080	13.3	32.1	35.1	75.1	74	1.1	8	2
6.1	3	●	MVE0610X03S070	19.4	42.1	45.1	84.1	83	1.1	7	2
6.1	3	●	MVE0610X03S080	19.4	42.1	45.1	84.1	83	1.1	8	2
6.2	2	●	MVE0620X02S070	13.5	32.1	35.1	75.1	74	1.1	7	2
6.2	2	●	MVE0620X02S080	13.5	32.1	35.1	75.1	74	1.1	8	2
6.2	3	●	MVE0620X03S070	19.7	42.1	45.1	84.1	83	1.1	7	2
6.2	3	●	MVE0620X03S080	19.7	42.1	45.1	84.1	83	1.1	8	2
6.3	2	●	MVE0630X02S070	13.7	32.1	35.1	75.1	74	1.1	7	2
6.3	2	●	MVE0630X02S080	13.7	32.1	35.1	75.1	74	1.1	8	2
6.3	3	●	MVE0630X03S070	20.0	42.1	45.1	84.1	83	1.1	7	2
6.3	3	●	MVE0630X03S080	20.0	42.1	45.1	84.1	83	1.1	8	2
6.4	2	●	MVE0640X02S070	14.0	32.2	35.2	75.2	74	1.2	7	2
6.4	2	●	MVE0640X02S080	14.0	32.2	35.2	75.2	74	1.2	8	2
6.4	3	●	MVE0640X03S070	20.4	42.2	45.2	84.2	83	1.2	7	2
6.4	3	●	MVE0640X03S080	20.4	42.2	45.2	84.2	83	1.2	8	2
6.5	2	●	MVE0650X02S070	14.2	32.2	35.2	75.2	74	1.2	7	2
6.5	2	●	MVE0650X02S080	14.2	32.2	35.2	75.2	74	1.2	8	2
6.5	3	●	MVE0650X03S070	20.7	42.2	45.2	84.2	83	1.2	7	2
6.5	3	●	MVE0650X03S080	20.7	42.2	45.2	84.2	83	1.2	8	2
6.6	2	●	MVE0660X02S070	14.4	35.2	35.2	75.2	74	1.2	7	2
6.6	2	●	MVE0660X02S080	14.4	35.2	37.2	75.2	74	1.2	8	2
6.6	3	●	MVE0660X03S070	21.0	44.2	44.2	84.2	83	1.2	7	2
6.6	3	●	MVE0660X03S080	21.0	44.2	46.2	84.2	83	1.2	8	2
6.7	2	●	MVE0670X02S070	14.6	35.2	35.2	75.2	74	1.2	7	2
6.7	2	●	MVE0670X02S080	14.6	35.2	37.2	75.2	74	1.2	8	2
6.7	3	●	MVE0670X03S070	21.3	44.2	44.2	84.2	83	1.2	7	2
6.7	3	●	MVE0670X03S080	21.3	44.2	46.2	84.2	83	1.2	8	2
6.8	2	●	MVE0680X02S070	14.8	35.2	35.2	75.2	74	1.2	7	2
6.8	2	●	MVE0680X02S080	14.8	35.2	37.2	75.2	74	1.2	8	2
6.8	3	●	MVE0680X03S070	21.6	44.2	44.2	84.2	83	1.2	7	2
6.8	3	●	MVE0680X03S080	21.6	44.2	46.2	84.2	83	1.2	8	2
6.9	2	●	MVE0690X02S070	15.1	35.3	35.3	75.3	74	1.3	7	2
6.9	2	●	MVE0690X02S080	15.1	35.3	37.3	75.3	74	1.3	8	2
6.9	3	●	MVE0690X03S070	22.0	44.3	44.3	84.3	83	1.3	7	2
6.9	3	●	MVE0690X03S080	22.0	44.3	46.3	84.3	83	1.3	8	2
7.0	2	●	MVE0700X02S070	15.3	35.3	35.3	75.3	74	1.3	7	2
7.0	2	●	MVE0700X02S080	15.3	35.3	37.3	75.3	74	1.3	8	2
7.0	3	●	MVE0700X03S070	22.3	44.3	44.3	84.3	83	1.3	7	2
7.0	3	●	MVE0700X03S080	22.3	44.3	46.3	84.3	83	1.3	8	2
7.1	2	●	MVE0710X02S080	15.5	35.3	38.3	80.3	79	1.3	8	2
7.1	3	●	MVE0710X03S080	22.6	46.3	49.3	91.3	90	1.3	8	2
7.2	2	●	MVE0720X02S080	15.7	35.3	38.3	80.3	79	1.3	8	2
7.2	3	●	MVE0720X03S080	22.9	46.3	49.3	91.3	90	1.3	8	2
7.3	2	●	MVE0730X02S080	15.9	35.3	38.3	80.3	79	1.3	8	2
7.3	3	●	MVE0730X03S080	23.2	46.3	49.3	91.3	90	1.3	8	2
7.4	2	●	MVE0740X02S080	16.1	35.3	38.3	80.3	79	1.3	8	2
7.4	3	●	MVE0740X03S080	23.5	46.3	49.3	91.3	90	1.3	8	2
7.5	2	●	MVE0750X02S080	16.4	35.4	38.4	80.4	79	1.4	8	2
7.5	3	●	MVE0750X03S080	23.9	46.4	49.4	91.4	90	1.4	8	2
7.6	2	●	MVE0760X02S080	16.6	38.4	38.4	80.4	79	1.4	8	2
7.6	3	●	MVE0760X03S080	24.2	49.4	49.4	91.4	90	1.4	8	2
7.7	2	●	MVE0770X02S080	16.8	38.4	38.4	80.4	79	1.4	8	2
7.7	3	●	MVE0770X03S080	24.5	49.4	49.4	91.4	90	1.4	8	2
7.8	2	●	MVE0780X02S080	17.0	38.4	38.4	80.4	79	1.4	8	2
7.8	3	●	MVE0780X03S080	24.8	49.4	49.4	91.4	90	1.4	8	2

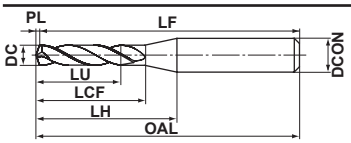
MVE

WSTAR DRILLS

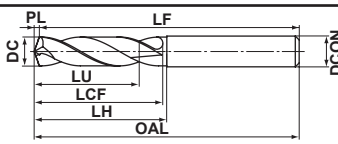
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
7.9	2	●	MVE0790X02S080	17.2	38.4	38.4	80.4	79	1.4	8	2
7.9	3	●	MVE0790X03S080	25.1	49.4	49.4	91.4	90	1.4	8	2
8.0	2	●	MVE0800X02S080	17.5	38.5	38.5	80.5	79	1.5	8	2
8.0	3	●	MVE0800X03S080	25.5	49.5	49.5	91.5	90	1.5	8	2
8.1	2	●	MVE0810X02S090	17.7	38.5	41.5	85.5	84	1.5	9	2
8.1	2	●	MVE0810X02S100	17.7	38.5	41.5	85.5	84	1.5	10	2
8.1	3	●	MVE0810X03S090	25.8	54.5	57.5	99.5	98	1.5	9	2
8.1	3	●	MVE0810X03S100	25.8	54.5	57.5	99.5	98	1.5	10	2
8.2	2	●	MVE0820X02S090	17.9	38.5	41.5	85.5	84	1.5	9	2
8.2	2	●	MVE0820X02S100	17.9	38.5	41.5	85.5	84	1.5	10	2
8.2	3	●	MVE0820X03S090	26.1	54.5	57.5	99.5	98	1.5	9	2
8.2	3	●	MVE0820X03S100	26.1	54.5	57.5	99.5	98	1.5	10	2
8.3	2	●	MVE0830X02S090	18.1	38.5	41.5	85.5	84	1.5	9	2
8.3	2	●	MVE0830X02S100	18.1	38.5	41.5	85.5	84	1.5	10	2
8.3	3	●	MVE0830X03S090	26.4	54.5	57.5	99.5	98	1.5	9	2
8.3	3	●	MVE0830X03S100	26.4	54.5	57.5	99.5	98	1.5	10	2
8.4	2	●	MVE0840X02S090	18.3	38.5	41.5	85.5	84	1.5	9	2
8.4	2	●	MVE0840X02S100	18.3	38.5	41.5	85.5	84	1.5	10	2
8.4	3	●	MVE0840X03S090	26.7	54.5	57.5	99.5	98	1.5	9	2
8.4	3	●	MVE0840X03S100	26.7	54.5	57.5	99.5	98	1.5	10	2
8.5	2	●	MVE0850X02S090	18.5	38.5	41.5	85.5	84	1.5	9	2
8.5	2	●	MVE0850X02S100	18.5	38.5	41.5	85.5	84	1.5	10	2
8.5	3	●	MVE0850X03S090	27.0	54.5	57.5	99.5	98	1.5	9	2
8.5	3	●	MVE0850X03S100	27.0	54.5	57.5	99.5	98	1.5	10	2
8.6	2	●	MVE0860X02S090	18.8	41.6	41.6	85.6	84	1.6	9	2
8.6	2	●	MVE0860X02S100	18.8	41.6	43.6	85.6	84	1.6	10	2
8.6	3	●	MVE0860X03S090	27.4	56.6	56.6	99.6	98	1.6	9	2
8.6	3	●	MVE0860X03S100	27.4	56.6	58.6	99.6	98	1.6	10	2
8.7	2	●	MVE0870X02S090	19.0	41.6	41.6	85.6	84	1.6	9	2
8.7	2	●	MVE0870X02S100	19.0	41.6	43.6	85.6	84	1.6	10	2
8.7	3	●	MVE0870X03S090	27.7	56.6	56.6	99.6	98	1.6	9	2
8.7	3	●	MVE0870X03S100	27.7	56.6	58.6	99.6	98	1.6	10	2
8.8	2	●	MVE0880X02S090	19.2	41.6	41.6	85.6	84	1.6	9	2
8.8	2	●	MVE0880X02S100	19.2	41.6	43.6	85.6	84	1.6	10	2
8.8	3	●	MVE0880X03S090	28.0	56.6	56.6	99.6	98	1.6	9	2
8.8	3	●	MVE0880X03S100	28.0	56.6	58.6	99.6	98	1.6	10	2
8.9	2	●	MVE0890X02S090	19.4	41.6	41.6	85.6	84	1.6	9	2
8.9	2	●	MVE0890X02S100	19.4	41.6	43.6	85.6	84	1.6	10	2
8.9	3	●	MVE0890X03S090	28.3	56.6	56.6	99.6	98	1.6	9	2
8.9	3	●	MVE0890X03S100	28.3	56.6	58.6	99.6	98	1.6	10	2
9.0	2	●	MVE0900X02S090	19.6	41.6	41.6	85.6	84	1.6	9	2
9.0	2	●	MVE0900X02S100	19.6	41.6	43.6	85.6	84	1.6	10	2
9.0	3	●	MVE0900X03S090	28.6	56.6	56.6	99.6	98	1.6	9	2
9.0	3	●	MVE0900X03S100	28.6	56.6	58.6	99.6	98	1.6	10	2
9.1	2	●	MVE0910X02S100	19.9	41.7	44.7	90.7	89	1.7	10	2
9.1	3	●	MVE0910X03S100	29.0	59.7	62.7	106.7	105	1.7	10	2
9.2	2	●	MVE0920X02S100	20.1	41.7	44.7	90.7	89	1.7	10	2
9.2	3	●	MVE0920X03S100	29.3	59.7	62.7	106.7	105	1.7	10	2
9.3	2	●	MVE0930X02S100	20.3	41.7	44.7	90.7	89	1.7	10	2
9.3	3	●	MVE0930X03S100	29.6	59.7	62.7	106.7	105	1.7	10	2
9.4	2	●	MVE0940X02S100	20.5	41.7	44.7	90.7	89	1.7	10	2
9.4	3	●	MVE0940X03S100	29.9	59.7	62.7	106.7	105	1.7	10	2
9.5	2	●	MVE0950X02S100	20.7	41.7	44.7	90.7	89	1.7	10	2
9.5	3	●	MVE0950X03S100	30.2	59.7	62.7	106.7	105	1.7	10	2
9.6	2	●	MVE0960X02S100	20.9	44.7	44.7	90.7	89	1.7	10	2
9.6	3	●	MVE0960X03S100	30.5	61.7	61.7	106.7	105	1.7	10	2
9.7	2	●	MVE0970X02S100	21.2	44.8	44.8	90.8	89	1.8	10	2
9.7	3	●	MVE0970X03S100	30.9	61.8	61.8	106.8	105	1.8	10	2
9.8	2	●	MVE0980X02S100	21.4	44.8	44.8	90.8	89	1.8	10	2
9.8	3	●	MVE0980X03S100	31.2	61.8	61.8	106.8	105	1.8	10	2
9.9	2	●	MVE0990X02S100	21.6	44.8	44.8	90.8	89	1.8	10	2
9.9	3	●	MVE0990X03S100	31.5	61.8	61.8	106.8	105	1.8	10	2
10.0	2	●	MVE1000X02S100	21.8	44.8	44.8	90.8	89	1.8	10	2
10.0	3	●	MVE1000X03S100	31.8	61.8	61.8	106.8	105	1.8	10	2
10.1	2	●	MVE1010X02S110	22.0	44.8	47.8	96.8	95	1.8	11	2
10.1	2	●	MVE1010X02S120	22.0	44.8	47.8	96.8	95	1.8	12	2
10.1	3	●	MVE1010X03S110	32.1	67.8	70.8	115.8	114	1.8	11	2
10.1	3	●	MVE1010X03S120	32.1	67.8	70.8	115.8	114	1.8	12	2
10.2	2	●	MVE1020X02S110	22.3	44.9	47.9	96.9	95	1.9	11	2
10.2	2	●	MVE1020X02S120	22.3	44.9	47.9	96.9	95	1.9	12	2
10.2	3	●	MVE1020X03S110	32.5	67.9	70.9	115.9	114	1.9	11	2
10.2	3	●	MVE1020X03S120	32.5	67.9	70.9	115.9	114	1.9	12	2
10.3	2	●	MVE1030X02S110	22.5	44.9	47.9	96.9	95	1.9	11	2
10.3	2	●	MVE1030X02S120	22.5	44.9	47.9	96.9	95	1.9	12	2
10.3	3	●	MVE1030X03S110	32.8	67.9	70.9	115.9	114	1.9	11	2
10.3	3	●	MVE1030X03S120	32.8	67.9	70.9	115.9	114	1.9	12	2
10.4	2	●	MVE1040X02S110	22.7	44.9	47.9	96.9	95	1.9	11	2
10.4	2	●	MVE1040X02S120	22.7	44.9	47.9	96.9	95	1.9	12	2
10.4	3	●	MVE1040X03S110	33.1	67.9	70.9	115.9	114	1.9	11	2
10.4	3	●	MVE1040X03S120	33.1	67.9	70.9	115.9	114	1.9	12	2
10.5	2	●	MVE1050X02S110	22.9	44.9	47.9	96.9	95	1.9	11	2
10.5	2	●	MVE1050X02S120	22.9	44.9	47.9	96.9	95	1.9	12	2
10.5	3	●	MVE1050X03S110	33.4	67.9	70.9	115.9	114	1.9	11	2
10.5	3	●	MVE1050X03S120	33.4	67.9	70.9	115.9	114	1.9	12	2
10.6	2	●	MVE1060X02S110	23.1	48.9	48.9	96.9	95	1.9	11	2
10.6	2	●	MVE1060X02S120	23.1	48.9	49.9	96.9	95	1.9	12	2
10.6	3	●	MVE1060X03S110	33.7	69.9	69.9	115.9	114	1.9	11	2
10.6	3	●	MVE1060X03S120	33.7	69.9	70.9	115.9	114	1.9	12	2
10.7	2	●	MVE1070X02S110	23.3	48.9	48.9	96.9	95	1.9	11	2
10.7	2	●	MVE1070X02S120	23.3	48.9	49.9	96.9	95	1.9	12	2
10.7	3	●	MVE1070X03S110	34.0	69.9	69.9	115.9	114	1.9	11	2
10.7	3	●	MVE1070X03S120	34.0	69.9	70.9	115.9	114	1.9	12	2
10.8	2	●	MVE1080X02S110	23.6	49.0	49.0	97.0	95	2.0	11	2
10.8	2	●	MVE1080X02S120	23.6	49.0	50.0	97.0	95	2.0	12	2
10.8	3	●	MVE1080X03S110	34.4	70.0	70.0	116.0	114	2.0	11	2
10.8	3	●	MVE1080X03S120	34.4	70.0	71.0	116.0	114	2.0	12	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1



Type2

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
10.9	2	●	MVE1090X02S110	23.8	49.0	49.0	97.0	95	2.0	11	2
10.9	2	●	MVE1090X02S120	23.8	49.0	50.0	97.0	95	2.0	12	2
10.9	3	●	MVE1090X03S110	34.7	70.0	70.0	116.0	114	2.0	11	2
10.9	3	●	MVE1090X03S120	34.7	70.0	71.0	116.0	114	2.0	12	2
11.0	2	●	MVE1100X02S110	24.0	49.0	49.0	97.0	95	2.0	11	2
11.0	2	●	MVE1100X02S120	24.0	49.0	50.0	97.0	95	2.0	12	2
11.0	3	●	MVE1100X03S110	35.0	70.0	70.0	116.0	114	2.0	11	2
11.0	3	●	MVE1100X03S120	35.0	70.0	71.0	116.0	114	2.0	12	2
11.1	2	●	MVE1110X02S120	24.2	49.0	52.0	97.0	95	2.0	12	2
11.1	3	●	MVE1110X03S120	35.3	73.0	76.0	123.0	121	2.0	12	2
11.2	2	●	MVE1120X02S120	24.4	49.0	52.0	97.0	95	2.0	12	2
11.2	3	●	MVE1120X03S120	35.6	73.0	76.0	123.0	121	2.0	12	2
11.3	2	●	MVE1130X02S120	24.7	49.1	52.1	97.1	95	2.1	12	2
11.3	3	●	MVE1130X03S120	36.0	73.1	76.1	123.1	121	2.1	12	2
11.4	2	●	MVE1140X02S120	24.9	49.1	52.1	97.1	95	2.1	12	2
11.4	3	●	MVE1140X03S120	36.3	73.1	76.1	123.1	121	2.1	12	2
11.5	2	●	MVE1150X02S120	25.1	49.1	52.1	97.1	95	2.1	12	2
11.5	3	●	MVE1150X03S120	36.6	73.1	76.1	123.1	121	2.1	12	2
11.6	2	●	MVE1160X02S120	25.3	49.1	49.1	97.1	95	2.1	12	2
11.6	3	●	MVE1160X03S120	36.9	75.1	75.1	123.1	121	2.1	12	2
11.7	2	●	MVE1170X02S120	25.5	49.1	49.1	97.1	95	2.1	12	2
11.7	3	●	MVE1170X03S120	37.2	75.1	75.1	123.1	121	2.1	12	2
11.8	2	●	MVE1180X02S120	25.7	49.1	49.1	97.1	95	2.1	12	2
11.8	3	●	MVE1180X03S120	37.5	75.1	75.1	123.1	121	2.1	12	2
11.9	2	●	MVE1190X02S120	26.0	49.2	49.2	97.2	95	2.2	12	2
11.9	3	●	MVE1190X03S120	37.9	75.2	75.2	123.2	121	2.2	12	2
12.0	2	●	MVE1200X02S120	26.2	49.2	49.2	97.2	95	2.2	12	2
12.0	3	●	MVE1200X03S120	38.2	75.2	75.2	123.2	121	2.2	12	2
12.1	2	●	MVE1210X02S130	26.4	53.2	56.2	104.2	102	2.2	13	2
12.1	2	□	MVE1210X02S140	26.4	53.2	56.2	104.2	102	2.2	14	2
12.1	3	●	MVE1210X03S130	38.5	78.2	81.2	139.2	137	2.2	13	2
12.1	3	□	MVE1210X03S140	38.5	78.2	81.2	139.2	137	2.2	14	2
12.2	2	●	MVE1220X02S130	26.6	53.2	56.2	104.2	102	2.2	13	2
12.2	2	□	MVE1220X02S140	26.6	53.2	56.2	104.2	102	2.2	14	2
12.2	3	●	MVE1220X03S130	38.8	78.2	81.2	139.2	137	2.2	13	2
12.2	3	□	MVE1220X03S140	38.8	78.2	81.2	139.2	137	2.2	14	2
12.3	2	●	MVE1230X02S130	26.8	53.2	56.2	104.2	102	2.2	13	2
12.3	2	□	MVE1230X02S140	26.8	53.2	56.2	104.2	102	2.2	14	2
12.3	3	●	MVE1230X03S130	39.1	78.2	81.2	139.2	137	2.2	13	2
12.3	3	□	MVE1230X03S140	39.1	78.2	81.2	139.2	137	2.2	14	2
12.4	2	●	MVE1240X02S130	27.1	53.3	56.3	104.3	102	2.3	13	2
12.4	2	□	MVE1240X02S140	27.1	53.3	56.3	104.3	102	2.3	14	2
12.4	3	●	MVE1240X03S130	39.5	78.3	81.3	139.3	137	2.3	13	2
12.4	3	□	MVE1240X03S140	39.5	78.3	81.3	139.3	137	2.3	14	2
12.5	2	●	MVE1250X02S130	27.3	53.3	56.3	104.3	102	2.3	13	2
12.5	2	□	MVE1250X02S140	27.3	53.3	56.3	104.3	102	2.3	14	2
12.5	3	●	MVE1250X03S130	39.8	78.3	81.3	139.3	137	2.3	13	2
12.5	3	□	MVE1250X03S140	39.8	78.3	81.3	139.3	137	2.3	14	2

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
12.6	2	●	MVE1260X02S130	27.5	53.3	53.3	104.3	102	2.3	13	2
12.6	2	□	MVE1260X02S140	27.5	53.3	53.3	104.3	102	2.3	14	2
12.6	3	●	MVE1260X03S130	40.1	80.3	80.3	139.3	137	2.3	13	2
12.6	3	□	MVE1260X03S140	40.1	80.3	80.3	139.3	137	2.3	14	2
12.7	2	●	MVE1270X02S130	27.7	53.3	53.3	104.3	102	2.3	13	2
12.7	2	□	MVE1270X02S140	27.7	53.3	53.3	104.3	102	2.3	14	2
12.7	3	●	MVE1270X03S130	40.4	80.3	80.3	139.3	137	2.3	13	2
12.7	3	□	MVE1270X03S140	40.4	80.3	80.3	139.3	137	2.3	14	2
12.8	2	●	MVE1280X02S130	27.9	53.3	53.3	104.3	102	2.3	13	2
12.8	2	□	MVE1280X02S140	27.9	53.3	53.3	104.3	102	2.3	14	2
12.8	3	●	MVE1280X03S130	40.7	80.3	80.3	139.3	137	2.3	13	2
12.8	3	□	MVE1280X03S140	40.7	80.3	80.3	139.3	137	2.3	14	2
12.9	2	●	MVE1290X02S130	28.1	53.3	53.3	104.3	102	2.3	13	2
12.9	2	□	MVE1290X02S140	28.1	53.3	53.3	104.3	102	2.3	14	2
12.9	3	●	MVE1290X03S130	41.0	80.3	80.3	139.3	137	2.3	13	2
12.9	3	□	MVE1290X03S140	41.0	80.3	80.3	139.3	137	2.3	14	2
13.0	2	●	MVE1300X02S130	28.4	53.4	53.4	104.4	102	2.4	13	2
13.0	2	□	MVE1300X02S140	28.4	53.4	53.4	104.4	102	2.4	14	2
13.0	3	●	MVE1300X03S130	41.4	80.4	80.4	139.4	137	2.4	13	2
13.0	3	□	MVE1300X03S140	41.4	80.4	80.4	139.4	137	2.4	14	2
13.1	2	●	MVE1310X02S140	28.6	56.4	59.4	109.4	107	2.4	14	2
13.1	3	●	MVE1310X03S140	41.7	86.4	89.4	149.4	147	2.4	14	2
13.2	2	●	MVE1320X02S140	28.8	56.4	59.4	109.4	107	2.4	14	2
13.2	3	●	MVE1320X03S140	42.0	86.4	89.4	149.4	147	2.4	14	2
13.3	2	●	MVE1330X02S140	29.0	56.4	59.4	109.4	107	2.4	14	2
13.3	3	●	MVE1330X03S140	42.3	86.4	89.4	149.4	147	2.4	14	2
13.4	2	●	MVE1340X02S140	29.2	56.4	59.4	109.4	107	2.4	14	2
13.4	3	●	MVE1340X03S140	42.6	86.4	89.4	149.4	147	2.4	14	2
13.5	2	●	MVE1350X02S140	29.5	56.5	59.5	109.5	107	2.5	14	2
13.5	3	●	MVE1350X03S140	43.0	86.5	89.5	149.5	147	2.5	14	2
13.6	2	●	MVE1360X02S140	29.7	56.5	56.5	109.5	107	2.5	14	2
13.6	3	●	MVE1360X03S140	43.3	88.5	88.5	149.5	147	2.5	14	2
13.7	2	●	MVE1370X02S140	29.9	56.5	56.5	109.5	107	2.5	14	2
13.7	3	●	MVE1370X03S140	43.6	88.5	88.5	149.5	147	2.5	14	2
13.8	2	●	MVE1380X02S140	30.1	56.5	56.5	109.5	107	2.5	14	2
13.8	3	●	MVE1380X03S140	43.9	88.5	88.5	149.5	147	2.5	14	2
13.9	2	●	MVE1390X02S140	30.3	56.5	56.5	109.5	107	2.5	14	2
13.9	3	●	MVE1390X03S140	44.2	88.5	88.5	149.5	147	2.5	14	2
14.0	2	●	MVE1400X02S140	30.5	56.5	56.5	109.5	107	2.5	14	2
14.0	3	●	MVE1400X03S140	44.5	88.5	88.5	149.5	147	2.5	14	2
14.1	2	●	MVE1410X02S150	30.8	58.6	61.6	113.6	111	2.6	15	2
14.1	2	□	MVE1410X02S160	30.8	58.6	61.6	113.6	111	2.6	16	2
14.1	3	●	MVE1410X03S150	44.9	91.6	94.6	155.6	153	2.6	15	2
14.1	3	□	MVE1410X03S160	44.9	91.6	94.6	155.6	153	2.6	16	2
14.2	2	●	MVE1420X02S150	31.0	58.6	61.6	113.6	111	2.6	15	2
14.2	2	□	MVE1420X02S160	31.0	58.6	61.6	113.6	111	2.6	16	2
14.2	3	●	MVE1420X03S150	45.2	91.6	94.6	155.6	153	2.6	15	2
14.2	3	□	MVE1420X03S160	45.2	91.6	94.6	155.6	153	2.6	16	2

MVE

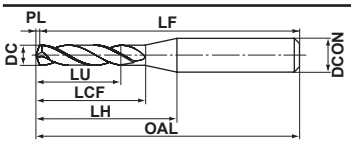
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
14.3	2	□	MVE1430X02S150	31.2	58.6	61.6	113.6	111	2.6	15	2
14.3	2	□	MVE1430X02S160	31.2	58.6	61.6	113.6	111	2.6	16	2
14.3	3	●	MVE1430X03S150	45.5	91.6	94.6	155.6	153	2.6	15	2
14.3	3	□	MVE1430X03S160	45.5	91.6	94.6	155.6	153	2.6	16	2
14.4	2	□	MVE1440X02S150	31.4	58.6	61.6	113.6	111	2.6	15	2
14.4	2	□	MVE1440X02S160	31.4	58.6	61.6	113.6	111	2.6	16	2
14.4	3	●	MVE1440X03S150	45.8	91.6	94.6	155.6	153	2.6	15	2
14.4	3	□	MVE1440X03S160	45.8	91.6	94.6	155.6	153	2.6	16	2
14.5	2	●	MVE1450X02S150	31.6	58.6	61.6	113.6	111	2.6	15	2
14.5	2	□	MVE1450X02S160	31.6	58.6	61.6	113.6	111	2.6	16	2
14.5	3	●	MVE1450X03S150	46.1	91.6	94.6	155.6	153	2.6	15	2
14.5	3	□	MVE1450X03S160	46.1	91.6	94.6	155.6	153	2.6	16	2
14.6	2	□	MVE1460X02S150	31.9	58.7	58.7	113.7	111	2.7	15	2
14.6	2	□	MVE1460X02S160	31.9	58.7	58.7	113.7	111	2.7	16	2
14.6	3	●	MVE1460X03S150	46.5	93.7	93.7	155.7	153	2.7	15	2
14.6	3	□	MVE1460X03S160	46.5	93.7	93.7	155.7	153	2.7	16	2
14.7	2	□	MVE1470X02S150	32.1	58.7	58.7	113.7	111	2.7	15	2
14.7	2	□	MVE1470X02S160	32.1	58.7	58.7	113.7	111	2.7	16	2
14.7	3	●	MVE1470X03S150	46.8	93.7	93.7	155.7	153	2.7	15	2
14.7	3	□	MVE1470X03S160	46.8	93.7	93.7	155.7	153	2.7	16	2
14.8	2	□	MVE1480X02S150	32.3	58.7	58.7	113.7	111	2.7	15	2
14.8	2	□	MVE1480X02S160	32.3	58.7	58.7	113.7	111	2.7	16	2
14.8	3	●	MVE1480X03S150	47.1	93.7	93.7	155.7	153	2.7	15	2
14.8	3	□	MVE1480X03S160	47.1	93.7	93.7	155.7	153	2.7	16	2
14.9	2	□	MVE1490X02S150	32.5	58.7	58.7	113.7	111	2.7	15	2
14.9	2	□	MVE1490X02S160	32.5	58.7	58.7	113.7	111	2.7	16	2
14.9	3	●	MVE1490X03S150	47.4	93.7	93.7	155.7	153	2.7	15	2
14.9	3	□	MVE1490X03S160	47.4	93.7	93.7	155.7	153	2.7	16	2
15.0	2	●	MVE1500X02S150	32.7	58.7	58.7	113.7	111	2.7	15	2
15.0	2	□	MVE1500X02S160	32.7	58.7	58.7	113.7	111	2.7	16	2
15.0	3	●	MVE1500X03S150	47.7	93.7	93.7	155.7	153	2.7	15	2
15.0	3	□	MVE1500X03S160	47.7	93.7	93.7	155.7	153	2.7	16	2
15.1	2	□	MVE1510X02S160	32.9	60.7	63.7	117.7	115	2.7	16	2
15.1	3	●	MVE1510X03S160	48.0	96.7	99.7	162.7	160	2.7	16	2
15.2	2	●	MVE1520X02S160	33.2	60.8	63.8	117.8	115	2.8	16	2
15.2	3	●	MVE1520X03S160	48.4	96.8	99.8	162.8	160	2.8	16	2
15.3	2	□	MVE1530X02S160	33.4	60.8	63.8	117.8	115	2.8	16	2
15.3	3	●	MVE1530X03S160	48.7	96.8	99.8	162.8	160	2.8	16	2
15.4	2	□	MVE1540X02S160	33.6	60.8	63.8	117.8	115	2.8	16	2
15.4	3	●	MVE1540X03S160	49.0	96.8	99.8	162.8	160	2.8	16	2
15.5	2	●	MVE1550X02S160	33.8	60.8	63.8	117.8	115	2.8	16	2
15.5	3	●	MVE1550X03S160	49.3	96.8	99.8	162.8	160	2.8	16	2
15.6	2	□	MVE1560X02S160	34.0	60.8	60.8	117.8	115	2.8	16	2
15.6	3	●	MVE1560X03S160	49.6	98.8	98.8	162.8	160	2.8	16	2
15.7	2	□	MVE1570X02S160	34.3	60.9	60.9	117.9	115	2.9	16	2
15.7	3	●	MVE1570X03S160	50.0	98.9	98.9	162.9	160	2.9	16	2
15.8	2	□	MVE1580X02S160	34.5	60.9	60.9	117.9	115	2.9	16	2
15.8	3	●	MVE1580X03S160	50.3	98.9	98.9	162.9	160	2.9	16	2

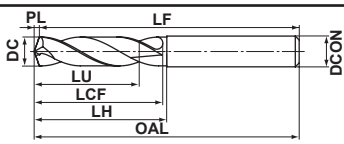
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
15.9	2	□	MVE1590X02S160	34.7	60.9	60.9	117.9	115	2.9	16	2
15.9	3	●	MVE1590X03S160	50.6	98.9	98.9	162.9	160	2.9	16	2
16.0	2	●	MVE1600X02S160	34.9	60.9	60.9	117.9	115	2.9	16	2
16.0	3	●	MVE1600X03S160	50.9	98.9	98.9	162.9	160	2.9	16	2
16.1	2	□	MVE1610X02S170	35.1	62.9	62.9	121.9	119	2.9	17	2
16.1	2	□	MVE1610X02S180	35.1	62.9	62.9	121.9	119	2.9	18	2
16.1	3	□	MVE1610X03S170	51.2	104.9	104.9	169.9	167	2.9	17	2
16.1	3	□	MVE1610X03S180	51.2	104.9	104.9	169.9	167	2.9	18	2
16.2	2	●	MVE1620X02S170	35.3	62.9	62.9	121.9	119	2.9	17	2
16.2	2	□	MVE1620X02S180	35.3	62.9	62.9	121.9	119	2.9	18	2
16.2	3	□	MVE1620X03S170	51.5	104.9	104.9	169.9	167	2.9	17	2
16.2	3	□	MVE1620X03S180	51.5	104.9	104.9	169.9	167	2.9	18	2
16.3	2	●	MVE1630X02S170	35.6	63.0	63.0	122.0	119	3.0	17	2
16.3	2	□	MVE1630X02S180	35.6	63.0	63.0	122.0	119	3.0	18	2
16.3	3	□	MVE1630X03S170	51.9	105.0	105.0	170.0	167	3.0	17	2
16.3	3	□	MVE1630X03S180	51.9	105.0	105.0	170.0	167	3.0	18	2
16.4	2	□	MVE1640X02S170	35.8	63.0	63.0	122.0	119	3.0	17	2
16.4	2	□	MVE1640X02S180	35.8	63.0	63.0	122.0	119	3.0	18	2
16.4	3	□	MVE1640X03S170	52.2	105.0	105.0	170.0	167	3.0	17	2
16.4	3	□	MVE1640X03S180	52.2	105.0	105.0	170.0	167	3.0	18	2
16.5	2	●	MVE1650X02S170	36.0	63.0	63.0	122.0	119	3.0	17	2
16.5	2	□	MVE1650X02S180	36.0	63.0	63.0	122.0	119	3.0	18	2
16.5	3	●	MVE1650X03S170	52.5	105.0	105.0	170.0	167	3.0	17	2
16.5	3	□	MVE1650X03S180	52.5	105.0	105.0	170.0	167	3.0	18	2
16.6	2	□	MVE1660X02S170	36.2	63.0	63.0	122.0	119	3.0	17	2
16.6	2	□	MVE1660X02S180	36.2	63.0	63.0	122.0	119	3.0	18	2
16.6	3	□	MVE1660X03S170	52.8	105.0	105.0	170.0	167	3.0	17	2
16.6	3	□	MVE1660X03S180	52.8	105.0	105.0	170.0	167	3.0	18	2
16.7	2	□	MVE1670X02S170	36.4	63.0	63.0	122.0	119	3.0	17	2
16.7	2	□	MVE1670X02S180	36.4	63.0	63.0	122.0	119	3.0	18	2
16.7	3	□	MVE1670X03S170	53.1	105.0	105.0	170.0	167	3.0	17	2
16.7	3	□	MVE1670X03S180	53.1	105.0	105.0	170.0	167	3.0	18	2
16.8	2	□	MVE1680X02S170	36.7	63.1	63.1	122.1	119	3.1	17	2
16.8	2	□	MVE1680X02S180	36.7	63.1	63.1	122.1	119	3.1	18	2
16.8	3	□	MVE1680X03S170	53.5	105.1	105.1	170.1	167	3.1	17	2
16.8	3	□	MVE1680X03S180	53.5	105.1	105.1	170.1	167	3.1	18	2
16.9	2	□	MVE1690X02S170	36.9	63.1	63.1	122.1	119	3.1	17	2
16.9	2	□	MVE1690X02S180	36.9	63.1	63.1	122.1	119	3.1	18	2
16.9	3	□	MVE1690X03S170	53.8	105.1	105.1	170.1	167	3.1	17	2
16.9	3	□	MVE1690X03S180	53.8	105.1	105.1	170.1	167	3.1	18	2
17.0	2	●	MVE1700X02S170	37.1	63.1	63.1	122.1	119	3.1	17	2
17.0	2	□	MVE1700X02S180	37.1	63.1	63.1	122.1	119	3.1	18	2
17.0	3	●	MVE1700X03S170	54.1	105.1	105.1	170.1	167	3.1	17	2
17.0	3	□	MVE1700X03S180	54.1	105.1	105.1	170.1	167	3.1	18	2
17.1	2	□	MVE1710X02S180	37.3	65.1	65.1	126.1	123	3.1	18	2
17.1	3	□	MVE1710X03S180	54.4	105.1	105.1	170.1	167	3.1	18	2
17.2	2	□	MVE1720X02S180	37.5	65.1	65.1	126.1	123	3.1	18	2
17.2	3	□	MVE1720X03S180	54.7	105.1	105.1	170.1	167	3.1	18	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1



Type2

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
17.3	2	□	MVE1730X02S180	37.7	65.1	65.1	126.1	123	3.1	18	2
17.3	3	□	MVE1730X03S180	55.0	105.1	105.1	170.1	167	3.1	18	2
17.4	2	□	MVE1740X02S180	38.0	65.2	65.2	126.2	123	3.2	18	2
17.4	3	□	MVE1740X03S180	55.4	105.2	105.2	170.2	167	3.2	18	2
17.5	2	●	MVE1750X02S180	38.2	65.2	65.2	126.2	123	3.2	18	2
17.5	3	●	MVE1750X03S180	55.7	105.2	105.2	170.2	167	3.2	18	2
17.6	2	□	MVE1760X02S180	38.4	65.2	65.2	126.2	123	3.2	18	2
17.6	3	□	MVE1760X03S180	56.0	105.2	105.2	170.2	167	3.2	18	2
17.7	2	□	MVE1770X02S180	38.6	65.2	65.2	126.2	123	3.2	18	2
17.7	3	□	MVE1770X03S180	56.3	105.2	105.2	170.2	167	3.2	18	2
17.8	2	●	MVE1780X02S180	38.8	65.2	65.2	126.2	123	3.2	18	2
17.8	3	□	MVE1780X03S180	56.6	105.2	105.2	170.2	167	3.2	18	2
17.9	2	□	MVE1790X02S180	39.1	65.3	65.3	126.3	123	3.3	18	2
17.9	3	□	MVE1790X03S180	57.0	105.3	105.3	170.3	167	3.3	18	2
18.0	2	●	MVE1800X02S180	39.3	65.3	65.3	126.3	123	3.3	18	2
18.0	3	●	MVE1800X03S180	57.3	105.3	105.3	170.3	167	3.3	18	2
18.1	2	□	MVE1810X02S190	39.5	67.3	67.3	130.3	127	3.3	19	2
18.1	2	□	MVE1810X02S200	39.5	67.3	67.3	130.3	127	3.3	20	2
18.1	3	□	MVE1810X03S190	57.6	117.3	117.3	182.3	179	3.3	19	2
18.1	3	□	MVE1810X03S200	57.6	117.3	117.3	182.3	179	3.3	20	2
18.2	2	□	MVE1820X02S190	39.7	67.3	67.3	130.3	127	3.3	19	2
18.2	2	□	MVE1820X02S200	39.7	67.3	67.3	130.3	127	3.3	20	2
18.2	3	□	MVE1820X03S190	57.9	117.3	117.3	182.3	179	3.3	19	2
18.2	3	□	MVE1820X03S200	57.9	117.3	117.3	182.3	179	3.3	20	2
18.3	2	□	MVE1830X02S190	39.9	67.3	67.3	130.3	127	3.3	19	2
18.3	2	□	MVE1830X02S200	39.9	67.3	67.3	130.3	127	3.3	20	2
18.3	3	□	MVE1830X03S190	58.2	117.3	117.3	182.3	179	3.3	19	2
18.3	3	□	MVE1830X03S200	58.2	117.3	117.3	182.3	179	3.3	20	2
18.4	2	□	MVE1840X02S190	40.1	67.3	67.3	130.3	127	3.3	19	2
18.4	2	□	MVE1840X02S200	40.1	67.3	67.3	130.3	127	3.3	20	2
18.4	3	□	MVE1840X03S190	58.5	117.3	117.3	182.3	179	3.3	19	2
18.4	3	□	MVE1840X03S200	58.5	117.3	117.3	182.3	179	3.3	20	2
18.5	2	●	MVE1850X02S190	40.4	67.4	67.4	130.4	127	3.4	19	2
18.5	2	□	MVE1850X02S200	40.4	67.4	67.4	130.4	127	3.4	20	2
18.5	3	●	MVE1850X03S190	58.9	117.4	117.4	182.4	179	3.4	19	2
18.5	3	□	MVE1850X03S200	58.9	117.4	117.4	182.4	179	3.4	20	2
18.6	2	□	MVE1860X02S190	40.6	67.4	67.4	130.4	127	3.4	19	2
18.6	2	□	MVE1860X02S200	40.6	67.4	67.4	130.4	127	3.4	20	2
18.6	3	□	MVE1860X03S190	59.2	117.4	117.4	182.4	179	3.4	19	2
18.6	3	□	MVE1860X03S200	59.2	117.4	117.4	182.4	179	3.4	20	2
18.7	2	□	MVE1870X02S190	40.8	67.4	67.4	130.4	127	3.4	19	2
18.7	2	□	MVE1870X02S200	40.8	67.4	67.4	130.4	127	3.4	20	2
18.7	3	□	MVE1870X03S190	59.5	117.4	117.4	182.4	179	3.4	19	2
18.7	3	□	MVE1870X03S200	59.5	117.4	117.4	182.4	179	3.4	20	2
18.8	2	□	MVE1880X02S190	41.0	67.4	67.4	130.4	127	3.4	19	2
18.8	2	□	MVE1880X02S200	41.0	67.4	67.4	130.4	127	3.4	20	2
18.8	3	□	MVE1880X03S190	59.8	117.4	117.4	182.4	179	3.4	19	2
18.8	3	□	MVE1880X03S200	59.8	117.4	117.4	182.4	179	3.4	20	2

DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
18.9	2	□	MVE1890X02S190	41.2	67.4	67.4	130.4	127	3.4	19	2
18.9	2	□	MVE1890X02S200	41.2	67.4	67.4	130.4	127	3.4	20	2
18.9	3	□	MVE1890X03S190	60.1	117.4	117.4	182.4	179	3.4	19	2
18.9	3	□	MVE1890X03S200	60.1	117.4	117.4	182.4	179	3.4	20	2
19.0	2	●	MVE1900X02S190	41.5	67.5	67.5	130.5	127	3.5	19	2
19.0	2	□	MVE1900X02S200	41.5	67.5	67.5	130.5	127	3.5	20	2
19.0	3	●	MVE1900X03S190	60.5	117.5	117.5	182.5	179	3.5	19	2
19.0	3	□	MVE1900X03S200	60.5	117.5	117.5	182.5	179	3.5	20	2
19.1	2	□	MVE1910X02S200	41.7	69.5	69.5	134.5	131	3.5	20	2
19.1	3	□	MVE1910X03S200	60.8	117.5	117.5	182.5	179	3.5	20	2
19.2	2	□	MVE1920X02S200	41.9	69.5	69.5	134.5	131	3.5	20	2
19.2	3	□	MVE1920X03S200	61.1	117.5	117.5	182.5	179	3.5	20	2
19.3	2	□	MVE1930X02S200	42.1	69.5	69.5	134.5	131	3.5	20	2
19.3	3	□	MVE1930X03S200	61.4	117.5	117.5	182.5	179	3.5	20	2
19.4	2	□	MVE1940X02S200	42.3	69.5	69.5	134.5	131	3.5	20	2
19.4	3	□	MVE1940X03S200	61.7	117.5	117.5	182.5	179	3.5	20	2
19.5	2	●	MVE1950X02S200	42.5	69.5	69.5	134.5	131	3.5	20	2
19.5	3	●	MVE1950X03S200	62.0	117.5	117.5	182.5	179	3.5	20	2
19.6	2	□	MVE1960X02S200	42.8	69.6	69.6	134.6	131	3.6	20	2
19.6	3	□	MVE1960X03S200	62.4	117.6	117.6	182.6	179	3.6	20	2
19.7	2	□	MVE1970X02S200	43.0	69.6	69.6	134.6	131	3.6	20	2
19.7	3	□	MVE1970X03S200	62.7	117.6	117.6	182.6	179	3.6	20	2
19.8	2	□	MVE1980X02S200	43.2	69.6	69.6	134.6	131	3.6	20	2
19.8	3	□	MVE1980X03S200	63.0	117.6	117.6	182.6	179	3.6	20	2
19.9	2	□	MVE1990X02S200	43.4	69.6	69.6	134.6	131	3.6	20	2
19.9	3	□	MVE1990X03S200	63.3	117.6	117.6	182.6	179	3.6	20	2
20.0	2	●	MVE2000X02S200	43.6	69.6	69.6	134.6	131	3.6	20	2
20.0	3	●	MVE2000X03S200	63.6	117.6	117.6	182.6	179	3.6	20	2

MVE

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) AISI 1010 etc			Carbon Steel, Alloy Steel (180—280HB) AISI 1045, AISI 4140 etc			Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	
3.2	6400	0.1	(0.06—0.13)	5900	0.1	(0.06—0.13)	5400	0.09	(0.06—0.12)
4.0	5500	0.12	(0.08—0.16)	5100	0.12	(0.08—0.16)	4700	0.11	(0.07—0.14)
5.0	4400	0.15	(0.10—0.20)	4100	0.15	(0.10—0.20)	3800	0.14	(0.09—0.18)
6.3	4000	0.2	(0.13—0.26)	3700	0.2	(0.13—0.26)	3500	0.18	(0.11—0.24)
8.0	3300	0.23	(0.18—0.28)	3100	0.23	(0.18—0.28)	2900	0.21	(0.16—0.25)
10.0	2800	0.27	(0.22—0.32)	2700	0.27	(0.22—0.32)	2500	0.23	(0.19—0.27)
12.0	2500	0.31	(0.28—0.34)	2300	0.31	(0.28—0.34)	2200	0.26	(0.23—0.29)
16.0	1900	0.33	(0.28—0.38)	1700	0.33	(0.28—0.38)	1600	0.29	(0.24—0.33)
20.0	1500	0.35	(0.30—0.40)	1400	0.35	(0.30—0.40)	1300	0.3	(0.26—0.34)

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc			Gray Cast Iron (≤350MPa) No 45 B etc			Ductile Cast Iron (≤450MPa) 60-40-8 etc		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	
3.2	1900	0.07	(0.05—0.08)	6900	0.1	(0.06—0.13)	6400	0.1	(0.06—0.13)
4.0	1500	0.08	(0.06—0.10)	5500	0.12	(0.08—0.16)	5100	0.12	(0.08—0.16)
5.0	1200	0.1	(0.07—0.13)	4400	0.15	(0.10—0.20)	4100	0.15	(0.10—0.20)
6.3	1200	0.13	(0.09—0.17)	3700	0.2	(0.13—0.26)	3500	0.2	(0.13—0.26)
8.0	900	0.14	(0.10—0.18)	2900	0.25	(0.18—0.31)	2700	0.23	(0.18—0.28)
10.0	700	0.16	(0.12—0.19)	2300	0.29	(0.22—0.35)	2200	0.27	(0.22—0.32)
12.0	600	0.18	(0.15—0.20)	2100	0.33	(0.28—0.37)	1900	0.31	(0.28—0.34)
16.0	400	0.19	(0.15—0.23)	1500	0.35	(0.28—0.42)	1400	0.33	(0.28—0.38)
20.0	300	0.2	(0.15—0.24)	1300	0.37	(0.30—0.44)	1200	0.35	(0.30—0.40)

Workpiece Material	Aluminium Alloys (Si<5%)			Heat Resistant Alloys Inconel718 etc			Hardened Steel (40—55HRC) AISI H13, L6 etc		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	
3.2	7900	0.1	(0.06—0.13)	1900	0.07	(0.05—0.09)	1900	0.07	(0.05—0.09)
4.0	6300	0.12	(0.08—0.16)	1500	0.09	(0.06—0.11)	1500	0.09	(0.06—0.11)
5.0	5000	0.15	(0.10—0.20)	1200	0.11	(0.08—0.14)	1200	0.11	(0.08—0.14)
6.3	4500	0.2	(0.13—0.26)	1200	0.14	(0.09—0.19)	1200	0.14	(0.09—0.19)
8.0	3500	0.23	(0.18—0.28)	900	0.14	(0.11—0.17)	900	0.14	(0.11—0.17)
10.0	2800	0.27	(0.22—0.32)	700	0.16	(0.12—0.19)	700	0.16	(0.12—0.19)
12.0	2600	0.31	(0.28—0.34)	600	0.16	(0.13—0.18)	600	0.16	(0.13—0.18)
16.0	1900	0.33	(0.28—0.38)	400	0.18	(0.14—0.21)	400	0.18	(0.14—0.21)
20.0	1700	0.35	(0.30—0.40)	400	0.19	(0.15—0.22)	400	0.19	(0.15—0.22)

DSAS NEW

● The unique hole geometry increases the coolant flow rate, resulting in high lubricity and a cooling effect.

Solid Carbide Drill for Machining Heat Resistant Super Alloys

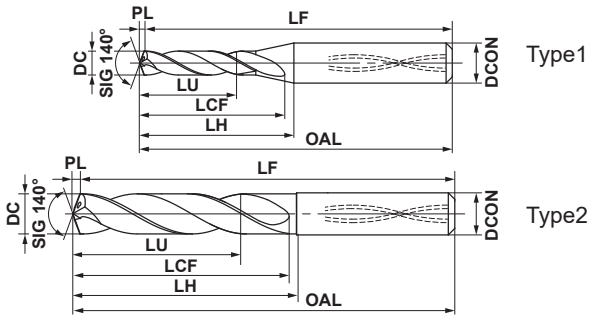
P | M | K | N | **S** | H

Heat Resistant Alloy

Internal Coolant



DC=3	3<DC≤6	6<DC≤10	10<DC≤12	
0 −0.018	0 −0.018	0 −0.022	0 −0.027	
DCON=6	6<DCON≤10	DCON=12		
0 −0.018	0 −0.009	0 −0.011		



✱When looking at the coating the colour can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.00	3	●	**DSAS0300X03S060**	9.5	21.5	23.5	70.5	70	0.5	6	1
3.00	5	●	**DSAS0300X05S060**	15.5	28.5	31.5	78.5	78	0.5	6	1
3.10	3	●	**DSAS0310X03S060**	9.9	21.6	23.6	70.6	70	0.6	6	1
3.10	5	●	**DSAS0310X05S060**	16.1	28.6	31.6	78.6	78	0.6	6	1
3.18	3	●	**DSAS0318X03S060**	10.1	21.6	23.6	70.6	70	0.6	6	1
3.18	5	●	**DSAS0318X05S060**	16.5	28.6	31.6	78.6	78	0.6	6	1
3.20	3	●	**DSAS0320X03S060**	10.2	21.6	23.6	70.6	70	0.6	6	1
3.20	5	●	**DSAS0320X05S060**	16.6	28.6	31.6	78.6	78	0.6	6	1
3.26	3	●	**DSAS0326X03S060**	10.4	21.6	23.6	70.6	70	0.6	6	1
3.26	5	●	**DSAS0326X05S060**	16.9	28.6	31.6	78.6	78	0.6	6	1
3.30	3	●	**DSAS0330X03S060**	10.5	21.6	23.6	70.6	70	0.6	6	1
3.30	5	●	**DSAS0330X05S060**	17.1	28.6	31.6	78.6	78	0.6	6	1
3.40	3	●	**DSAS0340X03S060**	10.8	21.6	23.6	70.6	70	0.6	6	1
3.40	5	●	**DSAS0340X05S060**	17.6	28.6	31.6	78.6	78	0.6	6	1
3.50	3	●	**DSAS0350X03S060**	11.1	21.6	23.6	70.6	70	0.6	6	1
3.50	5	●	**DSAS0350X05S060**	18.1	28.6	31.6	78.6	78	0.6	6	1
3.57	3	●	**DSAS0357X03S060**	11.4	22.7	23.7	70.7	70	0.7	6	1
3.57	5	●	**DSAS0357X05S060**	18.6	30.7	31.7	78.7	78	0.7	6	1
3.60	3	●	**DSAS0360X03S060**	11.5	22.7	23.7	70.7	70	0.7	6	1
3.60	5	●	**DSAS0360X05S060**	18.7	30.7	31.7	78.7	78	0.7	6	1
3.70	3	●	**DSAS0370X03S060**	11.8	22.7	23.7	70.7	70	0.7	6	1
3.70	5	●	**DSAS0370X05S060**	19.2	30.7	31.7	78.7	78	0.7	6	1
3.80	3	●	**DSAS0380X03S060**	12.1	22.7	23.7	70.7	70	0.7	6	1
3.80	5	●	**DSAS0380X05S060**	19.7	30.7	31.7	78.7	78	0.7	6	1
3.90	3	●	**DSAS0390X03S060**	12.4	22.7	23.7	70.7	70	0.7	6	1
3.90	5	●	**DSAS0390X05S060**	20.2	30.7	31.7	78.7	78	0.7	6	1
3.97	3	●	**DSAS0397X03S060**	12.6	22.7	23.7	70.7	70	0.7	6	1
3.97	5	●	**DSAS0397X05S060**	20.5	30.7	31.7	78.7	78	0.7	6	1
4.00	3	●	**DSAS0400X03S060**	12.7	22.7	23.7	70.7	70	0.7	6	1
4.00	5	●	**DSAS0400X05S060**	20.7	30.7	31.7	78.7	78	0.7	6	1
4.10	3	●	**DSAS0410X03S060**	13.0	24.7	26.7	73.7	73	0.7	6	1
4.10	5	●	**DSAS0410X05S060**	21.2	33.7	35.7	82.7	82	0.7	6	1
4.20	3	●	**DSAS0420X03S060**	13.4	24.8	26.8	73.8	73	0.8	6	1
4.20	5	●	**DSAS0420X05S060**	21.8	33.8	35.8	82.8	82	0.8	6	1
4.30	3	●	**DSAS0430X03S060**	13.7	24.8	26.8	73.8	73	0.8	6	1
4.30	5	●	**DSAS0430X05S060**	22.3	33.8	35.8	82.8	82	0.8	6	1
4.37	3	●	**DSAS0437X03S060**	13.9	24.8	26.8	73.8	73	0.8	6	1
4.37	5	●	**DSAS0437X05S060**	22.6	33.8	35.8	82.8	82	0.8	6	1

Note 1) The through coolant holes of drills Ø5mm or less are round.

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

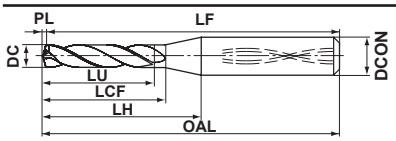
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N081

DSAS NEW

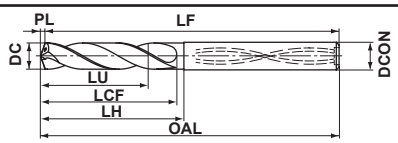
Solid Carbide Drill for Machining Heat Resistant Super Alloys

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
4.40	3	●	DSAS0440X03S060	14.0	24.8	26.8	73.8	73	0.8	6	1
4.40	5	●	DSAS0440X05S060	22.8	33.8	35.8	82.8	82	0.8	6	1
4.50	3	●	DSAS0450X03S060	14.3	24.8	26.8	73.8	73	0.8	6	1
4.50	5	●	DSAS0450X05S060	23.3	33.8	35.8	82.8	82	0.8	6	1
4.60	3	●	DSAS0460X03S060	14.6	25.8	28.8	75.8	75	0.8	6	1
4.60	5	●	DSAS0460X05S060	23.8	35.8	38.8	85.8	85	0.8	6	1
4.70	3	●	DSAS0470X03S060	15.0	25.9	28.9	75.9	75	0.9	6	1
4.70	5	●	DSAS0470X05S060	24.4	35.9	38.9	85.9	85	0.9	6	1
4.76	3	●	DSAS0476X03S060	15.2	25.9	28.9	75.9	75	0.9	6	1
4.76	5	●	DSAS0476X05S060	24.7	35.9	38.9	85.9	85	0.9	6	1
4.80	3	●	DSAS0480X03S060	15.3	25.9	28.9	75.9	75	0.9	6	1
4.80	5	●	DSAS0480X05S060	24.9	35.9	38.9	85.9	85	0.9	6	1
4.86	3	●	DSAS0486X03S060	15.5	25.9	28.9	75.9	75	0.9	6	1
4.86	5	●	DSAS0486X05S060	25.2	35.9	38.9	85.9	85	0.9	6	1
4.90	3	●	DSAS0490X03S060	15.6	25.9	28.9	75.9	75	0.9	6	1
4.90	5	●	DSAS0490X05S060	25.4	35.9	38.9	85.9	85	0.9	6	1
5.00	3	●	DSAS0500X03S060	15.9	28.9	29.9	81.9	81	0.9	6	2
5.00	5	●	DSAS0500X05S060	25.9	39.9	42.9	89.9	89	0.9	6	2
5.10	3	●	DSAS0510X03S060	16.2	28.9	29.9	81.9	81	0.9	6	2
5.10	5	●	DSAS0510X05S060	26.4	39.9	42.9	89.9	89	0.9	6	2
5.16	3	●	DSAS0516X03S060	16.5	29.0	30.0	82.0	81	1.0	6	2
5.16	5	●	DSAS0516X05S060	26.8	40.0	43.0	90.0	89	1.0	6	2
5.20	3	●	DSAS0520X03S060	16.6	29.0	30.0	82.0	81	1.0	6	2
5.20	5	●	DSAS0520X05S060	27.0	40.0	43.0	90.0	89	1.0	6	2
5.30	3	●	DSAS0530X03S060	16.9	29.0	30.0	82.0	81	1.0	6	2
5.30	5	●	DSAS0530X05S060	27.5	40.0	43.0	90.0	89	1.0	6	2
5.40	3	●	DSAS0540X03S060	17.2	29.0	30.0	82.0	81	1.0	6	2
5.40	5	●	DSAS0540X05S060	28.0	40.0	43.0	90.0	89	1.0	6	2
5.50	3	●	DSAS0550X03S060	17.5	29.0	30.0	82.0	81	1.0	6	2
5.50	5	●	DSAS0550X05S060	28.5	40.0	43.0	90.0	89	1.0	6	2
5.56	3	●	DSAS0556X03S060	17.8	31.1	31.1	82.1	81	1.1	6	2
5.56	5	●	DSAS0556X05S060	28.9	43.1	43.1	90.1	89	1.1	6	2
5.60	3	●	DSAS0560X03S060	17.9	31.1	31.1	82.1	81	1.1	6	2
5.60	5	●	DSAS0560X05S060	29.1	43.1	43.1	90.1	89	1.1	6	2
5.70	3	●	DSAS0570X03S060	18.2	31.1	31.1	82.1	81	1.1	6	2
5.70	5	●	DSAS0570X05S060	29.6	43.1	43.1	90.1	89	1.1	6	2
5.80	3	●	DSAS0580X03S060	18.5	31.1	31.1	82.1	81	1.1	6	2
5.80	5	●	DSAS0580X05S060	30.1	43.1	43.1	90.1	89	1.1	6	2
5.90	3	●	DSAS0590X03S060	18.8	31.1	31.1	82.1	81	1.1	6	2
5.90	5	●	DSAS0590X05S060	30.6	43.1	43.1	90.1	89	1.1	6	2
5.95	3	●	DSAS0595X03S060	19.0	31.1	31.1	82.1	81	1.1	6	2
5.95	5	●	DSAS0595X05S060	30.9	43.1	43.1	90.1	89	1.1	6	2
6.00	3	●	DSAS0600X03S060	19.1	31.1	31.1	82.1	81	1.1	6	2
6.00	5	●	DSAS0600X05S060	31.1	43.1	43.1	90.1	89	1.1	6	2
6.10	3	●	DSAS0610X03S080	19.5	34.2	37.2	87.2	86	1.2	8	2
6.10	5	●	DSAS0610X05S080	31.7	47.2	49.2	96.2	95	1.2	8	2
6.20	3	●	DSAS0620X03S080	19.8	34.2	37.2	87.2	86	1.2	8	2
6.20	5	●	DSAS0620X05S080	32.2	47.2	49.2	96.2	95	1.2	8	2
6.30	3	●	DSAS0630X03S080	20.1	34.2	37.2	87.2	86	1.2	8	2
6.30	5	●	DSAS0630X05S080	32.7	47.2	49.2	96.2	95	1.2	8	2
6.35	3	●	DSAS0635X03S080	20.3	34.2	37.2	87.2	86	1.2	8	2
6.35	5	●	DSAS0635X05S080	33.0	47.2	49.2	96.2	95	1.2	8	2
6.40	3	●	DSAS0640X03S080	20.4	34.2	37.2	87.2	86	1.2	8	2
6.40	5	●	DSAS0640X05S080	33.2	47.2	49.2	96.2	95	1.2	8	2
6.50	3	●	DSAS0650X03S080	20.7	34.2	37.2	87.2	86	1.2	8	2
6.50	5	●	DSAS0650X05S080	33.7	47.2	49.2	96.2	95	1.2	8	2

● : Inventory maintained in Japan.



Type1



Type2

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
6.60	3	●	**DSAS0660X03S080**	21.1	36.3	38.3	91.3	90	1.3	8	2
6.60	5	●	**DSAS0660X05S080**	34.3	50.3	52.3	99.3	98	1.3	8	2
6.70	3	●	**DSAS0670X03S080**	21.4	36.3	38.3	91.3	90	1.3	8	2
6.70	5	●	**DSAS0670X05S080**	34.8	50.3	52.3	99.3	98	1.3	8	2
6.75	3	●	**DSAS0675X03S080**	21.5	36.3	38.3	91.3	90	1.3	8	2
6.75	5	●	**DSAS0675X05S080**	35.0	50.3	52.3	99.3	98	1.3	8	2
6.80	3	●	**DSAS0680X03S080**	21.7	36.3	38.3	91.3	90	1.3	8	2
6.80	5	●	**DSAS0680X05S080**	35.3	50.3	52.3	99.3	98	1.3	8	2
6.90	3	●	**DSAS0690X03S080**	22.0	36.3	38.3	91.3	90	1.3	8	2
6.90	5	●	**DSAS0690X05S080**	35.8	50.3	52.3	99.3	98	1.3	8	2
6.95	3	●	**DSAS0695X03S080**	22.2	36.3	38.3	91.3	90	1.3	8	2
6.95	5	●	**DSAS0695X05S080**	36.1	50.3	52.3	99.3	98	1.3	8	2
7.00	3	●	**DSAS0700X03S080**	22.3	36.3	38.3	91.3	90	1.3	8	2
7.00	5	●	**DSAS0700X05S080**	36.3	50.3	52.3	99.3	98	1.3	8	2
7.10	3	●	**DSAS0710X03S080**	22.7	39.4	40.4	91.4	90	1.4	8	2
7.10	5	●	**DSAS0710X05S080**	36.9	54.4	57.4	104.4	103	1.4	8	2
7.14	3	●	**DSAS0714X03S080**	22.8	39.4	40.4	91.4	90	1.4	8	2
7.14	5	●	**DSAS0714X05S080**	37.1	54.4	57.4	104.4	103	1.4	8	2
7.20	3	●	**DSAS0720X03S080**	23.0	39.4	40.4	91.4	90	1.4	8	2
7.20	5	●	**DSAS0720X05S080**	37.4	54.4	57.4	104.4	103	1.4	8	2
7.30	3	●	**DSAS0730X03S080**	23.3	39.4	40.4	91.4	90	1.4	8	2
7.30	5	●	**DSAS0730X05S080**	37.9	54.4	57.4	104.4	103	1.4	8	2
7.40	3	●	**DSAS0740X03S080**	23.6	39.4	40.4	91.4	90	1.4	8	2
7.40	5	●	**DSAS0740X05S080**	38.4	54.4	57.4	104.4	103	1.4	8	2
7.50	3	●	**DSAS0750X03S080**	23.9	39.4	40.4	91.4	90	1.4	8	2
7.50	5	●	**DSAS0750X05S080**	38.9	54.4	57.4	104.4	103	1.4	8	2
7.54	3	●	**DSAS0754X03S080**	24.1	41.5	41.5	91.5	90	1.5	8	2
7.54	5	●	**DSAS0754X05S080**	39.2	57.5	57.5	104.5	103	1.5	8	2
7.60	3	●	**DSAS0760X03S080**	24.3	41.5	41.5	91.5	90	1.5	8	2
7.60	5	●	**DSAS0760X05S080**	39.5	57.5	57.5	104.5	103	1.5	8	2
7.70	3	●	**DSAS0770X03S080**	24.6	41.5	41.5	91.5	90	1.5	8	2
7.70	5	●	**DSAS0770X05S080**	40.0	57.5	57.5	104.5	103	1.5	8	2
7.80	3	●	**DSAS0780X03S080**	24.9	41.5	41.5	91.5	90	1.5	8	2
7.80	5	●	**DSAS0780X05S080**	40.5	57.5	57.5	104.5	103	1.5	8	2
7.90	3	●	**DSAS0790X03S080**	25.2	41.5	41.5	91.5	90	1.5	8	2
7.90	5	●	**DSAS0790X05S080**	41.0	57.5	57.5	104.5	103	1.5	8	2
7.94	3	●	**DSAS0794X03S080**	25.3	41.5	41.5	91.5	90	1.5	8	2
7.94	5	●	**DSAS0794X05S080**	41.2	57.5	57.5	104.5	103	1.5	8	2
8.00	3	●	**DSAS0800X03S080**	25.5	41.5	41.5	91.5	90	1.5	8	2
8.00	5	●	**DSAS0800X05S080**	41.5	57.5	57.5	104.5	103	1.5	8	2
8.10	3	●	**DSAS0810X03S100**	25.8	44.5	47.5	97.5	96	1.5	10	2
8.10	5	●	**DSAS0810X05S100**	42.0	61.5	63.5	114.5	113	1.5	10	2
8.20	3	●	**DSAS0820X03S100**	26.1	44.5	47.5	97.5	96	1.5	10	2
8.20	5	●	**DSAS0820X05S100**	42.5	61.5	63.5	114.5	113	1.5	10	2
8.30	3	●	**DSAS0830X03S100**	26.4	44.5	47.5	97.5	96	1.5	10	2
8.30	5	●	**DSAS0830X05S100**	43.0	61.5	63.5	114.5	113	1.5	10	2
8.33	3	●	**DSAS0833X03S100**	26.5	44.5	47.5	97.5	96	1.5	10	2
8.33	5	●	**DSAS0833X05S100**	43.2	61.5	63.5	114.5	113	1.5	10	2
8.40	3	●	**DSAS0840X03S100**	26.7	44.5	47.5	97.5	96	1.5	10	2
8.40	5	●	**DSAS0840X05S100**	43.5	61.5	63.5	114.5	113	1.5	10	2
8.50	3	●	**DSAS0850X03S100**	27.0	44.5	47.5	97.5	96	1.5	10	2
8.50	5	●	**DSAS0850X05S100**	44.0	61.5	63.5	114.5	113	1.5	10	2
8.60	3	●	**DSAS0860X03S100**	27.4	46.6	48.6	102.6	101	1.6	10	2
8.60	5	●	**DSAS0860X05S100**	44.6	64.6	66.6	117.6	116	1.6	10	2
8.70	3	●	**DSAS0870X03S100**	27.7	46.6	48.6	102.6	101	1.6	10	2
8.70	5	●	**DSAS0870X05S100**	45.1	64.6	66.6	117.6	116	1.6	10	2

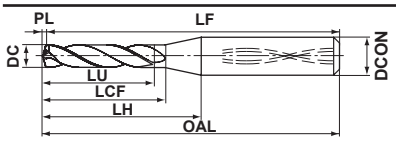
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N081

DSAS NEW

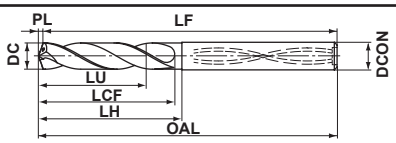
Solid Carbide Drill for Machining Heat Resistant Super Alloys

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
8.73	3	●	DSAS0873X03S100	27.8	46.6	48.6	102.6	101	1.6	10	2
8.73	5	●	DSAS0873X05S100	45.3	64.6	66.6	117.6	116	1.6	10	2
8.80	3	●	DSAS0880X03S100	28.0	46.6	48.6	102.6	101	1.6	10	2
8.80	5	●	DSAS0880X05S100	45.6	64.6	66.6	117.6	116	1.6	10	2
8.90	3	●	DSAS0890X03S100	28.3	46.6	48.6	102.6	101	1.6	10	2
8.90	5	●	DSAS0890X05S100	46.1	64.6	66.6	117.6	116	1.6	10	2
9.00	3	●	DSAS0900X03S100	28.6	46.6	48.6	102.6	101	1.6	10	2
9.00	5	●	DSAS0900X05S100	46.6	64.6	66.6	117.6	116	1.6	10	2
9.10	3	●	DSAS0910X03S100	29.1	49.8	50.8	102.8	101	1.8	10	2
9.10	5	●	DSAS0910X05S100	47.3	68.8	71.8	122.8	121	1.8	10	2
9.20	3	●	DSAS0920X03S100	29.4	49.8	50.8	102.8	101	1.8	10	2
9.20	5	●	DSAS0920X05S100	47.8	68.8	71.8	122.8	121	1.8	10	2
9.30	3	●	DSAS0930X03S100	29.7	49.8	50.8	102.8	101	1.8	10	2
9.30	5	●	DSAS0930X05S100	48.3	68.8	71.8	122.8	121	1.8	10	2
9.40	3	●	DSAS0940X03S100	30.0	49.8	50.8	102.8	101	1.8	10	2
9.40	5	●	DSAS0940X05S100	48.8	68.8	71.8	122.8	121	1.8	10	2
9.50	3	●	DSAS0950X03S100	30.3	49.8	50.8	102.8	101	1.8	10	2
9.50	5	●	DSAS0950X05S100	49.3	68.8	71.8	122.8	121	1.8	10	2
9.53	3	●	DSAS0953X03S100	30.4	49.8	50.8	102.8	101	1.8	10	2
9.53	5	●	DSAS0953X05S100	49.4	68.8	71.8	122.8	121	1.8	10	2
9.60	3	●	DSAS0960X03S100	30.6	49.8	50.8	102.8	101	1.8	10	2
9.60	5	●	DSAS0960X05S100	49.8	68.8	71.8	122.8	121	1.8	10	2
9.70	3	●	DSAS0970X03S100	30.9	49.8	50.8	102.8	101	1.8	10	2
9.70	5	●	DSAS0970X05S100	50.3	68.8	71.8	122.8	121	1.8	10	2
9.80	3	●	DSAS0980X03S100	31.2	51.8	51.8	102.8	101	1.8	10	2
9.80	5	●	DSAS0980X05S100	50.8	71.8	71.8	122.8	121	1.8	10	2
9.90	3	●	DSAS0990X03S100	31.5	51.9	51.8	102.8	101	1.8	10	2
9.90	5	●	DSAS0990X05S100	51.3	71.8	71.8	122.8	121	1.8	10	2
9.92	3	●	DSAS0992X03S100	31.6	51.8	51.8	102.8	101	1.8	10	2
9.92	5	●	DSAS0992X05S100	51.4	71.8	71.8	122.8	121	1.8	10	2
10.00	3	●	DSAS1000X03S100	31.8	51.8	51.8	102.8	101	1.8	10	2
10.00	5	●	DSAS1000X05S100	51.8	71.8	71.8	122.8	121	1.8	10	2
10.10	3	●	DSAS1010X03S120	32.2	54.9	57.9	112.9	111	1.9	12	2
10.10	5	●	DSAS1010X05S120	52.4	75.9	79.9	135.9	134	1.9	12	2
10.20	3	●	DSAS1020X03S120	32.5	54.9	57.9	112.9	111	1.9	12	2
10.20	5	●	DSAS1020X05S120	52.9	75.9	79.9	135.9	134	1.9	12	2
10.30	3	●	DSAS1030X03S120	32.8	54.9	57.9	112.9	111	1.9	12	2
10.30	5	●	DSAS1030X05S120	53.4	75.9	79.9	135.9	134	1.9	12	2
10.32	3	●	DSAS1032X03S120	32.9	54.9	57.9	112.9	111	1.9	12	2
10.32	5	●	DSAS1032X05S120	53.5	75.9	79.9	135.9	134	1.9	12	2
10.40	3	●	DSAS1040X03S120	33.1	54.9	57.9	112.9	111	1.9	12	2
10.40	5	●	DSAS1040X05S120	53.9	75.9	79.9	135.9	134	1.9	12	2
10.50	3	●	DSAS1050X03S120	33.4	54.9	57.9	112.9	111	1.9	12	2
10.50	5	●	DSAS1050X05S120	54.4	75.9	79.9	135.9	134	1.9	12	2
10.60	3	●	DSAS1060X03S120	33.7	54.9	57.9	112.9	111	1.9	12	2
10.60	5	●	DSAS1060X05S120	54.9	75.9	79.9	135.9	134	1.9	12	2
10.70	3	●	DSAS1070X03S120	34.0	54.9	57.9	112.9	111	1.9	12	2
10.70	5	●	DSAS1070X05S120	55.4	75.9	79.9	135.9	134	1.9	12	2
10.72	3	●	DSAS1072X03S120	34.1	57.0	59.0	118.0	116	2.0	12	2
10.72	5	●	DSAS1072X05S120	55.6	79.0	80.0	142.0	140	2.0	12	2
10.80	3	●	DSAS1080X03S120	34.4	57.0	59.0	118.0	116	2.0	12	2
10.80	5	●	DSAS1080X05S120	56.0	79.0	80.0	142.0	140	2.0	12	2
10.90	3	●	DSAS1090X03S120	34.7	57.0	59.0	118.0	116	2.0	12	2
10.90	5	●	DSAS1090X05S120	56.5	79.0	80.0	142.0	140	2.0	12	2
11.00	3	●	DSAS1100X03S120	35.0	57.0	59.0	118.0	116	2.0	12	2
11.00	5	●	DSAS1100X05S120	57.0	79.0	80.0	142.0	140	2.0	12	2

● : Inventory maintained in Japan.



Type1



Type2

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
11.10	3	●	**DSAS1110X03S120**	35.4	60.1	61.1	118.1	116	2.1	12	2
11.10	5	●	**DSAS1110X05S120**	57.6	83.1	86.1	142.1	140	2.1	12	2
11.11	3	●	**DSAS1111X03S120**	35.4	60.1	61.1	118.1	116	2.1	12	2
11.11	5	●	**DSAS1111X05S120**	57.7	83.1	86.1	142.1	140	2.1	12	2
11.20	3	●	**DSAS1120X03S120**	35.7	60.1	61.1	118.1	116	2.1	12	2
11.20	5	●	**DSAS1120X05S120**	58.1	83.1	86.1	142.1	140	2.1	12	2
11.30	3	●	**DSAS1130X03S120**	36.0	60.1	61.1	118.1	116	2.1	12	2
11.30	5	●	**DSAS1130X05S120**	58.6	83.1	86.1	142.1	140	2.1	12	2
11.40	3	●	**DSAS1140X03S120**	36.3	60.1	61.1	118.1	116	2.1	12	2
11.40	5	●	**DSAS1140X05S120**	59.1	83.1	86.1	142.1	140	2.1	12	2
11.50	3	●	**DSAS1150X03S120**	36.6	60.1	61.1	118.1	116	2.1	12	2
11.50	5	●	**DSAS1150X05S120**	59.6	83.1	86.1	142.1	140	2.1	12	2
11.51	3	●	**DSAS1151X03S120**	36.7	62.2	62.2	118.2	116	2.2	12	2
11.51	5	●	**DSAS1151X05S120**	59.7	86.2	86.2	142.2	140	2.2	12	2
11.60	3	●	**DSAS1160X03S120**	37.0	62.2	62.2	118.2	116	2.2	12	2
11.60	5	●	**DSAS1160X05S120**	60.2	86.2	86.2	142.2	140	2.2	12	2
11.70	3	●	**DSAS1170X03S120**	37.3	62.2	62.2	118.2	116	2.2	12	2
11.70	5	●	**DSAS1170X05S120**	60.7	86.2	86.2	142.2	140	2.2	12	2
11.80	3	●	**DSAS1180X03S120**	37.6	62.2	62.2	118.2	116	2.2	12	2
11.80	5	●	**DSAS1180X05S120**	61.2	86.2	86.2	142.2	140	2.2	12	2
11.90	3	●	**DSAS1190X03S120**	37.9	62.2	62.2	118.2	116	2.2	12	2
11.90	5	●	**DSAS1190X05S120**	61.7	86.2	86.2	142.2	140	2.2	12	2
12.00	3	●	**DSAS1200X03S120**	38.2	62.2	62.2	118.2	116	2.2	12	2
12.00	5	●	**DSAS1200X05S120**	62.2	86.2	86.2	142.2	140	2.2	12	2

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N081

DRILLING(SOLID CARBIDE)

DSAE NEW

Solid Carbide Drill for Machining Heat Resistant Super Alloys

●The specially designed, thin margin minimizes contact with the surface of the hole. This works in combination with the TRI-Cooling technology to reduce cutting heat and prevent generation of work hardening when machining heat resistant super alloys

UWC | DP9 | 140° | X

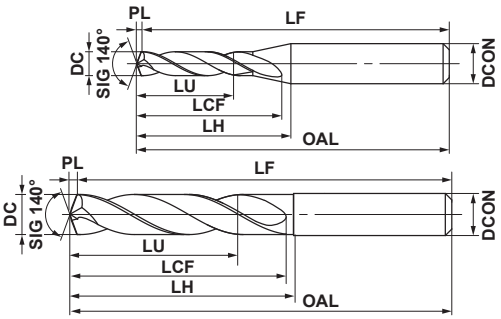
P | M | K | N | **S** | H

Heat Resistant Alloy

External Coolant



DC=3	3<DC≤6	6<DC≤10	10<DC≤12	
0 −0.018	0 −0.018	0 −0.022	0 −0.027	
DCON=6	6<DCON≤10	DCON=12		
0 −0.018	0 −0.009	0 −0.011		



✱When looking at the coating the colour can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC (mm)	Hole Depth (L/D)	DP9020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	**DSAE0300X03S060**	9.5	21.5	23.5	70.5	70	0.5	6	1
3.4	3	●	**DSAE0340X03S060**	10.8	21.6	23.6	70.6	70	0.6	6	1
4.0	3	●	**DSAE0400X03S060**	12.7	22.7	23.7	70.7	70	0.7	6	1
4.3	3	●	**DSAE0430X03S060**	13.7	24.8	26.8	73.8	73	0.8	6	1
4.5	3	●	**DSAE0450X03S060**	14.3	24.8	26.8	73.8	73	0.8	6	1
5.0	3	●	**DSAE0500X03S060**	15.9	28.9	29.9	81.9	81	0.9	6	2
5.1	3	●	**DSAE0510X03S060**	16.2	28.9	29.9	81.9	81	0.9	6	2
5.4	3	●	**DSAE0540X03S060**	17.2	29.0	30.0	82.0	81	1.0	6	2
5.5	3	●	**DSAE0550X03S060**	17.5	29.0	30.0	82.0	81	1.0	6	2
5.6	3	●	**DSAE0560X03S060**	17.9	31.1	31.1	82.1	81	1.1	6	2
5.9	3	●	**DSAE0590X03S060**	18.8	31.1	31.1	82.1	81	1.1	6	2
6.0	3	●	**DSAE0600X03S060**	19.1	31.1	31.1	82.1	81	1.1	6	2
6.1	3	●	**DSAE0610X03S080**	19.5	34.2	37.2	87.2	86	1.2	8	2
6.2	3	●	**DSAE0620X03S080**	19.8	34.2	37.2	87.2	86	1.2	8	2
6.4	3	●	**DSAE0640X03S080**	20.4	34.2	37.2	87.2	86	1.2	8	2
6.8	3	●	**DSAE0680X03S080**	21.7	36.3	38.3	91.3	90	1.3	8	2
6.9	3	●	**DSAE0690X03S080**	22.0	36.3	38.3	91.3	90	1.3	8	2
7.0	3	●	**DSAE0700X03S080**	22.3	36.3	38.3	91.3	90	1.3	8	2
7.1	3	●	**DSAE0710X03S080**	22.7	39.4	40.4	91.4	90	1.4	8	2
7.8	3	●	**DSAE0780X03S080**	24.9	41.5	41.5	91.5	90	1.5	8	2
8.0	3	●	**DSAE0800X03S080**	25.5	41.5	41.5	91.5	90	1.5	8	2
8.1	3	●	**DSAE0810X03S100**	25.8	44.5	47.5	97.5	96	1.5	10	2
8.2	3	●	**DSAE0820X03S100**	26.1	44.5	47.5	97.5	96	1.5	10	2
8.4	3	●	**DSAE0840X03S100**	26.7	44.5	47.5	97.5	96	1.5	10	2
8.5	3	●	**DSAE0850X03S100**	27.0	44.5	47.5	97.5	96	1.5	10	2
9.0	3	●	**DSAE0900X03S100**	28.6	46.6	48.6	102.6	101	1.6	10	2
10.0	3	●	**DSAE1000X03S100**	31.8	51.8	51.8	102.8	101	1.8	10	2
10.5	3	●	**DSAE1050X03S120**	33.4	54.9	57.9	112.9	111	1.9	12	2
10.7	3	●	**DSAE1070X03S120**	34.0	54.9	57.9	112.9	111	1.9	12	2
11.0	3	●	**DSAE1100X03S120**	35.0	57.0	59.0	118.0	116	2.0	12	2
11.5	3	●	**DSAE1150X03S120**	36.6	60.1	61.1	118.1	116	2.1	12	2
12.0	3	●	**DSAE1200X03S120**	38.2	62.2	62.2	118.2	116	2.2	12	2

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

DSAS / DSAE NEW

Solid Carbide Drill for Machining Heat Resistant Super Alloys

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Heat Resistant Alloys Inconel718 etc.		Titanium Alloys Ti-6Al-4V etc.	
Dia. **DC** (mm)	**L/D**	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed (Min.—Max.) (mm/rev)
3.0	**≤ 5**	1000	0.06 (0.04—0.10)	4200	0.08 (0.06—0.12)
4.0	**≤ 5**	790	0.06 (0.04—0.10)	3100	0.10 (0.08—0.16)
5.0	**≤ 5**	760	0.08 (0.06—0.12)	2500	0.12 (0.08—0.20)
6.0	**≤ 5**	790	0.10 (0.08—0.15)	2100	0.14 (0.10—0.20)
8.0	**≤ 5**	590	0.10 (0.08—0.15)	1600	0.18 (0.15—0.25)
10.0	**≤ 5**	570	0.10 (0.08—0.15)	1300	0.22 (0.18—0.28)
12.0	**≤ 5**	530	0.12 (0.08—0.15)	1100	0.24 (0.20—0.30)

Note 1) High pressure through spindle coolant is recommended for stable drilling.

Note 2) Emulsion type water-soluble coolant is recommended.

Note 3) When using non water-soluble coolant reduce the cutting speed by 10-20%.

Note 4) When drilling to depths deeper than DC x 1.0 while using an external coolant system, peck/step feed drilling is recommended at every DC x 0.5 depth to promote the breaking of chips.

MMS

WSTAR DRILLS

●Long tool life and high efficiency drilling for stainless steel.

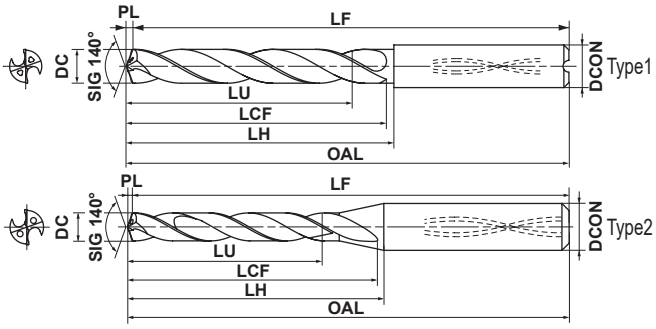


P | **M** | K | N | S | H

Stainless Steel

Internal Coolant





✱When looking at the coating the colour can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
	3<DCON≤6	6<DCON≤10	10<DCON≤18	18<DCON≤20
	0 −0.008	0 −0.009	0 −0.011	0 −0.013

h6

Note 1) MMS drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	MMS0300X3DB	9.5	21.5	23.5	70.5	70	0.5	6	2
3.0	5	●	MMS0300X5DB	15.5	28.5	31.5	78.5	78	0.5	6	2
3.1	3	●	MMS0310X3DB	9.9	21.6	23.6	70.6	70	0.6	6	2
3.1	5	●	MMS0310X5DB	16.1	28.6	31.6	78.6	78	0.6	6	2
3.2	3	●	MMS0320X3DB	10.2	21.6	23.6	70.6	70	0.6	6	2
3.2	5	●	MMS0320X5DB	16.6	28.6	31.6	78.6	78	0.6	6	2
3.3	3	●	MMS0330X3DB	10.5	21.6	23.6	70.6	70	0.6	6	2
3.3	5	●	MMS0330X5DB	17.1	28.6	31.6	78.6	78	0.6	6	2
3.4	3	●	MMS0340X3DB	10.8	21.6	23.6	70.6	70	0.6	6	2
3.4	5	●	MMS0340X5DB	17.6	28.6	31.6	78.6	78	0.6	6	2
3.5	3	●	MMS0350X3DB	11.1	21.6	23.6	70.6	70	0.6	6	2
3.5	5	●	MMS0350X5DB	18.1	28.6	31.6	78.6	78	0.6	6	2
3.6	3	●	MMS0360X3DB	11.5	22.7	23.7	70.7	70	0.7	6	2
3.6	5	●	MMS0360X5DB	18.7	30.7	31.7	78.7	78	0.7	6	2
3.7	3	●	MMS0370X3DB	11.8	22.7	23.7	70.7	70	0.7	6	2
3.7	5	●	MMS0370X5DB	19.2	30.7	31.7	78.7	78	0.7	6	2
3.8	3	●	MMS0380X3DB	12.1	22.7	23.7	70.7	70	0.7	6	2
3.8	5	●	MMS0380X5DB	19.7	30.7	31.7	78.7	78	0.7	6	2
3.9	3	●	MMS0390X3DB	12.4	22.7	23.7	70.7	70	0.7	6	2
3.9	5	●	MMS0390X5DB	20.2	30.7	31.7	78.7	78	0.7	6	2
4.0	3	●	MMS0400X3DB	12.7	22.7	23.7	70.7	70	0.7	6	2
4.0	5	●	MMS0400X5DB	20.7	30.7	31.7	78.7	78	0.7	6	2
4.1	3	●	MMS0410X3DB	13.0	24.7	26.7	73.7	73	0.7	6	2
4.1	5	●	MMS0410X5DB	21.2	33.7	35.7	82.7	82	0.7	6	2
4.2	3	●	MMS0420X3DB	13.4	24.8	26.8	73.8	73	0.8	6	2
4.2	5	●	MMS0420X5DB	21.8	33.8	35.8	82.8	82	0.8	6	2
4.3	3	●	MMS0430X3DB	13.7	24.8	26.8	73.8	73	0.8	6	2
4.3	5	●	MMS0430X5DB	22.3	33.8	35.8	82.8	82	0.8	6	2
4.4	3	●	MMS0440X3DB	14.0	24.8	26.8	73.8	73	0.8	6	2
4.4	5	●	MMS0440X5DB	22.8	33.8	35.8	82.8	82	0.8	6	2
4.5	3	●	MMS0450X3DB	14.3	24.8	26.8	73.8	73	0.8	6	2
4.5	5	●	MMS0450X5DB	23.3	33.8	35.8	82.8	82	0.8	6	2

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
4.6	3	●	MMS0460X3DB	14.6	25.8	28.8	75.8	75	0.8	6	1
4.6	5	●	MMS0460X5DB	23.8	35.8	38.8	85.8	85	0.8	6	1
4.7	3	●	MMS0470X3DB	15.0	25.9	28.9	75.9	75	0.9	6	1
4.7	5	●	MMS0470X5DB	24.4	35.9	38.9	85.9	85	0.9	6	1
4.8	3	●	MMS0480X3DB	15.3	25.9	28.9	75.9	75	0.9	6	1
4.8	5	●	MMS0480X5DB	24.9	35.9	38.9	85.9	85	0.9	6	1
4.9	3	●	MMS0490X3DB	15.6	25.9	28.9	75.9	75	0.9	6	1
4.9	5	●	MMS0490X5DB	25.4	35.9	38.9	85.9	85	0.9	6	1
5.0	3	●	MMS0500X3DB	15.9	25.9	28.9	75.9	75	0.9	6	1
5.0	5	●	MMS0500X5DB	25.9	35.9	38.9	85.9	85	0.9	6	1
5.1	3	●	MMS0510X3DB	16.2	28.9	30.9	81.9	81	0.9	6	1
5.1	5	●	MMS0510X5DB	26.4	39.9	42.9	89.9	89	0.9	6	1
5.2	3	●	MMS0520X3DB	16.5	28.9	30.9	81.9	81	0.9	6	1
5.2	5	●	MMS0520X5DB	26.9	39.9	42.9	89.9	89	0.9	6	1
5.3	3	●	MMS0530X3DB	16.9	29.0	31.0	82.0	81	1.0	6	1
5.3	5	●	MMS0530X5DB	27.5	40.0	43.0	90.0	89	1.0	6	1
5.4	3	●	MMS0540X3DB	17.2	29.0	31.0	82.0	81	1.0	6	1
5.4	5	●	MMS0540X5DB	28.0	40.0	43.0	90.0	89	1.0	6	1
5.5	3	●	MMS0550X3DB	17.5	29.0	31.0	82.0	81	1.0	6	1
5.5	5	●	MMS0550X5DB	28.5	40.0	43.0	90.0	89	1.0	6	1
5.6	3	●	MMS0560X3DB	17.8	31.0	31.0	82.0	81	1.0	6	1
5.6	5	●	MMS0560X5DB	29.0	43.0	43.0	90.0	89	1.0	6	1
5.7	3	●	MMS0570X3DB	18.1	31.0	31.0	82.0	81	1.0	6	1
5.7	5	●	MMS0570X5DB	29.5	43.0	43.0	90.0	89	1.0	6	1
5.8	3	●	MMS0580X3DB	18.5	31.1	31.1	82.1	81	1.1	6	1
5.8	5	●	MMS0580X5DB	30.1	43.1	43.1	90.1	89	1.1	6	1
5.9	3	●	MMS0590X3DB	18.8	31.1	31.1	82.1	81	1.1	6	1
5.9	5	●	MMS0590X5DB	30.6	43.1	43.1	90.1	89	1.1	6	1
6.0	3	●	MMS0600X3DB	19.1	31.1	31.1	82.1	81	1.1	6	1
6.0	5	●	MMS0600X5DB	31.1	43.1	43.1	90.1	89	1.1	6	1
6.1	3	●	MMS0610X3DB	19.4	34.1	36.1	87.1	86	1.1	8	1
6.1	5	●	MMS0610X5DB	31.6	47.1	49.1	96.1	95	1.1	8	1

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

Note 2) The coolant hole of ø6mm or less is round.

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
6.2	3	●	MMS0620X3DB	19.7	34.1	36.1	87.1	86	1.1	8	1
6.2	5	●	MMS0620X5DB	32.1	47.1	49.1	96.1	95	1.1	8	1
6.3	3	●	MMS0630X3DB	20.0	34.1	36.1	87.1	86	1.1	8	1
6.3	5	●	MMS0630X5DB	32.6	47.1	49.1	96.1	95	1.1	8	1
6.4	3	●	MMS0640X3DB	20.4	34.2	36.2	87.2	86	1.2	8	1
6.4	5	●	MMS0640X5DB	33.2	47.2	49.2	96.2	95	1.2	8	1
6.5	3	●	MMS0650X3DB	20.7	34.2	36.2	87.2	86	1.2	8	1
6.5	5	●	MMS0650X5DB	33.7	47.2	49.2	96.2	95	1.2	8	1
6.6	3	●	MMS0660X3DB	21.0	36.2	38.2	91.2	90	1.2	8	1
6.6	5	●	MMS0660X5DB	34.2	50.2	52.2	99.2	98	1.2	8	1
6.7	3	●	MMS0670X3DB	21.3	36.2	38.2	91.2	90	1.2	8	1
6.7	5	●	MMS0670X5DB	34.7	50.2	52.2	99.2	98	1.2	8	1
6.8	3	●	MMS0680X3DB	21.6	36.2	38.2	91.2	90	1.2	8	1
6.8	5	●	MMS0680X5DB	35.2	50.2	52.2	99.2	98	1.2	8	1
6.9	3	●	MMS0690X3DB	22.0	36.3	38.3	91.3	90	1.3	8	1
6.9	5	●	MMS0690X5DB	35.8	50.3	52.3	99.3	98	1.3	8	1
7.0	3	●	MMS0700X3DB	22.3	36.3	38.3	91.3	90	1.3	8	1
7.0	5	●	MMS0700X5DB	36.3	50.3	52.3	99.3	98	1.3	8	1
7.1	3	●	MMS0710X3DB	22.6	39.3	40.3	91.3	90	1.3	8	1
7.1	5	●	MMS0710X5DB	36.8	54.3	57.3	104.3	103	1.3	8	1
7.2	3	●	MMS0720X3DB	22.9	39.3	40.3	91.3	90	1.3	8	1
7.2	5	●	MMS0720X5DB	37.3	54.3	57.3	104.3	103	1.3	8	1
7.3	3	●	MMS0730X3DB	23.2	39.3	40.3	91.3	90	1.3	8	1
7.3	5	●	MMS0730X5DB	37.8	54.3	57.3	104.3	103	1.3	8	1
7.4	3	●	MMS0740X3DB	23.5	39.3	40.3	91.3	90	1.3	8	1
7.4	5	●	MMS0740X5DB	38.3	54.3	57.3	104.3	103	1.3	8	1
7.5	3	●	MMS0750X3DB	23.9	39.4	40.4	91.4	90	1.4	8	1
7.5	5	●	MMS0750X5DB	38.9	54.4	57.4	104.4	103	1.4	8	1
7.6	3	●	MMS0760X3DB	24.2	41.4	41.4	91.4	90	1.4	8	1
7.6	5	●	MMS0760X5DB	39.4	57.4	57.4	104.4	103	1.4	8	1
7.7	3	●	MMS0770X3DB	24.5	41.4	41.4	91.4	90	1.4	8	1
7.7	5	●	MMS0770X5DB	39.9	57.4	57.4	104.4	103	1.4	8	1
7.8	3	●	MMS0780X3DB	24.8	41.4	41.4	91.4	90	1.4	8	1
7.8	5	●	MMS0780X5DB	40.4	57.4	57.4	104.4	103	1.4	8	1
7.9	3	●	MMS0790X3DB	25.1	41.4	41.4	91.4	90	1.4	8	1
7.9	5	●	MMS0790X5DB	40.9	57.4	57.4	104.4	103	1.4	8	1
8.0	3	●	MMS0800X3DB	25.5	41.5	41.5	91.5	90	1.5	8	1
8.0	5	●	MMS0800X5DB	41.5	57.5	57.5	104.5	103	1.5	8	1
8.1	3	●	MMS0810X3DB	25.8	44.5	46.5	97.5	96	1.5	10	1
8.1	5	●	MMS0810X5DB	42.0	61.5	63.5	114.5	113	1.5	10	1
8.2	3	●	MMS0820X3DB	26.1	44.5	46.5	97.5	96	1.5	10	1
8.2	5	●	MMS0820X5DB	42.5	61.5	63.5	114.5	113	1.5	10	1
8.3	3	●	MMS0830X3DB	26.4	44.5	46.5	97.5	96	1.5	10	1
8.3	5	●	MMS0830X5DB	43.0	61.5	63.5	114.5	113	1.5	10	1
8.4	3	●	MMS0840X3DB	26.7	44.5	46.5	97.5	96	1.5	10	1
8.4	5	●	MMS0840X5DB	43.5	61.5	63.5	114.5	113	1.5	10	1
8.5	3	●	MMS0850X3DB	27.0	44.5	46.5	97.5	96	1.5	10	1
8.5	5	●	MMS0850X5DB	44.0	61.5	63.5	114.5	113	1.5	10	1

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.6	3	●	MMS0860X3DB	27.4	46.6	48.6	102.6	101	1.6	10	1
8.6	5	●	MMS0860X5DB	44.6	64.6	66.6	117.6	116	1.6	10	1
8.7	3	●	MMS0870X3DB	27.7	46.6	48.6	102.6	101	1.6	10	1
8.7	5	●	MMS0870X5DB	45.1	64.6	66.6	117.6	116	1.6	10	1
8.8	3	●	MMS0880X3DB	28.0	46.6	48.6	102.6	101	1.6	10	1
8.8	5	●	MMS0880X5DB	45.6	64.6	66.6	117.6	116	1.6	10	1
8.9	3	●	MMS0890X3DB	28.3	46.6	48.6	102.6	101	1.6	10	1
8.9	5	●	MMS0890X5DB	46.1	64.6	66.6	117.6	116	1.6	10	1
9.0	3	●	MMS0900X3DB	28.6	46.6	48.6	102.6	101	1.6	10	1
9.0	5	●	MMS0900X5DB	46.6	64.6	66.6	117.6	116	1.6	10	1
9.1	3	●	MMS0910X3DB	29.0	49.7	51.7	102.7	101	1.7	10	1
9.1	5	●	MMS0910X5DB	47.2	68.7	71.7	122.7	121	1.7	10	1
9.2	3	●	MMS0920X3DB	29.3	49.7	51.7	102.7	101	1.7	10	1
9.2	5	●	MMS0920X5DB	47.7	68.7	71.7	122.7	121	1.7	10	1
9.3	3	●	MMS0930X3DB	29.6	49.7	51.7	102.7	101	1.7	10	1
9.3	5	●	MMS0930X5DB	48.2	68.7	71.7	122.7	121	1.7	10	1
9.4	3	●	MMS0940X3DB	29.9	49.7	51.7	102.7	101	1.7	10	1
9.4	5	●	MMS0940X5DB	48.7	68.7	71.7	122.7	121	1.7	10	1
9.5	3	●	MMS0950X3DB	30.2	49.7	51.7	102.7	101	1.7	10	1
9.5	5	●	MMS0950X5DB	49.2	68.7	71.7	122.7	121	1.7	10	1
9.6	3	●	MMS0960X3DB	30.5	51.7	51.7	102.7	101	1.7	10	1
9.6	5	●	MMS0960X5DB	49.7	71.7	71.7	122.7	121	1.7	10	1
9.7	3	●	MMS0970X3DB	30.9	51.8	51.8	102.8	101	1.8	10	1
9.7	5	●	MMS0970X5DB	50.3	71.8	71.8	122.8	121	1.8	10	1
9.8	3	●	MMS0980X3DB	31.2	51.8	51.8	102.8	101	1.8	10	1
9.8	5	●	MMS0980X5DB	50.8	71.8	71.8	122.8	121	1.8	10	1
9.9	3	●	MMS0990X3DB	31.5	51.8	51.8	102.8	101	1.8	10	1
9.9	5	●	MMS0990X5DB	51.3	71.8	71.8	122.8	121	1.8	10	1
10.0	3	●	MMS1000X3DB	31.8	51.8	51.8	102.8	101	1.8	10	1
10.0	5	●	MMS1000X5DB	51.8	71.8	71.8	122.8	121	1.8	10	1
10.1	3	●	MMS1010X3DB	32.1	54.8	56.8	112.8	111	1.8	12	1
10.1	5	●	MMS1010X5DB	52.3	75.8	79.8	135.8	134	1.8	12	1
10.2	3	●	MMS1020X3DB	32.5	54.9	56.9	112.9	111	1.9	12	1
10.2	5	●	MMS1020X5DB	52.9	75.9	79.9	135.9	134	1.9	12	1
10.3	3	●	MMS1030X3DB	32.8	54.9	56.9	112.9	111	1.9	12	1
10.3	5	●	MMS1030X5DB	53.4	75.9	79.9	135.9	134	1.9	12	1
10.4	3	●	MMS1040X3DB	33.1	54.9	56.9	112.9	111	1.9	12	1
10.4	5	●	MMS1040X5DB	53.9	75.9	79.9	135.9	134	1.9	12	1
10.5	3	●	MMS1050X3DB	33.4	54.9	56.9	112.9	111	1.9	12	1
10.5	5	●	MMS1050X5DB	54.4	75.9	79.9	135.9	134	1.9	12	1
10.6	3	●	MMS1060X3DB	33.7	56.9	57.9	117.9	116	1.9	12	1
10.6	5	●	MMS1060X5DB	54.9	78.9	79.9	135.9	134	1.9	12	1
10.7	3	●	MMS1070X3DB	34.0	56.9	57.9	117.9	116	1.9	12	1
10.7	5	●	MMS1070X5DB	55.4	78.9	79.9	135.9	134	1.9	12	1
10.8	3	●	MMS1080X3DB	34.4	57.0	58.0	118.0	116	2.0	12	1
10.8	5	●	MMS1080X5DB	56.0	79.0	80.0	136.0	134	2.0	12	1
10.9	3	●	MMS1090X3DB	34.7	57.0	58.0	118.0	116	2.0	12	1
10.9	5	●	MMS1090X5DB	56.5	79.0	80.0	136.0	134	2.0	12	1

MMS

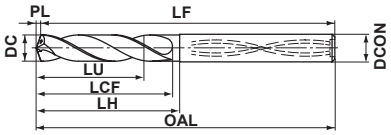
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
11.0	3	●	MMS1100X3DB	35.0	57.0	58.0	118.0	116	2.0	12	1
11.0	5	●	MMS1100X5DB	57.0	79.0	80.0	136.0	134	2.0	12	1
11.1	3	●	MMS1110X3DB	35.3	60.0	62.0	118.0	116	2.0	12	1
11.1	5	●	MMS1110X5DB	57.5	83.0	86.0	142.0	140	2.0	12	1
11.2	3	●	MMS1120X3DB	35.6	60.0	62.0	118.0	116	2.0	12	1
11.2	5	●	MMS1120X5DB	58.0	83.0	86.0	142.0	140	2.0	12	1
11.3	3	●	MMS1130X3DB	36.0	60.1	62.1	118.1	116	2.1	12	1
11.3	5	●	MMS1130X5DB	58.6	83.1	86.1	142.1	140	2.1	12	1
11.4	3	●	MMS1140X3DB	36.3	60.1	62.1	118.1	116	2.1	12	1
11.4	5	●	MMS1140X5DB	59.1	83.1	86.1	142.1	140	2.1	12	1
11.5	3	●	MMS1150X3DB	36.6	60.1	62.1	118.1	116	2.1	12	1
11.5	5	●	MMS1150X5DB	59.6	83.1	86.1	142.1	140	2.1	12	1
11.6	3	●	MMS1160X3DB	36.9	62.1	62.1	118.1	116	2.1	12	1
11.6	5	●	MMS1160X5DB	60.1	86.1	86.1	142.1	140	2.1	12	1
11.7	3	●	MMS1170X3DB	37.2	62.1	62.1	118.1	116	2.1	12	1
11.7	5	●	MMS1170X5DB	60.6	86.1	86.1	142.1	140	2.1	12	1
11.8	3	●	MMS1180X3DB	37.5	62.1	62.1	118.1	116	2.1	12	1
11.8	5	●	MMS1180X5DB	61.1	86.1	86.1	142.1	140	2.1	12	1
11.9	3	●	MMS1190X3DB	37.9	62.2	62.2	118.2	116	2.2	12	1
11.9	5	●	MMS1190X5DB	61.7	86.2	86.2	142.2	140	2.2	12	1
12.0	3	●	MMS1200X3DB	38.2	62.2	62.2	118.2	116	2.2	12	1
12.0	5	●	MMS1200X5DB	62.2	86.2	86.2	142.2	140	2.2	12	1
12.1	3	●	MMS1210X3DB	38.5	65.2	68.2	124.2	122	2.2	14	1
12.1	5	●	MMS1210X5DB	62.7	90.2	94.2	150.2	148	2.2	14	1
12.2	3	●	MMS1220X3DB	38.8	65.2	68.2	124.2	122	2.2	14	1
12.2	5	●	MMS1220X5DB	63.2	90.2	94.2	150.2	148	2.2	14	1
12.3	3	●	MMS1230X3DB	39.1	65.2	68.2	124.2	122	2.2	14	1
12.3	5	●	MMS1230X5DB	63.7	90.2	94.2	150.2	148	2.2	14	1
12.4	3	●	MMS1240X3DB	39.5	65.3	68.3	124.3	122	2.3	14	1
12.4	5	●	MMS1240X5DB	64.3	90.3	94.3	150.3	148	2.3	14	1
12.5	3	●	MMS1250X3DB	39.8	65.3	68.3	124.3	122	2.3	14	1
12.5	5	●	MMS1250X5DB	64.8	90.3	94.3	150.3	148	2.3	14	1
12.6	3	●	MMS1260X3DB	40.1	67.3	68.3	124.3	122	2.3	14	1
12.6	5	●	MMS1260X5DB	65.3	93.3	94.3	150.3	148	2.3	14	1
12.7	3	●	MMS1270X3DB	40.4	67.3	68.3	124.3	122	2.3	14	1
12.7	5	●	MMS1270X5DB	65.8	93.3	94.3	150.3	148	2.3	14	1
12.8	3	●	MMS1280X3DB	40.7	67.3	68.3	124.3	122	2.3	14	1
12.8	5	●	MMS1280X5DB	66.3	93.3	94.3	150.3	148	2.3	14	1
12.9	3	●	MMS1290X3DB	41.0	67.3	68.3	124.3	122	2.3	14	1
12.9	5	●	MMS1290X5DB	66.8	93.3	94.3	150.3	148	2.3	14	1
13.0	3	●	MMS1300X3DB	41.4	67.4	68.4	124.4	122	2.4	14	1
13.0	5	●	MMS1300X5DB	67.4	93.4	94.4	150.4	148	2.4	14	1
13.1	3	●	MMS1310X3DB	41.7	70.4	72.4	128.4	126	2.4	14	1
13.1	5	●	MMS1310X5DB	67.9	97.4	100.4	156.4	154	2.4	14	1
13.2	3	●	MMS1320X3DB	42.0	70.4	72.4	128.4	126	2.4	14	1
13.2	5	●	MMS1320X5DB	68.4	97.4	100.4	156.4	154	2.4	14	1
13.3	3	●	MMS1330X3DB	42.3	70.4	72.4	128.4	126	2.4	14	1
13.3	5	●	MMS1330X5DB	68.9	97.4	100.4	156.4	154	2.4	14	1
13.4	3	●	MMS1340X3DB	42.6	70.4	72.4	128.4	126	2.4	14	1
13.4	5	●	MMS1340X5DB	69.4	97.4	100.4	156.4	154	2.4	14	1
13.5	3	●	MMS1350X3DB	43.0	70.5	72.5	128.5	126	2.5	14	1
13.5	5	●	MMS1350X5DB	70.0	97.5	100.5	156.5	154	2.5	14	1
13.6	3	●	MMS1360X3DB	43.3	72.5	72.5	128.5	126	2.5	14	1
13.6	5	●	MMS1360X5DB	70.5	100.5	100.5	156.5	154	2.5	14	1
13.7	3	●	MMS1370X3DB	43.6	72.5	72.5	128.5	126	2.5	14	1
13.7	5	●	MMS1370X5DB	71.0	100.5	100.5	156.5	154	2.5	14	1
13.8	3	●	MMS1380X3DB	43.9	72.5	72.5	128.5	126	2.5	14	1
13.8	5	●	MMS1380X5DB	71.5	100.5	100.5	156.5	154	2.5	14	1
13.9	3	●	MMS1390X3DB	44.2	72.5	72.5	128.5	126	2.5	14	1
13.9	5	●	MMS1390X5DB	72.0	100.5	100.5	156.5	154	2.5	14	1
14.0	3	●	MMS1400X3DB	44.5	72.5	72.5	128.5	126	2.5	14	1
14.0	5	●	MMS1400X5DB	72.5	100.5	100.5	156.5	154	2.5	14	1
14.1	3	●	MMS1410X3DB	44.9	75.6	78.6	137.6	135	2.6	16	1
14.1	5	●	MMS1410X5DB	73.1	104.6	108.6	167.6	165	2.6	16	1
14.2	3	●	MMS1420X3DB	45.2	75.6	78.6	137.6	135	2.6	16	1
14.2	5	●	MMS1420X5DB	73.6	104.6	108.6	167.6	165	2.6	16	1
14.3	3	●	MMS1430X3DB	45.5	75.6	78.6	137.6	135	2.6	16	1
14.3	5	●	MMS1430X5DB	74.1	104.6	108.6	167.6	165	2.6	16	1
14.4	3	●	MMS1440X3DB	45.8	75.6	78.6	137.6	135	2.6	16	1
14.4	5	●	MMS1440X5DB	74.6	104.6	108.6	167.6	165	2.6	16	1
14.5	3	●	MMS1450X3DB	46.1	75.6	78.6	137.6	135	2.6	16	1
14.5	5	●	MMS1450X5DB	75.1	104.6	108.6	167.6	165	2.6	16	1
14.6	3	●	MMS1460X3DB	46.5	77.7	78.7	137.7	135	2.7	16	1
14.6	5	●	MMS1460X5DB	75.7	107.7	108.7	167.7	165	2.7	16	1
14.7	3	●	MMS1470X3DB	46.8	77.7	78.7	137.7	135	2.7	16	1
14.7	5	●	MMS1470X5DB	76.2	107.7	108.7	167.7	165	2.7	16	1
14.8	3	●	MMS1480X3DB	47.1	77.7	78.7	137.7	135	2.7	16	1
14.8	5	●	MMS1480X5DB	76.7	107.7	108.7	167.7	165	2.7	16	1
14.9	3	●	MMS1490X3DB	47.4	77.7	78.7	137.7	135	2.7	16	1
14.9	5	●	MMS1490X5DB	77.2	107.7	108.7	167.7	165	2.7	16	1
15.0	3	●	MMS1500X3DB	47.7	77.7	78.7	137.7	135	2.7	16	1
15.0	5	●	MMS1500X5DB	77.7	107.7	108.7	167.7	165	2.7	16	1
15.1	3	●	MMS1510X3DB	48.0	80.7	82.7	141.7	139	2.7	16	1
15.1	5	●	MMS1510X5DB	78.2	111.7	114.7	173.7	171	2.7	16	1
15.2	3	●	MMS1520X3DB	48.4	80.8	82.8	141.8	139	2.8	16	1
15.2	5	●	MMS1520X5DB	78.8	111.8	114.8	173.8	171	2.8	16	1
15.3	3	●	MMS1530X3DB	48.7	80.8	82.8	141.8	139	2.8	16	1
15.3	5	●	MMS1530X5DB	79.3	111.8	114.8	173.8	171	2.8	16	1
15.4	3	●	MMS1540X3DB	49.0	80.8	82.8	141.8	139	2.8	16	1
15.4	5	●	MMS1540X5DB	79.8	111.8	114.8	173.8	171	2.8	16	1
15.5	3	●	MMS1550X3DB	49.3	80.8	82.8	141.8	139	2.8	16	1
15.5	5	●	MMS1550X5DB	80.3	111.8	114.8	173.8	171	2.8	16	1
15.6	3	●	MMS1560X3DB	49.6	82.8	82.8	141.8	139	2.8	16	1
15.6	5	●	MMS1560X5DB	80.8	114.8	114.8	173.8	171	2.8	16	1
15.7	3	●	MMS1570X3DB	50.0	82.9	82.9	141.9	139	2.9	16	1
15.7	5	●	MMS1570X5DB	81.4	114.9	114.9	173.9	171	2.9	16	1

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1

DC (mm)	Hole Depth (L/D)	DP7020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
15.8	3	●	MMS1580X3DB	50.3	82.9	82.9	141.9	139	2.9	16	1
15.8	5	●	MMS1580X5DB	81.9	114.9	114.9	173.9	171	2.9	16	1
15.9	3	●	MMS1590X3DB	50.6	82.9	82.9	141.9	139	2.9	16	1
15.9	5	●	MMS1590X5DB	82.4	114.9	114.9	173.9	171	2.9	16	1
16.0	3	●	MMS1600X3DB	50.9	82.9	82.9	141.9	139	2.9	16	1
16.0	5	●	MMS1600X5DB	82.9	114.9	114.9	173.9	171	2.9	16	1
16.1	3	□	MMS1610X3DB	51.2	85.9	88.9	147.9	145	2.9	18	1
16.1	5	□	MMS1610X5DB	83.4	118.9	122.9	181.9	179	2.9	18	1
16.2	3	□	MMS1620X3DB	51.5	85.9	88.9	147.9	145	2.9	18	1
16.2	5	□	MMS1620X5DB	83.9	118.9	122.9	181.9	179	2.9	18	1
16.3	3	□	MMS1630X3DB	51.9	86.0	89.0	148.0	145	3.0	18	1
16.3	5	□	MMS1630X5DB	84.5	119.0	123.0	182.0	179	3.0	18	1
16.4	3	□	MMS1640X3DB	52.2	86.0	89.0	148.0	145	3.0	18	1
16.4	5	□	MMS1640X5DB	85.0	119.0	123.0	182.0	179	3.0	18	1
16.5	3	●	MMS1650X3DB	52.5	86.0	89.0	148.0	145	3.0	18	1
16.5	5	●	MMS1650X5DB	85.5	119.0	123.0	182.0	179	3.0	18	1
16.6	3	□	MMS1660X3DB	52.8	88.0	89.0	148.0	145	3.0	18	1
16.6	5	□	MMS1660X5DB	86.0	122.0	123.0	182.0	179	3.0	18	1
16.7	3	□	MMS1670X3DB	53.1	88.0	89.0	148.0	145	3.0	18	1
16.7	5	□	MMS1670X5DB	86.5	122.0	123.0	182.0	179	3.0	18	1
16.8	3	□	MMS1680X3DB	53.5	88.1	89.1	148.1	145	3.1	18	1
16.8	5	□	MMS1680X5DB	87.1	122.1	123.1	182.1	179	3.1	18	1
16.9	3	□	MMS1690X3DB	53.8	88.1	89.1	148.1	145	3.1	18	1
16.9	5	□	MMS1690X5DB	87.6	122.1	123.1	182.1	179	3.1	18	1
17.0	3	●	MMS1700X3DB	54.1	88.1	89.1	148.1	145	3.1	18	1
17.0	5	●	MMS1700X5DB	88.1	122.1	123.1	182.1	179	3.1	18	1
17.1	3	□	MMS1710X3DB	54.4	91.1	93.1	152.1	149	3.1	18	1
17.1	5	□	MMS1710X5DB	88.6	126.1	129.1	188.1	185	3.1	18	1
17.2	3	□	MMS1720X3DB	54.7	91.1	93.1	152.1	149	3.1	18	1
17.2	5	□	MMS1720X5DB	89.1	126.1	129.1	188.1	185	3.1	18	1
17.3	3	□	MMS1730X3DB	55.0	91.1	93.1	152.1	149	3.1	18	1
17.3	5	□	MMS1730X5DB	89.6	126.1	129.1	188.1	185	3.1	18	1
17.4	3	□	MMS1740X3DB	55.4	91.2	93.2	152.2	149	3.2	18	1
17.4	5	□	MMS1740X5DB	90.2	126.2	129.2	188.2	185	3.2	18	1
17.5	3	●	MMS1750X3DB	55.7	91.2	93.2	152.2	149	3.2	18	1
17.5	5	●	MMS1750X5DB	90.7	126.2	129.2	188.2	185	3.2	18	1
17.6	3	□	MMS1760X3DB	56.0	93.2	93.2	152.2	149	3.2	18	1
17.6	5	□	MMS1760X5DB	91.2	129.2	129.2	188.2	185	3.2	18	1
17.7	3	□	MMS1770X3DB	56.3	93.2	93.2	152.2	149	3.2	18	1
17.7	5	□	MMS1770X5DB	91.7	129.2	129.2	188.2	185	3.2	18	1
17.8	3	□	MMS1780X3DB	56.6	93.2	93.2	152.2	149	3.2	18	1
17.8	5	□	MMS1780X5DB	92.2	129.2	129.2	188.2	185	3.2	18	1
17.9	3	□	MMS1790X3DB	57.0	93.3	93.3	152.3	149	3.3	18	1
17.9	5	□	MMS1790X5DB	92.8	129.3	129.3	188.3	185	3.3	18	1
18.0	3	●	MMS1800X3DB	57.3	93.3	93.3	152.3	149	3.3	18	1
18.0	5	●	MMS1800X5DB	93.3	129.3	129.3	188.3	185	3.3	18	1
18.1	3	□	MMS1810X3DB	57.6	96.3	99.3	160.3	157	3.3	20	1
18.1	5	□	MMS1810X5DB	93.8	133.3	137.3	198.3	195	3.3	20	1
18.2	3	□	MMS1820X3DB	57.9	96.3	99.3	160.3	157	3.3	20	1
18.2	5	□	MMS1820X5DB	94.3	133.3	137.3	198.3	195	3.3	20	1
18.3	3	□	MMS1830X3DB	58.2	96.3	99.3	160.3	157	3.3	20	1
18.3	5	□	MMS1830X5DB	94.8	133.3	137.3	198.3	195	3.3	20	1
18.4	3	□	MMS1840X3DB	58.5	96.3	99.3	160.3	157	3.3	20	1
18.4	5	□	MMS1840X5DB	95.3	133.3	137.3	198.3	195	3.3	20	1
18.5	3	●	MMS1850X3DB	58.9	96.4	99.4	160.4	157	3.4	20	1
18.5	5	●	MMS1850X5DB	95.9	133.4	137.4	198.4	195	3.4	20	1
18.6	3	□	MMS1860X3DB	59.2	98.4	99.4	160.4	157	3.4	20	1
18.6	5	□	MMS1860X5DB	96.4	136.4	137.4	198.4	195	3.4	20	1
18.7	3	□	MMS1870X3DB	59.5	98.4	99.4	160.4	157	3.4	20	1
18.7	5	□	MMS1870X5DB	96.9	136.4	137.4	198.4	195	3.4	20	1
18.8	3	□	MMS1880X3DB	59.8	98.4	99.4	160.4	157	3.4	20	1
18.8	5	□	MMS1880X5DB	97.4	136.4	137.4	198.4	195	3.4	20	1
18.9	3	□	MMS1890X3DB	60.1	98.4	99.4	160.4	157	3.4	20	1
18.9	5	□	MMS1890X5DB	97.9	136.4	137.4	198.4	195	3.4	20	1
19.0	3	●	MMS1900X3DB	60.5	98.5	99.5	160.5	157	3.5	20	1
19.0	5	●	MMS1900X5DB	98.5	136.5	137.5	198.5	195	3.5	20	1
19.1	3	□	MMS1910X3DB	60.8	101.5	103.5	164.5	161	3.5	20	1
19.1	5	□	MMS1910X5DB	99.0	140.5	143.5	204.5	201	3.5	20	1
19.2	3	□	MMS1920X3DB	61.1	101.5	103.5	164.5	161	3.5	20	1
19.2	5	□	MMS1920X5DB	99.5	140.5	143.5	204.5	201	3.5	20	1
19.3	3	□	MMS1930X3DB	61.4	101.5	103.5	164.5	161	3.5	20	1
19.3	5	□	MMS1930X5DB	100.0	140.5	143.5	204.5	201	3.5	20	1
19.4	3	□	MMS1940X3DB	61.7	101.5	103.5	164.5	161	3.5	20	1
19.4	5	□	MMS1940X5DB	100.5	140.5	143.5	204.5	201	3.5	20	1
19.5	3	●	MMS1950X3DB	62.0	101.5	103.5	164.5	161	3.5	20	1
19.5	5	●	MMS1950X5DB	101.0	140.5	143.5	204.5	201	3.5	20	1
19.6	3	□	MMS1960X3DB	62.4	103.6	103.6	164.6	161	3.6	20	1
19.6	5	□	MMS1960X5DB	101.6	143.6	143.6	204.6	201	3.6	20	1
19.7	3	□	MMS1970X3DB	62.7	103.6	103.6	164.6	161	3.6	20	1
19.7	5	□	MMS1970X5DB	102.1	143.6	143.6	204.6	201	3.6	20	1
19.8	3	□	MMS1980X3DB	63.0	103.6	103.6	164.6	161	3.6	20	1
19.8	5	□	MMS1980X5DB	102.6	143.6	143.6	204.6	201	3.6	20	1
19.9	3	□	MMS1990X3DB	63.3	103.6	103.6	164.6	161	3.6	20	1
19.9	5	□	MMS1990X5DB	103.1	143.6	143.6	204.6	201	3.6	20	1
20.0	3	●	MMS2000X3DB	63.6	103.6	103.6	164.6	161	3.6	20	1
20.0	5	●	MMS2000X5DB	103.6	143.6	143.6	204.6	201	3.6	20	1

MMS

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc					Austenitic Stainless Steel (>200HB) AISI 304LN, AISI 316LN etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)
3.2	80	7900	0.13	(0.08—0.18)	1025	60	5900	0.1	(0.05—0.15)	590
4.0	80	6300	0.15	(0.10—0.20)	945	60	4700	0.12	(0.08—0.18)	560
5.0	80	5000	0.15	(0.10—0.20)	750	60	3800	0.12	(0.08—0.18)	455
6.3	80	4000	0.17	(0.12—0.22)	680	60	3000	0.15	(0.1—0.2)	450
8.0	80	3100	0.19	(0.14—0.24)	585	60	2300	0.17	(0.12—0.22)	390
10.0	60	1900	0.2	(0.15—0.25)	380	50	1500	0.18	(0.13—0.23)	270
12.0	60	1500	0.21	(0.16—0.26)	315	50	1300	0.19	(0.14—0.24)	245
16.0	60	1100	0.22	(0.17—0.27)	240	50	900	0.2	(0.15—0.25)	180
20.0	60	900	0.23	(0.18—0.28)	205	50	700	0.21	(0.16—0.26)	145

Workpiece Material	Duplex Stainless Steel (≤280HB) AISI 329 etc					Ferritic and Martensitic Stainless Steel (≤200HB) AISI 410, AISI 430 etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)
3.2	50	4900	0.1	(0.05—0.15)	490	80	7900	0.13	(0.08—0.18)	1025
4.0	50	3900	0.12	(0.08—0.18)	465	80	6300	0.15	(0.10—0.20)	945
5.0	50	3100	0.12	(0.08—0.18)	370	80	5000	0.15	(0.10—0.20)	750
6.3	50	2500	0.15	(0.1—0.2)	375	80	4000	0.17	(0.12—0.22)	680
8.0	50	1900	0.17	(0.12—0.22)	320	80	3100	0.19	(0.14—0.24)	585
10.0	40	1200	0.18	(0.13—0.23)	215	60	1900	0.2	(0.15—0.25)	380
12.0	40	1000	0.19	(0.14—0.24)	190	60	1500	0.21	(0.16—0.26)	315
16.0	40	700	0.2	(0.15—0.25)	140	60	1100	0.22	(0.17—0.27)	240
20.0	40	600	0.21	(0.16—0.26)	125	60	900	0.23	(0.18—0.28)	205

Workpiece Material	Ferritic and Martensitic Stainless Steel (>200HB) AISI 431, AISI 420 etc					Precipitation-Hardening Stainless Steel (<450HB) ASTM 630, ASTM 631 etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)
3.2	60	5900	0.1	(0.05—0.15)	590	50	4900	0.1	(0.05—0.15)	490
4.0	60	4700	0.12	(0.08—0.18)	560	50	3900	0.12	(0.08—0.18)	465
5.0	60	3800	0.12	(0.08—0.18)	455	50	3100	0.12	(0.08—0.18)	370
6.3	60	3000	0.15	(0.1—0.2)	450	50	2500	0.15	(0.1—0.2)	375
8.0	60	2300	0.17	(0.12—0.22)	390	50	1900	0.17	(0.12—0.22)	320
10.0	50	1500	0.18	(0.13—0.23)	270	40	1200	0.18	(0.13—0.23)	215
12.0	50	1300	0.19	(0.14—0.24)	245	40	1000	0.19	(0.14—0.24)	190
16.0	50	900	0.2	(0.15—0.25)	180	40	700	0.2	(0.15—0.25)	140
20.0	50	700	0.21	(0.16—0.26)	145	40	600	0.21	(0.16—0.26)	125

Note 1) For stable machining, internal coolant supply with high pressure is recommended.

Note 2) Emulsion type of water coolant is recommended.

Note 3) Recommended cutting conditions are for machining under the conditions of favourable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, or coolant property or discharge amount .

■ Stainless Steel Cross Reference List

Material		Japan	Germany		USA
		JIS	W-no.	DIN	AISI/SAE
Ferritic and Martensitic Stainless Steel	≤200HB	SUS416	1.4005	X12CrS3	416
		SUS410	1.4006	X10Cr13	410
		SUS430	1.4016	X6Cr17	430
		SUS434	1.4113	X6CrMo17	434
		SUS430LX	1.4510	X6CrTi17	430Ti
		—	1.4512	X6CrTi12	409
	>200HB	SUS420J1	1.4021	X20Cr13	420
		SUS431	1.4057	X20CrNi17-2	431
		SUS420J2	1.4028	X30Cr13	420
		SUS440C	1.4125	X10CrMo17	440C
Precipitation-Hardening Stainless Steel	<450HB	SUS630	1.4542	X5CrNiCuNb16 4	630 (17-4PH)
		—	1.4545	—	S15500 (15-5PH)
		SUS631	1.4568	X7CrNiAl17 7	631 (17-7PH)
Austenitic Stainless Steel	≤200HB	SUS304	1.4301	X5CrNi18 10	304
		SUS305	1.4303	X5CrNi8-12	305
		SUS303	1.4305	X12CrNiS18-9	303
		SUS304L	1.4307	X2CrNi19-11	304L
		SUS316	1.4401	X5CrNiMo17 12 2	316
	>200HB	SUS304LN	1.4311	X2CrNiN18 10	304LN
		SUS316L	1.4404	X2CrNiMo17 12 2	316L
		SUS316LN	1.4406	X2CrNiMoN17 12 2	316LN
		SUS316L	1.4435	X2CrNiMo18 14 3	—
		SUS317L	1.4438	X2CrNiMo18 15 4	317L
		—	1.4529	X1NiCrMoCuN25 20 7	N08926
		SUS321	1.4541	X6CrNiTi18-10	321
		SUS347	1.4550	X6CrNiNb18-10	347
		SUS316Ti	1.4571	X6CrNiMoTi17 12 2	316Ti
Duplex Stainless Steel	≤280HB	—	1.4362	X2CrNiN23 4	—
		SCS14A	1.4410	X2CrNiMoN25 7 4	S32750
		SUS329J1	1.4460	X3CrNiMoN27 5 2	329
		SUS329J3L	1.4462	X2CrNiMoN22 5 3	S31803

DRILLING(SOLID CARBIDE)

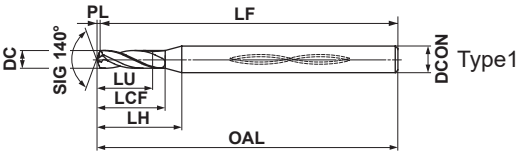
MHS
WSTAR DRILLS

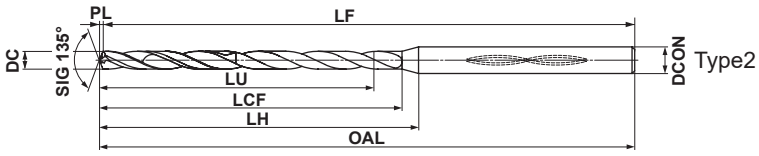
- Solid carbide drills for die & mould machining
- High backling strength and unique double margin.
- Non-step drilling with long tool life for high hardness steel, 35HRC-55HRC

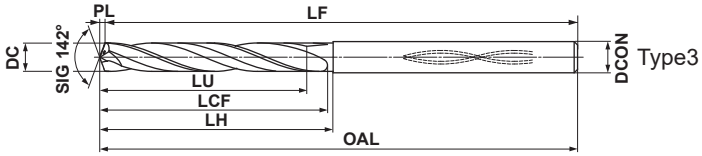
P Steel | M Stainless Steel | K | N | S Heat Resistant Alloy | H Hardened Steel

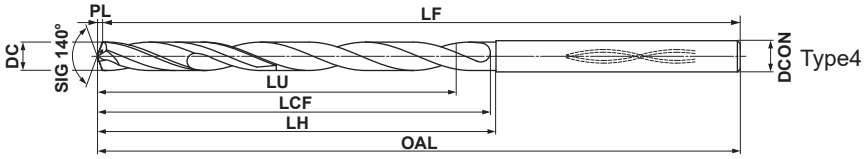
Internal Coolant











DC≤3	3<DC≤6	6<DC≤10	10<DC≤12
+0.010 −0.002	+0.010 −0.002	+0.010 −0.005	+0.010 −0.008
DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤12
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MHS drills are suitable for use with shrink fit holders.
Note 2) Use the smallest type of each diameter when drilling a pilot hole.

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
0.95	3	●	MHS0095L006B	3.0	6.2	10.0	60.2	60	0.17	3	1
0.95	6	●	MHS0095L009B	5.9	9.2	13.0	60.2	60	0.17	3	2
0.95	13	●	MHS0095L015B	12.5	15.2	19.0	60.2	60	0.17	3	2
0.95	23	●	MHS0095L025B	22.0	25.2	29.0	60.2	60	0.17	3	2
0.95	30	●	MHS0095L035B	28.7	35.2	39.0	80.2	80	0.17	3	2
1.00	3	●	MHS0100L006B	3.2	6.2	9.9	60.2	60	0.2	3	1
1.00	6	●	MHS0100L009B	6.2	9.2	12.9	60.2	60	0.2	3	2
1.00	12	●	MHS0100L015B	12.2	15.2	18.9	60.2	60	0.2	3	2
1.00	22	●	MHS0100L025B	22.2	25.2	28.9	60.2	60	0.2	3	2
1.00	30	●	MHS0100L035B	30.2	35.2	38.9	80.2	80	0.2	3	2
1.10	2	●	MHS0110L006B	2.4	6.2	9.7	60.2	60	0.2	3	1
1.10	5	●	MHS0110L009B	5.7	9.2	12.7	60.2	60	0.2	3	2
1.10	11	●	MHS0110L015B	12.3	15.2	18.7	60.2	60	0.2	3	2
1.10	20	●	MHS0110L025B	22.2	25.2	28.7	60.2	60	0.2	3	2
1.10	29	●	MHS0110L035B	32.1	35.2	38.7	80.2	80	0.2	3	2
1.20	2	●	MHS0120L006B	2.6	6.2	9.6	60.2	60	0.2	3	1
1.20	5	●	MHS0120L009B	6.2	9.2	12.6	60.2	60	0.2	3	2
1.20	10	●	MHS0120L015B	12.2	15.2	18.6	60.2	60	0.2	3	2
1.20	18	●	MHS0120L025B	21.8	25.2	28.6	60.2	60	0.2	3	2
1.20	26	●	MHS0120L035B	31.4	35.2	38.6	80.2	80	0.2	3	2
1.30	2	●	MHS0130L007B	2.8	7.2	10.4	60.2	60	0.2	3	1
1.30	5	●	MHS0130L011B	6.8	11.3	14.5	60.3	60	0.3	3	2
1.30	12	●	MHS0130L020B	15.9	20.3	23.5	60.3	60	0.3	3	2
1.30	20	●	MHS0130L030B	26.3	30.3	33.5	80.3	80	0.3	3	2
1.30	30	●	MHS0130L045B	39.3	45.3	48.5	80.3	80	0.3	3	2
1.40	2	●	MHS0140L007B	3.1	7.3	10.3	60.3	60	0.3	3	1
1.40	5	●	MHS0140L011B	7.3	11.3	14.3	60.3	60	0.3	3	2
1.40	11	●	MHS0140L020B	15.7	20.3	23.3	60.3	60	0.3	3	2
1.40	18	●	MHS0140L030B	25.5	30.3	33.3	80.3	80	0.3	3	2
1.40	29	●	MHS0140L045B	40.9	45.3	48.3	80.3	80	0.3	3	2
1.45	3	●	MHS0145L008B	4.7	8.3	11.2	60.3	60	0.3	3	1
1.45	6	●	MHS0145L013B	9.0	13.3	16.2	60.3	60	0.3	3	2
1.45	11	●	MHS0145L020B	16.3	20.3	23.2	60.3	60	0.3	3	2
1.45	21	●	MHS0145L035B	30.8	35.3	38.2	80.3	80	0.3	3	2
1.45	30	●	MHS0145L055B	43.8	55.3	58.2	100.3	100	0.3	3	2
1.50	2	●	MHS0150L008B	3.3	8.3	11.1	60.3	60	0.3	3	1
1.50	6	●	MHS0150L013B	9.3	13.3	16.1	60.3	60	0.3	3	2
1.50	10	●	MHS0150L020B	15.3	20.3	23.1	60.3	60	0.3	3	2
1.50	20	●	MHS0150L035B	30.3	35.3	38.1	80.3	80	0.3	3	2
1.50	30	●	MHS0150L055B	45.3	55.3	58.1	100.3	100	0.3	3	2
1.60	2	●	MHS0160L008B	3.5	8.3	10.9	60.3	60	0.3	3	1
1.60	5	●	MHS0160L013B	8.3	13.3	15.9	60.3	60	0.3	3	2
1.60	10	●	MHS0160L020B	16.3	20.3	22.9	60.3	60	0.3	3	2
1.60	19	●	MHS0160L035B	30.7	35.3	37.9	80.3	80	0.3	3	2
1.60	30	●	MHS0160L055B	48.3	55.3	57.9	100.3	100	0.3	3	2
1.70	2	●	MHS0170L008B	3.7	8.3	10.7	60.3	60	0.3	3	1
1.70	5	●	MHS0170L013B	8.9	13.4	15.8	60.4	60	0.4	3	2
1.70	9	●	MHS0170L020B	15.7	20.4	22.8	60.4	60	0.4	3	2

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.70	18	●	MHS0170L035B	31.0	35.4	37.8	80.4	80	0.4	3	2
1.70	29	●	MHS0170L055B	49.7	55.4	57.8	100.4	100	0.4	3	2
1.80	3	●	MHS0180L010B	5.7	10.3	12.5	60.3	60	0.3	3	1
1.80	5	●	MHS0180L015B	9.4	15.4	17.6	60.4	60	0.4	3	2
1.80	11	●	MHS0180L025B	20.2	25.4	27.6	60.4	60	0.4	3	2
1.80	22	●	MHS0180L045B	40.0	45.4	47.6	80.4	80	0.4	3	2
1.80	30	●	MHS0180L065B	54.4	65.4	67.6	100.4	100	0.4	3	2
1.90	2	●	MHS0190L010B	4.1	10.3	12.4	60.3	60	0.3	3	1
1.90	5	●	MHS0190L015B	9.9	15.4	17.5	60.4	60	0.4	3	2
1.90	10	●	MHS0190L025B	19.4	25.4	27.5	60.4	60	0.4	3	2
1.90	21	●	MHS0190L045B	40.3	45.4	47.5	80.4	80	0.4	3	2
1.90	30	●	MHS0190L065B	57.4	65.4	67.5	100.4	100	0.4	3	2
1.95	2	●	MHS0195L010B	4.3	10.4	12.4	60.4	60	0.4	3	1
1.95	5	●	MHS0195L015B	10.2	15.4	17.4	60.4	60	0.4	3	2
1.95	10	●	MHS0195L025B	19.9	25.4	27.4	60.4	60	0.4	3	2
1.95	20	●	MHS0195L045B	39.4	45.4	47.4	80.4	80	0.4	3	2
1.95	30	●	MHS0195L065B	58.9	65.4	67.4	100.4	100	0.4	3	2
2.00	2	●	MHS0200L010B	4.4	10.4	12.3	60.4	60	0.4	3	1
2.00	5	●	MHS0200L015B	10.4	15.4	17.3	60.4	60	0.4	3	2
2.00	9	●	MHS0200L025B	18.4	25.4	27.3	60.4	60	0.4	3	2
2.00	20	●	MHS0200L045B	40.4	45.4	47.3	80.4	80	0.4	3	2
2.00	30	●	MHS0200L065B	60.4	65.4	67.3	100.4	100	0.4	3	2
2.10	3	●	MHS0210L012B	6.7	12.4	14.1	60.4	60	0.4	3	1
2.10	7	●	MHS0210L020B	15.1	20.4	22.1	60.4	60	0.4	3	2
2.10	11	●	MHS0210L030B	23.5	30.4	32.1	80.4	80	0.4	3	2
2.10	23	●	MHS0210L055B	48.7	55.4	57.1	100.4	100	0.4	3	2
2.10	30	●	MHS0210L075B	63.4	75.4	77.1	120.4	120	0.4	3	2
2.20	2	●	MHS0220L012B	4.8	12.4	13.9	60.4	60	0.4	3	1
2.20	6	●	MHS0220L020B	13.7	20.5	22.0	60.5	60	0.5	3	2
2.20	11	●	MHS0220L030B	24.7	30.5	32.0	80.5	80	0.5	3	2
2.20	22	●	MHS0220L055B	48.9	55.5	57.0	100.5	100	0.5	3	2
2.20	30	●	MHS0220L075B	66.5	75.5	77.0	120.5	120	0.5	3	2
2.30	2	●	MHS0230L012B	5.0	12.4	13.7	60.4	60	0.4	3	1
2.30	6	●	MHS0230L020B	14.3	20.5	21.8	60.5	60	0.5	3	2
2.30	10	●	MHS0230L030B	23.5	30.5	31.8	80.5	80	0.5	3	2
2.30	21	●	MHS0230L055B	48.8	55.5	56.8	100.5	100	0.5	3	2
2.30	30	●	MHS0230L075B	69.5	75.5	76.8	120.5	120	0.5	3	2
2.40	2	●	MHS0240L012B	5.2	12.4	13.5	60.4	60	0.4	3	1
2.40	5	●	MHS0240L020B	12.5	20.5	21.6	60.5	60	0.5	3	2
2.40	9	●	MHS0240L030B	22.1	30.5	31.6	80.5	80	0.5	3	2
2.40	20	●	MHS0240L055B	48.5	55.5	56.6	100.5	100	0.5	3	2
2.40	28	●	MHS0240L075B	67.7	75.5	76.6	120.5	120	0.5	3	2
2.45	2	●	MHS0245L013B	5.3	13.4	14.4	70.4	70	0.4	4	1
2.45	5	●	MHS0245L020B	12.8	20.5	21.5	70.5	70	0.5	4	2
2.45	11	●	MHS0245L035B	27.5	35.5	36.5	90.5	90	0.5	4	2
2.45	24	●	MHS0245L065B	59.3	65.5	66.5	110.5	110	0.5	4	2
2.45	30	●	MHS0245L090B	74.0	90.5	91.5	140.5	140	0.5	4	2
2.50	2	●	MHS0250L013B	5.5	13.5	16.3	70.5	70	0.5	4	1
2.50	5	●	MHS0250L020B	13.0	20.5	23.3	70.5	70	0.5	4	2
2.50	11	●	MHS0250L035B	28.0	35.5	38.3	90.5	90	0.5	4	2
2.50	23	●	MHS0250L065B	58.0	65.5	68.3	110.5	110	0.5	4	2
2.50	30	●	MHS0250L090B	75.5	90.5	93.3	140.5	140	0.5	4	2
2.60	2	●	MHS0260L013B	5.7	13.5	16.1	70.5	70	0.5	4	1
2.60	5	●	MHS0260L020B	13.5	20.5	23.1	70.5	70	0.5	4	2
2.60	10	●	MHS0260L035B	26.5	35.5	38.1	90.5	90	0.5	4	2
2.60	22	●	MHS0260L065B	57.7	65.5	68.1	110.5	110	0.5	4	2
2.60	30	●	MHS0260L090B	78.5	90.5	93.1	140.5	140	0.5	4	2
2.70	2	●	MHS0270L013B	5.9	13.5	15.9	70.5	70	0.5	4	1
2.70	4	●	MHS0270L020B	11.4	20.6	23.0	70.6	70	0.6	4	2
2.70	10	●	MHS0270L035B	27.6	35.6	38.0	90.6	90	0.6	4	2
2.70	21	●	MHS0270L065B	57.3	65.6	68.0	110.6	110	0.6	4	2
2.70	30	●	MHS0270L090B	81.6	90.6	93.0	140.6	140	0.6	4	2
2.80	2	●	MHS0280L014B	6.1	14.5	16.7	70.5	70	0.5	4	1
2.80	4	●	MHS0280L020B	11.8	20.6	22.8	70.6	70	0.6	4	2
2.80	9	●	MHS0280L035B	25.8	35.6	37.8	90.6	90	0.6	4	2
2.80	20	●	MHS0280L065B	56.6	65.6	67.8	110.6	110	0.6	4	2
2.80	29	●	MHS0280L090B	81.8	90.6	92.8	140.6	140	0.6	4	2
2.90	2	●	MHS0290L014B	6.3	14.5	16.6	70.5	70	0.5	4	1
2.90	4	●	MHS0290L020B	12.2	20.6	22.7	70.6	70	0.6	4	2
2.90	9	●	MHS0290L035B	26.7	35.6	37.7	90.6	90	0.6	4	2
2.90	19	●	MHS0290L065B	55.7	65.6	67.7	110.6	110	0.6	4	2
2.90	28	●	MHS0290L090B	81.8	90.6	92.7	140.6	140	0.6	4	2
2.95	2	●	MHS0295L014B	6.4	14.5	16.5	70.5	70	0.5	4	1
2.95	4	●	MHS0295L020B	12.4	20.6	22.6	70.6	70	0.6	4	2
2.95	9	●	MHS0295L035B	27.2	35.6	37.6	90.6	90	0.6	4	2
2.95	19	●	MHS0295L065B	56.7	65.6	67.6	110.6	110	0.6	4	2
2.95	28	●	MHS0295L090B	83.2	90.6	92.6	140.6	140	0.6	4	2
3.0	4	●	MHS0300L020B	12.5	19.5	20.5	70.5	70	0.5	4	3
3.0	10	●	MHS0300L040B	30.5	39.5	40.5	90.5	90	0.5	4	4
3.0	17	●	MHS0300L060B	51.5	59.5	60.5	110.5	110	0.5	4	4
3.0	27	●	MHS0300L090B	81.5	89.5	90.5	140.5	140	0.5	4	4
3.1	4	□	MHS0310L020B	12.9	20.0	20.5	70.5	70	0.5	4	3
3.1	10	□	MHS0310L040B	31.6	40.1	40.6	90.6	90	0.6	4	4
3.1	17	□	MHS0310L060B	53.3	60.1	60.6	110.6	110	0.6	4	4
3.1	26	□	MHS0310L090B	81.2	90.1	90.6	140.6	140	0.6	4	4
3.2	4	□	MHS0320L020B	13.4	20.1	20.6	70.6	70	0.6	4	3
3.2	10	□	MHS0320L040B	32.6	40.1	40.6	90.6	90	0.6	4	4
3.2	16	□	MHS0320L060B	51.8	60.1	60.6	110.6	110	0.6	4	4
3.2	25	□	MHS0320L090B	80.6	90.1	90.6	140.6	140	0.6	4	4
3.3	3	□	MHS0330L020B	10.5	20.1	20.6	70.6	70	0.6	4	3
3.3	9	□	MHS0330L040B	30.3	40.1	40.6	90.6	90	0.6	4	4
3.3	16	□	MHS0330L060B	53.4	60.1	60.6	110.6	110	0.6	4	4
3.3	25	□	MHS0330L090B	83.1	90.1	90.6	140.6	140	0.6	4	4
3.4	3	□	MHS0340L020B	10.8	20.1	20.6	70.6	70	0.6	4	3
3.4	9	□	MHS0340L040B	31.2	40.1	40.6	90.6	90	0.6	4	4
3.4	15	□	MHS0340L060B	51.6	60.1	60.6	110.6	110	0.6	4	4

MHS

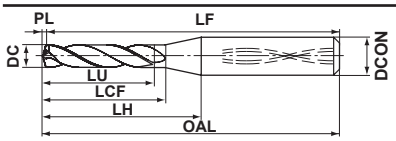
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.4	24	□	MHS0340L090B	82.2	90.1	90.6	140.6	140	0.6	4	4
3.5	3	●	MHS0350L020B	11.1	20.1	20.6	70.6	70	0.6	4	3
3.5	9	●	MHS0350L040B	32.1	40.1	40.6	90.6	90	0.6	4	4
3.5	14	●	MHS0350L060B	49.6	60.1	60.6	110.6	110	0.6	4	4
3.5	23	●	MHS0350L090B	81.1	90.1	90.6	140.6	140	0.6	4	4
3.6	3	□	MHS0360L020B	11.4	20.6	20.6	70.6	70	0.6	4	3
3.6	9	□	MHS0360L040B	33.1	40.7	40.7	90.7	90	0.7	4	4
3.6	14	□	MHS0360L060B	51.1	60.7	60.7	110.7	110	0.7	4	4
3.6	22	□	MHS0360L090B	79.9	90.7	90.7	140.7	140	0.7	4	4
3.6	30	□	MHS0360L120B	108.7	120.7	120.7	170.7	170	0.7	4	4
3.7	3	□	MHS0370L020B	11.7	20.6	20.6	70.6	70	0.6	4	3
3.7	8	□	MHS0370L040B	30.3	40.7	40.7	90.7	90	0.7	4	4
3.7	14	□	MHS0370L060B	52.5	60.7	60.7	110.7	110	0.7	4	4
3.7	22	□	MHS0370L090B	82.1	90.7	90.7	140.7	140	0.7	4	4
3.7	30	□	MHS0370L120B	111.7	120.7	120.7	170.7	170	0.7	4	4
3.8	3	●	MHS0380L020B	12.1	20.7	20.7	70.7	70	0.7	4	3
3.8	8	●	MHS0380L040B	31.1	40.7	40.7	90.7	90	0.7	4	4
3.8	13	●	MHS0380L060B	50.1	60.7	60.7	110.7	110	0.7	4	4
3.8	21	●	MHS0380L090B	80.5	90.7	90.7	140.7	140	0.7	4	4
3.8	29	●	MHS0380L120B	110.9	120.7	120.7	170.7	170	0.7	4	4
3.9	3	●	MHS0390L020B	12.4	20.7	20.7	70.7	70	0.7	4	3
3.9	8	●	MHS0390L040B	31.9	40.7	40.7	90.7	90	0.7	4	4
3.9	13	●	MHS0390L060B	51.4	60.7	60.7	110.7	110	0.7	4	4
3.9	21	□	MHS0390L090B	82.6	90.7	90.7	140.7	140	0.7	4	4
3.9	28	□	MHS0390L120B	109.9	120.7	120.7	170.7	170	0.7	4	4
4.0	2	●	MHS0400L020B	8.7	20.7	20.7	70.7	70	0.7	4	3
4.0	7	●	MHS0400L040B	28.7	40.7	40.7	90.7	90	0.7	4	4
4.0	12	●	MHS0400L060B	48.7	60.7	60.7	110.7	110	0.7	4	4
4.0	20	●	MHS0400L090B	80.7	90.7	90.7	140.7	140	0.7	4	4
4.0	27	●	MHS0400L120B	108.7	120.7	120.7	170.7	170	0.7	4	4
4.1	2	□	MHS0410L020B	8.9	19.2	20.7	70.7	70	0.7	6	3
4.1	7	□	MHS0410L040B	29.4	39.2	40.7	90.7	90	0.7	6	4
4.1	12	□	MHS0410L060B	49.9	59.2	60.7	110.7	110	0.7	6	4
4.1	19	□	MHS0410L090B	78.6	89.2	90.7	140.7	140	0.7	6	4
4.1	26	□	MHS0410L120B	107.3	119.2	120.7	170.7	170	0.7	6	4
4.2	2	□	MHS0420L020B	9.1	19.2	20.7	70.7	70	0.7	6	3
4.2	7	□	MHS0420L040B	30.2	39.3	40.8	90.8	90	0.8	6	4
4.2	11	□	MHS0420L060B	47.0	59.3	60.8	110.8	110	0.8	6	4
4.2	19	□	MHS0420L090B	80.6	89.3	90.8	140.8	140	0.8	6	4
4.2	26	□	MHS0420L120B	110.0	119.3	120.8	170.8	170	0.8	6	4
4.3	2	□	MHS0430L020B	9.3	19.2	20.7	70.7	70	0.7	6	3
4.3	6	□	MHS0430L040B	26.6	39.3	40.8	90.8	90	0.8	6	4
4.3	11	□	MHS0430L060B	48.1	59.3	60.8	110.8	110	0.8	6	4
4.3	18	□	MHS0430L090B	78.2	89.3	90.8	140.8	140	0.8	6	4
4.3	25	□	MHS0430L120B	108.3	119.3	120.8	170.8	170	0.8	6	4
4.4	2	●	MHS0440L020B	9.6	19.3	20.8	70.8	70	0.8	6	3
4.4	6	□	MHS0440L040B	27.2	39.3	40.8	90.8	90	0.8	6	4
4.4	11	□	MHS0440L060B	49.2	59.3	60.8	110.8	110	0.8	6	4
4.4	18	□	MHS0440L090B	80.0	89.3	90.8	140.8	140	0.8	6	4
4.4	24	□	MHS0440L120B	106.4	119.3	120.8	170.8	170	0.8	6	4
4.5	2	●	MHS0450L020B	9.8	19.3	20.8	70.8	70	0.8	6	3
4.5	6	●	MHS0450L040B	27.8	39.3	40.8	90.8	90	0.8	6	4
4.5	10	●	MHS0450L060B	45.8	59.3	60.8	110.8	110	0.8	6	4
4.5	17	●	MHS0450L090B	77.3	89.3	90.8	140.8	140	0.8	6	4
4.5	24	●	MHS0450L120B	108.8	119.3	120.8	170.8	170	0.8	6	4
4.6	2	□	MHS0460L020B	10.0	19.8	20.8	70.8	70	0.8	6	3
4.6	6	□	MHS0460L040B	28.4	39.8	40.8	90.8	90	0.8	6	4
4.6	10	□	MHS0460L060B	46.8	59.8	60.8	110.8	110	0.8	6	4
4.6	17	□	MHS0460L090B	79.0	89.8	90.8	140.8	140	0.8	6	4
4.6	23	□	MHS0460L120B	106.6	119.8	120.8	170.8	170	0.8	6	4
4.6	30	□	MHS0460L150B	138.8	149.8	150.8	200.8	200	0.8	6	4
4.7	2	□	MHS0470L020B	10.2	19.8	20.8	70.8	70	0.8	6	3
4.7	6	□	MHS0470L040B	29.1	39.9	40.9	90.9	90	0.9	6	4
4.7	10	□	MHS0470L060B	47.9	59.9	60.9	110.9	110	0.9	6	4
4.7	16	□	MHS0470L090B	76.1	89.9	90.9	140.9	140	0.9	6	4
4.7	23	□	MHS0470L120B	109.0	119.9	120.9	170.9	170	0.9	6	4
4.7	29	□	MHS0470L150B	137.2	149.9	150.9	200.9	200	0.9	6	4
4.8	1	●	MHS0480L020B	5.6	19.8	20.8	70.8	70	0.8	6	3
4.8	6	●	MHS0480L040B	29.7	39.9	40.9	90.9	90	0.9	6	4
4.8	10	●	MHS0480L060B	48.9	59.9	60.9	110.9	110	0.9	6	4
4.8	16	●	MHS0480L090B	77.7	89.9	90.9	140.9	140	0.9	6	4
4.8	22	●	MHS0480L120B	106.5	119.9	120.9	170.9	170	0.9	6	4
4.8	29	●	MHS0480L150B	140.1	149.9	150.9	200.9	200	0.9	6	4
4.9	1	□	MHS0490L020B	5.7	19.8	20.8	70.8	70	0.8	6	3
4.9	5	□	MHS0490L040B	25.4	39.9	40.9	90.9	90	0.9	6	4
4.9	10	□	MHS0490L060B	49.9	59.9	60.9	110.9	110	0.9	6	4
4.9	16	□	MHS0490L090B	79.3	89.9	90.9	140.9	140	0.9	6	4
4.9	22	□	MHS0490L120B	108.7	119.9	120.9	170.9	170	0.9	6	4
4.9	28	□	MHS0490L150B	138.1	149.9	150.9	200.9	200	0.9	6	4
5.0	1	●	MHS0500L020B	5.9	19.9	20.9	70.9	70	0.9	6	3
5.0	5	●	MHS0500L040B	25.9	39.9	40.9	90.9	90	0.9	6	4
5.0	9	●	MHS0500L060B	45.9	59.9	60.9	110.9	110	0.9	6	4
5.0	15	●	MHS0500L090B	75.9	89.9	90.9	140.9	140	0.9	6	4
5.0	21	●	MHS0500L120B	105.9	119.9	120.9	170.9	170	0.9	6	4
5.0	27	●	MHS0500L150B	135.9	149.9	150.9	200.9	200	0.9	6	4
5.1	3	□	MHS0510L030B	16.2	30.4	30.9	80.9	80	0.9	6	3
5.1	9	□	MHS0510L060B	46.8	60.4	60.9	110.9	110	0.9	6	4
5.1	15	□	MHS0510L090B	77.4	90.4	90.9	140.9	140	0.9	6	4
5.1	21	□	MHS0510L120B	108.0	120.4	120.9	170.9	170	0.9	6	4
5.1	27	□	MHS0510L150B	138.6	150.4	150.9	200.9	200	0.9	6	4
5.2	3	□	MHS0520L030B	16.5	30.4	30.9	80.9	80	0.9	6	3
5.2	9	□	MHS0520L060B	47.7	60.4	60.9	110.9	110	0.9	6	4
5.2	15	□	MHS0520L090B	78.9	90.4	90.9	140.9	140	0.9	6	4
5.2	20	□	MHS0520L120B	104.9	120.4	120.9	170.9	170	0.9	6	4
5.2	26	□	MHS0520L150B	136.1	150.4	150.9	200.9	200	0.9	6	4
5.3	3	□	MHS0530L030B	16.8	30.4	30.9	80.9	80	0.9	6	3

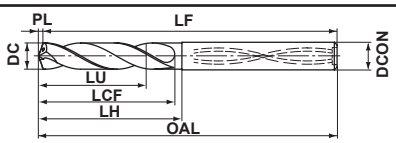
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type2



Type3, Type4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
5.3	9	□	MHS0530L060B	48.7	60.5	61.0	111.0	110	1.0	6	4
5.3	14	●	MHS0530L090B	75.2	90.5	91.0	141.0	140	1.0	6	4
5.3	20	□	MHS0530L120B	107.0	120.5	121.0	171.0	170	1.0	6	4
5.3	26	□	MHS0530L150B	138.8	150.5	151.0	201.0	200	1.0	6	4
5.4	3	□	MHS0540L030B	17.1	30.4	30.9	80.9	80	0.9	6	3
5.4	9	□	MHS0540L060B	49.6	60.5	61.0	111.0	110	1.0	6	4
5.4	14	□	MHS0540L090B	76.6	90.5	91.0	141.0	140	1.0	6	4
5.4	20	□	MHS0540L120B	109.0	120.5	121.0	171.0	170	1.0	6	4
5.4	25	□	MHS0540L150B	136.0	150.5	151.0	201.0	200	1.0	6	4
5.5	3	●	MHS0550L030B	17.4	30.4	30.9	80.9	80	0.9	6	3
5.5	8	●	MHS0550L060B	45.0	60.5	61.0	111.0	110	1.0	6	4
5.5	14	●	MHS0550L090B	78.0	90.5	91.0	141.0	140	1.0	6	4
5.5	19	●	MHS0550L120B	105.5	120.5	121.0	171.0	170	1.0	6	4
5.5	25	●	MHS0550L150B	138.5	150.5	151.0	201.0	200	1.0	6	4
5.6	3	□	MHS0560L030B	17.8	31.0	31.0	81.0	80	1.0	6	3
5.6	8	□	MHS0560L060B	45.8	61.0	61.0	111.0	110	1.0	6	4
5.6	14	□	MHS0560L090B	79.4	91.0	91.0	141.0	140	1.0	6	4
5.6	19	□	MHS0560L120B	107.4	121.0	121.0	171.0	170	1.0	6	4
5.6	24	□	MHS0560L150B	135.4	151.0	151.0	201.0	200	1.0	6	4
5.7	3	□	MHS0570L030B	18.1	31.0	31.0	81.0	80	1.0	6	3
5.7	8	□	MHS0570L060B	46.6	61.0	61.0	111.0	110	1.0	6	4
5.7	13	□	MHS0570L090B	75.1	91.0	91.0	141.0	140	1.0	6	4
5.7	19	□	MHS0570L120B	109.3	121.0	121.0	171.0	170	1.0	6	4
5.7	24	□	MHS0570L150B	137.8	151.0	151.0	201.0	200	1.0	6	4
5.8	3	●	MHS0580L030B	18.4	31.0	31.0	81.0	80	1.0	6	3
5.8	8	●	MHS0580L060B	47.5	61.1	61.1	111.1	110	1.1	6	4
5.8	13	●	MHS0580L090B	76.5	91.1	91.1	141.1	140	1.1	6	4
5.8	18	●	MHS0580L120B	105.5	121.1	121.1	171.1	170	1.1	6	4
5.8	23	●	MHS0580L150B	134.5	151.1	151.1	201.1	200	1.1	6	4
5.9	3	□	MHS0590L030B	18.7	31.0	31.0	81.0	80	1.0	6	3
5.9	8	□	MHS0590L060B	48.3	61.1	61.1	111.1	110	1.1	6	4
5.9	13	□	MHS0590L090B	77.8	91.1	91.1	141.1	140	1.1	6	4
5.9	18	□	MHS0590L120B	107.3	121.1	121.1	171.1	170	1.1	6	4
5.9	23	□	MHS0590L150B	136.8	151.1	151.1	201.1	200	1.1	6	4
6.0	2	●	MHS0600L030B	13.0	31.0	31.0	81.0	80	1.0	6	3
6.0	7	●	MHS0600L060B	43.1	61.1	61.1	111.1	110	1.1	6	4
6.0	12	●	MHS0600L090B	73.1	91.1	91.1	141.1	140	1.1	6	4
6.0	17	●	MHS0600L120B	103.1	121.1	121.1	171.1	170	1.1	6	4
6.0	22	●	MHS0600L150B	133.1	151.1	151.1	201.1	200	1.1	6	4
6.1	2	□	MHS0610L030B	13.3	29.6	31.1	81.1	80	1.1	8	3
6.1	7	□	MHS0610L060B	43.8	59.6	61.1	111.1	110	1.1	8	4
6.1	12	□	MHS0610L090B	74.3	89.6	91.1	141.1	140	1.1	8	4
6.1	17	□	MHS0610L120B	104.8	119.6	121.1	171.1	170	1.1	8	4
6.1	22	□	MHS0610L150B	135.3	149.6	151.1	201.1	200	1.1	8	4
6.2	2	□	MHS0620L030B	13.5	29.6	31.1	81.1	80	1.1	8	3
6.2	7	□	MHS0620L060B	44.5	59.6	61.1	111.1	110	1.1	8	4
6.2	12	□	MHS0620L090B	75.5	89.6	91.1	141.1	140	1.1	8	4
6.2	17	□	MHS0620L120B	106.5	119.6	121.1	171.1	170	1.1	8	4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
6.2	21	□	MHS0620L150B	131.3	149.6	151.1	201.1	200	1.1	8	4
6.3	2	□	MHS0630L030B	13.7	29.6	31.1	81.1	80	1.1	8	3
6.3	7	□	MHS0630L060B	45.2	59.6	61.1	111.1	110	1.1	8	4
6.3	12	□	MHS0630L090B	76.7	89.6	91.1	141.1	140	1.1	8	4
6.3	16	□	MHS0630L120B	101.9	119.6	121.1	171.1	170	1.1	8	4
6.3	21	□	MHS0630L150B	133.4	149.6	151.1	201.1	200	1.1	8	4
6.4	2	□	MHS0640L030B	13.9	29.6	31.1	81.1	80	1.1	8	3
6.4	7	□	MHS0640L060B	46.0	59.7	61.2	111.2	110	1.2	8	4
6.4	11	□	MHS0640L090B	71.6	89.7	91.2	141.2	140	1.2	8	4
6.4	16	□	MHS0640L120B	103.6	119.7	121.2	171.2	170	1.2	8	4
6.4	21	□	MHS0640L150B	135.6	149.7	151.2	201.2	200	1.2	8	4
6.5	2	●	MHS0650L030B	14.1	29.6	31.1	81.1	80	1.1	8	3
6.5	6	●	MHS0650L060B	40.2	59.7	61.2	111.2	110	1.2	8	4
6.5	11	●	MHS0650L090B	72.7	89.7	91.2	141.2	140	1.2	8	4
6.5	16	●	MHS0650L120B	105.2	119.7	121.2	171.2	170	1.2	8	4
6.5	20	●	MHS0650L150B	131.2	149.7	151.2	201.2	200	1.2	8	4
6.6	2	□	MHS0660L030B	14.3	30.1	31.1	81.1	80	1.1	8	3
6.6	6	□	MHS0660L060B	40.8	60.2	61.2	111.2	110	1.2	8	4
6.6	11	□	MHS0660L090B	73.8	90.2	91.2	141.2	140	1.2	8	4
6.6	16	□	MHS0660L120B	106.8	120.2	121.2	171.2	170	1.2	8	4
6.6	20	□	MHS0660L150B	133.2	150.2	151.2	201.2	200	1.2	8	4
6.6	28	□	MHS0660L200B	186.0	200.2	201.2	251.2	250	1.2	8	4
6.7	2	□	MHS0670L030B	14.6	30.2	31.2	81.2	80	1.2	8	3
6.7	6	□	MHS0670L060B	41.4	60.2	61.2	111.2	110	1.2	8	4
6.7	11	□	MHS0670L090B	74.9	90.2	91.2	141.2	140	1.2	8	4
6.7	15	□	MHS0670L120B	101.7	120.2	121.2	171.2	170	1.2	8	4
6.7	20	□	MHS0670L150B	135.2	150.2	151.2	201.2	200	1.2	8	4
6.7	27	□	MHS0670L200B	182.1	200.2	201.2	251.2	250	1.2	8	4
6.8	2	●	MHS0680L030B	14.8	30.2	31.2	81.2	80	1.2	8	3
6.8	6	●	MHS0680L060B	42.0	60.2	61.2	111.2	110	1.2	8	4
6.8	11	●	MHS0680L090B	76.0	90.2	91.2	141.2	140	1.2	8	4
6.8	15	●	MHS0680L120B	103.2	120.2	121.2	171.2	170	1.2	8	4
6.8	19	●	MHS0680L150B	130.4	150.2	151.2	201.2	200	1.2	8	4
6.8	27	●	MHS0680L200B	184.8	200.2	201.2	251.2	250	1.2	8	4
6.9	2	□	MHS0690L030B	15.0	30.2	31.2	81.2	80	1.2	8	3
6.9	6	□	MHS0690L060B	42.7	60.3	61.3	111.3	110	1.3	8	4
6.9	10	□	MHS0690L090B	70.3	90.3	91.3	141.3	140	1.3	8	4
6.9	15	□	MHS0690L120B	104.8	120.3	121.3	171.3	170	1.3	8	4
6.9	19	□	MHS0690L150B	132.4	150.3	151.3	201.3	200	1.3	8	4
6.9	26	□	MHS0690L200B	180.7	200.3	201.3	251.3	250	1.3	8	4
7.0	2	●	MHS0700L030B	15.2	30.2	31.2	81.2	80	1.2	8	3
7.0	6	●	MHS0700L060B	43.3	60.3	61.3	111.3	110	1.3	8	4
7.0	10	●	MHS0700L090B	71.3	90.3	91.3	141.3	140	1.3	8	4
7.0	14	●	MHS0700L120B	99.3	120.3	121.3	171.3	170	1.3	8	4
7.0	19	●	MHS0700L150B	134.3	150.3	151.3	201.3	200	1.3	8	4
7.0	26	●	MHS0700L200B	183.3	200.3	201.3	251.3	250	1.3	8	4
7.1	2	□	MHS0710L030B	15.4	30.7	31.2	81.2	80	1.2	8	3
7.1	6	□	MHS0710L060B	43.9	60.8	61.3	111.3	110	1.3	8	4

MHS

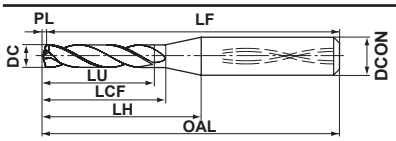
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
7.1	10	□	MHS0710L090B	72.3	90.8	91.3	141.3	140	1.3	8	4
7.1	14	□	MHS0710L120B	100.7	120.8	121.3	171.3	170	1.3	8	4
7.1	19	□	MHS0710L150B	136.2	150.8	151.3	201.3	200	1.3	8	4
7.1	26	□	MHS0710L200B	185.9	200.8	201.3	251.3	250	1.3	8	4
7.2	2	□	MHS0720L030B	15.6	30.7	31.2	81.2	80	1.2	8	3
7.2	6	□	MHS0720L060B	44.5	60.8	61.3	111.3	110	1.3	8	4
7.2	10	□	MHS0720L090B	73.3	90.8	91.3	141.3	140	1.3	8	4
7.2	14	□	MHS0720L120B	102.1	120.8	121.3	171.3	170	1.3	8	4
7.2	18	□	MHS0720L150B	130.9	150.8	151.3	201.3	200	1.3	8	4
7.2	25	□	MHS0720L200B	181.3	200.8	201.3	251.3	250	1.3	8	4
7.3	2	□	MHS0730L030B	15.9	30.8	31.3	81.3	80	1.3	8	3
7.3	6	□	MHS0730L060B	45.1	60.8	61.3	111.3	110	1.3	8	4
7.3	10	□	MHS0730L090B	74.3	90.8	91.3	141.3	140	1.3	8	4
7.3	14	□	MHS0730L120B	103.5	120.8	121.3	171.3	170	1.3	8	4
7.3	18	□	MHS0730L150B	132.7	150.8	151.3	201.3	200	1.3	8	4
7.3	25	□	MHS0730L200B	183.8	200.8	201.3	251.3	250	1.3	8	4
7.4	1	□	MHS0740L030B	8.7	30.8	31.3	81.3	80	1.3	8	3
7.4	6	□	MHS0740L060B	45.7	60.8	61.3	111.3	110	1.3	8	4
7.4	10	□	MHS0740L090B	75.3	90.8	91.3	141.3	140	1.3	8	4
7.4	14	□	MHS0740L120B	104.9	120.8	121.3	171.3	170	1.3	8	4
7.4	18	□	MHS0740L150B	134.5	150.8	151.3	201.3	200	1.3	8	4
7.4	24	□	MHS0740L200B	178.9	200.8	201.3	251.3	250	1.3	8	4
7.5	1	●	MHS0750L030B	8.8	30.8	31.3	81.3	80	1.3	8	3
7.5	5	●	MHS0750L060B	38.9	60.9	61.4	111.4	110	1.4	8	4
7.5	9	●	MHS0750L090B	68.9	90.9	91.4	141.4	140	1.4	8	4
7.5	13	●	MHS0750L120B	98.9	120.9	121.4	171.4	170	1.4	8	4
7.5	17	●	MHS0750L150B	128.9	150.9	151.4	201.4	200	1.4	8	4
7.5	24	●	MHS0750L200B	181.4	200.9	201.4	251.4	250	1.4	8	4
7.6	1	□	MHS0760L030B	8.9	31.3	31.3	81.3	80	1.3	8	3
7.6	5	□	MHS0760L060B	39.4	61.4	61.4	111.4	110	1.4	8	4
7.6	9	□	MHS0760L090B	69.8	91.4	91.4	141.4	140	1.4	8	4
7.6	13	□	MHS0760L120B	100.2	121.4	121.4	171.4	170	1.4	8	4
7.6	17	□	MHS0760L150B	130.6	151.4	151.4	201.4	200	1.4	8	4
7.6	24	□	MHS0760L200B	183.8	201.4	201.4	251.4	250	1.4	8	4
7.6	30	□	MHS0760L250B	229.4	251.4	251.4	301.4	300	1.4	8	4
7.7	1	□	MHS0770L030B	9.0	31.3	31.3	81.3	80	1.3	8	3
7.7	5	□	MHS0770L060B	39.9	61.4	61.4	111.4	110	1.4	8	4
7.7	9	□	MHS0770L090B	70.7	91.4	91.4	141.4	140	1.4	8	4
7.7	13	□	MHS0770L120B	101.5	121.4	121.4	171.4	170	1.4	8	4
7.7	17	□	MHS0770L150B	132.3	151.4	151.4	201.4	200	1.4	8	4
7.7	23	□	MHS0770L200B	178.5	201.4	201.4	251.4	250	1.4	8	4
7.7	30	□	MHS0770L250B	232.4	251.4	251.4	301.4	300	1.4	8	4
7.8	1	●	MHS0780L030B	9.1	31.3	31.3	81.3	80	1.3	8	3
7.8	5	●	MHS0780L060B	40.4	61.4	61.4	111.4	110	1.4	8	4
7.8	9	●	MHS0780L090B	71.6	91.4	91.4	141.4	140	1.4	8	4
7.8	13	●	MHS0780L120B	102.8	121.4	121.4	171.4	170	1.4	8	4
7.8	17	●	MHS0780L150B	134.0	151.4	151.4	201.4	200	1.4	8	4
7.8	23	●	MHS0780L200B	180.8	201.4	201.4	251.4	250	1.4	8	4
7.8	30	●	MHS0780L250B	235.4	251.4	251.4	301.4	300	1.4	8	4
7.9	1	□	MHS0790L030B	9.3	31.4	31.4	81.4	80	1.4	8	3
7.9	5	□	MHS0790L060B	40.9	61.4	61.4	111.4	110	1.4	8	4
7.9	9	□	MHS0790L090B	72.5	91.4	91.4	141.4	140	1.4	8	4
7.9	13	□	MHS0790L120B	104.1	121.4	121.4	171.4	170	1.4	8	4
7.9	16	□	MHS0790L150B	127.8	151.4	151.4	201.4	200	1.4	8	4
7.9	23	□	MHS0790L200B	183.1	201.4	201.4	251.4	250	1.4	8	4
7.9	29	□	MHS0790L250B	230.5	251.4	251.4	301.4	300	1.4	8	4
8.0	1	●	MHS0800L030B	9.4	31.4	31.4	81.4	80	1.4	8	3
8.0	5	●	MHS0800L060B	41.5	61.5	61.5	111.5	110	1.5	8	4
8.0	9	●	MHS0800L090B	73.5	91.5	91.5	141.5	140	1.5	8	4
8.0	12	●	MHS0800L120B	97.5	121.5	121.5	171.5	170	1.5	8	4
8.0	16	●	MHS0800L150B	129.5	151.5	151.5	201.5	200	1.5	8	4
8.0	22	●	MHS0800L200B	177.5	201.5	201.5	251.5	250	1.5	8	4
8.0	29	●	MHS0800L250B	233.5	251.5	251.5	301.5	300	1.5	8	4
8.1	2	□	MHS0810L040B	17.6	39.9	41.4	101.4	100	1.4	10	3
8.1	8	□	MHS0810L090B	66.3	90.0	91.5	151.5	150	1.5	10	4
8.1	12	□	MHS0810L120B	98.7	120.0	121.5	181.5	180	1.5	10	4
8.1	16	□	MHS0810L150B	131.1	150.0	151.5	211.5	210	1.5	10	4
8.1	22	□	MHS0810L200B	179.7	200.0	201.5	261.5	260	1.5	10	4
8.1	28	□	MHS0810L250B	228.3	250.0	251.5	311.5	310	1.5	10	4
8.2	2	□	MHS0820L040B	17.8	39.9	41.4	101.4	100	1.4	10	3
8.2	8	□	MHS0820L090B	67.1	90.0	91.5	151.5	150	1.5	10	4
8.2	12	□	MHS0820L120B	99.9	120.0	121.5	181.5	180	1.5	10	4
8.2	16	□	MHS0820L150B	132.7	150.0	151.5	211.5	210	1.5	10	4
8.2	22	□	MHS0820L200B	181.9	200.0	201.5	261.5	260	1.5	10	4
8.2	28	□	MHS0820L250B	231.1	250.0	251.5	311.5	310	1.5	10	4
8.3	2	□	MHS0830L040B	18.0	39.9	41.4	101.4	100	1.4	10	3
8.3	8	□	MHS0830L090B	67.9	90.0	91.5	151.5	150	1.5	10	4
8.3	12	□	MHS0830L120B	101.1	120.0	121.5	181.5	180	1.5	10	4
8.3	15	□	MHS0830L150B	126.0	150.0	151.5	211.5	210	1.5	10	4
8.3	21	□	MHS0830L200B	175.8	200.0	201.5	261.5	260	1.5	10	4
8.3	27	□	MHS0830L250B	225.6	250.0	251.5	311.5	310	1.5	10	4
8.4	2	□	MHS0840L040B	18.2	39.9	41.4	101.4	100	1.4	10	3
8.4	8	□	MHS0840L090B	68.7	90.0	91.5	151.5	150	1.5	10	4
8.4	12	□	MHS0840L120B	102.3	120.0	121.5	181.5	180	1.5	10	4
8.4	15	□	MHS0840L150B	127.5	150.0	151.5	211.5	210	1.5	10	4
8.4	21	□	MHS0840L200B	177.9	200.0	201.5	261.5	260	1.5	10	4
8.4	27	□	MHS0840L250B	228.3	250.0	251.5	311.5	310	1.5	10	4
8.5	2	●	MHS0850L040B	18.5	40.0	41.5	101.5	100	1.5	10	3
8.5	8	●	MHS0850L090B	69.5	90.0	91.5	151.5	150	1.5	10	4
8.5	11	●	MHS0850L120B	95.0	120.0	121.5	181.5	180	1.5	10	4
8.5	15	●	MHS0850L150B	129.0	150.0	151.5	211.5	210	1.5	10	4
8.5	21	●	MHS0850L200B	180.0	200.0	201.5	261.5	260	1.5	10	4
8.5	27	●	MHS0850L250B	231.0	250.0	251.5	311.5	310	1.5	10	4
8.6	2	□	MHS0860L040B	18.7	40.5	41.5	101.5	100	1.5	10	3
8.6	8	□	MHS0860L090B	70.4	90.6	91.6	151.6	150	1.6	10	4
8.6	11	□	MHS0860L120B	96.2	120.6	121.6	181.6	180	1.6	10	4

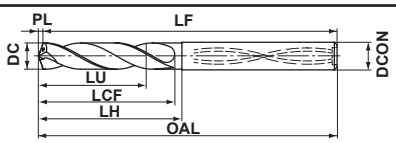
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type2



Type3, Type4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.6	15	□	MHS0860L150B	130.6	150.6	151.6	211.6	210	1.6	10	4
8.6	21	□	MHS0860L200B	182.2	200.6	201.6	261.6	260	1.6	10	4
8.6	26	□	MHS0860L250B	225.2	250.6	251.6	311.6	310	1.6	10	4
8.7	2	□	MHS0870L040B	18.9	40.5	41.5	101.5	100	1.5	10	3
8.7	8	□	MHS0870L090B	71.2	90.6	91.6	151.6	150	1.6	10	4
8.7	11	□	MHS0870L120B	97.3	120.6	121.6	181.6	180	1.6	10	4
8.7	15	□	MHS0870L150B	132.1	150.6	151.6	211.6	210	1.6	10	4
8.7	20	□	MHS0870L200B	175.6	200.6	201.6	261.6	260	1.6	10	4
8.7	26	□	MHS0870L250B	227.8	250.6	251.6	311.6	310	1.6	10	4
8.8	2	●	MHS0880L040B	19.1	40.5	41.5	101.5	100	1.5	10	3
8.8	8	●	MHS0880L090B	72.0	90.6	91.6	151.6	150	1.6	10	4
8.8	11	●	MHS0880L120B	98.4	120.6	121.6	181.6	180	1.6	10	4
8.8	14	●	MHS0880L150B	124.8	150.6	151.6	211.6	210	1.6	10	4
8.8	20	●	MHS0880L200B	177.6	200.6	201.6	261.6	260	1.6	10	4
8.8	26	●	MHS0880L250B	230.4	250.6	251.6	311.6	310	1.6	10	4
8.9	2	□	MHS0890L040B	19.3	40.5	41.5	101.5	100	1.5	10	3
8.9	7	□	MHS0890L090B	63.9	90.6	91.6	151.6	150	1.6	10	4
8.9	11	□	MHS0890L120B	99.5	120.6	121.6	181.6	180	1.6	10	4
8.9	14	□	MHS0890L150B	126.2	150.6	151.6	211.6	210	1.6	10	4
8.9	20	□	MHS0890L200B	179.6	200.6	201.6	261.6	260	1.6	10	4
8.9	25	□	MHS0890L250B	224.1	250.6	251.6	311.6	310	1.6	10	4
9.0	2	●	MHS0900L040B	19.5	40.5	41.5	101.5	100	1.5	10	3
9.0	7	●	MHS0900L090B	64.6	90.6	91.6	151.6	150	1.6	10	4
9.0	11	●	MHS0900L120B	100.6	120.6	121.6	181.6	180	1.6	10	4
9.0	14	●	MHS0900L150B	127.6	150.6	151.6	211.6	210	1.6	10	4
9.0	20	●	MHS0900L200B	181.6	200.6	201.6	261.6	260	1.6	10	4
9.0	25	●	MHS0900L250B	226.6	250.6	251.6	311.6	310	1.6	10	4
9.1	2	□	MHS0910L040B	19.8	41.1	41.6	101.6	100	1.6	10	3
9.1	7	□	MHS0910L090B	65.4	91.2	91.7	151.7	150	1.7	10	4
9.1	11	□	MHS0910L120B	101.8	121.2	121.7	181.7	180	1.7	10	4
9.1	14	□	MHS0910L150B	129.1	151.2	151.7	211.7	210	1.7	10	4
9.1	19	□	MHS0910L200B	174.6	201.2	201.7	261.7	260	1.7	10	4
9.1	25	□	MHS0910L250B	229.2	251.2	251.7	311.7	310	1.7	10	4
9.1	30	□	MHS0910L300B	274.7	301.2	301.7	361.7	360	1.7	10	4
9.2	2	□	MHS0920L040B	20.0	41.1	41.6	101.6	100	1.6	10	3
9.2	7	□	MHS0920L090B	66.1	91.2	91.7	151.7	150	1.7	10	4
9.2	10	□	MHS0920L120B	93.7	121.2	121.7	181.7	180	1.7	10	4
9.2	14	□	MHS0920L150B	130.5	151.2	151.7	211.7	210	1.7	10	4
9.2	19	□	MHS0920L200B	176.5	201.2	201.7	261.7	260	1.7	10	4
9.2	25	□	MHS0920L250B	231.7	251.2	251.7	311.7	310	1.7	10	4
9.2	30	□	MHS0920L300B	277.7	301.2	301.7	361.7	360	1.7	10	4
9.3	2	□	MHS0930L040B	20.2	41.1	41.6	101.6	100	1.6	10	3
9.3	7	□	MHS0930L090B	66.8	91.2	91.7	151.7	150	1.7	10	4
9.3	10	□	MHS0930L120B	94.7	121.2	121.7	181.7	180	1.7	10	4
9.3	14	□	MHS0930L150B	131.9	151.2	151.7	211.7	210	1.7	10	4
9.3	19	□	MHS0930L200B	178.4	201.2	201.7	261.7	260	1.7	10	4
9.3	24	□	MHS0930L250B	224.9	251.2	251.7	311.7	310	1.7	10	4
9.3	30	□	MHS0930L300B	280.7	301.2	301.7	361.7	360	1.7	10	4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
9.4	2	□	MHS0940L040B	20.4	41.1	41.6	101.6	100	1.6	10	3
9.4	7	□	MHS0940L090B	67.5	91.2	91.7	151.7	150	1.7	10	4
9.4	10	□	MHS0940L120B	95.7	121.2	121.7	181.7	180	1.7	10	4
9.4	13	□	MHS0940L150B	123.9	151.2	151.7	211.7	210	1.7	10	4
9.4	19	□	MHS0940L200B	180.3	201.2	201.7	261.7	260	1.7	10	4
9.4	24	□	MHS0940L250B	227.3	251.2	251.7	311.7	310	1.7	10	4
9.4	29	□	MHS0940L300B	274.3	301.2	301.7	361.7	360	1.7	10	4
9.5	2	●	MHS0950L040B	20.6	41.1	41.6	101.6	100	1.6	10	3
9.5	7	●	MHS0950L090B	68.2	91.2	91.7	151.7	150	1.7	10	4
9.5	10	●	MHS0950L120B	96.7	121.2	121.7	181.7	180	1.7	10	4
9.5	13	●	MHS0950L150B	125.2	151.2	151.7	211.7	210	1.7	10	4
9.5	18	●	MHS0950L200B	172.7	201.2	201.7	261.7	260	1.7	10	4
9.5	24	●	MHS0950L250B	229.7	251.2	251.7	311.7	310	1.7	10	4
9.5	29	●	MHS0950L300B	277.2	301.2	301.7	361.7	360	1.7	10	4
9.6	2	□	MHS0960L040B	20.9	41.7	41.7	101.7	100	1.7	10	3
9.6	7	□	MHS0960L090B	68.9	91.7	91.7	151.7	150	1.7	10	4
9.6	10	□	MHS0960L120B	97.7	121.7	121.7	181.7	180	1.7	10	4
9.6	13	□	MHS0960L150B	126.5	151.7	151.7	211.7	210	1.7	10	4
9.6	18	□	MHS0960L200B	174.5	201.7	201.7	261.7	260	1.7	10	4
9.6	24	□	MHS0960L250B	232.1	251.7	251.7	311.7	310	1.7	10	4
9.6	29	□	MHS0960L300B	280.1	301.7	301.7	361.7	360	1.7	10	4
9.7	2	□	MHS0970L040B	21.1	41.7	41.7	101.7	100	1.7	10	3
9.7	7	□	MHS0970L090B	69.7	91.8	91.8	151.8	150	1.8	10	4
9.7	10	□	MHS0970L120B	98.8	121.8	121.8	181.8	180	1.8	10	4
9.7	13	□	MHS0970L150B	127.9	151.8	151.8	211.8	210	1.8	10	4
9.7	18	□	MHS0970L200B	176.4	201.8	201.8	261.8	260	1.8	10	4
9.7	23	□	MHS0970L250B	224.9	251.8	251.8	311.8	310	1.8	10	4
9.7	28	□	MHS0970L300B	273.4	301.8	301.8	361.8	360	1.8	10	4
9.8	2	●	MHS0980L040B	21.3	41.7	41.7	101.7	100	1.7	10	3
9.8	7	●	MHS0980L090B	70.4	91.8	91.8	151.8	150	1.8	10	4
9.8	10	●	MHS0980L120B	99.8	121.8	121.8	181.8	180	1.8	10	4
9.8	13	●	MHS0980L150B	129.2	151.8	151.8	211.8	210	1.8	10	4
9.8	18	●	MHS0980L200B	178.2	201.8	201.8	261.8	260	1.8	10	4
9.8	23	●	MHS0980L250B	227.2	251.8	251.8	311.8	310	1.8	10	4
9.8	28	●	MHS0980L300B	276.2	301.8	301.8	361.8	360	1.8	10	4
9.9	2	□	MHS0990L040B	21.5	41.7	41.7	101.7	100	1.7	10	3
9.9	7	□	MHS0990L090B	71.1	91.8	91.8	151.8	150	1.8	10	4
9.9	10	□	MHS0990L120B	100.8	121.8	121.8	181.8	180	1.8	10	4
9.9	13	□	MHS0990L150B	130.5	151.8	151.8	211.8	210	1.8	10	4
9.9	18	□	MHS0990L200B	180.0	201.8	201.8	261.8	260	1.8	10	4
9.9	23	□	MHS0990L250B	229.5	251.8	251.8	311.8	310	1.8	10	4
9.9	28	□	MHS0990L300B	279.0	301.8	301.8	361.8	360	1.8	10	4
10.0	1	●	MHS1000L040B	11.7	41.7	41.7	101.7	100	1.7	10	3
10.0	6	●	MHS1000L090B	61.8	91.8	91.8	151.8	150	1.8	10	4
10.0	9	●	MHS1000L120B	91.8	121.8	121.8	181.8	180	1.8	10	4
10.0	12	●	MHS1000L150B	121.8	151.8	151.8	211.8	210	1.8	10	4
10.0	17	●	MHS1000L200B	171.8	201.8	201.8	261.8	260	1.8	10	4
10.0	22	●	MHS1000L250B	221.8	251.8	251.8	311.8	310	1.8	10	4

MHS

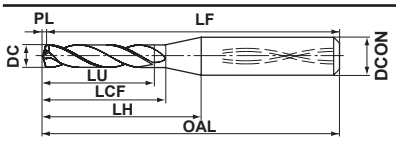
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
10.0	27	●	MHS1000L300B	271.8	301.8	301.8	361.8	360	1.8	10	4
10.1	1	□	MHS1010L040B	11.8	40.2	41.7	101.7	100	1.7	12	3
10.1	6	□	MHS1010L090B	62.4	90.3	91.8	151.8	150	1.8	12	4
10.1	9	□	MHS1010L120B	92.7	120.3	121.8	181.8	180	1.8	12	4
10.1	12	□	MHS1010L150B	123.0	150.3	151.8	211.8	210	1.8	12	4
10.1	17	□	MHS1010L200B	173.5	200.3	201.8	261.8	260	1.8	12	4
10.1	22	□	MHS1010L250B	224.0	250.3	251.8	311.8	310	1.8	12	4
10.1	27	□	MHS1010L300B	274.5	300.3	301.8	361.8	360	1.8	12	4
10.2	1	□	MHS1020L040B	12.0	40.3	41.8	101.8	100	1.8	12	3
10.2	6	□	MHS1020L090B	63.1	90.4	91.9	151.9	150	1.9	12	4
10.2	9	□	MHS1020L120B	93.7	120.4	121.9	181.9	180	1.9	12	4
10.2	12	□	MHS1020L150B	124.3	150.4	151.9	211.9	210	1.9	12	4
10.2	17	□	MHS1020L200B	175.3	200.4	201.9	261.9	260	1.9	12	4
10.2	22	□	MHS1020L250B	226.3	250.4	251.9	311.9	310	1.9	12	4
10.2	27	□	MHS1020L300B	277.3	300.4	301.9	361.9	360	1.9	12	4
10.3	1	□	MHS1030L040B	12.1	40.3	41.8	101.8	100	1.8	12	3
10.3	6	□	MHS1030L090B	63.7	90.4	91.9	151.9	150	1.9	12	4
10.3	9	□	MHS1030L120B	94.6	120.4	121.9	181.9	180	1.9	12	4
10.3	12	□	MHS1030L150B	125.5	150.4	151.9	211.9	210	1.9	12	4
10.3	17	□	MHS1030L200B	177.0	200.4	201.9	261.9	260	1.9	12	4
10.3	22	□	MHS1030L250B	228.5	250.4	251.9	311.9	310	1.9	12	4
10.3	26	□	MHS1030L300B	269.7	300.4	301.9	361.9	360	1.9	12	4
10.4	1	□	MHS1040L040B	12.2	40.3	41.8	101.8	100	1.8	12	3
10.4	6	□	MHS1040L090B	64.3	90.4	91.9	151.9	150	1.9	12	4
10.4	9	□	MHS1040L120B	95.5	120.4	121.9	181.9	180	1.9	12	4
10.4	12	□	MHS1040L150B	126.7	150.4	151.9	211.9	210	1.9	12	4
10.4	17	□	MHS1040L200B	178.7	200.4	201.9	261.9	260	1.9	12	4
10.4	21	□	MHS1040L250B	220.3	250.4	251.9	311.9	310	1.9	12	4
10.4	26	□	MHS1040L300B	272.3	300.4	301.9	361.9	360	1.9	12	4
10.5	1	●	MHS1050L040B	12.3	40.3	41.8	101.8	100	1.8	12	3
10.5	6	●	MHS1050L090B	64.9	90.4	91.9	151.9	150	1.9	12	4
10.5	9	●	MHS1050L120B	96.4	120.4	121.9	181.9	180	1.9	12	4
10.5	12	●	MHS1050L150B	127.9	150.4	151.9	211.9	210	1.9	12	4
10.5	16	●	MHS1050L200B	169.9	200.4	201.9	261.9	260	1.9	12	4
10.5	21	●	MHS1050L250B	222.4	250.4	251.9	311.9	310	1.9	12	4
10.5	26	●	MHS1050L300B	274.9	300.4	301.9	361.9	360	1.9	12	4
10.6	1	□	MHS1060L040B	12.4	40.8	41.8	101.8	100	1.8	12	3
10.6	6	□	MHS1060L090B	65.5	90.9	91.9	151.9	150	1.9	12	4
10.6	9	□	MHS1060L120B	97.3	120.9	121.9	181.9	180	1.9	12	4
10.6	12	□	MHS1060L150B	129.1	150.9	151.9	211.9	210	1.9	12	4
10.6	16	□	MHS1060L200B	171.5	200.9	201.9	261.9	260	1.9	12	4
10.6	21	□	MHS1060L250B	224.5	250.9	251.9	311.9	310	1.9	12	4
10.6	26	□	MHS1060L300B	277.5	300.9	301.9	361.9	360	1.9	12	4
10.7	1	□	MHS1070L040B	12.5	40.8	41.8	101.8	100	1.8	12	3
10.7	6	□	MHS1070L090B	66.1	90.9	91.9	151.9	150	1.9	12	4
10.7	9	□	MHS1070L120B	98.2	120.9	121.9	181.9	180	1.9	12	4
10.7	11	□	MHS1070L150B	119.6	150.9	151.9	211.9	210	1.9	12	4
10.7	16	□	MHS1070L200B	173.1	200.9	201.9	261.9	260	1.9	12	4
10.7	21	□	MHS1070L250B	226.6	250.9	251.9	311.9	310	1.9	12	4
10.7	25	□	MHS1070L300B	269.4	300.9	301.9	361.9	360	1.9	12	4
10.8	1	●	MHS1080L040B	12.7	40.9	41.9	101.9	100	1.9	12	3
10.8	6	●	MHS1080L090B	66.8	91.0	92.0	152.0	150	2.0	12	4
10.8	9	●	MHS1080L120B	99.2	121.0	122.0	182.0	180	2.0	12	4
10.8	11	●	MHS1080L150B	120.8	151.0	152.0	212.0	210	2.0	12	4
10.8	16	●	MHS1080L200B	174.8	201.0	202.0	262.0	260	2.0	12	4
10.8	21	●	MHS1080L250B	228.8	251.0	252.0	312.0	310	2.0	12	4
10.8	25	●	MHS1080L300B	272.0	301.0	302.0	362.0	360	2.0	12	4
10.9	1	□	MHS1090L040B	12.8	40.9	41.9	101.9	100	1.9	12	3
10.9	6	□	MHS1090L090B	67.4	91.0	92.0	152.0	150	2.0	12	4
10.9	8	□	MHS1090L120B	89.2	121.0	122.0	182.0	180	2.0	12	4
10.9	11	□	MHS1090L150B	121.9	151.0	152.0	212.0	210	2.0	12	4
10.9	16	□	MHS1090L200B	176.4	201.0	202.0	262.0	260	2.0	12	4
10.9	20	□	MHS1090L250B	220.0	251.0	252.0	312.0	310	2.0	12	4
10.9	25	□	MHS1090L300B	274.5	301.0	302.0	362.0	360	2.0	12	4
11.0	1	●	MHS1100L040B	12.9	40.9	41.9	101.9	100	1.9	12	3
11.0	6	●	MHS1100L090B	68.0	91.0	92.0	152.0	150	2.0	12	4
11.0	8	●	MHS1100L120B	90.0	121.0	122.0	182.0	180	2.0	12	4
11.0	11	●	MHS1100L150B	123.0	151.0	152.0	212.0	210	2.0	12	4
11.0	16	●	MHS1100L200B	178.0	201.0	202.0	262.0	260	2.0	12	4
11.0	20	●	MHS1100L250B	222.0	251.0	252.0	312.0	310	2.0	12	4
11.0	25	●	MHS1100L300B	277.0	301.0	302.0	362.0	360	2.0	12	4
11.1	1	□	MHS1110L040B	13.0	41.4	41.9	101.9	100	1.9	12	3
11.1	6	□	MHS1110L090B	68.6	91.5	92.0	152.0	150	2.0	12	4
11.1	8	□	MHS1110L120B	90.8	121.5	122.0	182.0	180	2.0	12	4
11.1	11	□	MHS1110L150B	124.1	151.5	152.0	212.0	210	2.0	12	4
11.1	15	□	MHS1110L200B	168.5	201.5	202.0	262.0	260	2.0	12	4
11.1	20	□	MHS1110L250B	224.0	251.5	252.0	312.0	310	2.0	12	4
11.1	24	□	MHS1110L300B	268.4	301.5	302.0	362.0	360	2.0	12	4
11.2	1	□	MHS1120L040B	13.1	41.4	41.9	101.9	100	1.9	12	3
11.2	5	□	MHS1120L090B	58.0	91.5	92.0	152.0	150	2.0	12	4
11.2	8	□	MHS1120L120B	91.6	121.5	122.0	182.0	180	2.0	12	4
11.2	11	□	MHS1120L150B	125.2	151.5	152.0	212.0	210	2.0	12	4
11.2	15	□	MHS1120L200B	170.0	201.5	202.0	262.0	260	2.0	12	4
11.2	20	□	MHS1120L250B	226.0	251.5	252.0	312.0	310	2.0	12	4
11.2	24	□	MHS1120L300B	270.8	301.5	302.0	362.0	360	2.0	12	4
11.3	1	□	MHS1130L040B	13.2	41.4	41.9	101.9	100	1.9	12	3
11.3	5	□	MHS1130L090B	58.6	91.6	92.1	152.1	150	2.1	12	4
11.3	8	□	MHS1130L120B	92.5	121.6	122.1	182.1	180	2.1	12	4
11.3	11	□	MHS1130L150B	126.4	151.6	152.1	212.1	210	2.1	12	4
11.3	15	□	MHS1130L200B	171.6	201.6	202.1	262.1	260	2.1	12	4
11.3	20	□	MHS1130L250B	228.1	251.6	252.1	312.1	310	2.1	12	4
11.3	24	□	MHS1130L300B	273.3	301.6	302.1	362.1	360	2.1	12	4
11.4	1	□	MHS1140L040B	13.4	41.5	42.0	102.0	100	2.0	12	3
11.4	5	□	MHS1140L090B	59.1	91.6	92.1	152.1	150	2.1	12	4
11.4	8	□	MHS1140L120B	93.3	121.6	122.1	182.1	180	2.1	12	4
11.4	11	□	MHS1140L150B	127.5	151.6	152.1	212.1	210	2.1	12	4

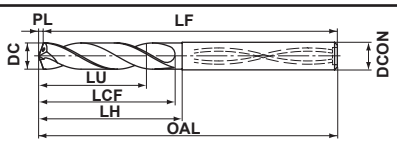
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type2



Type3, Type4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
11.4	15	□	**MHS1140L200B**	173.1	201.6	202.1	262.1	260	2.1	12	4
11.4	19	□	**MHS1140L250B**	218.7	251.6	252.1	312.1	310	2.1	12	4
11.4	24	□	**MHS1140L300B**	275.7	301.6	302.1	362.1	360	2.1	12	4
11.5	1	●	**MHS1150L040B**	13.5	41.5	42.0	102.0	100	2.0	12	3
11.5	5	●	**MHS1150L090B**	59.6	91.6	92.1	152.1	150	2.1	12	4
11.5	8	●	**MHS1150L120B**	94.1	121.6	122.1	182.1	180	2.1	12	4
11.5	10	●	**MHS1150L150B**	117.1	151.6	152.1	212.1	210	2.1	12	4
11.5	15	●	**MHS1150L200B**	174.6	201.6	202.1	262.1	260	2.1	12	4
11.5	19	●	**MHS1150L250B**	220.6	251.6	252.1	312.1	310	2.1	12	4
11.5	24	●	**MHS1150L300B**	278.1	301.6	302.1	362.1	360	2.1	12	4
11.6	1	□	**MHS1160L040B**	13.6	42.0	42.0	102.0	100	2.0	12	3
11.6	5	□	**MHS1160L090B**	60.1	92.1	92.1	152.1	150	2.1	12	4
11.6	8	□	**MHS1160L120B**	94.9	122.1	122.1	182.1	180	2.1	12	4
11.6	10	□	**MHS1160L150B**	118.1	152.1	152.1	212.1	210	2.1	12	4
11.6	15	□	**MHS1160L200B**	176.1	202.1	202.1	262.1	260	2.1	12	4
11.6	19	□	**MHS1160L250B**	222.5	252.1	252.1	312.1	310	2.1	12	4
11.6	23	□	**MHS1160L300B**	268.9	302.1	302.1	362.1	360	2.1	12	4
11.7	1	□	**MHS1170L040B**	13.7	42.0	42.0	102.0	100	2.0	12	3
11.7	5	□	**MHS1170L090B**	60.6	92.1	92.1	152.1	150	2.1	12	4
11.7	8	□	**MHS1170L120B**	95.7	122.1	122.1	182.1	180	2.1	12	4
11.7	10	□	**MHS1170L150B**	119.1	152.1	152.1	212.1	210	2.1	12	4
11.7	15	□	**MHS1170L200B**	177.6	202.1	202.1	262.1	260	2.1	12	4
11.7	19	□	**MHS1170L250B**	224.4	252.1	252.1	312.1	310	2.1	12	4
11.7	23	□	**MHS1170L300B**	271.2	302.1	302.1	362.1	360	2.1	12	4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
11.8	1	●	**MHS1180L040B**	13.8	42.0	42.0	102.0	100	2.0	12	3
11.8	5	●	**MHS1180L090B**	61.1	92.1	92.1	152.1	150	2.1	12	4
11.8	8	●	**MHS1180L120B**	96.5	122.1	122.1	182.1	180	2.1	12	4
11.8	10	●	**MHS1180L150B**	120.1	152.1	152.1	212.1	210	2.1	12	4
11.8	14	●	**MHS1180L200B**	167.3	202.1	202.1	262.1	260	2.1	12	4
11.8	19	●	**MHS1180L250B**	226.3	252.1	252.1	312.1	310	2.1	12	4
11.8	23	●	**MHS1180L300B**	273.5	302.1	302.1	362.1	360	2.1	12	4
11.9	1	□	**MHS1190L040B**	13.9	42.0	42.0	102.0	100	2.0	12	3
11.9	5	□	**MHS1190L090B**	61.7	92.2	92.2	152.2	150	2.2	12	4
11.9	8	□	**MHS1190L120B**	97.4	122.2	122.2	182.2	180	2.2	12	4
11.9	10	□	**MHS1190L150B**	121.2	152.2	152.2	212.2	210	2.2	12	4
11.9	14	□	**MHS1190L200B**	168.8	202.2	202.2	262.2	260	2.2	12	4
11.9	19	□	**MHS1190L250B**	228.3	252.2	252.2	312.2	310	2.2	12	4
11.9	23	□	**MHS1190L300B**	275.9	302.2	302.2	362.2	360	2.2	12	4
12.0	1	●	**MHS1200L040B**	14.1	42.1	42.1	102.1	100	2.1	12	3
12.0	5	●	**MHS1200L090B**	62.2	92.2	92.2	152.2	150	2.2	12	4
12.0	7	●	**MHS1200L120B**	86.2	122.2	122.2	182.2	180	2.2	12	4
12.0	10	●	**MHS1200L150B**	122.2	152.2	152.2	212.2	210	2.2	12	4
12.0	14	●	**MHS1200L200B**	170.2	202.2	202.2	262.2	260	2.2	12	4
12.0	18	●	**MHS1200L250B**	218.2	252.2	252.2	312.2	310	2.2	12	4
12.0	22	●	**MHS1200L300B**	266.2	302.2	302.2	362.2	360	2.2	12	4

MHS

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB), Carbon Steel, Alloy Steel (180－280HB) AISI 1010, AISI 1045, AISI 4140 etc				Ferritic and Martensitic Stainless Steel (>200HB) AISI 431, AISI 420 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	40	12700	0.030 (0.020－0.040)	380	20	6400	0.030 (0.020－0.040)	190
1.2	50	13300	0.035 (0.025－0.050)	465	30	8000	0.035 (0.025－0.050)	280
1.6	60	11900	0.050 (0.030－0.065)	595	40	8000	0.050 (0.030－0.065)	400
2.0	70	11100	0.060 (0.040－0.080)	665	50	8000	0.060 (0.040－0.080)	480
2.5	80	10200	0.075 (0.050－0.100)	765	60	7600	0.075 (0.050－0.100)	570
3.2	80	8000	0.100 (0.070－0.130)	800	60	6000	0.100 (0.070－0.130)	600
4.0	80	6400	0.100 (0.090－0.110)	640	60	4800	0.090 (0.080－0.090)	430
5.0	80	5100	0.130 (0.110－0.140)	665	60	3800	0.110 (0.100－0.120)	420
6.3	80	4000	0.160 (0.140－0.180)	640	60	3000	0.140 (0.130－0.150)	420
8.0	80	3200	0.200 (0.180－0.230)	640	60	2400	0.170 (0.160－0.190)	410
10.0	80	2600	0.250 (0.220－0.280)	650	60	1900	0.220 (0.200－0.230)	420
12.0	80	2100	0.300 (0.270－0.340)	630	60	1600	0.260 (0.240－0.280)	415

Workpiece Material	Pre-hardened Steel (35－45HRC), Alloy Tool Steel (≤350) AISI P21, AISI P20, ASTM H13, AISI L6 etc				Stainless Steel (40－55HRC), Precipitation-Hardening Stainless Steel (<450HB) AISI 431, AISI 420, STAVAX, S17400, S17700 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	20	6400	0.025 (0.020－0.030)	160	40	12700	0.020 (0.015－0.025)	255
1.2	30	8000	0.030 (0.020－0.035)	240	40	10600	0.025 (0.020－0.030)	265
1.6	40	8000	0.040 (0.030－0.045)	320	50	10000	0.035 (0.025－0.040)	350
2.0	50	8000	0.045 (0.035－0.060)	360	50	8000	0.040 (0.030－0.050)	320
2.5	60	7600	0.060 (0.045－0.075)	455	60	7600	0.050 (0.040－0.065)	380
3.2	60	6000	0.080 (0.060－0.090)	480	60	6000	0.060 (0.050－0.080)	360
4.0	60	4800	0.080 (0.070－0.100)	385	60	4800	0.080 (0.060－0.100)	385
5.0	60	3800	0.110 (0.090－0.130)	420	60	3800	0.100 (0.080－0.130)	380
6.3	60	3000	0.130 (0.110－0.160)	390	60	3000	0.110 (0.090－0.130)	330
8.0	60	2400	0.170 (0.140－0.200)	410	60	2400	0.140 (0.120－0.160)	335
10.0	60	1900	0.210 (0.170－0.250)	400	60	1900	0.170 (0.140－0.200)	325
12.0	60	1600	0.250 (0.210－0.300)	400	60	1600	0.210 (0.170－0.240)	335

Note 1) When using a product with a length of L / D 10 or greater, please drill a pilot hole first (without one the tool may swing apart or break due to centrifugal force.)

Note 2) MHS drills are suitable for use with shrink fit holders.

Note 3) Use the smallest type of each diameter when drilling a pilot hole.

Workpiece Material	Hardened Steel (40—55HRC), Heat Resistant Alloy AISI H13, L6, Inconel718 etc			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	10	3200	0.015 (0.015—0.020)	50
1.2	10	2700	0.020 (0.015—0.025)	55
1.6	10	2000	0.025 (0.020—0.030)	50
2.0	20	3200	0.035 (0.025—0.040)	110
2.5	20	2600	0.040 (0.030—0.050)	105
3.2	20	2000	0.050 (0.040—0.070)	100
4.0	30	2400	0.070 (0.050—0.080)	170
5.0	30	1900	0.080 (0.060—0.100)	150
6.3	30	1500	0.090 (0.080—0.110)	135
8.0	40	1600	0.120 (0.100—0.130)	190
10.0	40	1300	0.150 (0.130—0.170)	195
12.0	40	1100	0.180 (0.150—0.200)	200

Note 1) When using a product with a length of L / D 10 or greater, please drill a pilot hole first (without one the tool may swing apart or break due to centrifugal force.)
Note 2) MHS drills are suitable for use with shrink fit holders.
Note 3) Use the smallest type of each diameter when drilling a pilot hole.

DRILLING(SOLID CARBIDE)

MNS

WSTAR DRILLS

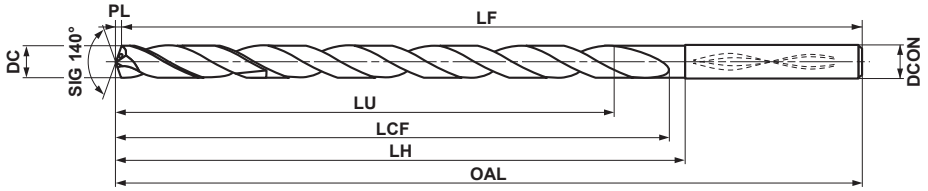
- 4 holes special coolant system, good for resistance to adhesion.
- High efficiency drilling for aluminium alloys.

P | M | K | **N** | S | H

Non-ferrous Metal

Internal Coolant





DC=3	3<DC≤6	6<DC≤10	10<DC≤14
0 −0.014	0 −0.018	0 −0.022	0 −0.027
DCON=3	**3<DCON≤6**	**6<DCON≤10**	**10<DCON≤14**
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MNS drills are suitable for use with shrink fit holders.
Note 2) 4.5 or smaller diameter drills are designed with 2 colant holes.
Note 3) Use MNS...LB or MAE...MB, MAS...MB (N104, N108 pages) when drilling pilot holes.

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
3.0	5	●	MNS0300LB	15.5	33.5	33.5	81.5	81	0.5	3
3.0	10	●	MNS0300X10DB	30.5	39.5	42.5	90.5	90	0.5	3
3.0	20	●	MNS0300X20DB	60.5	69.5	72.5	120.5	120	0.5	3
3.0	30	●	MNS0300X30DB	90.5	99.5	102.5	150.5	150	0.5	3
3.1	5	●	MNS0310LB	16.1	39.6	39.6	87.6	87	0.6	4
3.1	10	□	MNS0310X10DB	31.6	46.6	49.6	97.6	97	0.6	4
3.1	20	□	MNS0310X20DB	62.6	81.6	84.6	132.6	132	0.6	4
3.1	30	□	MNS0310X30DB	93.6	116.6	119.6	167.6	167	0.6	4
3.2	5	●	MNS0320LB	16.6	39.6	39.6	87.6	87	0.6	4
3.2	10	●	MNS0320X10DB	32.6	46.6	49.6	97.6	97	0.6	4
3.2	20	●	MNS0320X20DB	64.6	81.6	84.6	132.6	132	0.6	4
3.2	30	●	MNS0320X30DB	96.6	116.6	119.6	167.6	167	0.6	4
3.3	5	●	MNS0330LB	17.1	39.6	39.6	87.6	87	0.6	4
3.3	10	□	MNS0330X10DB	33.6	46.6	49.6	97.6	97	0.6	4
3.3	20	□	MNS0330X20DB	66.6	81.6	84.6	132.6	132	0.6	4
3.3	30	□	MNS0330X30DB	99.6	116.6	119.6	167.6	167	0.6	4
3.4	5	●	MNS0340LB	17.6	39.6	39.6	87.6	87	0.6	4
3.4	10	●	MNS0340X10DB	34.6	46.6	49.6	97.6	97	0.6	4
3.4	20	●	MNS0340X20DB	68.6	81.6	84.6	132.6	132	0.6	4
3.4	30	●	MNS0340X30DB	102.6	116.6	119.6	167.6	167	0.6	4
3.5	5	●	MNS0350LB	18.1	39.6	39.6	87.6	87	0.6	4
3.5	10	□	MNS0350X10DB	35.6	46.6	49.6	97.6	97	0.6	4
3.5	20	□	MNS0350X20DB	70.6	81.6	84.6	132.6	132	0.6	4
3.5	30	□	MNS0350X30DB	105.6	116.6	119.6	167.6	167	0.6	4
3.6	5	●	MNS0360LB	18.7	44.7	44.7	92.7	92	0.7	4
3.6	10	●	MNS0360X10DB	36.7	52.7	55.7	103.7	103	0.7	4
3.6	20	●	MNS0360X20DB	72.7	92.7	95.7	143.7	143	0.7	4
3.6	30	●	MNS0360X30DB	108.7	132.7	135.7	183.7	183	0.7	4
3.7	5	●	MNS0370LB	19.2	44.7	44.7	92.7	92	0.7	4
3.7	10	□	MNS0370X10DB	37.7	52.7	55.7	103.7	103	0.7	4
3.7	20	□	MNS0370X20DB	74.7	92.7	95.7	143.7	143	0.7	4
3.7	30	□	MNS0370X30DB	111.7	132.7	135.7	183.7	183	0.7	4
3.8	5	●	MNS0380LB	19.7	44.7	44.7	92.7	92	0.7	4
3.8	10	□	MNS0380X10DB	38.7	52.7	55.7	103.7	103	0.7	4
3.8	20	□	MNS0380X20DB	76.7	92.7	95.7	143.7	143	0.7	4
3.8	30	□	MNS0380X30DB	114.7	132.7	135.7	183.7	183	0.7	4
3.9	5	●	MNS0390LB	20.2	44.7	44.7	92.7	92	0.7	4
3.9	10	●	MNS0390X10DB	39.7	52.7	55.7	103.7	103	0.7	4
3.9	20	●	MNS0390X20DB	78.7	92.7	95.7	143.7	143	0.7	4
3.9	30	●	MNS0390X30DB	117.7	132.7	135.7	183.7	183	0.7	4
4.0	5	●	MNS0400LB	20.7	44.7	44.7	92.7	92	0.7	4
4.0	10	●	MNS0400X10DB	40.7	52.7	55.7	103.7	103	0.7	4
4.0	20	●	MNS0400X20DB	80.7	92.7	95.7	143.7	143	0.7	4
4.0	30	●	MNS0400X30DB	120.7	132.7	135.7	183.7	183	0.7	4
4.1	5	●	MNS0410LB	21.2	50.7	50.7	100.7	100	0.7	5
4.1	10	□	MNS0410X10DB	41.7	59.7	62.7	112.7	112	0.7	5
4.1	20	□	MNS0410X20DB	82.7	104.7	107.7	157.7	157	0.7	5
4.1	30	□	MNS0410X30DB	123.7	149.7	152.7	202.7	202	0.7	5
4.2	5	●	MNS0420LB	21.8	50.8	50.8	100.8	100	0.8	5
4.2	10	□	MNS0420X10DB	42.8	59.8	62.8	112.8	112	0.8	5
4.2	20	□	MNS0420X20DB	84.8	104.8	107.8	157.8	157	0.8	5
4.2	30	□	MNS0420X30DB	126.8	149.8	152.8	202.8	202	0.8	5
4.3	5	●	MNS0430LB	22.3	50.8	50.8	100.8	100	0.8	5
4.3	10	□	MNS0430X10DB	43.8	59.8	62.8	112.8	112	0.8	5
4.3	20	□	MNS0430X20DB	86.8	104.8	107.8	157.8	157	0.8	5
4.3	30	□	MNS0430X30DB	129.8	149.8	152.8	202.8	202	0.8	5

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm)						
				LU	LCF	LH	OAL	LF	PL	DCON
4.4	5	●	MNS0440LB	22.8	50.8	50.8	100.8	100	0.8	5
4.4	10	□	MNS0440X10DB	44.8	59.8	62.8	112.8	112	0.8	5
4.4	20	□	MNS0440X20DB	88.8	104.8	107.8	157.8	157	0.8	5
4.4	30	□	MNS0440X30DB	132.8	149.8	152.8	202.8	202	0.8	5
4.5	5	●	MNS0450LB	23.3	50.8	50.8	100.8	100	0.8	5
4.5	10	□	MNS0450X10DB	45.8	59.8	62.8	112.8	112	0.8	5
4.5	20	□	MNS0450X20DB	90.8	104.8	107.8	157.8	157	0.8	5
4.5	30	□	MNS0450X30DB	135.8	149.8	152.8	202.8	202	0.8	5
4.6	5	●	MNS0460LB	23.8	55.8	55.8	105.8	105	0.8	5
4.6	10	□	MNS0460X10DB	46.8	65.8	68.8	118.8	118	0.8	5
4.6	20	□	MNS0460X20DB	92.8	115.8	118.8	168.8	168	0.8	5
4.6	30	□	MNS0460X30DB	138.8	165.8	168.8	218.8	218	0.8	5
4.7	5	●	MNS0470LB	24.4	55.9	55.9	105.9	105	0.9	5
4.7	10	□	MNS0470X10DB	47.9	65.9	68.9	118.9	118	0.9	5
4.7	20	□	MNS0470X20DB	94.9	115.9	118.9	168.9	168	0.9	5
4.7	30	□	MNS0470X30DB	141.9	165.9	168.9	218.9	218	0.9	5
4.8	5	●	MNS0480LB	24.9	55.9	55.9	105.9	105	0.9	5
4.8	10	□	MNS0480X10DB	48.9	65.9	68.9	118.9	118	0.9	5
4.8	20	□	MNS0480X20DB	96.9	115.9	118.9	168.9	168	0.9	5
4.8	30	□	MNS0480X30DB	144.9	165.9	168.9	218.9	218	0.9	5
4.9	5	●	MNS0490LB	25.4	55.9	55.9	105.9	105	0.9	5
4.9	10	●	MNS0490X10DB	49.9	65.9	68.9	118.9	118	0.9	5
4.9	20	●	MNS0490X20DB	98.9	115.9	118.9	168.9	168	0.9	5
4.9	30	●	MNS0490X30DB	147.9	165.9	168.9	218.9	218	0.9	5
5.0	5	●	MNS0500LB	25.9	44.9	44.9	100.9	100	0.9	6
5.0	10	●	MNS0500X10DB	50.9	65.9	68.9	118.9	118	0.9	5
5.0	20	●	MNS0500X20DB	100.9	115.9	118.9	168.9	168	0.9	5
5.0	30	●	MNS0500X30DB	150.9	165.9	168.9	218.9	218	0.9	5
5.1	5	●	MNS0510LB	26.4	44.9	44.9	100.9	100	0.9	6
5.1	10	●	MNS0510X10DB	51.9	72.9	75.9	127.9	127	0.9	6
5.1	20	●	MNS0510X20DB	102.9	127.9	130.9	182.9	182	0.9	6
5.1	30	●	MNS0510X30DB	153.9	182.9	185.9	237.9	237	0.9	6
5.2	5	●	MNS0520LB	26.9	44.9	44.9	100.9	100	0.9	6
5.2	10	□	MNS0520X10DB	52.9	72.9	75.9	127.9	127	0.9	6
5.2	20	□	MNS0520X20DB	104.9	127.9	130.9	182.9	182	0.9	6
5.2	30	□	MNS0520X30DB	156.9	182.9	185.9	237.9	237	0.9	6
5.3	5	●	MNS0530LB	27.5	45.0	45.0	101.0	100	1.0	6
5.3	10	□	MNS0530X10DB	54.0	73.0	76.0	128.0	127	1.0	6
5.3	20	□	MNS0530X20DB	107.0	128.0	131.0	183.0	182	1.0	6
5.3	30	□	MNS0530X30DB	160.0	183.0	186.0	238.0	237	1.0	6
5.4	5	●	MNS0540LB	28.0	45.0	45.0	101.0	100	1.0	6
5.4	10	□	MNS0540X10DB	55.0	73.0	76.0	128.0	127	1.0	6
5.4	20	□	MNS0540X20DB	109.0	128.0	131.0	183.0	182	1.0	6
5.4	30	□	MNS0540X30DB	163.0	183.0	186.0	238.0	237	1.0	6
5.5	5	●	MNS0550LB	28.5	45.0	45.0	101.0	100	1.0	6
5.5	10	●	MNS0550X10DB	56.0	73.0	76.0	128.0	127	1.0	6
5.5	20	●	MNS0550X20DB	111.0	128.0	131.0	183.0	182	1.0	6
5.5	30	●	MNS0550X30DB	166.0	183.0	186.0	238.0	237	1.0	6

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm)						
				LU	LCF	LH	OAL	LF	PL	DCON
5.6	5	●	MNS0560LB	29.0	49.0	49.0	101.0	100	1.0	6
5.6	10	□	MNS0560X10DB	57.0	79.0	82.0	134.0	133	1.0	6
5.6	20	□	MNS0560X20DB	113.0	139.0	142.0	194.0	193	1.0	6
5.6	30	□	MNS0560X30DB	169.0	199.0	202.0	254.0	253	1.0	6
5.7	5	●	MNS0570LB	29.5	49.0	49.0	101.0	100	1.0	6
5.7	10	□	MNS0570X10DB	58.0	79.0	82.0	134.0	133	1.0	6
5.7	20	□	MNS0570X20DB	115.0	139.0	142.0	194.0	193	1.0	6
5.7	30	□	MNS0570X30DB	172.0	199.0	202.0	254.0	253	1.0	6
5.8	5	●	MNS0580LB	30.1	49.1	49.1	101.1	100	1.1	6
5.8	10	□	MNS0580X10DB	59.1	79.1	82.1	134.1	133	1.1	6
5.8	20	□	MNS0580X20DB	117.1	139.1	142.1	194.1	193	1.1	6
5.8	30	□	MNS0580X30DB	175.1	199.1	202.1	254.1	253	1.1	6
5.9	5	●	MNS0590LB	30.6	49.1	49.1	101.1	100	1.1	6
5.9	10	□	MNS0590X10DB	60.1	79.1	82.1	134.1	133	1.1	6
5.9	20	□	MNS0590X20DB	119.1	139.1	142.1	194.1	193	1.1	6
5.9	30	□	MNS0590X30DB	178.1	199.1	202.1	254.1	253	1.1	6
6.0	5	●	MNS0600LB	31.1	49.1	49.1	101.1	100	1.1	6
6.0	10	●	MNS0600X10DB	61.1	79.1	82.1	134.1	133	1.1	6
6.0	20	●	MNS0600X20DB	121.1	139.1	142.1	194.1	193	1.1	6
6.0	30	●	MNS0600X30DB	181.1	199.1	202.1	254.1	253	1.1	6
6.1	5	●	MNS0610LB	31.6	53.1	53.1	110.1	109	1.1	7
6.1	10	●	MNS0610X10DB	62.1	86.1	89.1	142.1	141	1.1	7
6.1	20	●	MNS0610X20DB	123.1	151.1	154.1	207.1	206	1.1	7
6.1	30	●	MNS0610X30DB	184.1	216.1	219.1	272.1	271	1.1	7
6.2	5	●	MNS0620LB	32.1	53.1	53.1	110.1	109	1.1	7
6.2	10	□	MNS0620X10DB	63.1	86.1	89.1	142.1	141	1.1	7
6.2	20	□	MNS0620X20DB	125.1	151.1	154.1	207.1	206	1.1	7
6.2	30	□	MNS0620X30DB	187.1	216.1	219.1	272.1	271	1.1	7
6.3	5	●	MNS0630LB	32.6	53.1	53.1	110.1	109	1.1	7
6.3	10	□	MNS0630X10DB	64.1	86.1	89.1	142.1	141	1.1	7
6.3	20	□	MNS0630X20DB	127.1	151.1	154.1	207.1	206	1.1	7
6.3	30	□	MNS0630X30DB	190.1	216.1	219.1	272.1	271	1.1	7
6.4	5	●	MNS0640LB	33.2	53.2	53.2	110.2	109	1.2	7
6.4	10	□	MNS0640X10DB	65.2	86.2	89.2	142.2	141	1.2	7
6.4	20	□	MNS0640X20DB	129.2	151.2	154.2	207.2	206	1.2	7
6.4	30	□	MNS0640X30DB	193.2	216.2	219.2	272.2	271	1.2	7
6.5	5	●	MNS0650LB	33.7	53.2	53.2	110.2	109	1.2	7
6.5	10	●	MNS0650X10DB	66.2	86.2	89.2	142.2	141	1.2	7
6.5	20	●	MNS0650X20DB	131.2	151.2	154.2	207.2	206	1.2	7
6.5	30	●	MNS0650X30DB	196.2	216.2	219.2	272.2	271	1.2	7
6.6	5	●	MNS0660LB	34.2	57.2	57.2	110.2	109	1.2	7
6.6	10	□	MNS0660X10DB	67.2	92.2	95.2	148.2	147	1.2	7
6.6	20	□	MNS0660X20DB	133.2	162.2	165.2	218.2	217	1.2	7
6.6	30	□	MNS0660X30DB	199.2	232.2	235.2	288.2	287	1.2	7
6.7	5	●	MNS0670LB	34.7	57.2	57.2	110.2	109	1.2	7
6.7	10	●	MNS0670X10DB	68.2	92.2	95.2	148.2	147	1.2	7
6.7	20	●	MNS0670X20DB	135.2	162.2	165.2	218.2	217	1.2	7
6.7	30	●	MNS0670X30DB	202.2	232.2	235.2	288.2	287	1.2	7

MNS

WSTAR DRILLS

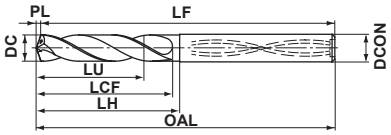
DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
6.8	5	●	MNS0680LB	35.2	57.2	57.2	110.2	109	1.2	7
6.8	10	□	MNS0680X10DB	69.2	92.2	95.2	148.2	147	1.2	7
6.8	20	□	MNS0680X20DB	137.2	162.2	165.2	218.2	217	1.2	7
6.8	30	□	MNS0680X30DB	205.2	232.2	235.2	288.2	287	1.2	7
6.9	5	●	MNS0690LB	35.8	57.3	57.3	110.3	109	1.3	7
6.9	10	□	MNS0690X10DB	70.3	92.3	95.3	148.3	147	1.3	7
6.9	20	□	MNS0690X20DB	139.3	162.3	165.3	218.3	217	1.3	7
6.9	30	□	MNS0690X30DB	208.3	232.3	235.3	288.3	287	1.3	7
7.0	5	●	MNS0700LB	36.3	57.3	57.3	110.3	109	1.3	7
7.0	10	●	MNS0700X10DB	71.3	92.3	95.3	148.3	147	1.3	7
7.0	20	●	MNS0700X20DB	141.3	162.3	165.3	218.3	217	1.3	7
7.0	30	●	MNS0700X30DB	211.3	232.3	235.3	288.3	287	1.3	7
7.1	5	●	MNS0710LB	36.8	61.3	65.3	119.3	118	1.3	8
7.1	10	□	MNS0710X10DB	72.3	99.3	102.3	156.3	155	1.3	8
7.1	20	□	MNS0710X20DB	143.3	174.3	177.3	231.3	230	1.3	8
7.1	30	□	MNS0710X30DB	214.3	249.3	252.3	306.3	305	1.3	8
7.2	5	●	MNS0720LB	37.3	61.3	65.3	119.3	118	1.3	8
7.2	10	●	MNS0720X10DB	73.3	99.3	102.3	156.3	155	1.3	8
7.2	20	●	MNS0720X20DB	145.3	174.3	177.3	231.3	230	1.3	8
7.2	30	●	MNS0720X30DB	217.3	249.3	252.3	306.3	305	1.3	8
7.3	5	●	MNS0730LB	37.8	61.3	65.3	119.3	118	1.3	8
7.3	10	□	MNS0730X10DB	74.3	99.3	102.3	156.3	155	1.3	8
7.3	20	□	MNS0730X20DB	147.3	174.3	177.3	231.3	230	1.3	8
7.3	30	□	MNS0730X30DB	220.3	249.3	252.3	306.3	305	1.3	8
7.4	5	●	MNS0740LB	38.3	61.3	65.3	119.3	118	1.3	8
7.4	10	□	MNS0740X10DB	75.3	99.3	102.3	156.3	155	1.3	8
7.4	20	□	MNS0740X20DB	149.3	174.3	177.3	231.3	230	1.3	8
7.4	30	□	MNS0740X30DB	223.3	249.3	252.3	306.3	305	1.3	8
7.5	5	●	MNS0750LB	38.9	61.4	65.4	119.4	118	1.4	8
7.5	10	□	MNS0750X10DB	76.4	99.4	102.4	156.4	155	1.4	8
7.5	20	□	MNS0750X20DB	151.4	174.4	177.4	231.4	230	1.4	8
7.5	30	□	MNS0750X30DB	226.4	249.4	252.4	306.4	305	1.4	8
7.6	5	●	MNS0760LB	39.4	65.4	65.4	119.4	118	1.4	8
7.6	10	□	MNS0760X10DB	77.4	105.4	108.4	162.4	161	1.4	8
7.6	20	□	MNS0760X20DB	153.4	185.4	188.4	242.4	241	1.4	8
7.6	30	□	MNS0760X30DB	229.4	265.4	268.4	322.4	321	1.4	8
7.7	5	●	MNS0770LB	39.9	65.4	65.4	119.4	118	1.4	8
7.7	10	□	MNS0770X10DB	78.4	105.4	108.4	162.4	161	1.4	8
7.7	20	□	MNS0770X20DB	155.4	185.4	188.4	242.4	241	1.4	8
7.7	30	□	MNS0770X30DB	232.4	265.4	268.4	322.4	321	1.4	8
7.8	5	●	MNS0780LB	40.4	65.4	65.4	119.4	118	1.4	8
7.8	10	●	MNS0780X10DB	79.4	105.4	108.4	162.4	161	1.4	8
7.8	20	●	MNS0780X20DB	157.4	185.4	188.4	242.4	241	1.4	8
7.8	30	●	MNS0780X30DB	235.4	265.4	268.4	322.4	321	1.4	8
7.9	5	●	MNS0790LB	40.9	65.4	65.4	119.4	118	1.4	8
7.9	10	□	MNS0790X10DB	80.4	105.4	108.4	162.4	161	1.4	8
7.9	20	□	MNS0790X20DB	159.4	185.4	188.4	242.4	241	1.4	8
7.9	30	□	MNS0790X30DB	238.4	265.4	268.4	322.4	321	1.4	8

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
8.0	5	●	MNS0800LB	41.5	65.5	65.5	119.5	118	1.5	8
8.0	10	●	MNS0800X10DB	81.5	105.5	108.5	162.5	161	1.5	8
8.0	20	●	MNS0800X20DB	161.5	185.5	188.5	242.5	241	1.5	8
8.0	30	●	MNS0800X30DB	241.5	265.5	268.5	322.5	321	1.5	8
8.1	5	●	MNS0810LB	42.0	69.5	73.5	128.5	127	1.5	9
8.1	10	□	MNS0810X10DB	82.5	112.5	115.5	170.5	169	1.5	9
8.1	20	□	MNS0810X20DB	163.5	197.5	200.5	255.5	254	1.5	9
8.1	30	□	MNS0810X30DB	244.5	282.5	285.5	340.5	339	1.5	9
8.2	5	●	MNS0820LB	42.5	69.5	73.5	128.5	127	1.5	9
8.2	10	□	MNS0820X10DB	83.5	112.5	115.5	170.5	169	1.5	9
8.2	20	□	MNS0820X20DB	165.5	197.5	200.5	255.5	254	1.5	9
8.2	30	□	MNS0820X30DB	247.5	282.5	285.5	340.5	339	1.5	9
8.3	5	●	MNS0830LB	43.0	69.5	73.5	128.5	127	1.5	9
8.3	10	□	MNS0830X10DB	84.5	112.5	115.5	170.5	169	1.5	9
8.3	20	□	MNS0830X20DB	167.5	197.5	200.5	255.5	254	1.5	9
8.3	30	□	MNS0830X30DB	250.5	282.5	285.5	340.5	339	1.5	9
8.4	5	●	MNS0840LB	43.5	69.5	73.5	128.5	127	1.5	9
8.4	10	□	MNS0840X10DB	85.5	112.5	115.5	170.5	169	1.5	9
8.4	20	□	MNS0840X20DB	169.5	197.5	200.5	255.5	254	1.5	9
8.4	30	□	MNS0840X30DB	253.5	282.5	285.5	340.5	339	1.5	9
8.5	5	●	MNS0850LB	44.0	69.5	73.5	128.5	127	1.5	9
8.5	10	□	MNS0850X10DB	86.5	112.5	115.5	170.5	169	1.5	9
8.5	20	□	MNS0850X20DB	171.5	197.5	200.5	255.5	254	1.5	9
8.5	30	□	MNS0850X30DB	256.5	282.5	285.5	340.5	339	1.5	9
8.6	5	●	MNS0860LB	44.6	73.6	73.6	128.6	127	1.6	9
8.6	10	□	MNS0860X10DB	87.6	118.6	121.6	176.6	175	1.6	9
8.6	20	□	MNS0860X20DB	173.6	208.6	211.6	266.6	265	1.6	9
8.6	30	□	MNS0860X30DB	259.6	298.6	301.6	356.6	355	1.6	9
8.7	5	●	MNS0870LB	45.1	73.6	73.6	128.6	127	1.6	9
8.7	10	□	MNS0870X10DB	88.6	118.6	121.6	176.6	175	1.6	9
8.7	20	□	MNS0870X20DB	175.6	208.6	211.6	266.6	265	1.6	9
8.7	30	□	MNS0870X30DB	262.6	298.6	301.6	356.6	355	1.6	9
8.8	5	●	MNS0880LB	45.6	73.6	73.6	128.6	127	1.6	9
8.8	10	□	MNS0880X10DB	89.6	118.6	121.6	176.6	175	1.6	9
8.8	20	□	MNS0880X20DB	177.6	208.6	211.6	266.6	265	1.6	9
8.8	30	□	MNS0880X30DB	265.6	298.6	301.6	356.6	355	1.6	9
8.9	5	●	MNS0890LB	46.1	73.6	73.6	128.6	127	1.6	9
8.9	10	□	MNS0890X10DB	90.6	118.6	121.6	176.6	175	1.6	9
8.9	20	□	MNS0890X20DB	179.6	208.6	211.6	266.6	265	1.6	9
8.9	30	□	MNS0890X30DB	268.6	298.6	301.6	356.6	355	1.6	9
9.0	5	●	MNS0900LB	46.6	73.6	73.6	128.6	127	1.6	9
9.0	10	●	MNS0900X10DB	91.6	118.6	121.6	176.6	175	1.6	9
9.0	20	●	MNS0900X20DB	181.6	208.6	211.6	266.6	265	1.6	9
9.0	30	●	MNS0900X30DB	271.6	298.6	301.6	356.6	355	1.6	9
9.1	5	●	MNS0910LB	47.2	77.7	81.7	137.7	136	1.7	10
9.1	10	□	MNS0910X10DB	92.7	125.7	128.7	183.7	182	1.7	10
9.1	20	□	MNS0910X20DB	183.7	220.7	223.7	278.7	277	1.7	10
9.1	30	□	MNS0910X30DB	274.7	315.7	318.7	373.7	372	1.7	10

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
9.2	5	●	MNS0920LB	47.7	77.7	81.7	137.7	136	1.7	10
9.2	10	□	MNS0920X10DB	93.7	125.7	128.7	183.7	182	1.7	10
9.2	20	□	MNS0920X20DB	185.7	220.7	223.7	278.7	277	1.7	10
9.2	30	□	MNS0920X30DB	277.7	315.7	318.7	373.7	372	1.7	10
9.3	5	●	MNS0930LB	48.2	77.7	81.7	137.7	136	1.7	10
9.3	10	□	MNS0930X10DB	94.7	125.7	128.7	183.7	182	1.7	10
9.3	20	□	MNS0930X20DB	187.7	220.7	223.7	278.7	277	1.7	10
9.3	30	□	MNS0930X30DB	280.7	315.7	318.7	373.7	372	1.7	10
9.4	5	●	MNS0940LB	48.7	77.7	81.7	137.7	136	1.7	10
9.4	10	□	MNS0940X10DB	95.7	125.7	128.7	183.7	182	1.7	10
9.4	20	□	MNS0940X20DB	189.7	220.7	223.7	278.7	277	1.7	10
9.4	30	□	MNS0940X30DB	283.7	315.7	318.7	373.7	372	1.7	10
9.5	5	●	MNS0950LB	49.2	77.7	81.7	137.7	136	1.7	10
9.5	10	□	MNS0950X10DB	96.7	125.7	128.7	183.7	182	1.7	10
9.5	20	□	MNS0950X20DB	191.7	220.7	223.7	278.7	277	1.7	10
9.5	30	□	MNS0950X30DB	286.7	315.7	318.7	373.7	372	1.7	10
9.6	5	●	MNS0960LB	49.7	81.7	81.7	137.7	136	1.7	10
9.6	10	□	MNS0960X10DB	97.7	131.7	134.7	189.7	188	1.7	10
9.6	20	□	MNS0960X20DB	193.7	231.7	234.7	289.7	288	1.7	10
9.6	30	□	MNS0960X30DB	289.7	331.7	334.7	389.7	388	1.7	10
9.7	5	●	MNS0970LB	50.3	81.8	81.8	137.8	136	1.8	10
9.7	10	□	MNS0970X10DB	98.8	131.8	134.8	189.8	188	1.8	10
9.7	20	□	MNS0970X20DB	195.8	231.8	234.8	289.8	288	1.8	10
9.7	30	□	MNS0970X30DB	292.8	331.8	334.8	389.8	388	1.8	10
9.8	5	●	MNS0980LB	50.8	81.8	81.8	137.8	136	1.8	10
9.8	10	●	MNS0980X10DB	99.8	131.8	134.8	189.8	188	1.8	10
9.8	20	●	MNS0980X20DB	197.8	231.8	234.8	289.8	288	1.8	10
9.8	30	●	MNS0980X30DB	295.8	331.8	334.8	389.8	388	1.8	10
9.9	5	●	MNS0990LB	51.3	81.8	81.8	137.8	136	1.8	10
9.9	10	□	MNS0990X10DB	100.8	131.8	134.8	189.8	188	1.8	10
9.9	20	□	MNS0990X20DB	199.8	231.8	234.8	289.8	288	1.8	10
9.9	30	□	MNS0990X30DB	298.8	331.8	334.8	389.8	388	1.8	10
10.0	5	●	MNS1000LB	51.8	81.8	81.8	137.8	136	1.8	10
10.0	10	●	MNS1000X10DB	101.8	131.8	134.8	189.8	188	1.8	10
10.0	20	●	MNS1000X20DB	201.8	231.8	234.8	289.8	288	1.8	10
10.0	30	●	MNS1000X30DB	301.8	331.8	334.8	389.8	388	1.8	10
10.1	5	●	MNS1010LB	52.3	85.8	89.8	150.8	149	1.8	11
10.1	10	□	MNS1010X10DB	102.8	138.8	141.8	202.8	201	1.8	11
10.1	20	□	MNS1010X20DB	203.8	243.8	246.8	307.8	306	1.8	11
10.2	5	●	MNS1020LB	52.9	85.9	89.9	150.9	149	1.9	11
10.2	10	□	MNS1020X10DB	103.9	138.9	141.9	202.9	201	1.9	11
10.2	20	□	MNS1020X20DB	205.9	243.9	246.9	307.9	306	1.9	11
10.3	5	●	MNS1030LB	53.4	85.9	89.9	150.9	149	1.9	11
10.3	10	□	MNS1030X10DB	104.9	138.9	141.9	202.9	201	1.9	11
10.3	20	□	MNS1030X20DB	207.9	243.9	246.9	307.9	306	1.9	11
10.4	5	●	MNS1040LB	53.9	85.9	89.9	150.9	149	1.9	11
10.4	10	□	MNS1040X10DB	105.9	138.9	141.9	202.9	201	1.9	11
10.4	20	□	MNS1040X20DB	209.9	243.9	246.9	307.9	306	1.9	11

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
10.5	5	●	MNS1050LB	54.4	85.9	89.9	150.9	149	1.9	11
10.5	10	●	MNS1050X10DB	106.9	138.9	141.9	202.9	201	1.9	11
10.5	20	●	MNS1050X20DB	211.9	243.9	246.9	307.9	306	1.9	11
10.6	5	●	MNS1060LB	54.9	89.9	89.9	150.9	149	1.9	11
10.6	10	□	MNS1060X10DB	107.9	144.9	147.9	208.9	207	1.9	11
10.6	20	□	MNS1060X20DB	213.9	254.9	257.9	318.9	317	1.9	11
10.7	5	●	MNS1070LB	55.4	89.9	89.9	150.9	149	1.9	11
10.7	10	□	MNS1070X10DB	108.9	144.9	147.9	208.9	207	1.9	11
10.7	20	□	MNS1070X20DB	215.9	254.9	257.9	318.9	317	1.9	11
10.8	5	●	MNS1080LB	56.0	90.0	90.0	151.0	149	2.0	11
10.8	10	□	MNS1080X10DB	110.0	145.0	148.0	209.0	207	2.0	11
10.8	20	□	MNS1080X20DB	218.0	255.0	258.0	319.0	317	2.0	11
10.9	5	●	MNS1090LB	56.5	90.0	90.0	151.0	149	2.0	11
10.9	10	□	MNS1090X10DB	111.0	145.0	148.0	209.0	207	2.0	11
10.9	20	□	MNS1090X20DB	220.0	255.0	258.0	319.0	317	2.0	11
11.0	5	●	MNS1100LB	57.0	90.0	90.0	151.0	149	2.0	11
11.0	10	●	MNS1100X10DB	112.0	145.0	148.0	209.0	207	2.0	11
11.0	20	●	MNS1100X20DB	222.0	255.0	258.0	319.0	317	2.0	11
11.1	5	●	MNS1110LB	57.5	94.0	98.0	160.0	158	2.0	12
11.1	10	□	MNS1110X10DB	113.0	152.0	155.0	217.0	215	2.0	12
11.1	20	□	MNS1110X20DB	224.0	267.0	270.0	332.0	330	2.0	12
11.2	5	●	MNS1120LB	58.0	94.0	98.0	160.0	158	2.0	12
11.2	10	□	MNS1120X10DB	114.0	152.0	155.0	217.0	215	2.0	12
11.2	20	□	MNS1120X20DB	226.0	267.0	270.0	332.0	330	2.0	12
11.3	5	●	MNS1130LB	58.6	94.1	98.1	160.1	158	2.1	12
11.3	10	□	MNS1130X10DB	115.1	152.1	155.1	217.1	215	2.1	12
11.3	20	□	MNS1130X20DB	228.1	267.1	270.1	332.1	330	2.1	12
11.4	5	●	MNS1140LB	59.1	94.1	98.1	160.1	158	2.1	12
11.4	10	□	MNS1140X10DB	116.1	152.1	155.1	217.1	215	2.1	12
11.4	20	□	MNS1140X20DB	230.1	267.1	270.1	332.1	330	2.1	12
11.5	5	●	MNS1150LB	59.6	94.1	98.1	160.1	158	2.1	12
11.5	10	□	MNS1150X10DB	117.1	152.1	155.1	217.1	215	2.1	12
11.5	20	□	MNS1150X20DB	232.1	267.1	270.1	332.1	330	2.1	12
11.6	5	●	MNS1160LB	60.1	98.1	98.1	160.1	158	2.1	12
11.6	10	□	MNS1160X10DB	118.1	158.1	161.1	223.1	221	2.1	12
11.6	20	□	MNS1160X20DB	234.1	278.1	281.1	343.1	341	2.1	12
11.7	5	●	MNS1170LB	60.6	98.1	98.1	160.1	158	2.1	12
11.7	10	□	MNS1170X10DB	119.1	158.1	161.1	223.1	221	2.1	12
11.7	20	□	MNS1170X20DB	236.1	278.1	281.1	343.1	341	2.1	12
11.8	5	●	MNS1180LB	61.1	98.1	98.1	160.1	158	2.1	12
11.8	10	□	MNS1180X10DB	120.1	158.1	161.1	223.1	221	2.1	12
11.8	20	□	MNS1180X20DB	238.1	278.1	281.1	343.1	341	2.1	12
11.9	5	●	MNS1190LB	61.7	98.2	98.2	160.2	158	2.2	12
11.9	10	□	MNS1190X10DB	121.2	158.2	161.2	223.2	221	2.2	12
11.9	20	□	MNS1190X20DB	240.2	278.2	281.2	343.2	341	2.2	12
12.0	5	●	MNS1200LB	62.2	98.2	98.2	160.2	158	2.2	12
12.0	10	●	MNS1200X10DB	122.2	158.2	161.2	223.2	221	2.2	12
12.0	20	●	MNS1200X20DB	242.2	278.2	281.2	343.2	341	2.2	12

MNS

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
12.1	5	●	MNS1210LB	62.7	102.2	106.2	169.2	167	2.2	13
12.1	10	□	MNS1210X10DB	123.2	165.2	168.2	231.2	229	2.2	13
12.1	20	□	MNS1210X20DB	244.2	290.2	293.2	356.2	354	2.2	13
12.2	5	●	MNS1220LB	63.2	102.2	106.2	169.2	167	2.2	13
12.2	10	□	MNS1220X10DB	124.2	165.2	168.2	231.2	229	2.2	13
12.2	20	□	MNS1220X20DB	246.2	290.2	293.2	356.2	354	2.2	13
12.3	5	●	MNS1230LB	63.7	102.2	106.2	169.2	167	2.2	13
12.3	10	□	MNS1230X10DB	125.2	165.2	168.2	231.2	229	2.2	13
12.3	20	□	MNS1230X20DB	248.2	290.2	293.2	356.2	354	2.2	13
12.4	5	●	MNS1240LB	64.3	102.3	106.3	169.3	167	2.3	13
12.4	10	□	MNS1240X10DB	126.3	165.3	168.3	231.3	229	2.3	13
12.4	20	□	MNS1240X20DB	250.3	290.3	293.3	356.3	354	2.3	13
12.5	5	●	MNS1250LB	64.8	102.3	106.3	169.3	167	2.3	13
12.5	10	□	MNS1250X10DB	127.3	165.3	168.3	231.3	229	2.3	13
12.5	20	□	MNS1250X20DB	252.3	290.3	293.3	356.3	354	2.3	13
12.6	5	●	MNS1260LB	65.3	106.3	106.3	169.3	167	2.3	13
12.6	10	□	MNS1260X10DB	128.3	171.3	174.3	237.3	235	2.3	13
12.6	20	□	MNS1260X20DB	254.3	301.3	304.3	367.3	365	2.3	13
12.7	5	●	MNS1270LB	65.8	106.3	106.3	169.3	167	2.3	13
12.7	10	□	MNS1270X10DB	129.3	171.3	174.3	237.3	235	2.3	13
12.7	20	□	MNS1270X20DB	256.3	301.3	304.3	367.3	365	2.3	13
12.8	5	●	MNS1280LB	66.3	106.3	106.3	169.3	167	2.3	13
12.8	10	□	MNS1280X10DB	130.3	171.3	174.3	237.3	235	2.3	13
12.8	20	□	MNS1280X20DB	258.3	301.3	304.3	367.3	365	2.3	13
12.9	5	●	MNS1290LB	66.8	106.3	106.3	169.3	167	2.3	13
12.9	10	□	MNS1290X10DB	131.3	171.3	174.3	237.3	235	2.3	13
12.9	20	□	MNS1290X20DB	260.3	301.3	304.3	367.3	365	2.3	13
13.0	5	●	MNS1300LB	67.4	106.4	106.4	169.4	167	2.4	13
13.0	10	●	MNS1300X10DB	132.4	171.4	174.4	237.4	235	2.4	13
13.0	20	●	MNS1300X20DB	262.4	301.4	304.4	367.4	365	2.4	13

DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
13.1	5	●	MNS1310LB	67.9	110.4	114.4	178.4	176	2.4	14
13.1	10	□	MNS1310X10DB	133.4	178.4	181.4	245.4	243	2.4	14
13.1	20	□	MNS1310X20DB	264.4	313.4	316.4	380.4	378	2.4	14
13.2	5	●	MNS1320LB	68.4	110.4	114.4	178.4	176	2.4	14
13.2	10	□	MNS1320X10DB	134.4	178.4	181.4	245.4	243	2.4	14
13.2	20	□	MNS1320X20DB	266.4	313.4	316.4	380.4	378	2.4	14
13.3	5	●	MNS1330LB	68.9	110.4	114.4	178.4	176	2.4	14
13.3	10	□	MNS1330X10DB	135.4	178.4	181.4	245.4	243	2.4	14
13.3	20	□	MNS1330X20DB	268.4	313.4	316.4	380.4	378	2.4	14
13.4	5	●	MNS1340LB	69.4	110.4	114.4	178.4	176	2.4	14
13.4	10	□	MNS1340X10DB	136.4	178.4	181.4	245.4	243	2.4	14
13.4	20	□	MNS1340X20DB	270.4	313.4	316.4	380.4	378	2.4	14
13.5	5	●	MNS1350LB	70.0	110.5	114.5	178.5	176	2.5	14
13.5	10	□	MNS1350X10DB	137.5	178.5	181.5	245.5	243	2.5	14
13.5	20	□	MNS1350X20DB	272.5	313.5	316.5	380.5	378	2.5	14
13.6	5	●	MNS1360LB	70.5	114.5	114.5	178.5	176	2.5	14
13.6	10	□	MNS1360X10DB	138.5	184.5	187.5	251.5	249	2.5	14
13.6	20	□	MNS1360X20DB	274.5	324.5	327.5	391.5	389	2.5	14
13.7	5	●	MNS1370LB	71.0	114.5	114.5	178.5	176	2.5	14
13.7	10	□	MNS1370X10DB	139.5	184.5	187.5	251.5	249	2.5	14
13.7	20	□	MNS1370X20DB	276.5	324.5	327.5	391.5	389	2.5	14
13.8	5	●	MNS1380LB	71.5	114.5	114.5	178.5	176	2.5	14
13.8	10	□	MNS1380X10DB	140.5	184.5	187.5	251.5	249	2.5	14
13.8	20	□	MNS1380X20DB	278.5	324.5	327.5	391.5	389	2.5	14
13.9	5	●	MNS1390LB	72.0	114.5	114.5	178.5	176	2.5	14
13.9	10	□	MNS1390X10DB	141.5	184.5	187.5	251.5	249	2.5	14
13.9	20	□	MNS1390X20DB	280.5	324.5	327.5	391.5	389	2.5	14
14.0	5	●	MNS1400LB	72.5	114.5	114.5	178.5	176	2.5	14
14.0	10	●	MNS1400X10DB	142.5	184.5	187.5	251.5	249	2.5	14
14.0	20	●	MNS1400X20DB	282.5	324.5	327.5	391.5	389	2.5	14

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

ISO13399 ➢ N002

RECOMMENDED CUTTING CONDITIONS

■ LB Type Drill

Workpiece Material	Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc		Aluminium Alloys (5%≤Si≤10%) ASTM 333.0 etc		Aluminium Alloys (Si>10%) ASTM 383.0, ASTM A390.0 etc	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)
3.2	11900	0.1 (0.11—0.16)	11900	0.15 (0.16—0.21)	11900	0.15 (0.16—0.21)
4.0	9500	0.15 (0.13—0.20)	9500	0.2 (0.20—0.27)	9500	0.2 (0.20—0.27)
5.0	7600	0.2 (0.17—0.25)	7600	0.25 (0.25—0.33)	7600	0.25 (0.25—0.33)
6.3	7500	0.25 (0.21—0.32)	7500	0.35 (0.32—0.42)	7500	0.35 (0.32—0.42)
8.0	5900	0.3 (0.27—0.40)	5900	0.45 (0.40—0.53)	5900	0.45 (0.40—0.53)
10.0	4700	0.4 (0.33—0.50)	4700	0.55 (0.50—0.67)	4700	0.55 (0.50—0.67)
12.0	5300	0.5 (0.40—0.60)	5300	0.7 (0.60—0.80)	5300	0.7 (0.60—0.80)
14.0	4500	0.5 (0.40—0.60)	4500	0.7 (0.60—0.80)	4500	0.7 (0.60—0.80)

Note 1) When using a product with a length of L / D 10 or greater, please drill a pilot hole first. (Centrifugal force may cause the tool to swing and break.)
Note 2) Use MNS...LB or MAE...MB, MAS...MB (N104, N108 pages) when drilling pilot holes.

■ DB Type Drill

Workpiece Material	Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc		Aluminium Alloys (5%≤Si≤10%) ASTM 333.0 etc		Aluminium Alloys (Si>10%) ASTM 383.0, ASTM A390.0 etc	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)
3.2	8900	0.1 (0.11—0.16)	8900	0.15 (0.16—0.21)	8900	0.15 (0.16—0.21)
4.0	7100	0.15 (0.13—0.20)	7100	0.2 (0.20—0.27)	7100	0.2 (0.20—0.27)
5.0	5700	0.2 (0.17—0.25)	5700	0.25 (0.25—0.33)	5700	0.25 (0.25—0.33)
6.3	6000	0.25 (0.21—0.32)	6000	0.35 (0.32—0.42)	6000	0.35 (0.32—0.42)
8.0	4700	0.3 (0.27—0.40)	4700	0.45 (0.40—0.53)	4700	0.45 (0.40—0.53)
10.0	3800	0.4 (0.33—0.50)	3800	0.55 (0.50—0.67)	3800	0.55 (0.50—0.67)
12.0	4200	0.5 (0.40—0.60)	4200	0.7 (0.60—0.80)	4200	0.7 (0.60—0.80)
14.0	3600	0.5 (0.40—0.60)	3600	0.7 (0.60—0.80)	3600	0.7 (0.60—0.80)

Note 1) When using a product with a length of L / D 10 or greater, please drill a pilot hole first. (Centrifugal force may cause the tool to swing and break.)
Note 2) Use MNS...LB or MAE...MB, MAS...MB (N104, N108 pages) when drilling pilot holes.

DRILLING(SOLID CARBIDE)

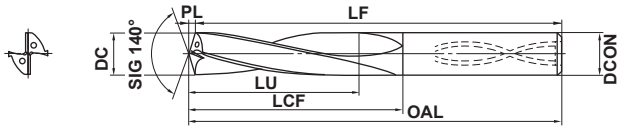
MAS

- Specially for aluminium and cast iron drilling.
- High hole accuracy.
- Can be used for pre-hole drilling for roll tap.
- Helical through coolant hole enables high-speed machining.

P | M | **K** Cast Iron | **N** Non-ferrous Metal | S | H

Internal Coolant





DC=3	3<DC≤6	6<DC≤10	10<DC≤16
+0.005 0	+0.005 0	+0.005 0	+0.005 0
DCON=3	**3<DCON≤6**	**6<DCON≤10**	**10<DCON≤16**
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MAS type bigger thanϕ5.0 have a recess in the end face.
Note 2) MAS drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
3.0	3	□	MAS0300MB	9.5	21.5	61.5	61	0.5	3
3.0	6	●	MAS0300LB	18.5	30.5	70.5	70	0.5	3
3.1	3	□	MAS0310MB	9.9	24.6	64.6	64	0.6	4
3.1	6	●	MAS0310LB	19.2	34.6	74.6	74	0.6	4
3.2	3	□	MAS0320MB	10.2	24.6	64.6	64	0.6	4
3.2	6	●	MAS0320LB	19.8	34.6	74.6	74	0.6	4
3.3	3	□	MAS0330MB	10.5	24.6	64.6	64	0.6	4
3.3	6	●	MAS0330LB	20.4	34.6	74.6	74	0.6	4
3.4	3	□	MAS0340MB	10.8	24.6	64.6	64	0.6	4
3.4	6	●	MAS0340LB	21.0	34.6	74.6	74	0.6	4
3.5	3	□	MAS0350MB	11.1	24.6	64.6	64	0.6	4
3.5	6	●	MAS0350LB	21.6	34.6	74.6	74	0.6	4
3.6	3	□	MAS0360MB	11.5	28.7	68.7	68	0.7	4
3.6	6	●	MAS0360LB	22.3	40.7	80.7	80	0.7	4
3.65	3	□	* MAS0365MB	11.7	28.7	68.7	68	0.7	4
3.65	6	●	* MAS0365LB	22.6	40.7	80.7	80	0.7	4
3.7	3	□	MAS0370MB	11.8	28.7	68.7	68	0.7	4
3.7	6	●	MAS0370LB	22.9	40.7	80.7	80	0.7	4
3.8	3	□	MAS0380MB	12.1	28.7	68.7	68	0.7	4
3.8	6	●	MAS0380LB	23.5	40.7	80.7	80	0.7	4
3.9	3	□	MAS0390MB	12.4	28.7	68.7	68	0.7	4
3.9	6	●	MAS0390LB	24.1	40.7	80.7	80	0.7	4
4.0	3	□	MAS0400MB	12.7	28.7	68.7	68	0.7	4
4.0	6	●	MAS0400LB	24.7	40.7	80.7	80	0.7	4
4.1	3	□	MAS0410MB	13.0	31.7	71.7	71	0.7	5
4.1	6	●	MAS0410LB	25.3	44.7	84.7	84	0.7	5
4.2	3	□	MAS0420MB	13.4	31.8	71.8	71	0.8	5
4.2	6	●	MAS0420LB	26.0	44.8	84.8	84	0.8	5
4.3	3	□	MAS0430MB	13.7	31.8	71.8	71	0.8	5
4.3	6	●	MAS0430LB	26.6	44.8	84.8	84	0.8	5

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
4.4	3	□	MAS0440MB	14.0	31.8	71.8	71	0.8	5
4.4	6	●	MAS0440LB	27.2	44.8	84.8	84	0.8	5
4.5	3	□	* MAS0450MB	14.3	31.8	71.8	71	0.8	5
4.5	6	●	* MAS0450LB	27.8	44.8	84.8	84	0.8	5
4.6	3	□	MAS0460MB	14.6	33.8	73.8	73	0.8	5
4.6	6	●	MAS0460LB	28.4	48.8	88.8	88	0.8	5
4.7	3	□	MAS0470MB	15.0	33.9	73.9	73	0.9	5
4.7	6	●	MAS0470LB	29.1	48.9	88.9	88	0.9	5
4.8	3	□	MAS0480MB	15.3	33.9	73.9	73	0.9	5
4.8	6	●	MAS0480LB	29.7	48.9	88.9	88	0.9	5
4.9	3	□	MAS0490MB	15.6	33.9	73.9	73	0.9	5
4.9	6	●	MAS0490LB	30.3	48.9	88.9	88	0.9	5
5.0	3	●	MAS0500MB	15.9	33.9	73.9	73	0.9	5
5.0	6	●	MAS0500LB	30.9	48.9	88.9	88	0.9	5
5.1	3	□	MAS0510MB	16.2	36.9	76.9	76	0.9	6
5.1	6	●	MAS0510LB	31.5	52.9	92.9	92	0.9	6
5.2	3	□	MAS0520MB	16.5	36.9	76.9	76	0.9	6
5.2	6	●	MAS0520LB	32.1	52.9	92.9	92	0.9	6
5.3	3	□	MAS0530MB	16.9	37.0	77.0	76	1.0	6
5.3	6	●	MAS0530LB	32.8	53.0	93.0	92	1.0	6
5.4	3	□	* MAS0540MB	17.2	37.0	77.0	76	1.0	6
5.4	6	●	* MAS0540LB	33.4	53.0	93.0	92	1.0	6
5.5	3	●	MAS0550MB	17.5	37.0	77.0	76	1.0	6
5.5	6	●	MAS0550LB	34.0	53.0	93.0	92	1.0	6
5.6	3	□	MAS0560MB	17.8	40.0	80.0	79	1.0	6
5.6	6	●	MAS0560LB	34.6	58.0	98.0	97	1.0	6
5.7	3	□	MAS0570MB	18.1	40.0	80.0	79	1.0	6
5.7	6	●	MAS0570LB	35.2	58.0	98.0	97	1.0	6
5.8	3	□	MAS0580MB	18.5	40.1	80.1	79	1.1	6
5.8	6	●	MAS0580LB	35.9	58.1	98.1	97	1.1	6

* mark signifies the pilot hole of the roll tap.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
5.9	3	□	MAS0590MB	18.8	40.1	80.1	79	1.1	6
5.9	6	●	MAS0590LB	36.5	58.1	98.1	97	1.1	6
6.0	3	●	MAS0600MB	19.1	40.1	80.1	79	1.1	6
6.0	6	●	MAS0600LB	37.1	58.1	98.1	97	1.1	6
6.1	3	□	MAS0610MB	19.4	43.1	85.1	84	1.1	7
6.1	6	●	MAS0610LB	37.7	63.1	105.1	104	1.1	7
6.2	3	□	MAS0620MB	19.7	43.1	85.1	84	1.1	7
6.2	6	●	MAS0620LB	38.3	63.1	105.1	104	1.1	7
6.3	3	□	MAS0630MB	20.0	43.1	85.1	84	1.1	7
6.3	6	●	MAS0630LB	38.9	63.1	105.1	104	1.1	7
6.4	3	□	MAS0640MB	20.4	43.2	85.2	84	1.2	7
6.4	6	●	MAS0640LB	39.6	63.2	105.2	104	1.2	7
6.5	3	●	MAS0650MB	20.7	43.2	85.2	84	1.2	7
6.5	6	●	MAS0650LB	40.2	63.2	105.2	104	1.2	7
6.6	3	□	MAS0660MB	21.0	43.2	85.2	84	1.2	7
6.6	6	●	MAS0660LB	40.8	66.2	108.2	107	1.2	7
6.7	3	□	MAS0670MB	21.3	43.2	85.2	84	1.2	7
6.7	6	●	MAS0670LB	41.4	66.2	108.2	107	1.2	7
6.8	3	●	MAS0680MB	21.6	43.2	85.2	84	1.2	7
6.8	6	●	MAS0680LB	42.0	66.2	108.2	107	1.2	7
6.9	3	□	MAS0690MB	22.0	43.3	85.3	84	1.3	7
6.9	6	●	MAS0690LB	42.7	66.3	108.3	107	1.3	7
7.0	3	●	MAS0700MB	22.3	43.3	85.3	84	1.3	7
7.0	6	●	MAS0700LB	43.3	66.3	108.3	107	1.3	7
7.1	3	□	MAS0710MB	22.6	49.3	91.3	90	1.3	8
7.1	6	●	MAS0710LB	43.9	69.3	111.3	110	1.3	8
7.2	3	□	* MAS0720MB	22.9	49.3	91.3	90	1.3	8
7.2	6	●	* MAS0720LB	44.5	69.3	111.3	110	1.3	8
7.3	3	□	MAS0730MB	23.2	49.3	91.3	90	1.3	8
7.3	6	●	MAS0730LB	45.1	69.3	111.3	110	1.3	8
7.35	3	●	MAS0735MB	23.4	49.3	91.3	90	1.3	8
7.35	6	●	MAS0735LB	45.4	69.3	111.3	110	1.3	8
7.4	3	□	MAS0740MB	23.5	49.3	91.3	90	1.3	8
7.4	6	●	MAS0740LB	45.7	69.3	111.3	110	1.3	8
7.5	3	□	MAS0750MB	23.9	49.4	91.4	90	1.4	8
7.5	6	●	MAS0750LB	46.4	69.4	111.4	110	1.4	8
7.6	3	□	MAS0760MB	24.2	49.4	91.4	90	1.4	8
7.6	6	●	MAS0760LB	47.0	73.4	115.4	114	1.4	8
7.7	3	□	MAS0770MB	24.5	49.4	91.4	90	1.4	8
7.7	6	●	MAS0770LB	47.6	73.4	115.4	114	1.4	8
7.8	3	□	MAS0780MB	24.8	49.4	91.4	90	1.4	8
7.8	6	●	MAS0780LB	48.2	73.4	115.4	114	1.4	8
7.9	3	□	MAS0790MB	25.1	49.4	91.4	90	1.4	8
7.9	6	●	MAS0790LB	48.8	73.4	115.4	114	1.4	8
8.0	3	●	MAS0800MB	25.5	49.5	91.5	90	1.5	8
8.0	6	●	MAS0800LB	49.5	73.5	115.5	114	1.5	8
8.1	3	□	MAS0810MB	25.8	51.5	95.5	94	1.5	9
8.1	6	●	MAS0810LB	50.1	76.5	120.5	119	1.5	9
8.2	3	□	MAS0820MB	26.1	51.5	95.5	94	1.5	9
8.2	6	●	MAS0820LB	50.7	76.5	120.5	119	1.5	9

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
8.3	3	□	MAS0830MB	26.4	51.5	95.5	94	1.5	9
8.3	6	●	MAS0830LB	51.3	76.5	120.5	119	1.5	9
8.4	3	□	MAS0840MB	26.7	51.5	95.5	94	1.5	9
8.4	6	●	MAS0840LB	51.9	76.5	120.5	119	1.5	9
8.5	3	●	MAS0850MB	27.0	51.5	95.5	94	1.5	9
8.5	6	●	MAS0850LB	52.5	76.5	120.5	119	1.5	9
8.6	3	□	MAS0860MB	27.4	51.6	95.6	94	1.6	9
8.6	6	●	MAS0860LB	53.2	78.6	122.6	121	1.6	9
8.7	3	□	MAS0870MB	27.7	51.6	95.6	94	1.6	9
8.7	6	●	MAS0870LB	53.8	78.6	122.6	121	1.6	9
8.8	3	□	MAS0880MB	28.0	51.6	95.6	94	1.6	9
8.8	6	●	MAS0880LB	54.4	78.6	122.6	121	1.6	9
8.9	3	□	MAS0890MB	28.3	51.6	95.6	94	1.6	9
8.9	6	●	MAS0890LB	55.0	78.6	122.6	121	1.6	9
9.0	3	●	MAS0900MB	28.6	51.6	95.6	94	1.6	9
9.0	6	●	MAS0900LB	55.6	78.6	122.6	121	1.6	9
9.1	3	□	MAS0910MB	29.0	54.7	98.7	97	1.7	10
9.1	6	●	MAS0910LB	56.3	82.7	126.7	125	1.7	10
9.2	3	□	* MAS0920MB	29.3	54.7	98.7	97	1.7	10
9.2	6	●	* MAS0920LB	56.9	82.7	126.7	125	1.7	10
9.21	3	●	MAS0921MB	29.3	54.7	98.7	97	1.7	10
9.21	6	●	MAS0921LB	57.0	82.7	126.7	125	1.7	10
9.3	3	□	MAS0930MB	29.6	54.7	98.7	97	1.7	10
9.3	6	●	MAS0930LB	57.5	82.7	126.7	125	1.7	10
9.4	3	□	MAS0940MB	29.9	54.7	98.7	97	1.7	10
9.4	6	●	MAS0940LB	58.1	82.7	126.7	125	1.7	10
9.5	3	●	MAS0950MB	30.2	54.7	98.7	97	1.7	10
9.5	6	●	MAS0950LB	58.7	82.7	126.7	125	1.7	10
9.6	3	□	MAS0960MB	30.5	54.7	98.7	97	1.7	10
9.6	6	●	MAS0960LB	59.3	82.7	126.7	125	1.7	10
9.7	3	□	MAS0970MB	30.9	54.8	98.8	97	1.8	10
9.7	6	●	MAS0970LB	60.0	82.8	126.8	125	1.8	10
9.8	3	□	MAS0980MB	31.2	54.8	98.8	97	1.8	10
9.8	6	●	MAS0980LB	60.6	82.8	126.8	125	1.8	10
9.9	3	□	MAS0990MB	31.5	54.8	98.8	97	1.8	10
9.9	6	●	MAS0990LB	61.2	82.8	126.8	125	1.8	10
10.0	3	●	MAS1000MB	31.8	54.8	98.8	97	1.8	10
10.0	6	●	MAS1000LB	61.8	82.8	126.8	125	1.8	10
10.1	3	□	MAS1010MB	32.1	56.8	102.8	101	1.8	11
10.1	6	□	MAS1010LB	62.4	90.8	136.8	135	1.8	11
10.2	3	□	MAS1020MB	32.5	56.9	102.9	101	1.9	11
10.2	6	□	MAS1020LB	63.1	90.9	136.9	135	1.9	11
10.3	3	●	MAS1030MB	32.8	56.9	102.9	101	1.9	11
10.3	6	●	MAS1030LB	63.7	90.9	136.9	135	1.9	11
10.4	3	□	MAS1040MB	33.1	56.9	102.9	101	1.9	11
10.4	6	□	MAS1040LB	64.3	90.9	136.9	135	1.9	11
10.5	3	●	MAS1050MB	33.4	56.9	102.9	101	1.9	11
10.5	6	●	MAS1050LB	64.9	90.9	136.9	135	1.9	11
10.6	3	□	MAS1060MB	33.7	56.9	102.9	101	1.9	11
10.6	6	□	MAS1060LB	65.5	90.9	136.9	135	1.9	11

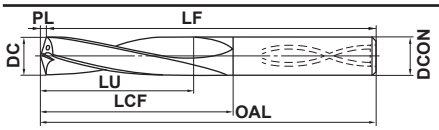
MAS

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
10.7	3	□	MAS1070MB	34.0	56.9	102.9	101	1.9	11
10.7	6	□	MAS1070LB	66.1	90.9	136.9	135	1.9	11
10.8	3	□	MAS1080MB	34.4	57.0	103.0	101	2.0	11
10.8	6	□	MAS1080LB	66.8	91.0	137.0	135	2.0	11
10.9	3	□	MAS1090MB	34.7	57.0	103.0	101	2.0	11
10.9	6	□	MAS1090LB	67.4	91.0	137.0	135	2.0	11
11.0	3	●	MAS1100MB	35.0	57.0	103.0	101	2.0	11
11.0	6	●	MAS1100LB	68.0	91.0	137.0	135	2.0	11
11.08	3	●	* MAS1108MB	35.2	62.0	108.0	106	2.0	12
11.08	6	●	* MAS1108LB	68.5	96.0	142.0	140	2.0	12
11.1	3	□	MAS1110MB	35.3	62.0	108.0	106	2.0	12
11.1	6	□	MAS1110LB	68.6	96.0	142.0	140	2.0	12
11.2	3	□	MAS1120MB	35.6	62.0	108.0	106	2.0	12
11.2	6	□	MAS1120LB	69.2	96.0	142.0	140	2.0	12
11.3	3	□	MAS1130MB	36.0	62.1	108.1	106	2.1	12
11.3	6	□	MAS1130LB	69.9	96.1	142.1	140	2.1	12
11.4	3	□	MAS1140MB	36.3	62.1	108.1	106	2.1	12
11.4	6	□	MAS1140LB	70.5	96.1	142.1	140	2.1	12
11.5	3	□	MAS1150MB	36.6	62.1	108.1	106	2.1	12
11.5	6	□	MAS1150LB	71.1	96.1	142.1	140	2.1	12
11.6	3	□	MAS1160MB	36.9	62.1	108.1	106	2.1	12
11.6	6	□	MAS1160LB	71.7	96.1	142.1	140	2.1	12
11.7	3	□	MAS1170MB	37.2	62.1	108.1	106	2.1	12
11.7	6	□	MAS1170LB	72.3	96.1	142.1	140	2.1	12
11.8	3	□	MAS1180MB	37.5	62.1	108.1	106	2.1	12
11.8	6	□	MAS1180LB	72.9	96.1	142.1	140	2.1	12
11.9	3	□	MAS1190MB	37.9	62.2	108.2	106	2.2	12
11.9	6	□	MAS1190LB	73.6	96.2	142.2	140	2.2	12
12.0	3	●	MAS1200MB	38.2	62.2	108.2	106	2.2	12
12.0	6	●	MAS1200LB	74.2	96.2	142.2	140	2.2	12
12.1	3	□	MAS1210MB	38.5	67.2	117.2	115	2.2	13
12.1	6	□	MAS1210LB	74.8	102.2	152.2	150	2.2	13
12.2	3	□	MAS1220MB	38.8	67.2	117.2	115	2.2	13
12.2	6	□	MAS1220LB	75.4	102.2	152.2	150	2.2	13
12.3	3	□	MAS1230MB	39.1	67.2	117.2	115	2.2	13
12.3	6	□	MAS1230LB	76.0	102.2	152.2	150	2.2	13
12.4	3	□	MAS1240MB	39.5	67.3	117.3	115	2.3	13
12.4	6	□	MAS1240LB	76.7	102.3	152.3	150	2.3	13
12.5	3	●	MAS1250MB	39.8	67.3	117.3	115	2.3	13
12.5	6	●	MAS1250LB	77.3	102.3	152.3	150	2.3	13
12.6	3	□	MAS1260MB	40.1	67.3	117.3	115	2.3	13
12.6	6	□	MAS1260LB	77.9	102.3	152.3	150	2.3	13
12.7	3	□	MAS1270MB	40.4	67.3	117.3	115	2.3	13
12.7	6	□	MAS1270LB	78.5	102.3	152.3	150	2.3	13
12.8	3	□	MAS1280MB	40.7	67.3	117.3	115	2.3	13
12.8	6	□	MAS1280LB	79.1	102.3	152.3	150	2.3	13
12.9	3	□	MAS1290MB	41.0	67.3	117.3	115	2.3	13
12.9	6	□	MAS1290LB	79.7	102.3	152.3	150	2.3	13
12.96	3	●	* MAS1296MB	41.3	67.4	117.4	115	2.4	13
12.96	6	●	* MAS1296LB	80.2	102.4	152.4	150	2.4	13
13.0	3	●	MAS1300MB	41.4	67.4	117.4	115	2.4	13
13.0	6	●	MAS1300LB	80.4	102.4	152.4	150	2.4	13
13.1	3	□	MAS1310MB	41.7	72.4	122.4	120	2.4	14
13.1	6	□	MAS1310LB	81.0	112.4	162.4	160	2.4	14
13.2	3	□	MAS1320MB	42.0	72.4	122.4	120	2.4	14
13.2	6	□	MAS1320LB	81.6	112.4	162.4	160	2.4	14
13.3	3	□	MAS1330MB	42.3	72.4	122.4	120	2.4	14
13.3	6	□	MAS1330LB	82.2	112.4	162.4	160	2.4	14
13.4	3	□	MAS1340MB	42.6	72.4	122.4	120	2.4	14
13.4	6	□	MAS1340LB	82.8	112.4	162.4	160	2.4	14
13.5	3	●	MAS1350MB	43.0	72.5	122.5	120	2.5	14
13.5	6	●	MAS1350LB	83.5	112.5	162.5	160	2.5	14
13.6	3	□	MAS1360MB	43.3	72.5	122.5	120	2.5	14
13.6	6	□	MAS1360LB	84.1	112.5	162.5	160	2.5	14
13.7	3	□	MAS1370MB	43.6	72.5	122.5	120	2.5	14
13.7	6	□	MAS1370LB	84.7	112.5	162.5	160	2.5	14
13.8	3	□	MAS1380MB	43.9	72.5	122.5	120	2.5	14
13.8	6	□	MAS1380LB	85.3	112.5	162.5	160	2.5	14
13.9	3	□	MAS1390MB	44.2	72.5	122.5	120	2.5	14
13.9	6	□	MAS1390LB	85.9	112.5	162.5	160	2.5	14
14.0	3	●	MAS1400MB	44.5	72.5	122.5	120	2.5	14
14.0	6	●	MAS1400LB	86.5	112.5	162.5	160	2.5	14
14.1	3	□	MAS1410MB	44.9	74.6	132.6	130	2.6	15
14.1	6	□	MAS1410LB	87.2	117.6	175.6	173	2.6	15
14.2	3	□	MAS1420MB	45.2	74.6	132.6	130	2.6	15
14.2	6	□	MAS1420LB	87.8	117.6	175.6	173	2.6	15
14.3	3	□	MAS1430MB	45.5	74.6	132.6	130	2.6	15
14.3	6	□	MAS1430LB	88.4	117.6	175.6	173	2.6	15
14.4	3	□	MAS1440MB	45.8	74.6	132.6	130	2.6	15
14.4	6	□	MAS1440LB	89.0	117.6	175.6	173	2.6	15
14.5	3	□	MAS1450MB	46.1	74.6	132.6	130	2.6	15
14.5	6	□	MAS1450LB	89.6	117.6	175.6	173	2.6	15
14.6	3	□	MAS1460MB	46.5	74.7	132.7	130	2.7	15
14.6	6	□	MAS1460LB	90.3	117.7	175.7	173	2.7	15
14.7	3	□	MAS1470MB	46.8	74.7	132.7	130	2.7	15
14.7	6	□	MAS1470LB	90.9	117.7	175.7	173	2.7	15
14.8	3	□	MAS1480MB	47.1	74.7	132.7	130	2.7	15
14.8	6	□	MAS1480LB	91.5	117.7	175.7	173	2.7	15
14.9	3	□	MAS1490MB	47.4	74.7	132.7	130	2.7	15
14.9	6	□	MAS1490LB	92.1	117.7	175.7	173	2.7	15
14.96	3	●	* MAS1496MB	47.6	74.7	132.7	130	2.7	15
14.96	6	●	* MAS1496LB	92.5	117.7	175.7	173	2.7	15
15.0	3	●	MAS1500MB	47.7	74.7	132.7	130	2.7	15
15.0	6	●	MAS1500LB	92.7	117.7	175.7	173	2.7	15
15.1	3	□	MAS1510MB	48.0	78.7	136.7	134	2.7	16
15.1	6	□	MAS1510LB	93.3	122.7	180.7	178	2.7	16

* mark signifies the pilot hole of the roll tap.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
15.2	3	□	**MAS1520MB**	48.4	78.8	136.8	134	2.8	16
15.2	6	□	**MAS1520LB**	94.0	122.8	180.8	178	2.8	16
15.3	3	□	**MAS1530MB**	48.7	78.8	136.8	134	2.8	16
15.3	6	□	**MAS1530LB**	94.6	122.8	180.8	178	2.8	16
15.4	3	□	**MAS1540MB**	49.0	78.8	136.8	134	2.8	16
15.4	6	□	**MAS1540LB**	95.2	122.8	180.8	178	2.8	16
15.5	3	□	**MAS1550MB**	49.3	78.8	136.8	134	2.8	16
15.5	6	□	**MAS1550LB**	95.8	122.8	180.8	178	2.8	16
15.6	3	□	**MAS1560MB**	49.6	78.8	136.8	134	2.8	16
15.6	6	□	**MAS1560LB**	96.4	122.8	180.8	178	2.8	16

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
15.7	3	□	**MAS1570MB**	50.0	78.9	136.9	134	2.9	16
15.7	6	□	**MAS1570LB**	97.1	122.9	180.9	178	2.9	16
15.8	3	□	**MAS1580MB**	50.3	78.9	136.9	134	2.9	16
15.8	6	□	**MAS1580LB**	97.7	122.9	180.9	178	2.9	16
15.9	3	□	**MAS1590MB**	50.6	78.9	136.9	134	2.9	16
15.9	6	□	**MAS1590LB**	98.3	122.9	180.9	178	2.9	16
16.0	3	●	**MAS1600MB**	50.9	78.9	136.9	134	2.9	16
16.0	6	●	**MAS1600LB**	98.9	122.9	180.9	178	2.9	16

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N110

DRILLING(SOLID CARBIDE)

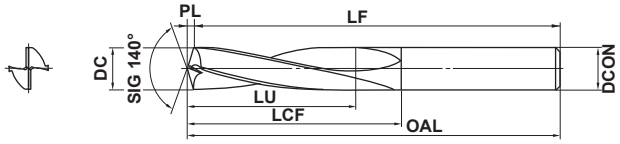
MAE

- Specially for aluminium and cast iron drilling.
- High hole accuracy.
- Can be used for pre-hole drilling for roll tap.

P | M | **K** Cast Iron | **N** Non-ferrous Metal | S | H

External Coolant





DC=3	3<DC≤6	6<DC≤10	10<DC≤16
+0.005 0	+0.005 0	+0.005 0	+0.005 0
DCON=3	**3<DCON≤6**	**6<DCON≤10**	**10<DCON≤16**
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MAE drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
3.0	3	●	**MAE0300MB**	9.5	21.5	61.5	61	0.5	3
3.1	3	●	**MAE0310MB**	9.9	24.6	64.6	64	0.6	4
3.2	3	●	**MAE0320MB**	10.2	24.6	64.6	64	0.6	4
3.3	3	●	**MAE0330MB**	10.5	24.6	64.6	64	0.6	4
3.4	3	●	**MAE0340MB**	10.8	24.6	64.6	64	0.6	4
3.5	3	●	**MAE0350MB**	11.1	24.6	64.6	64	0.6	4
3.6	3	●	**MAE0360MB**	11.5	28.7	68.7	68	0.7	4
3.65	3	●	***MAE0365MB**	11.7	28.7	68.7	68	0.7	4
3.7	3	●	**MAE0370MB**	11.8	28.7	68.7	68	0.7	4
3.8	3	●	**MAE0380MB**	12.1	28.7	68.7	68	0.7	4
3.9	3	●	**MAE0390MB**	12.4	28.7	68.7	68	0.7	4
4.0	3	●	**MAE0400MB**	12.7	28.7	68.7	68	0.7	4
4.1	3	●	**MAE0410MB**	13.0	31.7	71.7	71	0.7	5
4.2	3	●	**MAE0420MB**	13.4	31.8	71.8	71	0.8	5
4.3	3	●	**MAE0430MB**	13.7	31.8	71.8	71	0.8	5
4.4	3	●	**MAE0440MB**	14.0	31.8	71.8	71	0.8	5
4.5	3	●	**MAE0450MB**	14.3	31.8	71.8	71	0.8	5
4.6	3	●	***MAE0460MB**	14.6	33.8	73.8	73	0.8	5
4.7	3	●	**MAE0470MB**	15.0	33.9	73.9	73	0.9	5
4.8	3	●	**MAE0480MB**	15.3	33.9	73.9	73	0.9	5
4.9	3	●	**MAE0490MB**	15.6	33.9	73.9	73	0.9	5
5.0	3	●	**MAE0500MB**	15.9	33.9	73.9	73	0.9	5
5.1	3	●	**MAE0510MB**	16.2	36.9	76.9	76	0.9	6
5.2	3	●	**MAE0520MB**	16.5	36.9	76.9	76	0.9	6
5.3	3	●	**MAE0530MB**	16.9	37.0	77.0	76	1.0	6
5.4	3	●	**MAE0540MB**	17.2	37.0	77.0	76	1.0	6
5.5	3	●	***MAE0550MB**	17.5	37.0	77.0	76	1.0	6
5.6	3	●	**MAE0560MB**	17.8	40.0	80.0	79	1.0	6
5.7	3	●	**MAE0570MB**	18.1	40.0	80.0	79	1.0	6
5.8	3	●	**MAE0580MB**	18.5	40.1	80.1	79	1.1	6
5.9	3	●	**MAE0590MB**	18.8	40.1	80.1	79	1.1	6

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
6.0	3	●	**MAE0600MB**	19.1	40.1	80.1	79	1.1	6
6.1	3	●	**MAE0610MB**	19.4	43.1	85.1	84	1.1	7
6.2	3	●	**MAE0620MB**	19.7	43.1	85.1	84	1.1	7
6.3	3	●	**MAE0630MB**	20.0	43.1	85.1	84	1.1	7
6.4	3	●	**MAE0640MB**	20.4	43.2	85.2	84	1.2	7
6.5	3	●	**MAE0650MB**	20.7	43.2	85.2	84	1.2	7
6.6	3	●	**MAE0660MB**	21.0	43.2	85.2	84	1.2	7
6.7	3	●	**MAE0670MB**	21.3	43.2	85.2	84	1.2	7
6.8	3	●	**MAE0680MB**	21.6	43.2	85.2	84	1.2	7
6.9	3	●	**MAE0690MB**	22.0	43.3	85.3	84	1.3	7
7.0	3	●	**MAE0700MB**	22.3	43.3	85.3	84	1.3	7
7.1	3	●	**MAE0710MB**	22.6	49.3	91.3	90	1.3	8
7.2	3	●	**MAE0720MB**	22.9	49.3	91.3	90	1.3	8
7.3	3	●	**MAE0730MB**	23.2	49.3	91.3	90	1.3	8
7.35	3	●	***MAE0735MB**	23.4	49.3	91.3	90	1.3	8
7.4	3	●	**MAE0740MB**	23.5	49.3	91.3	90	1.3	8
7.5	3	●	**MAE0750MB**	23.9	49.4	91.4	90	1.4	8
7.6	3	●	**MAE0760MB**	24.2	49.4	91.4	90	1.4	8
7.7	3	●	**MAE0770MB**	24.5	49.4	91.4	90	1.4	8
7.8	3	●	**MAE0780MB**	24.8	49.4	91.4	90	1.4	8
7.9	3	●	**MAE0790MB**	25.1	49.4	91.4	90	1.4	8
8.0	3	●	**MAE0800MB**	25.5	49.5	91.5	90	1.5	8
8.1	3	●	**MAE0810MB**	25.8	51.5	95.5	94	1.5	9
8.2	3	●	**MAE0820MB**	26.1	51.5	95.5	94	1.5	9
8.3	3	●	**MAE0830MB**	26.4	51.5	95.5	94	1.5	9
8.4	3	●	**MAE0840MB**	26.7	51.5	95.5	94	1.5	9
8.5	3	●	**MAE0850MB**	27.0	51.5	95.5	94	1.5	9
8.6	3	●	**MAE0860MB**	27.4	51.6	95.6	94	1.6	9
8.7	3	●	**MAE0870MB**	27.7	51.6	95.6	94	1.6	9
8.8	3	●	**MAE0880MB**	28.0	51.6	95.6	94	1.6	9
8.9	3	●	**MAE0890MB**	28.3	51.6	95.6	94	1.6	9

* mark signifies the pilot hole of the roll tap.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm)					
				LU	LCF	OAL	LF	PL	DCON
9.0	3	●	MAE0900MB	28.6	51.6	95.6	94	1.6	9
9.1	3	●	MAE0910MB	29.0	54.7	98.7	97	1.7	10
9.2	3	●	MAE0920MB	29.3	54.7	98.7	97	1.7	10
9.21	3	●	* MAE0921MB	29.3	54.7	98.7	97	1.7	10
9.3	3	●	MAE0930MB	29.6	54.7	98.7	97	1.7	10
9.4	3	●	MAE0940MB	29.9	54.7	98.7	97	1.7	10
9.5	3	●	MAE0950MB	30.2	54.7	98.7	97	1.7	10
9.6	3	●	MAE0960MB	30.5	54.7	98.7	97	1.7	10
9.7	3	●	MAE0970MB	30.9	54.8	98.8	97	1.8	10
9.8	3	●	MAE0980MB	31.2	54.8	98.8	97	1.8	10
9.9	3	●	MAE0990MB	31.5	54.8	98.8	97	1.8	10
10.0	3	●	MAE1000MB	31.8	54.8	98.8	97	1.8	10
10.1	3	□	MAE1010MB	32.1	56.8	102.8	101	1.8	11
10.2	3	□	MAE1020MB	32.5	56.9	102.9	101	1.9	11
10.3	3	●	MAE1030MB	32.8	56.9	102.9	101	1.9	11
10.4	3	□	MAE1040MB	33.1	56.9	102.9	101	1.9	11
10.5	3	●	MAE1050MB	33.4	56.9	102.9	101	1.9	11
10.6	3	□	MAE1060MB	33.7	56.9	102.9	101	1.9	11
10.7	3	□	MAE1070MB	34.0	56.9	102.9	101	1.9	11
10.8	3	□	MAE1080MB	34.4	57.0	103.0	101	2.0	11
10.9	3	□	MAE1090MB	34.7	57.0	103.0	101	2.0	11
11.0	3	●	MAE1100MB	35.0	57.0	103.0	101	2.0	11
11.08	3	●	* MAE1108MB	35.2	62.0	108.0	106	2.0	12
11.1	3	□	MAE1110MB	35.3	62.0	108.0	106	2.0	12
11.2	3	□	MAE1120MB	35.6	62.0	108.0	106	2.0	12
11.3	3	□	MAE1130MB	36.0	62.1	108.1	106	2.1	12
11.4	3	□	MAE1140MB	36.3	62.1	108.1	106	2.1	12
11.5	3	□	MAE1150MB	36.6	62.1	108.1	106	2.1	12
11.6	3	□	MAE1160MB	36.9	62.1	108.1	106	2.1	12
11.7	3	□	MAE1170MB	37.2	62.1	108.1	106	2.1	12
11.8	3	□	MAE1180MB	37.5	62.1	108.1	106	2.1	12
11.9	3	□	MAE1190MB	37.9	62.2	108.2	106	2.2	12
12.0	3	●	MAE1200MB	38.2	62.2	108.2	106	2.2	12
12.1	3	□	MAE1210MB	38.5	67.2	117.2	115	2.2	13
12.2	3	□	MAE1220MB	38.8	67.2	117.2	115	2.2	13
12.3	3	□	MAE1230MB	39.1	67.2	117.2	115	2.2	13
12.4	3	□	MAE1240MB	39.5	67.3	117.3	115	2.3	13
12.5	3	●	MAE1250MB	39.8	67.3	117.3	115	2.3	13
12.6	3	□	MAE1260MB	40.1	67.3	117.3	115	2.3	13
12.7	3	□	MAE1270MB	40.4	67.3	117.3	115	2.3	13
12.8	3	□	MAE1280MB	40.7	67.3	117.3	115	2.3	13
12.9	3	□	MAE1290MB	41.0	67.3	117.3	115	2.3	13
12.96	3	●	* MAE1296MB	41.3	67.4	117.4	115	2.4	13
13.0	3	●	MAE1300MB	41.4	67.4	117.4	115	2.4	13
13.1	3	□	MAE1310MB	41.7	72.4	122.4	120	2.4	14
13.2	3	□	MAE1320MB	42.0	72.4	122.4	120	2.4	14
13.3	3	□	MAE1330MB	42.3	72.4	122.4	120	2.4	14
13.4	3	□	MAE1340MB	42.6	72.4	122.4	120	2.4	14

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm)					
				LU	LCF	OAL	LF	PL	DCON
13.5	3	●	MAE1350MB	43.0	72.5	122.5	120	2.5	14
13.6	3	□	MAE1360MB	43.3	72.5	122.5	120	2.5	14
13.7	3	□	MAE1370MB	43.6	72.5	122.5	120	2.5	14
13.8	3	□	MAE1380MB	43.9	72.5	122.5	120	2.5	14
13.9	3	□	MAE1390MB	44.2	72.5	122.5	120	2.5	14
14.0	3	●	MAE1400MB	44.5	72.5	122.5	120	2.5	14
14.1	3	□	MAE1410MB	44.9	74.6	132.6	130	2.6	15
14.2	3	□	MAE1420MB	45.2	74.6	132.6	130	2.6	15
14.3	3	□	MAE1430MB	45.5	74.6	132.6	130	2.6	15
14.4	3	□	MAE1440MB	45.8	74.6	132.6	130	2.6	15
14.5	3	□	MAE1450MB	46.1	74.6	132.6	130	2.6	15
14.6	3	□	MAE1460MB	46.5	74.7	132.7	130	2.7	15
14.7	3	□	MAE1470MB	46.8	74.7	132.7	130	2.7	15
14.8	3	□	MAE1480MB	47.1	74.7	132.7	130	2.7	15
14.9	3	□	MAE1490MB	47.4	74.7	132.7	130	2.7	15
14.96	3	●	* MAE1496MB	47.6	74.7	132.7	130	2.7	15
15.0	3	●	MAE1500MB	47.7	74.7	132.7	130	2.7	15
15.1	3	□	MAE1510MB	48.0	78.7	136.7	134	2.7	16
15.2	3	□	MAE1520MB	48.4	78.8	136.8	134	2.8	16
15.3	3	□	MAE1530MB	48.7	78.8	136.8	134	2.8	16
15.4	3	□	MAE1540MB	49.0	78.8	136.8	134	2.8	16
15.5	3	□	MAE1550MB	49.3	78.8	136.8	134	2.8	16
15.6	3	□	MAE1560MB	49.6	78.8	136.8	134	2.8	16
15.7	3	□	MAE1570MB	50.0	78.9	136.9	134	2.9	16
15.8	3	□	MAE1580MB	50.3	78.9	136.9	134	2.9	16
15.9	3	□	MAE1590MB	50.6	78.9	136.9	134	2.9	16
16.0	3	●	MAE1600MB	50.9	78.9	136.9	134	2.9	16

MAS / MAE

RECOMMENDED CUTTING CONDITIONS

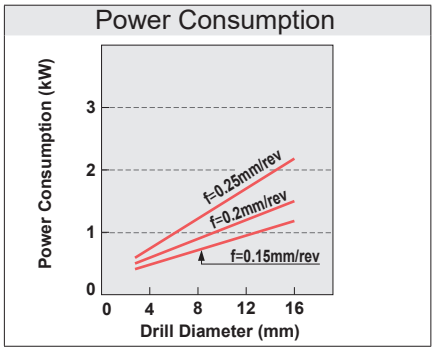
Type		Workpiece Material	Drill Dia. ϕ3.0—ϕ6.0		Drill Dia. ϕ6.1—ϕ10.0		Drill Dia. ϕ10.1—ϕ16.0	
			Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
MAE	N	Aluminium Alloy Casting	90 (40—140)	0.15 (0.05—0.3)	100 (50—150)	0.2 (0.1—0.3)	120 (60—170)	0.25 (0.1—0.4)
		Aluminium Alloy Die Casting	100 (60—150)	0.12 (0.05—0.25)	110 (70—160)	0.15 (0.05—0.25)	130 (80—180)	0.2 (0.1—0.3)
	K	Gray Cast Iron	40 (20—60)	0.15 (0.1—0.2)	60 (40—80)	0.2 (0.1—0.3)	80 (60—100)	0.3 (0.2—0.4)
		Ductile Cast Iron	30 (20—40)	0.1 (0.05—0.15)	40 (20—60)	0.12 (0.05—0.2)	60 (40—80)	0.2 (0.1—0.3)
MAS	N	Aluminium Alloy Casting	100 (60—150)	0.15 (0.05—0.3)	120 (80—170)	0.2 (0.1—0.3)	150 (100—200)	0.25 (0.1—0.4)
		Aluminium Alloy Die Casting	120 (80—170)	0.12 (0.05—0.25)	150 (100—180)	0.15 (0.05—0.25)	160 (120—200)	0.2 (0.1—0.3)
	K	Gray Cast Iron	60 (40—80)	0.15 (0.1—0.2)	80 (60—110)	0.2 (0.1—0.3)	100 (70—130)	0.3 (0.2—0.4)
		Ductile Cast Iron	45 (30—60)	0.1 (0.05—0.15)	60 (40—80)	0.12 (0.05—0.2)	80 (60—100)	0.2 (0.1—0.3)

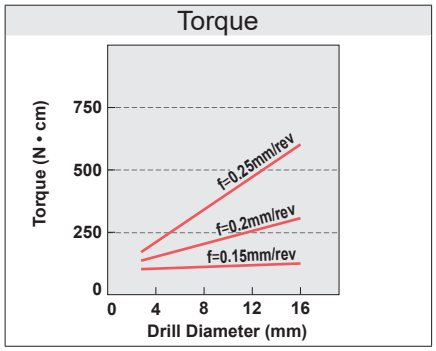
■ APPLIED OUTER DIAMETER FOR PILOT HOLE

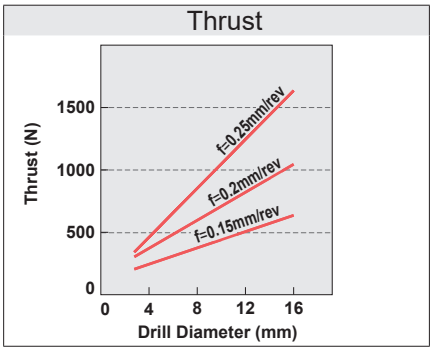
Thread Size	Thread Tapping			Rolled Thread Tapping		
	Drill Diameter (**DC**)	Hole Diameter Tolerance		Drill Diameter (**DC**)	Hole Diameter Tolerance	
		max.	min.		max.	min.
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.70
M5x0.8	**4.2**	4.134	4.334	**4.60**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.50**	5.48	5.57
M8x1.25	**6.8**	6.647	6.912	**7.35**	7.34	7.41
M10x1.5	**8.5**	8.376	8.676	**9.21**	9.18	9.28
M12x1.75	**10.3**	10.106	10.441	**11.08**	11.05	11.15
M14x2	**12.0**	11.835	12.210	**12.96**	12.92	13.04
M16x2	**14.0**	13.835	14.210	**14.96**	14.92	15.04

CUTTING RESISTANCE

Workpiece : JIS AC4B-T6 Drilled Depth : L/D=3(Through Hole) Cutting Speed : 100m/min WSO (10%)

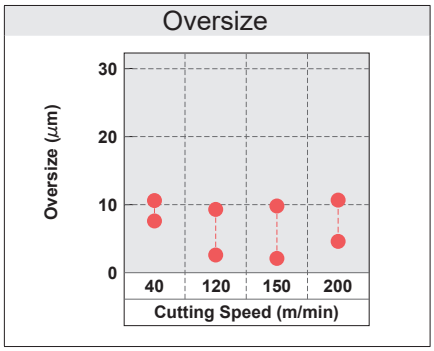


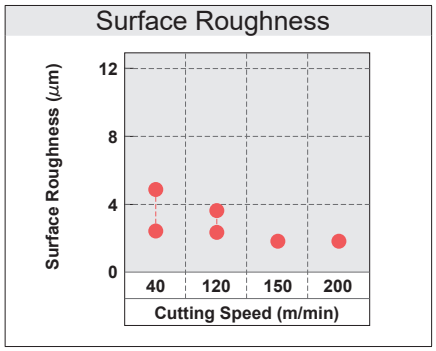


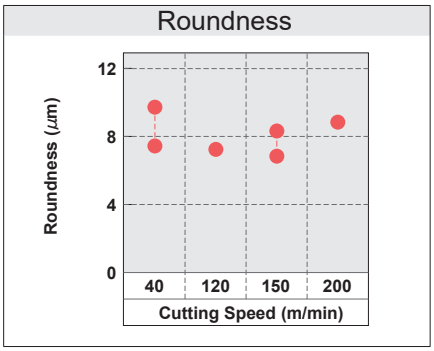


MACHINED HOLE ACCURACY

Tool : MAS1100MB Workpiece : JIS AC4B-T6 Feed : 0.35mm/rev Drilled Depth : 33mm WSO (10%)







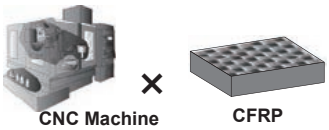
MCC

CNC Machine/For CFRP

●The 90° cutting angle thoroughly reduces thrust and minimizes delamination.

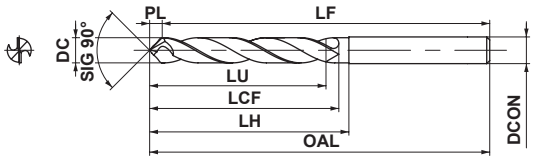
P M K **N** S H

Non-ferrous Metal



External Coolant





3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
0 −0.018	0 −0.022	0 −0.027	0 −0.033
DCON=6	6<DCON≤10	10<DCON≤12	
0 −0.008	0 −0.009	0 −0.011	

Hole Diameter		Drill Diameter		Hole Depth	Order Number	DD2105	Dimensions (mm)						
*AWG	Inch (inch)	DC (mm)	Inch (inch)	(L/D)			LU	LCF	LH	OAL	LF	PL	DCON
—	3/16	4.76	.1875	3	**MCC0476X03S060**	●	16.7	40	40	80	77.6	2.4	6
—	1/4	6.38	.251	3	**MCC0638X03S080**	●	22.3	50	50	90	86.8	3.2	8
—	5/16	7.96	.3125	3	**MCC0796X03S080**	●	27.9	50	50	90	86.0	4.0	8
—	3/8	9.55	.375	3	**MCC0955X03S100**	●	33.5	50	50	100	95.2	4.8	10
—	7/16	11.14	.4375	3	**MCC1114X03S120**	●	39.0	60	60	110	104.4	5.6	12

***AWG :** American Wire Gage

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		CFRP			
Drill Dia. DC (mm)	Drill Dia. DC (inch)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
4.76	**.1875**	100	6700	0.08 (0.05—0.12)	540
6.38	**.251**	100	5000	0.1 (0.05—0.12)	500
7.96	**.3125**	100	4000	0.1 (0.05—0.12)	400
9.55	**.375**	100	3400	0.1 (0.05—0.12)	340
11.14	**.4375**	100	2900	0.1 (0.05—0.12)	290

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

Scan here for product NEWS ▶

MCA

CNC Machine/For CFRP+Al

●The gap between CFPR and aluminium machining hole diameter is reduced due to good chip discharge by special groove structure.

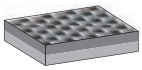
P | M | K | **N** | S | H

Non-ferrous Metal



CNC Machine

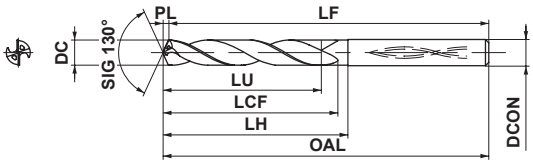
×



CFRP+Al

Internal Coolant





6<DC≤10
0
– 0.022
6<DCON≤10
0
– 0.009

Hole Diameter		Drill Diameter		Hole Depth	Order Number	DD2110	Dimensions (mm)						
*AWG	Inch (inch)	DC (mm)	Inch (inch)	(L/D)			LU	LCF	LH	OAL	LF	PL	DCON
—	1/4	6.38	.251	5	**MCA0638X05S070**	□	33.4	51	51	91	89.5	1.5	7
—	3/8	9.55	.375	5	**MCA0955X05S100**	□	50.0	77	77	118	115.8	2.2	10

∗**AWG :** American Wire Gage

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		CFRP				Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc			
Drill Dia. DC (mm)	Drill Dia. DC (inch)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
6.38	**.251**	100	5000	0.15 (0.10—0.20)	750	100	5000	0.03 (0.02—0.04)	150
9.55	**.375**	100	3400	0.15 (0.10—0.20)	680	100	3400	0.03 (0.02—0.04)	100

Note 1) It is recommended to divide cutting conditions per each workpiece material.

MCT

CNC Machine/For CFRP+Ti

●The sharp cutting edge achieves high-quality hole machining with CFRP and titanium machining.

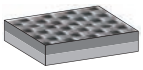
P M K **N** S H

Non-ferrous Metal



CNC Machine

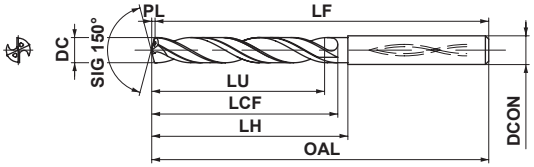
×



CFRP+Ti

Internal Coolant





6<DC≤10	0 / −0.022
6<DCON≤10	0 / −0.009

Hole Diameter		Drill Diameter		Hole Depth	Order Number	TF15	Dimensions (mm)						
AWG *	Inch (inch)	**DC** (mm)	Inch (inch)	(L/D)			**LU**	**LCF**	**LH**	**OAL**	**LF**	**PL**	**DCON**
—	1/4	6.38	.251	5	**MCT0638X05S070**	□	32.8	47	47	96	95.1	0.9	7
—	3/8	9.55	.375	5	**MCT0955X05S100**	□	49.1	71	71	122	120.7	1.3	10

∗**AWG :** American Wire Gage

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		CFRP				Titanium Alloys Ti-6Al-4V				
Drill Dia. **DC** (mm)	Drill Dia. **DC** (inch)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Peck machining (mm)
6.38	**.251**	100	5000	0.15 (0.10—0.20)	750	15	750	0.02 (0.01—0.03)	15	1
9.55	**.375**	100	3400	0.15 (0.10—0.20)	680	15	500	0.02 (0.01—0.03)	10	1

Note 1) This condition is for when internal air or mist is used.

Note 2) It is recommended to divide cutting conditions per each workpiece material.

□ **: Non stock, produced to order only.**

□ **: For produced-to-order products, the minimum number of lots is:**
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

Scan here for product NEWS ▶

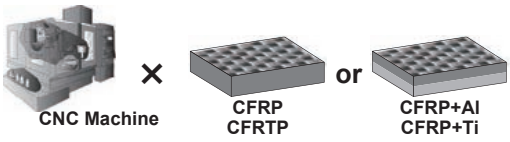
MCW

●The unique cutting edge shape suppresses the gap between the machining hole diameter of stack material and the burr on the exit side of the machining hole.

CNC Machine/CFRP and Stack Material High Precision

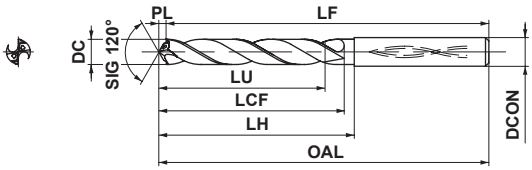
P | M | K | **N** | S | H

Non-ferrous Metal



Internal Coolant





6<DC≤10	0 / −0.022
6<DCON≤10	0 / −0.009

Hole Diameter		Drill Diameter		Hole Depth	Order Number	HT110	DD2110	Dimensions (mm)						
AWG*	Inch (inch)	DC (mm)	Inch (inch)	(L/D)				LU	LCF	LH	OAL	LF	PL	DCON
—	1/4	6.38	.251	5	**MCW0638X05S070**	□	□	33.7	52	52	92	90.2	1.8	7
—	3/8	9.55	.375	5	**MCW0955X05S100**	□	□	50.6	73	73	119	116.2	2.8	10

∗**AWG :** American Wire Gage

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		CFRP			
Drill Dia. DC (mm)	Drill Dia. DC (inch)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
6.38	**.251**	100	5000	0.15 (0.10—0.20)	750
9.55	**.375**	100	3400	0.15 (0.10—0.20)	680

Workpiece Material		Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc					Titanium Alloys Ti-6Al-4V				
Drill Dia. DC (mm)	Drill Dia. DC (inch)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Peck Machining (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Peck Machining (mm)
6.38	**.251**	100	5000	0.15 (0.10—0.20)	750	3	15	750	0.02 (0.01—0.03)	15	1
9.55	**.375**	100	3400	0.15 (0.10—0.20)	500	3	15	500	0.02 (0.01—0.03)	10	1

Note 1) This condition is for when internal air or mist is used.
Note 2) It is recommended to divide cutting conditions per each workpiece material.

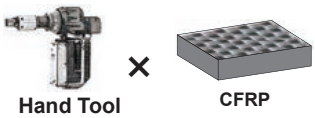
MCCH

Hand Tool/For CFRP

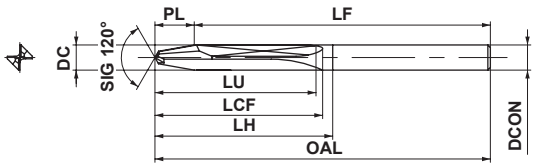
●Highly reliable hole machining is achieved by the adoption of cemented carbide for hand tools and double angle.

P | M | K | **N** | S | H

Non-ferrous Metal







1≤DC≤3	3<DC≤6	6<DC≤10
0 – 0.014	0 – 0.018	0 – 0.022
DCON=3	3<DCON≤6	6<DCON≤10
0 – 0.006	0 – 0.008	0 – 0.009

Hole Diameter		Drill Diameter		Hole Depth	Order Number	DT2030	Dimensions (mm)						
*AWG	Inch (inch)	DC (mm)	Inch (inch)	(L/D)			LU	LCF	LH	OAL	LF	PL	DCON
#40	—	2.5	.0985	15	**MCCH0250X15S030**	●	42.1	48	50	100	95.4	4.6	3
#30	—	3.26	.1285	10	**MCCH0326X10S040**	●	38.6	48	50	100	94.0	6.0	4
#20	—	4.1	.1615	8	**MCCH0410X08S050**	●	40.3	48	50	100	92.5	7.5	5
#11	—	4.86	.1915	5	**MCCH0486X05S050**	●	33.2	48	50	100	91.1	8.9	5
—	1/4	6.38	.251	3	**MCCH0638X03S070**	●	30.8	48	50	100	88.3	11.7	7
—	3/8	9.55	.375	2	**MCCH0955X02S100**	●	36.6	48	50	100	82.5	17.5	10

***AWG :** American Wire Gage

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

MCAH

Hand Tool/For CFRP+Al

●Highly reliable hole machining is achieved by setting cemented carbide for hand tools and combination of the groove shape and optimal twisted angle.

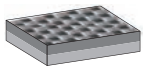
P | M | K | **N** | S | H

Non-ferrous Metal



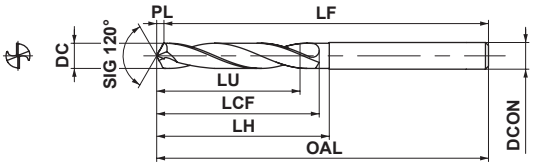
Hand Tool

×



CFRP+Al





1≤DC≤3	3<DC≤6	6<DC≤10
0 – 0.014	0 – 0.018	0 – 0.022
DCON=3	**3<DCON≤6**	**6<DCON≤10**
0 – 0.006	0 – 0.008	0 – 0.009

Hole Diameter		Drill Diameter		Hole Depth	Order Number	DT2030	Dimensions (mm)						
*AWG	Inch (inch)	DC (mm)	Inch (inch)	(L/D)			LU	LCF	LH	OAL	LF	PL	DCON
#40	—	2.5	.0985	15	**MCAH0250X15S030**	●	38.2	50	50	100	99.3	0.7	3
#30	—	3.26	.1285	15	**MCAH0326X15S040**	●	49.8	50	50	100	99.1	0.9	4
#20	—	4.1	.1615	10	**MCAH0410X10S050**	●	42.2	50	50	100	98.8	1.2	5
#11	—	4.86	.1915	8	**MCAH0486X08S050**	●	40.3	50	50	100	98.6	1.4	5
—	1/4	6.38	.251	5	**MCAH0638X05S070**	●	33.7	50	50	100	98.2	1.8	7
—	3/8	9.55	.375	3	**MCAH0955X03S100**	●	31.5	50	50	100	97.2	2.8	10

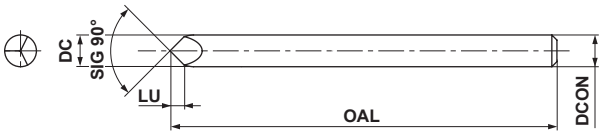
∗**AWG :** American Wire Gage

MSP

Starting Drill for Pilot Hole Drilling

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	





Order Number	Grade	Stock	Dimensions (mm)				Diameter Range (mm)
			DC	LU	OAL	DCON	
MSP0300SB	**VP15TF**	●	3.0	1.5	38.0	3.0	**0.1–3.0**

RECOMMENDED CUTTING CONDITIONS

Hole Size Range (mm)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
0.1–3.0	10000	0.0005 (0.00025–0.001)	5

● : **Inventory maintained in Japan.**

Scan here for product NEWS ▶

MSE

MIRACLE MINI STAR DRILL

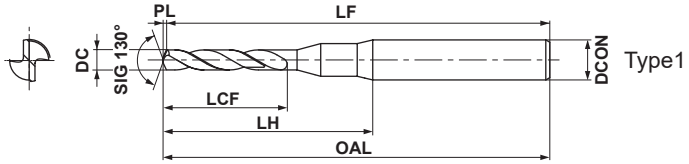
- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S Heat Resistant Alloy | H

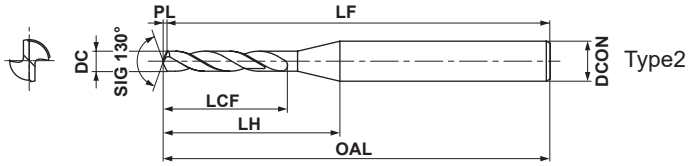
External Coolant







Type1



Type2

0.10≤DC≤0.99	0 / −0.009
DCON=3	0 / −0.006

Note 1) MSE drills are suitable for use with shrink fit holders.

DC (mm)	VP20MF	VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.10	●		MSE0010SB	1.2	9.7	38.0	38	0.02	3	1
0.11	●		MSE0011SB	1.2	9.7	38.0	38	0.03	3	1
0.12	●		MSE0012SB	1.4	9.7	38.0	38	0.03	3	1
0.13	●		MSE0013SB	1.4	9.7	38.0	38	0.03	3	1
0.14	●		MSE0014SB	2.0	9.7	38.0	38	0.03	3	1
0.15	●		MSE0015SB	2.0	9.7	38.0	38	0.03	3	1
0.16	●		MSE0016SB	2.0	9.7	38.0	38	0.04	3	1
0.17	●		MSE0017SB	2.0	9.7	38.0	38	0.04	3	1
0.18	●		MSE0018SB	2.0	9.7	38.0	38	0.04	3	1
0.19	●		MSE0019SB	2.0	9.7	38.0	38	0.04	3	1
0.20	●		MSE0020SB	2.6	9.8	38.1	38	0.05	3	1
0.21	●		MSE0021SB	2.6	9.8	38.1	38	0.05	3	1
0.22	●		MSE0022SB	2.6	9.8	38.1	38	0.05	3	1
0.23	●		MSE0023SB	2.6	9.8	38.1	38	0.05	3	1
0.24	●		MSE0024SB	3.1	9.8	38.1	38	0.06	3	1
0.25	●		MSE0025SB	3.1	9.8	38.1	38	0.06	3	1
0.26	●		MSE0026SB	3.1	9.8	38.1	38	0.06	3	1
0.27	●		MSE0027SB	3.1	9.8	38.1	38	0.06	3	1
0.28	●		MSE0028SB	3.1	9.8	38.1	38	0.07	3	1
0.29	●		MSE0029SB	3.1	9.8	38.1	38	0.07	3	1
0.30		●	MSE0030SB	5.1	10.3	38.1	38	0.07	3	2
0.31		●	MSE0031SB	5.1	10.3	38.1	38	0.07	3	2
0.32		●	MSE0032SB	5.1	10.3	38.1	38	0.07	3	2
0.33		●	MSE0033SB	5.1	10.3	38.1	38	0.08	3	2
0.34		●	MSE0034SB	6.1	11.3	38.1	38	0.08	3	2
0.35		●	MSE0035SB	6.1	11.2	38.1	38	0.08	3	2
0.36		●	MSE0036SB	6.1	11.2	38.1	38	0.08	3	2
0.37		●	MSE0037SB	6.1	11.2	38.1	38	0.09	3	2

DC (mm)	VP20MF	VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.38		●	MSE0038SB	6.1	11.2	38.1	38	0.09	3	2
0.39		●	MSE0039SB	6.1	11.2	38.1	38	0.09	3	2
0.40		●	MSE0040SB	7.1	12.2	38.1	38	0.09	3	2
0.41		●	MSE0041SB	7.1	12.1	38.1	38	0.10	3	2
0.42		●	MSE0042SB	7.1	12.1	38.1	38	0.10	3	2
0.43		●	MSE0043SB	7.1	12.1	38.1	38	0.10	3	2
0.44		●	MSE0044SB	7.1	12.1	38.1	38	0.10	3	2
0.45		●	MSE0045SB	7.1	12.1	38.1	38	0.10	3	2
0.46		●	MSE0046SB	7.1	12.0	38.1	38	0.11	3	2
0.47		●	MSE0047SB	7.1	12.0	38.1	38	0.11	3	2
0.48		●	MSE0048SB	7.1	12.0	38.1	38	0.11	3	2
0.49		●	MSE0049SB	7.1	12.0	38.1	38	0.11	3	2
0.50		●	MSE0050SB	7.1	12.0	38.1	38	0.12	3	2
0.51		●	MSE0051SB	7.1	11.9	38.1	38	0.12	3	2
0.52		●	MSE0052SB	7.1	11.9	38.1	38	0.12	3	2
0.53		●	MSE0053SB	7.1	11.9	38.1	38	0.12	3	2
0.54		●	MSE0054SB	7.1	11.9	38.1	38	0.13	3	2
0.55		●	MSE0055SB	7.1	11.9	38.1	38	0.13	3	2
0.56		●	MSE0056SB	7.1	11.9	38.1	38	0.13	3	2
0.57		●	MSE0057SB	7.1	11.8	38.1	38	0.13	3	2
0.58		●	MSE0058SB	7.1	11.8	38.1	38	0.14	3	2
0.59		●	MSE0059SB	7.1	11.8	38.1	38	0.14	3	2
0.60		●	MSE0060SB	7.1	11.8	38.1	38	0.14	3	2
0.61		●	MSE0061SB	7.1	11.8	38.1	38	0.14	3	2
0.62		●	MSE0062SB	7.1	11.7	38.1	38	0.14	3	2
0.63		●	MSE0063SB	7.2	11.8	38.2	38	0.15	3	2
0.64		●	MSE0064SB	7.2	11.8	38.2	38	0.15	3	2
0.65		●	MSE0065SB	7.2	11.8	38.2	38	0.15	3	2

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

MSE

MIRACLE MINI STAR DRILL

DC (mm)	VP20MF	VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.66		●	**MSE0066SB**	7.2	11.8	38.2	38	0.15	3	2
0.67		●	**MSE0067SB**	7.2	11.7	38.2	38	0.16	3	2
0.68		●	**MSE0068SB**	7.2	11.7	38.2	38	0.16	3	2
0.69		●	**MSE0069SB**	7.2	11.7	38.2	38	0.16	3	2
0.70		●	**MSE0070SB**	8.2	12.7	38.2	38	0.16	3	2
0.71		●	**MSE0071SB**	8.2	12.7	38.2	38	0.17	3	2
0.72		●	**MSE0072SB**	8.2	12.7	38.2	38	0.17	3	2
0.73		●	**MSE0073SB**	8.2	12.6	38.2	38	0.17	3	2
0.74		●	**MSE0074SB**	8.2	12.6	38.2	38	0.17	3	2
0.75		●	**MSE0075SB**	8.2	12.6	38.2	38	0.17	3	2
0.76		●	**MSE0076SB**	8.2	12.6	38.2	38	0.18	3	2
0.77		●	**MSE0077SB**	8.2	12.6	38.2	38	0.18	3	2
0.78		●	**MSE0078SB**	8.2	12.5	38.2	38	0.18	3	2
0.79		●	**MSE0079SB**	8.2	12.5	38.2	38	0.18	3	2
0.80		●	**MSE0080SB**	10.2	14.5	38.2	38	0.19	3	2
0.81		●	**MSE0081SB**	10.2	14.5	38.2	38	0.19	3	2
0.82		●	**MSE0082SB**	10.2	14.5	38.2	38	0.19	3	2

DC (mm)	VP20MF	VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.83		●	**MSE0083SB**	10.2	14.5	38.2	38	0.19	3	2
0.84		●	**MSE0084SB**	10.2	14.4	38.2	38	0.20	3	2
0.85		●	**MSE0085SB**	10.2	14.4	38.2	38	0.20	3	2
0.86		●	**MSE0086SB**	10.2	14.4	38.2	38	0.20	3	2
0.87		●	**MSE0087SB**	10.2	14.4	38.2	38	0.20	3	2
0.88		●	**MSE0088SB**	10.2	14.4	38.2	38	0.21	3	2
0.89		●	**MSE0089SB**	10.2	14.3	38.2	38	0.21	3	2
0.90		●	**MSE0090SB**	10.2	14.3	38.2	38	0.21	3	2
0.91		●	**MSE0091SB**	10.2	14.3	38.2	38	0.21	3	2
0.92		●	**MSE0092SB**	10.2	14.3	38.2	38	0.21	3	2
0.93		●	**MSE0093SB**	10.2	14.3	38.2	38	0.22	3	2
0.94		●	**MSE0094SB**	10.2	14.2	38.2	38	0.22	3	2
0.95		●	**MSE0095SB**	10.2	14.2	38.2	38	0.22	3	2
0.96		●	**MSE0096SB**	10.2	14.2	38.2	38	0.22	3	2
0.97		●	**MSE0097SB**	10.2	14.2	38.2	38	0.23	3	2
0.98		●	**MSE0098SB**	10.2	14.2	38.2	38	0.23	3	2
0.99		●	**MSE0099SB**	10.2	14.2	38.2	38	0.23	3	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) AISI 1010 etc					Carbon Steel, Alloy Steel (180−280HB) AISI 1045, AISI 4140 etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001−0.003)	0.02	40	6	20000	0.002 (0.001−0.003)	0.02	40
0.12	8	20000	0.002 (0.001−0.003)	0.02	40	8	20000	0.002 (0.001−0.003)	0.02	40
0.16	10	20000	0.002 (0.001−0.003)	0.02	40	10	20000	0.002 (0.001−0.003)	0.02	40
0.2	13	20000	0.003 (0.002−0.004)	0.04	60	13	20000	0.003 (0.002−0.004)	0.04	60
0.25	16	20000	0.003 (0.002−0.004)	0.04	60	16	20000	0.003 (0.002−0.004)	0.04	60
0.32	20	20000	0.004 (0.003−0.005)	0.05	80	20	20000	0.004 (0.003−0.005)	0.05	80
0.4	25	20000	0.004 (0.003−0.005)	0.05	80	25	20000	0.004 (0.003−0.005)	0.05	80
0.5	31	20000	0.006 (0.005−0.007)	0.1	120	31	20000	0.006 (0.005−0.007)	0.1	120
0.63	40	20000	0.008 (0.006−0.01)	0.1	160	40	20000	0.008 (0.006−0.01)	0.1	160
0.8	50	20000	0.02 (0.015−0.025)	0.3	400	50	20000	0.015 (0.012−0.018)	0.3	300
0.99	62	20000	0.04 (0.03−0.05)	0.3	800	62	20000	0.02 (0.015−0.025)	0.3	400

Note 1) When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended.
(Order number : MSP0300SB, Cutting conditions : Refer to page N118.)
Note 2) Change cutting conditions depending on your machine and workpiece rigidity.
Note 3) When machining holes over 5D, reduce the step stated above.
Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above.
Lower the revolutions if you use oil fluid or mist.

● : **Inventory maintained in Japan.**

Workpiece Material	Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc					Pre-Hardened Steel (35−45HRC) AISI P21, AISI P20 etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001−0.003)	0.02	40	6	20000	0.002 (0.001−0.003)	0.02	40
0.12	8	20000	0.002 (0.001−0.003)	0.02	40	8	20000	0.002 (0.001−0.003)	0.02	40
0.16	10	20000	0.002 (0.001−0.003)	0.02	40	10	20000	0.002 (0.001−0.003)	0.02	40
0.2	13	20000	0.003 (0.002−0.004)	0.04	60	13	20000	0.003 (0.002−0.004)	0.04	60
0.25	16	20000	0.003 (0.002−0.004)	0.04	60	16	20000	0.003 (0.002−0.004)	0.04	60
0.32	20	20000	0.004 (0.003−0.005)	0.05	80	20	20000	0.004 (0.003−0.005)	0.05	80
0.4	25	20000	0.004 (0.003−0.005)	0.05	80	25	20000	0.004 (0.003−0.005)	0.05	80
0.5	31	20000	0.006 (0.005−0.007)	0.1	120	31	20000	0.006 (0.005−0.007)	0.1	120
0.63	40	20000	0.008 (0.006−0.01)	0.1	160	40	20000	0.008 (0.006−0.01)	0.1	160
0.8	50	20000	0.015 (0.012−0.018)	0.3	300	50	20000	0.015 (0.012−0.018)	0.3	300
0.99	62	20000	0.02 (0.015−0.025)	0.3	400	62	20000	0.02 (0.015−0.025)	0.3	400

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc					Gray Cast Iron (≤350MPa) No 45 B etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001−0.003)	0.02	40	6	20000	0.002 (0.001−0.003)	0.02	40
0.12	8	20000	0.002 (0.001−0.003)	0.02	40	8	20000	0.002 (0.001−0.003)	0.02	40
0.16	10	20000	0.002 (0.001−0.003)	0.02	40	10	20000	0.002 (0.001−0.003)	0.02	40
0.2	11	18000	0.003 (0.002−0.004)	0.04	54	13	20000	0.003 (0.002−0.004)	0.04	60
0.25	14	18000	0.003 (0.002−0.004)	0.04	54	16	20000	0.003 (0.002−0.004)	0.04	60
0.32	15	15000	0.004 (0.003−0.005)	0.05	60	20	20000	0.004 (0.003−0.005)	0.05	80
0.4	19	15000	0.004 (0.003−0.005)	0.05	60	25	20000	0.004 (0.003−0.005)	0.05	80
0.5	16	10000	0.006 (0.005−0.007)	0.1	60	31	20000	0.006 (0.005−0.007)	0.1	120
0.63	20	10000	0.008 (0.006−0.01)	0.1	80	40	20000	0.008 (0.006−0.01)	0.1	160
0.8	15	6000	0.015 (0.012−0.018)	0.2	90	50	20000	0.02 (0.015−0.025)	0.3	400
0.99	19	6000	0.02 (0.015−0.025)	0.2	120	62	20000	0.04 (0.03−0.05)	0.3	800

Workpiece Material	Aluminium Alloys (Si<5%)					Heat Resistant Alloys Inconel718 etc				
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)
0.1	6	20000	0.002 (0.001−0.003)	0.05	40	2	7000	0.001 (0.0005−0.001)	0.02	7
0.12	8	20000	0.003 (0.002−0.004)	0.05	60	3	7000	0.001 (0.0005−0.001)	0.02	7
0.16	10	20000	0.004 (0.003−0.005)	0.05	80	4	7000	0.001 (0.0005−0.001)	0.02	7
0.2	13	20000	0.006 (0.005−0.007)	0.1	120	3	5000	0.002 (0.001−0.002)	0.04	10
0.25	16	20000	0.008 (0.006−0.01)	0.1	160	4	5000	0.002 (0.001−0.002)	0.04	10
0.32	20	20000	0.01 (0.008−0.012)	0.3	200	4	4000	0.002 (0.001−0.002)	0.05	8
0.4	25	20000	0.02 (0.015−0.025)	0.3	400	5	4000	0.002 (0.001−0.002)	0.05	8
0.5	31	20000	0.03 (0.025−0.035)	0.5	600	5	3000	0.003 (0.001−0.003)	0.1	9
0.63	40	20000	0.04 (0.035−0.045)	0.5	800	6	3000	0.004 (0.002−0.004)	0.1	12
0.8	50	20000	0.05 (0.045−0.055)	0.8	1000	5	1800	0.006 (0.004−0.006)	0.2	10.8
0.99	62	20000	0.06 (0.055−0.065)	0.8	1200	6	1800	0.01 (0.008−0.01)	0.2	18

Note 1) When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended.
(Order number : MSP0300SB, Cutting conditions : Refer to page N118.)
Note 2) Change cutting conditions depending on your machine and workpiece rigidity.
Note 3) When machining holes over 5D, reduce the step stated above.
Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above.
Lower the revolutions if you use oil fluid or mist.

CARBIDE

MWS

WSTAR DRILLS

●For high accuracy and efficient drilling of carbon steel to difficult-to-cut materials.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

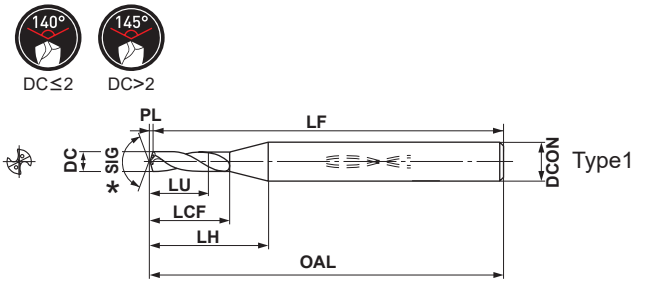
	0.5≤DC<1	1≤DC<2.95
	+0.009 0	+0.014 0
DCON=3		
h6	0 −0.006	

Internal Coolant

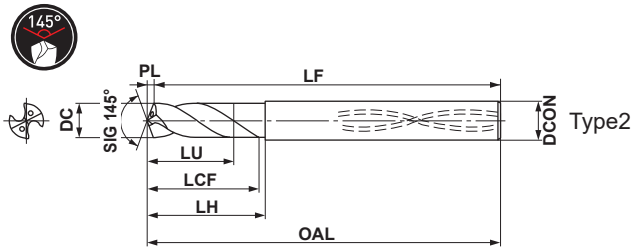
SB Type

(Drill for machining of pilot hole)







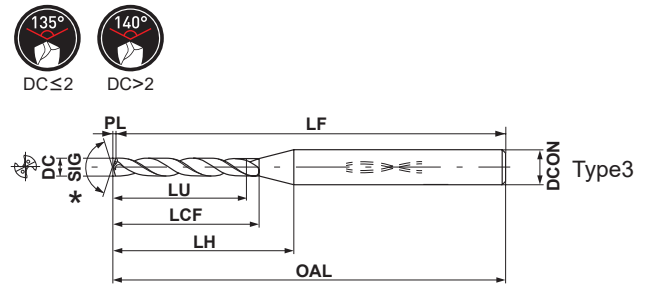


LB/XB Type



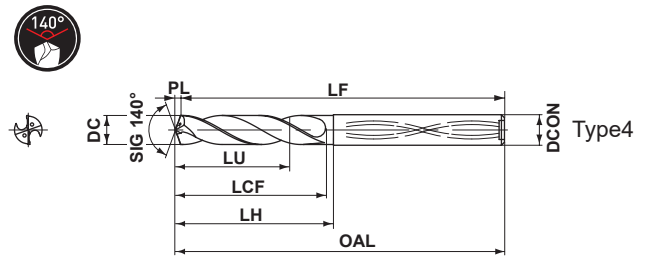


	0.5≤DC<1	1≤DC<2.95
	0 −0.009	0 −0.014
DCON=3		
h6	0 −0.006	



DB Type







Note 1) MWS drills are suitable for use with shrink fit holders.

* Point Angle:Type1 140° for drill diameter ϕ 0.50-2.0 and 145° for ϕ 2.05-2.95.
Type3 135° for drill diameter ϕ 0.50-2.0 and 140° for ϕ 2.05-2.95.

Note 2) Use the MWS...SB type for drilling pilot holes.

N

DRILLING

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
0.50	1	●	MWS0050SB	0.6	2.6	7.3	47.1	47	0.09	3	1
0.50	5	●	MWS0050LB	2.6	8.1	13.1	47.1	47	0.10	3	3
0.50	12	●	MWS0050XB	6.1	16.1	21.1	47.1	47	0.10	3	3
0.51	1	●	MWS0051SB	0.6	2.7	7.3	47.1	47	0.09	3	1
0.51	5	●	MWS0051LB	2.7	8.1	13.1	47.1	47	0.11	3	3
0.51	12	●	MWS0051XB	6.2	16.1	21.1	47.1	47	0.11	3	3
0.52	1	●	MWS0052SB	0.6	2.7	7.3	47.1	47	0.09	3	1
0.52	5	●	MWS0052LB	2.7	8.1	13.1	47.1	47	0.11	3	3
0.52	12	●	MWS0052XB	6.4	16.1	21.1	47.1	47	0.11	3	3
0.53	1	●	MWS0053SB	0.6	2.7	7.3	47.1	47	0.10	3	1
0.53	5	●	MWS0053LB	2.8	8.1	13.1	47.1	47	0.11	3	3
0.53	12	●	MWS0053XB	6.5	16.1	21.1	47.1	47	0.11	3	3
0.54	1	●	MWS0054SB	0.6	2.7	7.3	47.1	47	0.10	3	1
0.54	5	●	MWS0054LB	2.8	8.1	13.1	47.1	47	0.11	3	3
0.54	12	●	MWS0054XB	6.6	16.1	21.1	47.1	47	0.11	3	3
0.55	1	●	MWS0055SB	0.7	2.7	7.3	47.1	47	0.10	3	1
0.55	5	●	MWS0055LB	2.9	8.1	13.1	47.1	47	0.11	3	3
0.55	12	●	MWS0055XB	6.7	16.1	21.1	47.1	47	0.11	3	3
0.56	1	●	MWS0056SB	0.7	3.0	7.6	47.1	47	0.10	3	1
0.56	5	●	MWS0056LB	2.9	8.1	13.1	47.1	47	0.12	3	3
0.56	12	●	MWS0056XB	6.8	16.1	21.1	47.1	47	0.12	3	3
0.57	1	●	MWS0057SB	0.7	3.0	7.5	47.1	47	0.10	3	1
0.57	5	●	MWS0057LB	3.0	8.1	13.1	47.1	47	0.12	3	3
0.57	12	●	MWS0057XB	7.0	16.1	21.1	47.1	47	0.12	3	3
0.58	1	●	MWS0058SB	0.7	3.0	7.5	47.1	47	0.11	3	1
0.58	5	●	MWS0058LB	3.0	8.1	13.1	47.1	47	0.12	3	3
0.58	12	●	MWS0058XB	7.1	16.1	21.1	47.1	47	0.12	3	3
0.59	1	●	MWS0059SB	0.7	3.0	7.5	47.1	47	0.11	3	1
0.59	5	●	MWS0059LB	3.1	8.1	12.1	47.1	47	0.12	3	3
0.59	12	●	MWS0059XB	7.2	16.1	20.1	47.1	47	0.12	3	3
0.60	1	●	MWS0060SB	0.7	3.0	7.5	47.1	47	0.11	3	1
0.60	5	●	MWS0060LB	3.1	8.1	12.1	47.1	47	0.12	3	3
0.60	12	●	MWS0060XB	7.3	16.1	20.1	47.1	47	0.12	3	3
0.61	1	●	MWS0061SB	0.7	3.2	7.7	47.1	47	0.11	3	1
0.61	5	●	MWS0061LB	3.2	8.1	12.1	47.1	47	0.13	3	3
0.61	12	●	MWS0061XB	7.5	16.1	20.1	47.1	47	0.13	3	3
0.62	1	●	MWS0062SB	0.7	3.2	7.6	47.1	47	0.11	3	1
0.62	5	●	MWS0062LB	3.2	8.1	12.1	47.1	47	0.13	3	3
0.62	12	●	MWS0062XB	7.6	16.1	20.1	47.1	47	0.13	3	3
0.63	1	●	MWS0063SB	0.7	3.2	7.6	47.1	47	0.11	3	1
0.63	5	●	MWS0063LB	3.3	8.1	12.1	47.1	47	0.13	3	3
0.63	12	●	MWS0063XB	7.7	16.1	20.1	47.1	47	0.13	3	3
0.64	1	●	MWS0064SB	0.8	3.2	7.6	47.1	47	0.12	3	1
0.64	5	●	MWS0064LB	3.3	8.1	12.1	47.1	47	0.13	3	3
0.64	12	●	MWS0064XB	7.8	16.1	20.1	47.1	47	0.13	3	3
0.65	1	●	MWS0065SB	0.8	3.2	7.6	47.1	47	0.12	3	1
0.65	5	●	MWS0065LB	3.4	8.1	12.1	47.1	47	0.13	3	3
0.65	12	●	MWS0065XB	7.9	16.1	20.1	47.1	47	0.13	3	3
0.66	1	●	MWS0066SB	0.8	3.5	7.9	47.1	47	0.12	3	1
0.66	5	●	MWS0066LB	3.4	8.1	12.1	47.1	47	0.14	3	3
0.66	12	●	MWS0066XB	8.1	16.1	20.1	47.1	47	0.14	3	3
0.67	1	●	MWS0067SB	0.8	3.5	7.8	47.1	47	0.12	3	1
0.67	5	●	MWS0067LB	3.5	8.1	12.1	47.1	47	0.14	3	3
0.67	12	●	MWS0067XB	8.2	16.1	20.1	47.1	47	0.14	3	3
0.68	1	●	MWS0068SB	0.8	3.5	7.8	47.1	47	0.12	3	1
0.68	5	●	MWS0068LB	3.5	8.1	12.1	47.1	47	0.14	3	3
0.68	12	●	MWS0068XB	8.3	16.1	20.1	47.1	47	0.14	3	3
0.69	1	●	MWS0069SB	0.8	3.5	7.8	47.1	47	0.13	3	1
0.69	5	●	MWS0069LB	3.6	8.1	12.1	47.1	47	0.14	3	3
0.69	12	●	MWS0069XB	8.4	16.1	20.1	47.1	47	0.14	3	3
0.70	1	●	MWS0070SB	0.8	3.5	7.8	47.1	47	0.13	3	1
0.70	5	●	MWS0070LB	3.6	8.1	12.1	47.1	47	0.14	3	3
0.70	12	●	MWS0070XB	8.5	16.1	20.1	47.1	47	0.14	3	3
0.71	1	●	MWS0071SB	0.8	3.7	8.0	50.1	50	0.13	3	1
0.71	5	●	MWS0071LB	3.7	10.1	14.1	50.1	50	0.15	3	3
0.71	12	●	MWS0071XB	8.7	20.1	24.1	50.1	50	0.15	3	3
0.72	1	●	MWS0072SB	0.9	3.7	8.0	50.1	50	0.13	3	1
0.72	5	●	MWS0072LB	3.8	10.1	14.1	50.1	50	0.15	3	3
0.72	12	●	MWS0072XB	8.8	20.1	24.1	50.1	50	0.15	3	3
0.73	1	●	MWS0073SB	0.9	3.7	7.9	50.1	50	0.13	3	1
0.73	5	●	MWS0073LB	3.8	10.1	14.1	50.1	50	0.15	3	3
0.73	12	●	MWS0073XB	8.9	20.1	24.1	50.1	50	0.15	3	3
0.74	1	●	MWS0074SB	0.9	3.7	7.9	50.1	50	0.13	3	1
0.74	5	●	MWS0074LB	3.9	10.1	14.1	50.1	50	0.15	3	3
0.74	12	●	MWS0074XB	9.0	20.1	24.1	50.1	50	0.15	3	3
0.75	1	●	MWS0075SB	0.9	3.7	7.9	50.1	50	0.14	3	1
0.75	5	●	MWS0075LB	3.9	10.1	14.1	50.1	50	0.16	3	3
0.75	12	●	MWS0075XB	9.2	20.1	24.1	50.1	50	0.16	3	3
0.76	1	●	MWS0076SB	0.9	4.0	8.2	50.1	50	0.14	3	1
0.76	5	●	MWS0076LB	4.0	10.1	14.1	50.1	50	0.16	3	3
0.76	12	●	MWS0076XB	9.3	20.1	24.1	50.1	50	0.16	3	3
0.77	1	●	MWS0077SB	0.9	4.0	8.2	50.1	50	0.14	3	1
0.77	5	●	MWS0077LB	4.0	10.1	14.1	50.1	50	0.16	3	3
0.77	12	●	MWS0077XB	9.4	20.1	24.1	50.1	50	0.16	3	3
0.78	1	●	MWS0078SB	0.9	4.0	8.1	50.1	50	0.14	3	1
0.78	5	●	MWS0078LB	4.1	10.1	14.1	50.1	50	0.16	3	3
0.78	12	●	MWS0078XB	9.5	20.1	24.1	50.1	50	0.16	3	3
0.79	1	●	MWS0079SB	0.9	4.0	8.1	50.1	50	0.14	3	1
0.79	5	●	MWS0079LB	4.1	10.1	14.1	50.1	50	0.16	3	3
0.79	12	●	MWS0079XB	9.6	20.1	24.1	50.1	50	0.16	3	3
0.80	1	●	MWS0080SB	1.0	4.1	8.2	50.2	50	0.15	3	1
0.80	5	●	MWS0080LB	4.2	10.2	14.2	50.2	50	0.17	3	3
0.80	12	●	MWS0080XB	9.8	20.2	24.2	50.2	50	0.17	3	3
0.81	1	●	MWS0081SB	1.0	4.3	8.4	50.2	50	0.15	3	1
0.81	5	●	MWS0081LB	4.2	10.2	14.2	50.2	50	0.17	3	3
0.81	12	●	MWS0081XB	9.9	20.2	24.2	50.2	50	0.17	3	3

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

MWS

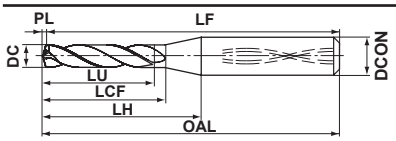
WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
0.82	1	●	MWS0082SB	1.0	4.3	8.4	50.2	50	0.15	3	1
0.82	5	●	MWS0082LB	4.3	10.2	14.2	50.2	50	0.17	3	3
0.82	12	●	MWS0082XB	10.0	20.2	24.2	50.2	50	0.17	3	3
0.83	1	●	MWS0083SB	1.0	4.3	8.3	50.2	50	0.15	3	1
0.83	5	●	MWS0083LB	4.3	10.2	14.2	50.2	50	0.17	3	3
0.83	12	●	MWS0083XB	10.1	20.2	24.2	50.2	50	0.17	3	3
0.84	1	●	MWS0084SB	1.0	4.3	8.3	50.2	50	0.15	3	1
0.84	5	●	MWS0084LB	4.4	10.2	14.2	50.2	50	0.17	3	3
0.84	12	●	MWS0084XB	10.3	20.2	24.2	50.2	50	0.17	3	3
0.85	1	●	MWS0085SB	1.0	4.3	8.3	50.2	50	0.15	3	1
0.85	5	●	MWS0085LB	4.4	10.2	14.2	50.2	50	0.18	3	3
0.85	12	●	MWS0085XB	10.4	20.2	24.2	50.2	50	0.18	3	3
0.86	1	●	MWS0086SB	1.0	4.6	8.6	50.2	50	0.16	3	1
0.86	5	●	MWS0086LB	4.5	10.2	14.2	50.2	50	0.18	3	3
0.86	12	●	MWS0086XB	10.5	20.2	24.2	50.2	50	0.18	3	3
0.87	1	●	MWS0087SB	1.0	4.6	8.6	50.2	50	0.16	3	1
0.87	5	●	MWS0087LB	4.5	10.2	14.2	50.2	50	0.18	3	3
0.87	12	●	MWS0087XB	10.6	20.2	24.2	50.2	50	0.18	3	3
0.88	1	●	MWS0088SB	1.0	4.6	8.6	50.2	50	0.16	3	1
0.88	5	●	MWS0088LB	4.6	10.2	14.2	50.2	50	0.18	3	3
0.88	12	●	MWS0088XB	10.7	20.2	24.2	50.2	50	0.18	3	3
0.89	1	●	MWS0089SB	1.1	4.6	8.5	50.2	50	0.16	3	1
0.89	5	●	MWS0089LB	4.6	10.2	14.2	50.2	50	0.18	3	3
0.89	12	●	MWS0089XB	10.9	20.2	24.2	50.2	50	0.18	3	3
0.90	1	●	MWS0090SB	1.1	4.6	8.5	50.2	50	0.16	3	1
0.90	5	●	MWS0090LB	4.7	10.2	14.2	50.2	50	0.19	3	3
0.90	12	●	MWS0090XB	11.0	20.2	24.2	50.2	50	0.19	3	3
0.91	1	●	MWS0091SB	1.1	4.8	8.7	50.2	50	0.17	3	1
0.91	5	●	MWS0091LB	4.7	10.2	14.2	50.2	50	0.19	3	3
0.91	12	●	MWS0091XB	11.1	20.2	24.2	50.2	50	0.19	3	3
0.92	1	●	MWS0092SB	1.1	4.8	8.7	50.2	50	0.17	3	1
0.92	5	●	MWS0092LB	4.8	10.2	14.2	50.2	50	0.19	3	3
0.92	12	●	MWS0092XB	11.2	20.2	24.2	50.2	50	0.19	3	3
0.93	1	●	MWS0093SB	1.1	4.8	8.7	50.2	50	0.17	3	1
0.93	5	●	MWS0093LB	4.8	10.2	14.2	50.2	50	0.19	3	3
0.93	12	●	MWS0093XB	11.4	20.2	24.2	50.2	50	0.19	3	3
0.94	1	●	MWS0094SB	1.1	4.8	8.6	50.2	50	0.17	3	1
0.94	5	●	MWS0094LB	4.9	10.2	14.2	50.2	50	0.19	3	3
0.94	12	●	MWS0094XB	11.5	20.2	24.2	50.2	50	0.19	3	3
0.95	1	●	MWS0095SB	1.1	4.8	8.6	50.2	50	0.17	3	1
0.95	5	●	MWS0095LB	5.0	10.2	14.2	50.2	50	0.20	3	3
0.95	12	●	MWS0095XB	11.6	20.2	24.2	50.2	50	0.20	3	3
0.96	1	●	MWS0096SB	1.1	5.1	8.9	50.2	50	0.17	3	1
0.96	5	●	MWS0096LB	5.0	10.2	14.2	50.2	50	0.20	3	3
0.96	12	●	MWS0096XB	11.7	20.2	24.2	50.2	50	0.20	3	3
0.97	1	●	MWS0097SB	1.2	5.1	8.9	50.2	50	0.18	3	1
0.97	5	●	MWS0097LB	5.1	10.2	14.2	50.2	50	0.20	3	3
0.97	12	●	MWS0097XB	11.8	20.2	24.2	50.2	50	0.20	3	3
0.98	1	●	MWS0098SB	1.2	5.1	8.9	50.2	50	0.18	3	1
0.98	5	●	MWS0098LB	5.1	10.2	14.2	50.2	50	0.20	3	3
0.98	12	●	MWS0098XB	12.0	20.2	24.2	50.2	50	0.20	3	3
0.99	1	●	MWS0099SB	1.2	5.1	8.9	50.2	50	0.18	3	1
0.99	5	●	MWS0099LB	5.2	10.2	14.2	50.2	50	0.21	3	3
0.99	12	●	MWS0099XB	12.1	20.2	24.2	50.2	50	0.21	3	3
1.00	1	●	MWS0100SB	1.2	5.2	8.9	55.2	55	0.2	3	1
1.00	5	●	MWS0100LB	5.2	11.2	15.2	55.2	55	0.2	3	3
1.00	12	●	MWS0100XB	12.2	23.2	27.2	55.2	55	0.2	3	3
1.00	20	●	MWS0100X20DB	20.2	24.2	28.2	60.2	60	0.2	3	3
1.00	25	●	MWS0100X25DB	25.2	28.2	32.2	66.2	66	0.2	3	3
1.00	30	●	MWS0100X30DB	30.2	33.2	37.2	72.2	72	0.2	3	3
1.05	1	□	MWS0105SB	1.3	5.4	9.0	55.2	55	0.2	3	1
1.05	20	□	MWS0105X20DB	21.2	24.2	28.2	60.2	60	0.2	3	3
1.05	25	□	MWS0105X25DB	26.5	29.2	33.2	66.2	66	0.2	3	3
1.05	30	□	MWS0105X30DB	31.7	35.2	38.2	72.2	72	0.2	3	3
1.10	1	●	MWS0110SB	1.3	5.6	9.1	55.2	55	0.2	3	1
1.10	5	●	MWS0110LB	5.7	17.2	21.2	55.2	55	0.2	3	3
1.10	12	●	MWS0110XB	13.4	23.2	27.2	55.2	55	0.2	3	3
1.10	20	●	MWS0110X20DB	22.2	25.2	29.2	60.2	60	0.2	3	3
1.10	25	●	MWS0110X25DB	27.7	31.2	34.2	66.2	66	0.2	3	3
1.10	30	●	MWS0110X30DB	33.2	36.2	40.2	72.2	72	0.2	3	3
1.15	1	□	MWS0115SB	1.4	5.8	9.3	55.2	55	0.2	3	1
1.15	20	□	MWS0115X20DB	23.2	26.2	30.2	60.2	60	0.2	3	3
1.15	25	□	MWS0115X25DB	29.0	32.2	36.2	66.2	66	0.2	3	3
1.15	30	□	MWS0115X30DB	34.7	38.2	41.2	72.2	72	0.2	3	3
1.20	1	●	MWS0120SB	1.4	6.2	9.6	55.2	55	0.2	3	1
1.20	5	●	MWS0120LB	6.3	17.2	20.2	55.2	55	0.2	3	3
1.20	12	●	MWS0120XB	14.7	23.2	26.2	55.2	55	0.2	3	3
1.20	20	●	MWS0120X20DB	24.3	28.2	31.2	60.2	60	0.2	3	3
1.20	25	●	MWS0120X25DB	30.3	34.2	37.2	66.2	66	0.2	3	3
1.20	30	●	MWS0120X30DB	36.3	40.2	43.2	72.2	72	0.2	3	3
1.25	1	□	MWS0125SB	1.5	6.4	9.7	55.2	55	0.2	3	1
1.25	20	□	MWS0125X20DB	25.3	29.3	32.3	68.3	68	0.3	3	3
1.25	25	□	MWS0125X25DB	31.6	35.3	38.3	74.3	74	0.3	3	3
1.25	30	□	MWS0125X30DB	37.8	41.3	45.3	82.3	82	0.3	3	3
1.30	1	●	MWS0130SB	1.5	6.6	9.8	55.2	55	0.2	3	1
1.30	5	●	MWS0130LB	6.8	17.3	20.3	55.3	55	0.3	3	3
1.30	12	●	MWS0130XB	15.9	23.3	26.3	55.3	55	0.3	3	3
1.30	20	●	MWS0130X20DB	26.3	30.3	33.3	68.3	68	0.3	3	3
1.30	25	●	MWS0130X25DB	32.8	36.3	40.3	74.3	74	0.3	3	3
1.30	30	●	MWS0130X30DB	39.3	43.3	46.3	82.3	82	0.3	3	3
1.35	1	□	MWS0135SB	1.7	6.8	9.9	55.2	55	0.3	3	1
1.35	20	□	MWS0135X20DB	27.3	31.3	34.3	68.3	68	0.3	3	3
1.35	25	□	MWS0135X25DB	34.1	38.3	41.3	74.3	74	0.3	3	3
1.35	30	□	MWS0135X30DB	40.8	45.3	48.3	82.3	82	0.3	3	3
1.40	1	●	MWS0140SB	1.7	7.3	10.3	55.3	55	0.3	3	1
1.40	5	●	MWS0140LB	7.3	17.3	20.3	55.3	55	0.3	3	3

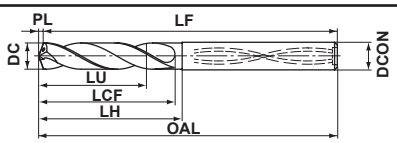
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1, Type3



Type2, Type4

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.40	12	●	MWS0140XB	17.1	23.3	26.3	55.3	55	0.3	3	3
1.40	20	●	MWS0140X20DB	28.3	32.3	35.3	68.3	68	0.3	3	3
1.40	25	●	MWS0140X25DB	35.3	39.3	42.3	74.3	74	0.3	3	3
1.40	30	●	MWS0140X30DB	42.3	46.3	49.3	82.3	82	0.3	3	3
1.45	1	□	MWS0145SB	1.8	7.5	10.4	55.3	55	0.3	3	1
1.45	20	□	MWS0145X20DB	29.3	33.3	36.3	68.3	68	0.3	3	3
1.45	25	□	MWS0145X25DB	36.6	41.3	43.3	74.3	74	0.3	3	3
1.45	30	□	MWS0145X30DB	43.8	48.3	51.3	82.3	82	0.3	3	3
1.50	1	●	MWS0150SB	1.8	7.7	10.5	55.3	55	0.3	3	1
1.50	5	●	MWS0150LB	7.8	17.3	20.3	55.3	55	0.3	3	3
1.50	12	●	MWS0150XB	18.3	23.3	26.3	55.3	55	0.3	3	3
1.50	20	●	MWS0150X20DB	30.3	35.3	37.3	68.3	68	0.3	3	3
1.50	25	●	MWS0150X25DB	37.8	42.3	45.3	74.3	74	0.3	3	3
1.50	30	●	MWS0150X30DB	45.3	50.3	52.3	82.3	82	0.3	3	3
1.55	1	□	MWS0155SB	1.9	7.9	10.6	68.3	68	0.3	3	1
1.55	20	□	MWS0155X20DB	31.3	36.3	38.3	78.3	78	0.3	3	3
1.55	25	□	MWS0155X25DB	39.1	43.3	46.3	86.3	86	0.3	3	3
1.55	30	□	MWS0155X30DB	46.8	51.3	54.3	95.3	95	0.3	3	3
1.60	1	●	MWS0160SB	1.9	8.3	10.9	68.3	68	0.3	3	1
1.60	5	●	MWS0160LB	8.3	22.3	25.3	68.3	68	0.3	3	3
1.60	12	●	MWS0160XB	19.5	30.3	33.3	68.3	68	0.3	3	3
1.60	20	●	MWS0160X20DB	32.3	37.3	39.3	78.3	78	0.3	3	3
1.60	25	●	MWS0160X25DB	40.3	45.3	47.3	86.3	86	0.3	3	3
1.60	30	●	MWS0160X30DB	48.3	53.3	55.3	95.3	95	0.3	3	3
1.65	1	□	MWS0165SB	2.0	8.5	11.0	68.3	68	0.3	3	1
1.65	20	□	MWS0165X20DB	33.3	38.3	40.3	78.3	78	0.3	3	3
1.65	25	□	MWS0165X25DB	41.6	46.3	49.3	86.3	86	0.3	3	3
1.65	30	□	MWS0165X30DB	49.8	54.3	57.3	95.3	95	0.3	3	3
1.70	1	●	MWS0170SB	2.0	8.7	11.1	68.3	68	0.3	3	1
1.70	5	●	MWS0170LB	8.9	22.4	24.4	68.4	68	0.4	3	3
1.70	12	●	MWS0170XB	20.8	30.4	32.4	68.4	68	0.4	3	3
1.70	20	●	MWS0170X20DB	34.4	39.4	42.4	78.4	78	0.4	3	3
1.70	25	●	MWS0170X25DB	42.9	48.4	50.4	86.4	86	0.4	3	3
1.70	30	●	MWS0170X30DB	51.4	56.4	59.4	95.4	95	0.4	3	3
1.75	1	□	MWS0175SB	2.1	8.9	11.2	68.3	68	0.3	3	1
1.75	20	□	MWS0175X20DB	35.4	40.4	43.4	84.4	84	0.4	3	3
1.75	25	□	MWS0175X25DB	44.2	49.4	51.4	94.4	94	0.4	3	3
1.75	30	□	MWS0175X30DB	52.9	58.4	60.4	102.4	102	0.4	3	3
1.80	1	●	MWS0180SB	2.1	9.3	11.5	68.3	68	0.3	3	1
1.80	5	●	MWS0180LB	9.4	22.4	24.4	68.4	68	0.4	3	3
1.80	12	●	MWS0180XB	22.0	30.4	32.4	68.4	68	0.4	3	3
1.80	20	●	MWS0180X20DB	36.4	41.4	44.4	84.4	84	0.4	3	3
1.80	25	●	MWS0180X25DB	45.4	50.4	53.4	94.4	94	0.4	3	3
1.80	30	●	MWS0180X30DB	54.4	59.4	62.4	102.4	102	0.4	3	3
1.85	1	□	MWS0185SB	2.2	9.5	11.6	68.3	68	0.3	3	1
1.85	20	□	MWS0185X20DB	37.4	43.4	45.4	84.4	84	0.4	3	3
1.85	25	□	MWS0185X25DB	46.7	52.4	54.4	94.4	94	0.4	3	3
1.85	30	□	MWS0185X30DB	55.9	61.4	63.4	102.4	102	0.4	3	3

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.90	1	●	MWS0190SB	2.3	9.7	11.8	68.3	68	0.3	3	1
1.90	5	●	MWS0190LB	9.9	22.4	24.4	68.4	68	0.4	3	3
1.90	12	●	MWS0190XB	23.2	30.4	32.4	68.4	68	0.4	3	3
1.90	20	●	MWS0190X20DB	38.4	44.4	46.4	84.4	84	0.4	3	3
1.90	25	●	MWS0190X25DB	47.9	53.4	55.4	94.4	94	0.4	3	3
1.90	30	●	MWS0190X30DB	57.4	63.4	65.4	102.4	102	0.4	3	3
1.95	1	□	MWS0195SB	2.4	10.0	12.0	68.4	68	0.4	3	1
1.95	20	□	MWS0195X20DB	39.4	45.4	47.4	84.4	84	0.4	3	3
1.95	25	□	MWS0195X25DB	49.2	55.4	57.4	94.4	94	0.4	3	3
1.95	30	□	MWS0195X30DB	58.9	64.4	66.4	102.4	102	0.4	3	3
2.00	1	●	MWS0200SB	2.4	10.4	12.3	68.4	68	0.4	3	1
2.00	5	●	MWS0200LB	10.4	22.4	24.4	68.4	68	0.4	3	3
2.00	12	●	MWS0200XB	24.4	30.4	32.4	68.4	68	0.4	3	3
2.00	20	●	MWS0200X20DB	40.4	46.4	48.4	84.4	84	0.4	3	3
2.00	25	●	MWS0200X25DB	50.4	56.4	58.4	94.4	94	0.4	3	3
2.00	30	●	MWS0200X30DB	60.4	66.4	68.4	102.4	102	0.4	3	3
2.05	1	□	MWS0205SB	2.4	10.5	12.3	74.3	74	0.3	3	1
2.05	20	□	MWS0205X20DB	41.4	47.4	49.4	94.4	94	0.4	3	3
2.05	25	□	MWS0205X25DB	51.7	57.4	59.4	107.4	107	0.4	3	3
2.05	30	□	MWS0205X30DB	61.9	68.4	69.4	118.4	118	0.4	3	3
2.10	1	●	MWS0210SB	2.4	10.7	12.4	74.3	74	0.3	3	1
2.10	5	●	MWS0210LB	10.9	28.4	30.4	74.4	74	0.4	3	3
2.10	12	●	MWS0210XB	25.6	38.4	40.4	74.4	74	0.4	3	3
2.10	20	●	MWS0210X20DB	42.4	48.4	50.4	94.4	94	0.4	3	3
2.10	25	●	MWS0210X25DB	52.9	59.4	60.4	107.4	107	0.4	3	3
2.10	30	●	MWS0210X30DB	63.4	69.4	71.4	118.4	118	0.4	3	3
2.15	1	□	MWS0215SB	2.5	10.9	12.5	74.3	74	0.3	3	1
2.15	20	□	MWS0215X20DB	43.4	49.4	51.4	94.4	94	0.4	3	3
2.15	25	□	MWS0215X25DB	54.2	60.4	62.4	107.4	107	0.4	3	3
2.15	30	□	MWS0215X30DB	64.9	71.4	73.4	118.4	118	0.4	3	3
2.20	1	●	MWS0220SB	2.6	11.3	12.8	74.3	74	0.3	3	1
2.20	5	●	MWS0220LB	11.4	28.4	29.4	74.4	74	0.4	3	3
2.20	12	●	MWS0220XB	26.8	38.4	39.4	74.4	74	0.4	3	3
2.20	20	●	MWS0220X20DB	44.4	51.4	52.4	94.4	94	0.4	3	3
2.20	25	●	MWS0220X25DB	55.4	62.4	63.4	107.4	107	0.4	3	3
2.20	30	●	MWS0220X30DB	66.4	73.4	74.4	118.4	118	0.4	3	3
2.25	1	□	MWS0225SB	2.7	11.6	13.0	74.4	74	0.4	3	1
2.25	20	□	MWS0225X20DB	45.4	52.4	53.4	94.4	94	0.4	3	3
2.25	25	□	MWS0225X25DB	56.7	63.4	64.4	107.4	107	0.4	3	3
2.25	30	□	MWS0225X30DB	67.9	74.4	76.4	118.4	118	0.4	3	3
2.30	1	●	MWS0230SB	2.7	11.8	13.1	74.4	74	0.4	3	1
2.30	5	●	MWS0230LB	11.9	28.4	29.4	74.4	74	0.4	3	3
2.30	12	●	MWS0230XB	28.0	38.4	39.4	74.4	74	0.4	3	3
2.30	20	●	MWS0230X20DB	46.4	53.4	54.4	94.4	94	0.4	3	3
2.30	25	●	MWS0230X25DB	57.9	64.4	66.4	107.4	107	0.4	3	3
2.30	30	●	MWS0230X30DB	69.4	76.4	77.4	118.4	118	0.4	3	3
2.35	1	□	MWS0235SB	2.8	12.0	13.2	74.4	74	0.4	3	1
2.35	20	□	MWS0235X20DB	47.4	54.4	55.4	94.4	94	0.4	3	3

MWS

WSTAR DRILLS

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
2.35	25	□	MWS0235X25DB	59.2	66.4	67.4	107.4	107	0.4	3	3
2.35	30	□	MWS0235X30DB	70.9	78.4	79.4	118.4	118	0.4	3	3
2.40	1	●	MWS0240SB	2.8	12.4	13.5	74.4	74	0.4	3	1
2.40	5	●	MWS0240LB	12.4	28.4	29.4	74.4	74	0.4	3	3
2.40	12	●	MWS0240XB	29.2	38.4	39.4	74.4	74	0.4	3	3
2.40	20	●	MWS0240X20DB	48.4	55.4	56.4	94.4	94	0.4	3	3
2.40	25	●	MWS0240X25DB	60.4	67.4	68.4	107.4	107	0.4	3	3
2.40	30	●	MWS0240X30DB	72.4	79.4	80.4	118.4	118	0.4	3	3
2.45	1	□	MWS0245SB	2.9	12.6	13.6	74.4	74	0.4	3	1
2.45	20	□	MWS0245X20DB	49.5	56.4	57.4	94.4	94	0.4	3	3
2.45	25	□	MWS0245X25DB	61.8	69.4	70.4	107.4	107	0.4	3	3
2.45	30	□	MWS0245X30DB	74.0	81.4	82.4	118.4	118	0.4	3	3
2.50	1	●	MWS0250SB	2.9	12.8	13.7	74.4	74	0.4	3	1
2.50	5	●	MWS0250LB	13.0	28.5	29.5	74.5	74	0.5	3	3
2.50	12	●	MWS0250XB	30.5	38.5	39.5	74.5	74	0.5	3	3
2.50	20	●	MWS0250X20DB	50.5	58.5	59.5	94.5	94	0.5	3	3
2.50	25	●	MWS0250X25DB	63.0	70.5	71.5	107.5	107	0.5	3	3
2.50	30	●	MWS0250X30DB	75.5	83.5	84.5	118.5	118	0.5	3	3
2.55	1	□	MWS0255SB	3.1	13.0	13.0	81.4	81	0.4	3	2
2.55	20	□	MWS0255X20DB	51.5	59.5	59.5	103.5	103	0.5	3	4
2.55	25	□	MWS0255X25DB	64.3	71.5	71.5	117.5	117	0.5	3	4
2.55	30	□	MWS0255X30DB	77.0	84.5	84.5	132.5	132	0.5	3	4
2.60	1	●	MWS0260SB	3.1	13.4	13.4	81.4	81	0.4	3	2
2.60	5	●	MWS0260LB	13.5	33.5	33.5	81.5	81	0.5	3	4
2.60	12	●	MWS0260XB	31.7	45.5	45.5	81.5	81	0.5	3	4
2.60	20	●	MWS0260X20DB	52.5	60.5	60.5	103.5	103	0.5	3	4
2.60	25	●	MWS0260X25DB	65.5	73.5	73.5	117.5	117	0.5	3	4
2.60	30	●	MWS0260X30DB	78.5	86.5	86.5	132.5	132	0.5	3	4
2.65	1	□	MWS0265SB	3.2	13.6	13.6	81.4	81	0.4	3	2
2.65	20	□	MWS0265X20DB	53.5	61.5	61.5	103.5	103	0.5	3	4
2.65	25	□	MWS0265X25DB	66.8	74.5	74.5	117.5	117	0.5	3	4
2.65	30	□	MWS0265X30DB	80.0	87.5	87.5	132.5	132	0.5	3	4
2.70	1	●	MWS0270SB	3.2	13.8	13.8	81.4	81	0.4	3	2
2.70	5	●	MWS0270LB	14.0	33.5	33.5	81.5	81	0.5	3	4
2.70	12	●	MWS0270XB	32.9	45.5	45.5	81.5	81	0.5	3	4
2.70	20	●	MWS0270X20DB	54.5	62.5	62.5	103.5	103	0.5	3	4
2.70	25	●	MWS0270X25DB	68.0	76.5	76.5	117.5	117	0.5	3	4
2.70	30	●	MWS0270X30DB	81.5	89.5	89.5	132.5	132	0.5	3	4
2.75	1	□	MWS0275SB	3.3	14.0	14.0	81.4	81	0.4	3	2
2.75	20	□	MWS0275X20DB	55.5	63.5	63.5	103.5	103	0.5	3	4
2.75	25	□	MWS0275X25DB	69.3	77.5	77.5	117.5	117	0.5	3	4
2.75	30	□	MWS0275X30DB	83.0	91.5	91.5	132.5	132	0.5	3	4
2.80	1	●	MWS0280SB	3.3	14.4	14.4	81.4	81	0.4	3	2
2.80	5	●	MWS0280LB	14.5	33.5	33.5	81.5	81	0.5	3	4
2.80	12	●	MWS0280XB	34.1	45.5	45.5	81.5	81	0.5	3	4
2.80	20	●	MWS0280X20DB	56.5	64.5	64.5	103.5	103	0.5	3	4
2.80	25	●	MWS0280X25DB	70.5	78.5	78.5	117.5	117	0.5	3	4
2.80	30	●	MWS0280X30DB	84.5	92.5	92.5	132.5	132	0.5	3	4
2.85	1	□	MWS0285SB	3.4	14.6	14.6	81.4	81	0.4	3	2
2.85	20	□	MWS0285X20DB	57.5	66.5	66.5	103.5	103	0.5	3	4
2.85	25	□	MWS0285X25DB	71.8	80.5	80.5	117.5	117	0.5	3	4
2.85	30	□	MWS0285X30DB	86.0	94.5	94.5	132.5	132	0.5	3	4
2.90	1	●	MWS0290SB	3.4	14.9	14.9	81.5	81	0.5	3	2
2.90	5	●	MWS0290LB	15.0	33.5	33.5	81.5	81	0.5	3	4
2.90	12	●	MWS0290XB	35.3	45.5	45.5	81.5	81	0.5	3	4
2.90	20	●	MWS0290X20DB	58.5	67.5	67.5	103.5	103	0.5	3	4
2.90	25	●	MWS0290X25DB	73.0	81.5	81.5	117.5	117	0.5	3	4
2.90	30	●	MWS0290X30DB	87.5	96.5	96.5	132.5	132	0.5	3	4
2.95	1	□	MWS0295SB	3.5	15.1	15.1	81.5	81	0.5	3	2
2.95	20	□	MWS0295X20DB	59.5	68.5	68.5	103.5	103	0.5	3	4
2.95	25	□	MWS0295X25DB	74.3	83.5	83.5	117.5	117	0.5	3	4
2.95	30	□	MWS0295X30DB	89.0	97.5	97.5	132.5	132	0.5	3	4

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

ISO13399 ➤ N002

RECOMMENDED CUTTING CONDITIONS

■ SB/LB/XB Type Drill(L/D≤12)

Workpiece Material	Mild Steel (≤180HB) AISI 1010 etc				Carbon Steel･Alloy Steel (180−280HB) AISI 1045, AISI 4140 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Table Feed (mm/min)
0.5	40	25400	0.01 (0.005−0.015)	250	40	25400	0.01 (0.005−0.015)	250
0.63	40	20200	0.014 (0.008−0.020)	280	40	20200	0.014 (0.008−0.020)	280
0.8	45	17900	0.028 (0.016−0.040)	500	45	17900	0.028 (0.016−0.040)	500
1.0	50	15900	0.035 (0.020−0.050)	555	50	15900	0.035 (0.020−0.050)	555
1.2	50	13200	0.045 (0.030−0.060)	590	50	13200	0.045 (0.030−0.060)	590
1.6	50	9900	0.055 (0.035−0.080)	540	50	9900	0.055 (0.035−0.080)	540
2.0	50	7900	0.07 (0.040−0.100)	550	50	7900	0.07 (0.040−0.100)	550
2.5	60	7600	0.085 (0.050−0.125)	645	60	7600	0.085 (0.050−0.125)	645
2.9	60	7600	0.085 (0.050−0.125)	645	60	7600	0.085 (0.050−0.125)	645

Workpiece Material	Carbon Steel･Alloy Steel (280−350HB) AISI 4340 etc				Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Table Feed (mm/min)
0.5	30	19000	0.01 (0.005−0.015)	190	20	12700	0.008 (0.005−0.010)	100
0.63	30	15100	0.014 (0.008−0.020)	210	20	10100	0.01 (0.008−0.013)	100
0.8	35	13900	0.028 (0.016−0.040)	385	25	9900	0.02 (0.016−0.026)	195
1.0	40	12700	0.035 (0.020−0.050)	440	30	9500	0.03 (0.020−0.044)	285
1.2	40	10600	0.045 (0.030−0.060)	475	30	7900	0.04 (0.030−0.053)	315
1.6	40	7900	0.055 (0.035−0.080)	430	30	5900	0.05 (0.035−0.070)	295
2.0	40	6300	0.07 (0.040−0.100)	440	30	4700	0.06 (0.040−0.080)	280
2.5	50	6300	0.085 (0.050−0.125)	535	40	5000	0.075 (0.050−0.100)	375
2.9	50	6300	0.085 (0.050−0.125)	535	40	5000	0.075 (0.050−0.100)	375

MWS

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

■ SB/LB/XB Type Drill(L/D≤12)

Workpiece Material	Gray Cast Iron (≤350MPa) No 45 B etc				Ductile Cast Iron (≤450MPa) 60-40-8 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.5	40	25400	0.01 (0.005—0.015)	250	30	19000	0.01 (0.005—0.015)	190
0.63	40	20200	0.014 (0.008—0.020)	280	30	15100	0.014 (0.008—0.020)	210
0.8	45	17900	0.028 (0.016—0.040)	500	35	13900	0.028 (0.016—0.040)	385
1.0	50	15900	0.035 (0.020—0.050)	555	40	12700	0.035 (0.020—0.050)	440
1.2	50	13200	0.045 (0.030—0.060)	590	40	10600	0.045 (0.030—0.060)	475
1.6	50	9900	0.055 (0.035—0.080)	540	40	7900	0.055 (0.035—0.080)	430
2.0	50	7900	0.07 (0.040—0.100)	550	40	6300	0.07 (0.040—0.100)	440
2.5	60	7600	0.085 (0.050—0.125)	645	50	6300	0.085 (0.050—0.125)	535
2.9	60	7600	0.085 (0.050—0.125)	645	50	6300	0.085 (0.050—0.125)	535

Workpiece Material	Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc				Heat Resistant Alloys Inconel718			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.5	40	25400	0.014 (0.008—0.020)	355	10	6300	0.006 (0.004—0.008)	35
0.63	40	20200	0.02 (0.012—0.030)	400	10	5000	0.008 (0.007—0.010)	40
0.8	45	17900	0.036 (0.024—0.050)	640	10	3900	0.016 (0.013—0.021)	60
1.0	60	19000	0.05 (0.030—0.075)	950	10	3100	0.02 (0.016—0.027)	60
1.2	70	18500	0.065 (0.045—0.090)	1200	10	2600	0.025 (0.022—0.032)	65
1.6	80	15900	0.085 (0.053—0.120)	1350	10	1900	0.03 (0.025—0.040)	55
2.0	90	14300	0.105 (0.060—0.150)	1500	15	2300	0.04 (0.032—0.050)	90
2.5	100	12700	0.135 (0.075—0.200)	1710	15	1900	0.05 (0.040—0.060)	95
2.9	100	12700	0.135 (0.075—0.200)	1710	15	1900	0.05 (0.040—0.060)	95

■ DB Type Drill(L/D>12)

Workpiece Material	Mild Steel (≤180 HB) AISI 1010 etc				Carbon Steel·Alloy Steel (180—280HB) AISI 1045, AISI 4140 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	50	15900	0.02 (0.010—0.030)	320	40	12700	0.02 (0.010—0.030)	255
1.2	50	13200	0.025 (0.016—0.037)	330	40	10600	0.025 (0.016—0.037)	265
1.6	50	9900	0.055 (0.032—0.080)	545	40	7900	0.055 (0.032—0.080)	435
2.0	60	9500	0.07 (0.040—0.100)	665	50	7900	0.07 (0.040—0.100)	550
2.5	60	7600	0.09 (0.063—0.125)	685	50	6300	0.09 (0.055—0.125)	565
2.9	60	7600	0.09 (0.063—0.125)	685	50	6300	0.09 (0.055—0.125)	565

Workpiece Material	Carbon Steel·Alloy Steel (280—350HB) AISI 4340 etc				Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	30	9500	0.015 (0.009—0.028)	140	30	9500	0.015 (0.009—0.028)	140
1.2	30	7900	0.02 (0.013—0.035)	160	30	7900	0.02 (0.013—0.035)	155
1.6	30	5900	0.05 (0.027—0.076)	295	30	5900	0.045 (0.025—0.065)	265
2.0	50	7900	0.065 (0.034—0.095)	515	30	4700	0.055 (0.030—0.080)	255
2.5	50	6300	0.08 (0.045—0.120)	505	40	5000	0.06 (0.035—0.085)	300
2.9	50	6300	0.08 (0.045—0.120)	505	40	5000	0.06 (0.035—0.085)	300

Workpiece Material	Gray Cast Iron (≤350MPa) No 45 B etc				Ductile Cast Iron (≤450MPa) 60-40-8 etc			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	40	12700	0.02 (0.010—0.030)	255	30	9500	0.015 (0.009—0.028)	140
1.2	40	10600	0.025 (0.016—0.037)	265	30	7900	0.02 (0.013—0.035)	160
1.6	40	7900	0.055 (0.032—0.080)	435	30	5900	0.05 (0.027—0.076)	295
2.0	50	7900	0.07 (0.040—0.100)	550	50	7900	0.065 (0.034—0.095)	515
2.5	50	6300	0.09 (0.055—0.125)	565	50	6300	0.08 (0.045—0.120)	505
2.9	50	6300	0.09 (0.055—0.125)	565	50	6300	0.08 (0.045—0.120)	505

Workpiece Material	Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc				Heat Resistant Alloys Inconel718			
Drill Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	50	15900	0.05 (0.030—0.075)	795	10	3100	0.02 (0.016—0.027)	60
1.2	60	15900	0.065 (0.045—0.090)	1035	10	2600	0.025 (0.022—0.032)	65
1.6	70	13900	0.085 (0.053—0.120)	1180	10	1900	0.03 (0.025—0.040)	55
2.0	80	12700	0.105 (0.060—0.150)	1335	15	2300	0.04 (0.032—0.050)	90
2.5	90	11400	0.135 (0.075—0.200)	1540	15	1900	0.05 (0.040—0.060)	95
2.9	90	11400	0.135 (0.075—0.200)	1540	15	1900	0.05 (0.040—0.060)	95

DRILLING(SOLID CARBIDE)

MZE

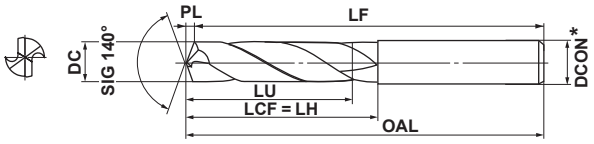
●A wide groove width provides good chip discharge.

UWC VP 140° X

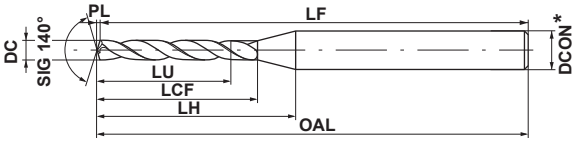
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

External Coolant





Type1



Type2

* DCON <2 : h6
DCON ≥2 : h8

	DC<2	2≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
	0 −0.014	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
		2≤DCON≤3	3<DCON≤6	6<DCON≤10	10<DCON≤18	18<DCON≤20
h6 h8		0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033

Note 1) Use the MZE-SA type for drilling pilot holes.

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	●	MZE0100SB	2.2	6.2	8.2	55.2	55	0.2	2.0	2
1.1	2	●	MZE0110SB	2.4	7.2	9.2	55.2	55	0.2	2.0	2
1.2	2	●	MZE0120SB	2.6	8.2	9.2	55.2	55	0.2	2.0	2
1.3	2	●	MZE0130SB	2.8	8.2	9.2	55.2	55	0.2	2.0	2
1.4	2	●	MZE0140SB	3.1	9.3	10.3	55.3	55	0.3	2.0	2
1.5	2	●	MZE0150SB	3.3	9.3	10.3	55.3	55	0.3	2.0	2
1.6	2	●	MZE0160SB	3.5	10.3	10.3	55.3	55	0.3	2.0	1
1.7	2	●	MZE0170SB	3.7	10.3	10.3	55.3	55	0.3	2.0	1
1.8	2	●	MZE0180SB	3.9	11.3	11.3	55.3	55	0.3	2.0	1
1.9	2	●	MZE0190SB	4.1	11.3	11.3	55.3	55	0.3	2.0	1
2.0	2	●	MZE0200SA	4.4	12.4	12.4	55.4	55	0.4	2.0	1
2.0	3	●	MZE0200MA	6.4	16.4	16.4	55.4	55	0.4	2.0	1
2.1	2	●	MZE0210SA	4.6	12.4	12.4	55.4	55	0.4	2.1	1
2.1	3	●	MZE0210MA	6.7	16.4	16.4	55.4	55	0.4	2.1	1
2.2	2	●	MZE0220SA	4.8	13.4	13.4	55.4	55	0.4	2.2	1
2.2	3	●	MZE0220MA	7.0	18.4	18.4	55.4	55	0.4	2.2	1
2.3	2	●	MZE0230SA	5.0	13.4	13.4	55.4	55	0.4	2.3	1
2.3	3	●	MZE0230MA	7.3	18.4	18.4	55.4	55	0.4	2.3	1
2.4	2	●	MZE0240SA	5.2	16.4	16.4	55.4	55	0.4	2.4	1
2.4	3	●	MZE0240MA	7.6	20.4	20.4	55.4	55	0.4	2.4	1
2.5	2	●	MZE0250SA	5.5	16.5	16.5	55.5	55	0.5	2.5	1
2.5	3	●	MZE0250MA	8.0	20.5	20.5	55.5	55	0.5	2.5	1
2.6	2	●	MZE0260SA	5.7	16.5	16.5	55.5	55	0.5	2.6	1
2.6	3	●	MZE0260MA	8.3	20.5	20.5	55.5	55	0.5	2.6	1
2.7	2	●	MZE0270SA	5.9	16.5	16.5	55.5	55	0.5	2.7	1
2.7	3	●	MZE0270MA	8.6	20.5	20.5	55.5	55	0.5	2.7	1

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
2.8	2	●	MZE0280SA	6.1	16.5	16.5	55.5	55	0.5	2.8	1
2.8	3	●	MZE0280MA	8.9	21.5	21.5	60.5	60	0.5	2.8	1
2.9	2	●	MZE0290SA	6.3	16.5	16.5	55.5	55	0.5	2.9	1
2.9	3	●	MZE0290MA	9.2	21.5	21.5	60.5	60	0.5	2.9	1
3.0	2	●	MZE0300SA	6.5	16.5	16.5	55.5	55	0.5	3.0	1
3.0	3	●	MZE0300MA	9.5	21.5	21.5	60.5	60	0.5	3.0	1
3.1	2	●	MZE0310SA	6.8	18.6	18.6	55.6	55	0.6	3.1	1
3.1	3	●	MZE0310MA	9.9	24.6	24.6	60.6	60	0.6	3.1	1
3.2	2	●	MZE0320SA	7.0	18.6	18.6	55.6	55	0.6	3.2	1
3.2	3	●	MZE0320MA	10.2	24.6	24.6	60.6	60	0.6	3.2	1
3.3	2	●	MZE0330SA	7.2	18.6	18.6	55.6	55	0.6	3.3	1
3.3	3	●	MZE0330MA	10.5	24.6	24.6	60.6	60	0.6	3.3	1
3.4	2	●	MZE0340SA	7.4	20.6	20.6	55.6	55	0.6	3.4	1
3.4	3	●	MZE0340MA	10.8	24.6	24.6	60.6	60	0.6	3.4	1
3.5	2	●	MZE0350SA	7.6	20.6	20.6	55.6	55	0.6	3.5	1
3.5	3	●	MZE0350MA	11.1	24.6	24.6	60.6	60	0.6	3.5	1
3.6	2	●	MZE0360SA	7.9	20.7	20.7	55.7	55	0.7	3.6	1
3.6	3	●	MZE0360MA	11.5	27.7	27.7	60.7	60	0.7	3.6	1
3.7	2	●	MZE0370SA	8.1	20.7	20.7	55.7	55	0.7	3.7	1
3.7	3	●	MZE0370MA	11.8	27.7	27.7	60.7	60	0.7	3.7	1
3.8	2	●	MZE0380SA	8.3	22.7	22.7	55.7	55	0.7	3.8	1
3.8	3	●	MZE0380MA	12.1	27.7	27.7	60.7	60	0.7	3.8	1
3.9	2	●	MZE0390SA	8.5	22.7	22.7	55.7	55	0.7	3.9	1
3.9	3	●	MZE0390MA	12.4	27.7	27.7	60.7	60	0.7	3.9	1
4.0	2	●	MZE0400SA	8.7	22.7	22.7	55.7	55	0.7	4.0	1
4.0	3	●	MZE0400MA	12.7	27.7	27.7	60.7	60	0.7	4.0	1

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
4.1	2	●	MZE0410SA	8.9	22.7	22.7	55.7	55	0.7	4.1	1
4.1	3	●	MZE0410MA	13.0	29.7	29.7	63.7	63	0.7	4.1	1
4.2	2	●	MZE0420SA	9.2	22.8	22.8	55.8	55	0.8	4.2	1
4.2	3	●	MZE0420MA	13.4	29.8	29.8	63.8	63	0.8	4.2	1
4.3	2	●	MZE0430SA	9.4	24.8	24.8	58.8	58	0.8	4.3	1
4.3	3	●	MZE0430MA	13.7	29.8	29.8	63.8	63	0.8	4.3	1
4.4	2	●	MZE0440SA	9.6	24.8	24.8	58.8	58	0.8	4.4	1
4.4	3	●	MZE0440MA	14.0	29.8	29.8	63.8	63	0.8	4.4	1
4.5	2	●	MZE0450SA	9.8	24.8	24.8	58.8	58	0.8	4.5	1
4.5	3	●	MZE0450MA	14.3	29.8	29.8	63.8	63	0.8	4.5	1
4.6	2	●	MZE0460SA	10.0	24.8	24.8	58.8	58	0.8	4.6	1
4.6	3	●	MZE0460MA	14.6	32.8	32.8	68.8	68	0.8	4.6	1
4.7	2	●	MZE0470SA	10.3	24.9	24.9	58.9	58	0.9	4.7	1
4.7	3	●	MZE0470MA	15.0	32.9	32.9	68.9	68	0.9	4.7	1
4.8	2	●	MZE0480SA	10.5	26.9	26.9	62.9	62	0.9	4.8	1
4.8	3	●	MZE0480MA	15.3	32.9	32.9	68.9	68	0.9	4.8	1
4.9	2	●	MZE0490SA	10.7	26.9	26.9	62.9	62	0.9	4.9	1
4.9	3	●	MZE0490MA	15.6	32.9	32.9	68.9	68	0.9	4.9	1
5.0	2	●	MZE0500SA	10.9	26.9	26.9	62.9	62	0.9	5.0	1
5.0	3	●	MZE0500MA	15.9	32.9	32.9	68.9	68	0.9	5.0	1
5.1	2	●	MZE0510SA	11.1	26.9	26.9	62.9	62	0.9	5.1	1
5.1	3	●	MZE0510MA	16.2	34.9	34.9	72.9	72	0.9	5.1	1
5.2	2	●	MZE0520SA	11.3	26.9	26.9	62.9	62	0.9	5.2	1
5.2	3	●	MZE0520MA	16.5	34.9	34.9	72.9	72	0.9	5.2	1
5.3	2	●	MZE0530SA	11.6	27.0	27.0	63.0	62	1.0	5.3	1
5.3	3	●	MZE0530MA	16.9	35.0	35.0	73.0	72	1.0	5.3	1
5.4	2	●	MZE0540SA	11.8	29.0	29.0	67.0	66	1.0	5.4	1
5.4	3	●	MZE0540MA	17.2	35.0	35.0	73.0	72	1.0	5.4	1
5.5	2	●	MZE0550SA	12.0	29.0	29.0	67.0	66	1.0	5.5	1
5.5	3	●	MZE0550MA	17.5	35.0	35.0	73.0	72	1.0	5.5	1
5.6	2	●	MZE0560SA	12.2	29.0	29.0	67.0	66	1.0	5.6	1
5.6	3	●	MZE0560MA	17.8	37.0	37.0	75.0	74	1.0	5.6	1
5.7	2	●	MZE0570SA	12.4	29.0	29.0	67.0	66	1.0	5.7	1
5.7	3	●	MZE0570MA	18.1	37.0	37.0	75.0	74	1.0	5.7	1
5.8	2	●	MZE0580SA	12.7	29.1	29.1	67.1	66	1.1	5.8	1
5.8	3	●	MZE0580MA	18.5	37.1	37.1	75.1	74	1.1	5.8	1
5.9	2	●	MZE0590SA	12.9	29.1	29.1	67.1	66	1.1	5.9	1
5.9	3	●	MZE0590MA	18.8	37.1	37.1	75.1	74	1.1	5.9	1
6.0	2	●	MZE0600SA	13.1	29.1	29.1	67.1	66	1.1	6.0	1
6.0	3	●	MZE0600MA	19.1	42.1	42.1	82.1	81	1.1	6.0	1
6.1	2	●	MZE0610SA	13.3	32.1	32.1	71.1	70	1.1	6.1	1
6.1	3	●	MZE0610MA	19.4	42.1	42.1	82.1	81	1.1	6.1	1
6.2	2	●	MZE0620SA	13.5	32.1	32.1	71.1	70	1.1	6.2	1
6.2	3	●	MZE0620MA	19.7	42.1	42.1	82.1	81	1.1	6.2	1
6.3	2	●	MZE0630SA	13.7	32.1	32.1	71.1	70	1.1	6.3	1
6.3	3	●	MZE0630MA	20.0	42.1	42.1	82.1	81	1.1	6.3	1
6.4	2	●	MZE0640SA	14.0	32.2	32.2	71.2	70	1.2	6.4	1
6.4	3	●	MZE0640MA	20.4	42.2	42.2	82.2	81	1.2	6.4	1

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
6.5	2	●	MZE0650SA	14.2	32.2	32.2	71.2	70	1.2	6.5	1
6.5	3	●	MZE0650MA	20.7	42.2	42.2	82.2	81	1.2	6.5	1
6.6	2	●	MZE0660SA	14.4	32.2	32.2	71.2	70	1.2	6.6	1
6.6	3	●	MZE0660MA	21.0	44.2	44.2	84.2	83	1.2	6.6	1
6.7	2	●	MZE0670SA	14.6	32.2	32.2	71.2	70	1.2	6.7	1
6.7	3	●	MZE0670MA	21.3	44.2	44.2	84.2	83	1.2	6.7	1
6.8	2	●	MZE0680SA	14.8	35.2	35.2	75.2	74	1.2	6.8	1
6.8	3	●	MZE0680MA	21.6	44.2	44.2	84.2	83	1.2	6.8	1
6.9	2	●	MZE0690SA	15.1	35.3	35.3	75.3	74	1.3	6.9	1
6.9	3	●	MZE0690MA	22.0	44.3	44.3	84.3	83	1.3	6.9	1
7.0	2	●	MZE0700SA	15.3	35.3	35.3	75.3	74	1.3	7.0	1
7.0	3	●	MZE0700MA	22.3	44.3	44.3	84.3	83	1.3	7.0	1
7.1	2	●	MZE0710SA	15.5	35.3	35.3	75.3	74	1.3	7.1	1
7.1	3	●	MZE0710MA	22.6	46.3	46.3	88.3	87	1.3	7.1	1
7.2	2	●	MZE0720SA	15.7	35.3	35.3	75.3	74	1.3	7.2	1
7.2	3	●	MZE0720MA	22.9	46.3	46.3	88.3	87	1.3	7.2	1
7.3	2	●	MZE0730SA	15.9	35.3	35.3	75.3	74	1.3	7.3	1
7.3	3	●	MZE0730MA	23.2	46.3	46.3	88.3	87	1.3	7.3	1
7.4	2	●	MZE0740SA	16.1	35.3	35.3	75.3	74	1.3	7.4	1
7.4	3	●	MZE0740MA	23.5	46.3	46.3	88.3	87	1.3	7.4	1
7.5	2	●	MZE0750SA	16.4	35.4	35.4	75.4	74	1.4	7.5	1
7.5	3	●	MZE0750MA	23.9	46.4	46.4	88.4	87	1.4	7.5	1
7.6	2	●	MZE0760SA	16.6	38.4	38.4	80.4	79	1.4	7.6	1
7.6	3	●	MZE0760MA	24.2	49.4	49.4	91.4	90	1.4	7.6	1
7.7	2	●	MZE0770SA	16.8	38.4	38.4	80.4	79	1.4	7.7	1
7.7	3	●	MZE0770MA	24.5	49.4	49.4	91.4	90	1.4	7.7	1
7.8	2	●	MZE0780SA	17.0	38.4	38.4	80.4	79	1.4	7.8	1
7.8	3	●	MZE0780MA	24.8	49.4	49.4	91.4	90	1.4	7.8	1
7.9	2	●	MZE0790SA	17.2	38.4	38.4	80.4	79	1.4	7.9	1
7.9	3	●	MZE0790MA	25.1	49.4	49.4	91.4	90	1.4	7.9	1
8.0	2	●	MZE0800SA	17.5	38.5	38.5	80.5	79	1.5	8.0	1
8.0	3	●	MZE0800MA	25.5	49.5	49.5	91.5	90	1.5	8.0	1
8.1	2	●	MZE0810SA	17.7	38.5	38.5	80.5	79	1.5	8.1	1
8.1	3	●	MZE0810MA	25.8	54.5	54.5	97.5	96	1.5	8.1	1
8.2	2	●	MZE0820SA	17.9	38.5	38.5	80.5	79	1.5	8.2	1
8.2	3	●	MZE0820MA	26.1	54.5	54.5	97.5	96	1.5	8.2	1
8.3	2	●	MZE0830SA	18.1	38.5	38.5	80.5	79	1.5	8.3	1
8.3	3	●	MZE0830MA	26.4	54.5	54.5	97.5	96	1.5	8.3	1
8.4	2	●	MZE0840SA	18.3	38.5	38.5	80.5	79	1.5	8.4	1
8.4	3	●	MZE0840MA	26.7	54.5	54.5	97.5	96	1.5	8.4	1
8.5	2	●	MZE0850SA	18.5	38.5	38.5	80.5	79	1.5	8.5	1
8.5	3	●	MZE0850MA	27.0	54.5	54.5	97.5	96	1.5	8.5	1
8.6	2	●	MZE0860SA	18.8	41.6	41.6	85.6	84	1.6	8.6	1
8.6	3	●	MZE0860MA	27.4	56.6	56.6	99.6	98	1.6	8.6	1
8.7	2	●	MZE0870SA	19.0	41.6	41.6	85.6	84	1.6	8.7	1
8.7	3	●	MZE0870MA	27.7	56.6	56.6	99.6	98	1.6	8.7	1
8.8	2	●	MZE0880SA	19.2	41.6	41.6	85.6	84	1.6	8.8	1
8.8	3	●	MZE0880MA	28.0	56.6	56.6	99.6	98	1.6	8.8	1

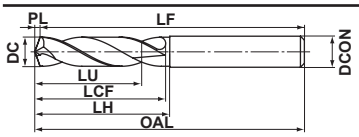
MZE

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
8.9	2	●	MZE0890SA	19.4	41.6	41.6	85.6	84	1.6	8.9	1
8.9	3	●	MZE0890MA	28.3	56.6	56.6	99.6	98	1.6	8.9	1
9.0	2	●	MZE0900SA	19.6	41.6	41.6	85.6	84	1.6	9.0	1
9.0	3	●	MZE0900MA	28.6	56.6	56.6	99.6	98	1.6	9.0	1
9.1	2	●	MZE0910SA	19.9	41.7	41.7	85.7	84	1.7	9.1	1
9.1	3	●	MZE0910MA	29.0	59.7	59.7	103.7	102	1.7	9.1	1
9.2	2	●	MZE0920SA	20.1	41.7	41.7	85.7	84	1.7	9.2	1
9.2	3	●	MZE0920MA	29.3	59.7	59.7	103.7	102	1.7	9.2	1
9.3	2	●	MZE0930SA	20.3	41.7	41.7	85.7	84	1.7	9.3	1
9.3	3	●	MZE0930MA	29.6	59.7	59.7	103.7	102	1.7	9.3	1
9.4	2	●	MZE0940SA	20.5	41.7	41.7	85.7	84	1.7	9.4	1
9.4	3	●	MZE0940MA	29.9	59.7	59.7	103.7	102	1.7	9.4	1
9.5	2	●	MZE0950SA	20.7	41.7	41.7	85.7	84	1.7	9.5	1
9.5	3	●	MZE0950MA	30.2	59.7	59.7	103.7	102	1.7	9.5	1
9.6	2	●	MZE0960SA	20.9	44.7	44.7	90.7	89	1.7	9.6	1
9.6	3	●	MZE0960MA	30.5	61.7	61.7	106.7	105	1.7	9.6	1
9.7	2	●	MZE0970SA	21.2	44.8	44.8	90.8	89	1.8	9.7	1
9.7	3	●	MZE0970MA	30.9	61.8	61.8	106.8	105	1.8	9.7	1
9.8	2	●	MZE0980SA	21.4	44.8	44.8	90.8	89	1.8	9.8	1
9.8	3	●	MZE0980MA	31.2	61.8	61.8	106.8	105	1.8	9.8	1
9.9	2	●	MZE0990SA	21.6	44.8	44.8	90.8	89	1.8	9.9	1
9.9	3	●	MZE0990MA	31.5	61.8	61.8	106.8	105	1.8	9.9	1
10.0	2	●	MZE1000SA	21.8	44.8	44.8	90.8	89	1.8	10.0	1
10.0	3	●	MZE1000MA	31.8	61.8	61.8	106.8	105	1.8	10.0	1
10.1	2	●	MZE1010SA	22.0	44.8	44.8	90.8	89	1.8	10.1	1
10.1	3	●	MZE1010MA	32.1	67.8	67.8	113.8	112	1.8	10.1	1
10.2	2	●	MZE1020SA	22.3	44.9	44.9	90.9	89	1.9	10.2	1
10.2	3	●	MZE1020MA	32.5	67.9	67.9	113.9	112	1.9	10.2	1
10.3	2	●	MZE1030SA	22.5	44.9	44.9	90.9	89	1.9	10.3	1
10.3	3	●	MZE1030MA	32.8	67.9	67.9	113.9	112	1.9	10.3	1
10.4	2	●	MZE1040SA	22.7	44.9	44.9	90.9	89	1.9	10.4	1
10.4	3	●	MZE1040MA	33.1	67.9	67.9	113.9	112	1.9	10.4	1
10.5	2	●	MZE1050SA	22.9	44.9	44.9	90.9	89	1.9	10.5	1
10.5	3	●	MZE1050MA	33.4	67.9	67.9	113.9	112	1.9	10.5	1
10.6	2	●	MZE1060SA	23.1	44.9	44.9	90.9	89	1.9	10.6	1
10.6	3	●	MZE1060MA	33.7	69.9	69.9	115.9	114	1.9	10.6	1
10.7	2	●	MZE1070SA	23.3	48.9	48.9	96.9	95	1.9	10.7	1
10.7	3	●	MZE1070MA	34.0	69.9	69.9	115.9	114	1.9	10.7	1
10.8	2	●	MZE1080SA	23.6	49.0	49.0	97.0	95	2.0	10.8	1
10.8	3	●	MZE1080MA	34.4	70.0	70.0	116.0	114	2.0	10.8	1
10.9	2	●	MZE1090SA	23.8	49.0	49.0	97.0	95	2.0	10.9	1
10.9	3	●	MZE1090MA	34.7	70.0	70.0	116.0	114	2.0	10.9	1
11.0	2	●	MZE1100SA	24.0	49.0	49.0	97.0	95	2.0	11.0	1
11.0	3	●	MZE1100MA	35.0	70.0	70.0	116.0	114	2.0	11.0	1
11.1	2	●	MZE1110SA	24.2	49.0	49.0	97.0	95	2.0	11.1	1
11.1	3	●	MZE1110MA	35.3	73.0	73.0	120.0	118	2.0	11.1	1
11.2	2	●	MZE1120SA	24.4	49.0	49.0	97.0	95	2.0	11.2	1
11.2	3	●	MZE1120MA	35.6	73.0	73.0	120.0	118	2.0	11.2	1
11.3	2	●	MZE1130SA	24.7	49.1	49.1	97.1	95	2.1	11.3	1
11.3	3	●	MZE1130MA	36.0	73.1	73.1	120.1	118	2.1	11.3	1
11.4	2	●	MZE1140SA	24.9	49.1	49.1	97.1	95	2.1	11.4	1
11.4	3	●	MZE1140MA	36.3	73.1	73.1	120.1	118	2.1	11.4	1
11.5	2	●	MZE1150SA	25.1	49.1	49.1	97.1	95	2.1	11.5	1
11.5	3	●	MZE1150MA	36.6	73.1	73.1	120.1	118	2.1	11.5	1
11.6	2	●	MZE1160SA	25.3	49.1	49.1	97.1	95	2.1	11.6	1
11.6	3	●	MZE1160MA	36.9	75.1	75.1	123.1	121	2.1	11.6	1
11.7	2	●	MZE1170SA	25.5	49.1	49.1	97.1	95	2.1	11.7	1
11.7	3	●	MZE1170MA	37.2	75.1	75.1	123.1	121	2.1	11.7	1
11.8	2	●	MZE1180SA	25.7	49.1	49.1	97.1	95	2.1	11.8	1
11.8	3	●	MZE1180MA	37.5	75.1	75.1	123.1	121	2.1	11.8	1
11.9	2	●	MZE1190SA	26.0	53.2	53.2	104.2	102	2.2	11.9	1
11.9	3	●	MZE1190MA	37.9	75.2	75.2	123.2	121	2.2	11.9	1
12.0	2	●	MZE1200SA	26.2	53.2	53.2	104.2	102	2.2	12.0	1
12.0	3	●	MZE1200MA	38.2	75.2	75.2	123.2	121	2.2	12.0	1
12.1	2	●	MZE1210SA	26.4	53.2	53.2	104.2	102	2.2	12.1	1
12.1	3	●	MZE1210MA	38.5	78.2	78.2	137.2	135	2.2	12.1	1
12.2	2	●	MZE1220SA	26.6	53.2	53.2	104.2	102	2.2	12.2	1
12.2	3	●	MZE1220MA	38.8	78.2	78.2	137.2	135	2.2	12.2	1
12.3	2	●	MZE1230SA	26.8	53.2	53.2	104.2	102	2.2	12.3	1
12.3	3	●	MZE1230MA	39.1	78.2	78.2	137.2	135	2.2	12.3	1
12.4	2	●	MZE1240SA	27.1	53.3	53.3	104.3	102	2.3	12.4	1
12.4	3	●	MZE1240MA	39.5	78.3	78.3	137.3	135	2.3	12.4	1
12.5	2	●	MZE1250SA	27.3	53.3	53.3	104.3	102	2.3	12.5	1
12.5	3	●	MZE1250MA	39.8	78.3	78.3	137.3	135	2.3	12.5	1
12.6	2	●	MZE1260SA	27.5	53.3	53.3	104.3	102	2.3	12.6	1
12.6	3	●	MZE1260MA	40.1	80.3	80.3	139.3	137	2.3	12.6	1
12.7	2	●	MZE1270SA	27.7	53.3	53.3	104.3	102	2.3	12.7	1
12.7	3	●	MZE1270MA	40.4	80.3	80.3	139.3	137	2.3	12.7	1
12.8	2	●	MZE1280SA	27.9	53.3	53.3	104.3	102	2.3	12.8	1
12.8	3	●	MZE1280MA	40.7	80.3	80.3	139.3	137	2.3	12.8	1
12.9	2	●	MZE1290SA	28.1	53.3	53.3	104.3	102	2.3	12.9	1
12.9	3	●	MZE1290MA	41.0	80.3	80.3	139.3	137	2.3	12.9	1
13.0	2	●	MZE1300SA	28.4	53.4	53.4	104.4	102	2.4	13.0	1
13.0	3	●	MZE1300MA	41.4	80.4	80.4	139.4	137	2.4	13.0	1
13.1	2	●	MZE1310SA	28.6	53.4	53.4	104.4	102	2.4	13.1	1
13.1	3	●	MZE1310MA	41.7	86.4	86.4	146.4	144	2.4	13.1	1
13.2	2	●	MZE1320SA	28.8	53.4	53.4	104.4	102	2.4	13.2	1
13.2	3	●	MZE1320MA	42.0	86.4	86.4	146.4	144	2.4	13.2	1
13.3	2	●	MZE1330SA	29.0	56.4	56.4	109.4	107	2.4	13.3	1
13.3	3	●	MZE1330MA	42.3	86.4	86.4	146.4	144	2.4	13.3	1
13.4	2	●	MZE1340SA	29.2	56.4	56.4	109.4	107	2.4	13.4	1
13.4	3	●	MZE1340MA	42.6	86.4	86.4	146.4	144	2.4	13.4	1
13.5	2	●	MZE1350SA	29.5	56.5	56.5	109.5	107	2.5	13.5	1
13.5	3	●	MZE1350MA	43.0	86.5	86.5	146.5	144	2.5	13.5	1
13.6	2	●	MZE1360SA	29.7	56.5	56.5	109.5	107	2.5	13.6	1
13.6	3	●	MZE1360MA	43.3	88.5	88.5	149.5	147	2.5	13.6	1

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more



Type1

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
13.7	2	●	MZE1370SA	29.9	56.5	56.5	109.5	107	2.5	13.7	1
13.7	3	●	MZE1370MA	43.6	88.5	88.5	149.5	147	2.5	13.7	1
13.8	2	●	MZE1380SA	30.1	56.5	56.5	109.5	107	2.5	13.8	1
13.8	3	●	MZE1380MA	43.9	88.5	88.5	149.5	147	2.5	13.8	1
13.9	2	●	MZE1390SA	30.3	56.5	56.5	109.5	107	2.5	13.9	1
13.9	3	●	MZE1390MA	44.2	88.5	88.5	149.5	147	2.5	13.9	1
14.0	2	●	MZE1400SA	30.5	56.5	56.5	109.5	107	2.5	14.0	1
14.0	3	●	MZE1400MA	44.5	88.5	88.5	149.5	147	2.5	14.0	1
14.1	2	●	MZE1410SA	30.8	58.6	58.6	113.6	111	2.6	14.1	1
14.1	3	●	MZE1410MA	44.9	91.6	91.6	153.6	151	2.6	14.1	1
14.2	2	●	MZE1420SA	31.0	58.6	58.6	113.6	111	2.6	14.2	1
14.2	3	●	MZE1420MA	45.2	91.6	91.6	153.6	151	2.6	14.2	1
14.3	2	□	MZE1430SA	31.2	58.6	58.6	113.6	111	2.6	14.3	1
14.3	3	●	MZE1430MA	45.5	91.6	91.6	153.6	151	2.6	14.3	1
14.4	2	□	MZE1440SA	31.4	58.6	58.6	113.6	111	2.6	14.4	1
14.4	3	●	MZE1440MA	45.8	91.6	91.6	153.6	151	2.6	14.4	1
14.5	2	●	MZE1450SA	31.6	58.6	58.6	113.6	111	2.6	14.5	1
14.5	3	●	MZE1450MA	46.1	91.6	91.6	153.6	151	2.6	14.5	1
14.6	2	□	MZE1460SA	31.9	58.7	58.7	113.7	111	2.7	14.6	1
14.6	3	●	MZE1460MA	46.5	93.7	93.7	155.7	153	2.7	14.6	1
14.7	2	□	MZE1470SA	32.1	58.7	58.7	113.7	111	2.7	14.7	1
14.7	3	●	MZE1470MA	46.8	93.7	93.7	155.7	153	2.7	14.7	1
14.8	2	□	MZE1480SA	32.3	58.7	58.7	113.7	111	2.7	14.8	1
14.8	3	●	MZE1480MA	47.1	93.7	93.7	155.7	153	2.7	14.8	1
14.9	2	□	MZE1490SA	32.5	58.7	58.7	113.7	111	2.7	14.9	1
14.9	3	●	MZE1490MA	47.4	93.7	93.7	155.7	153	2.7	14.9	1
15.0	2	●	MZE1500SA	32.7	58.7	58.7	113.7	111	2.7	15.0	1
15.0	3	●	MZE1500MA	47.7	93.7	93.7	155.7	153	2.7	15.0	1
15.1	2	□	MZE1510SA	32.9	60.7	60.7	117.7	115	2.7	15.1	1
15.1	3	●	MZE1510MA	48.0	96.7	96.7	159.7	157	2.7	15.1	1
15.2	2	●	MZE1520SA	33.2	60.8	60.8	117.8	115	2.8	15.2	1
15.2	3	●	MZE1520MA	48.4	96.8	96.8	159.8	157	2.8	15.2	1
15.3	2	□	MZE1530SA	33.4	60.8	60.8	117.8	115	2.8	15.3	1
15.3	3	●	MZE1530MA	48.7	96.8	96.8	159.8	157	2.8	15.3	1
15.4	2	□	MZE1540SA	33.6	60.8	60.8	117.8	115	2.8	15.4	1
15.4	3	●	MZE1540MA	49.0	96.8	96.8	159.8	157	2.8	15.4	1
15.5	2	●	MZE1550SA	33.8	60.8	60.8	117.8	115	2.8	15.5	1
15.5	3	●	MZE1550MA	49.3	96.8	96.8	159.8	157	2.8	15.5	1
15.6	2	□	MZE1560SA	34.0	60.8	60.8	117.8	115	2.8	15.6	1
15.6	3	●	MZE1560MA	49.6	98.8	98.8	162.8	160	2.8	15.6	1
15.7	2	□	MZE1570SA	34.3	60.9	60.9	117.9	115	2.9	15.7	1
15.7	3	●	MZE1570MA	50.0	98.9	98.9	162.9	160	2.9	15.7	1
15.8	2	□	MZE1580SA	34.5	60.9	60.9	117.9	115	2.9	15.8	1
15.8	3	●	MZE1580MA	50.3	98.9	98.9	162.9	160	2.9	15.8	1
15.9	2	□	MZE1590SA	34.7	60.9	60.9	117.9	115	2.9	15.9	1
15.9	3	●	MZE1590MA	50.6	98.9	98.9	162.9	160	2.9	15.9	1
16.0	2	●	MZE1600SA	34.9	60.9	60.9	117.9	115	2.9	16.0	1
16.0	3	●	MZE1600MA	50.9	98.9	98.9	162.9	160	2.9	16.0	1

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
16.1	2	□	MZE1610SA	35.1	62.9	62.9	121.9	119	2.9	16.1	1
16.1	3	□	MZE1610MA	51.2	104.9	104.9	169.9	167	2.9	16.1	1
16.2	2	●	MZE1620SA	35.3	62.9	62.9	121.9	119	2.9	16.2	1
16.2	3	□	MZE1620MA	51.5	104.9	104.9	169.9	167	2.9	16.2	1
16.3	2	●	MZE1630SA	35.6	63.0	63.0	122.0	119	3.0	16.3	1
16.3	3	□	MZE1630MA	51.9	105.0	105.0	170.0	167	3.0	16.3	1
16.4	2	□	MZE1640SA	35.8	63.0	63.0	122.0	119	3.0	16.4	1
16.4	3	□	MZE1640MA	52.2	105.0	105.0	170.0	167	3.0	16.4	1
16.5	2	●	MZE1650SA	36.0	63.0	63.0	122.0	119	3.0	16.5	1
16.5	3	●	MZE1650MA	52.5	105.0	105.0	170.0	167	3.0	16.5	1
16.6	2	□	MZE1660SA	36.2	63.0	63.0	122.0	119	3.0	16.6	1
16.6	3	□	MZE1660MA	52.8	105.0	105.0	170.0	167	3.0	16.6	1
16.7	2	□	MZE1670SA	36.4	63.0	63.0	122.0	119	3.0	16.7	1
16.7	3	□	MZE1670MA	53.1	105.0	105.0	170.0	167	3.0	16.7	1
16.8	2	□	MZE1680SA	36.7	63.1	63.1	122.1	119	3.1	16.8	1
16.8	3	□	MZE1680MA	53.5	105.1	105.1	170.1	167	3.1	16.8	1
16.9	2	□	MZE1690SA	36.9	63.1	63.1	122.1	119	3.1	16.9	1
16.9	3	□	MZE1690MA	53.8	105.1	105.1	170.1	167	3.1	16.9	1
17.0	2	●	MZE1700SA	37.1	63.1	63.1	122.1	119	3.1	17.0	1
17.0	3	●	MZE1700MA	54.1	105.1	105.1	170.1	167	3.1	17.0	1
17.1	2	□	MZE1710SA	37.3	65.1	65.1	126.1	123	3.1	17.1	1
17.1	3	□	MZE1710MA	54.4	105.1	105.1	170.1	167	3.1	17.1	1
17.2	2	□	MZE1720SA	37.5	65.1	65.1	126.1	123	3.1	17.2	1
17.2	3	□	MZE1720MA	54.7	105.1	105.1	170.1	167	3.1	17.2	1
17.3	2	□	MZE1730SA	37.7	65.1	65.1	126.1	123	3.1	17.3	1
17.3	3	□	MZE1730MA	55.0	105.1	105.1	170.1	167	3.1	17.3	1
17.4	2	□	MZE1740SA	38.0	65.2	65.2	126.2	123	3.2	17.4	1
17.4	3	□	MZE1740MA	55.4	105.2	105.2	170.2	167	3.2	17.4	1
17.5	2	●	MZE1750SA	38.2	65.2	65.2	126.2	123	3.2	17.5	1
17.5	3	●	MZE1750MA	55.7	105.2	105.2	170.2	167	3.2	17.5	1
17.6	2	□	MZE1760SA	38.4	65.2	65.2	126.2	123	3.2	17.6	1
17.6	3	□	MZE1760MA	56.0	105.2	105.2	170.2	167	3.2	17.6	1
17.7	2	□	MZE1770SA	38.6	65.2	65.2	126.2	123	3.2	17.7	1
17.7	3	□	MZE1770MA	56.3	105.2	105.2	170.2	167	3.2	17.7	1
17.8	2	●	MZE1780SA	38.8	65.2	65.2	126.2	123	3.2	17.8	1
17.8	3	□	MZE1780MA	56.6	105.2	105.2	170.2	167	3.2	17.8	1
17.9	2	□	MZE1790SA	39.1	65.3	65.3	126.3	123	3.3	17.9	1
17.9	3	□	MZE1790MA	57.0	105.3	105.3	170.3	167	3.3	17.9	1
18.0	2	●	MZE1800SA	39.3	65.3	65.3	126.3	123	3.3	18.0	1
18.0	3	●	MZE1800MA	57.3	105.3	105.3	170.3	167	3.3	18.0	1
18.1	2	□	MZE1810SA	39.5	67.3	67.3	130.3	127	3.3	18.1	1
18.1	3	□	MZE1810MA	57.6	117.3	117.3	182.3	179	3.3	18.1	1
18.2	2	□	MZE1820SA	39.7	67.3	67.3	130.3	127	3.3	18.2	1
18.2	3	□	MZE1820MA	57.9	117.3	117.3	182.3	179	3.3	18.2	1
18.3	2	□	MZE1830SA	39.9	67.3	67.3	130.3	127	3.3	18.3	1
18.3	3	□	MZE1830MA	58.2	117.3	117.3	182.3	179	3.3	18.3	1
18.4	2	□	MZE1840SA	40.1	67.3	67.3	130.3	127	3.3	18.4	1
18.4	3	□	MZE1840MA	58.5	117.3	117.3	182.3	179	3.3	18.4	1

MZE

DC (mm)	Hole Depth (L/D)	VP15TF	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
18.5	2	●	MZE1850SA	40.4	67.4	67.4	130.4	127	3.4	18.5	1
18.5	3	●	MZE1850MA	58.9	117.4	117.4	182.4	179	3.4	18.5	1
18.6	2	□	MZE1860SA	40.6	67.4	67.4	130.4	127	3.4	18.6	1
18.6	3	□	MZE1860MA	59.2	117.4	117.4	182.4	179	3.4	18.6	1
18.7	2	□	MZE1870SA	40.8	67.4	67.4	130.4	127	3.4	18.7	1
18.7	3	□	MZE1870MA	59.5	117.4	117.4	182.4	179	3.4	18.7	1
18.8	2	□	MZE1880SA	41.0	67.4	67.4	130.4	127	3.4	18.8	1
18.8	3	□	MZE1880MA	59.8	117.4	117.4	182.4	179	3.4	18.8	1
18.9	2	□	MZE1890SA	41.2	67.4	67.4	130.4	127	3.4	18.9	1
18.9	3	□	MZE1890MA	60.1	117.4	117.4	182.4	179	3.4	18.9	1
19.0	2	●	MZE1900SA	41.5	67.5	67.5	130.5	127	3.5	19.0	1
19.0	3	●	MZE1900MA	60.5	117.5	117.5	182.5	179	3.5	19.0	1
19.1	2	□	MZE1910SA	41.7	69.5	69.5	134.5	131	3.5	19.1	1
19.1	3	□	MZE1910MA	60.8	117.5	117.5	182.5	179	3.5	19.1	1
19.2	2	□	MZE1920SA	41.9	69.5	69.5	134.5	131	3.5	19.2	1
19.2	3	□	MZE1920MA	61.1	117.5	117.5	182.5	179	3.5	19.2	1
19.3	2	□	MZE1930SA	42.1	69.5	69.5	134.5	131	3.5	19.3	1
19.3	3	□	MZE1930MA	61.4	117.5	117.5	182.5	179	3.5	19.3	1
19.4	2	□	MZE1940SA	42.3	69.5	69.5	134.5	131	3.5	19.4	1
19.4	3	□	MZE1940MA	61.7	117.5	117.5	182.5	179	3.5	19.4	1
19.5	2	●	MZE1950SA	42.5	69.5	69.5	134.5	131	3.5	19.5	1
19.5	3	●	MZE1950MA	62.0	117.5	117.5	182.5	179	3.5	19.5	1
19.6	2	□	MZE1960SA	42.8	69.6	69.6	134.6	131	3.6	19.6	1
19.6	3	□	MZE1960MA	62.4	117.6	117.6	182.6	179	3.6	19.6	1
19.7	2	□	MZE1970SA	43.0	69.6	69.6	134.6	131	3.6	19.7	1
19.7	3	□	MZE1970MA	62.7	117.6	117.6	182.6	179	3.6	19.7	1
19.8	2	□	MZE1980SA	43.2	69.6	69.6	134.6	131	3.6	19.8	1
19.8	3	□	MZE1980MA	63.0	117.6	117.6	182.6	179	3.6	19.8	1
19.9	2	□	MZE1990SA	43.4	69.6	69.6	134.6	131	3.6	19.9	1
19.9	3	□	MZE1990MA	63.3	117.6	117.6	182.6	179	3.6	19.9	1
20.0	2	●	MZE2000SA	43.6	69.6	69.6	134.6	131	3.6	20.0	1
20.0	3	●	MZE2000MA	63.6	117.6	117.6	182.6	179	3.6	20.0	1

Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) AISI 1010 etc		Carbon Steel, Alloy Steel (180−280HB) AISI 1045, AISI 4140 etc		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc	
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.−Max.) (mm/rev)
1.0	12700	0.035 (0.020−0.050)	11100	0.035 (0.020−0.050)	9500	0.035 (0.020−0.050)
1.2	10600	0.045 (0.030−0.060)	9200	0.045 (0.030−0.060)	7900	0.045 (0.030−0.060)
1.6	8900	0.055 (0.035−0.080)	7900	0.055 (0.035−0.080)	6900	0.055 (0.035−0.080)
2.0	7100	0.07 (0.040−0.100)	6300	0.07 (0.040−0.100)	5500	0.07 (0.040−0.100)
2.5	5700	0.085 (0.050−0.125)	5000	0.085 (0.050−0.125)	4400	0.085 (0.050−0.125)
3.2	4400	0.1 (0.060−0.13)	3900	0.1 (0.06−0.13)	3400	0.09 (0.06−0.12)
4.0	3500	0.12 (0.080−0.16)	3100	0.12 (0.08−0.16)	2700	0.11 (0.07−0.14)
5.0	2800	0.15 (0.100−0.20)	2500	0.15 (0.10−0.20)	2200	0.14 (0.09−0.18)
6.3	2700	0.2 (0.13−0.26)	2500	0.2 (0.13−0.26)	2200	0.18 (0.11−0.24)
8.0	2100	0.23 (0.18−0.28)	1900	0.23 (0.18−0.28)	1700	0.21 (0.16−0.25)
10.0	1700	0.27 (0.22−0.32)	1500	0.27 (0.22−0.32)	1400	0.23 (0.19−0.27)
12.0	1700	0.31 (0.28−0.34)	1500	0.31 (0.28−0.34)	1400	0.26 (0.23−0.29)
16.0	1300	0.33 (0.28−0.38)	1200	0.33 (0.28−0.38)	1100	0.29 (0.24−0.33)
20.0	1100	0.35 (0.30−0.40)	1000	0.35 (0.30−0.40)	900	0.3 (0.26−0.34)

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is:
①Less than ø3 = 10 or more ②ø3 or more to less than ø10 = 5 or more
③ø10 or more = 3 or more

ISO13399 ➤ N002

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc		Gray Cast Iron (≤350MPa) No 45 B etc		Ductile Cast Iron (≤450MPa) 60-40-8 etc	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	4700	0.03 (0.020—0.044)	14300	0.035 (0.020—0.050)	12700	0.035 (0.020—0.050)
1.2	3900	0.04 (0.030—0.053)	11900	0.045 (0.030—0.060)	10600	0.045 (0.030—0.060)
1.6	3900	0.05 (0.035—0.070)	9900	0.055 (0.035—0.080)	8900	0.055 (0.035—0.080)
2.0	3100	0.06 (0.040—0.080)	7900	0.07 (0.040—0.100)	7100	0.07 (0.040—0.100)
2.5	2500	0.075 (0.050—0.100)	6300	0.085 (0.050—0.125)	5700	0.085 (0.050—0.125)
3.2	1900	0.07 (0.05—0.08)	4900	0.1 (0.06—0.13)	4400	0.1 (0.06—0.13)
4.0	1500	0.08 (0.06—0.10)	3900	0.12 (0.08—0.16)	3500	0.12 (0.08—0.16)
5.0	1200	0.1 (0.07—0.13)	3100	0.15 (0.10—0.20)	2800	0.15 (0.10—0.20)
6.3	1200	0.13 (0.09—0.17)	3000	0.2 (0.13—0.26)	2700	0.2 (0.13—0.26)
8.0	900	0.14 (0.10—0.18)	2300	0.25 (0.18—0.31)	2100	0.23 (0.18—0.28)
10.0	700	0.16 (0.12—0.19)	1900	0.29 (0.22—0.35)	1700	0.27 (0.22—0.32)
12.0	600	0.18 (0.15—0.20)	1800	0.33 (0.28—0.37)	1700	0.31 (0.28—0.34)
16.0	400	0.19 (0.15—0.23)	1300	0.35 (0.28—0.42)	1300	0.33 (0.28—0.38)
20.0	300	0.2 (0.15—0.24)	1100	0.37 (0.30—0.44)	1100	0.35 (0.30—0.40)

Workpiece Material	Aluminium Alloys (Si<5%) ASTM A6061, ASTM A7075 etc		Heat Resistant Alloys Inconel718 etc		Hardened Steel (40—55HRC) AISI H13, L6 etc	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
1.0	15900	0.05 (0.030—0.075)	3100	0.02 (0.016—0.027)	3100	0.02 (0.016—0.031)
1.2	13200	0.065 (0.045—0.090)	2600	0.025 (0.022—0.032)	2600	0.03 (0.022—0.037)
1.6	11900	0.085 (0.053—0.120)	1900	0.03 (0.025—0.040)	1900	0.03 (0.025—0.040)
2.0	9500	0.105 (0.060—0.150)	2300	0.04 (0.032—0.050)	2300	0.04 (0.032—0.050)
2.5	8900	0.135 (0.075—0.200)	1900	0.05 (0.040—0.060)	1900	0.05 (0.040—0.060)
3.2	7900	0.1 (0.06—0.13)	1900	0.07 (0.05—0.09)	1900	0.07 (0.05—0.09)
4.0	6300	0.12 (0.08—0.16)	1500	0.09 (0.06—0.11)	1500	0.09 (0.06—0.11)
5.0	5000	0.15 (0.10—0.20)	1200	0.11 (0.08—0.14)	1200	0.11 (0.08—0.14)
6.3	4500	0.2 (0.13—0.26)	1200	0.14 (0.09—0.19)	1200	0.14 (0.09—0.19)
8.0	3500	0.23 (0.18—0.28)	900	0.14 (0.11—0.17)	900	0.14 (0.11—0.17)
10.0	2800	0.27 (0.22—0.32)	700	0.16 (0.12—0.19)	700	0.16 (0.12—0.19)
12.0	2600	0.31 (0.28—0.34)	600	0.16 (0.13—0.18)	600	0.16 (0.13—0.18)
16.0	2100	0.33 (0.28—0.38)	400	0.18 (0.14—0.21)	500	0.18 (0.14—0.21)
20.0	1700	0.35 (0.30—0.40)	400	0.19 (0.15—0.22)	400	0.19 (0.15—0.22)

MGS

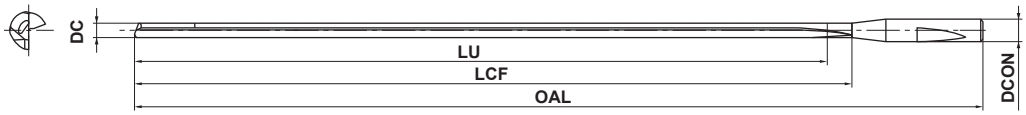
SOLID GUN DRILL

- Micro deep hole drilling is possible.
- Excellent run-out accuracy ensures high precision drilling.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		

Internal Coolant





DC≤3
0 −0.005

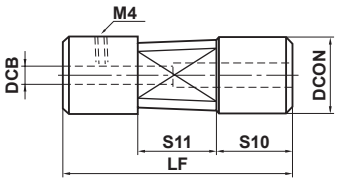
Note 1) MGS drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (L/D)	HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	DCON
0.7	50	●	MGS0070L040B	35.0	40	80	3
0.7	80	●	MGS0070L060B	56.0	60	100	3
0.8	45	●	MGS0080L040B	36.0	40	80	3
0.8	70	●	MGS0080L060B	56.0	60	100	3
0.9	40	●	MGS0090L040B	36.0	40	80	3
0.9	60	●	MGS0090L060B	54.0	60	100	3
1.0	35	●	MGS0100L040B	35.0	40	80	3
1.0	55	●	MGS0100L060B	55.0	60	100	3
1.0	75	●	MGS0100L080B	75.0	80	120	3
1.1	30	●	MGS0110L040B	33.0	40	80	3
1.1	50	●	MGS0110L060B	55.0	60	100	3
1.1	65	●	MGS0110L080B	71.5	80	120	3
1.2	30	●	MGS0120L040B	36.0	40	80	3
1.2	45	●	MGS0120L060B	54.0	60	100	3
1.2	60	●	MGS0120L080B	72.0	80	120	3
1.3	40	●	MGS0130L060B	52.0	60	100	3
1.3	55	●	MGS0130L080B	71.5	80	120	3
1.3	70	●	MGS0130L100B	91.0	100	140	3
1.4	35	●	MGS0140L060B	49.0	60	100	3
1.4	50	●	MGS0140L080B	70.0	80	120	3
1.4	65	●	MGS0140L100B	91.0	100	140	3
1.5	35	●	MGS0150L060B	52.5	60	100	3
1.5	50	●	MGS0150L080B	75.0	80	120	3
1.5	60	●	MGS0150L100B	90.0	100	140	3
1.6	30	●	MGS0160L060B	48.0	60	100	3
1.6	45	●	MGS0160L080B	72.0	80	120	3
1.6	55	●	MGS0160L100B	88.0	100	140	3
1.7	30	●	MGS0170L060B	51.0	60	100	3
1.7	40	●	MGS0170L080B	68.0	80	120	3
1.7	55	●	MGS0170L100B	93.5	100	140	3
1.8	30	●	MGS0180L060B	54.0	60	100	3
1.8	40	●	MGS0180L080B	72.0	80	120	3
1.8	50	●	MGS0180L100B	90.0	100	140	3
1.9	25	●	MGS0190L060B	47.5	60	100	3
1.9	35	●	MGS0190L080B	66.5	80	120	3
1.9	45	●	MGS0190L100B	85.5	100	140	3
2.0	25	●	MGS0200L060B	50.0	60	100	3
2.0	35	●	MGS0200L080B	70.0	80	120	3
2.0	45	●	MGS0200L100B	90.0	100	140	3
2.1	35	●	MGS0210L080B	73.5	80	120	3
2.1	40	●	MGS0210L100B	84.0	100	140	3
2.2	30	●	MGS0220L080B	66.0	80	120	3
2.2	40	●	MGS0220L100B	88.0	100	140	3
2.3	30	●	MGS0230L080B	69.0	80	120	3
2.3	40	●	MGS0230L100B	92.0	100	140	3
2.4	30	●	MGS0240L080B	72.0	80	120	3
2.4	35	●	MGS0240L100B	84.0	100	140	3
2.5	25	●	MGS0250L080B	62.5	80	120	3
2.5	35	●	MGS0250L100B	87.5	100	140	3
2.6	25	●	MGS0260L080B	65.0	80	120	3
2.6	35	●	MGS0260L100B	91.0	100	140	3
2.7	25	●	MGS0270L080B	67.5	80	120	3
2.7	30	●	MGS0270L100B	81.0	100	140	3
2.8	25	●	MGS0280L080B	70.0	80	120	3
2.8	30	●	MGS0280L100B	84.0	100	140	3
2.9	20	●	MGS0290L080B	58.0	80	120	3
2.9	30	●	MGS0290L100B	87.0	100	140	3
3.0	20	●	MGS0300L080B	60.0	80	120	3
3.0	30	●	MGS0300L100B	90.0	100	140	3

Note 1) Please consult us regarding coated type drills.

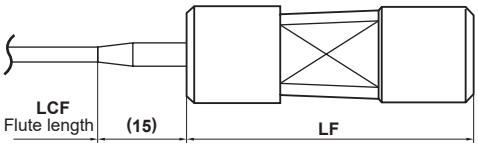
● : Inventory maintained in Japan.

■DRIVER



Order Number	Stock	Dimensions (mm)						
		DCON	DCB	LF	S10	S11	Set Screw	Wrench
MGD38	●	12.7	3.0	38.1	12.6	12.7	HSS04004	HKY20F
MGD70	●	12.7	3.0	70.0	25.0	20.0	HSS04004	HKY20F

■ WHEN CONNECTED WITH A DRIVER



MGS

SOLID GUN DRILL

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) AISI 1010 etc				Carbon Steel, Alloy Steel (180−280HB) AISI 1045, AISI 4140 etc			
Recommended grinding fluid	Water-insoluble				Water-insoluble			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.8	50	19800	0.01 (0.005−0.016)	195	40	15900	0.01 (0.005−0.016)	155
1.0	50	15900	0.01 (0.007−0.020)	155	40	12700	0.01 (0.007−0.020)	125
1.2	60	15900	0.015 (0.008−0.024)	235	50	13200	0.015 (0.008−0.024)	195
1.6	60	11900	0.02 (0.011−0.032)	235	50	9900	0.02 (0.011−0.032)	195
2.0	60	9500	0.025 (0.013−0.040)	235	50	7900	0.025 (0.013−0.040)	195
2.5	70	8900	0.03 (0.017−0.050)	265	60	7600	0.03 (0.017−0.050)	225
3.0	70	7400	0.04 (0.020−0.060)	295	60	6300	0.04 (0.020−0.060)	250

Workpiece Material	Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc				Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc			
Recommended grinding fluid	Water-insoluble				Water-insoluble			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.8	30	11900	0.005 (0.004−0.005)	55	30	11900	0.01 (0.005−0.016)	115
1.0	30	9500	0.005 (0.005−0.007)	45	30	9500	0.01 (0.007−0.020)	95
1.2	40	10600	0.005 (0.006−0.008)	50	30	7900	0.015 (0.008−0.024)	115
1.6	40	7900	0.01 (0.008−0.011)	75	40	7900	0.02 (0.011−0.032)	155
2.0	40	6300	0.01 (0.010−0.013)	60	40	6300	0.025 (0.013−0.040)	155
2.5	50	6300	0.015 (0.013−0.017)	90	40	5000	0.03 (0.017−0.050)	150
3.0	50	5300	0.015 (0.015−0.020)	75	40	4200	0.04 (0.020−0.060)	165

Workpiece Material	Gray Cast Iron (≤350MPa) No 45 B etc				Ductile Cast Iron (≤450MPa) 60-40-8 etc			
Recommended grinding fluid	Water-insoluble Water-soluble				Water-insoluble Water-soluble			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.8	50	19800	0.01 (0.008−0.016)	195	40	15900	0.005 (0.005−0.008)	75
1.0	50	15900	0.015 (0.010−0.020)	235	40	12700	0.005 (0.007−0.010)	60
1.2	60	15900	0.015 (0.012−0.024)	235	50	13200	0.01 (0.008−0.012)	130
1.6	60	11900	0.02 (0.016−0.032)	235	50	9900	0.01 (0.011−0.016)	95
2.0	60	9500	0.03 (0.020−0.040)	285	50	7900	0.015 (0.013−0.020)	115
2.5	70	8900	0.035 (0.025−0.050)	310	60	7600	0.02 (0.017−0.025)	150
3.0	70	7400	0.045 (0.030−0.060)	330	60	6300	0.025 (0.020−0.030)	155

Workpiece Material	Aluminium Alloys (Si<5%)				Copper, Copper alloys			
Recommended grinding fluid	Water-insoluble Water-soluble				Water-insoluble Water-soluble			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
0.8	50	19800	0.01 (0.008−0.016)	195	40	15900	0.01 (0.008−0.016)	155
1.0	60	19000	0.015 (0.010−0.020)	285	50	15900	0.015 (0.010−0.020)	235
1.2	70	18500	0.015 (0.012−0.024)	275	60	15900	0.015 (0.012−0.024)	235
1.6	80	15900	0.02 (0.016−0.032)	315	70	13900	0.02 (0.016−0.032)	275
2.0	90	14300	0.03 (0.020−0.040)	425	80	12700	0.03 (0.020−0.040)	380
2.5	100	12700	0.035 (0.025−0.050)	440	90	11400	0.035 (0.025−0.050)	395
3.0	100	10600	0.045 (0.030−0.060)	475	100	10600	0.045 (0.030−0.060)	475

Note 1) Requires a guide bush or pilot hole.

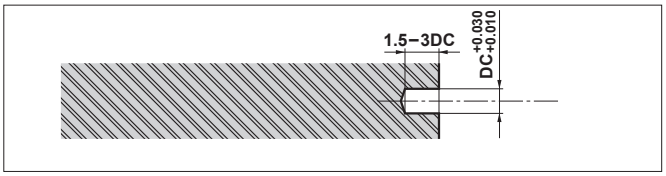
Note 2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.

Note 3) For safety and success, high pressure coolant is required. (Minimum coolant pressure=1,000PSI)

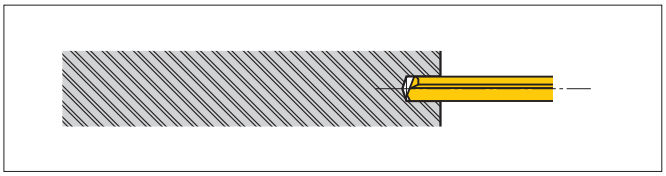
SPECIAL APPLICATION NOTES

- Requires a guide bush or pilot hole.
- Coolant filter must be less than 5 microns.
  Fine filtration is necessary to prevent blockage of the coolant holes.
- For safety and success, high pressure coolant is required.
  (Minimum coolant pressure=1,000PSI)

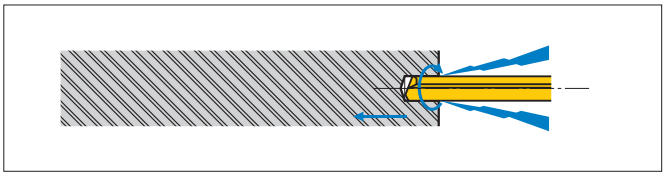
HOW TO USE



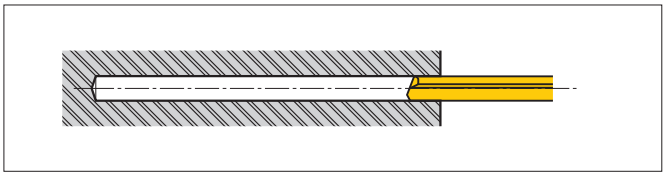
1. Machining a Pilot Hole
   - The diameter of the pilot hole is +0.01 to +0.03mm for the diameter of the MGS drill.
   - The depth of the hole needs to be 1.5 to 3 times that of diameter of the pilot hole.
   - MVE / MVS drills are ideal for drilling pilot holes.



2. Insert the MGS drill into the pilot hole while the drill is stopped or is rotating in reverse at 300 rpm or less.
   - UP to 1-2mm before hole bottom.



3. Coolant is turned ON, raise cutting speed and feed to the recommended cutting condition.
   - Rotating the tool before inserting it into the pilot hole may cause the tool to break which is extremely dangerous.



4. After drilling
   - Quickly return to the position when inserting tool into pilot hole.
   - After oil supply and cutting rotation are stopped, pull the drill out from the pilot hole and return to the original position.

DCSSS

Short, For Non-Ferrous Materials

UWC | DC | 130° DC<1.5 | 135° DC≥1.5 | X DC≥1.5

P M K **N** S H

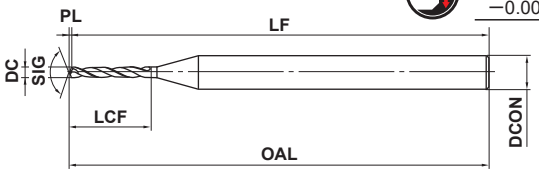
Non-ferrous Metal

0.2≤DC≤2 $^{0}_{-0.014}$

DCON=3 h6 $^{0}_{-0.006}$

External Coolant





●Original CVD diamond coating technology provides excellent adhesion for coating layer and enables stable drilling without peeling or chipping.

DC (mm)	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON	Stock
0.2	DCSSSD0020	2.1	38.1	38	0.05	3	●
0.3	DCSSSD0030	3.1	38.1	38	0.07	3	●
0.4	DCSSSD0040	4.1	38.1	38	0.09	3	●
0.5	DCSSSD0050	4.1	38.1	38	0.12	3	●
0.6	DCSSSD0060	5.1	38.1	38	0.14	3	●
0.7	DCSSSD0070	5.2	38.2	38	0.16	3	●
0.8	DCSSSD0080	6.2	38.2	38	0.19	3	●
0.9	DCSSSD0090	6.2	38.2	38	0.21	3	●
1.0	DCSSSD0100	8.2	38.2	38	0.2	3	●
1.1	DCSSSD0110	8.3	38.3	38	0.3	3	●

DC (mm)	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON	Stock
1.2	DCSSSD0120	8.3	38.3	38	0.3	3	●
1.3	DCSSSD0130	8.3	38.3	38	0.3	3	●
1.4	DCSSSD0140	8.3	38.3	38	0.3	3	●
1.5	DCSSSD0150	10.3	45.3	45	0.3	3	●
1.6	DCSSSD0160	10.3	45.3	45	0.3	3	●
1.7	DCSSSD0170	10.4	45.4	45	0.4	3	●
1.8	DCSSSD0180	10.4	45.4	45	0.4	3	●
1.9	DCSSSD0190	10.4	45.4	45	0.4	3	●
2.0	DCSSSD0200	12.4	45.4	45	0.4	3	●

DCSSM

Medium, For Non-Ferrous Materials

UWC | DC | 135° | X

P M K **N** S H

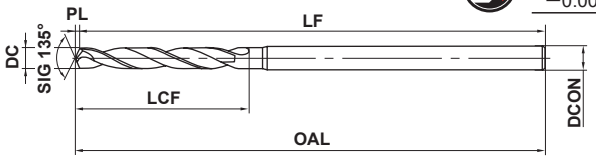
Non-ferrous Metal

2.1≤DC≤3 $^{0}_{-0.014}$

DCON=3 h6 $^{0}_{-0.006}$

External Coolant





●Original CVD diamond coating technology provides excellent adhesion for coating layer and enables stable drilling without peeling or chipping.

DC (mm)	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON	Stock
2.1	DCSSMD0210	17.4	60.4	60	0.4	3	●
2.2	DCSSMD0220	17.5	60.5	60	0.5	3	●
2.3	DCSSMD0230	17.5	60.5	60	0.5	3	●
2.4	DCSSMD0240	17.5	60.5	60	0.5	3	●
2.5	DCSSMD0250	21.5	60.5	60	0.5	3	●
2.6	DCSSMD0260	21.5	60.5	60	0.5	3	●

DC (mm)	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON	Stock
2.7	DCSSMD0270	21.6	60.6	60	0.6	3	●
2.8	DCSSMD0280	21.6	60.6	60	0.6	3	●
2.9	DCSSMD0290	21.6	60.6	60	0.6	3	●
3.0	DCSSMD0300	21.6	60.6	60	0.6	3	●

● : Inventory maintained in Japan.

DCSSS
Short, For Non-Ferrous Materials

DCSSM
Medium, For Non-Ferrous Materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Aluminium Alloys		Aluminium Alloy Casting		Copper Copper Alloys		Graphite Machineable Ceramics		MMC FRP	
Dia. **DC** (mm)	Revolution (min-1)	Feed rate (mm/rev)	Revolution (min-1)	Feed rate (mm/rev)	Revolution (min-1)	Feed rate (mm/rev)	Revolution (min-1)	Feed rate (mm/rev)	Revolution (min-1)	Feed rate (mm/rev)
0.2	20000	0.006	10000	0.003	20000	0.003	20000	0.01	10000	0.003
0.5	20000	0.02	10000	0.01	20000	0.01	20000	0.03	10000	0.01
1.0	20000	0.04	10000	0.02	20000	0.02	20000	0.05	10000	0.02
1.5	20000	0.05	10000	0.02	16000	0.02	16000	0.08	10000	0.02
2.0	20000	0.06	9000	0.03	11000	0.03	11000	0.10	9000	0.03
2.5	18500	0.08	7500	0.04	10000	0.04	10000	0.12	7500	0.04
3.0	17000	0.10	6000	0.05	8500	0.05	8500	0.15	6000	0.05

Note 1) When drilling very hard workpiece materials, reduce the feed.
Note 2) Use water-soluble coolant or grinding fluid when working.
Note 3) When drilling deep holes, moderate the cutting conditions.
Note 4) The revolution speed can be increased by using a high-speed spindle.

DCBSS

Drill for Hard, Brittle Materials

UWC DC 180° 166°

DC<0.07 DC≥0.07

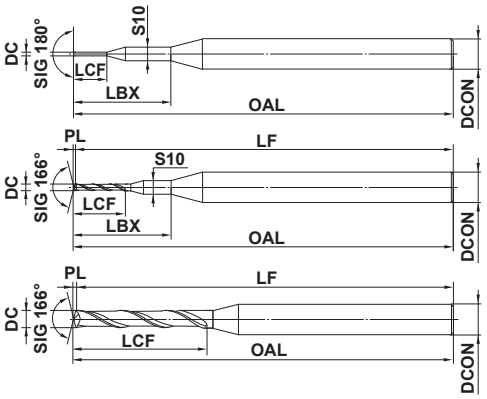
P M K **N** S H

Non-ferrous Metal

External Coolant



- For machining materials such as sintered ceramics and quartz glass that cannot be machined with conventional drills.



	0.05≤DC<0.2	0.2≤DC≤3
h6	0 −0.009	0 −0.014
	0 −0.006	0 −0.006

DC (mm)	Order Number	LBX	LCF	OAL	LF	PL	S10	DCON	Stock	Type	Short Delivery
0.05	DCBSSD0005	6	0.5	38.0	38	–	1.0	3	□	1	◎
0.06	DCBSSD0006	6	0.6	38.0	38	–	1.0	3	□	1	
0.07	DCBSSD0007	6	0.7	38.004	38	0.004	1.0	3	□	2	◎
0.08	DCBSSD0008	6	0.8	38.005	38	0.005	1.0	3	□	2	◎
0.09	DCBSSD0009	6	0.9	38.006	38	0.006	1.0	3	□	2	◎
0.10	DCBSSD0010	6	1.0	38.01	38	0.01	1.0	3	●	2	
0.11	DCBSSD0011	6	1.2	38.01	38	0.01	1.0	3	●	2	
0.12	DCBSSD0012	6	1.4	38.01	38	0.01	1.0	3	●	2	
0.13	DCBSSD0013	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.14	DCBSSD0014	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.15	DCBSSD0015	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.16	DCBSSD0016	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.17	DCBSSD0017	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.18	DCBSSD0018	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.19	DCBSSD0019	6	1.5	38.01	38	0.01	1.0	3	●	2	
0.20	DCBSSD0020	–	2.0	38.01	38	0.01	–	3	●	3	
0.21	DCBSSD0021	–	2.0	38.01	38	0.01	–	3	□	3	◎
0.22	DCBSSD0022	–	2.0	38.01	38	0.01	–	3	□	3	◎
0.23	DCBSSD0023	–	2.0	38.01	38	0.01	–	3	□	3	◎
0.24	DCBSSD0024	–	2.0	38.01	38	0.01	–	3	□	3	◎
0.25	DCBSSD0025	–	2.5	38.02	38	0.02	–	3	●	3	
0.26	DCBSSD0026	–	2.5	38.02	38	0.02	–	3	□	3	◎
0.27	DCBSSD0027	–	2.5	38.02	38	0.02	–	3	□	3	◎
0.28	DCBSSD0028	–	2.5	38.02	38	0.02	–	3	□	3	◎
0.29	DCBSSD0029	–	2.5	38.02	38	0.02	–	3	□	3	◎
0.30	DCBSSD0030	–	3.0	38.02	38	0.02	–	3	●	3	

DC (mm)	Order Number	LBX	LCF	OAL	LF	PL	S10	DCON	Stock	Type	Short Delivery
0.31	DCBSSD0031	–	3.0	38.02	38	0.02	–	3	□	3	◎
0.32	DCBSSD0032	–	3.0	38.02	38	0.02	–	3	□	3	◎
0.33	DCBSSD0033	–	3.0	38.02	38	0.02	–	3	□	3	◎
0.34	DCBSSD0034	–	3.5	38.02	38	0.02	–	3	□	3	◎
0.35	DCBSSD0035	–	3.5	38.02	38	0.02	–	3	●	3	
0.36	DCBSSD0036	–	3.5	38.02	38	0.02	–	3	□	3	◎
0.40	DCBSSD0040	–	4.0	38.02	38	0.02	–	3	●	3	
0.45	DCBSSD0045	–	4.0	38.03	38	0.03	–	3	□	3	◎
0.50	DCBSSD0050	–	4.0	38.03	38	0.03	–	3	●	3	
0.55	DCBSSD0055	–	4.5	38.03	38	0.03	–	3	□	3	◎
0.60	DCBSSD0060	–	5.0	38.04	38	0.04	–	3	●	3	
0.70	DCBSSD0070	–	5.0	38.04	38	0.04	–	3	●	3	
0.80	DCBSSD0080	–	6.1	38.05	38	0.05	–	3	●	3	
0.85	DCBSSD0085	–	6.1	38.05	38	0.05	–	3	□	3	◎
0.90	DCBSSD0090	–	6.1	38.06	38	0.06	–	3	●	3	
1.00	DCBSSD0100	–	8.1	38.1	38	0.1	–	3	●	3	
1.10	DCBSSD0110	–	8.1	38.1	38	0.1	–	3	●	3	
1.20	DCBSSD0120	–	8.1	38.1	38	0.1	–	3	●	3	
1.30	DCBSSD0130	–	8.1	38.1	38	0.1	–	3	●	3	
1.40	DCBSSD0140	–	8.1	38.1	38	0.1	–	3	●	3	
1.50	DCBSSD0150	–	10.1	38.1	38	0.1	–	3	●	3	
1.60	DCBSSD0160	–	10.1	38.1	38	0.1	–	3	●	3	
1.70	DCBSSD0170	–	10.1	38.1	38	0.1	–	3	●	3	
1.80	DCBSSD0180	–	10.1	38.1	38	0.1	–	3	●	3	
1.90	DCBSSD0190	–	10.1	38.1	38	0.1	–	3	●	3	
2.00	DCBSSD0200	–	12.1	38.1	38	0.1	–	3	●	3	

Note 1) Stock mark □(produced to order products) shows the basic sizes. Consult us, if different diameters and flute lengths are needed.
Note 2) Drills with ◎ mark can be delivered within 1-2 weeks. For the delivery of other drills, contact Mitsubishi Materials.
Note 3) DC=0.05, 0.06 are special shape specifications without groove. LCF is the neck lengths instead of the flute lengths.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Order Number	LBX	LCF	OAL	LF	PL	S10	DCON	Stock	Type	Short Delivery
2.10	DCBSSD0210	–	12.1	38.1	38	0.1	–	3	□	3	◎
2.20	DCBSSD0220	–	12.1	38.1	38	0.1	–	3	□	3	◎
2.30	DCBSSD0230	–	12.1	38.1	38	0.1	–	3	□	3	
2.40	DCBSSD0240	–	12.2	38.2	38	0.2	–	3	□	3	◎
2.50	DCBSSD0250	–	12.2	38.2	38	0.2	–	3	●	3	

DC (mm)	Order Number	LBX	LCF	OAL	LF	PL	S10	DCON	Stock	Type	Short Delivery
2.60	DCBSSD0260	–	12.2	38.2	38	0.2	–	3	□	3	
2.70	DCBSSD0270	–	12.2	38.2	38	0.2	–	3	□	3	
2.80	DCBSSD0280	–	12.2	38.2	38	0.2	–	3	□	3	
2.90	DCBSSD0290	–	12.2	38.2	38	0.2	–	3	□	3	
3.00	DCBSSD0300	–	12.2	38.2	38	0.2	–	3	□	3	◎

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Aluminium Nitride				Alumina				Zirconia			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Step (mm)
0.05	3	20000	0.000015	0.001	3	20000	0.00001	0.001	3	20000	0.00001	0.001
0.08	5	20000	0.00003	0.003	5	20000	0.00002	0.002	5	20000	0.00002	0.001
0.1	6	20000	0.0002	0.01	6	20000	0.0001	0.005	6	20000	0.0001	0.003
0.16	9	18000	0.0002	0.01	9	18000	0.0001	0.005	9	18000	0.0001	0.003
0.2	9	15000	0.0002	0.01	9	15000	0.0001	0.005	9	15000	0.0001	0.003
0.32	12	12000	0.0002	0.01	12	12000	0.0001	0.005	12	12000	0.0001	0.003
0.4	15	12000	0.0002	0.01	15	12000	0.0001	0.005	15	12000	0.0001	0.003
0.5	19	12000	0.0002	0.01	19	12000	0.0001	0.005	19	12000	0.0001	0.003
0.6	19	10000	0.0002	0.01	19	10000	0.0001	0.005	19	10000	0.0001	0.003
0.8	25	10000	0.0002	0.01	25	10000	0.0001	0.005	25	10000	0.0001	0.003
1	31	10000	0.0002	0.01	31	10000	0.0001	0.005	31	10000	0.0001	0.003
1.2	30	8000	0.00025	0.01	30	8000	0.00015	0.005	30	8000	0.00015	0.003
1.6	40	8000	0.0003	0.01	40	8000	0.0002	0.005	40	8000	0.0002	0.003
2	38	6000	0.0003	0.01	38	6000	0.0002	0.005	38	6000	0.0002	0.003
3	47	5000	0.0003	0.01	47	5000	0.0003	0.005	47	5000	0.0002	0.003

Workpiece Material	Silicon Carbide Silicon Nitride				Quartz Glass			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Step (mm)
0.05	3	20000	0.000005	0.0005	3	20000	0.000015	0.001
0.08	5	20000	0.00001	0.001	5	20000	0.00003	0.005
0.1	6	20000	0.00005	0.002	6	20000	0.0002	0.05
0.16	9	18000	0.00005	0.002	9	18000	0.0002	0.05
0.2	9	15000	0.00005	0.002	9	15000	0.0002	0.05
0.32	12	12000	0.00005	0.002	12	12000	0.0002	0.05
0.4	15	12000	0.00005	0.002	15	12000	0.0003	0.05
0.5	19	12000	0.00005	0.002	19	12000	0.0003	0.05
0.6	19	10000	0.00005	0.002	19	10000	0.0003	0.05
0.8	25	10000	0.00005	0.002	25	10000	0.0003	0.05
1	31	10000	0.00005	0.002	31	10000	0.0003	0.05
1.2	30	8000	0.00007	0.002	30	8000	0.0004	0.05
1.6	40	8000	0.0001	0.002	40	8000	0.0004	0.05
2	38	6000	0.0001	0.002	38	6000	0.0004	0.05
3	47	5000	0.0001	0.002	47	5000	0.0005	0.05

Note 1) Depending on the type of machine, it is possible to apply cutting speeds over 20000min^{-1}.
Note 2) Use water-soluble coolant or grinding fluid when working.
Note 3) The intermediate diameter revolution is not tabulated. It is matched to the large diameter side and closest drill diameter conditions or by calculating the cutting speed of the closest drill diameter. Set the feed rate per revolution to a suitable value with the recommended feed rate of the closest drill diameter as the standard.

STAW

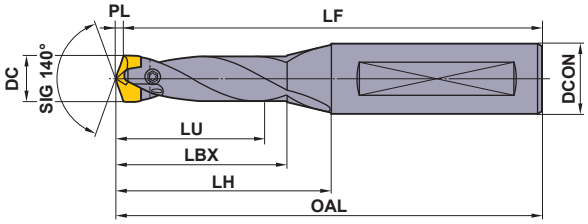
Small Diameter Indexable Drill

- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.



P Steel | M Stainless Steel | K Cast Iron | N | S | H





HOLDERS

DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	Dimensions (mm) LU	LBX	LH	OAL	LF	PL	DCON	F Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
10.0 – 10.4	1.5	STAWSS1000S16	●	16.8	23.8	33.8	81.8	80	1.8	16	TIP06F	10.0	* STAWN1000TH	●	□
	3	STAWSN1000S16	●	31.8	38.8	48.8	96.8	95	1.8	16	TIP06F	10.1	STAWN1010TH	●	□
	5	STAWMN1000S16	●	51.8	58.8	68.8	116.8	115	1.8	16	TIP06F	10.2	STAWN1020TH	●	□
	8	STAWLN1000S16	●	81.8	88.8	98.8	146.8	145	1.8	16	TIP06F	10.3	STAWN1030TH	●	□
												10.4	STAWN1040TH	●	□
10.5 – 10.9	1.5	STAWSS1050S16	●	17.7	23.9	33.9	81.9	80	1.9	16	TIP06F	10.5	* STAWN1050TH	●	□
	3	STAWSN1050S16	●	33.4	38.9	48.9	96.9	95	1.9	16	TIP06F	10.6	STAWN1060TH	●	□
	5	STAWMN1050S16	●	54.4	58.9	68.9	116.9	115	1.9	16	TIP06F	10.7	STAWN1070TH	●	□
	8	STAWLN1050S16	●	85.9	88.9	98.9	146.9	145	1.9	16	TIP06F	10.8	STAWN1080TH	●	□
												10.9	STAWN1090TH	●	□
11.0 – 11.4	1.5	STAWSS1100S16	●	18.5	27.0	38.0	86.0	84	2.0	16	TIP06F	11.0	* STAWN1100TH	●	□
	3	STAWSN1100S16	●	35.0	43.0	54.0	102.0	100	2.0	16	TIP06F	11.1	STAWN1110TH	●	□
	5	STAWMN1100S16	●	57.0	68.0	79.0	127.0	125	2.0	16	TIP06F	11.2	STAWN1120TH	●	□
	8	STAWLN1100S16	●	90.0	98.0	109.0	157.0	155	2.0	16	TIP06F	11.3	STAWN1130TH	●	□
												11.4	STAWN1140TH	●	□
11.5 – 11.9	1.5	STAWSS1150S16	●	19.4	27.1	38.1	86.1	84	2.1	16	TIP06F	11.5	* STAWN1150TH	●	□
	3	STAWSN1150S16	●	36.6	43.1	54.1	102.1	100	2.1	16	TIP06F	11.6	STAWN1160TH	●	□
	5	STAWMN1150S16	●	59.6	68.1	79.1	127.1	125	2.1	16	TIP06F	11.7	STAWN1170TH	●	□
	8	STAWLN1150S16	●	94.1	98.1	109.1	157.1	155	2.1	16	TIP06F	11.8	STAWN1180TH	●	□
												11.9	STAWN1190TH	●	□
12.0 – 12.4	1.5	STAWSS1200S16	●	20.2	29.2	41.2	89.2	87	2.2	16	TIP06F	12.0	* STAWN1200TH	●	□
	3	STAWSN1200S16	●	38.2	47.2	59.2	107.2	105	2.2	16	TIP06F	12.1	STAWN1210TH	●	□
	5	STAWMN1200S16	●	62.2	72.2	84.2	132.2	130	2.2	16	TIP06F	12.2	STAWN1220TH	●	□
	8	STAWLN1200S16	●	98.2	107.2	119.2	167.2	165	2.2	16	TIP06F	12.3	STAWN1230TH	●	□
												12.4	STAWN1240TH	●	□

Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.

DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	F W Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
12.5 – 12.9	1.5	STAWSS1250S16	●	21.1	29.3	41.3	89.3	87	2.3	16	TIP06F	12.5	* STAWN1250TH	●	□
	3	STAWSN1250S16	●	39.8	47.3	59.3	107.3	105	2.3	16	TIP06F	12.6	STAWN1260TH	●	□
	5	STAWMN1250S16	●	64.8	72.3	84.3	132.3	130	2.3	16	TIP06F	12.7	STAWN1270TH	●	□
	8	STAWLN1250S16	●	102.3	107.3	119.3	167.3	165	2.3	16	TIP06F	12.8	STAWN1280TH	●	□
												12.9	STAWN1290TH	●	□
13.0 – 13.4	1.5	STAWSS1300S16	●	21.9	32.4	45.4	93.4	91	2.4	16	TIP08W	13.0	* STAWN1300TH	●	□
	3	STAWSN1300S16	●	41.4	51.4	64.4	112.4	110	2.4	16	TIP08W	13.1	STAWN1310TH	●	□
	5	STAWMN1300S16	●	67.4	76.4	89.4	137.4	135	2.4	16	TIP08W	13.2	STAWN1320TH	●	□
	8	STAWLN1300S16	●	106.4	116.4	129.4	177.4	175	2.4	16	TIP08W	13.3	STAWN1330TH	●	□
												13.4	STAWN1340TH	●	□
13.5 – 13.9	1.5	STAWSS1350S16	●	22.8	32.5	45.5	93.5	91	2.5	16	TIP08W	13.5	* STAWN1350TH	●	□
	3	STAWSN1350S16	●	43.0	51.5	64.5	112.5	110	2.5	16	TIP08W	13.6	STAWN1360TH	●	□
	5	STAWMN1350S16	●	70.0	76.5	89.5	137.5	135	2.5	16	TIP08W	13.7	STAWN1370TH	●	□
	8	STAWLN1350S16	●	110.5	116.5	129.5	177.5	175	2.5	16	TIP08W	13.8	STAWN1380TH	●	□
												13.9	STAWN1390TH	●	□
14.0 – 14.4	1.5	STAWSS1400S16	●	23.5	33.5	47.5	95.5	93	2.5	16	TIP08W	14.0	* STAWN1400TH	●	
	3	STAWSN1400S16	●	44.5	55.5	69.5	117.5	115	2.5	16	TIP08W	14.1	STAWN1410TH	●	
	5	STAWMN1400S16	●	72.5	85.5	99.5	147.5	145	2.5	16	TIP08W	14.2	STAWN1420TH	●	
	8	STAWLN1400S16	●	114.5	124.5	139.5	187.5	185	2.5	16	TIP08W	14.3	STAWN1430TH	●	
												14.4	STAWN1440TH	●	
14.5 – 14.9	1.5	STAWSS1450S16	●	24.4	33.6	47.6	95.6	93	2.6	16	TIP08W	14.5	* STAWN1450TH	●	
	3	STAWSN1450S16	●	46.1	55.6	69.6	117.6	115	2.6	16	TIP08W	14.6	STAWN1460TH	●	
	5	STAWMN1450S16	●	75.1	85.6	99.6	147.6	145	2.6	16	TIP08W	14.7	STAWN1470TH	●	
	8	STAWLN1450S16	●	118.6	124.6	139.6	187.6	185	2.6	16	TIP08W	14.8	STAWN1480TH	●	
												14.9	STAWN1490TH	●	
15.0 – 15.4	1.5	STAWSS1500S20	●	25.2	35.7	50.7	100.7	98	2.7	20	TIP08W	15.0	* STAWN1500TH	●	
	3	STAWSN1500S20	●	47.7	62.7	77.7	127.7	125	2.7	20	TIP08W	15.1	STAWN1510TH	●	
	5	STAWMN1500S20	●	77.7	92.7	107.7	157.7	155	2.7	20	TIP08W	15.2	STAWN1520TH	●	
	8	STAWLN1500S20	●	122.7	132.7	150.7	200.7	198	2.7	20	TIP08W	15.3	STAWN1530TH	●	
												15.4	STAWN1540TH	●	

STAW

Small Diameter Indexable Drill

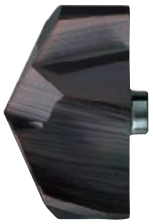
DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	W Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
15.5 – 16.4	1.5	STAWSS1600S20	●	26.1	36.8	52.8	102.8	100	2.8	20	TIP10W	15.5	* STAWN1550T	●	
												15.6	STAWN1560T	●	
												15.7	STAWN1570T	●	
	3	STAWSN1600S20	●	49.3	62.8	82.8	132.8	130	2.8	20	TIP10W	15.8	STAWN1580T	●	
												15.9	STAWN1590T	●	
	5	STAWMN1600S20	●	80.3	92.8	117.8	167.8	165	2.8	20	TIP10W	16.0	STAWN1600T	●	
												16.1	STAWN1610T	●	
												16.2	STAWN1620T	●	
	8	STAWLN1600S20	●	126.8	140.8	160.8	210.8	208	2.8	20	TIP10W	16.3	STAWN1630T	●	
												16.4	STAWN1640T	●	
16.5 – 17.4	1.5	STAWSS1700S20	●	27.8	39.0	56.0	106.0	103	3.0	20	TIP10W	16.5	* STAWN1650T	●	
												16.6	STAWN1660T	●	
												16.7	STAWN1670T	●	
	3	STAWSN1700S20	●	52.5	64.0	88.0	138.0	135	3.0	20	TIP10W	16.8	STAWN1680T	●	
												16.9	STAWN1690T	●	
	5	STAWMN1700S20	●	85.5	98.0	123.0	173.0	170	3.0	20	TIP10W	17.0	STAWN1700T	●	
												17.1	STAWN1710T	●	
												17.2	STAWN1720T	●	
	8	STAWLN1700S20	●	135.0	149.0	169.0	219.0	216	3.0	20	TIP10W	17.3	STAWN1730T	●	
												17.4	STAWN1740T	●	
17.5 – 18.4	1.5	STAWSS1800S20	●	29.5	40.2	58.2	108.2	105	3.2	20	TIP10W	17.5	* STAWN1750T	●	
												17.6	STAWN1760T	●	
												17.7	STAWN1770T	●	
	3	STAWSN1800S20	●	55.7	67.2	93.2	143.2	140	3.2	20	TIP10W	17.8	STAWN1780T	●	
												17.9	STAWN1790T	●	
	5	STAWMN1800S20	●	90.7	103.2	128.2	178.2	175	3.2	20	TIP10W	18.0	STAWN1800T	●	
												18.1	STAWN1810T	●	
												18.2	STAWN1820T	●	
	8	STAWLN1800S20	●	143.2	157.2	177.2	227.2	224	3.2	20	TIP10W	18.3	STAWN1830T	●	
												18.4	STAWN1840T	●	

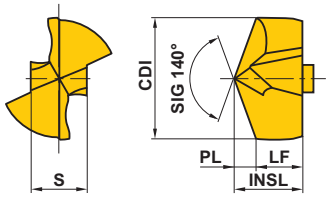
Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.

INSERTS





Order Number	Coated		Dimensions (mm)					Applicable Holder
	VP15TF	VP10H	CDI	INSL	LF	PL	S	
STAWN1000TH	●	□	10.0	5.6	3.8	1.8	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
STAWN1010TH	●	□	10.1	5.6	3.8	1.8	4.6	
STAWN1020TH	●	□	10.2	5.7	3.8	1.9	4.6	
STAWN1030TH	●	□	10.3	5.7	3.8	1.9	4.6	
STAWN1040TH	●	□	10.4	5.7	3.8	1.9	4.6	
STAWN1050TH	●	□	10.5	5.9	4.0	1.9	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
STAWN1060TH	●	□	10.6	5.9	4.0	1.9	4.8	
STAWN1070TH	●	□	10.7	5.9	4.0	1.9	4.8	
STAWN1080TH	●	□	10.8	6.0	4.0	2.0	4.8	
STAWN1090TH	●	□	10.9	6.0	4.0	2.0	4.8	
STAWN1100TH	●	□	11.0	6.2	4.2	2.0	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
STAWN1110TH	●	□	11.1	6.2	4.2	2.0	5.1	
STAWN1120TH	●	□	11.2	6.2	4.2	2.0	5.1	
STAWN1130TH	●	□	11.3	6.3	4.2	2.1	5.1	
STAWN1140TH	●	□	11.4	6.3	4.2	2.1	5.1	
STAWN1150TH	●	□	11.5	6.5	4.4	2.1	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
STAWN1160TH	●	□	11.6	6.5	4.4	2.1	5.3	
STAWN1170TH	●	□	11.7	6.5	4.4	2.1	5.3	
STAWN1180TH	●	□	11.8	6.5	4.4	2.1	5.3	
STAWN1190TH	●	□	11.9	6.6	4.4	2.2	5.3	
STAWN1200TH	●	□	12.0	6.8	4.6	2.2	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
STAWN1210TH	●	□	12.1	6.8	4.6	2.2	5.5	
STAWN1220TH	●	□	12.2	6.8	4.6	2.2	5.5	
STAWN1230TH	●	□	12.3	6.8	4.6	2.2	5.5	
STAWN1240TH	●	□	12.4	6.9	4.6	2.3	5.5	
STAWN1250TH	●	□	12.5	7.1	4.8	2.3	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
STAWN1260TH	●	□	12.6	7.1	4.8	2.3	5.8	
STAWN1270TH	●	□	12.7	7.1	4.8	2.3	5.8	
STAWN1280TH	●	□	12.8	7.1	4.8	2.3	5.8	
STAWN1290TH	●	□	12.9	7.1	4.8	2.3	5.8	
STAWN1300TH	●	□	13.0	7.3	4.9	2.4	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
STAWN1310TH	●	□	13.1	7.3	4.9	2.4	6.0	
STAWN1320TH	●	□	13.2	7.3	4.9	2.4	6.0	
STAWN1330TH	●	□	13.3	7.3	4.9	2.4	6.0	
STAWN1340TH	●	□	13.4	7.3	4.9	2.4	6.0	
STAWN1350TH	●	□	13.5	7.6	5.1	2.5	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
STAWN1360TH	●	□	13.6	7.6	5.1	2.5	6.2	
STAWN1370TH	●	□	13.7	7.6	5.1	2.5	6.2	
STAWN1380TH	●	□	13.8	7.6	5.1	2.5	6.2	
STAWN1390TH	●	□	13.9	7.6	5.1	2.5	6.2	
STAWN1400TH	●		14.0	7.8	5.3	2.5	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
STAWN1410TH	●		14.1	7.9	5.3	2.6	6.4	
STAWN1420TH	●		14.2	7.9	5.3	2.6	6.4	
STAWN1430TH	●		14.3	7.9	5.3	2.6	6.4	
STAWN1440TH	●		14.4	7.9	5.3	2.6	6.4	

STAW

Small Diameter Indexable Drill

Order Number	Coated		Dimensions (mm)					Applicable Holder
	VP15TF	VP10H	CDI	INSL	LF	PL	S	
STAWN1450TH	●		14.5	8.1	5.5	2.6	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
STAWN1460TH	●		14.6	8.2	5.5	2.7	6.7	
STAWN1470TH	●		14.7	8.2	5.5	2.7	6.7	
STAWN1480TH	●		14.8	8.2	5.5	2.7	6.7	
STAWN1490TH	●		14.9	8.2	5.5	2.7	6.7	
STAWN1500TH	●		15.0	8.4	5.7	2.7	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
STAWN1510TH	●		15.1	8.4	5.7	2.7	6.9	
STAWN1520TH	●		15.2	8.5	5.7	2.8	6.9	
STAWN1530TH	●		15.3	8.5	5.7	2.8	6.9	
STAWN1540TH	●		15.4	8.5	5.7	2.8	6.9	
STAWN1550T	●		15.5	8.7	5.9	2.8	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
STAWN1560T	●		15.6	8.7	5.9	2.8	7.1	
STAWN1570T	●		15.7	8.8	5.9	2.9	7.1	
STAWN1580T	●		15.8	8.8	5.9	2.9	7.1	
STAWN1590T	●		15.9	8.8	5.9	2.9	7.1	
STAWN1600T	●		16.0	8.8	5.9	2.9	7.1	
STAWN1610T	●		16.1	8.8	5.9	2.9	7.1	
STAWN1620T	●		16.2	8.8	5.9	2.9	7.1	
STAWN1630T	●		16.3	8.9	5.9	3.0	7.1	
STAWN1640T	●		16.4	8.9	5.9	3.0	7.1	
STAWN1650T	●		16.5	9.3	6.3	3.0	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
STAWN1660T	●		16.6	9.3	6.3	3.0	7.6	
STAWN1670T	●		16.7	9.3	6.3	3.0	7.6	
STAWN1680T	●		16.8	9.4	6.3	3.1	7.6	
STAWN1690T	●		16.9	9.4	6.3	3.1	7.6	
STAWN1700T	●		17.0	9.4	6.3	3.1	7.6	
STAWN1710T	●		17.1	9.4	6.3	3.1	7.6	
STAWN1720T	●		17.2	9.4	6.3	3.1	7.6	
STAWN1730T	●		17.3	9.4	6.3	3.1	7.6	
STAWN1740T	●		17.4	9.5	6.3	3.2	7.6	
STAWN1750T	●		17.5	9.9	6.7	3.2	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
STAWN1760T	●		17.6	9.9	6.7	3.2	8.1	
STAWN1770T	●		17.7	9.9	6.7	3.2	8.1	
STAWN1780T	●		17.8	9.9	6.7	3.2	8.1	
STAWN1790T	●		17.9	10.0	6.7	3.3	8.1	
STAWN1800T	●		18.0	10.0	6.7	3.3	8.1	
STAWN1810T	●		18.1	10.0	6.7	3.3	8.1	
STAWN1820T	●		18.2	10.0	6.7	3.3	8.1	
STAWN1830T	●		18.3	10.0	6.7	3.3	8.1	
STAWN1840T	●		18.4	10.0	6.7	3.3	8.1	

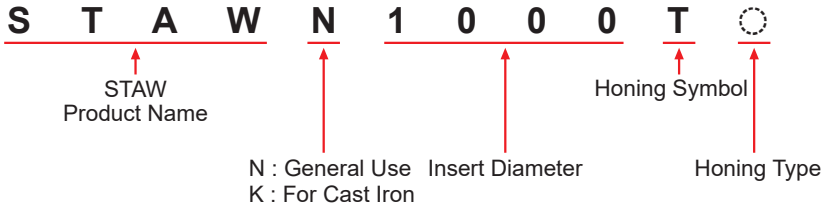
● : Inventory maintained in Japan.

Contains one inserts per case.

■ HONE WIDTH

If an insert with honing other than standard is needed, please order using the symbols below.

(Insert Order Number)



(Honing Standard)

Honing Type	Hone Width (mm)
F	0
G	0.02—0.05
H	0.05—0.10
-	0.10—0.15
K	0.15—0.20
S	0.20—0.25
M	0.25—0.30

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Drill Diameter	ϕ10.0—ϕ12.9		ϕ13.0—ϕ13.9		ϕ14.0—ϕ15.4		ϕ15.5—ϕ18.4	
		Conditions / Hardness	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel	≤180HB	80 (60—100)	0.20 (0.15—0.25)	90 (70—110)	0.25 (0.20—0.30)	100 (80—120)	0.30 (0.25—0.35)	100 (80—120)	0.35 (0.25—0.40)
	Carbon Steel Alloy Steel	180—280HB	80 (60—100)	0.20 (0.15—0.25)	90 (70—110)	0.25 (0.20—0.30)	100 (80—120)	0.30 (0.25—0.35)	100 (80—120)	0.35 (0.25—0.40)
		280—350HB	70 (60—90)	0.20 (0.15—0.25)	80 (60—100)	0.25 (0.20—0.30)	90 (70—110)	0.25 (0.20—0.30)	90 (70—110)	0.30 (0.20—0.35)
M	Stainless Steel	≤200HB	40 (30—50)	0.13 (0.10—0.16)	50 (40—60)	0.15 (0.12—0.18)	60 (50—70)	0.17 (0.14—0.20)	60 (50—70)	0.17 (0.14—0.20)
K	Gray Cast Iron	Tensile Strength ≤350MPa	80 (60—100)	0.20 (0.15—0.25)	90 (70—110)	0.25 (0.20—0.30)	100 (80—120)	0.30 (0.25—0.35)	120 (80—140)	0.45 (0.35—0.55)
	Ductile Cast Iron	Tensile Strength ≤450MPa	70 (60—90)	0.20 (0.15—0.25)	80 (60—100)	0.25 (0.20—0.30)	90 (70—110)	0.30 (0.25—0.35)	100 (80—120)	0.35 (0.25—0.40)

Note 1) When using a drill for DC×1.5 depth of hole, it is possible to increase the feed rate by approx. 20%.
Note 2) When using the DC×8 type holder, reduce the cutting speed by approx. 20%.
Note 3) When using DC×8, it is recommended to pre-drill a pilot hole of the same size.
Note 4) For stainless steel, please use internal coolant. (Mist & MQL are not recommended).

STAW

Small Diameter Indexable Drill

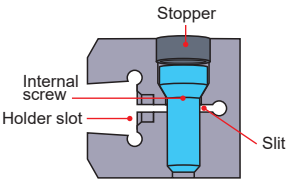
NOTES ON USE

■INSERT INSTALLATION

1. Before inserting the insert into the holder, ensure that there are no foreign objects or dirt in the holder slot or slit. If there are any foreign objects or dirt, use compressed air to remove them.

2. Use the provided wrench to loosen the inner screw to open the tip of the holder, then put the insert into the holder slot as shown in figure 1.
   *Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.

3. After the insert has been set in the holder slot, tighten the inner screw while holding the insert lightly as shown in figure 2 to securely clamp and locate the insert.
   *Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.



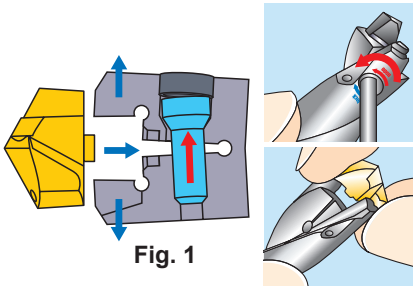


Fig. 1

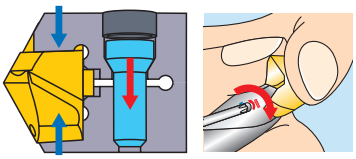
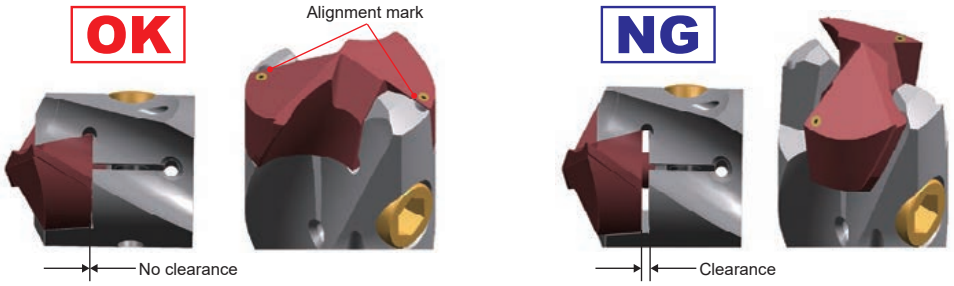


Fig. 2

Tighten the clamp screw according to the torque below.

Drill Diameter (mm)	Clamp Torque N · m
10 －12.9	1
13 －15.4	2
15.5－18.4	2.5

4. Check that there is no gap between the bottom of the insert and holder slot.



Note 1) Poor or incorrect clamping of inserts can cause poor drilling performance and/or drill breakage. Therefore ensure that the alignment marks on both the body and insert are aligned when setting. When machining, use safety guards and goggles.

SPARE PARTS

Applicable Holder	Pack Order Number (Internal Screw & Stopper)	Internal Screw	Stopper
STAWSS/SN/MN/LN1000S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1050S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1100S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1150S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1200S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1250S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1300S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1350S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1400S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1450S16	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1500S20	WS253909TPS-45LH	WS253909TPS	WS45LH
STAWSS/SN/MN/LN1600S20	WS304912TPS-55LH	WS304912TPS	WS55LH
STAWSS/SN/MN/LN1700S20	WS304912TPS-55LH	WS304912TPS	WS55LH
STAWSS/SN/MN/LN1800S20	WS304912TPS-55LH	WS304912TPS	WS55LH

Note 1) The parts are packaged in the form of internal screw, stopper and operation manual. Please replace the parts in accordance with the operation manual.

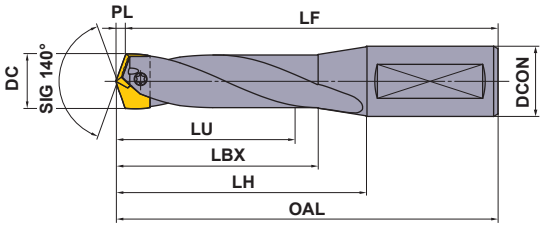
TAW

●Wavy cutting edge design for good chip control.
●Serration geometry for accurate insert location.

P Steel | M Stainless Steel | K Cast Iron | N | S | H

(General Use)





■HOLDERS

DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
18.5 – 19.4	3	TAWSN1900S25	●	58.9	71.4	102.4	158.4	155.0	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS	18.5	＊TAWNH1850T	●	□
															18.6	TAWNH1860T	●	□
															18.7	TAWNH1870T	●	□
															18.8	TAWNH1880T	●	□
	5	TAWMN1900S25	●	95.9	110.4	137.4	193.4	190.0	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS	18.9	TAWNH1890T	●	□
															19.0	TAWNH1900T	●	□
															19.1	TAWNH1910T	●	□
	8	TAWLN1900S25	●	151.4	165.4	188.4	244.4	241.0	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS	19.2	TAWNH1920T	●	□
															19.3	TAWNH1930T	●	□
															19.4	TAWNH1940T	●	□
19.5 – 20.4	3	TAWSN2000S25	●	62.0	75.5	102.5	158.5	155.0	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS	19.5	＊TAWNH1950T	●	□
															19.6	TAWNH1960T	●	□
															19.7	TAWNH1970T	●	□
															19.8	TAWNH1980T	●	□
	5	TAWMN2000S25	●	101.0	116.5	142.5	198.5	195.0	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS	19.9	TAWNH1990T	●	□
															20.0	TAWNH2000T	●	□
															20.1	TAWNH2010T	□	□
	8	TAWLN2000S25	●	159.5	173.5	196.5	252.5	249.0	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS	20.2	TAWNH2020T	□	□
															20.3	TAWNH2030T	□	□
															20.4	TAWNH2040T	□	□

Note 1) The above dimensions (＊) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

Scan here for product NEWS ▶

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.

INSERT DESCRIPTION ➢ N156
SPARE PARTS ➢ P001

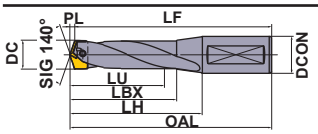
TAW

DC (mm)	Hole Depth (L/D)	Holder Order Number	Holder Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Insert Stock VP15TF	Insert Stock VP10H
20.5 — 21.4	3	TAWSN2100S25	●	65.2	78.7	102.7	158.7	155.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	20.5	*TAWNH2050T	●	□
															20.6	TAWNH2060T	□	□
															20.7	TAWNH2070T	□	□
															20.8	TAWNH2080T	□	□
	5	TAWMN2100S25	●	106.2	121.7	142.7	198.7	195.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	20.9	TAWNH2090T	□	□
															21.0	TAWNH2100T	●	□
															21.1	TAWNH2110T	□	□
	8	TAWLN2100S25	●	167.7	181.7	205.7	261.7	258.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	21.2	TAWNH2120T	□	□
															21.3	TAWNH2130T	□	□
															21.4	TAWNH2140T	□	□
21.5 — 22.4	3	TAWSN2200S25	●	68.4	83.2	108.2	164.2	160.3	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	*TAWNH2150T	●	□
															21.6	TAWNH2160T	□	□
															21.7	TAWNH2170T	□	□
															21.8	TAWNH2180T	□	□
	5	TAWMN2200S25	●	111.4	128.2	148.2	204.2	200.3	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	21.9	TAWNH2190T	□	□
															22.0	TAWNH2200T	●	□
															22.1	TAWNH2210T	□	□
	8	TAWLN2200S25	●	175.9	189.9	213.9	269.9	266.0	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	22.2	TAWNH2220T	□	□
															22.3	TAWNH2230T	□	□
															22.4	TAWNH2240T	□	□
22.5 — 23.4	3	TAWSN2300S25	●	71.6	86.4	108.4	164.4	160.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	*TAWNH2250T	●	□
															22.6	TAWNH2260T	□	□
															22.7	TAWNH2270T	□	□
															22.8	TAWNH2280T	□	□
	5	TAWMN2300S25	●	116.6	133.4	158.4	214.4	210.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	22.9	TAWNH2290T	□	□
															23.0	TAWNH2300T	●	□
															23.1	TAWNH2310T	□	□
	8	TAWLN2300S25	●	184.1	198.1	227.1	283.1	279.0	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	23.2	TAWNH2320T	□	□
															23.3	TAWNH2330T	□	□
															23.4	TAWNH2340T	□	□

Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.



DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
23.5 — 24.4	3	TAWSN2400S32	●	74.8	90.6	114.6	174.6	170.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.5	*TAWNH2350T	●	□
															23.6	TAWNH2360T	□	□
															23.7	TAWNH2370T	□	□
															23.8	TAWNH2380T	□	□
	5	TAWMN2400S32	●	121.8	139.6	164.6	224.6	220.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.9	TAWNH2390T	□	□
															24.0	TAWNH2400T	●	□
															24.1	TAWNH2410T	□	□
	8	TAWLN2400S32	●	192.3	206.6	236.6	296.6	292.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS	24.2	TAWNH2420T	□	□
															24.3	TAWNH2430T	□	□
															24.4	TAWNH2440T	□	□
24.5 — 25.4	3	TAWSN2500S32	●	78.0	93.1	115.1	175.1	170.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS	24.5	*TAWNH2450T	●	□
															24.6	TAWNH2460T	□	□
															24.7	TAWNH2470T	□	□
															24.8	TAWNH2480T	□	□
	5	TAWMN2500S32	●	127.0	145.1	170.1	230.1	225.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS	24.9	TAWNH2490T	□	□
															25.0	TAWNH2500T	●	□
															25.1	TAWNH2510T	□	□
	8	TAWLN2500S32	●	200.5	215.1	245.1	305.1	300.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS	25.2	TAWNH2520T	□	□
															25.3	TAWNH2530T	□	□
															25.4	TAWNH2540T	□	□
25.5 — 26.4	3	TAWSN2600S32	●	81.1	97.2	120.2	180.2	175.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.5	*TAWNH2550T	●	□
															25.6	TAWNH2560T	□	□
															25.7	TAWNH2570T	□	□
															25.8	TAWNH2580T	□	□
	5	TAWMN2600S32	●	132.1	151.2	175.2	235.2	230.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.9	TAWNH2590T	□	□
															26.0	TAWNH2600T	●	□
															26.1	TAWNH2610T	□	□
	8	TAWLN2600S32	●	208.6	223.2	253.2	313.2	308.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.2	TAWNH2620T	□	□
															26.3	TAWNH2630T	□	□
															26.4	TAWNH2640T	□	□

INSERT DESCRIPTION ➤ N156
SPARE PARTS ➤ P001

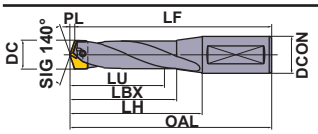
TAW

DC (mm)	Hole Depth (L/D)	Holder Order Number	Holder Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Insert Stock VP15TF	Insert Stock VP10H
26.5 — 27.4	3	TAWSN2700S32	●	84.3	99.4	120.4	180.4	175.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	＊TAWNH2650T	●	□
															26.6	TAWNH2660T	□	□
															26.7	TAWNH2670T	□	□
															26.8	TAWNH2680T	□	□
	5	TAWMN2700S32	●	137.3	156.4	180.4	240.4	235.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.9	TAWNH2690T	□	□
															27.0	TAWNH2700T	●	□
															27.1	TAWNH2710T	□	□
	8	TAWLN2700S32	●	216.8	231.4	261.4	321.4	316.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	27.2	TAWNH2720T	□	□
															27.3	TAWNH2730T	□	□
															27.4	TAWNH2740T	□	□
27.5 — 28.4	3	TAWSN2800S32	●	87.5	102.2	125.2	185.2	180.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	＊TAWNH2750T	●	□
															27.6	TAWNH2760T	□	□
															27.7	TAWNH2770T	□	□
															27.8	TAWNH2780T	□	□
	5	TAWMN2800S32	●	142.5	162.2	185.2	245.2	240.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	27.9	TAWNH2790T	□	□
															28.0	TAWNH2800T	●	□
															28.1	TAWNH2810T	□	□
	8	TAWLN2800S32	●	225.0	239.2	269.2	329.2	324.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	28.2	TAWNH2820T	□	□
															28.3	TAWNH2830T	□	□
															28.4	TAWNH2840T	□	□
28.5 — 29.4	3	TAWSN2900S32	●	90.7	105.4	130.4	190.4	185.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	＊TAWNH2850T	●	□
															28.6	TAWNH2860T	□	□
															28.7	TAWNH2870T	□	□
															28.8	TAWNH2880T	□	□
	5	TAWMN2900S32	●	147.7	167.4	190.4	250.4	245.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.9	TAWNH2890T	□	□
															29.0	TAWNH2900T	●	□
															29.1	TAWNH2910T	□	□
	8	TAWLN2900S32	●	233.2	247.4	277.4	337.4	332.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.2	TAWNH2920T	□	□
															29.3	TAWNH2930T	□	□
															29.4	TAWNH2940T	□	□

Note 1) The above dimensions (＊) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. **□ : Non stock, produced to order only.**

□ : For produced-to-order products, the minimum number of lots is 5. One insert is included per one case.



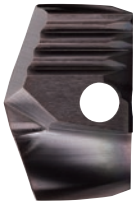
DC (mm)	Hole Depth (L/D)	Holder Order Number	Holder Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Insert Stock VP15TF	Insert Stock VP10H
29.5 — 30.4	3	TAWSN3000S32	●	93.9	109.6	130.6	190.6	185.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	＊TAWNH2950T	●	□
															29.6	TAWNH2960T	□	□
															29.7	TAWNH2970T	□	□
															29.8	TAWNH2980T	□	□
	5	TAWMN3000S32	●	152.9	172.6	200.6	260.6	255.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	29.9	TAWNH2990T	□	□
															30.0	TAWNH3000T	●	□
															30.1	TAWNH3010T	□	□
															30.2	TAWNH3020T	□	□
	8	TAWLN3000S32	●	241.4	255.6	290.6	350.6	345.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	30.3	TAWNH3030T	□	□
															30.4	TAWNH3040T	□	□

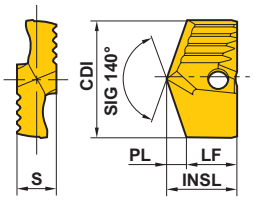
INSERT DESCRIPTION ➤ N156
SPARE PARTS ➤ P001

TAW

INSERTS

H Type





Order Number	Coated VP15TF	Coated VP10H	Dimensions (mm) CDI	INSL	LF	PL	S	Applicable Holder
TAWNH1850T	●	□	18.5	12.7	9.3	3.4	7.0	
TAWNH1860T	●	□	18.6	12.7	9.3	3.4	7.0	
TAWNH1870T	●	□	18.7	12.7	9.3	3.4	7.0	TAWSN 1900S25
TAWNH1880T	●	□	18.8	12.7	9.3	3.4	7.0	
TAWNH1890T	●	□	18.9	12.7	9.3	3.4	7.0	TAWMN 1900S25
TAWNH1900T	●	□	19.0	12.7	9.2	3.5	7.0	
TAWNH1910T	●	□	19.1	12.7	9.2	3.5	7.0	TAWLN 1900S25
TAWNH1920T	●	□	19.2	12.7	9.2	3.5	7.0	
TAWNH1930T	●	□	19.3	12.7	9.2	3.5	7.0	
TAWNH1940T	●	□	19.4	12.7	9.2	3.5	7.0	
TAWNH1950T	●	□	19.5	12.6	9.1	3.5	7.0	
TAWNH1960T	●	□	19.6	12.7	9.1	3.6	7.0	
TAWNH1970T	●	□	19.7	12.7	9.1	3.6	7.0	TAWSN 2000S25
TAWNH1980T	●	□	19.8	12.7	9.1	3.6	7.0	
TAWNH1990T	●	□	19.9	12.7	9.1	3.6	7.0	TAWMN 2000S25
TAWNH2000T	●	□	20.0	12.6	9.0	3.6	7.0	
TAWNH2010T	□	□	20.1	12.7	9.0	3.7	7.0	TAWLN 2000S25
TAWNH2020T	□	□	20.2	12.7	9.0	3.7	7.0	
TAWNH2030T	□	□	20.3	12.7	9.0	3.7	7.0	
TAWNH2040T	□	□	20.4	12.7	9.0	3.7	7.0	
TAWNH2050T	●	□	20.5	12.6	8.9	3.7	7.0	
TAWNH2060T	□	□	20.6	12.6	8.9	3.7	7.0	
TAWNH2070T	□	□	20.7	12.7	8.9	3.8	7.0	TAWSN 2100S25
TAWNH2080T	□	□	20.8	12.7	8.9	3.8	7.0	
TAWNH2090T	□	□	20.9	12.7	8.9	3.8	7.0	TAWMN 2100S25
TAWNH2100T	●	□	21.0	12.6	8.8	3.8	7.0	
TAWNH2110T	□	□	21.1	12.6	8.8	3.8	7.0	TAWLN 2100S25
TAWNH2120T	□	□	21.2	12.7	8.8	3.9	7.0	
TAWNH2130T	□	□	21.3	12.7	8.8	3.9	7.0	
TAWNH2140T	□	□	21.4	12.7	8.8	3.9	7.0	
TAWNH2150T	●	□	21.5	14.5	10.6	3.9	8.0	
TAWNH2160T	□	□	21.6	14.5	10.6	3.9	8.0	
TAWNH2170T	□	□	21.7	14.5	10.6	3.9	8.0	TAWSN 2200S25
TAWNH2180T	□	□	21.8	14.6	10.6	4.0	8.0	
TAWNH2190T	□	□	21.9	14.6	10.6	4.0	8.0	TAWMN 2200S25
TAWNH2200T	●	□	22.0	14.5	10.5	4.0	8.0	
TAWNH2210T	□	□	22.1	14.5	10.5	4.0	8.0	TAWLN 2200S25
TAWNH2220T	□	□	22.2	14.5	10.5	4.0	8.0	
TAWNH2230T	□	□	22.3	14.6	10.5	4.1	8.0	
TAWNH2240T	□	□	22.4	14.6	10.5	4.1	8.0	

Order Number	Coated VP15TF	Coated VP10H	Dimensions (mm) CDI	INSL	LF	PL	S	Applicable Holder
TAWNH2250T	●	□	22.5	14.5	10.4	4.1	8.0	TAWSN 2300S25
TAWNH2260T	□	□	22.6	14.5	10.4	4.1	8.0	
TAWNH2270T	□	□	22.7	14.5	10.4	4.1	8.0	TAWMN 2300S25
TAWNH2280T	□	□	22.8	14.5	10.4	4.1	8.0	
TAWNH2290T	□	□	22.9	14.6	10.4	4.2	8.0	TAWLN 2300S25
TAWNH2300T	●	□	23.0	14.5	10.3	4.2	8.0	
TAWNH2310T	□	□	23.1	14.5	10.3	4.2	8.0	TAWSN 2300S25
TAWNH2320T	□	□	23.2	14.5	10.3	4.2	8.0	
TAWNH2330T	□	□	23.3	14.5	10.3	4.2	8.0	TAWMN 2300S25
TAWNH2340T	□	□	23.4	14.6	10.3	4.3	8.0	TAWLN 2300S25
TAWNH2350T	●	□	23.5	14.5	10.2	4.3	8.0	
TAWNH2360T	□	□	23.6	14.5	10.2	4.3	8.0	
TAWNH2370T	□	□	23.7	14.5	10.2	4.3	8.0	TAWSN 2400S32
TAWNH2380T	□	□	23.8	14.5	10.2	4.3	8.0	
TAWNH2390T	□	□	23.9	14.5	10.2	4.3	8.0	TAWMN 2400S32
TAWNH2400T	●	□	24.0	14.5	10.1	4.4	8.0	
TAWNH2410T	□	□	24.1	14.5	10.1	4.4	8.0	TAWLN 2400S32
TAWNH2420T	□	□	24.2	14.5	10.1	4.4	8.0	
TAWNH2430T	□	□	24.3	14.5	10.1	4.4	8.0	
TAWNH2440T	□	□	24.4	14.5	10.1	4.4	8.0	
TAWNH2450T	●	□	24.5	16.2	11.7	4.5	9.0	
TAWNH2460T	□	□	24.6	16.2	11.7	4.5	9.0	
TAWNH2470T	□	□	24.7	16.2	11.7	4.5	9.0	TAWSN 2500S32
TAWNH2480T	□	□	24.8	16.2	11.7	4.5	9.0	
TAWNH2490T	□	□	24.9	16.2	11.7	4.5	9.0	TAWMN 2500S32
TAWNH2500T	●	□	25.0	16.1	11.6	4.5	9.0	
TAWNH2510T	□	□	25.1	16.2	11.6	4.6	9.0	TAWLN 2500S32
TAWNH2520T	□	□	25.2	16.2	11.6	4.6	9.0	
TAWNH2530T	□	□	25.3	16.2	11.6	4.6	9.0	
TAWNH2540T	□	□	25.4	16.2	11.6	4.6	9.0	
TAWNH2550T	●	□	25.5	16.1	11.5	4.6	9.0	
TAWNH2560T	□	□	25.6	16.2	11.5	4.7	9.0	
TAWNH2570T	□	□	25.7	16.2	11.5	4.7	9.0	TAWSN 2600S32
TAWNH2580T	□	□	25.8	16.2	11.5	4.7	9.0	
TAWNH2590T	□	□	25.9	16.2	11.5	4.7	9.0	TAWMN 2600S32
TAWNH2600T	●	□	26.0	16.1	11.4	4.7	9.0	
TAWNH2610T	□	□	26.1	16.1	11.4	4.7	9.0	TAWLN 2600S32
TAWNH2620T	□	□	26.2	16.2	11.4	4.8	9.0	
TAWNH2630T	□	□	26.3	16.2	11.4	4.8	9.0	
TAWNH2640T	□	□	26.4	16.2	11.4	4.8	9.0	

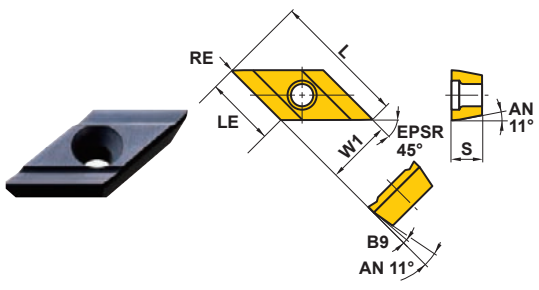
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.

Order Number	Coated VP15TF	Coated VP10H	Dimensions (mm) CDI	INSL	LF	PL	S	Applicable Holder
TAWNH2650T	●	□	26.5	16.1	11.3	4.8	9.0	
TAWNH2660T	□	□	26.6	16.1	11.3	4.8	9.0	
TAWNH2670T	□	□	26.7	16.2	11.3	4.9	9.0	TAWSN
TAWNH2680T	□	□	26.8	16.2	11.3	4.9	9.0	2700S32
TAWNH2690T	□	□	26.9	16.2	11.3	4.9	9.0	TAWMN
TAWNH2700T	●	□	27.0	16.1	11.2	4.9	9.0	2700S32
TAWNH2710T	□	□	27.1	16.1	11.2	4.9	9.0	TAWLN
TAWNH2720T	□	□	27.2	16.1	11.2	4.9	9.0	2700S32
TAWNH2730T	□	□	27.3	16.2	11.2	5.0	9.0	
TAWNH2740T	□	□	27.4	16.2	11.2	5.0	9.0	
TAWNH2750T	●	□	27.5	17.3	12.3	5.0	10.0	
TAWNH2760T	□	□	27.6	17.3	12.3	5.0	10.0	
TAWNH2770T	□	□	27.7	17.3	12.3	5.0	10.0	TAWSN
TAWNH2780T	□	□	27.8	17.4	12.3	5.1	10.0	2800S32
TAWNH2790T	□	□	27.9	17.4	12.3	5.1	10.0	TAWMN
TAWNH2800T	●	□	28.0	17.3	12.2	5.1	10.0	2800S32
TAWNH2810T	□	□	28.1	17.3	12.2	5.1	10.0	TAWLN
TAWNH2820T	□	□	28.2	17.3	12.2	5.1	10.0	2800S32
TAWNH2830T	□	□	28.3	17.4	12.2	5.2	10.0	
TAWNH2840T	□	□	28.4	17.4	12.2	5.2	10.0	

Order Number	Coated VP15TF	Coated VP10H	Dimensions (mm) CDI	INSL	LF	PL	S	Applicable Holder
TAWNH2850T	●	□	28.5	17.3	12.1	5.2	10.0	
TAWNH2860T	□	□	28.6	17.3	12.1	5.2	10.0	
TAWNH2870T	□	□	28.7	17.3	12.1	5.2	10.0	TAWSN
TAWNH2880T	□	□	28.8	17.3	12.1	5.2	10.0	2900S32
TAWNH2890T	□	□	28.9	17.4	12.1	5.3	10.0	TAWMN
TAWNH2900T	●	□	29.0	17.3	12.0	5.3	10.0	2900S32
TAWNH2910T	□	□	29.1	17.3	12.0	5.3	10.0	TAWLN
TAWNH2920T	□	□	29.2	17.3	12.0	5.3	10.0	2900S32
TAWNH2930T	□	□	29.3	17.3	12.0	5.3	10.0	
TAWNH2940T	□	□	29.4	17.4	12.0	5.4	10.0	
TAWNH2950T	●	□	29.5	17.3	11.9	5.4	10.0	
TAWNH2960T	□	□	29.6	17.3	11.9	5.4	10.0	
TAWNH2970T	□	□	29.7	17.3	11.9	5.4	10.0	TAWSN
TAWNH2980T	□	□	29.8	17.3	11.9	5.4	10.0	3000S32
TAWNH2990T	□	□	29.9	17.3	11.9	5.4	10.0	TAWMN
TAWNH3000T	●	□	30.0	17.3	11.8	5.5	10.0	3000S32
TAWNH3010T	□	□	30.1	17.3	11.8	5.5	10.0	TAWLN
TAWNH3020T	□	□	30.2	17.3	11.8	5.5	10.0	3000S32
TAWNH3030T	□	□	30.3	17.3	11.8	5.5	10.0	
TAWNH3040T	□	□	30.4	17.3	11.8	5.5	10.0	

Insert for TAW Drill Chamfering Module

Shape Geometry	Order Number	Coated VP15TF		Dimensions (mm) L	LE	WI	S	RE	B9
	**TAWC12T301-45GM**	▲		17.4	9.05	8.5	3.97	0.1	5°

TAW

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Drill Diameter	ϕ18.5—ϕ21.4		ϕ21.5—ϕ24.4	
		Conditions / Hardness	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel	≤180HB	90 (70—110)	0.25 (0.20—0.30)	100 (80—120)	0.30 (0.25—0.35)
P	Carbon Steel Alloy Steel	180—280HB	80 (60—100)	0.25 (0.20—0.30)	90 (70—110)	0.30 (0.25—0.35)
P		280—350HB	70 (50—90)	0.20 (0.15—0.25)	80 (60—100)	0.25 (0.20—0.30)
M	Stainless Steel	≤200HB	60 (50—70)	0.20 (0.15—0.22)	60 (50—70)	0.20 (0.15—0.22)
K	Gray Cast Iron	Tensile Strength ≤350MPa	120 (60—140)	0.25 (0.20—0.30)	130 (80—150)	0.35 (0.25—0.40)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	80 (60—90)	0.25 (0.20—0.30)	90 (60—100)	0.30 (0.25—0.35)

	Workpiece Material	Drill Diameter	ϕ24.5—ϕ27.4		ϕ27.5—ϕ30.4	
		Conditions / Hardness	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel	≤180HB	110 (80—120)	0.30 (0.25—0.35)	110 (80—120)	0.30 (0.25—0.35)
P	Carbon Steel Alloy Steel	180—280HB	100 (80—120)	0.30 (0.25—0.35)	100 (80—120)	0.30 (0.25—0.35)
P		280—350HB	90 (70—110)	0.25 (0.20—0.30)	90 (70—110)	0.25 (0.20—0.30)
M	Stainless Steel	≤200HB	70 (60—80)	0.25 (0.20—0.28)	70 (60—80)	0.25 (0.20—0.28)
K	Gray Cast Iron	Tensile Strength ≤350MPa	140 (90—160)	0.35 (0.25—0.40)	140 (90—160)	0.40 (0.30—0.45)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	100 (80—110)	0.30 (0.25—0.35)	100 (80—110)	0.30 (0.25—0.35)

Note 1) When using the DC×8 type holder, reduce the cutting speed by approx. 20%.
Note 2) When using DC×8, it is recommended to pre-drill a pilot hole of the same size.
Note 3) H type honing is recommended when machining mild steel and stainless steel.

■HONE WIDTH

If an insert with honing other than standard is needed, please order using the symbols below.

(Insert Order Number)

T A W N H 1 4 0 0 T ○

- T A W: TAW Product Name
- N: N : General Use / K : For Cast Iron / B : For Bridges
- H: H : H Type
- 1 4 0 0: Insert Diameter
- T: Honing Symbol
- ○: Honing Type

(Honing Standard)

Honing Type	Hone Width (mm)
F	0
G	0.02—0.05
H	0.05—0.10
-(Standard)	0.10—0.15
K	0.15—0.20
S	0.20—0.25
M	0.25—0.30

NOTES ON USE

■INSERT INSTALLATION

- ●Loosen the clamp screw to install the insert.
- ●Correctly mesh the insert and the holder serrations, then slide the insert to the bottom of the slot.
- ●Fasten the clamp screw using the torque wrench provided while holding the insert lightly as shown. (Figure 1)
- ●Check that there is no gap between the bottom of the insert and holder. (Figure 2)

Tighten the clamp screw according to the torque below.

Drill Diameter (mm)	Clamp Torque (N · m)
14—15	2.0
16—18	2.0
19—21	3.5
22—24	5.5
25—27	8.5
28—30	12.0

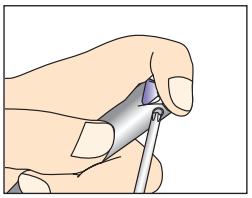


Fig. 1

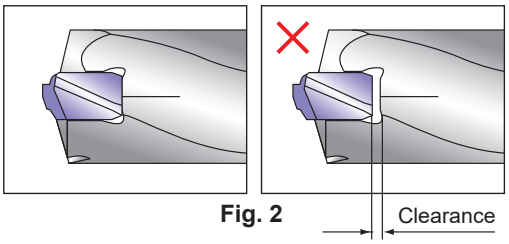


Fig. 2

INSERT REPLACEMENT

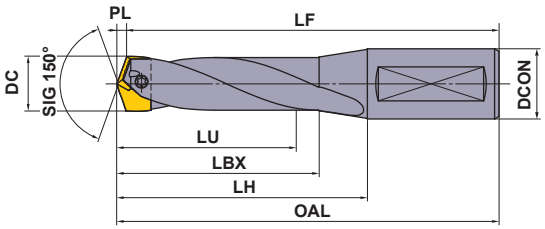
- ●Thouroughly clean the serrations of the holder before installing a new insert.
  Remove heavy dirt in the holder serrations by using the cleaning plate provided.

TAW

P Steel | M | K | N | S | H

(For Bridge Construction)



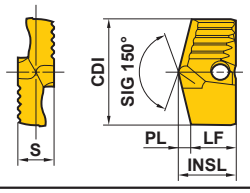


HOLDERS

DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	Dimensions (mm) LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Insert Stock VP15TF
24.5	3	TAWSB2500S32	●	76.8	91.3	113.3	173.3	170.0	3.3	32	WS406023T	TKY25T	WPT4405	MK1KS	24.5	*TAWBH2450T	●
24.6															24.6	TAWBH2460T	□
24.7	5	TAWMB2500S32	□	125.8	143.3	168.3	228.3	225.0	3.3	32	WS406023T	TKY25T	WPT4405	MK1KS	24.7	TAWBH2470T	●
26.5	3	TAWSB2700S32	●	83.1	97.6	118.6	178.6	175.0	3.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	*TAWBH2650T	□
26.7	5	TAWMB2700S32	□	136.1	154.6	178.6	238.6	235.0	3.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.7	TAWBH2670T	●

Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

INSERTS

Shape	Order Number	Coated VP15TF	Dimensions (mm) CDI	INSL	LF	PL	S	Applicable Holder	Hone Width (mm)	Geometry
H Type 	TAWBH2450T	●	24.5	15.0	11.7	3.3	9.0	TAWSB2500S32 TAWMB2500S32	0.20—0.25	
	TAWBH2460T	□	24.6	15.0	11.7	3.3	9.0			
	TAWBH2470T	●	24.7	15.0	11.7	3.3	9.0			
	TAWBH2650T	□	26.5	14.9	11.3	3.6	9.0	TAWSB2700S32 TAWMB2700S32		
	TAWBH2670T	●	26.7	14.9	11.3	3.6	9.0			

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Drill Diameter / Conditions / Hardness	ϕ24.5, ϕ24.6, ϕ24.7 Cutting Speed (m/min)	ϕ24.5, ϕ24.6, ϕ24.7 Feed (mm/rev)	ϕ26.5, ϕ26.7 Cutting Speed (m/min)	ϕ26.5, ϕ26.7 Feed (mm/rev)
P	Structural Steel	JIS SS400	Tensile Strength ≦400—500MPa	70 (60—80)	0.30 (0.25—0.35)	70 (60—80)	0.30 (0.25—0.35)
		JIS SM490	Tensile Strength ≦490—610MPa	65 (55—75)	0.30 (0.25—0.35)	65 (55—75)	0.30 (0.25—0.35)
		JIS SM570	Tensile Strength ≦570—720MPa	60 (50—70)	0.30 (0.25—0.35)	60 (50—70)	0.30 (0.25—0.35)

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : For produced-to-order products, the minimum number of lots is 5.
One insert is included per one case.

Scan here for product NEWS ▶

SPARE PARTS ➤ P001

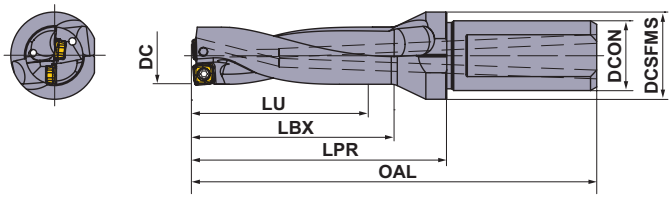
CARBIDE

MVX

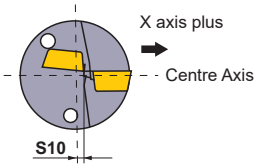
- Ideal combination of outer CVD insert and inner PVD insert.
- High rigidity body that enables L/D=6 deep hole machining.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		Hardened Steel





Maximum offset for turning

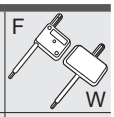


	Machining Tolerance(Guide)(mm)		
L/D	ø14.0—ø33.0	ø33.5—ø47.0	ø48.0—ø63.0
2D, 3D	0 + 0.25	0 + 0.3	0 + 0.3
4D, 5D	0 + 0.35	0 + 0.4	0 + 0.45
6D	0 + 0.45	0 + 0.6	

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	F Wrench
14.0	2	**MVX1400X2F20**	●	2	28	35	50	93	20	25	0.6	**SO○X05**	TPS20-1	TIP06F
14.0	3	**MVX1400X3F20**	●	2	42	49	64	107	20	25	0.6	**SO○X05**	TPS20-1	TIP06F
14.0	4	**MVX1400X4F20**	●	2	56	63	78	121	20	25	0.6	**SO○X05**	TPS20-1	TIP06F
14.0	5	**MVX1400X5F20**	●	2	70	77	92	135	20	25	0.6	**SO○X05**	TPS20-1	TIP06F
14.5	2	**MVX1450X2F20**	●	2	29	36	51	94	20	25	0.5	**SO○X05**	TPS20-1	TIP06F
14.5	3	**MVX1450X3F20**	●	2	43.5	50.5	65.5	108.5	20	25	0.5	**SO○X05**	TPS20-1	TIP06F
14.5	4	**MVX1450X4F20**	●	2	58	65	80	123	20	25	0.5	**SO○X05**	TPS20-1	TIP06F
14.5	5	**MVX1450X5F20**	●	2	72.5	79.5	94.5	137.5	20	25	0.5	**SO○X05**	TPS20-1	TIP06F
15.0	2	**MVX1500X2F20**	●	2	30	37	52	95	20	25	0.35	**SO○X05**	TPS20-1	TIP06F
15.0	3	**MVX1500X3F20**	●	2	45	52	67	110	20	25	0.35	**SO○X05**	TPS20-1	TIP06F
15.0	4	**MVX1500X4F20**	●	2	60	67	82	125	20	25	0.35	**SO○X05**	TPS20-1	TIP06F
15.0	5	**MVX1500X5F20**	●	2	75	82	97	140	20	25	0.35	**SO○X05**	TPS20-1	TIP06F
15.5	2	**MVX1550X2F20**	●	2	31	38	53	96	20	25	0.3	**SO○X05**	TPS20-1	TIP06F
15.5	3	**MVX1550X3F20**	●	2	46.5	53.5	68.5	111.5	20	25	0.3	**SO○X05**	TPS20-1	TIP06F
15.5	4	**MVX1550X4F20**	●	2	62	69	84	127	20	25	0.3	**SO○X05**	TPS20-1	TIP06F
15.5	5	**MVX1550X5F20**	●	2	77.5	84.5	99.5	142.5	20	25	0.3	**SO○X05**	TPS20-1	TIP06F
16.0	2	**MVX1600X2F20**	●	2	32	39	54	97	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.0	3	**MVX1600X3F20**	●	2	48	55	70	113	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.0	4	**MVX1600X4F20**	●	2	64	71	86	129	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.0	5	**MVX1600X5F20**	●	2	80	87	102	145	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.5	2	**MVX1650X2F20**	●	2	33	40	55	98	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.5	3	**MVX1650X3F20**	●	2	49.5	56.5	71.5	114.5	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.5	4	**MVX1650X4F20**	●	2	66	73	88	131	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
16.5	5	**MVX1650X5F20**	●	2	82.5	89.5	104.5	147.5	20	25	0.25	**SO○X05**	TPS20-1	TIP06F
17.0	2	**MVX1700X2F20**	●	2	34	41	56	99	20	25	0.5	**SO○X06**	TPS25	TIP07F
17.0	3	**MVX1700X3F20**	●	2	51	58	73	116	20	25	0.5	**SO○X06**	TPS25	TIP07F
17.0	4	**MVX1700X4F20**	●	2	68	75	90	133	20	25	0.5	**SO○X06**	TPS25	TIP07F
17.0	5	**MVX1700X5F20**	●	2	85	92	107	150	20	25	0.5	**SO○X06**	TPS25	TIP07F
17.0	6	**MVX1700X6F20**	●	2	102	109	124	167	20	25	0.5	**SO○X06**	TPS25	TIP07F
17.5	2	**MVX1750X2F25**	●	2	35	42	62	112	25	32	0.45	**SO○X06**	TPS25	TIP07F
17.5	3	**MVX1750X3F25**	●	2	52.5	59.5	79.5	129.5	25	32	0.45	**SO○X06**	TPS25	TIP07F
17.5	4	**MVX1750X4F25**	●	2	70	77	97	147	25	32	0.45	**SO○X06**	TPS25	TIP07F

* Clamp Torque (N • m) : TPS20-1=0.6, TPS25=1.0

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)						S10 (mm)	Insert Number	 Clamp Screw	 Wrench
					LU	LBX	LPR	OAL	DCON	DCSFMS				
17.5	5	**MVX1750X5F25**	●	2	87.5	94.5	114.5	164.5	25	32	0.45	**SO○X06**	TPS25	TIP07F
17.5	6	**MVX1750X6F25**	●	2	105	112	132	182	25	32	0.45	**SO○X06**	TPS25	TIP07F
18.0	2	**MVX1800X2F25**	●	2	36	43	63	113	25	32	0.4	**SO○X06**	TPS25	TIP07F
18.0	3	**MVX1800X3F25**	●	2	54	61	81	131	25	32	0.4	**SO○X06**	TPS25	TIP07F
18.0	4	**MVX1800X4F25**	●	2	72	79	99	149	25	32	0.4	**SO○X06**	TPS25	TIP07F
18.0	5	**MVX1800X5F25**	●	2	90	97	117	167	25	32	0.4	**SO○X06**	TPS25	TIP07F
18.0	6	**MVX1800X6F25**	●	2	108	115	135	185	25	32	0.4	**SO○X06**	TPS25	TIP07F
18.5	2	**MVX1850X2F25**	●	2	37	44	64	114	25	32	0.35	**SO○X06**	TPS25	TIP07F
18.5	3	**MVX1850X3F25**	●	2	55.5	62.5	82.5	132.5	25	32	0.35	**SO○X06**	TPS25	TIP07F
18.5	4	**MVX1850X4F25**	●	2	74	81	101	151	25	32	0.35	**SO○X06**	TPS25	TIP07F
18.5	5	**MVX1850X5F25**	●	2	92.5	99.5	119.5	169.5	25	32	0.35	**SO○X06**	TPS25	TIP07F
18.5	6	**MVX1850X6F25**	●	2	111	118	138	188	25	32	0.35	**SO○X06**	TPS25	TIP07F
19.0	2	**MVX1900X2F25**	●	2	38	45	65	115	25	32	0.3	**SO○X06**	TPS25	TIP07F
19.0	3	**MVX1900X3F25**	●	2	57	64	84	134	25	32	0.3	**SO○X06**	TPS25	TIP07F
19.0	4	**MVX1900X4F25**	●	2	76	83	103	153	25	32	0.3	**SO○X06**	TPS25	TIP07F
19.0	5	**MVX1900X5F25**	●	2	95	102	122	172	25	32	0.3	**SO○X06**	TPS25	TIP07F
19.0	6	**MVX1900X6F25**	●	2	114	121	141	191	25	32	0.3	**SO○X06**	TPS25	TIP07F
19.5	2	**MVX1950X2F25**	●	2	39	46	66	116	25	32	0.25	**SO○X06**	TPS25	TIP07F
19.5	3	**MVX1950X3F25**	●	2	58.5	65.5	85.5	135.5	25	32	0.25	**SO○X06**	TPS25	TIP07F
19.5	4	**MVX1950X4F25**	●	2	78	85	105	155	25	32	0.25	**SO○X06**	TPS25	TIP07F
19.5	5	**MVX1950X5F25**	●	2	97.5	104.5	124.5	174.5	25	32	0.25	**SO○X06**	TPS25	TIP07F
19.5	6	**MVX1950X6F25**	●	2	117	124	144	194	25	32	0.25	**SO○X06**	TPS25	TIP07F
20.0	2	**MVX2000X2F25**	●	2	40	47	67	117	25	32	0.6	**SO○X07**	TPS3	TIP10F
20.0	3	**MVX2000X3F25**	●	2	60	67	87	137	25	32	0.6	**SO○X07**	TPS3	TIP10F
20.0	4	**MVX2000X4F25**	●	2	80	87	107	157	25	32	0.6	**SO○X07**	TPS3	TIP10F
20.0	5	**MVX2000X5F25**	●	2	100	107	127	177	25	32	0.6	**SO○X07**	TPS3	TIP10F
20.0	6	**MVX2000X6F25**	●	2	120	127	147	197	25	32	0.6	**SO○X07**	TPS3	TIP10F
20.5	2	**MVX2050X2F25**	●	2	41	48	68	118	25	32	0.55	**SO○X07**	TPS3	TIP10F
20.5	3	**MVX2050X3F25**	●	2	61.5	68.5	88.5	138.5	25	32	0.55	**SO○X07**	TPS3	TIP10F
21.0	2	**MVX2100X2F25**	●	2	42	49	69	119	25	32	0.5	**SO○X07**	TPS3	TIP10F
21.0	3	**MVX2100X3F25**	●	2	63	70	90	140	25	32	0.5	**SO○X07**	TPS3	TIP10F
21.0	4	**MVX2100X4F25**	●	2	84	91	111	161	25	32	0.5	**SO○X07**	TPS3	TIP10F
21.0	5	**MVX2100X5F25**	●	2	105	112	132	182	25	32	0.5	**SO○X07**	TPS3	TIP10F
21.0	6	**MVX2100X6F25**	●	2	126	133	153	203	25	32	0.5	**SO○X07**	TPS3	TIP10F
21.5	2	**MVX2150X2F25**	●	2	43	50	70	120	25	32	0.45	**SO○X07**	TPS3	TIP10F
21.5	3	**MVX2150X3F25**	●	2	64.5	71.5	91.5	141.5	25	32	0.45	**SO○X07**	TPS3	TIP10F
22.0	2	**MVX2200X2F25**	●	2	44	51	71	121	25	32	0.4	**SO○X07**	TPS3	TIP10F
22.0	3	**MVX2200X3F25**	●	2	66	73	93	143	25	32	0.4	**SO○X07**	TPS3	TIP10F
22.0	4	**MVX2200X4F25**	●	2	88	95	115	165	25	32	0.4	**SO○X07**	TPS3	TIP10F
22.0	5	**MVX2200X5F25**	●	2	110	117	137	187	25	32	0.4	**SO○X07**	TPS3	TIP10F
22.0	6	**MVX2200X6F25**	●	2	132	139	159	209	25	32	0.4	**SO○X07**	TPS3	TIP10F
22.5	2	**MVX2250X2F25**	●	2	45	52	72	122	25	32	0.35	**SO○X07**	TPS3	TIP10F
22.5	3	**MVX2250X3F25**	●	2	67.5	74.5	94.5	144.5	25	32	0.35	**SO○X07**	TPS3	TIP10F
23.0	2	**MVX2300X2F25**	●	2	46	53	73	123	25	32	0.8	**SO○X08**	TPS351	TIP10W
23.0	3	**MVX2300X3F25**	●	2	69	76	96	146	25	32	0.8	**SO○X08**	TPS351	TIP10W
23.0	4	**MVX2300X4F25**	●	2	92	99	119	169	25	32	0.8	**SO○X08**	TPS351	TIP10W
23.0	5	**MVX2300X5F25**	●	2	115	122	142	192	25	32	0.8	**SO○X08**	TPS351	TIP10W
23.0	6	**MVX2300X6F25**	●	2	138	145	165	215	25	32	0.8	**SO○X08**	TPS351	TIP10W
23.5	2	**MVX2350X2F25**	●	2	47	54	74	124	25	32	0.75	**SO○X08**	TPS351	TIP10W
23.5	3	**MVX2350X3F25**	●	2	70.5	77.5	97.5	147.5	25	32	0.75	**SO○X08**	TPS351	TIP10W

* Clamp Torque (N • m) : TPS25=1.0, TPS3=2.0, TPS351=2.5

Scan here for product NEWS ▶

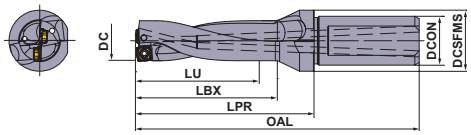
INSERT DESCRIPTION ➤ N167
SPARE PARTS ➤ P001

MVX

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	W Wrench
24.0	2	**MVX2400X2F25**	●	2	48	55	75	125	25	32	0.7	**SO○X08**	TPS351	TIP10W
24.0	3	**MVX2400X3F25**	●	2	72	79	99	149	25	32	0.7	**SO○X08**	TPS351	TIP10W
24.0	4	**MVX2400X4F25**	●	2	96	103	123	173	25	32	0.7	**SO○X08**	TPS351	TIP10W
24.0	5	**MVX2400X5F25**	●	2	120	127	147	197	25	32	0.7	**SO○X08**	TPS351	TIP10W
24.0	6	**MVX2400X6F25**	●	2	144	151	171	221	25	32	0.7	**SO○X08**	TPS351	TIP10W
24.5	2	**MVX2450X2F25**	●	2	49	56	76	126	25	32	0.65	**SO○X08**	TPS351	TIP10W
24.5	3	**MVX2450X3F25**	●	2	73.5	80.5	100.5	150.5	25	32	0.65	**SO○X08**	TPS351	TIP10W
25.0	2	**MVX2500X2F25**	●	2	50	57	77	127	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.0	3	**MVX2500X3F25**	●	2	75	82	102	152	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.0	4	**MVX2500X4F25**	●	2	100	107	127	177	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.0	5	**MVX2500X5F25**	●	2	125	132	152	202	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.0	6	**MVX2500X6F25**	●	2	150	157	177	227	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.5	2	**MVX2550X2F25**	●	2	51	58	78	128	25	32	0.6	**SO○X08**	TPS351	TIP10W
25.5	3	**MVX2550X3F25**	●	2	76.5	83.5	103.5	153.5	25	32	0.6	**SO○X08**	TPS351	TIP10W
26.0	2	**MVX2600X2F32**	●	2	52	59	79	134	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.0	3	**MVX2600X3F32**	●	2	78	85	105	160	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.0	4	**MVX2600X4F32**	●	2	104	111	131	186	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.0	5	**MVX2600X5F32**	●	2	130	137	157	212	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.0	6	**MVX2600X6F32**	●	2	156	163	183	238	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.5	2	**MVX2650X2F32**	●	2	53	60	80	135	32	42	0.5	**SO○X08**	TPS351	TIP10W
26.5	3	**MVX2650X3F32**	●	2	79.5	86.5	106.5	161.5	32	42	0.5	**SO○X08**	TPS351	TIP10W
27.0	2	**MVX2700X2F32**	●	2	54	61	81	136	32	42	0.45	**SO○X08**	TPS351	TIP10W
27.0	3	**MVX2700X3F32**	●	2	81	88	108	163	32	42	0.45	**SO○X08**	TPS351	TIP10W
27.0	4	**MVX2700X4F32**	●	2	108	115	135	190	32	42	0.45	**SO○X08**	TPS351	TIP10W
27.0	5	**MVX2700X5F32**	●	2	135	142	162	217	32	42	0.45	**SO○X08**	TPS351	TIP10W
27.0	6	**MVX2700X6F32**	●	2	162	169	189	244	32	42	0.45	**SO○X08**	TPS351	TIP10W
27.5	2	**MVX2750X2F32**	●	2	55	62	82	137	32	42	0.4	**SO○X08**	TPS351	TIP10W
27.5	3	**MVX2750X3F32**	●	2	82.5	89.5	109.5	164.5	32	42	0.4	**SO○X08**	TPS351	TIP10W
28.0	2	**MVX2800X2F32**	●	2	56	63	83	138	32	42	0.85	**SO○X09**	TPS4	TIP15W
28.0	3	**MVX2800X3F32**	●	2	84	91	111	166	32	42	0.85	**SO○X09**	TPS4	TIP15W
28.0	4	**MVX2800X4F32**	●	2	112	119	139	194	32	42	0.85	**SO○X09**	TPS4	TIP15W
28.0	5	**MVX2800X5F32**	●	2	140	147	167	222	32	42	0.85	**SO○X09**	TPS4	TIP15W
28.0	6	**MVX2800X6F32**	●	2	168	175	195	250	32	42	0.85	**SO○X09**	TPS4	TIP15W
28.5	2	**MVX2850X2F32**	●	2	57	64	84	139	32	42	0.8	**SO○X09**	TPS4	TIP15W
28.5	3	**MVX2850X3F32**	●	2	85.5	92.5	112.5	167.5	32	42	0.8	**SO○X09**	TPS4	TIP15W
29.0	2	**MVX2900X2F32**	●	2	58	65	85	140	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.0	3	**MVX2900X3F32**	●	2	87	94	114	169	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.0	4	**MVX2900X4F32**	●	2	116	123	143	198	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.0	5	**MVX2900X5F32**	●	2	145	152	172	227	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.0	6	**MVX2900X6F32**	●	2	174	181	201	256	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.5	2	**MVX2950X2F32**	●	2	59	66	86	141	32	42	0.7	**SO○X09**	TPS4	TIP15W
29.5	3	**MVX2950X3F32**	●	2	88.5	95.5	115.5	170.5	32	42	0.7	**SO○X09**	TPS4	TIP15W
30.0	2	**MVX3000X2F32**	●	2	60	67	87	142	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.0	3	**MVX3000X3F32**	●	2	90	97	117	172	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.0	4	**MVX3000X4F32**	●	2	120	127	147	202	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.0	5	**MVX3000X5F32**	●	2	150	157	177	232	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.0	6	**MVX3000X6F32**	●	2	180	187	207	262	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.5	3	**MVX3050X3F32**	●	2	91.5	98.5	118.5	173.5	32	42	0.6	**SO○X09**	TPS4	TIP15W
31.0	2	**MVX3100X2F40**	●	2	62	69	89	154	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.0	3	**MVX3100X3F40**	●	2	93	100	120	185	40	50	0.55	**SO○X09**	TPS4	TIP15W

* Clamp Torque (N • m) : TPS351=2.5, TPS4=3.5

● : **Inventory maintained in Japan.**



DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	W Wrench
31.0	4	**MVX3100X4F40**	●	2	124	131	151	216	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.0	5	**MVX3100X5F40**	●	2	155	162	182	247	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.0	6	**MVX3100X6F40**	●	2	186	193	213	278	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.5	3	**MVX3150X3F40**	●	2	94.5	101.5	121.5	186.5	40	50	0.55	**SO○X09**	TPS4	TIP15W
32.0	2	**MVX3200X2F40**	●	2	64	71	91	156	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.0	3	**MVX3200X3F40**	●	2	96	103	123	188	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.0	4	**MVX3200X4F40**	●	2	128	135	155	220	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.0	5	**MVX3200X5F40**	●	2	160	167	187	252	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.0	6	**MVX3200X6F40**	●	2	192	199	219	284	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.5	3	**MVX3250X3F40**	●	2	97.5	104.5	124.5	189.5	40	50	0.45	**SO○X09**	TPS4	TIP15W
33.0	2	**MVX3300X2F40**	●	2	66	73	93	158	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.0	3	**MVX3300X3F40**	●	2	99	106	126	191	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.0	4	**MVX3300X4F40**	●	2	132	139	159	224	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.0	5	**MVX3300X5F40**	●	2	165	172	192	257	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.0	6	**MVX3300X6F40**	●	2	198	205	225	290	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.5	3	**MVX3350X3F40**	●	2	100.5	107.5	127.5	192.5	40	50	1.15	**SO○X11**	TPS43	TIP15W
34.0	2	**MVX3400X2F40**	●	2	68	75	105	170	40	50	1.11	**SO○X11**	TPS43	TIP15W
34.0	3	**MVX3400X3F40**	●	2	102	109	139	204	40	50	1.11	**SO○X11**	TPS43	TIP15W
34.0	4	**MVX3400X4F40**	●	2	136	143	173	238	40	50	1.11	**SO○X11**	TPS43	TIP15W
34.0	5	**MVX3400X5F40**	●	2	170	177	207	272	40	50	1.11	**SO○X11**	TPS43	TIP15W
34.0	6	**MVX3400X6F40**	●	2	204	211	241	306	40	50	1.1	**SO○X11**	TPS43	TIP15W
34.5	3	**MVX3450X3F40**	●	2	103.5	110.5	140.5	205.5	40	50	1.08	**SO○X11**	TPS43	TIP15W
35.0	2	**MVX3500X2F40**	●	2	70	77	107	172	40	50	1.03	**SO○X11**	TPS43	TIP15W
35.0	3	**MVX3500X3F40**	●	2	105	112	142	207	40	50	1.03	**SO○X11**	TPS43	TIP15W
35.0	4	**MVX3500X4F40**	●	2	140	147	177	242	40	50	1.03	**SO○X11**	TPS43	TIP15W
35.0	5	**MVX3500X5F40**	●	2	175	182	212	277	40	50	1.03	**SO○X11**	TPS43	TIP15W
35.0	6	**MVX3500X6F40**	●	2	210	217	247	312	40	50	1.02	**SO○X11**	TPS43	TIP15W
35.5	3	**MVX3550X3F40**	●	2	106.5	113.5	143.5	208.5	40	50	0.99	**SO○X11**	TPS43	TIP15W
36.0	2	**MVX3600X2F40**	●	2	72	79	109	174	40	50	0.95	**SO○X11**	TPS43	TIP15W
36.0	3	**MVX3600X3F40**	●	2	108	115	145	210	40	50	0.95	**SO○X11**	TPS43	TIP15W
36.0	4	**MVX3600X4F40**	●	2	144	151	181	246	40	50	0.95	**SO○X11**	TPS43	TIP15W
36.0	5	**MVX3600X5F40**	●	2	180	187	217	282	40	50	0.95	**SO○X11**	TPS43	TIP15W
36.0	6	**MVX3600X6F40**	●	2	216	223	253	318	40	50	0.94	**SO○X11**	TPS43	TIP15W
37.0	2	**MVX3700X2F40**	●	2	74	81	111	176	40	50	0.87	**SO○X11**	TPS43	TIP15W
37.0	3	**MVX3700X3F40**	●	2	111	118	148	213	40	50	0.87	**SO○X11**	TPS43	TIP15W
37.0	4	**MVX3700X4F40**	●	2	148	155	185	250	40	50	0.87	**SO○X11**	TPS43	TIP15W
37.0	5	**MVX3700X5F40**	●	2	185	192	222	287	40	50	0.87	**SO○X11**	TPS43	TIP15W
37.0	6	**MVX3700X6F40**	●	2	222	229	259	324	40	50	0.86	**SO○X11**	TPS43	TIP15W
38.0	2	**MVX3800X2F40**	●	2	76	83	113	178	40	50	0.79	**SO○X11**	TPS43	TIP15W
38.0	3	**MVX3800X3F40**	●	2	114	121	151	216	40	50	0.79	**SO○X11**	TPS43	TIP15W
38.0	4	**MVX3800X4F40**	●	2	152	159	189	254	40	50	0.79	**SO○X11**	TPS43	TIP15W
38.0	5	**MVX3800X5F40**	●	2	190	197	227	292	40	50	0.79	**SO○X11**	TPS43	TIP15W
38.0	6	**MVX3800X6F40**	●	2	228	235	265	330	40	50	0.78	**SO○X11**	TPS43	TIP15W
39.0	2	**MVX3900X2F40**	●	2	78	85	115	180	40	50	0.71	**SO○X11**	TPS43	TIP15W
39.0	3	**MVX3900X3F40**	●	2	117	124	154	219	40	50	0.71	**SO○X11**	TPS43	TIP15W
39.0	4	**MVX3900X4F40**	●	2	156	163	193	258	40	50	0.71	**SO○X11**	TPS43	TIP15W
39.0	5	**MVX3900X5F40**	●	2	195	202	232	297	40	50	0.71	**SO○X11**	TPS43	TIP15W
39.0	6	**MVX3900X6F40**	●	2	234	241	271	336	40	50	0.7	**SO○X11**	TPS43	TIP15W
40.0	2	**MVX4000X2F40**	●	2	80	87	117	182	40	50	1.46	**SO○X13**	TPS43	TIP15W
40.0	3	**MVX4000X3F40**	●	2	120	127	157	222	40	50	1.46	**SO○X13**	TPS43	TIP15W

* Clamp Torque (N • m) : TPS4=3.5, TPS43=3.5

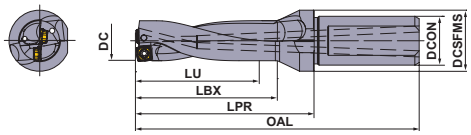
INSERT DESCRIPTION ➢ N167
SPARE PARTS ➢ P001

MVX

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	W D Wrench
40.0	4	**MVX4000X4F40**	●	2	160	167	197	262	40	50	1.46	**SO○X13**	TPS43	TIP15W
40.0	5	**MVX4000X5F40**	●	2	200	207	237	302	40	50	1.46	**SO○X13**	TPS43	TIP15W
40.0	6	**MVX4000X6F40**	●	2	240	247	277	342	40	50	1.45	**SO○X13**	TPS43	TIP15W
41.0	2	**MVX4100X2F40**	●	2	82	89	119	184	40	50	1.36	**SO○X13**	TPS43	TIP15W
41.0	3	**MVX4100X3F40**	●	2	123	130	160	225	40	50	1.36	**SO○X13**	TPS43	TIP15W
41.0	4	**MVX4100X4F40**	●	2	164	171	201	266	40	50	1.36	**SO○X13**	TPS43	TIP15W
41.0	5	**MVX4100X5F40**	●	2	205	212	242	307	40	50	1.36	**SO○X13**	TPS43	TIP15W
41.0	6	**MVX4100X6F40**	●	2	246	253	283	348	40	50	1.35	**SO○X13**	TPS43	TIP15W
42.0	2	**MVX4200X2F40**	●	2	84	91	121	186	40	50	1.27	**SO○X13**	TPS43	TIP15W
42.0	3	**MVX4200X3F40**	●	2	126	133	163	228	40	50	1.27	**SO○X13**	TPS43	TIP15W
42.0	4	**MVX4200X4F40**	●	2	168	175	205	270	40	63	1.27	**SO○X13**	TPS43	TIP15W
42.0	4	**MVX4200X4F50**	●	2	168	175	205	280	50	63	1.27	**SO○X13**	TPS43	TIP15W
42.0	5	**MVX4200X5F40**	●	2	210	217	247	312	40	63	1.27	**SO○X13**	TPS43	TIP15W
42.0	5	**MVX4200X5F50**	●	2	210	217	247	322	50	63	1.27	**SO○X13**	TPS43	TIP15W
42.0	6	**MVX4200X6F40**	●	2	252	259	289	354	40	63	1.27	**SO○X13**	TPS43	TIP15W
42.0	6	**MVX4200X6F50**	●	2	252	259	289	364	50	63	1.26	**SO○X13**	TPS43	TIP15W
43.0	2	**MVX4300X2F40**	●	2	86	93	123	188	40	50	1.18	**SO○X13**	TPS43	TIP15W
43.0	3	**MVX4300X3F40**	●	2	129	136	166	231	40	50	1.18	**SO○X13**	TPS43	TIP15W
43.0	4	**MVX4300X4F40**	●	2	172	179	209	274	40	63	1.18	**SO○X13**	TPS43	TIP15W
43.0	4	**MVX4300X4F50**	●	2	172	179	209	284	50	63	1.18	**SO○X13**	TPS43	TIP15W
43.0	5	**MVX4300X5F40**	●	2	215	222	252	317	40	63	1.18	**SO○X13**	TPS43	TIP15W
43.0	5	**MVX4300X5F50**	●	2	215	222	252	327	50	63	1.18	**SO○X13**	TPS43	TIP15W
43.0	6	**MVX4300X6F40**	●	2	258	265	295	360	40	63	1.17	**SO○X13**	TPS43	TIP15W
43.0	6	**MVX4300X6F50**	●	2	258	265	295	370	50	63	1.17	**SO○X13**	TPS43	TIP15W
44.0	2	**MVX4400X2F40**	●	2	88	95	125	190	40	50	1.08	**SO○X13**	TPS43	TIP15W
44.0	3	**MVX4400X3F40**	●	2	132	139	169	234	40	50	1.08	**SO○X13**	TPS43	TIP15W
44.0	4	**MVX4400X4F40**	●	2	176	183	213	278	40	63	1.08	**SO○X13**	TPS43	TIP15W
44.0	4	**MVX4400X4F50**	●	2	176	183	213	288	50	63	1.08	**SO○X13**	TPS43	TIP15W
44.0	5	**MVX4400X5F40**	●	2	220	227	257	322	40	63	1.08	**SO○X13**	TPS43	TIP15W
44.0	5	**MVX4400X5F50**	●	2	220	227	257	332	50	63	1.08	**SO○X13**	TPS43	TIP15W
45.0	2	**MVX4500X2F40**	●	2	90	97	127	192	40	50	0.99	**SO○X13**	TPS43	TIP15W
45.0	3	**MVX4500X3F40**	●	2	135	142	172	237	40	50	0.99	**SO○X13**	TPS43	TIP15W
45.0	4	**MVX4500X4F40**	●	2	180	187	217	282	40	63	0.99	**SO○X13**	TPS43	TIP15W
45.0	4	**MVX4500X4F50**	●	2	180	187	217	292	50	63	0.99	**SO○X13**	TPS43	TIP15W
45.0	5	**MVX4500X5F40**	●	2	225	232	262	327	40	63	0.99	**SO○X13**	TPS43	TIP15W
45.0	5	**MVX4500X5F50**	●	2	225	232	262	337	50	63	0.99	**SO○X13**	TPS43	TIP15W
46.0	2	**MVX4600X2F40**	●	2	92	99	129	194	40	50	0.89	**SO○X13**	TPS43	TIP15W
46.0	3	**MVX4600X3F40**	●	2	138	145	175	240	40	50	0.89	**SO○X13**	TPS43	TIP15W
46.0	4	**MVX4600X4F40**	●	2	184	191	221	286	40	63	0.89	**SO○X13**	TPS43	TIP15W
46.0	4	**MVX4600X4F50**	●	2	184	191	221	296	50	63	0.89	**SO○X13**	TPS43	TIP15W
46.0	5	**MVX4600X5F40**	●	2	230	237	267	332	40	63	0.89	**SO○X13**	TPS43	TIP15W
46.0	5	**MVX4600X5F50**	●	2	230	237	267	342	50	63	0.89	**SO○X13**	TPS43	TIP15W
47.0	2	**MVX4700X2F40**	●	2	94	101	141	206	40	63	1.9	**SO○X16**	TPS54	TIP25D
47.0	3	**MVX4700X3F40**	●	2	141	148	188	253	40	63	1.9	**SO○X16**	TPS54	TIP25D
47.0	4	**MVX4700X4F40**	●	2	188	195	235	300	40	63	1.9	**SO○X16**	TPS54	TIP25D
47.0	4	**MVX4700X4F50**	●	2	188	195	235	310	50	63	1.9	**SO○X16**	TPS54	TIP25D
47.0	5	**MVX4700X5F40**	●	2	235	242	282	347	40	63	1.9	**SO○X16**	TPS54	TIP25D
47.0	5	**MVX4700X5F50**	●	2	235	242	282	357	50	63	1.9	**SO○X16**	TPS54	TIP25D
48.0	2	**MVX4800X2F40**	●	2	96	103	143	208	40	63	1.8	**SO○X16**	TPS54	TIP25D
48.0	3	**MVX4800X3F40**	●	2	144	151	191	256	40	63	1.8	**SO○X16**	TPS54	TIP25D

* Clamp Torque (N • m) : TPS43=3.5, TPS54=7.5

● : **Inventory maintained in Japan.**



DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	D Wrench
48.0	4	**MVX4800X4F40**	●	2	192	199	239	304	40	63	1.8	**SO○X16**	TPS54	TIP25D
48.0	4	**MVX4800X4F50**	●	2	192	199	239	314	50	63	1.8	**SO○X16**	TPS54	TIP25D
48.0	5	**MVX4800X5F40**	●	2	240	247	287	352	40	63	1.8	**SO○X16**	TPS54	TIP25D
48.0	5	**MVX4800X5F50**	●	2	240	247	287	362	50	63	1.8	**SO○X16**	TPS54	TIP25D
49.0	2	**MVX4900X2F40**	●	2	98	105	145	210	40	63	1.7	**SO○X16**	TPS54	TIP25D
49.0	3	**MVX4900X3F40**	●	2	147	154	194	259	40	63	1.7	**SO○X16**	TPS54	TIP25D
49.0	4	**MVX4900X4F40**	●	2	196	203	243	308	40	63	1.7	**SO○X16**	TPS54	TIP25D
49.0	4	**MVX4900X4F50**	●	2	196	203	243	318	50	63	1.7	**SO○X16**	TPS54	TIP25D
49.0	5	**MVX4900X5F40**	●	2	245	252	292	357	40	63	1.7	**SO○X16**	TPS54	TIP25D
49.0	5	**MVX4900X5F50**	●	2	245	252	292	367	50	63	1.7	**SO○X16**	TPS54	TIP25D
50.0	2	**MVX5000X2F40**	●	2	100	107	147	212	40	63	1.6	**SO○X16**	TPS54	TIP25D
50.0	3	**MVX5000X3F40**	●	2	150	157	197	262	40	63	1.6	**SO○X16**	TPS54	TIP25D
50.0	4	**MVX5000X4F40**	●	2	200	207	247	312	40	63	1.6	**SO○X16**	TPS54	TIP25D
50.0	4	**MVX5000X4F50**	●	2	200	207	247	322	50	63	1.6	**SO○X16**	TPS54	TIP25D
50.0	5	**MVX5000X5F40**	●	2	250	257	297	362	40	63	1.6	**SO○X16**	TPS54	TIP25D
50.0	5	**MVX5000X5F50**	●	2	250	257	297	372	50	63	1.6	**SO○X16**	TPS54	TIP25D
51.0	2	**MVX5100X2F40**	●	2	102	109	149	214	40	63	1.5	**SO○X16**	TPS54	TIP25D
51.0	3	**MVX5100X3F40**	●	2	153	160	200	265	40	63	1.5	**SO○X16**	TPS54	TIP25D
51.0	4	**MVX5100X4F40**	●	2	204	211	251	316	40	63	1.5	**SO○X16**	TPS54	TIP25D
51.0	4	**MVX5100X4F50**	●	2	204	211	251	326	50	63	1.5	**SO○X16**	TPS54	TIP25D
51.0	5	**MVX5100X5F40**	●	2	255	262	302	367	40	63	1.5	**SO○X16**	TPS54	TIP25D
51.0	5	**MVX5100X5F50**	●	2	255	262	302	377	50	63	1.5	**SO○X16**	TPS54	TIP25D
52.0	2	**MVX5200X2F40**	●	2	104	111	151	216	40	63	1.39	**SO○X16**	TPS54	TIP25D
52.0	3	**MVX5200X3F40**	●	2	156	163	203	268	40	63	1.39	**SO○X16**	TPS54	TIP25D
52.0	4	**MVX5200X4F40**	●	2	208	215	255	320	40	63	1.39	**SO○X16**	TPS54	TIP25D
52.0	4	**MVX5200X4F50**	●	2	208	215	255	330	50	63	1.39	**SO○X16**	TPS54	TIP25D
52.0	5	**MVX5200X5F40**	●	2	260	267	307	372	40	63	1.39	**SO○X16**	TPS54	TIP25D
52.0	5	**MVX5200X5F50**	●	2	260	267	307	382	50	63	1.39	**SO○X16**	TPS54	TIP25D
53.0	2	**MVX5300X2F40**	●	2	106	113	153	218	40	63	1.29	**SO○X16**	TPS54	TIP25D
53.0	3	**MVX5300X3F40**	●	2	159	166	206	271	40	63	1.29	**SO○X16**	TPS54	TIP25D
53.0	4	**MVX5300X4F40**	●	2	212	219	259	324	40	63	1.29	**SO○X16**	TPS54	TIP25D
53.0	4	**MVX5300X4F50**	●	2	212	219	259	334	50	63	1.29	**SO○X16**	TPS54	TIP25D
53.0	5	**MVX5300X5F40**	●	2	265	272	312	377	40	63	1.29	**SO○X16**	TPS54	TIP25D
53.0	5	**MVX5300X5F50**	●	2	265	272	312	387	50	63	1.29	**SO○X16**	TPS54	TIP25D
54.0	2	**MVX5400X2F40**	●	2	108	115	155	220	40	63	1.19	**SO○X16**	TPS54	TIP25D
54.0	3	**MVX5400X3F40**	●	2	162	169	209	274	40	63	1.19	**SO○X16**	TPS54	TIP25D
54.0	4	**MVX5400X4F40**	●	2	216	223	263	328	40	63	1.19	**SO○X16**	TPS54	TIP25D
54.0	4	**MVX5400X4F50**	●	2	216	223	263	338	50	63	1.19	**SO○X16**	TPS54	TIP25D
54.0	5	**MVX5400X5F40**	●	2	270	277	317	382	40	63	1.19	**SO○X16**	TPS54	TIP25D
54.0	5	**MVX5400X5F50**	●	2	270	277	317	392	50	63	1.19	**SO○X16**	TPS54	TIP25D
55.0	2	**MVX5500X2F40**	●	2	110	117	157	222	40	63	1.08	**SO○X16**	TPS54	TIP25D
55.0	3	**MVX5500X3F40**	●	2	165	172	212	277	40	63	1.08	**SO○X16**	TPS54	TIP25D
55.0	4	**MVX5500X4F40**	●	2	220	227	267	332	40	63	1.08	**SO○X16**	TPS54	TIP25D
55.0	4	**MVX5500X4F50**	●	2	220	227	267	342	50	63	1.08	**SO○X16**	TPS54	TIP25D
55.0	5	**MVX5500X5F40**	●	2	275	282	322	387	40	63	1.08	**SO○X16**	TPS54	TIP25D
55.0	5	**MVX5500X5F50**	●	2	275	282	322	397	50	63	1.08	**SO○X16**	TPS54	TIP25D
56.0	2	**MVX5600X2F40**	●	2	112	119	159	224	40	63	0.98	**SO○X16**	TPS54	TIP25D
56.0	3	**MVX5600X3F40**	●	2	168	175	215	280	40	63	0.98	**SO○X16**	TPS54	TIP25D
56.0	4	**MVX5600X4F40**	●	2	224	231	271	336	40	63	0.98	**SO○X16**	TPS54	TIP25D
56.0	4	**MVX5600X4F50**	●	2	224	231	271	346	50	63	0.98	**SO○X16**	TPS54	TIP25D

* Clamp Torque (N • m) : TPS54=7.5

INSERT DESCRIPTION ➢ N167
SPARE PARTS ➢ P001

MVX

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	S10 (mm)	Insert Number	Clamp Screw	D Wrench
56.0	5	**MVX5600X5F40**	●	2	280	287	327	392	40	63	0.98	**SO○X16**	TPS54	TIP25D
56.0	5	**MVX5600X5F50**	●	2	280	287	327	402	50	63	0.98	**SO○X16**	TPS54	TIP25D
57.0	2	**MVX5700X2F40**	●	2	114	121	161	226	40	68	1.47	**SO○X18**	TPS54	TIP25D
57.0	3	**MVX5700X3F40**	●	2	171	178	218	283	40	68	1.47	**SO○X18**	TPS54	TIP25D
57.0	4	**MVX5700X4F40**	●	2	228	235	275	340	40	68	1.47	**SO○X18**	TPS54	TIP25D
57.0	4	**MVX5700X4F50**	●	2	228	235	275	350	50	68	1.47	**SO○X18**	TPS54	TIP25D
57.0	5	**MVX5700X5F40**	●	2	285	292	332	397	40	68	1.47	**SO○X18**	TPS54	TIP25D
57.0	5	**MVX5700X5F50**	●	2	285	292	332	407	50	68	1.47	**SO○X18**	TPS54	TIP25D
58.0	2	**MVX5800X2F40**	●	2	116	123	163	228	40	68	1.37	**SO○X18**	TPS54	TIP25D
58.0	3	**MVX5800X3F40**	●	2	174	181	221	286	40	68	1.37	**SO○X18**	TPS54	TIP25D
58.0	4	**MVX5800X4F40**	●	2	232	239	279	344	40	68	1.37	**SO○X18**	TPS54	TIP25D
58.0	4	**MVX5800X4F50**	●	2	232	239	279	354	50	68	1.37	**SO○X18**	TPS54	TIP25D
58.0	5	**MVX5800X5F40**	●	2	290	297	337	402	40	68	1.37	**SO○X18**	TPS54	TIP25D
58.0	5	**MVX5800X5F50**	●	2	290	297	337	412	50	68	1.37	**SO○X18**	TPS54	TIP25D
59.0	2	**MVX5900X2F40**	●	2	118	125	165	230	40	68	1.26	**SO○X18**	TPS54	TIP25D
59.0	3	**MVX5900X3F40**	●	2	177	184	224	289	40	68	1.26	**SO○X18**	TPS54	TIP25D
59.0	4	**MVX5900X4F40**	●	2	236	243	283	348	40	68	1.26	**SO○X18**	TPS54	TIP25D
59.0	4	**MVX5900X4F50**	●	2	236	243	283	358	50	68	1.26	**SO○X18**	TPS54	TIP25D
59.0	5	**MVX5900X5F40**	●	2	295	302	342	407	40	68	1.26	**SO○X18**	TPS54	TIP25D
59.0	5	**MVX5900X5F50**	●	2	295	302	342	417	50	68	1.26	**SO○X18**	TPS54	TIP25D
60.0	2	**MVX6000X2F40**	●	2	120	127	167	232	40	68	1.16	**SO○X18**	TPS54	TIP25D
60.0	3	**MVX6000X3F40**	●	2	180	187	227	292	40	68	1.16	**SO○X18**	TPS54	TIP25D
60.0	4	**MVX6000X4F40**	●	2	240	247	287	352	40	68	1.16	**SO○X18**	TPS54	TIP25D
60.0	4	**MVX6000X4F50**	●	2	240	247	287	362	50	68	1.16	**SO○X18**	TPS54	TIP25D
60.0	5	**MVX6000X5F40**	●	2	300	307	347	412	40	68	1.16	**SO○X18**	TPS54	TIP25D
60.0	5	**MVX6000X5F50**	●	2	300	307	347	422	50	68	1.16	**SO○X18**	TPS54	TIP25D
61.0	2	**MVX6100X2F40**	●	2	122	129	169	234	40	68	1.05	**SO○X18**	TPS54	TIP25D
61.0	3	**MVX6100X3F40**	●	2	183	190	230	295	40	68	1.05	**SO○X18**	TPS54	TIP25D
61.0	4	**MVX6100X4F40**	●	2	244	251	291	356	40	68	1.05	**SO○X18**	TPS54	TIP25D
61.0	4	**MVX6100X4F50**	●	2	244	251	291	366	50	68	1.05	**SO○X18**	TPS54	TIP25D
61.0	5	**MVX6100X5F40**	●	2	305	312	352	417	40	68	1.05	**SO○X18**	TPS54	TIP25D
61.0	5	**MVX6100X5F50**	●	2	305	312	352	427	50	68	1.05	**SO○X18**	TPS54	TIP25D
62.0	2	**MVX6200X2F40**	●	2	124	131	171	236	40	68	0.95	**SO○X18**	TPS54	TIP25D
62.0	3	**MVX6200X3F40**	●	2	186	193	233	298	40	68	0.95	**SO○X18**	TPS54	TIP25D
62.0	4	**MVX6200X4F40**	●	2	248	255	295	360	40	68	0.95	**SO○X18**	TPS54	TIP25D
62.0	4	**MVX6200X4F50**	●	2	248	255	295	370	50	68	0.95	**SO○X18**	TPS54	TIP25D
62.0	5	**MVX6200X5F40**	●	2	310	317	357	422	40	68	0.95	**SO○X18**	TPS54	TIP25D
62.0	5	**MVX6200X5F50**	●	2	310	317	357	432	50	68	0.95	**SO○X18**	TPS54	TIP25D
63.0	2	**MVX6300X2F40**	●	2	126	133	173	238	40	68	0.85	**SO○X18**	TPS54	TIP25D
63.0	3	**MVX6300X3F40**	●	2	189	196	236	301	40	68	0.85	**SO○X18**	TPS54	TIP25D
63.0	4	**MVX6300X4F40**	●	2	252	259	299	364	40	68	0.85	**SO○X18**	TPS54	TIP25D
63.0	4	**MVX6300X4F50**	●	2	252	259	299	374	50	68	0.85	**SO○X18**	TPS54	TIP25D
63.0	5	**MVX6300X5F40**	●	2	315	322	362	427	40	68	0.85	**SO○X18**	TPS54	TIP25D
63.0	5	**MVX6300X5F50**	●	2	315	322	362	437	50	68	0.85	**SO○X18**	TPS54	TIP25D

* Clamp Torque (N • m) : TPS54=7.5

● : **Inventory maintained in Japan.**

Contains one insert per case.

INSERTS

Shape	Drill Dia.	Insert Number	IC	S	RE	Coated MC5020	Coated MC1020	Coated VP15TF	Coated DP8020	Carbide TF15		Geometry
UM	ø14.0—ø16.5	**SOMX052704-UM**	5.0	2.7	0.4	●	●	●				ø14.0—ø16.5
	ø17.0—ø19.5	**SOMX063005-UM**	6.0	3.0	0.5	●	●	●				
	ø20.0—ø22.5	**SOMX073505-UM**	7.0	3.5	0.5	●	●	●				
	ø23.0—ø27.5	**SOMX084005-UM**	8.3	4.0	0.5	●	●	●				
	ø28.0—ø33.0	**SOMX094506-UM**	9.7	4.5	0.6	●	●	●				
	ø33.5—ø39.0	**SOMX115506-UM**	11.6	5.5	0.6	●	●	●				ø17.0—ø63.0
	ø40.0—ø46.0	**SOMX136008-UM**	13.8	6.0	0.8	●	●	●				
	ø47.0—ø56.0	**SOMX166508-UM**	16.5	6.5	0.8	●	●	●				
General Purpose and Inner or Outer Edge	ø57.0—ø63.0	**SOMX187008-UM**	18.2	7.0	0.8	●	●	●				
US	ø17.0—ø19.5	**SOMX063005-US**	6.0	3.0	0.5			●				
	ø20.0—ø22.5	**SOMX073505-US**	7.0	3.5	0.5			●				
	ø23.0—ø27.5	**SOMX084005-US**	8.3	4.0	0.5			●				
	ø28.0—ø33.0	**SOMX094506-US**	9.7	4.5	0.6			●				
	ø33.5—ø39.0	**SOMX115506-US**	11.6	5.5	0.6			●				
	ø40.0—ø46.0	**SOMX136008-US**	13.8	6.0	0.8			●				
	ø47.0—ø56.0	**SOMX166508-US**	16.5	6.5	0.8			●				
For Stainless Steel and Inner Edge	ø57.0—ø63.0	**SOMX187008-US**	18.2	7.0	0.8			●				
UH	ø17.0—ø19.5	**SOMX062905-UH**	6.0	2.9	0.5				●			
	ø20.0—ø22.5	**SOMX073405-UH**	7.0	3.4	0.5				●			
	ø23.0—ø27.5	**SOMX083905-UH**	8.3	3.9	0.5				●			
	ø28.0—ø33.0	**SOMX094406-UH**	9.7	4.4	0.6				●			
	ø33.5—ø39.0	**SOMX115406-UH**	11.6	5.4	0.6				●			
	ø40.0—ø46.0	**SOMX135908-UH**	13.8	5.9	0.8				●			
	ø47.0—ø56.0	**SOMX166408-UH**	16.5	6.4	0.8				●			
Strong Cutting Edge Type and Inner Edge	ø57.0—ø63.0	**SOMX186908-UH**	18.2	6.9	0.8				●			
UN	ø17.0—ø19.5	**SOGX063005-UN**	6.0	3.0	0.5					●		
	ø20.0—ø22.5	**SOGX073505-UN**	7.0	3.5	0.5					●		
	ø23.0—ø27.5	**SOGX084005-UN**	8.3	4.0	0.5					●		
	ø28.0—ø33.0	**SOGX094506-UN**	9.7	4.5	0.6					●		
	ø33.5—ø39.0	**SOGX115506-UN**	11.6	5.5	0.6					●		
	ø40.0—ø46.0	**SOGX136008-UN**	13.8	6.0	0.8					●		
	ø47.0—ø56.0	**SOGX166508-UN**	16.5	6.5	0.8					●		
Aluminium Alloy and Inner or Outer Edge	ø57.0—ø63.0	**SOGX187008-UN**	18.2	7.0	0.8					●		

Note 1) MC1020 and MC5020 are made exclusively for use as an outer insert. DP8020 is made exclusively for use as an inner insert.

INSERT RECOMMENDATION

Workpiece Material		1st Recommendation Outer Insert	1st Recommendation Inner Insert	When outer insert fractures Outer Insert	When outer insert fractures Inner Insert
P	Mild Steel, Alloy Steel	MC1020	VP15TF	VP15TF	VP15TF
		UM Breaker	**UM Breaker**	**UM Breaker**	**UM Breaker**
M	Stainless Steel	MC1020	VP15TF	VP15TF	VP15TF
		UM Breaker	**US Breaker**	**UM Breaker**	**US Breaker**
K	Cast Iron	MC5020	VP15TF	VP15TF	VP15TF
		UM Breaker	**UM Breaker**	**UM Breaker**	**UM Breaker**

Workpiece Material		1st Recommendation Outer Insert	1st Recommendation Inner Insert	When outer insert fractures Outer Insert	When outer insert fractures Inner Insert
H	Hardened Steel	MC1020	DP8020	VP15TF	DP8020
		UM Breaker	**UH Breaker**	**UM Breaker**	**UH Breaker**
N	Aluminium Alloy	TF15	TF15		
		UN Breaker	**UN Breaker**		

MVX

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Speed (m/min)	Inner Breaker	ϕ14—ϕ16.5mm Feed Rate (mm/rev) L/D=2, 3	4	5
P	Mild Steel (ASTM A36, AISI 1010 etc.)	≤180HB	200 (180—235)	UM	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.05 (0.04—0.06)
				UH	—	—	—
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140 etc.)	180—280HB	140 (115—180)	UM	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)
				UH	—	—	—
	Carbon Steel, Alloy Steel (AISI 4340 etc.)	280—350HB	100 (75—140)	UM	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)
				UH	—	—	—
	Alloy Tool Steel (SKD, SKT etc.)	≤350HB	135 (100—170)	UM	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)
				UH	—	—	—
M	Austenitic Stainless Steel (AISI 304, AISI 316 etc.)	≤200HB	130 (80—180)	US	—	—	—
				UM	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LN etc.)	>200HB	130 (80—180)	US	—	—	—
				UM	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430 etc.)	≤200HB	120 (80—165)	US	—	—	—
				UM	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420J2 etc.)	>200HB	120 (80—165)	US	—	—	—
				UM	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)
K	Gray Cast Iron (FC300 etc.)	Tensile Strength ≤350MPa	160 (130—195)	UM	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)
	Ductile Cast Iron (FCD450 etc.)	Tensile Strength ≤450MPa	100 (80—135)	UM	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)
	Ductile Cast Iron (FCD700 etc.)	Tensile Strength ≤800MPa	100 (70—125)	UM	0.08 (0.06—0.12)	0.07 (0.06—0.08)	0.07 (0.06—0.08)
N	Aluminium Alloys (A6061, A7075)	Si<5%	200 (100—350)	UN	—	—	—
	Aluminium Alloys (AC4B)	5%≤Si≤10%	150 (100—200)	UN	—	—	—
	Aluminium Alloys (ADC12, A390)	Si>10%	150 (100—200)	UN	—	—	—
H	Hardened Steel (AISI H13, JIS SKT4)	38—45HRC	50 (30—80)	UH	—	—	—

Note 1) Reduce the cutting speed to around 70% when VP15TF is used as an outer insert.
Note 2) L/D=3 is the recommended maximum depth when only external coolant is used.
Note 3) Internal through coolant is highly necessary when drilling stainless steel.

	ϕ17—ϕ19.5mm				ϕ20—ϕ23.5mm				ϕ24—ϕ29.5mm			
	Feed Rate (mm/rev)				Feed Rate (mm/rev)				Feed Rate (mm/rev)			
	L/D=2, 3	4	5	6	L/D=2, 3	4	5	6	L/D=2, 3	4	5	6
	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.04 (0.04—0.05)	0.06 (0.04—0.08)	0.06 (0.04—0.07)	0.06 (0.04—0.07)	0.04 (0.04—0.05)	0.07 (0.04—0.08)	0.06 (0.04—0.07)	0.06 (0.04—0.07)	0.05 (0.04—0.06)
	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.08)	0.12 (0.08—0.18)	0.10 (0.08—0.12)	0.10 (0.08—0.12)	0.09 (0.08—0.10)
	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.08)	0.12 (0.08—0.18)	0.10 (0.08—0.12)	0.10 (0.08—0.12)	0.09 (0.08—0.10)
	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.08)	0.12 (0.08—0.18)	0.10 (0.08—0.12)	0.10 (0.08—0.12)	0.09 (0.08—0.10)
	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.04 (0.04—0.05)	0.08 (0.06—0.12)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.09 (0.06—0.12)	0.07 (0.06—0.09)	0.07 (0.06—0.09)	0.06 (0.06—0.08)
	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.04 (0.04—0.05)	0.08 (0.06—0.12)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.09 (0.06—0.12)	0.07 (0.06—0.09)	0.07 (0.06—0.09)	0.06 (0.06—0.08)
	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.04 (0.04—0.05)	0.08 (0.06—0.12)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.09 (0.06—0.12)	0.07 (0.06—0.09)	0.07 (0.06—0.09)	0.06 (0.06—0.08)
	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.10 (0.06—0.14)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.05 (0.04—0.06)	0.04 (0.04—0.05)	0.08 (0.06—0.12)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)	0.09 (0.06—0.12)	0.07 (0.06—0.09)	0.07 (0.06—0.09)	0.06 (0.06—0.08)
	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.14 (0.10—0.18)	0.10 (0.10—0.12)	0.10 (0.10—0.12)	0.07 (0.06—0.08)	0.15 (0.10—0.20)	0.11 (0.10—0.13)	0.11 (0.10—0.13)	0.09 (0.08—0.10)
	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.13 (0.10—0.16)	0.10 (0.10—0.11)	0.10 (0.10—0.11)	0.07 (0.06—0.08)	0.14 (0.10—0.18)	0.11 (0.10—0.12)	0.11 (0.10—0.12)	0.09 (0.08—0.10)
	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.13 (0.10—0.16)	0.10 (0.10—0.11)	0.10 (0.10—0.11)	0.07 (0.06—0.08)	0.14 (0.10—0.18)	0.11 (0.10—0.12)	0.11 (0.10—0.12)	0.09 (0.08—0.10)
	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
	0.08 (0.04—0.12)	0.06 (0.04—0.09)	—	—	0.09 (0.06—0.14)	0.07 (0.06—0.09)	—	—	0.09 (0.06—0.14)	0.07 (0.06—0.09)	—	—

MVX

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Cutting Speed (m/min)	Inner Breaker	ϕ30—ϕ63mm Feed Rate (mm/rev) L/D=2, 3	4	5	6
P	Mild Steel (ASTM A36, AISI 1010 etc.)	≤180HB	200 (180—235)	UM	0.08 (0.06—0.10)	0.07 (0.06—0.08)	0.07 (0.06—0.08)	0.06 (0.06—0.07)
				UH				
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140 etc.)	180—280HB	140 (115—180)	UM	0.14 (0.08—0.20)	0.12 (0.08—0.16)	0.12 (0.08—0.16)	0.11 (0.10—0.12)
				UH				
	Carbon Steel, Alloy Steel (AISI 4340 etc.)	280—350HB	100 (75—140)	UM	0.14 (0.08—0.20)	0.12 (0.08—0.16)	0.12 (0.08—0.16)	0.11 (0.10—0.12)
				UH				
	Alloy Tool Steel (SKD, SKT etc.)	≤350HB	135 (100—170)	UM	0.14 (0.08—0.20)	0.12 (0.08—0.16)	0.12 (0.08—0.16)	0.10 (0.08—0.12)
				UH				
M	Austenitic Stainless Steel (AISI 304, AISI 316 etc.)	≤200HB	130 (80—180)	US	0.10 (0.06—0.14)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.10)
				UM	0.09 (0.06—0.12)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LN etc.)	>200HB	130 (80—180)	US	0.10 (0.06—0.14)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.10)
				UM	0.09 (0.06—0.12)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430 etc.)	≤200HB	120 (80—165)	US	0.10 (0.06—0.14)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.10)
				UM	0.09 (0.06—0.12)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420J2 etc.)	>200HB	120 (80—165)	US	0.10 (0.06—0.14)	0.09 (0.06—0.12)	0.09 (0.06—0.12)	0.07 (0.06—0.10)
				UM	0.09 (0.06—0.12)	0.08 (0.06—0.10)	0.08 (0.06—0.10)	0.07 (0.06—0.08)
K	Gray Cast Iron (FC300 etc.)	Tensile Strength ≤350MPa	160 (130—195)	UM	0.15 (0.10—0.20)	0.12 (0.10—0.13)	0.12 (0.10—0.13)	0.11 (0.10—0.12)
	Ductile Cast Iron (FCD450 etc.)	Tensile Strength ≤450MPa	100 (80—135)	UM	0.15 (0.10—0.20)	0.12 (0.10—0.13)	0.12 (0.10—0.13)	0.11 (0.10—0.12)
	Ductile Cast Iron (FCD700 etc.)	Tensile Strength ≤800MPa	100 (70—125)	UM	0.15 (0.10—0.20)	0.12 (0.10—0.13)	0.12 (0.10—0.13)	0.11 (0.10—0.12)
N	Aluminium Alloys (A6061, A7075)	Si<5%	200 (100—350)	UN	0.12 (0.05—0.20)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
	Aluminium Alloys (AC4B)	5%≤Si≤10%	150 (100—200)	UN	0.12 (0.05—0.20)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
	Aluminium Alloys (ADC12, A390)	Si>10%	150 (100—200)	UN	0.12 (0.05—0.20)	0.12 (0.05—0.18)	0.12 (0.05—0.18)	0.08 (0.05—0.12)
H	Hardened Steel (AISI H13, JIS SKT4)	38—45HRC	50 (30—80)	UH	0.11 (0.06—0.16)	0.09 (0.06—0.012)	—	—

Note 1) Reduce the cutting speed to around 70% when VP15TF is used as an outer insert.
Note 2) L/D=3 is the recommended maximum depth when only external coolant is used.
Note 3) Internal through coolant is highly necessary when drilling stainless steel.

USAGE NOTE ➤ N178

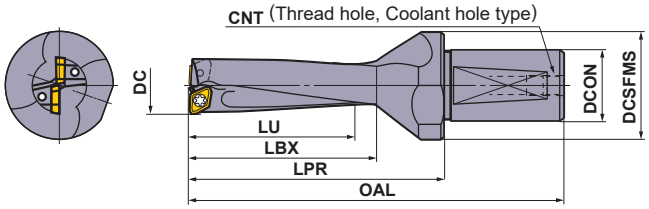
TAFS/TAFM/TAFL

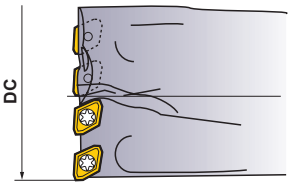
- High rigidity holder.
- 4 corner use insert.
- Various grades and chip breakers.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			



Note 1) A screw hole on the flange section is not a coolant hole.





Number of Teeth = 4 (ϕDC ≥ 49)

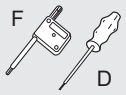
DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	F Wrench
12.0	2	TAFS1200F20	●	2	24	29	39	82	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
12.0	3	TAFM1200F20	●	2	36	41	51	94	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
12.5	2	TAFS1250F20	●	2	25	29	39	82	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
12.5	3	TAFM1250F20	●	2	37.5	41	51	94	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
13.0	2	TAFS1300F20	●	2	26	31	41	84	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
13.0	3	TAFM1300F20	●	2	39	44	54	97	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
13.5	2	TAFS1350F20	●	2	27	31	41	84	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
13.5	3	TAFM1350F20	●	2	40.5	44	54	97	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
14.0	2	TAFS1400F20	●	2	28	33	43	86	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
14.0	3	TAFM1400F20	●	2	42	47	57	100	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
14.5	2	TAFS1450F20	●	2	29	33	43	86	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
14.5	3	TAFM1450F20	●	2	43.5	47	57	100	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
15.0	2	TAFS1500F20	●	2	30	35	45	88	20	25	PT1/8	GPMT060204-U○	TS2	TKY06F
15.0	3	TAFM1500F20	●	2	45	50	60	103	20	25	PT1/8	GPMT060204-U○	TS2	TKY06F
15.5	2	TAFS1550F20	●	2	31	35	45	88	20	25	PT1/8	GPMT060204-U○	TS2	TKY06F
15.5	3	TAFM1550F20	●	2	46.5	50	60	103	20	25	PT1/8	GPMT060204-U○	TS2	TKY06F
16.0	2	TAFS1600F25	●	2	32	38	57	107	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
16.0	3	TAFM1600F25	●	2	48	54	73	123	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
16.0	4	TAFL1600F25	●	2	64	70	89	139	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
16.5	2	TAFS1650F25	●	2	33	38	57	107	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
16.5	3	TAFM1650F25	●	2	49.5	54	73	123	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
17.0	2	TAFS1700F25	●	2	34	41	59	109	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
17.0	3	TAFM1700F25	●	2	51	58	76	126	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
17.0	4	TAFL1700F25	●	2	68	75	93	143	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
17.5	2	TAFS1750F25	▲	2	35	41	59	109	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
17.5	3	TAFM1750F25	▲	2	52.5	58	76	126	25	35	PT1/8	GPMT060204-U○	TS2	TKY06F
18.0	2	TAFS1800F25	▲	2	36	43	61	111	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
18.0	3	TAFM1800F25	▲	2	54	61	79	129	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
18.0	4	TAFL1800F25	▲	2	72	79	97	147	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
18.5	2	TAFS1850F25	▲	2	37	43	61	111	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F

∗ Clamp Torque (N • m) : TS2=0.5, TS25=1.0

● : Inventory maintained in Japan.
▲ : Inventory maintained in Japan. To be replaced by new products.

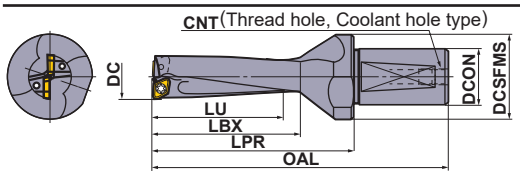
INSERT DESCRIPTION ➤ N175
SPARE PARTS ➤ P001

TAFS/TAFM/TAFL

DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)							Insert Number		
					LU	LBX	LPR	OAL	DCON	DCSFMS	CNT		Clamp Screw	Wrench
18.5	3	TAFM1850F25	▲	2	55.5	61	79	129	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
19.0	2	TAFS1900F25	▲	2	38	46	63	113	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
19.0	3	TAFM1900F25	▲	2	57	65	82	132	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
19.0	4	TAFL1900F25	▲	2	76	84	101	151	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
19.5	2	TAFS1950F25	▲	2	39	46	63	113	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
19.5	3	TAFM1950F25	▲	2	58.5	65	82	132	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
20.0	2	TAFS2000F25	▲	2	40	48	65	115	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
20.0	3	TAFM2000F25	▲	2	60	68	85	135	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
20.0	4	TAFL2000F25	▲	2	80	88	105	155	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
20.5	2	TAFS2050F25	▲	2	41	48	65	115	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
20.5	3	TAFM2050F25	▲	2	61.5	68	85	135	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
21.0	2	TAFS2100F25	▲	2	42	50	67	117	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
21.0	3	TAFM2100F25	▲	2	63	71	88	138	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
21.0	4	TAFL2100F25	▲	2	84	92	109	159	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
21.5	2	TAFS2150F25	▲	2	43	50	67	117	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
21.5	3	TAFM2150F25	▲	2	64.5	71	88	138	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
22.0	2	TAFS2200F25	▲	2	44	53	69	119	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
22.0	3	TAFM2200F25	▲	2	66	75	91	141	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
22.0	4	TAFL2200F25	▲	2	88	97	113	163	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
22.5	2	TAFS2250F25	▲	2	45	53	69	119	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
22.5	3	TAFM2250F25	▲	2	67.5	75	91	141	25	35	PT1/8	GPMT070204-U○	TS25	TKY08F
23.0	2	TAFS2300F25	▲	2	46	55	71	121	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
23.0	3	TAFM2300F25	▲	2	69	78	94	144	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
23.0	4	TAFL2300F25	▲	2	92	101	117	167	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
23.5	2	TAFS2350F25	▲	2	47	55	71	121	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
23.5	3	TAFM2350F25	▲	2	70.5	78	94	144	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
24.0	2	TAFS2400F25	▲	2	48	58	73	123	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
24.0	3	TAFM2400F25	▲	2	72	82	97	147	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
24.0	4	TAFL2400F25	▲	2	96	106	121	171	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
24.5	2	TAFS2450F25	▲	2	49	58	73	123	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
24.5	3	TAFM2450F25	▲	2	73.5	82	97	147	25	35	PT1/8	GPMT090304-U○	TS3	TKY08F
25.0	2	TAFS2500F32	▲	2	50	60	75	130	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
25.0	3	TAFM2500F32	▲	2	75	85	100	155	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
25.0	4	TAFL2500F32	▲	2	100	110	125	180	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
25.5	2	TAFS2550F32	▲	2	51	60	75	130	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
25.5	3	TAFM2550F32	▲	2	76.5	85	100	155	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
26.0	2	TAFS2600F32	▲	2	52	62	77	132	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
26.0	3	TAFM2600F32	▲	2	78	88	103	158	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
26.0	4	TAFL2600F32	▲	2	104	114	129	184	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
26.5	2	TAFS2650F32	▲	2	53	62	77	132	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
26.5	3	TAFM2650F32	▲	2	79.5	88	103	158	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
27.0	2	TAFS2700F32	▲	2	54	65	79	134	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
27.0	3	TAFM2700F32	▲	2	81	92	106	161	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
27.0	4	TAFL2700F32	▲	2	108	119	133	188	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
27.5	2	TAFS2750F32	▲	2	55	65	79	134	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
27.5	3	TAFM2750F32	▲	2	82.5	92	106	161	32	42	PT1/8	GPMT090304-U○	TS3	TKY08F
28.0	2	TAFS2800F32	▲	2	56	67	81	136	32	42	PT1/8	GPMT11T308-U○	TS4	TKY15D
28.0	3	TAFM2800F32	▲	2	84	95	109	164	32	42	PT1/8	GPMT11T308-U○	TS4	TKY15D

* Clamp Torque (N • m) : TS25=1.0, TS3=1.0

▲ : Inventory maintained in Japan. To be replaced by new products.

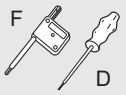


DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)							Insert Number	Clamp Screw	D Wrench
					LU	LBX	LPR	OAL	DCON	DCSFMS	CNT			
28.0	4	**TAFL2800F32**	▲	2	112	123	137	192	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
28.5	2	**TAFS2850F32**	▲	2	57	67	81	136	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
28.5	3	**TAFM2850F32**	▲	2	85.5	95	109	164	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
29.0	2	**TAFS2900F32**	▲	2	58	70	83	138	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
29.0	3	**TAFM2900F32**	▲	2	87	99	112	167	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
29.0	4	**TAFL2900F32**	▲	2	116	128	141	196	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
29.5	2	**TAFS2950F32**	▲	2	59	70	83	138	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
29.5	3	**TAFM2950F32**	▲	2	88.5	99	112	167	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
30.0	2	**TAFS3000F40**	▲	2	60	72	90	155	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
30.0	3	**TAFM3000F40**	▲	2	90	102	120	185	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
30.0	4	**TAFL3000F40**	▲	2	120	132	150	215	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
31.0	2	**TAFS3100F40**	▲	2	62	74	92	157	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
31.0	3	**TAFM3100F40**	▲	2	93	105	123	188	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
31.0	4	**TAFL3100F40**	▲	2	124	136	154	219	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
32.0	2	**TAFS3200F40**	▲	2	64	77	94	159	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
32.0	3	**TAFM3200F40**	▲	2	96	109	126	191	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
32.0	4	**TAFL3200F40**	▲	2	128	141	158	223	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
33.0	2	**TAFS3300F40**	▲	2	66	79	96	161	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
33.0	3	**TAFM3300F40**	▲	2	99	112	129	194	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
33.0	4	**TAFL3300F40**	▲	2	132	145	162	227	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
34.0	2	**TAFS3400F40**	▲	2	68	82	98	163	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
34.0	3	**TAFM3400F40**	▲	2	102	116	132	197	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
34.0	4	**TAFL3400F40**	▲	2	136	150	166	231	40	50	PT1/4	**GPMT11T308-U○**	TS4	TKY15D
35.0	2	**TAFS3500F40**	▲	2	70	84	100	165	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
35.0	3	**TAFM3500F40**	▲	2	105	119	135	200	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
36.0	2	**TAFS3600F40**	▲	2	72	86	102	167	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
36.0	3	**TAFM3600F40**	▲	2	108	122	138	203	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
37.0	2	**TAFS3700F40**	▲	2	74	89	104	169	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
37.0	3	**TAFM3700F40**	▲	2	111	126	141	206	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
38.0	2	**TAFS3800F40**	▲	2	76	91	106	171	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
38.0	3	**TAFM3800F40**	▲	2	114	129	144	209	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
39.0	2	**TAFS3900F40**	▲	2	78	94	108	173	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
39.0	3	**TAFM3900F40**	▲	2	117	133	147	212	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
40.0	2	**TAFS4000F40**	▲	2	80	96	110	175	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
40.0	3	**TAFM4000F40**	▲	2	120	136	150	215	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
41.0	2	**TAFS4100F40**	▲	2	82	98	112	177	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
41.0	3	**TAFM4100F40**	▲	2	123	139	153	218	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
42.0	2	**TAFS4200F40**	▲	2	84	101	114	179	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
42.0	3	**TAFM4200F40**	▲	2	126	143	156	221	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
43.0	2	**TAFS4300F40**	▲	2	86	103	116	181	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
43.0	3	**TAFM4300F40**	▲	2	129	146	159	224	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
44.0	2	**TAFS4400F40**	▲	2	88	106	118	183	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
44.0	3	**TAFM4400F40**	▲	2	132	150	162	227	40	50	PT1/4	**GPMT140408-U○**	TS55	TKY25D
45.0	2	**TAFS4500F40**	▲	2	90	108	120	185	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
45.0	3	**TAFM4500F40**	▲	2	135	153	165	230	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
46.0	2	**TAFS4600F40**	▲	2	92	110	122	187	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
46.0	3	**TAFM4600F40**	▲	2	138	156	168	233	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
47.0	2	**TAFS4700F40**	▲	2	94	113	124	189	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D

* Clamp Torque (N • m) : TS4=3.5, TS55=7.5

INSERT DESCRIPTION ➤ N175
SPARE PARTS ➤ P001

TAFS/TAFM/TAFL

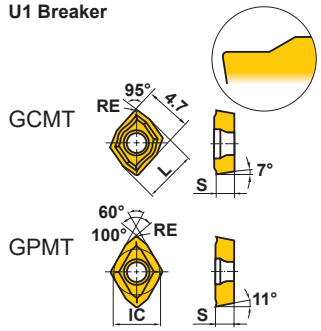
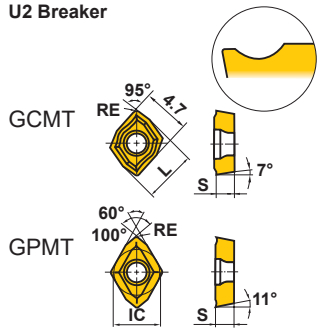
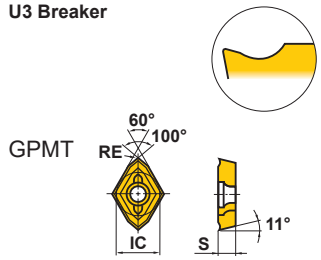
DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)							Insert Number	 Clamp Screw	 Wrench
					LU	LBX	LPR	OAL	DCON	DCSFMS	CNT			
47.0	3	**TAFM4700F40**	▲	2	141	160	171	236	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
48.0	2	**TAFS4800F40**	▲	2	96	115	126	191	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
48.0	3	**TAFM4800F40**	▲	2	144	163	174	239	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
49.0	2	**TAFS4900F40**	▲	4	98	118	133	198	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
49.0	3	**TAFM4900F40**	▲	4	147	167	182	247	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
50.0	2	**TAFS5000F40**	▲	4	100	120	135	200	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
50.0	3	**TAFM5000F40**	▲	4	150	170	185	250	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
51.0	2	**TAFS5100F40**	▲	4	102	122	137	202	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
51.0	3	**TAFM5100F40**	▲	4	153	173	188	253	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
52.0	2	**TAFS5200F40**	▲	4	104	125	139	204	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
52.0	3	**TAFM5200F40**	▲	4	156	177	191	256	40	58	PT1/4	**GPMT090304-U○**	TS3	TKY08F
53.0	2	**TAFS5300F40**	▲	4	106	127	141	206	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
53.0	3	**TAFM5300F40**	▲	4	159	180	194	259	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
54.0	2	**TAFS5400F40**	▲	4	108	128	143	208	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
54.0	3	**TAFM5400F40**	▲	4	162	182	197	262	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
55.0	2	**TAFS5500F40**	▲	4	110	130	145	210	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
55.0	3	**TAFM5500F40**	▲	4	165	185	200	265	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
56.0	2	**TAFS5600F40**	▲	4	112	132	147	212	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F
56.0	3	**TAFM5600F40**	▲	4	168	188	203	268	40	63	PT1/4	**GPMT090304-U○**	TS3	TKY08F

* Clamp Torque (N • m) : TS3=1.0, TS55=7.5

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

Contains 10 inserts per case.

INSERTS

Geometry	Drill Dia.	Insert Number	Dimensions (mm)				Coated				
			IC	L	S	RE	VP15TF	UP20M	GP20M	UE6020	US735
U1 Breaker GCMT / GPMT 	ø12.0—ø14.5	**GCMT040204-U1**	—	5.0	2.38	0.4		●			
	ø15.0—ø17.5	**GPMT060204-U1**	5.56	—	2.38	0.4		▲		▲	
	ø18.0—ø22.5	**GPMT070204-U1**	6.35	—	2.38	0.4		▲		▲	
	ø23.0—ø27.5 ø49.0—ø56.0	**GPMT090304-U1**	7.94	—	3.18	0.4		▲		▲	
	ø28.0—ø34.0	**GPMT11T308-U1**	9.525	—	3.97	0.8		▲		▲	
	ø35.0—ø48.0	**GPMT140408-U1**	12.70	—	4.76	0.8		▲		▲	
U2 Breaker GCMT / GPMT 	ø12.0—ø14.5	**GCMT040204-U2**	—	5.0	2.38	0.4	●		●		
	ø15.0—ø17.5	**GPMT060204-U2**	5.56	—	2.38	0.4	▲	▲		▲	▲
	ø18.0—ø22.5	**GPMT070204-U2**	6.35	—	2.38	0.4	▲	▲		▲	▲
	ø23.0—ø27.5 ø49.0—ø56.0	**GPMT090304-U2**	7.94	—	3.18	0.4	▲	▲		▲	▲
	ø28.0—ø34.0	**GPMT11T308-U2**	9.525	—	3.97	0.8	▲	▲		▲	▲
	ø35.0—ø48.0	**GPMT140408-U2**	12.70		4.76	0.8	▲	▲		▲	▲
U3 Breaker GPMT 	ø15.0—ø17.5	**GPMT060204-U3**	5.56	—	2.38	0.4		▲		▲	▲
	ø18.0—ø22.5	**GPMT070204-U3**	6.35	—	2.38	0.4		▲		▲	▲
	ø23.0—ø27.5 ø49.0—ø56.0	**GPMT090304-U3**	7.94	—	3.18	0.4		▲		▲	▲
	ø28.0—ø34.0	**GPMT11T308-U3**	9.525	—	3.97	0.8		▲		▲	▲
	ø35.0—ø48.0	**GPMT140408-U3**	12.70	—	4.76	0.8		▲		▲	▲

INSERT RECOMMENDATION

■CHIP BREAKER RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Workpiece Material / Breaker	P						M		K			
	Mild Steel		Carbon Steel		Alloy Steel		Stainless Steel		Gray Cast Iron		Ductile Cast Iron	
	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT
U1	◎	◎	○	○	○	○	○	○	○	○	○	○
U2	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
U3		○		○		○		○		○		○

■INSERT GRADE RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Workpiece Material / Grade	P						M		K			
	Mild Steel		Carbon Steel		Alloy Steel		Stainless Steel		Gray Cast Iron		Ductile Cast Iron	
	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT
VP15TF		○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
UP20M	◎	◎	○	○	○	○	○	○	○	○	○	○
GP20M	○		○		○		○		○		○	
UE6020		○		○		○		○		○		○
US735		○		○		○		○		○		○

N
DRILLING

USAGE NOTE ➤ N179
SPARE PARTS ➤ P001

TAFS/TAFM/TAFL

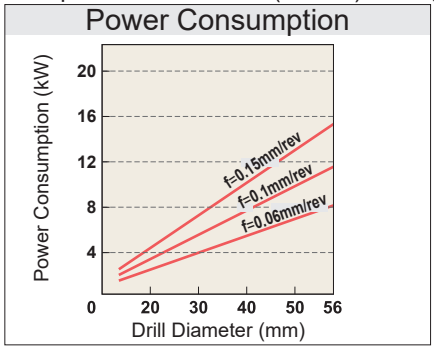
RECOMMENDED CUTTING CONDITIONS

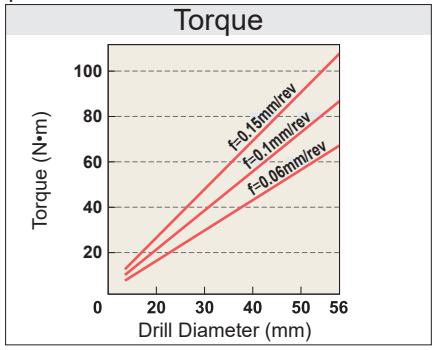
Workpiece Material		Hardness	Cutting Speed (m/min) For L/D=2,3 (ϕ12–ϕ14.5)	Cutting Speed (m/min) For L/D=2,3 (ϕ15–)	Cutting Speed (m/min) For L/D=4 (ϕ16–)	Breaker	Feed (mm/rev) Drill Diameter (mm) ϕ12–ϕ14.5	ϕ15–ϕ22.5	ϕ23–ϕ34	ϕ35–ϕ48	ϕ49–ϕ56
P	Mild Steel	≤180HB	150 (100–200)	200 (150–300)	140 (100–200)	U1	0.06 (0.04–0.10)	0.07 (0.04–0.10)	0.08 (0.04–0.10)	0.10 (0.04–0.12)	0.08 (0.04–0.10)
						U2	0.06 (0.04–0.10)	0.08 (0.04–0.12)	0.10 (0.04–0.12)	0.12 (0.04–0.14)	0.10 (0.04–0.12)
						U3	–	0.08 (0.04–0.12)	0.10 (0.04–0.12)	0.12 (0.04–0.14)	0.10 (0.04–0.12)
	Carbon Steel	180–280HB	120 (80–160)	150 (120–180)	100 (80–120)	U1	0.06 (0.04–0.10)	0.09 (0.06–0.12)	0.12 (0.08–0.14)	0.15 (0.08–0.18)	0.12 (0.08–0.14)
						U2	0.06 (0.04–0.10)	0.12 (0.06–0.14)	0.14 (0.08–0.18)	0.17 (0.08–0.20)	0.14 (0.08–0.18)
						U3	–	0.12 (0.06–0.14)	0.14 (0.08–0.18)	0.17 (0.08–0.20)	0.14 (0.08–0.18)
	Alloy Steel	180–280HB	120 (80–160)	150 (120–180)	100 (80–120)	U1	0.06 (0.04–0.10)	0.08 (0.06–0.10)	0.09 (0.06–0.12)	0.11 (0.06–0.14)	0.09 (0.06–0.12)
						U2	0.06 (0.04–0.10)	0.10 (0.06–0.12)	0.12 (0.08–0.16)	0.14 (0.08–0.18)	0.12 (0.08–0.16)
						U3	–	0.10 (0.06–0.12)	0.12 (0.08–0.16)	0.14 (0.08–0.18)	0.12 (0.08–0.16)
M	Stainless Steel	≤200HB	100 (80–120)	150 (120–200)	110 (80–140)	U1	0.07 (0.04–0.10)	0.07 (0.04–0.10)	0.08 (0.04–0.10)	0.10 (0.04–0.12)	0.08 (0.04–0.10)
						U2	0.07 (0.04–0.10)	0.08 (0.04–0.12)	0.10 (0.04–0.14)	0.12 (0.04–0.16)	0.10 (0.04–0.14)
						U3	–	0.08 (0.04–0.12)	0.10 (0.04–0.14)	0.12 (0.04–0.16)	0.10 (0.04–0.14)
K	Gray Cast Iron	Tensile Strength ≤350MPa	120 (80–160)	150 (120–180)	140 (110–160)	U1	0.07 (0.06–0.10)	0.07 (0.06–0.10)	0.10 (0.04–0.14)	0.10 (0.06–0.14)	0.10 (0.06–0.14)
						U2	0.07 (0.06–0.10)	0.15 (0.10–0.18)	0.20 (0.10–0.25)	0.20 (0.10–0.25)	0.20 (0.10–0.25)
						U3	–	0.15 (0.10–0.18)	0.20 (0.10–0.25)	0.20 (0.10–0.25)	0.20 (0.10–0.25)
	Ductile Cast Iron	Tensile Strength ≤450MPa	120 (80–150)	150 (120–180)	100 (80–120)	U1	0.06 (0.04–0.10)	0.07 (0.06–0.10)	0.10 (0.06–0.14)	0.10 (0.06–0.14)	0.10 (0.06–0.14)
						U2	0.06 (0.04–0.10)	0.12 (0.08–0.14)	0.15 (0.08–0.20)	0.18 (0.08–0.20)	0.15 (0.08–0.20)
						U3	–	0.12 (0.08–0.14)	0.15 (0.08–0.20)	0.18 (0.08–0.20)	0.15 (0.08–0.20)

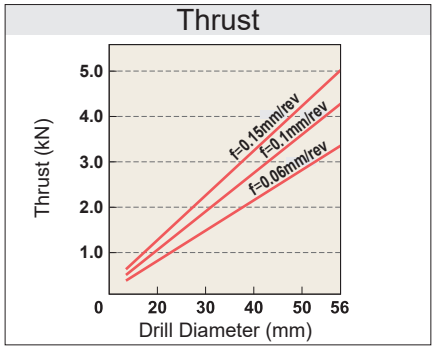
Note 1) When using drills for L/D= 4, the feed should be reduced to 80% of the above recommendations.

■CUTTING RESISTANCE

Workpiece : JIS SCM440(220HB) Cutting Speed : 150m/min Insert : U2 Breaker



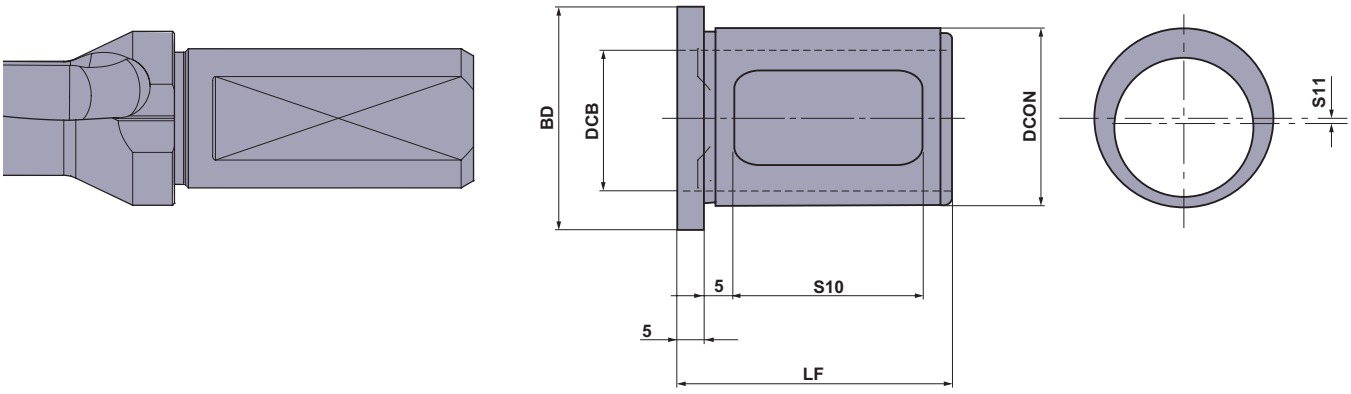




USAGE NOTE ➤ N179

JUST FIT SLEEVE [JFS]

● When intstalling on the drill shank the rotation axis of the drill is slightly decentered. It enables slight enlargement of the machined hole. (enlargement range: 0.1-0.5mm)



Order Number	Stock	Set Order Number	Dimensions (mm)					✱Increase (S11×2)	MVX Order Number The Last Three Letters
			DCB	DCON	BD	LF	S10		
JFS2520-10	●	**JFS-1**	20	25	33	43	30	0.1	F20
JFS2520-20	●	**JFS-1**	20	25	33	43	30	0.2	F20
JFS2520-30	●	**JFS-1**	20	25	33	43	30	0.3	F20
JFS2520-40	●	**JFS-1**	20	25	33	43	30	0.4	F20
JFS2520-50	●	**JFS-1**	20	25	33	43	30	0.5	F20
JFS3225-10	●	**JFS-2**	25	32	40	50	34	0.1	F25
JFS3225-20	●	**JFS-2**	25	32	40	50	34	0.2	F25
JFS3225-30	●	**JFS-2**	25	32	40	50	34	0.3	F25
JFS3225-40	●	**JFS-2**	25	32	40	50	34	0.4	F25
JFS3225-50	●	**JFS-2**	25	32	40	50	34	0.5	F25
JFS4032-10	●	**JFS-3**	32	40	48	55	40	0.1	F32
JFS4032-20	●	**JFS-3**	32	40	48	55	40	0.2	F32
JFS4032-30	●	**JFS-3**	32	40	48	55	40	0.3	F32
JFS4032-40	●	**JFS-3**	32	40	48	55	40	0.4	F32
JFS4032-50	●	**JFS-3**	32	40	48	55	40	0.5	F32
JFS5040-10	●	–	40	50	68	65	50	0.1	F40
JFS5040-20	●	–	40	50	68	65	50	0.2	F40
JFS5040-30	●	–	40	50	68	65	50	0.3	F40
JFS5040-40	●	–	40	50	68	65	50	0.4	F40
JFS5040-50	●	–	40	50	68	65	50	0.5	F40

It does not correspond to the shank diameter ø50mm.

✱Increase : Size of the increase in the cutting diameter.

■ Guideline for Selecting a JUST FIT SLEEVE

Desired = (Drillø+ Increase of JFS) + 0.1mm

(E.g.) Desired diameter is ø20.3mm (oversize is taken as 0.1mm).

ø20.3=(MVX2000 X ◌F25+JFS3225-20)+0.1

- MVX2000 X ◌F25 → ø20mm Drill
- JFS3225-20 → Using JFS an Increase of 0.2mm.
- 0.1 → Oversize

<Tool Selected>
MVX : **MVX2000 X ◌F25**
JUST FIT SLEEVE [JFS]
: **JFS3225-20**

Note 1) Oversize can vary due to the cutting conditions used, please use the above as a guideline.

■ Ordering the JUST FIT SLEEVE

● **Purchasing Method 1**
Oversize can vary due to the cutting conditions used. Therefore it is recommended to purchase as a set. (5 sleeves/set) When placing an order, please use the set order number.

● **Purchasing Method 2**
It is possible to order individually. When placing an order, please use the order number.

● **: Inventory maintained in Japan.**

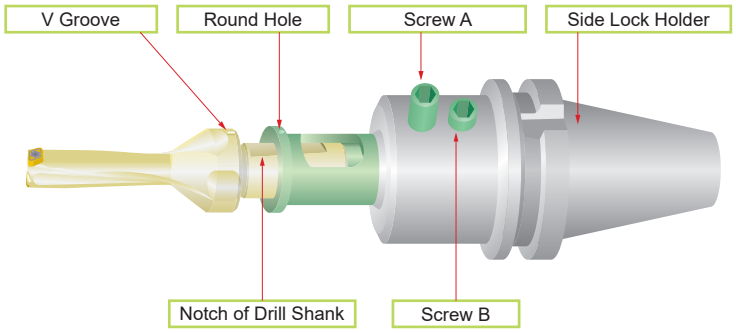
JUST FIT SLEEVE [JFS]

APPLICATION OF JUST FIT SLEEVE

1 When inserting the drill into the side lock holder, aligin the V groove on the outer peripheral edge of the drill flange, as well as the round holes of the outer peripheral edge of the sleeve flange and the screws of the side lock holder for fixing the drill. (If the drill does not have a V groove, align the notch of the drill shank with the round holes of the sleeve.)

2 Insert screw A of the side lock holder directly to the open window of the sleeve and fix the drill. Tighten screw B to a degree so as not to damage the sleeve.

<Note>
- Fine adjustments cannot be made for the diameter
- Cannot be used with collect chuck type holders.

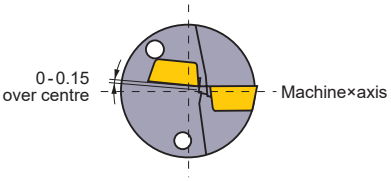


APPLICATION OF MVX TYPE DRILL

●Use on a Lathe

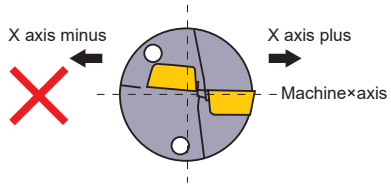
(1)The outer insert and machine X axis must be set to be parallel. The drill is designed so that when the drill centre and the machine spindle centre are aligned then the inner insert height is 0-0.15mm lower.

*The inner insert may fracture if the centre height of the inner insert is higher than the machine X axis.

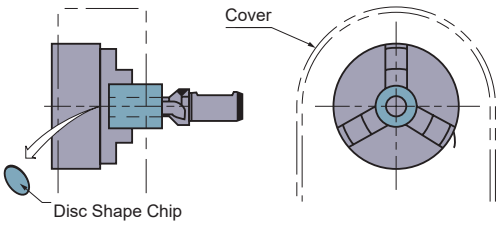


(2)By off setting it is possible to adjust the hole diameter. To do this adjust in the positive X axis direction (hole oversize direction). For the amount of possible adjustment please refer to the dimensions list.

*It is not recommended to adjust in the negative X axis direction as this may lead to drill interference with the hole.



(3)When through hole drilling on a lathe the disc produced by the drill exiting the workpiece may be expelled at high velocity.
To reduce the danger of injury or damage a cover guard is highly recommended.

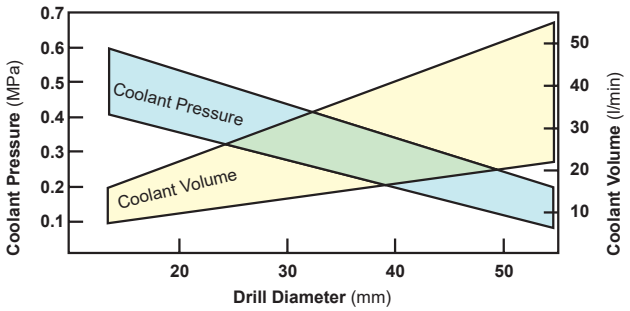


APPLICATION OF TAF TYPE DRILL

●Please ensure the highest rigidity possible exists in both machine set up and workholding.

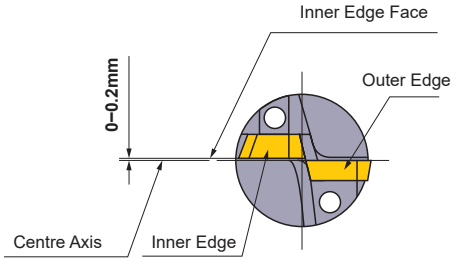
●Refer to the following graph on the right for coolant pressure and volume. Coolant is an important factor in the efficient use of these drills.

●Cannot be used for stack drilling.
In common with many indexable insert drills, these drills produce a round disc on exit which unless evacuated may cause the drill to fracture.

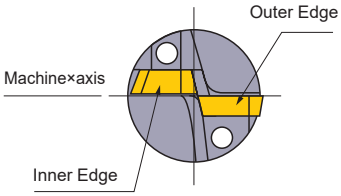


●Use on a Lathe

(1)The inner cutting edge must be positioned between 0—0.2mm over centre.

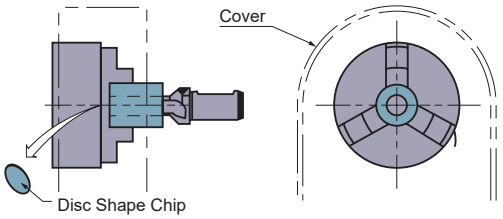


(2)To adjust the hole diameter by off-setting the drill, the outer cutting edge and machine axis must be set to be parallel.



(3)When producing an oversize hole.
The drill offset should be no more than 2% of the diameter.
It is not possible to produce an undersized hole.

(4)When through hole drilling on a lathe the disc produced by the drill exiting the workpiece may be expelled at high velocity.
To reduce the danger of injury or damage a cover guard is highly recommended.

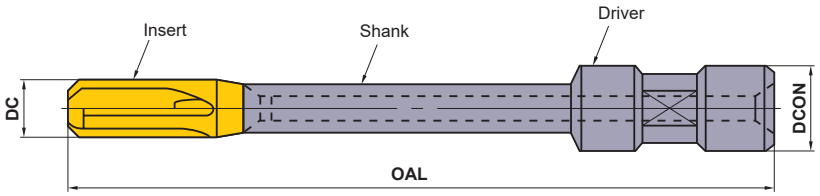


GUN REAMER

●Straight Reamer Type

●Reamer Diameter : ϕ6.0—ϕ30.0
●Number of teeth : 1, 2, 3, 4, 6

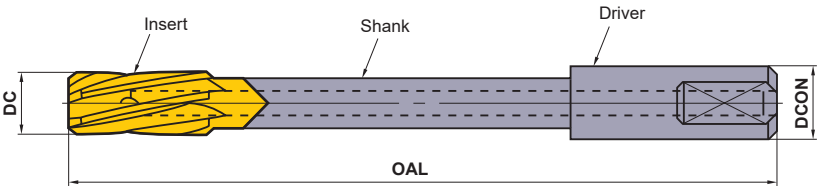




●Spiral Reamer Type

●Reamer Diameter : ϕ6.0—ϕ30.0
●Number of teeth : 4, 6

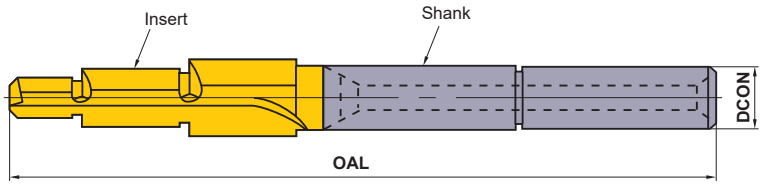




●Line Reamer Type

●Reamer Diameter : ϕ6.0—ϕ30.0
●Number of teeth : 1, 2, 4





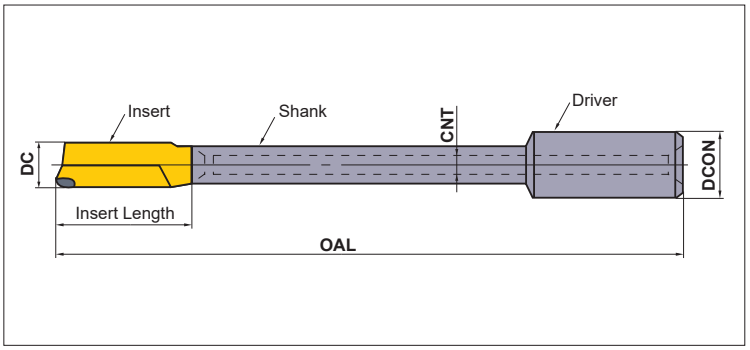
■ORDERING METHOD

Please specify the following when ordering.
①Reamer Name ②Diameter of Reamer (DC) ③Length of Reamer (OAL) ④Outside Diameter of Driver (DCON) and Type
⑤Number of Teeth ⑥Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)
e.g.) General Gun Reamer ϕ12 x 450 x ϕ19.5 A type Driver, 4-Teeth, FC250 (180HB) x $\phi 12^{\pm 0.020}$ x 100 x Through Hole

WITH DIAMOND COMPOUND

GUN REAMER





STANDARD

Reamer Diameter	Insert Length	Overall Length OAL	Number of Teeth	Shape of Teeth
ø6—ø30.3	*	*	*	Straight

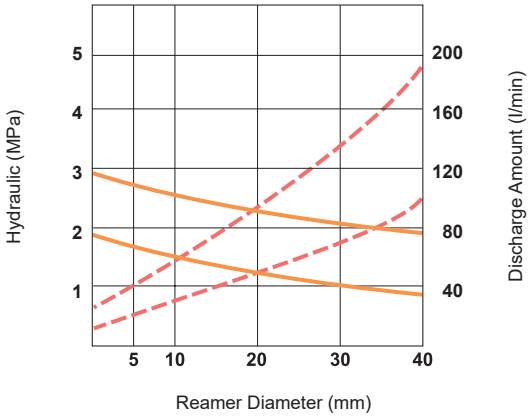
*Please contact us for any geometry (different diameter of reamer, insert length, tool length, number of teeth) that is not in this list.

Reamer Diameter DC	Driver Hole Diameter CNT	External Diameter of Driver DCON
6.0≤DC≤7.0	3.5	12.70
7.0<DC≤13.3	4.8	19.05
13.3<DC≤20.8	6.4	25.40
20.8<DC≤25.3	8.0	31.75
25.3<DC≤30.3	8.0	38.10

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Cutting Speed (m/min)	Feed (mm/rev)		
		ø5 — ø10	ø10 — ø20	ø25 — ø30
Aluminium Alloys	150 (100—200)	0.08 (0.05—0.10)	0.10 (0.05—0.15)	0.10 (0.05—0.15)
Alloy Steel	130 (80—180)	0.03 (0.02—0.04)	0.05 (0.03—0.06)	0.06 (0.04—0.07)

■COOLANT



■ORDERING METHOD

Please specify the following when ordering.

①Reamer Name ②Diameter of Reamer (DC) ③Length of Reamer (OAL) ④Number of Teeth ⑤Outside Diameter of Driver (DCON) and Type ⑥Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)

e.g.) Gun Reamer with Diamond Compound ϕ10 x 300 1-Tooth x ϕ19.05 A Type Driver, AC4B x $\phi 10^{+0.01}_{0}$ x 200 x Through Hole

DRILLING(HSS TYPE)

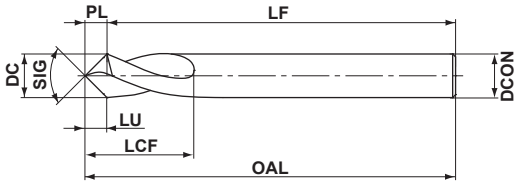
GKCD NEW

Leading Drill Series, Cobalt HSS

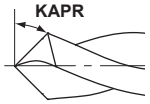
60° 90°DC>12 120°

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			





Type1



- HSS Cobalt material is used for its excellent heat, wear and chipping resistance and is ideal for use over a wide range of materials, from carbon to stainless steel.
- Achieves an excellent cost performance ratio on low feed and low speed applications.

DC (mm)	SIG	Stock	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	KAPR	DCON	Type
3.0	60°	●	**GKCDD030P060**	2.4	10	50	47.4	2.6	60°	3	1
4.0	60°	●	**GKCDD040P060**	3.3	12	52	48.5	3.4	60°	4	1
5.0	60°	●	**GKCDD050P060**	4.1	15	60	55.6	4.3	60°	5	1
6.0	60°	●	**GKCDD060P060**	4.9	20	66	60.8	5.2	60°	6	1
8.0	60°	●	**GKCDD080P060**	6.6	25	79	72.0	6.9	60°	8	1
10.0	60°	●	**GKCDD100P060**	8.3	25	89	80.3	8.6	60°	10	1
12.0	60°	●	**GKCDD120P060**	9.9	30	102	91.6	10.4	60°	12	1
3.0	90°	●	**GKCDD030P090**	1.4	10	50	48.5	1.5	45°	3	1
4.0	90°	●	**GKCDD040P090**	1.9	12	52	50.0	2.0	45°	4	1
5.0	90°	●	**GKCDD050P090**	2.4	15	60	57.5	2.5	45°	5	1
6.0	90°	●	**GKCDD060P090**	2.8	20	66	63.0	3.0	45°	6	1
8.0	90°	●	**GKCDD080P090**	3.8	25	79	75.0	4.0	45°	8	1
10.0	90°	●	**GKCDD100P090**	4.8	25	89	84.0	5.0	45°	10	1
12.0	90°	●	**GKCDD120P090**	5.7	30	102	96.0	6.0	45°	12	1
16.0	90°	●	**GKCDD160P090**	7.7	35	115	107.0	8.0	45°	16	1
20.0	90°	●	**GKCDD200P090**	9.6	40	131	121.0	10.0	45°	20	1
3.0	120°	●	**GKCDD030P120**	0.8	10	50	49.1	0.8	30°	3	1
4.0	120°	●	**GKCDD040P120**	1.1	12	52	50.8	1.1	30°	4	1
6.0	120°	●	**GKCDD060P120**	1.6	20	66	64.2	1.7	30°	6	1
8.0	120°	●	**GKCDD080P120**	2.2	25	79	76.7	2.3	30°	8	1
10.0	120°	●	**GKCDD100P120**	2.7	25	89	86.2	2.8	30°	10	1
12.0	120°	●	**GKCDD120P120**	3.3	30	102	98.6	3.4	30°	12	1

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ N002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB) JIS SS400, S10C etc.		Carbon Steel, Alloy Steel (180−280HB) JIS S45C, SCM440 etc.		Carbon Steel, Alloy Steel (280−350HB) JIS SNCM439 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)
3.0	3800	0.06	2400	0.06	1200	0.04
4.0	2900	0.08	1800	0.08	910	0.05
5.0	2300	0.10	1400	0.10	730	0.05
6.0	1900	0.10	1200	0.10	610	0.06
8.0	1400	0.12	900	0.12	450	0.08
10.0	1100	0.15	710	0.15	360	0.10
12.0	950	0.15	600	0.15	300	0.12
16.0	720	0.20	450	0.20	220	0.16
20.0	560	0.25	360	0.20	180	0.20

Workpiece Material	Austenitic Stainless Steel (≤200HB) JIS SUS304, SUS316 etc.		Gray Cast Iron (≤350MPa) JIS FC300 etc.		Ductile Cast Iron (≤450MPa) JIS FCD450 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)
3.0	1100	0.06	3800	0.06	2600	0.06
4.0	800	0.08	2900	0.08	1900	0.08
5.0	640	0.10	2300	0.10	1500	0.08
6.0	530	0.10	1900	0.10	1300	0.08
8.0	400	0.12	1400	0.12	990	0.10
10.0	320	0.15	1100	0.15	790	0.13
12.0	270	0.15	950	0.15	660	0.13
16.0	200	0.20	720	0.20	490	0.18
20.0	160	0.25	560	0.25	390	0.22

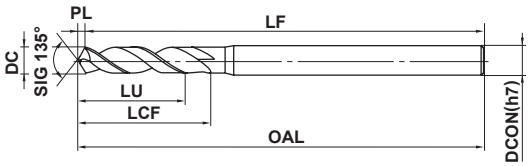
Note 1) When chamfering the pilot hole diameter (D), use the tool diameter DC within the following range: D < DC < 2D.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the dwell time or reduce the revolutions.
Note 5) When centering, please do not exceed the **LU** (usable length).
Note 6) When chamfering with a large diameter tool, please select the cutting speed according to the actual cutting diameter.

SEPDS

SE High Precision Drill (S)

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	





*LU = LCF-2DC (Max 3×DC)

0.5≤DC≤3	3.1≤DC≤4
0 −0.006	0 −0.008

●Unique D-STH process dramatically improves sharpness and welding resistance and smooth chip discharge.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SEPDSD0050	0.50	3.1	50.1	50	0.10	3	●
SEPDSD0055	0.55	3.1	50.1	50	0.11	3	●
SEPDSD0060	0.60	5.1	50.1	50	0.12	3	●
SEPDSD0065	0.65	5.1	50.1	50	0.13	3	●
SEPDSD0070	0.70	5.1	50.1	50	0.14	3	●
SEPDSD0075	0.75	5.2	50.2	50	0.16	3	●
SEPDSD0080	0.80	5.2	50.2	50	0.17	3	●
SEPDSD0085	0.85	5.2	50.2	50	0.18	3	●
SEPDSD0090	0.90	6.2	50.2	50	0.19	3	●
SEPDSD0095	0.95	6.2	50.2	50	0.2	3	●
SEPDSD0100	1.0	6.2	50.2	50	0.2	3	●
SEPDSD0110	1.1	8.2	55.2	55	0.2	3	●
SEPDSD0120	1.2	8.3	55.3	55	0.3	3	●
SEPDSD0130	1.3	9.3	55.3	55	0.3	3	●
SEPDSD0140	1.4	9.3	55.3	55	0.3	3	●
SEPDSD0150	1.5	9.3	55.3	55	0.3	3	●
SEPDSD0160	1.6	11.3	55.3	55	0.3	3	●
SEPDSD0170	1.7	11.4	55.4	55	0.4	3	●
SEPDSD0180	1.8	11.4	55.4	55	0.4	3	●
SEPDSD0190	1.9	12.4	55.4	55	0.4	3	●
SEPDSD0200	2.0	12.4	60.4	60	0.4	3	●
SEPDSD0210	2.1	12.4	60.4	60	0.4	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SEPDSD0220	2.2	12.5	60.5	60	0.5	3	●
SEPDSD0230	2.3	13.5	60.5	60	0.5	3	●
SEPDSD0240	2.4	13.5	60.5	60	0.5	3	●
SEPDSD0250	2.5	13.5	60.5	60	0.5	3	●
SEPDSD0260	2.6	15.5	60.5	60	0.5	3	●
SEPDSD0270	2.7	15.6	60.6	60	0.6	3	●
SEPDSD0280	2.8	15.6	60.6	60	0.6	3	●
SEPDSD0290	2.9	15.6	60.6	60	0.6	3	●
SEPDSD0300	3.0	15.6	60.6	60	0.6	3	●
SEPDSD0310	3.1	17.6	70.6	70	0.6	4	●
SEPDSD0320	3.2	17.7	70.7	70	0.7	4	●
SEPDSD0330	3.3	19.7	70.7	70	0.7	4	●
SEPDSD0340	3.4	19.7	70.7	70	0.7	4	●
SEPDSD0350	3.5	19.7	70.7	70	0.7	4	●
SEPDSD0360	3.6	21.8	70.8	70	0.8	4	●
SEPDSD0370	3.7	21.8	70.8	70	0.8	4	●
SEPDSD0380	3.8	21.8	70.8	70	0.8	4	●
SEPDSD0390	3.9	21.8	70.8	70	0.8	4	●
SEPDSD0400	4.0	21.8	70.8	70	0.8	4	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB), Aluminium Alloys (Si<5%) AISI 1010 etc				Carbon Steel, Alloy Steel (180—280HB), Gray Cast Iron (≤350MPa), Copper, Copper Alloys AISI 1045, AISI 4140, No 45 B etc				Alloy Steel, Tool Steel (≤250HB) Ferritic and Martensitic Stainless Steel (≤200HB) AISI D2, AISI 410, AISI 430 etc			
Drill Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)
0.5	24	15000	0.02	300	18	11250	0.01	110	13	8000	0.01	80
0.65	28	13700	0.03	410	22	10700	0.02	210	14	6800	0.02	135
0.8	33	13100	0.04	520	27	10700	0.03	320	14	5500	0.03	165
1.0	38	12000	0.05	600	31	10000	0.05	500	16	5000	0.05	250
1.2	38	10000	0.06	600	31	8200	0.06	490	17	4500	0.05	225
1.6	40	8000	0.08	640	33	6500	0.08	520	18	3500	0.06	210
2.0	40	6400	0.09	575	35	5500	0.09	495	18	2900	0.06	170
2.5	40	5100	0.11	560	35	4400	0.11	480	18	2300	0.08	180
3.2	40	4000	0.13	520	34	3400	0.13	440	18	1800	0.09	160
4.0	40	3200	0.15	480	35	2800	0.15	420	18	1400	0.10	140

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304LN, AISI 316LN etc				Alloy Steel, Tool Steel (≤30HRC) ASTM H13, AISI L6 etc			
Drill Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)
0.5	10	6600	0.01	65	10	6600	0.01	65
0.65	11	5300	0.012	60	11	5300	0.012	60
0.8	11	4300	0.015	60	11	4300	0.015	60
1.0	12	3800	0.02	75	12	3800	0.02	75
1.2	12	3100	0.025	75	12	3100	0.023	70
1.6	14	2700	0.03	80	14	2700	0.03	80
2.0	15	2400	0.04	95	15	2400	0.04	95
2.5	15	1900	0.05	95	15	1900	0.04	75
3.2	15	1500	0.07	105	15	1500	0.05	75
4.0	15	1200	0.09	105	15	1200	0.07	80

Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDS,VAPDM is recommended for the workpiece whose hardness is over 30HRC.
Note 5) WSTAR drill(MVE, MVS) are recommended for precipitation-hardening stainless steel (JIS-SUS630/ISO-L-No58X5CrNiCuNb16-4/ ASTM-S17400, JIS-SUS631/DIN-X7CrNiAl177/ASTM-S17700)
Note 6) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
Note 7) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid. Please reduce the revolution when using water-insoluble cutting fluid.
Note 8) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

DRILLING(HSS MILLING SHANK DRILLS)

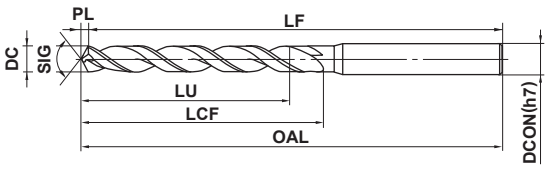
SEPDM

SE High Precision Drill (M)

DC<4 DC=4

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	





*LU = LCF-2DC (Max 5×DC)

0.5≤DC≤3	3.1≤DC≤4
0 −0.006	0 −0.008

●Unique D-STH process dramatically improves sharpness and welding resistance and smooth chip discharge.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SEPDMD0050	0.50	6.2	50.2	50	0.15	3	●
SEPDMD0055	0.55	6.2	50.2	50	0.17	3	●
SEPDMD0060	0.60	8.2	50.2	50	0.18	3	●
SEPDMD0065	0.65	8.2	50.2	50	0.20	3	●
SEPDMD0070	0.70	10.2	50.2	50	0.21	3	●
SEPDMD0075	0.75	10.2	50.2	50	0.23	3	●
SEPDMD0080	0.80	10.2	50.2	50	0.24	3	●
SEPDMD0085	0.85	10.3	50.3	50	0.26	3	●
SEPDMD0090	0.90	12.3	50.3	50	0.27	3	●
SEPDMD0095	0.95	12.3	50.3	50	0.29	3	●
SEPDMD0100	1.0	12.3	60.3	60	0.3	3	●
SEPDMD0110	1.1	16.3	60.3	60	0.3	3	●
SEPDMD0120	1.2	16.4	60.4	60	0.4	3	●
SEPDMD0130	1.3	16.4	60.4	60	0.4	3	●
SEPDMD0140	1.4	18.4	60.4	60	0.4	3	●
SEPDMD0150	1.5	18.5	60.5	60	0.5	3	●
SEPDMD0160	1.6	20.5	60.5	60	0.5	3	●
SEPDMD0170	1.7	20.5	60.5	60	0.5	3	●
SEPDMD0180	1.8	22.5	60.5	60	0.5	3	●
SEPDMD0190	1.9	22.6	60.6	60	0.6	3	●
SEPDMD0200	2.0	23.6	70.6	70	0.6	3	●
SEPDMD0210	2.1	23.6	70.6	70	0.6	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SEPDMD0220	2.2	26.7	70.7	70	0.7	3	●
SEPDMD0230	2.3	26.7	70.7	70	0.7	3	●
SEPDMD0240	2.4	29.7	70.7	70	0.7	3	●
SEPDMD0250	2.5	29.8	70.8	70	0.8	3	●
SEPDMD0260	2.6	29.8	70.8	70	0.8	3	●
SEPDMD0270	2.7	32.8	70.8	70	0.8	3	●
SEPDMD0280	2.8	32.8	70.8	70	0.8	3	●
SEPDMD0290	2.9	32.9	70.9	70	0.9	3	●
SEPDMD0300	3.0	32.9	70.9	70	0.9	3	●
SEPDMD0310	3.1	35.9	85.9	85	0.9	4	●
SEPDMD0320	3.2	36.0	86.0	85	1.0	4	●
SEPDMD0330	3.3	36.0	86.0	85	1.0	4	●
SEPDMD0340	3.4	39.0	86.0	85	1.0	4	●
SEPDMD0350	3.5	39.1	86.1	85	1.1	4	●
SEPDMD0360	3.6	39.1	86.1	85	1.1	4	●
SEPDMD0370	3.7	39.1	86.1	85	1.1	4	●
SEPDMD0380	3.8	43.1	86.1	85	1.1	4	●
SEPDMD0390	3.9	43.2	86.2	85	1.2	4	●
SEPDMD0400	4.0	42.8	85.8	85	0.8	4	●

● : Inventory maintained in Japan.

ISO13399 ➤ N002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB), Aluminium Alloys (Si<5%) AISI 1010 etc				Carbon Steel, Alloy Steel (180—280HB), Gray Cast Iron (≤350MPa), Copper, Copper Alloys AISI 1045, AISI 4140, No 45 B etc				Alloy Steel, Tool Steel (≤250HB) Ferritic and Martensitic Stainless Steel (≤200HB) AISI D2, AISI 410, AISI 430 etc			
Drill Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)
0.5	24	15000	0.02	300	18	11250	0.01	110	13	8000	0.01	80
0.65	28	13700	0.03	410	22	10700	0.02	210	14	6800	0.02	135
0.8	33	13100	0.04	520	27	10700	0.03	320	14	5500	0.03	165
1.0	38	12000	0.05	600	31	10000	0.05	500	16	5000	0.05	250
1.2	38	10000	0.06	600	31	8200	0.06	490	17	4500	0.05	225
1.6	40	8000	0.08	640	33	6500	0.08	520	18	3500	0.06	210
2.0	40	6400	0.09	575	35	5500	0.09	495	18	2900	0.06	170
2.5	40	5100	0.11	560	35	4400	0.11	480	18	2300	0.08	180
3.2	40	4000	0.13	520	34	3400	0.13	440	18	1800	0.09	160
4.0	40	3200	0.15	480	35	2800	0.15	420	18	1400	0.10	140

Workpiece Material	Austenitic Stainless Steel (≤200HB) AISI 304LN, AISI 316LN etc				Alloy Steel, Tool Steel (≤30HRC) ASTM H13, AISI L6 etc			
Drill Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed (mm/rev)	Feed rate (mm/min)
0.5	10	6600	0.01	65	10	6600	0.01	65
0.65	11	5300	0.012	60	11	5300	0.012	60
0.8	11	4300	0.015	60	11	4300	0.015	60
1.0	12	3800	0.02	75	12	3800	0.02	75
1.2	12	3100	0.025	75	12	3100	0.023	70
1.6	14	2700	0.03	80	14	2700	0.03	80
2.0	15	2400	0.04	95	15	2400	0.04	95
2.5	15	1900	0.05	95	15	1900	0.04	75
3.2	15	1500	0.07	105	15	1500	0.05	75
4.0	15	1200	0.09	105	15	1200	0.07	80

Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDS,VAPDM is recommended for the workpiece whose hardness is over 30HRC.
Note 5) WSTAR drill(MVE, MVS) are recommended for precipitation-hardening stainless steel (JIS-SUS630/ISO-L-No58X5CrNiCuNb16-4/ ASTM-S17400, JIS-SUS631/DIN-X7CrNiAl177/ASTM-S17700)
Note 6) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
Note 7) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid. Please reduce the revolution when using water-insoluble cutting fluid.
Note 8) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

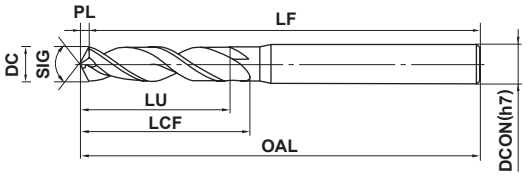
VAPDS

Short, High precision

HG HSS | V | 118° DC<2 | 135° DC≥2 | X

P Steel | M Stainless Steel | K Cast Iron | N | S | H





*LU = LCF-2DC (Max 3×DC)

0.5≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

*All drills except those with intervals of 0.1mm and under dia. 2.0mm have a tolerance of 0−-0.009mm.

●Highly efficient drilling and long tool life have been achieved with the Violet coating.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0050	0.50	3.2	50.2	50	0.15	3	●
VAPDSD0051	0.51	3.2	50.2	50	0.15	3	●
VAPDSD0052	0.52	3.2	50.2	50	0.16	3	●
VAPDSD0053	0.53	3.2	50.2	50	0.16	3	●
VAPDSD0054	0.54	3.2	50.2	50	0.16	3	●
VAPDSD0055	0.55	3.2	50.2	50	0.17	3	●
VAPDSD0056	0.56	4.2	50.2	50	0.17	3	●
VAPDSD0057	0.57	4.2	50.2	50	0.17	3	●
VAPDSD0058	0.58	4.2	50.2	50	0.17	3	●
VAPDSD0059	0.59	4.2	50.2	50	0.18	3	●
VAPDSD0060	0.60	5.2	50.2	50	0.18	3	●
VAPDSD0061	0.61	5.2	50.2	50	0.18	3	●
VAPDSD0062	0.62	5.2	50.2	50	0.19	3	●
VAPDSD0063	0.63	5.2	50.2	50	0.19	3	●
VAPDSD0064	0.64	5.2	50.2	50	0.19	3	●
VAPDSD0065	0.65	5.2	50.2	50	0.20	3	●
VAPDSD0066	0.66	5.2	50.2	50	0.20	3	●
VAPDSD0067	0.67	5.2	50.2	50	0.20	3	●
VAPDSD0068	0.68	5.2	50.2	50	0.20	3	●
VAPDSD0069	0.69	5.2	50.2	50	0.21	3	●
VAPDSD0070	0.70	5.2	50.2	50	0.21	3	●
VAPDSD0071	0.71	5.2	50.2	50	0.21	3	●
VAPDSD0072	0.72	5.2	50.2	50	0.22	3	●
VAPDSD0073	0.73	5.2	50.2	50	0.22	3	●
VAPDSD0074	0.74	5.2	50.2	50	0.22	3	●
VAPDSD0075	0.75	5.2	50.2	50	0.23	3	●
VAPDSD0076	0.76	5.2	50.2	50	0.23	3	●
VAPDSD0077	0.77	5.2	50.2	50	0.23	3	●
VAPDSD0078	0.78	5.2	50.2	50	0.23	3	●
VAPDSD0079	0.79	5.2	50.2	50	0.24	3	●
VAPDSD0080	0.80	5.2	50.2	50	0.24	3	●
VAPDSD0081	0.81	5.2	50.2	50	0.24	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0082	0.82	5.3	50.3	50	0.25	3	●
VAPDSD0083	0.83	5.3	50.3	50	0.25	3	●
VAPDSD0084	0.84	5.3	50.3	50	0.25	3	●
VAPDSD0085	0.85	5.3	50.3	50	0.26	3	●
VAPDSD0086	0.86	6.3	50.3	50	0.26	3	●
VAPDSD0087	0.87	6.3	50.3	50	0.26	3	●
VAPDSD0088	0.88	6.3	50.3	50	0.26	3	●
VAPDSD0089	0.89	6.3	50.3	50	0.27	3	●
VAPDSD0090	0.90	6.3	50.3	50	0.27	3	●
VAPDSD0091	0.91	6.3	50.3	50	0.27	3	●
VAPDSD0092	0.92	6.3	50.3	50	0.28	3	●
VAPDSD0093	0.93	6.3	50.3	50	0.28	3	●
VAPDSD0094	0.94	6.3	50.3	50	0.28	3	●
VAPDSD0095	0.95	6.3	50.3	50	0.29	3	●
VAPDSD0096	0.96	6.3	50.3	50	0.29	3	●
VAPDSD0097	0.97	6.3	50.3	50	0.29	3	●
VAPDSD0098	0.98	6.3	50.3	50	0.29	3	●
VAPDSD0099	0.99	6.3	50.3	50	0.30	3	●
VAPDSD0100	1.00	6.3	50.3	50	0.3	3	●
VAPDSD0101	1.01	6.3	50.3	50	0.3	3	●
VAPDSD0102	1.02	6.3	50.3	50	0.3	3	●
VAPDSD0103	1.03	6.3	50.3	50	0.3	3	●
VAPDSD0104	1.04	6.3	50.3	50	0.3	3	●
VAPDSD0105	1.05	6.3	50.3	50	0.3	3	●
VAPDSD0106	1.06	6.3	50.3	50	0.3	3	●
VAPDSD0107	1.07	8.3	55.3	55	0.3	3	●
VAPDSD0108	1.08	8.3	55.3	55	0.3	3	●
VAPDSD0109	1.09	8.3	55.3	55	0.3	3	●
VAPDSD0110	1.10	8.3	55.3	55	0.3	3	●
VAPDSD0111	1.11	8.3	55.3	55	0.3	3	●
VAPDSD0112	1.12	8.3	55.3	55	0.3	3	●
VAPDSD0113	1.13	8.3	55.3	55	0.3	3	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0114	1.14	8.3	55.3	55	0.3	3	●
VAPDSD0115	1.15	8.4	55.4	55	0.4	3	●
VAPDSD0116	1.16	8.4	55.4	55	0.4	3	●
VAPDSD0117	1.17	8.4	55.4	55	0.4	3	●
VAPDSD0118	1.18	8.4	55.4	55	0.4	3	●
VAPDSD0119	1.19	8.4	55.4	55	0.4	3	●
VAPDSD0120	1.20	8.4	55.4	55	0.4	3	●
VAPDSD0121	1.21	8.4	55.4	55	0.4	3	●
VAPDSD0122	1.22	8.4	55.4	55	0.4	3	●
VAPDSD0123	1.23	8.4	55.4	55	0.4	3	●
VAPDSD0124	1.24	8.4	55.4	55	0.4	3	●
VAPDSD0125	1.25	8.4	55.4	55	0.4	3	●
VAPDSD0126	1.26	8.4	55.4	55	0.4	3	●
VAPDSD0127	1.27	8.4	55.4	55	0.4	3	●
VAPDSD0128	1.28	8.4	55.4	55	0.4	3	●
VAPDSD0129	1.29	8.4	55.4	55	0.4	3	●
VAPDSD0130	1.30	9.4	55.4	55	0.4	3	●
VAPDSD0131	1.31	9.4	55.4	55	0.4	3	●
VAPDSD0132	1.32	9.4	55.4	55	0.4	3	●
VAPDSD0133	1.33	9.4	55.4	55	0.4	3	●
VAPDSD0134	1.34	9.4	55.4	55	0.4	3	●
VAPDSD0135	1.35	9.4	55.4	55	0.4	3	●
VAPDSD0136	1.36	9.4	55.4	55	0.4	3	●
VAPDSD0137	1.37	9.4	55.4	55	0.4	3	●
VAPDSD0138	1.38	9.4	55.4	55	0.4	3	●
VAPDSD0139	1.39	9.4	55.4	55	0.4	3	●
VAPDSD0140	1.40	9.4	55.4	55	0.4	3	●
VAPDSD0141	1.41	9.4	55.4	55	0.4	3	●
VAPDSD0142	1.42	9.4	55.4	55	0.4	3	●
VAPDSD0143	1.43	9.4	55.4	55	0.4	3	●
VAPDSD0144	1.44	9.4	55.4	55	0.4	3	●
VAPDSD0145	1.45	9.4	55.4	55	0.4	3	●
VAPDSD0146	1.46	9.4	55.4	55	0.4	3	●
VAPDSD0147	1.47	9.4	55.4	55	0.4	3	●
VAPDSD0148	1.48	9.4	55.4	55	0.4	3	●
VAPDSD0149	1.49	9.5	55.5	55	0.5	3	●
VAPDSD0150	1.50	9.5	55.5	55	0.5	3	●
VAPDSD0151	1.51	11.5	55.5	55	0.5	3	●
VAPDSD0152	1.52	11.5	55.5	55	0.5	3	●
VAPDSD0153	1.53	11.5	55.5	55	0.5	3	●
VAPDSD0154	1.54	11.5	55.5	55	0.5	3	●
VAPDSD0155	1.55	11.5	55.5	55	0.5	3	●
VAPDSD0156	1.56	11.5	55.5	55	0.5	3	●
VAPDSD0157	1.57	11.5	55.5	55	0.5	3	●
VAPDSD0158	1.58	11.5	55.5	55	0.5	3	●
VAPDSD0159	1.59	11.5	55.5	55	0.5	3	●
VAPDSD0160	1.60	11.5	55.5	55	0.5	3	●
VAPDSD0161	1.61	11.5	55.5	55	0.5	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0162	1.62	11.5	55.5	55	0.5	3	●
VAPDSD0163	1.63	11.5	55.5	55	0.5	3	●
VAPDSD0164	1.64	11.5	55.5	55	0.5	3	●
VAPDSD0165	1.65	11.5	55.5	55	0.5	3	●
VAPDSD0166	1.66	11.5	55.5	55	0.5	3	●
VAPDSD0167	1.67	11.5	55.5	55	0.5	3	●
VAPDSD0168	1.68	11.5	55.5	55	0.5	3	●
VAPDSD0169	1.69	11.5	55.5	55	0.5	3	●
VAPDSD0170	1.70	11.5	55.5	55	0.5	3	●
VAPDSD0171	1.71	11.5	55.5	55	0.5	3	●
VAPDSD0172	1.72	11.5	55.5	55	0.5	3	●
VAPDSD0173	1.73	11.5	55.5	55	0.5	3	●
VAPDSD0174	1.74	11.5	55.5	55	0.5	3	●
VAPDSD0175	1.75	11.5	55.5	55	0.5	3	●
VAPDSD0176	1.76	11.5	55.5	55	0.5	3	●
VAPDSD0177	1.77	11.5	55.5	55	0.5	3	●
VAPDSD0178	1.78	11.5	55.5	55	0.5	3	●
VAPDSD0179	1.79	11.5	55.5	55	0.5	3	●
VAPDSD0180	1.80	11.5	55.5	55	0.5	3	●
VAPDSD0181	1.81	11.5	55.5	55	0.5	3	●
VAPDSD0182	1.82	11.6	55.6	55	0.6	3	●
VAPDSD0183	1.83	11.6	55.6	55	0.6	3	●
VAPDSD0184	1.84	11.6	55.6	55	0.6	3	●
VAPDSD0185	1.85	11.6	55.6	55	0.6	3	●
VAPDSD0186	1.86	11.6	55.6	55	0.6	3	●
VAPDSD0187	1.87	11.6	55.6	55	0.6	3	●
VAPDSD0188	1.88	11.6	55.6	55	0.6	3	●
VAPDSD0189	1.89	11.6	55.6	55	0.6	3	●
VAPDSD0190	1.90	12.6	55.6	55	0.6	3	●
VAPDSD0191	1.91	12.6	60.6	60	0.6	3	●
VAPDSD0192	1.92	12.6	60.6	60	0.6	3	●
VAPDSD0193	1.93	12.6	60.6	60	0.6	3	●
VAPDSD0194	1.94	12.6	60.6	60	0.6	3	●
VAPDSD0195	1.95	12.6	60.6	60	0.6	3	●
VAPDSD0196	1.96	12.6	60.6	60	0.6	3	●
VAPDSD0197	1.97	12.6	60.6	60	0.6	3	●
VAPDSD0198	1.98	12.6	60.6	60	0.6	3	●
VAPDSD0199	1.99	12.6	60.6	60	0.6	3	●
VAPDSD0200	2.00	12.4	60.4	60	0.4	3	●
VAPDSD0205	2.05	12.4	60.4	60	0.4	3	●
VAPDSD0210	2.10	12.4	60.4	60	0.4	3	●
VAPDSD0215	2.15	12.5	60.5	60	0.5	3	●
VAPDSD0220	2.20	12.5	60.5	60	0.5	3	●
VAPDSD0225	2.25	12.5	60.5	60	0.5	3	●
VAPDSD0230	2.30	13.5	60.5	60	0.5	3	●
VAPDSD0235	2.35	13.5	60.5	60	0.5	3	●
VAPDSD0240	2.40	13.5	60.5	60	0.5	3	●
VAPDSD0245	2.45	13.5	60.5	60	0.5	3	●

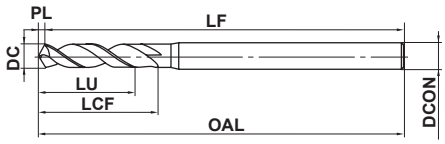
VAPDS

Short, High precision

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0250	2.50	13.5	60.5	60	0.5	3	●
VAPDSD0255	2.55	13.5	60.5	60	0.5	3	●
VAPDSD0260	2.60	15.5	60.5	60	0.5	3	●
VAPDSD0265	2.65	15.6	60.6	60	0.6	3	●
VAPDSD0270	2.70	15.6	60.6	60	0.6	3	●
VAPDSD0275	2.75	15.6	60.6	60	0.6	3	●
VAPDSD0280	2.80	15.6	60.6	60	0.6	3	●
VAPDSD0285	2.85	15.6	60.6	60	0.6	3	●
VAPDSD0290	2.90	15.6	60.6	60	0.6	3	●
VAPDSD0295	2.95	15.6	60.6	60	0.6	3	●
VAPDSD0300	3.00	15.6	60.6	60	0.6	3	●
VAPDSD0305	3.05	17.6	70.6	70	0.6	4	●
VAPDSD0310	3.10	17.6	70.6	70	0.6	4	●
VAPDSD0315	3.15	17.7	70.7	70	0.7	4	●
VAPDSD0320	3.20	17.7	70.7	70	0.7	4	●
VAPDSD0325	3.25	17.7	70.7	70	0.7	4	●
VAPDSD0330	3.30	19.7	70.7	70	0.7	4	●
VAPDSD0335	3.35	19.7	70.7	70	0.7	4	●
VAPDSD0340	3.40	19.7	70.7	70	0.7	4	●
VAPDSD0345	3.45	19.7	70.7	70	0.7	4	●
VAPDSD0350	3.50	19.7	70.7	70	0.7	4	●
VAPDSD0355	3.55	19.7	70.7	70	0.7	4	●
VAPDSD0360	3.60	21.8	70.8	70	0.8	4	●
VAPDSD0365	3.65	21.8	70.8	70	0.8	4	●
VAPDSD0370	3.70	21.8	70.8	70	0.8	4	●
VAPDSD0375	3.75	21.8	70.8	70	0.8	4	●
VAPDSD0380	3.80	21.8	70.8	70	0.8	4	●
VAPDSD0385	3.85	21.8	70.8	70	0.8	4	●
VAPDSD0390	3.90	21.8	70.8	70	0.8	4	●
VAPDSD0395	3.95	21.8	70.8	70	0.8	4	●
VAPDSD0400	4.00	21.8	70.8	70	0.8	4	●
VAPDSD0405	4.05	21.8	80.8	80	0.8	6	●
VAPDSD0410	4.10	21.9	80.9	80	0.9	6	●
VAPDSD0415	4.15	21.9	80.9	80	0.9	6	●
VAPDSD0420	4.20	21.9	80.9	80	0.9	6	●
VAPDSD0425	4.25	21.9	80.9	80	0.9	6	●
VAPDSD0430	4.30	23.9	80.9	80	0.9	6	●
VAPDSD0435	4.35	23.9	80.9	80	0.9	6	●
VAPDSD0440	4.40	23.9	80.9	80	0.9	6	●
VAPDSD0445	4.45	23.9	80.9	80	0.9	6	●
VAPDSD0450	4.50	23.9	80.9	80	0.9	6	●
VAPDSD0455	4.55	23.9	80.9	80	0.9	6	●
VAPDSD0460	4.60	26.0	81.0	80	1.0	6	●
VAPDSD0465	4.65	26.0	81.0	80	1.0	6	●
VAPDSD0470	4.70	26.0	81.0	80	1.0	6	●
VAPDSD0475	4.75	26.0	81.0	80	1.0	6	●
VAPDSD0480	4.80	26.0	81.0	80	1.0	6	●
VAPDSD0485	4.85	26.0	81.0	80	1.0	6	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0490	4.90	26.0	81.0	80	1.0	6	●
VAPDSD0495	4.95	26.0	81.0	80	1.0	6	●
VAPDSD0500	5.00	26.0	81.0	80	1.0	6	●
VAPDSD0505	5.05	26.1	81.1	80	1.1	6	●
VAPDSD0510	5.10	26.1	81.1	80	1.1	6	●
VAPDSD0515	5.15	26.1	81.1	80	1.1	6	●
VAPDSD0520	5.20	26.1	81.1	80	1.1	6	●
VAPDSD0525	5.25	26.1	81.1	80	1.1	6	●
VAPDSD0530	5.30	26.1	81.1	80	1.1	6	●
VAPDSD0535	5.35	28.1	81.1	80	1.1	6	●
VAPDSD0540	5.40	28.1	81.1	80	1.1	6	●
VAPDSD0545	5.45	28.1	81.1	80	1.1	6	●
VAPDSD0550	5.50	28.1	81.1	80	1.1	6	●
VAPDSD0555	5.55	28.2	81.2	80	1.2	6	●
VAPDSD0560	5.60	28.2	81.2	80	1.2	6	●
VAPDSD0565	5.65	28.2	81.2	80	1.2	6	●
VAPDSD0570	5.70	28.2	81.2	80	1.2	6	●
VAPDSD0575	5.75	28.2	81.2	80	1.2	6	●
VAPDSD0580	5.80	28.2	81.2	80	1.2	6	●
VAPDSD0585	5.85	28.2	81.2	80	1.2	6	●
VAPDSD0590	5.90	28.2	81.2	80	1.2	6	●
VAPDSD0595	5.95	28.2	81.2	80	1.2	6	●
VAPDSD0600	6.00	28.2	81.2	80	1.2	6	●
VAPDSD0605	6.05	31.3	81.3	80	1.3	8	●
VAPDSD0610	6.10	31.3	81.3	80	1.3	8	●
VAPDSD0615	6.15	31.3	81.3	80	1.3	8	●
VAPDSD0620	6.20	31.3	81.3	80	1.3	8	●
VAPDSD0625	6.25	31.3	81.3	80	1.3	8	●
VAPDSD0630	6.30	31.3	81.3	80	1.3	8	●
VAPDSD0635	6.35	31.3	81.3	80	1.3	8	●
VAPDSD0640	6.40	31.3	81.3	80	1.3	8	●
VAPDSD0645	6.45	31.3	81.3	80	1.3	8	●
VAPDSD0650	6.50	31.4	81.4	80	1.4	8	●
VAPDSD0655	6.55	31.4	81.4	80	1.4	8	●
VAPDSD0660	6.60	31.4	81.4	80	1.4	8	●
VAPDSD0665	6.65	31.4	81.4	80	1.4	8	●
VAPDSD0670	6.70	31.4	81.4	80	1.4	8	●
VAPDSD0675	6.75	33.4	81.4	80	1.4	8	●
VAPDSD0680	6.80	33.4	81.4	80	1.4	8	●
VAPDSD0685	6.85	33.4	81.4	80	1.4	8	●
VAPDSD0690	6.90	33.4	81.4	80	1.4	8	●
VAPDSD0695	6.95	33.4	81.4	80	1.4	8	●
VAPDSD0700	7.00	33.5	81.5	80	1.5	8	●
VAPDSD0705	7.05	33.5	81.5	80	1.5	8	●
VAPDSD0710	7.10	33.5	81.5	80	1.5	8	●
VAPDSD0715	7.15	33.5	81.5	80	1.5	8	●
VAPDSD0720	7.20	33.5	81.5	80	1.5	8	●
VAPDSD0725	7.25	33.5	81.5	80	1.5	8	●

● : Inventory maintained in Japan.



Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD0730	7.30	33.5	81.5	80	1.5	8	●
VAPDSD0735	7.35	33.5	81.5	80	1.5	8	●
VAPDSD0740	7.40	33.5	81.5	80	1.5	8	●
VAPDSD0745	7.45	33.5	81.5	80	1.5	8	●
VAPDSD0750	7.50	33.6	81.6	80	1.6	8	●
VAPDSD0755	7.55	36.6	86.6	85	1.6	8	●
VAPDSD0760	7.60	36.6	86.6	85	1.6	8	●
VAPDSD0765	7.65	36.6	86.6	85	1.6	8	●
VAPDSD0770	7.70	36.6	86.6	85	1.6	8	●
VAPDSD0775	7.75	36.6	86.6	85	1.6	8	●
VAPDSD0780	7.80	36.6	86.6	85	1.6	8	●
VAPDSD0785	7.85	36.6	86.6	85	1.6	8	●
VAPDSD0790	7.90	36.6	86.6	85	1.6	8	●
VAPDSD0795	7.95	36.7	86.7	85	1.7	8	●
VAPDSD0800	8.00	36.7	86.7	85	1.7	8	●
VAPDSD0805	8.05	36.7	91.7	90	1.7	10	●
VAPDSD0810	8.10	36.7	91.7	90	1.7	10	●
VAPDSD0815	8.15	36.7	91.7	90	1.7	10	●
VAPDSD0820	8.20	36.7	91.7	90	1.7	10	●
VAPDSD0825	8.25	36.7	91.7	90	1.7	10	●
VAPDSD0830	8.30	36.7	91.7	90	1.7	10	●
VAPDSD0835	8.35	36.7	91.7	90	1.7	10	●
VAPDSD0840	8.40	36.7	91.7	90	1.7	10	●
VAPDSD0845	8.45	36.8	91.8	90	1.8	10	●
VAPDSD0850	8.50	36.8	91.8	90	1.8	10	●
VAPDSD0855	8.55	39.8	94.8	93	1.8	10	●
VAPDSD0860	8.60	39.8	94.8	93	1.8	10	●
VAPDSD0865	8.65	39.8	94.8	93	1.8	10	●
VAPDSD0870	8.70	39.8	94.8	93	1.8	10	●
VAPDSD0875	8.75	39.8	94.8	93	1.8	10	●
VAPDSD0880	8.80	39.8	94.8	93	1.8	10	●
VAPDSD0885	8.85	39.8	94.8	93	1.8	10	●
VAPDSD0890	8.90	39.8	94.8	93	1.8	10	●
VAPDSD0895	8.95	39.9	94.9	93	1.9	10	●
VAPDSD0900	9.00	39.9	94.9	93	1.9	10	●
VAPDSD0910	9.10	39.9	94.9	93	1.9	10	●
VAPDSD0920	9.20	39.9	94.9	93	1.9	10	●
VAPDSD0930	9.30	39.9	94.9	93	1.9	10	●
VAPDSD0940	9.40	40.0	95.0	93	2.0	10	●
VAPDSD0950	9.50	40.0	95.0	93	2.0	10	●
VAPDSD0960	9.60	43.0	98.0	96	2.0	10	●
VAPDSD0970	9.70	43.0	98.0	96	2.0	10	●
VAPDSD0980	9.80	43.0	98.0	96	2.0	10	●
VAPDSD0990	9.90	43.1	98.1	96	2.1	10	●
VAPDSD1000	10.00	43.1	98.1	96	2.1	10	●
VAPDSD1010	10.10	43.1	103.1	101	2.1	12	●
VAPDSD1020	10.20	43.1	103.1	101	2.1	12	●
VAPDSD1030	10.30	43.1	103.1	101	2.1	12	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSD1040	10.40	43.2	103.2	101	2.2	12	●
VAPDSD1050	10.50	43.2	103.2	101	2.2	12	●
VAPDSD1060	10.60	43.2	103.2	101	2.2	12	●
VAPDSD1070	10.70	47.2	107.2	105	2.2	12	●
VAPDSD1080	10.80	47.2	107.2	105	2.2	12	●
VAPDSD1090	10.90	47.3	107.3	105	2.3	12	●
VAPDSD1100	11.00	47.3	107.3	105	2.3	12	●
VAPDSD1110	11.10	47.3	107.3	105	2.3	12	●
VAPDSD1120	11.20	47.3	107.3	105	2.3	12	●
VAPDSD1130	11.30	47.3	107.3	105	2.3	12	●
VAPDSD1140	11.40	47.4	107.4	105	2.4	12	●
VAPDSD1150	11.50	47.4	107.4	105	2.4	12	●
VAPDSD1160	11.60	47.4	107.4	105	2.4	12	●
VAPDSD1170	11.70	47.4	107.4	105	2.4	12	●
VAPDSD1180	11.80	47.4	107.4	105	2.4	12	●
VAPDSD1190	11.90	51.5	111.5	109	2.5	12	●
VAPDSD1200	12.0	51.5	111.5	109	2.5	12	●
VAPDSD1210	12.1	51.5	111.5	109	2.5	12	●
VAPDSD1220	12.2	51.5	111.5	109	2.5	12	●
VAPDSD1230	12.3	51.6	111.6	109	2.6	12	●
VAPDSD1240	12.4	51.6	111.6	109	2.6	12	●
VAPDSD1250	12.5	51.6	111.6	109	2.6	12	●
VAPDSD1260	12.6	51.6	111.6	109	2.6	12	●
VAPDSD1270	12.7	51.6	111.6	109	2.6	12	●
VAPDSD1280	12.8	51.7	111.7	109	2.7	12	●
VAPDSD1290	12.9	51.7	111.7	109	2.7	12	●
VAPDSD1300	13.0	51.7	111.7	109	2.7	12	●

VAPDS

Short, High precision

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel		Carbon Steel, Alloy Steel Cast Iron AISI 1049, SCM, FC		Alloy Tool Steel (Low-hardness Materials), Ferritic Stainless Steel, Martensitic Stainless Steel AISI 430, AISI 405, AISI D2, AISI 420, AISI 440		Alloy Tool Steel (−40HRC) Precipitation-Hardening Stainless Steel AISI H13, ASTM 630, ASTM 631	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	18000	0.02	16000	0.02	9000	0.02	8200	0.02
1.0	12000	0.05	10000	0.05	6300	0.05	5500	0.04
2.0	6400	0.09	5500	0.09	3200	0.09	2900	0.05
3.0	4300	0.13	3700	0.13	2100	0.13	1900	0.06
4.0	3200	0.15	2800	0.15	1600	0.15	1400	0.08
5.0	2600	0.18	2200	0.18	1300	0.18	1100	0.10
6.0	2100	0.19	1800	0.19	1100	0.20	950	0.11
8.0	1600	0.24	1400	0.24	800	0.22	720	0.13
10.0	1300	0.28	1100	0.28	640	0.25	570	0.15
12.0	1100	0.34	930	0.34	530	0.30	480	0.17
13.0	980	0.36	860	0.36	490	0.32	440	0.19

Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDSSUS are recommended for austenitic stainless steel (AISI 304).
Note 5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
Note 6) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.

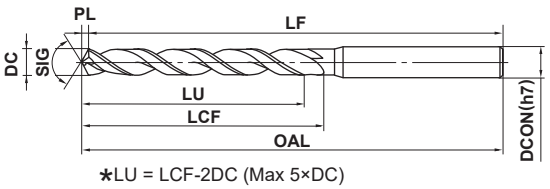
VAPDM

Medium, High precision

HG HSS | V | 118° DC<2 | 135° DC≥2 | X

P Steel | M Stainless Steel | K Cast Iron | N | S | H





*LU = LCF-2DC (Max 5×DC)

0.5≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤32
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

● Highly efficient drilling and long tool life have been achieved with the Violet coating.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD0050	0.50	6.2	50.2	50	0.15	3	●
VAPDMD0055	0.55	6.2	50.2	50	0.17	3	●
VAPDMD0060	0.60	8.2	50.2	50	0.18	3	●
VAPDMD0065	0.65	8.2	50.2	50	0.20	3	●
VAPDMD0070	0.70	10.2	50.2	50	0.21	3	●
VAPDMD0075	0.75	10.2	50.2	50	0.23	3	●
VAPDMD0080	0.80	10.2	50.2	50	0.24	3	●
VAPDMD0085	0.85	10.3	50.3	50	0.26	3	●
VAPDMD0090	0.90	12.3	50.3	50	0.27	3	●
VAPDMD0095	0.95	12.3	50.3	50	0.29	3	●
VAPDMD0100	1.00	12.3	60.3	60	0.3	3	●
VAPDMD0105	1.05	12.3	60.3	60	0.3	3	●
VAPDMD0110	1.10	16.3	60.3	60	0.3	3	●
VAPDMD0115	1.15	16.4	60.4	60	0.4	3	●
VAPDMD0120	1.20	16.4	60.4	60	0.4	3	●
VAPDMD0125	1.25	16.4	60.4	60	0.4	3	●
VAPDMD0130	1.30	16.4	60.4	60	0.4	3	●
VAPDMD0135	1.35	18.4	60.4	60	0.4	3	●
VAPDMD0140	1.40	18.4	60.4	60	0.4	3	●
VAPDMD0145	1.45	18.4	60.4	60	0.4	3	●
VAPDMD0150	1.50	18.5	60.5	60	0.5	3	●
VAPDMD0155	1.55	20.5	60.5	60	0.5	3	●
VAPDMD0160	1.60	20.5	60.5	60	0.5	3	●
VAPDMD0165	1.65	20.5	60.5	60	0.5	3	●
VAPDMD0170	1.70	20.5	60.5	60	0.5	3	●
VAPDMD0175	1.75	20.5	60.5	60	0.5	3	●
VAPDMD0180	1.80	22.5	60.5	60	0.5	3	●
VAPDMD0185	1.85	22.6	60.6	60	0.6	3	●
VAPDMD0190	1.90	22.6	60.6	60	0.6	3	●
VAPDMD0195	1.95	23.6	60.6	60	0.6	3	●
VAPDMD0200	2.00	23.4	70.4	70	0.4	3	●
VAPDMD0205	2.05	23.4	70.4	70	0.4	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD0210	2.10	23.4	70.4	70	0.4	3	●
VAPDMD0215	2.15	23.5	70.5	70	0.5	3	●
VAPDMD0220	2.20	26.5	70.5	70	0.5	3	●
VAPDMD0225	2.25	26.5	70.5	70	0.5	3	●
VAPDMD0230	2.30	26.5	70.5	70	0.5	3	●
VAPDMD0235	2.35	26.5	70.5	70	0.5	3	●
VAPDMD0240	2.40	29.5	70.5	70	0.5	3	●
VAPDMD0245	2.45	29.5	70.5	70	0.5	3	●
VAPDMD0250	2.50	29.5	70.5	70	0.5	3	●
VAPDMD0255	2.55	29.5	70.5	70	0.5	3	●
VAPDMD0260	2.60	29.5	70.5	70	0.5	3	●
VAPDMD0265	2.65	29.6	70.6	70	0.6	3	●
VAPDMD0270	2.70	32.6	70.6	70	0.6	3	●
VAPDMD0275	2.75	32.6	70.6	70	0.6	3	●
VAPDMD0280	2.80	32.6	70.6	70	0.6	3	●
VAPDMD0285	2.85	32.6	70.6	70	0.6	3	●
VAPDMD0290	2.90	32.6	70.6	70	0.6	3	●
VAPDMD0295	2.95	32.6	70.6	70	0.6	3	●
VAPDMD0300	3.00	32.6	70.6	70	0.6	3	●
VAPDMD0305	3.05	35.6	85.6	85	0.6	4	●
VAPDMD0310	3.10	35.6	85.6	85	0.6	4	●
VAPDMD0315	3.15	35.7	85.7	85	0.7	4	●
VAPDMD0320	3.20	35.7	85.7	85	0.7	4	●
VAPDMD0325	3.25	35.7	85.7	85	0.7	4	●
VAPDMD0330	3.30	35.7	85.7	85	0.7	4	●
VAPDMD0335	3.35	35.7	85.7	85	0.7	4	●
VAPDMD0340	3.40	38.7	85.7	85	0.7	4	●
VAPDMD0345	3.45	38.7	85.7	85	0.7	4	●
VAPDMD0350	3.50	38.7	85.7	85	0.7	4	●
VAPDMD0355	3.55	38.7	85.7	85	0.7	4	●
VAPDMD0360	3.60	38.8	85.8	85	0.8	4	●
VAPDMD0365	3.65	38.8	85.8	85	0.8	4	●

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

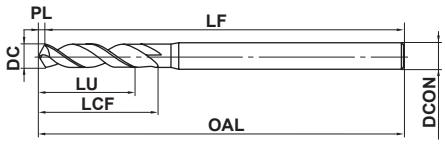
VAPDM

Medium, High precision

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD0370	3.70	38.8	85.8	85	0.8	4	●
VAPDMD0375	3.75	42.8	85.8	85	0.8	4	●
VAPDMD0380	3.80	42.8	85.8	85	0.8	4	●
VAPDMD0385	3.85	42.8	85.8	85	0.8	4	●
VAPDMD0390	3.90	42.8	85.8	85	0.8	4	●
VAPDMD0395	3.95	42.8	85.8	85	0.8	4	●
VAPDMD0400	4.00	42.8	85.8	85	0.8	4	●
VAPDMD0405	4.05	42.8	100.8	100	0.8	6	●
VAPDMD0410	4.10	42.9	100.9	100	0.9	6	●
VAPDMD0415	4.15	42.9	100.9	100	0.9	6	●
VAPDMD0420	4.20	42.9	100.9	100	0.9	6	●
VAPDMD0425	4.25	46.9	100.9	100	0.9	6	●
VAPDMD0430	4.30	46.9	100.9	100	0.9	6	●
VAPDMD0435	4.35	46.9	100.9	100	0.9	6	●
VAPDMD0440	4.40	46.9	100.9	100	0.9	6	●
VAPDMD0445	4.45	46.9	100.9	100	0.9	6	●
VAPDMD0450	4.50	46.9	100.9	100	0.9	6	●
VAPDMD0455	4.55	46.9	100.9	100	0.9	6	●
VAPDMD0460	4.60	47.0	101.0	100	1.0	6	●
VAPDMD0465	4.65	47.0	101.0	100	1.0	6	●
VAPDMD0470	4.70	47.0	101.0	100	1.0	6	●
VAPDMD0475	4.75	47.0	101.0	100	1.0	6	●
VAPDMD0480	4.80	52.0	101.0	100	1.0	6	●
VAPDMD0485	4.85	52.0	101.0	100	1.0	6	●
VAPDMD0490	4.90	52.0	101.0	100	1.0	6	●
VAPDMD0495	4.95	52.0	101.0	100	1.0	6	●
VAPDMD0500	5.00	52.0	101.0	100	1.0	6	●
VAPDMD0505	5.05	52.1	101.1	100	1.1	6	●
VAPDMD0510	5.10	52.1	101.1	100	1.1	6	●
VAPDMD0515	5.15	52.1	101.1	100	1.1	6	●
VAPDMD0520	5.20	52.1	101.1	100	1.1	6	●
VAPDMD0525	5.25	52.1	101.1	100	1.1	6	●
VAPDMD0530	5.30	52.1	101.1	100	1.1	6	●
VAPDMD0535	5.35	57.1	107.1	106	1.1	6	●
VAPDMD0540	5.40	57.1	107.1	106	1.1	6	●
VAPDMD0545	5.45	57.1	107.1	106	1.1	6	●
VAPDMD0550	5.50	57.1	107.1	106	1.1	6	●
VAPDMD0555	5.55	57.2	107.2	106	1.2	6	●
VAPDMD0560	5.60	57.2	107.2	106	1.2	6	●
VAPDMD0565	5.65	57.2	107.2	106	1.2	6	●
VAPDMD0570	5.70	57.2	107.2	106	1.2	6	●
VAPDMD0575	5.75	57.2	107.2	106	1.2	6	●
VAPDMD0580	5.80	57.2	107.2	106	1.2	6	●
VAPDMD0585	5.85	57.2	107.2	106	1.2	6	●
VAPDMD0590	5.90	57.2	107.2	106	1.2	6	●
VAPDMD0595	5.95	57.2	107.2	106	1.2	6	●
VAPDMD0600	6.00	57.2	107.2	106	1.2	6	●
VAPDMD0605	6.05	63.3	113.3	112	1.3	8	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD0610	6.10	63.3	113.3	112	1.3	8	●
VAPDMD0615	6.15	63.3	113.3	112	1.3	8	●
VAPDMD0620	6.20	63.3	113.3	112	1.3	8	●
VAPDMD0625	6.25	63.3	113.3	112	1.3	8	●
VAPDMD0630	6.30	63.3	113.3	112	1.3	8	●
VAPDMD0635	6.35	63.3	113.3	112	1.3	8	●
VAPDMD0640	6.40	63.3	113.3	112	1.3	8	●
VAPDMD0645	6.45	63.3	113.3	112	1.3	8	●
VAPDMD0650	6.50	63.4	113.4	112	1.4	8	●
VAPDMD0655	6.55	63.4	113.4	112	1.4	8	●
VAPDMD0660	6.60	63.4	113.4	112	1.4	8	●
VAPDMD0665	6.65	63.4	113.4	112	1.4	8	●
VAPDMD0670	6.70	63.4	113.4	112	1.4	8	●
VAPDMD0675	6.75	68.4	118.4	117	1.4	8	●
VAPDMD0680	6.80	68.4	118.4	117	1.4	8	●
VAPDMD0685	6.85	68.4	118.4	117	1.4	8	●
VAPDMD0690	6.90	68.4	118.4	117	1.4	8	●
VAPDMD0695	6.95	68.4	118.4	117	1.4	8	●
VAPDMD0700	7.00	68.5	118.5	117	1.5	8	●
VAPDMD0705	7.05	68.5	118.5	117	1.5	8	●
VAPDMD0710	7.10	68.5	118.5	117	1.5	8	●
VAPDMD0715	7.15	68.5	118.5	117	1.5	8	●
VAPDMD0720	7.20	68.5	118.5	117	1.5	8	●
VAPDMD0725	7.25	68.5	118.5	117	1.5	8	●
VAPDMD0730	7.30	68.5	118.5	117	1.5	8	●
VAPDMD0735	7.35	68.5	118.5	117	1.5	8	●
VAPDMD0740	7.40	68.5	118.5	117	1.5	8	●
VAPDMD0745	7.45	68.5	118.5	117	1.5	8	●
VAPDMD0750	7.50	68.6	118.6	117	1.6	8	●
VAPDMD0755	7.55	74.6	124.6	123	1.6	8	●
VAPDMD0760	7.60	74.6	124.6	123	1.6	8	●
VAPDMD0765	7.65	74.6	124.6	123	1.6	8	●
VAPDMD0770	7.70	74.6	124.6	123	1.6	8	●
VAPDMD0775	7.75	74.6	124.6	123	1.6	8	●
VAPDMD0780	7.80	74.6	124.6	123	1.6	8	●
VAPDMD0785	7.85	74.6	124.6	123	1.6	8	●
VAPDMD0790	7.90	74.6	124.6	123	1.6	8	●
VAPDMD0795	7.95	74.7	124.7	123	1.7	8	●
VAPDMD0800	8.00	74.7	124.7	123	1.7	8	●
VAPDMD0805	8.05	74.7	129.7	128	1.7	10	●
VAPDMD0810	8.10	74.7	129.7	128	1.7	10	●
VAPDMD0815	8.15	74.7	129.7	128	1.7	10	●
VAPDMD0820	8.20	74.7	129.7	128	1.7	10	●
VAPDMD0825	8.25	74.7	129.7	128	1.7	10	●
VAPDMD0830	8.30	74.7	129.7	128	1.7	10	●
VAPDMD0835	8.35	74.7	129.7	128	1.7	10	●
VAPDMD0840	8.40	74.7	129.7	128	1.7	10	●
VAPDMD0845	8.45	74.8	129.8	128	1.8	10	●

● : Inventory maintained in Japan.



Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD0850	8.50	74.8	129.8	128	1.8	10	●
VAPDMD0855	8.55	80.8	135.8	134	1.8	10	●
VAPDMD0860	8.60	80.8	135.8	134	1.8	10	●
VAPDMD0865	8.65	80.8	135.8	134	1.8	10	●
VAPDMD0870	8.70	80.8	135.8	134	1.8	10	●
VAPDMD0875	8.75	80.8	135.8	134	1.8	10	●
VAPDMD0880	8.80	80.8	135.8	134	1.8	10	●
VAPDMD0885	8.85	80.8	135.8	134	1.8	10	●
VAPDMD0890	8.90	80.8	135.8	134	1.8	10	●
VAPDMD0895	8.95	80.9	135.9	134	1.9	10	●
VAPDMD0900	9.00	80.9	135.9	134	1.9	10	●
VAPDMD0910	9.10	80.9	135.9	134	1.9	10	●
VAPDMD0920	9.20	80.9	135.9	134	1.9	10	●
VAPDMD0930	9.30	80.9	135.9	134	1.9	10	●
VAPDMD0940	9.40	81.0	136.0	134	2.0	10	●
VAPDMD0950	9.50	81.0	136.0	134	2.0	10	●
VAPDMD0960	9.60	87.0	142.0	140	2.0	10	●
VAPDMD0970	9.70	87.0	142.0	140	2.0	10	●
VAPDMD0980	9.80	87.0	142.0	140	2.0	10	●
VAPDMD0990	9.90	87.1	142.1	140	2.1	10	●
VAPDMD1000	10.0	87.1	142.1	140	2.1	10	●
VAPDMD1010	10.1	87.1	147.1	145	2.1	12	●
VAPDMD1020	10.2	87.1	147.1	145	2.1	12	●
VAPDMD1030	10.3	87.1	147.1	145	2.1	12	●
VAPDMD1040	10.4	87.2	147.2	145	2.2	12	●
VAPDMD1050	10.5	87.2	147.2	145	2.2	12	●
VAPDMD1060	10.6	87.2	147.2	145	2.2	12	●
VAPDMD1070	10.7	94.2	154.2	152	2.2	12	●
VAPDMD1080	10.8	94.2	154.2	152	2.2	12	●
VAPDMD1090	10.9	94.3	154.3	152	2.3	12	●
VAPDMD1100	11.0	94.3	154.3	152	2.3	12	●
VAPDMD1110	11.1	94.3	154.3	152	2.3	12	●
VAPDMD1120	11.2	94.3	154.3	152	2.3	12	●
VAPDMD1130	11.3	94.3	154.3	152	2.3	12	●
VAPDMD1140	11.4	94.4	154.4	152	2.4	12	●
VAPDMD1150	11.5	94.4	154.4	152	2.4	12	●
VAPDMD1160	11.6	94.4	154.4	152	2.4	12	●
VAPDMD1170	11.7	94.4	154.4	152	2.4	12	●
VAPDMD1180	11.8	94.4	154.4	152	2.4	12	●
VAPDMD1190	11.9	101.5	161.5	159	2.5	12	●
VAPDMD1200	12.0	101.5	161.5	159	2.5	12	●
VAPDMD1210	12.1	101.5	161.5	159	2.5	12	●
VAPDMD1220	12.2	101.5	161.5	159	2.5	12	●
VAPDMD1230	12.3	101.6	161.6	159	2.6	12	●
VAPDMD1240	12.4	101.6	161.6	159	2.6	12	●
VAPDMD1250	12.5	101.6	161.6	159	2.6	12	●
VAPDMD1260	12.6	101.6	161.6	159	2.6	12	●
VAPDMD1270	12.7	101.6	161.6	159	2.6	12	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMD1280	12.8	101.7	161.7	159	2.7	12	●
VAPDMD1290	12.9	101.7	161.7	159	2.7	12	●
VAPDMD1300	13.0	101.7	161.7	159	2.7	12	●
VAPDMD1350	13.5	102.8	162.8	160	2.8	16	●
VAPDMD1400	14.0	102.9	162.9	160	2.9	16	●
VAPDMD1410	14.1	107.9	167.9	165	2.9	16	●
VAPDMD1420	14.2	107.9	167.9	165	2.9	16	●
VAPDMD1450	14.5	108.0	168.0	165	3.0	16	●
VAPDMD1500	15.0	108.1	168.1	165	3.1	16	●
VAPDMD1550	15.5	113.2	173.2	170	3.2	16	●
VAPDMD1560	15.6	113.2	173.2	170	3.2	16	●
VAPDMD1570	15.7	113.3	173.3	170	3.3	16	●
VAPDMD1600	16.0	113.3	173.3	170	3.3	16	●
VAPDMD1650	16.5	113.4	178.4	175	3.4	20	●
VAPDMD1700	17.0	113.5	178.5	175	3.5	20	●
VAPDMD1750	17.5	118.6	183.6	180	3.6	20	●
VAPDMD1760	17.6	118.7	183.7	180	3.7	20	●
VAPDMD1770	17.7	118.7	183.7	180	3.7	20	●
VAPDMD1800	18.0	118.7	183.7	180	3.7	20	●
VAPDMD1850	18.5	123.8	188.8	185	3.8	20	●
VAPDMD1900	19.0	123.9	188.9	185	3.9	20	●
VAPDMD1950	19.5	124.0	189.0	185	4.0	20	●
VAPDMD1960	19.6	124.1	189.1	185	4.1	20	●
VAPDMD1970	19.7	124.1	189.1	185	4.1	20	●
VAPDMD2000	20.0	124.1	189.1	185	4.1	20	●
VAPDMD2050	20.5	129.3	204.3	200	4.3	25	●
VAPDMD2100	21.0	129.4	204.4	200	4.4	25	●
VAPDMD2110	21.1	129.4	204.4	200	4.4	25	●
VAPDMD2120	21.2	129.4	204.4	200	4.4	25	●
VAPDMD2150	21.5	129.5	204.5	200	4.5	25	●
VAPDMD2200	22.0	129.6	204.6	200	4.6	25	●
VAPDMD2250	22.5	134.7	209.7	205	4.7	25	●
VAPDMD2300	23.0	134.8	209.8	205	4.8	25	●
VAPDMD2350	23.5	134.9	209.9	205	4.9	25	●
VAPDMD2400	24.0	140.0	215.0	210	5.0	25	●
VAPDMD2450	24.5	140.1	215.1	210	5.1	25	●
VAPDMD2500	25.0	140.2	215.2	210	5.2	25	●
VAPDMD2550	25.5	145.3	225.3	220	5.3	32	●
VAPDMD2600	26.0	145.4	225.4	220	5.4	32	●
VAPDMD2650	26.5	145.5	225.5	220	5.5	32	●
VAPDMD2700	27.0	145.6	225.6	220	5.6	32	●
VAPDMD2800	28.0	145.8	225.8	220	5.8	32	●
VAPDMD2900	29.0	151.0	231.0	225	6.0	32	●
VAPDMD3000	30.0	151.2	231.2	225	6.2	32	●
VAPDMD3100	31.0	156.4	236.4	230	6.4	32	●
VAPDMD3200	32.0	161.6	241.6	235	6.6	32	●

VAPDM

Medium, High precision

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel		Carbon Steel, Alloy Steel Cast Iron AISI 1049, SCM, FC		Alloy Tool Steel (Low-hardness Materials), Ferritic Stainless Steel, Martensitic Stainless Steel AISI 430, AISI 405, AISI D2, AISI 420, AISI 440		Alloy Tool Steel (−40HRC) Precipitation-Hardening Stainless Steel AISI H13, ASTM 630, ASTM 631	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	17000	0.01	12800	0.01	8000	0.01	6600	0.01
1.0	11000	0.05	8300	0.05	5000	0.05	4100	0.04
2.0	6400	0.09	4800	0.09	2900	0.06	2400	0.05
3.0	4300	0.13	3200	0.13	1900	0.10	1600	0.06
4.0	3200	0.15	2400	0.15	1400	0.10	1200	0.08
5.0	2600	0.18	1900	0.18	1100	0.13	950	0.10
6.0	2100	0.19	1600	0.20	950	0.15	800	0.11
8.0	1600	0.24	1200	0.22	720	0.18	600	0.13
10.0	1300	0.28	950	0.25	570	0.21	480	0.15
12.0	1100	0.34	800	0.30	480	0.25	400	0.17
14.0	910	0.39	680	0.35	410	0.30	340	0.21
15.0	850	0.40	640	0.36	380	0.31	320	0.22
16.0	800	0.42	600	0.38	360	0.32	300	0.23
18.0	710	0.44	530	0.40	320	0.34	270	0.24
20.0	570	0.44	450	0.40	250	0.34	220	0.24
22.0	520	0.46	410	0.42	230	0.36	200	0.25
24.0	480	0.48	370	0.44	210	0.37	190	0.26
26.0	440	0.51	340	0.46	200	0.39	170	0.28
28.0	410	0.53	320	0.48	180	0.41	160	0.29
30.0	380	0.55	300	0.50	170	0.43	150	0.30
32.0	360	0.55	280	0.50	160	0.43	140	0.30

Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDMSUS are recommended for austenitic stainless steel (AISI 304).
Note 5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
Note 6) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.

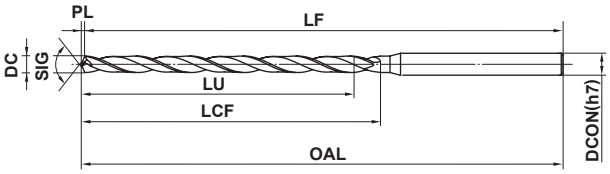
VAPDJ

Semi Long, High Precision

DC<2 2≤DC

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			





*LU = LCF-2DC (Max 10×DC)

0.5≤DC≤3	3<DC≤6	6<DC≤10
0 −0.014	0 −0.018	0 −0.022

●Long-lasting drill bits for stable, high accuracy, non-step drilling of deep L/D=10 holes

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDJD0100	1.0	18.3	66.3	66	0.3	3	●
VAPDJD0110	1.1	22.3	66.3	66	0.3	3	●
VAPDJD0120	1.2	22.4	66.4	66	0.4	3	●
VAPDJD0130	1.3	22.4	66.4	66	0.4	3	●
VAPDJD0140	1.4	24.4	66.4	66	0.4	3	●
VAPDJD0150	1.5	24.5	66.5	66	0.5	3	●
VAPDJD0160	1.6	30.5	71.5	71	0.5	3	●
VAPDJD0170	1.7	30.5	71.5	71	0.5	3	●
VAPDJD0180	1.8	33.5	71.5	71	0.5	3	●
VAPDJD0190	1.9	33.6	71.6	71	0.6	3	●
VAPDJD0200	2.0	36.4	81.4	81	0.4	3	●
VAPDJD0210	2.1	36.4	81.4	81	0.4	3	●
VAPDJD0220	2.2	36.5	81.5	81	0.5	3	●
VAPDJD0230	2.3	36.5	81.5	81	0.5	3	●
VAPDJD0240	2.4	39.5	81.5	81	0.5	3	●
VAPDJD0250	2.5	39.5	81.5	81	0.5	3	●
VAPDJD0260	2.6	39.5	81.5	81	0.5	3	●
VAPDJD0270	2.7	45.6	81.6	81	0.6	3	●
VAPDJD0280	2.8	45.6	81.6	81	0.6	3	●
VAPDJD0290	2.9	45.6	81.6	81	0.6	3	●
VAPDJD0300	3.0	45.6	81.6	81	0.6	3	●
VAPDJD0310	3.1	51.6	102.6	102	0.6	4	●
VAPDJD0320	3.2	51.7	102.7	102	0.7	4	●
VAPDJD0330	3.3	51.7	102.7	102	0.7	4	●
VAPDJD0340	3.4	54.7	102.7	102	0.7	4	●
VAPDJD0350	3.5	54.7	102.7	102	0.7	4	●
VAPDJD0360	3.6	57.8	102.8	102	0.8	4	●
VAPDJD0370	3.7	57.8	102.8	102	0.8	4	●
VAPDJD0380	3.8	60.8	102.8	102	0.8	4	●
VAPDJD0390	3.9	60.8	102.8	102	0.8	4	●
VAPDJD0400	4.0	60.8	102.8	102	0.8	4	●
VAPDJD0410	4.1	60.9	118.9	118	0.9	6	●
VAPDJD0420	4.2	60.9	118.9	118	0.9	6	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDJD0430	4.3	66.9	118.9	118	0.9	6	●
VAPDJD0440	4.4	66.9	118.9	118	0.9	6	●
VAPDJD0450	4.5	66.9	118.9	118	0.9	6	●
VAPDJD0460	4.6	67.0	122.0	121	1.0	6	●
VAPDJD0470	4.7	67.0	122.0	121	1.0	6	●
VAPDJD0480	4.8	73.0	122.0	121	1.0	6	●
VAPDJD0490	4.9	73.0	122.0	121	1.0	6	●
VAPDJD0500	5.0	73.0	122.0	121	1.0	6	●
VAPDJD0510	5.1	73.1	122.1	121	1.1	6	●
VAPDJD0520	5.2	73.1	122.1	121	1.1	6	●
VAPDJD0530	5.3	73.1	122.1	121	1.1	6	●
VAPDJD0540	5.4	79.1	129.1	128	1.1	6	●
VAPDJD0550	5.5	79.1	129.1	128	1.1	6	●
VAPDJD0560	5.6	79.2	129.2	128	1.2	6	●
VAPDJD0570	5.7	79.2	129.2	128	1.2	6	●
VAPDJD0580	5.8	79.2	129.2	128	1.2	6	●
VAPDJD0590	5.9	79.2	129.2	128	1.2	6	●
VAPDJD0600	6.0	79.2	129.2	128	1.2	6	●
VAPDJD0650	6.5	85.4	135.4	134	1.4	8	●
VAPDJD0680	6.8	91.4	141.4	140	1.4	8	●
VAPDJD0690	6.9	91.4	141.4	140	1.4	8	●
VAPDJD0700	7.0	91.5	141.5	140	1.5	8	●
VAPDJD0710	7.1	91.5	141.5	140	1.5	8	●
VAPDJD0750	7.5	91.6	141.6	140	1.6	8	●
VAPDJD0780	7.8	97.6	147.6	146	1.6	8	●
VAPDJD0790	7.9	97.6	147.6	146	1.6	8	●
VAPDJD0800	8.0	97.7	147.7	146	1.7	8	●
VAPDJD0850	8.5	103.8	158.8	157	1.8	10	●
VAPDJD0860	8.6	115.8	170.8	169	1.8	10	●
VAPDJD0900	9.0	115.9	170.9	169	1.9	10	●
VAPDJD0950	9.5	116.0	171.0	169	2.0	10	●
VAPDJD0960	9.6	122.0	177.0	175	2.0	10	●
VAPDJD1000	10.0	122.1	177.1	175	2.1	10	●

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

VAPDJ

Semi long, High precision

RECOMMENDED CUTTING CONDITIONS

Workpiece material	Mild Steel AISI 1010 etc.		Carbon Steel, Alloy Steel Gray Cast Iron AISI 1045, AISI 4140, AISI No 45 B etc.		Alloy Tool Steel (Low-hardness Materials) Ferritic Stainless Steel Martensitic Stainless Steel AISI D2, AISI 430, AISI 420, AISI 440 etc.		Alloy Tool Steel (─40HRC) AISI H13 etc.	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
1.0	7800	0.030	6000	0.030	3600	0.026	2400	0.018
1.2	6500	0.036	5000	0.036	3200	0.030	2000	0.022
1.6	5700	0.045	4400	0.045	2800	0.034	1760	0.024
2.0	5200	0.060	4000	0.060	2400	0.040	1600	0.030
2.5	4200	0.075	3200	0.075	1900	0.050	1280	0.037
3.2	3200	0.100	2500	0.100	1500	0.070	1000	0.050
4.0	2600	0.120	2000	0.120	1200	0.084	800	0.060
5.0	2100	0.150	1600	0.150	960	0.110	640	0.075
6.5	1600	0.180	1200	0.160	720	0.130	480	0.080
8.0	1300	0.200	1000	0.180	600	0.150	400	0.090
10.0	1000	0.240	800	0.220	480	0.180	320	0.110

Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) Depending on machining conditions, non-step machining may make chip ejection difficult, or cause chip elongation. In these cases, please use step processing. Step amount should be between DCx1 - DCx3.
Note 5) The cutting conditions mentioned above are standard when using water-soluble coolant.
Lower the revolution when insoluble cutting fluid is used.
Note 6) If the revolution speed the intermediate diameter is not listed in the table, match it to the large diameter side and closest drill diameter conditions. Set the feed rate per revolution to a suitable value with the recommended feed rate of the closest drill diameter as the standard.

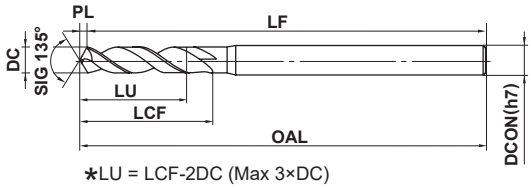
VAPDSSUS

Short, High precision, For stainless steel



P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S Heat Resistant Alloy | H





∗LU = LCF-2DC (Max 3×DC)

0.5≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033

∗All drills except those with intervals of 0.1mm and under dia. 4.0mm have a tolerance of 0—-0.009mm.

● Violet coating combination enable high efficiency drilling and long tool life for drilling of stainless steel.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0050	0.50	3.1	50.1	50	0.10	3	●
VAPDSSUSD0053	0.53	3.1	50.1	50	0.11	3	●
VAPDSSUSD0055	0.55	3.1	50.1	50	0.11	3	●
VAPDSSUSD0056	0.56	4.1	50.1	50	0.12	3	●
VAPDSSUSD0060	0.60	5.1	50.1	50	0.12	3	●
VAPDSSUSD0065	0.65	5.1	50.1	50	0.13	3	●
VAPDSSUSD0070	0.70	5.1	50.1	50	0.14	3	●
VAPDSSUSD0075	0.75	5.2	50.2	50	0.16	3	●
VAPDSSUSD0080	0.80	5.2	50.2	50	0.17	3	●
VAPDSSUSD0085	0.85	5.2	50.2	50	0.18	3	●
VAPDSSUSD0090	0.90	6.2	50.2	50	0.19	3	●
VAPDSSUSD0092	0.92	6.2	50.2	50	0.19	3	●
VAPDSSUSD0095	0.95	6.2	50.2	50	0.20	3	●
VAPDSSUSD0100	1.00	6.2	50.2	50	0.2	3	●
VAPDSSUSD0101	1.01	6.2	50.2	50	0.2	3	●
VAPDSSUSD0102	1.02	6.2	50.2	50	0.2	3	●
VAPDSSUSD0105	1.05	6.2	50.2	50	0.2	3	●
VAPDSSUSD0107	1.07	8.2	55.2	55	0.2	3	●
VAPDSSUSD0109	1.09	8.2	55.2	55	0.2	3	●
VAPDSSUSD0110	1.10	8.2	55.2	55	0.2	3	●
VAPDSSUSD0112	1.12	8.2	55.2	55	0.2	3	●
VAPDSSUSD0115	1.15	8.2	55.2	55	0.2	3	●
VAPDSSUSD0117	1.17	8.2	55.2	55	0.2	3	●
VAPDSSUSD0120	1.20	8.3	55.3	55	0.3	3	●
VAPDSSUSD0122	1.22	8.3	55.3	55	0.3	3	●
VAPDSSUSD0123	1.23	8.3	55.3	55	0.3	3	●
VAPDSSUSD0124	1.24	8.3	55.3	55	0.3	3	●
VAPDSSUSD0125	1.25	8.3	55.3	55	0.3	3	●
VAPDSSUSD0126	1.26	8.3	55.3	55	0.3	3	●
VAPDSSUSD0127	1.27	8.3	55.3	55	0.3	3	●
VAPDSSUSD0128	1.28	8.3	55.3	55	0.3	3	●
VAPDSSUSD0130	1.30	9.3	55.3	55	0.3	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0135	1.35	9.3	55.3	55	0.3	3	●
VAPDSSUSD0140	1.40	9.3	55.3	55	0.3	3	●
VAPDSSUSD0143	1.43	9.3	55.3	55	0.3	3	●
VAPDSSUSD0145	1.45	9.3	55.3	55	0.3	3	●
VAPDSSUSD0150	1.50	9.3	55.3	55	0.3	3	●
VAPDSSUSD0151	1.51	11.3	55.3	55	0.3	3	●
VAPDSSUSD0152	1.52	11.3	55.3	55	0.3	3	●
VAPDSSUSD0153	1.53	11.3	55.3	55	0.3	3	●
VAPDSSUSD0155	1.55	11.3	55.3	55	0.3	3	●
VAPDSSUSD0156	1.56	11.3	55.3	55	0.3	3	●
VAPDSSUSD0157	1.57	11.3	55.3	55	0.3	3	●
VAPDSSUSD0160	1.60	11.3	55.3	55	0.3	3	●
VAPDSSUSD0162	1.62	11.3	55.3	55	0.3	3	●
VAPDSSUSD0163	1.63	11.3	55.3	55	0.3	3	●
VAPDSSUSD0165	1.65	11.3	55.3	55	0.3	3	●
VAPDSSUSD0170	1.70	11.4	55.4	55	0.4	3	●
VAPDSSUSD0175	1.75	11.4	55.4	55	0.4	3	●
VAPDSSUSD0178	1.78	11.4	55.4	55	0.4	3	●
VAPDSSUSD0180	1.80	11.4	55.4	55	0.4	3	●
VAPDSSUSD0181	1.81	11.4	55.4	55	0.4	3	●
VAPDSSUSD0182	1.82	11.4	55.4	55	0.4	3	●
VAPDSSUSD0183	1.83	11.4	55.4	55	0.4	3	●
VAPDSSUSD0185	1.85	11.4	55.4	55	0.4	3	●
VAPDSSUSD0190	1.90	12.4	55.4	55	0.4	3	●
VAPDSSUSD0192	1.92	12.4	60.4	60	0.4	3	●
VAPDSSUSD0193	1.93	12.4	60.4	60	0.4	3	●
VAPDSSUSD0195	1.95	12.4	60.4	60	0.4	3	●
VAPDSSUSD0198	1.98	12.4	60.4	60	0.4	3	●
VAPDSSUSD0200	2.00	12.4	60.4	60	0.4	3	●
VAPDSSUSD0202	2.02	12.4	60.4	60	0.4	3	●
VAPDSSUSD0203	2.03	12.4	60.4	60	0.4	3	●
VAPDSSUSD0205	2.05	12.4	60.4	60	0.4	3	●

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N205

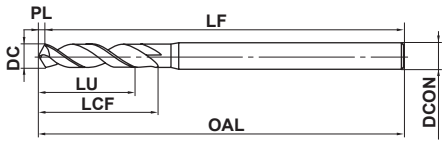
VAPDSSUS

Short, High precision, For stainless steel

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0207	2.07	12.4	60.4	60	0.4	3	●
VAPDSSUSD0210	2.10	12.4	60.4	60	0.4	3	●
VAPDSSUSD0211	2.11	12.4	60.4	60	0.4	3	●
VAPDSSUSD0212	2.12	12.4	60.4	60	0.4	3	●
VAPDSSUSD0215	2.15	12.5	60.5	60	0.5	3	●
VAPDSSUSD0220	2.20	12.5	60.5	60	0.5	3	●
VAPDSSUSD0221	2.21	12.5	60.5	60	0.5	3	●
VAPDSSUSD0223	2.23	12.5	60.5	60	0.5	3	●
VAPDSSUSD0225	2.25	12.5	60.5	60	0.5	3	●
VAPDSSUSD0227	2.27	12.5	60.5	60	0.5	3	●
VAPDSSUSD0228	2.28	12.5	60.5	60	0.5	3	●
VAPDSSUSD0230	2.30	13.5	60.5	60	0.5	3	●
VAPDSSUSD0232	2.32	13.5	60.5	60	0.5	3	●
VAPDSSUSD0235	2.35	13.5	60.5	60	0.5	3	●
VAPDSSUSD0238	2.38	13.5	60.5	60	0.5	3	●
VAPDSSUSD0240	2.40	13.5	60.5	60	0.5	3	●
VAPDSSUSD0243	2.43	13.5	60.5	60	0.5	3	●
VAPDSSUSD0244	2.44	13.5	60.5	60	0.5	3	●
VAPDSSUSD0245	2.45	13.5	60.5	60	0.5	3	●
VAPDSSUSD0250	2.50	13.5	60.5	60	0.5	3	●
VAPDSSUSD0252	2.52	13.5	60.5	60	0.5	3	●
VAPDSSUSD0253	2.53	13.5	60.5	60	0.5	3	●
VAPDSSUSD0255	2.55	13.5	60.5	60	0.5	3	●
VAPDSSUSD0257	2.57	13.5	60.5	60	0.5	3	●
VAPDSSUSD0258	2.58	13.5	60.5	60	0.5	3	●
VAPDSSUSD0260	2.60	15.5	60.5	60	0.5	3	●
VAPDSSUSD0262	2.62	15.5	60.5	60	0.5	3	●
VAPDSSUSD0265	2.65	15.6	60.6	60	0.6	3	●
VAPDSSUSD0270	2.70	15.6	60.6	60	0.6	3	●
VAPDSSUSD0275	2.75	15.6	60.6	60	0.6	3	●
VAPDSSUSD0276	2.76	15.6	60.6	60	0.6	3	●
VAPDSSUSD0277	2.77	15.6	60.6	60	0.6	3	●
VAPDSSUSD0278	2.78	15.6	60.6	60	0.6	3	●
VAPDSSUSD0280	2.80	15.6	60.6	60	0.6	3	●
VAPDSSUSD0285	2.85	15.6	60.6	60	0.6	3	●
VAPDSSUSD0290	2.90	15.6	60.6	60	0.6	3	●
VAPDSSUSD0295	2.95	15.6	60.6	60	0.6	3	●
VAPDSSUSD0297	2.97	15.6	60.6	60	0.6	3	●
VAPDSSUSD0298	2.98	15.6	60.6	60	0.6	3	●
VAPDSSUSD0299	2.99	15.6	60.6	60	0.6	3	●
VAPDSSUSD0300	3.00	15.6	60.6	60	0.6	3	●
VAPDSSUSD0301	3.01	17.6	70.6	70	0.6	4	●
VAPDSSUSD0302	3.02	17.6	70.6	70	0.6	4	●
VAPDSSUSD0303	3.03	17.6	70.6	70	0.6	4	●
VAPDSSUSD0304	3.04	17.6	70.6	70	0.6	4	●
VAPDSSUSD0305	3.05	17.6	70.6	70	0.6	4	●
VAPDSSUSD0310	3.10	17.6	70.6	70	0.6	4	●
VAPDSSUSD0315	3.15	17.7	70.7	70	0.7	4	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0320	3.20	17.7	70.7	70	0.7	4	●
VAPDSSUSD0325	3.25	17.7	70.7	70	0.7	4	●
VAPDSSUSD0330	3.30	19.7	70.7	70	0.7	4	●
VAPDSSUSD0335	3.35	19.7	70.7	70	0.7	4	●
VAPDSSUSD0340	3.40	19.7	70.7	70	0.7	4	●
VAPDSSUSD0345	3.45	19.7	70.7	70	0.7	4	●
VAPDSSUSD0350	3.50	19.7	70.7	70	0.7	4	●
VAPDSSUSD0355	3.55	19.7	70.7	70	0.7	4	●
VAPDSSUSD0356	3.56	19.7	70.7	70	0.7	4	●
VAPDSSUSD0360	3.60	21.8	70.8	70	0.8	4	●
VAPDSSUSD0365	3.65	21.8	70.8	70	0.8	4	●
VAPDSSUSD0366	3.66	21.8	70.8	70	0.8	4	●
VAPDSSUSD0367	3.67	21.8	70.8	70	0.8	4	●
VAPDSSUSD0368	3.68	21.8	70.8	70	0.8	4	●
VAPDSSUSD0369	3.69	21.8	70.8	70	0.8	4	●
VAPDSSUSD0370	3.70	21.8	70.8	70	0.8	4	●
VAPDSSUSD0371	3.71	21.8	70.8	70	0.8	4	●
VAPDSSUSD0375	3.75	21.8	70.8	70	0.8	4	●
VAPDSSUSD0380	3.80	21.8	70.8	70	0.8	4	●
VAPDSSUSD0385	3.85	21.8	70.8	70	0.8	4	●
VAPDSSUSD0390	3.90	21.8	70.8	70	0.8	4	●
VAPDSSUSD0400	4.00	21.8	70.8	70	0.8	4	●
VAPDSSUSD0405	4.05	21.8	80.8	80	0.8	6	●
VAPDSSUSD0410	4.10	21.9	80.9	80	0.9	6	●
VAPDSSUSD0415	4.15	21.9	80.9	80	0.9	6	●
VAPDSSUSD0420	4.20	21.9	80.9	80	0.9	6	●
VAPDSSUSD0425	4.25	21.9	80.9	80	0.9	6	●
VAPDSSUSD0430	4.30	23.9	80.9	80	0.9	6	●
VAPDSSUSD0440	4.40	23.9	80.9	80	0.9	6	●
VAPDSSUSD0450	4.50	23.9	80.9	80	0.9	6	●
VAPDSSUSD0455	4.55	23.9	80.9	80	0.9	6	●
VAPDSSUSD0460	4.60	26.0	81.0	80	1.0	6	●
VAPDSSUSD0465	4.65	26.0	81.0	80	1.0	6	●
VAPDSSUSD0470	4.70	26.0	81.0	80	1.0	6	●
VAPDSSUSD0480	4.80	26.0	81.0	80	1.0	6	●
VAPDSSUSD0490	4.90	26.0	81.0	80	1.0	6	●
VAPDSSUSD0500	5.00	26.0	81.0	80	1.0	6	●
VAPDSSUSD0505	5.05	26.1	81.1	80	1.1	6	●
VAPDSSUSD0510	5.10	26.1	81.1	80	1.1	6	●
VAPDSSUSD0515	5.15	26.1	81.1	80	1.1	6	●
VAPDSSUSD0520	5.20	26.1	81.1	80	1.1	6	●
VAPDSSUSD0530	5.30	26.1	81.1	80	1.1	6	●
VAPDSSUSD0540	5.40	28.1	81.1	80	1.1	6	●
VAPDSSUSD0550	5.50	28.1	81.1	80	1.1	6	●
VAPDSSUSD0555	5.55	28.2	81.2	80	1.2	6	●
VAPDSSUSD0560	5.60	28.2	81.2	80	1.2	6	●
VAPDSSUSD0565	5.65	28.2	81.2	80	1.2	6	●
VAPDSSUSD0570	5.70	28.2	81.2	80	1.2	6	●

● : Inventory maintained in Japan.



Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0580	5.80	28.2	81.2	80	1.2	6	●
VAPDSSUSD0590	5.90	28.2	81.2	80	1.2	6	●
VAPDSSUSD0600	6.00	28.2	81.2	80	1.2	6	●
VAPDSSUSD0605	6.05	31.3	81.3	80	1.3	8	●
VAPDSSUSD0610	6.10	31.3	81.3	80	1.3	8	●
VAPDSSUSD0615	6.15	31.3	81.3	80	1.3	8	●
VAPDSSUSD0620	6.20	31.3	81.3	80	1.3	8	●
VAPDSSUSD0625	6.25	31.3	81.3	80	1.3	8	●
VAPDSSUSD0630	6.30	31.3	81.3	80	1.3	8	●
VAPDSSUSD0640	6.40	31.3	81.3	80	1.3	8	●
VAPDSSUSD0645	6.45	31.3	81.3	80	1.3	8	●
VAPDSSUSD0650	6.50	31.4	81.4	80	1.4	8	●
VAPDSSUSD0660	6.60	31.4	81.4	80	1.4	8	●
VAPDSSUSD0670	6.70	31.4	81.4	80	1.4	8	●
VAPDSSUSD0680	6.80	33.4	81.4	80	1.4	8	●
VAPDSSUSD0685	6.85	33.4	81.4	80	1.4	8	●
VAPDSSUSD0690	6.90	33.4	81.4	80	1.4	8	●
VAPDSSUSD0700	7.00	33.5	81.5	80	1.5	8	●
VAPDSSUSD0705	7.05	33.5	81.5	80	1.5	8	●
VAPDSSUSD0710	7.10	33.5	81.5	80	1.5	8	●
VAPDSSUSD0720	7.20	33.5	81.5	80	1.5	8	●
VAPDSSUSD0730	7.30	33.5	81.5	80	1.5	8	●
VAPDSSUSD0735	7.35	33.5	81.5	80	1.5	8	●
VAPDSSUSD0740	7.40	33.5	81.5	80	1.5	8	●
VAPDSSUSD0750	7.50	33.6	81.6	80	1.6	8	●
VAPDSSUSD0760	7.60	36.6	86.6	85	1.6	8	●
VAPDSSUSD0770	7.70	36.6	86.6	85	1.6	8	●
VAPDSSUSD0780	7.80	36.6	86.6	85	1.6	8	●
VAPDSSUSD0790	7.90	36.6	86.6	85	1.6	8	●
VAPDSSUSD0800	8.00	36.7	86.7	85	1.7	8	●
VAPDSSUSD0805	8.05	36.7	91.7	90	1.7	10	●
VAPDSSUSD0810	8.10	36.7	91.7	90	1.7	10	●
VAPDSSUSD0815	8.15	36.7	91.7	90	1.7	10	●
VAPDSSUSD0820	8.20	36.7	91.7	90	1.7	10	●
VAPDSSUSD0830	8.30	36.7	91.7	90	1.7	10	●
VAPDSSUSD0840	8.40	36.7	91.7	90	1.7	10	●
VAPDSSUSD0850	8.50	36.8	91.8	90	1.8	10	●
VAPDSSUSD0855	8.55	39.8	94.8	93	1.8	10	●
VAPDSSUSD0860	8.60	39.8	94.8	93	1.8	10	●
VAPDSSUSD0870	8.70	39.8	94.8	93	1.8	10	●
VAPDSSUSD0880	8.80	39.8	94.8	93	1.8	10	●
VAPDSSUSD0890	8.90	39.8	94.8	93	1.8	10	●
VAPDSSUSD0900	9.00	39.9	94.9	93	1.9	10	●
VAPDSSUSD0920	9.20	39.9	94.9	93	1.9	10	●
VAPDSSUSD0930	9.30	39.9	94.9	93	1.9	10	●
VAPDSSUSD0950	9.50	40.0	95.0	93	2.0	10	●
VAPDSSUSD0960	9.60	43.0	98.0	96	2.0	10	●
VAPDSSUSD0970	9.70	43.0	98.0	96	2.0	10	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0980	9.80	43.0	98.0	96	2.0	10	●
VAPDSSUSD1000	10.0	43.1	98.1	96	2.1	10	●
VAPDSSUSD1010	10.1	43.1	103.1	101	2.1	12	●
VAPDSSUSD1020	10.2	43.1	103.1	101	2.1	12	●
VAPDSSUSD1030	10.3	43.1	103.1	101	2.1	12	●
VAPDSSUSD1040	10.4	43.2	103.2	101	2.2	12	●
VAPDSSUSD1050	10.5	43.2	103.2	101	2.2	12	●
VAPDSSUSD1060	10.6	43.2	103.2	101	2.2	12	●
VAPDSSUSD1080	10.8	47.2	107.2	105	2.2	12	●
VAPDSSUSD1090	10.9	47.3	107.3	105	2.3	12	●
VAPDSSUSD1100	11.0	47.3	107.3	105	2.3	12	●
VAPDSSUSD1150	11.5	47.4	107.4	105	2.4	12	●
VAPDSSUSD1180	11.8	47.4	107.4	105	2.4	12	●
VAPDSSUSD1200	12.0	51.5	111.5	109	2.5	12	●
VAPDSSUSD1230	12.3	51.6	111.6	109	2.6	12	●
VAPDSSUSD1250	12.5	51.6	111.6	109	2.6	12	●
VAPDSSUSD1270	12.7	51.6	111.6	109	2.6	12	●
VAPDSSUSD1280	12.8	51.7	111.7	109	2.7	12	●
VAPDSSUSD1300	13.0	51.7	111.7	109	2.7	12	●
VAPDSSUSD1350	13.5	53.8	113.8	111	2.8	16	●
VAPDSSUSD1400	14.0	53.9	113.9	111	2.9	16	●
VAPDSSUSD1410	14.1	55.9	115.9	113	2.9	16	●
VAPDSSUSD1420	14.2	55.9	115.9	113	2.9	16	●
VAPDSSUSD1450	14.5	56.0	116.0	113	3.0	16	●
VAPDSSUSD1500	15.0	56.1	116.1	113	3.1	16	●
VAPDSSUSD1550	15.5	58.2	118.2	115	3.2	16	●
VAPDSSUSD1600	16.0	58.3	118.3	115	3.3	16	●
VAPDSSUSD1700	17.0	60.5	125.5	122	3.5	20	●
VAPDSSUSD1750	17.5	61.6	126.6	123	3.6	20	●
VAPDSSUSD1800	18.0	61.7	126.7	123	3.7	20	●
VAPDSSUSD2000	20.0	66.1	131.1	127	4.1	20	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N205

DRILLING(HSS TYPE)

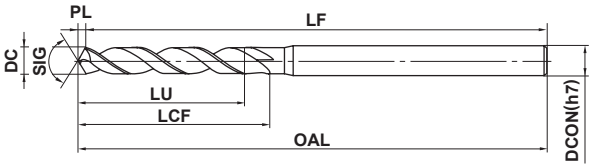
VAPDMSUS

Medium, High Precision, For Stainless Steel

CQ HSS | V | 118° DC<4 | 135° DC≥4 | X DC≥1

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	





*LU = LCF-2DC (Max 5×DC)

0.5≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

*All drills except those with intervals of 0.1mm and under dia. 4.0mm have a tolerance of 0—0.009mm.

●Violet coating combination enable high efficiency drilling and long tool life for drilling of stainless steel.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMSUSD0050	0.50	6.2	50.2	50	0.15	3	●
VAPDMSUSD0055	0.55	6.2	50.2	50	0.17	3	●
VAPDMSUSD0060	0.60	8.2	50.2	50	0.18	3	●
VAPDMSUSD0065	0.65	8.2	50.2	50	0.20	3	●
VAPDMSUSD0070	0.70	10.2	50.2	50	0.21	3	●
VAPDMSUSD0075	0.75	10.2	50.2	50	0.23	3	●
VAPDMSUSD0077	0.77	10.2	50.2	50	0.23	3	●
VAPDMSUSD0080	0.80	10.2	50.2	50	0.24	3	●
VAPDMSUSD0081	0.81	10.2	50.2	50	0.24	3	●
VAPDMSUSD0082	0.82	10.3	50.3	50	0.25	3	●
VAPDMSUSD0085	0.85	10.3	50.3	50	0.26	3	●
VAPDMSUSD0090	0.90	12.3	50.3	50	0.27	3	●
VAPDMSUSD0092	0.92	12.3	50.3	50	0.28	3	●
VAPDMSUSD0095	0.95	12.3	50.3	50	0.29	3	●
VAPDMSUSD0097	0.97	12.3	50.3	50	0.29	3	●
VAPDMSUSD0100	1.00	12.3	60.3	60	0.3	3	●
VAPDMSUSD0101	1.01	12.3	60.3	60	0.3	3	●
VAPDMSUSD0102	1.02	12.3	60.3	60	0.3	3	●
VAPDMSUSD0103	1.03	12.3	60.3	60	0.3	3	●
VAPDMSUSD0105	1.05	12.3	60.3	60	0.3	3	●
VAPDMSUSD0110	1.10	16.3	60.3	60	0.3	3	●
VAPDMSUSD0112	1.12	16.3	60.3	60	0.3	3	●
VAPDMSUSD0115	1.15	16.4	60.4	60	0.4	3	●
VAPDMSUSD0120	1.20	16.4	60.4	60	0.4	3	●
VAPDMSUSD0122	1.22	16.4	60.4	60	0.4	3	●
VAPDMSUSD0125	1.25	16.4	60.4	60	0.4	3	●
VAPDMSUSD0126	1.26	16.4	60.4	60	0.4	3	●
VAPDMSUSD0130	1.30	16.4	60.4	60	0.4	3	●
VAPDMSUSD0132	1.32	18.4	60.4	60	0.4	3	●
VAPDMSUSD0135	1.35	18.4	60.4	60	0.4	3	●
VAPDMSUSD0140	1.40	18.4	60.4	60	0.4	3	●
VAPDMSUSD0144	1.44	18.4	60.4	60	0.4	3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMSUSD0145	1.45	18.4	60.4	60	0.4	3	●
VAPDMSUSD0150	1.50	18.5	60.5	60	0.5	3	●
VAPDMSUSD0151	1.51	20.5	60.5	60	0.5	3	●
VAPDMSUSD0152	1.52	20.5	60.5	60	0.5	3	●
VAPDMSUSD0153	1.53	20.5	60.5	60	0.5	3	●
VAPDMSUSD0155	1.55	20.5	60.5	60	0.5	3	●
VAPDMSUSD0158	1.58	20.5	60.5	60	0.5	3	●
VAPDMSUSD0160	1.60	20.5	60.5	60	0.5	3	●
VAPDMSUSD0161	1.61	20.5	60.5	60	0.5	3	●
VAPDMSUSD0162	1.62	20.5	60.5	60	0.5	3	●
VAPDMSUSD0163	1.63	20.5	60.5	60	0.5	3	●
VAPDMSUSD0165	1.65	20.5	60.5	60	0.5	3	●
VAPDMSUSD0170	1.70	20.5	60.5	60	0.5	3	●
VAPDMSUSD0175	1.75	20.5	60.5	60	0.5	3	●
VAPDMSUSD0180	1.80	22.5	60.5	60	0.5	3	●
VAPDMSUSD0182	1.82	22.6	60.6	60	0.6	3	●
VAPDMSUSD0183	1.83	22.6	60.6	60	0.6	3	●
VAPDMSUSD0185	1.85	22.6	60.6	60	0.6	3	●
VAPDMSUSD0190	1.90	22.6	60.6	60	0.6	3	●
VAPDMSUSD0195	1.95	23.6	60.6	60	0.6	3	●
VAPDMSUSD0200	2.00	23.6	70.6	70	0.6	3	●
VAPDMSUSD0203	2.03	23.6	70.6	70	0.6	3	●
VAPDMSUSD0205	2.05	23.6	70.6	70	0.6	3	●
VAPDMSUSD0210	2.10	23.6	70.6	70	0.6	3	●
VAPDMSUSD0212	2.12	23.6	70.6	70	0.6	3	●
VAPDMSUSD0215	2.15	23.7	70.7	70	0.7	3	●
VAPDMSUSD0220	2.20	26.7	70.7	70	0.7	3	●
VAPDMSUSD0225	2.25	26.7	70.7	70	0.7	3	●
VAPDMSUSD0230	2.30	26.7	70.7	70	0.7	3	●
VAPDMSUSD0235	2.35	26.7	70.7	70	0.7	3	●
VAPDMSUSD0238	2.38	26.7	70.7	70	0.7	3	●
VAPDMSUSD0240	2.40	29.7	70.7	70	0.7	3	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMSUSD0243	2.43	29.7	70.7	70	0.7	3	●
VAPDMSUSD0245	2.45	29.7	70.7	70	0.7	3	●
VAPDMSUSD0248	2.48	29.8	70.8	70	0.8	3	●
VAPDMSUSD0250	2.50	29.8	70.8	70	0.8	3	●
VAPDMSUSD0255	2.55	29.8	70.8	70	0.8	3	●
VAPDMSUSD0260	2.60	29.8	70.8	70	0.8	3	●
VAPDMSUSD0262	2.62	29.8	70.8	70	0.8	3	●
VAPDMSUSD0265	2.65	29.8	70.8	70	0.8	3	●
VAPDMSUSD0270	2.70	32.8	70.8	70	0.8	3	●
VAPDMSUSD0275	2.75	32.8	70.8	70	0.8	3	●
VAPDMSUSD0278	2.78	32.8	70.8	70	0.8	3	●
VAPDMSUSD0280	2.80	32.8	70.8	70	0.8	3	●
VAPDMSUSD0285	2.85	32.9	70.9	70	0.9	3	●
VAPDMSUSD0290	2.90	32.9	70.9	70	0.9	3	●
VAPDMSUSD0295	2.95	32.9	70.9	70	0.9	3	●
VAPDMSUSD0298	2.98	32.9	70.9	70	0.9	3	●
VAPDMSUSD0300	3.00	32.9	70.9	70	0.9	3	●
VAPDMSUSD0301	3.01	35.9	85.9	85	0.9	4	●
VAPDMSUSD0302	3.02	35.9	85.9	85	0.9	4	●
VAPDMSUSD0303	3.03	35.9	85.9	85	0.9	4	●
VAPDMSUSD0305	3.05	35.9	85.9	85	0.9	4	●
VAPDMSUSD0310	3.10	35.9	85.9	85	0.9	4	●
VAPDMSUSD0315	3.15	36.0	86.0	85	1.0	4	●
VAPDMSUSD0320	3.20	36.0	86.0	85	1.0	4	●
VAPDMSUSD0325	3.25	36.0	86.0	85	1.0	4	●
VAPDMSUSD0330	3.30	36.0	86.0	85	1.0	4	●
VAPDMSUSD0333	3.33	39.0	86.0	85	1.0	4	●
VAPDMSUSD0335	3.35	39.0	86.0	85	1.0	4	●
VAPDMSUSD0340	3.40	39.0	86.0	85	1.0	4	●
VAPDMSUSD0345	3.45	39.0	86.0	85	1.0	4	●
VAPDMSUSD0350	3.50	39.1	86.1	85	1.1	4	●
VAPDMSUSD0355	3.55	39.1	86.1	85	1.1	4	●
VAPDMSUSD0360	3.60	39.1	86.1	85	1.1	4	●
VAPDMSUSD0365	3.65	39.1	86.1	85	1.1	4	●
VAPDMSUSD0367	3.67	39.1	86.1	85	1.1	4	●
VAPDMSUSD0368	3.68	39.1	86.1	85	1.1	4	●
VAPDMSUSD0370	3.70	39.1	86.1	85	1.1	4	●
VAPDMSUSD0372	3.72	43.1	86.1	85	1.1	4	●
VAPDMSUSD0380	3.80	43.1	86.1	85	1.1	4	●
VAPDMSUSD0390	3.90	43.2	86.2	85	1.2	4	●
VAPDMSUSD0396	3.96	43.2	86.2	85	1.2	4	●
VAPDMSUSD0400	4.00	42.8	85.8	85	0.8	4	●
VAPDMSUSD0405	4.05	42.8	100.8	100	0.8	6	●
VAPDMSUSD0410	4.10	42.9	100.9	100	0.9	6	●
VAPDMSUSD0420	4.20	42.9	100.9	100	0.9	6	●
VAPDMSUSD0425	4.25	46.9	100.9	100	0.9	6	●
VAPDMSUSD0430	4.30	46.9	100.9	100	0.9	6	●
VAPDMSUSD0440	4.40	46.9	100.9	100	0.9	6	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMSUSD0445	4.45	46.9	100.9	100	0.9	6	●
VAPDMSUSD0450	4.50	46.9	100.9	100	0.9	6	●
VAPDMSUSD0460	4.60	47.0	101.0	100	1.0	6	●
VAPDMSUSD0470	4.70	47.0	101.0	100	1.0	6	●
VAPDMSUSD0480	4.80	52.0	101.0	100	1.0	6	●
VAPDMSUSD0490	4.90	52.0	101.0	100	1.0	6	●
VAPDMSUSD0495	4.95	52.0	101.0	100	1.0	6	●
VAPDMSUSD0500	5.00	52.0	101.0	100	1.0	6	●
VAPDMSUSD0510	5.10	52.1	101.1	100	1.1	6	●
VAPDMSUSD0520	5.20	52.1	101.1	100	1.1	6	●
VAPDMSUSD0530	5.30	52.1	101.1	100	1.1	6	●
VAPDMSUSD0540	5.40	57.1	107.1	106	1.1	6	●
VAPDMSUSD0550	5.50	57.1	107.1	106	1.1	6	●
VAPDMSUSD0555	5.55	57.2	107.2	106	1.2	6	●
VAPDMSUSD0560	5.60	57.2	107.2	106	1.2	6	●
VAPDMSUSD0570	5.70	57.2	107.2	106	1.2	6	●
VAPDMSUSD0580	5.80	57.2	107.2	106	1.2	6	●
VAPDMSUSD0590	5.90	57.2	107.2	106	1.2	6	●
VAPDMSUSD0600	6.00	57.2	107.2	106	1.2	6	●
VAPDMSUSD0610	6.10	63.3	113.3	112	1.3	8	●
VAPDMSUSD0620	6.20	63.3	113.3	112	1.3	8	●
VAPDMSUSD0630	6.30	63.3	113.3	112	1.3	8	●
VAPDMSUSD0640	6.40	63.3	113.3	112	1.3	8	●
VAPDMSUSD0650	6.50	63.4	113.4	112	1.4	8	●
VAPDMSUSD0660	6.60	63.4	113.4	112	1.4	8	●
VAPDMSUSD0680	6.80	68.4	118.4	117	1.4	8	●
VAPDMSUSD0690	6.90	68.4	118.4	117	1.4	8	●
VAPDMSUSD0700	7.00	68.5	118.5	117	1.5	8	●
VAPDMSUSD0735	7.35	68.5	118.5	117	1.5	8	●
VAPDMSUSD0740	7.40	68.5	118.5	117	1.5	8	●
VAPDMSUSD0750	7.50	68.6	118.6	117	1.6	8	●
VAPDMSUSD0755	7.55	74.6	124.6	123	1.6	8	●
VAPDMSUSD0760	7.60	74.6	124.6	123	1.6	8	●
VAPDMSUSD0780	7.80	74.6	124.6	123	1.6	8	●
VAPDMSUSD0800	8.00	74.7	124.7	123	1.7	8	●
VAPDMSUSD0810	8.10	74.7	129.7	128	1.7	10	●
VAPDMSUSD0820	8.20	74.7	129.7	128	1.7	10	●
VAPDMSUSD0840	8.40	74.7	129.7	128	1.7	10	●
VAPDMSUSD0850	8.50	74.8	129.8	128	1.8	10	●
VAPDMSUSD0860	8.60	80.8	135.8	134	1.8	10	●
VAPDMSUSD0870	8.70	80.8	135.8	134	1.8	10	●
VAPDMSUSD0880	8.80	80.8	135.8	134	1.8	10	●
VAPDMSUSD0900	9.00	80.9	135.9	134	1.9	10	●
VAPDMSUSD0950	9.50	81.0	136.0	134	2.0	10	●
VAPDMSUSD0980	9.80	87.0	142.0	140	2.0	10	●
VAPDMSUSD1000	10.0	87.1	142.1	140	2.1	10	●
VAPDMSUSD1020	10.2	87.1	147.1	145	2.1	12	●
VAPDMSUSD1030	10.3	87.1	147.1	145	2.1	12	●

VAPDMSUS

Medium, High Precision, For Stainless Steel

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDMSUSD1040	10.4	87.2	147.2	145	2.2	12	●
VAPDMSUSD1050	10.5	87.2	147.2	145	2.2	12	●
VAPDMSUSD1100	11.0	94.3	154.3	152	2.3	12	●
VAPDMSUSD1150	11.5	94.4	154.4	152	2.4	12	●
VAPDMSUSD1200	12.0	101.5	161.5	159	2.5	12	●
VAPDMSUSD1250	12.5	101.6	161.6	159	2.6	12	●
VAPDMSUSD1300	13.0	101.7	161.7	159	2.7	12	●

● : Inventory maintained in Japan.

ISO13399 ➢ N002

VAPDSSUS VAPDMSUS

VIOLET DRILLS, High precision, For stainless steel, Short/medium

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Stainless Steel				Carbon Steel, Alloy Steel Cast Iron Copper, Copper Alloys		Structural Steel Aluminium Alloys	
	Austenitic AISI 304, AISI 316		Martensitic Ferritic AISI 430		AISI 1049, SCM, FC			
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	7600	0.01	8800	0.01	11250	0.01	15000	0.02
1.0	4800	0.02	6300	0.05	10000	0.05	12000	0.05
2.0	2400	0.04	3200	0.06	5500	0.09	6400	0.09
3.0	1600	0.07	2100	0.10	3700	0.13	4300	0.13
4.0	1200	0.09	1600	0.10	2800	0.15	3200	0.15
5.0	950	0.12	1300	0.13	2200	0.18	2600	0.18
6.0	800	0.14	1100	0.15	1800	0.20	2100	0.19
8.0	600	0.18	800	0.18	1400	0.22	1600	0.24
10.0	480	0.22	640	0.21	1100	0.25	1300	0.28
12.0	400	0.24	530	0.25	930	0.30	1100	0.34
13.0	370	0.26	490	0.28	860	0.32	1000	0.36
14.0	340	0.30	450	0.27	730	0.31	930	0.36
15.0	320	0.31	425	0.28	680	0.32	870	0.38
16.0	300	0.32	400	0.30	640	0.34	820	0.42
18.0	270	0.34	350	0.32	570	0.36	725	0.43
20.0	240	0.36	320	0.35	510	0.38	660	0.45

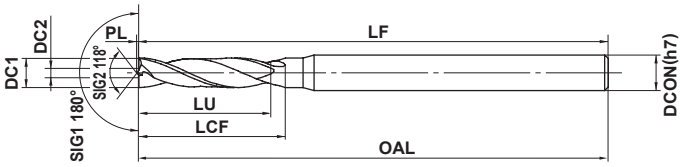
Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) For precipitation-hardened stainless steel (JIS SUS630 and SUS631), MVE, MVS and MMS are recommended.
Note 5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
Note 6) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.

VAPDSCB

Short Flute Length, High Precision, For Counter Boring

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC (Max 3×DC)

DC≤3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤32
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

●Unique geometry offers high efficiency counter boring.
Excellent chip breaking and flat counterbored surface.

Order Number	Dimensions (mm)							Stock
	DC1	DC2	LCF	OAL	LF	PL	DCON	
VAPDSCBD0200	2.0	0.7	12	60.2	60	0.2	3	●
VAPDSCBD0210	2.1	0.7	12	60.2	60	0.2	3	●
VAPDSCBD0220	2.2	0.7	12	60.2	60	0.2	3	●
VAPDSCBD0230	2.3	0.7	13	60.2	60	0.2	3	●
VAPDSCBD0240	2.4	0.7	13	60.2	60	0.2	3	●
VAPDSCBD0250	2.5	0.7	13	60.2	60	0.2	3	●
VAPDSCBD0260	2.6	0.8	15	60.2	60	0.2	3	●
VAPDSCBD0270	2.7	0.8	15	60.2	60	0.2	3	●
VAPDSCBD0280	2.8	0.8	15	60.2	60	0.2	3	●
VAPDSCBD0290	2.9	0.8	15	60.2	60	0.2	3	●
VAPDSCBD0300	3.0	0.8	15	60.2	60	0.2	3	●
VAPDSCBD0310	3.1	0.8	17	70.2	70	0.2	4	●
VAPDSCBD0320	3.2	0.8	17	70.2	70	0.2	4	●
VAPDSCBD0330	3.3	0.8	19	70.2	70	0.2	4	●
VAPDSCBD0340	3.4	0.8	19	70.2	70	0.2	4	●
VAPDSCBD0350	3.5	0.8	19	70.2	70	0.2	4	●
VAPDSCBD0360	3.6	1.0	21	70.2	70	0.2	4	●
VAPDSCBD0370	3.7	1.0	21	70.2	70	0.2	4	●
VAPDSCBD0380	3.8	1.0	21	70.2	70	0.2	4	●
VAPDSCBD0390	3.9	1.0	21	70.2	70	0.2	4	●
VAPDSCBD0400	4.0	1.0	21	70.3	70	0.3	4	●
VAPDSCBD0410	4.1	1.0	21	80.3	80	0.3	6	●
VAPDSCBD0420	4.2	1.0	21	80.3	80	0.3	6	●
VAPDSCBD0430	4.3	1.0	23	80.3	80	0.3	6	●
VAPDSCBD0440	4.4	1.0	23	80.3	80	0.3	6	●
VAPDSCBD0450	4.5	1.0	23	80.3	80	0.3	6	●
VAPDSCBD0460	4.6	1.4	25	80.3	80	0.3	6	●
VAPDSCBD0470	4.7	1.4	25	80.3	80	0.3	6	●
VAPDSCBD0480	4.8	1.4	25	80.3	80	0.3	6	●
VAPDSCBD0490	4.9	1.4	25	80.3	80	0.3	6	●
VAPDSCBD0500	5.0	1.4	25	80.4	80	0.4	6	●
VAPDSCBD0510	5.1	1.4	25	80.4	80	0.4	6	●
VAPDSCBD0520	5.2	1.4	25	80.4	80	0.4	6	●
VAPDSCBD0530	5.3	1.4	25	80.4	80	0.4	6	●
VAPDSCBD0540	5.4	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0550	5.5	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0560	5.6	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0570	5.7	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0580	5.8	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0590	5.9	1.4	27	80.4	80	0.4	6	●

Order Number	Dimensions (mm)							Stock
	DC1	DC2	LCF	OAL	LF	PL	DCON	
VAPDSCBD0600	6.0	1.4	27	80.4	80	0.4	6	●
VAPDSCBD0610	6.1	1.4	30	80.4	80	0.4	8	●
VAPDSCBD0620	6.2	1.4	30	80.4	80	0.4	8	●
VAPDSCBD0630	6.3	1.4	30	80.4	80	0.4	8	●
VAPDSCBD0640	6.4	1.4	30	80.4	80	0.4	8	●
VAPDSCBD0650	6.5	1.4	30	80.4	80	0.4	8	●
VAPDSCBD0660	6.6	1.8	30	80.4	80	0.4	8	●
VAPDSCBD0670	6.7	1.8	30	80.4	80	0.4	8	●
VAPDSCBD0680	6.8	1.8	32	80.4	80	0.4	8	●
VAPDSCBD0690	6.9	1.8	32	80.4	80	0.4	8	●
VAPDSCBD0700	7.0	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0710	7.1	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0720	7.2	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0730	7.3	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0740	7.4	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0750	7.5	1.8	32	80.6	80	0.6	8	●
VAPDSCBD0760	7.6	2.0	35	85.6	85	0.6	8	●
VAPDSCBD0770	7.7	2.0	35	85.6	85	0.6	8	●
VAPDSCBD0780	7.8	2.0	35	85.6	85	0.6	8	●
VAPDSCBD0790	7.9	2.0	35	85.6	85	0.6	8	●
VAPDSCBD0800	8.0	2.0	35	85.6	85	0.6	8	●
VAPDSCBD0810	8.1	2.0	35	90.6	90	0.6	10	●
VAPDSCBD0850	8.5	2.0	35	90.6	90	0.6	10	●
VAPDSCBD0860	8.6	2.8	38	93.6	93	0.6	10	●
VAPDSCBD0880	8.8	2.8	38	93.6	93	0.6	10	●
VAPDSCBD0900	9.0	2.8	38	93.8	93	0.8	10	●
VAPDSCBD0910	9.1	2.8	38	93.8	93	0.8	10	●
VAPDSCBD0950	9.5	2.8	38	93.8	93	0.8	10	●
VAPDSCBD0960	9.6	3.2	41	96.8	96	0.8	10	●
VAPDSCBD0980	9.8	3.2	41	96.8	96	0.8	10	●
VAPDSCBD1000	10.0	3.2	41	96.9	96	0.9	10	●
VAPDSCBD1010	10.1	3.2	41	101.9	101	0.9	12	●
VAPDSCBD1030	10.3	3.2	41	101.9	101	0.9	12	●
VAPDSCBD1050	10.5	3.2	41	101.9	101	0.9	12	●
VAPDSCBD1080	10.8	3.7	45	105.9	105	0.9	12	●
VAPDSCBD1100	11.0	3.7	45	105.9	105	0.9	12	●
VAPDSCBD1110	11.1	3.7	45	105.9	105	0.9	12	●
VAPDSCBD1150	11.5	3.7	45	105.9	105	0.9	12	●
VAPDSCBD1180	11.8	3.7	45	105.9	105	0.9	12	●
VAPDSCBD1200	12.0	3.7	49	109.9	109	0.9	12	●

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Order Number	Dimensions (mm)							Stock
	DC1	DC2	LCF	OAL	LF	PL	DCON	
VAPDSCBD1250	12.5	3.7	49	109.9	109	0.9	12	●
VAPDSCBD1300	13.0	4.2	49	110.1	109	1.1	12	●
VAPDSCBD1350	13.5	4.2	51	122.1	121	1.1	16	●
VAPDSCBD1380	13.8	4.2	51	122.1	121	1.1	16	●
VAPDSCBD1400	14.0	4.2	51	122.1	121	1.1	16	●
VAPDSCBD1410	14.1	5.5	58	124.1	123	1.1	16	●
VAPDSCBD1420	14.2	5.5	58	124.1	123	1.1	16	●
VAPDSCBD1450	14.5	5.5	58	124.1	123	1.1	16	●
VAPDSCBD1480	14.8	5.5	58	124.1	123	1.1	16	●
VAPDSCBD1500	15.0	5.5	58	124.3	123	1.3	16	●
VAPDSCBD1550	15.5	5.5	60	126.3	125	1.3	16	●
VAPDSCBD1570	15.7	5.5	60	126.3	125	1.3	16	●
VAPDSCBD1580	15.8	5.5	60	126.3	125	1.3	16	●
VAPDSCBD1600	16.0	5.5	60	126.3	125	1.3	16	●
VAPDSCBD1700	17.0	5.5	62	133.3	132	1.3	20	●
VAPDSCBD1750	17.5	5.5	63	134.6	133	1.6	20	●
VAPDSCBD1760	17.6	6.5	63	134.6	133	1.6	20	●
VAPDSCBD1770	17.7	6.5	63	134.6	133	1.6	20	●
VAPDSCBD1780	17.8	6.5	63	134.6	133	1.6	20	●
VAPDSCBD1800	18.0	6.5	63	134.6	133	1.6	20	●

Order Number	Dimensions (mm)							Stock
	DC1	DC2	LCF	OAL	LF	PL	DCON	
VAPDSCBD1810	18.1	6.5	65	136.6	135	1.6	20	●
VAPDSCBD1900	19.0	6.5	65	136.6	135	1.6	20	●
VAPDSCBD1980	19.8	7.5	67	138.6	137	1.6	20	●
VAPDSCBD2000	20.0	7.5	67	138.8	137	1.8	20	●
VAPDSCBD2010	20.1	7.5	67	138.8	137	1.8	20	●
VAPDSCBD2100	21.0	7.5	75	166.8	165	1.8	25	●
VAPDSCBD2200	22.0	7.5	75	166.8	165	1.8	25	●
VAPDSCBD2300	23.0	7.5	80	171.8	170	1.8	25	●
VAPDSCBD2400	24.0	8.5	80	172.2	170	2.2	25	●
VAPDSCBD2500	25.0	8.5	85	182.2	180	2.2	25	●
VAPDSCBD2600	26.0	9.0	85	182.2	180	2.2	32	●
VAPDSCBD2700	27.0	9.0	95	192.2	190	2.2	32	●
VAPDSCBD2800	28.0	10.0	95	192.6	190	2.6	32	●
VAPDSCBD2900	29.0	10.0	100	197.6	195	2.6	32	●
VAPDSCBD3000	30.0	11.0	100	197.6	195	2.6	32	●
VAPDSCBD3100	31.0	11.0	105	202.6	200	2.6	32	●
VAPDSCBD3200	32.0	13.0	105	202.6	200	2.6	32	●

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel Aluminium Alloys		Carbon Steel, Alloy Steel Cast Iron AISI 1049, SCM, FCD		Alloy Tool Steel (Low-hardness Materials) Ferritic Stainless Steel Martensitic Stainless Steel AISI D2, AISI 430, AISI 405, AISI 420, AISI 440		Alloy Tool Steel (−40HRC) Precipitation-Hardening Stainless Steel AISI H13, ASTM 630, ASTM 631	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
2.0	5600	0.07	4800	0.07	3200	0.07	2800	0.04
3.0	3700	0.10	3200	0.10	2100	0.10	1900	0.05
4.0	2800	0.12	2400	0.12	1600	0.12	1400	0.06
5.0	2200	0.14	1900	0.14	1300	0.14	1150	0.07
6.0	1850	0.15	1600	0.15	1050	0.15	950	0.08
8.0	1400	0.20	1200	0.20	800	0.20	720	0.10
10.0	1100	0.23	960	0.23	640	0.21	570	0.11
12.0	950	0.26	800	0.26	530	0.24	470	0.12
14.0	800	0.27	680	0.27	450	0.25	410	0.13
16.0	700	0.28	500	0.28	360	0.26	300	0.14
18.0	620	0.29	450	0.29	320	0.27	260	0.15
20.0	560	0.30	400	0.30	290	0.27	240	0.15
22.0	510	0.32	360	0.32	260	0.29	220	0.16
24.0	460	0.33	330	0.33	240	0.30	200	0.16
26.0	430	0.35	310	0.35	220	0.31	180	0.17
28.0	400	0.36	290	0.36	210	0.33	170	0.18
30.0	370	0.37	270	0.37	190	0.34	160	0.18
32.0	350	0.38	250	0.38	180	0.35	150	0.19

Note 1) The cutting conditions table above assumes that the hole depth is DC×3 and there is no preprepared hole. If the depth of the hole is DC×1 or less, it is possible to increase the rotation speed by around 1.2 times.
Note 2) Machining without a pilot hole is recommended. If there is a pilot hole, the chips will not split properly. If chip breakage is required, use step machining.
Note 3) For counter boring of a sloped face, a carbide end mill is recommended.
Note 4) When machining austenitic stainless steel (JIS SUS304, SUS316), set the revolution at 40%-70% and the feed rate 40%-60%.
Note 5) Please use a collet type drill chuck or a milling chuck.
Note 6) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 7) Use sufficient cutting fluid.
Note 8) The above-mentioned cutting conditions are standard when using water-insoluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.

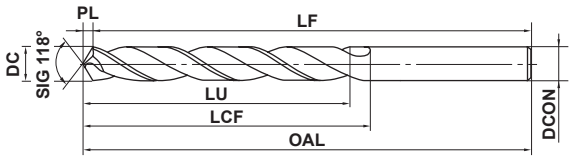
DRILLING(HSS TYPE)

VSD
Straight shank

HSS | V | 110° | 118° | X | XR
DC<0.7 | DC≥0.7 | DC<2 | DC≥2

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

0.5≤DC<1	1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.010	0 −0.014	0 −0.018	0 −0.022	0 −0.027

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VSDD0050	0.5	6.2	27.2	27	0.18	0.5	●
VSDD0060	0.6	7.2	30.2	30	0.21	0.6	●
VSDD0070	0.7	9.2	32.2	32	0.21	0.7	●
VSDD0080	0.8	10.2	34.2	34	0.24	0.8	●
VSDD0090	0.9	11.3	36.3	36	0.27	0.9	●
VSDD0100	1.0	12.3	40.3	40	0.3	1.0	●
VSDD0110	1.1	14.3	42.3	42	0.3	1.1	●
VSDD0120	1.2	16.4	42.4	42	0.4	1.2	●
VSDD0130	1.3	16.4	45.4	45	0.4	1.3	●
VSDD0140	1.4	18.4	48.4	48	0.4	1.4	●
VSDD0150	1.5	18.5	48.5	48	0.5	1.5	●
VSDD0160	1.6	20.5	50.5	50	0.5	1.6	●
VSDD0170	1.7	20.5	50.5	50	0.5	1.7	●
VSDD0180	1.8	22.5	52.5	52	0.5	1.8	●
VSDD0190	1.9	22.6	52.6	52	0.6	1.9	●
VSDD0200	2.0	23.6	55.6	55	0.6	2.0	●
VSDD0210	2.1	23.6	55.6	55	0.6	2.1	●
VSDD0220	2.2	26.7	58.7	58	0.7	2.2	●
VSDD0230	2.3	26.7	58.7	58	0.7	2.3	●
VSDD0240	2.4	29.7	61.7	61	0.7	2.4	●
VSDD0250	2.5	29.8	61.8	61	0.8	2.5	●
VSDD0260	2.6	29.8	64.8	64	0.8	2.6	●
VSDD0270	2.7	32.8	64.8	64	0.8	2.7	●
VSDD0280	2.8	32.8	67.8	67	0.8	2.8	●
VSDD0290	2.9	32.9	71.9	71	0.9	2.9	●
VSDD0300	3.0	32.9	71.9	71	0.9	3.0	●
VSDD0310	3.1	35.9	71.9	71	0.9	3.1	●
VSDD0320	3.2	36.0	72.0	71	1.0	3.2	●
VSDD0330	3.3	36.0	74.0	73	1.0	3.3	●
VSDD0340	3.4	39.0	74.0	73	1.0	3.4	●
VSDD0350	3.5	39.1	74.1	73	1.1	3.5	●
VSDD0360	3.6	39.1	77.1	76	1.1	3.6	●
VSDD0370	3.7	39.1	77.1	76	1.1	3.7	●
VSDD0380	3.8	43.1	77.1	76	1.1	3.8	●
VSDD0390	3.9	43.2	80.2	79	1.2	3.9	●
VSDD0400	4.0	43.2	84.2	83	1.2	4.0	●
VSDD0410	4.1	43.2	84.2	83	1.2	4.1	●
VSDD0420	4.2	43.3	84.3	83	1.3	4.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VSDD0430	4.3	47.3	84.3	83	1.3	4.3	●
VSDD0440	4.4	47.3	87.3	86	1.3	4.4	●
VSDD0450	4.5	47.4	87.4	86	1.4	4.5	●
VSDD0460	4.6	47.4	87.4	86	1.4	4.6	●
VSDD0470	4.7	47.4	90.4	89	1.4	4.7	●
VSDD0480	4.8	52.4	90.4	89	1.4	4.8	●
VSDD0490	4.9	52.5	93.5	92	1.5	4.9	●
VSDD0500	5.0	52.5	93.5	92	1.5	5.0	●
VSDD0510	5.1	52.5	93.5	92	1.5	5.1	●
VSDD0520	5.2	52.6	96.6	95	1.6	5.2	●
VSDD0530	5.3	52.6	96.6	95	1.6	5.3	●
VSDD0540	5.4	57.6	96.6	95	1.6	5.4	●
VSDD0550	5.5	57.7	96.7	95	1.7	5.5	●
VSDD0560	5.6	57.7	99.7	98	1.7	5.6	●
VSDD0570	5.7	57.7	99.7	98	1.7	5.7	●
VSDD0580	5.8	57.7	99.7	98	1.7	5.8	●
VSDD0590	5.9	57.8	99.8	98	1.8	5.9	●
VSDD0600	6.0	57.8	103.8	102	1.8	6.0	●
VSDD0610	6.1	63.8	103.8	102	1.8	6.1	●
VSDD0620	6.2	63.9	103.9	102	1.9	6.2	●
VSDD0630	6.3	63.9	103.9	102	1.9	6.3	●
VSDD0640	6.4	63.9	106.9	105	1.9	6.4	●
VSDD0650	6.5	64.0	107.0	105	2.0	6.5	●
VSDD0660	6.6	64.0	107.0	105	2.0	6.6	●
VSDD0670	6.7	64.0	107.0	105	2.0	6.7	●
VSDD0680	6.8	69.0	107.0	105	2.0	6.8	●
VSDD0690	6.9	69.1	107.1	105	2.1	6.9	●
VSDD0700	7.0	69.1	107.1	105	2.1	7.0	●
VSDD0710	7.1	69.1	110.1	108	2.1	7.1	●
VSDD0720	7.2	69.2	110.2	108	2.2	7.2	●
VSDD0730	7.3	69.2	110.2	108	2.2	7.3	●
VSDD0740	7.4	69.2	113.2	111	2.2	7.4	●
VSDD0750	7.5	69.3	113.3	111	2.3	7.5	●
VSDD0760	7.6	75.3	113.3	111	2.3	7.6	●
VSDD0770	7.7	75.3	116.3	114	2.3	7.7	●
VSDD0780	7.8	75.3	116.3	114	2.3	7.8	●
VSDD0790	7.9	75.4	116.4	114	2.4	7.9	●
VSDD0800	8.0	75.4	116.4	114	2.4	8.0	●

Note 1) Less than ø5-ø1.9mm : 5 pcs/case, More than ø2mm : 1 pcs/case.

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VSDD0810	8.1	75.4	119.4	117	2.4	8.1	●
VSDD0820	8.2	75.5	119.5	117	2.5	8.2	●
VSDD0830	8.3	75.5	119.5	117	2.5	8.3	●
VSDD0840	8.4	75.5	123.5	121	2.5	8.4	●
VSDD0850	8.5	75.6	123.6	121	2.6	8.5	●
VSDD0860	8.6	81.6	123.6	121	2.6	8.6	●
VSDD0870	8.7	81.6	123.6	121	2.6	8.7	●
VSDD0880	8.8	81.6	126.6	124	2.6	8.8	●
VSDD0890	8.9	81.7	126.7	124	2.7	8.9	●
VSDD0900	9.0	81.7	126.7	124	2.7	9.0	●
VSDD0910	9.1	81.7	126.7	124	2.7	9.1	●
VSDD0920	9.2	81.8	129.8	127	2.8	9.2	●
VSDD0930	9.3	81.8	129.8	127	2.8	9.3	●
VSDD0940	9.4	81.8	129.8	127	2.8	9.4	●
VSDD0950	9.5	81.9	129.9	127	2.9	9.5	●
VSDD0960	9.6	87.9	132.9	130	2.9	9.6	●
VSDD0970	9.7	87.9	132.9	130	2.9	9.7	●
VSDD0980	9.8	87.9	132.9	130	2.9	9.8	●
VSDD0990	9.9	88.0	133.0	130	3.0	9.9	●
VSDD1000	10.0	88.0	133.0	130	3.0	10.0	●
VSDD1010	10.1	88.0	136.0	133	3.0	10.1	●
VSDD1020	10.2	88.1	136.1	133	3.1	10.2	●
VSDD1030	10.3	88.1	136.1	133	3.1	10.3	●
VSDD1040	10.4	88.1	136.1	133	3.1	10.4	●
VSDD1050	10.5	88.2	140.2	137	3.2	10.5	●
VSDD1060	10.6	88.2	140.2	137	3.2	10.6	●
VSDD1070	10.7	95.2	140.2	137	3.2	10.7	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VSDD1080	10.8	95.2	143.2	140	3.2	10.8	●
VSDD1090	10.9	95.3	143.3	140	3.3	10.9	●
VSDD1100	11.0	95.3	143.3	140	3.3	11.0	●
VSDD1110	11.1	95.3	143.3	140	3.3	11.1	●
VSDD1120	11.2	95.4	146.4	143	3.4	11.2	●
VSDD1130	11.3	95.4	146.4	143	3.4	11.3	●
VSDD1140	11.4	95.4	146.4	143	3.4	11.4	●
VSDD1150	11.5	95.5	146.5	143	3.5	11.5	●
VSDD1160	11.6	95.5	149.5	146	3.5	11.6	●
VSDD1170	11.7	95.5	149.5	146	3.5	11.7	●
VSDD1180	11.8	95.5	149.5	146	3.5	11.8	●
VSDD1190	11.9	102.6	149.6	146	3.6	11.9	●
VSDD1200	12.0	102.6	152.6	149	3.6	12.0	●
VSDD1210	12.1	102.6	152.6	149	3.6	12.1	●
VSDD1220	12.2	102.7	152.7	149	3.7	12.2	●
VSDD1230	12.3	102.7	152.7	149	3.7	12.3	●
VSDD1240	12.4	102.7	155.7	152	3.7	12.4	●
VSDD1250	12.5	102.8	155.8	152	3.8	12.5	●
VSDD1260	12.6	102.8	155.8	152	3.8	12.6	●
VSDD1270	12.7	102.8	155.8	152	3.8	12.7	●
VSDD1280	12.8	102.8	155.8	152	3.8	12.8	●
VSDD1290	12.9	102.9	155.9	152	3.9	12.9	●
VSDD1300	13.0	102.9	155.9	152	3.9	13.0	●

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel		Carbon Steel AISI 1049		Stainless Steel AISI 420		Stainless Steel, Tool Steel (Low-hardness Materials) Heat-treated Steel (−40HRC) AISI 304, AISI D2, AISI H13	
Cutting Speed	40m/min		30m/min		20m/min		10−14m/min	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	15000	0.01	11250	0.01	7500	0.01	5620	0.01
1.0	10000	0.02	7500	0.02	5000	0.02	3750	0.02
1.5	8200	0.03	6150	0.03	4100	0.03	2800	0.03
2.0	6370	0.05	4780	0.05	3180	0.05	2200	0.04
3.0	4250	0.10	3180	0.10	2120	0.07	1400	0.06
4.0	3180	0.13	2390	0.13	1590	0.09	1100	0.08
5.0	2550	0.15	1910	0.15	1270	0.11	860	0.10
6.0	2120	0.18	1590	0.18	1060	0.13	720	0.11
7.0	1820	0.20	1360	0.20	910	0.14	610	0.12
8.0	1590	0.22	1190	0.21	800	0.15	540	0.13
9.0	1420	0.24	1060	0.22	710	0.17	480	0.14
10.0	1270	0.26	960	0.23	640	0.18	430	0.15
11.0	1160	0.28	870	0.24	580	0.19	390	0.16
12.0	1060	0.30	800	0.25	530	0.20	360	0.17
13.0	980	0.30	730	0.26	490	0.20	330	0.17

Note 1) Please reduce the revolution depending on drilling situation when the application lacks rigidity.
Note 2) Please use step drilling and reduce the cutting conditions in the case when the drilling depth exceeds DC×3.
Note 3) The above-mentioned cutting conditions are standard when using water-soluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.

DRILLING(HSS TYPE)

GSD

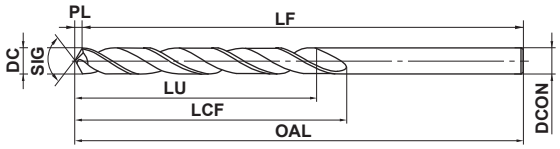
TiN, Straight Shank

HSS | G | 110° | 118° | X | XR

DC<0.7 | DC≥0.7 | DC<2 | DC≥2

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

0.5≤DC<1	1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.010	0 −0.014	0 −0.018	0 −0.022	0 −0.027

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GSDD0050	0.5	6.2	27.2	27	0.18	0.5	●
GSDD0060	0.6	7.2	30.2	30	0.21	0.6	●
GSDD0070	0.7	9.2	32.2	32	0.21	0.7	●
GSDD0080	0.8	10.2	34.2	34	0.24	0.8	●
GSDD0090	0.9	11.3	36.3	36	0.27	0.9	●
GSDD0100	1.0	12.3	40.3	40	0.3	1.0	●
GSDD0110	1.1	14.3	42.3	42	0.3	1.1	●
GSDD0120	1.2	16.4	42.4	42	0.4	1.2	●
GSDD0130	1.3	16.4	45.4	45	0.4	1.3	●
GSDD0140	1.4	18.4	48.4	48	0.4	1.4	●
GSDD0150	1.5	18.5	48.5	48	0.5	1.5	●
GSDD0160	1.6	20.5	50.5	50	0.5	1.6	●
GSDD0170	1.7	20.5	50.5	50	0.5	1.7	●
GSDD0180	1.8	22.5	52.5	52	0.5	1.8	●
GSDD0190	1.9	22.6	52.6	52	0.6	1.9	●
GSDD0200	2.0	23.6	55.6	55	0.6	2.0	●
GSDD0210	2.1	23.6	55.6	55	0.6	2.1	●
GSDD0220	2.2	26.7	58.7	58	0.7	2.2	●
GSDD0230	2.3	26.7	58.7	58	0.7	2.3	●
GSDD0240	2.4	29.7	61.7	61	0.7	2.4	●
GSDD0250	2.5	29.8	61.8	61	0.8	2.5	●
GSDD0260	2.6	29.8	64.8	64	0.8	2.6	●
GSDD0270	2.7	32.8	64.8	64	0.8	2.7	●
GSDD0280	2.8	32.8	67.8	67	0.8	2.8	●
GSDD0290	2.9	32.9	71.9	71	0.9	2.9	●
GSDD0300	3.0	32.9	71.9	71	0.9	3.0	●
GSDD0310	3.1	35.9	71.9	71	0.9	3.1	●
GSDD0320	3.2	36.0	72.0	71	1.0	3.2	●
GSDD0330	3.3	36.0	74.0	73	1.0	3.3	●
GSDD0340	3.4	39.0	74.0	73	1.0	3.4	●
GSDD0350	3.5	39.1	74.1	73	1.1	3.5	●
GSDD0360	3.6	39.1	77.1	76	1.1	3.6	●
GSDD0370	3.7	39.1	77.1	76	1.1	3.7	●
GSDD0380	3.8	43.1	77.1	76	1.1	3.8	●
GSDD0390	3.9	43.2	80.2	79	1.2	3.9	●
GSDD0400	4.0	43.2	84.2	83	1.2	4.0	●
GSDD0410	4.1	43.2	84.2	83	1.2	4.1	●
GSDD0420	4.2	43.3	84.3	83	1.3	4.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GSDD0430	4.3	47.3	84.3	83	1.3	4.3	●
GSDD0440	4.4	47.3	87.3	86	1.3	4.4	●
GSDD0450	4.5	47.4	87.4	86	1.4	4.5	●
GSDD0460	4.6	47.4	87.4	86	1.4	4.6	●
GSDD0470	4.7	47.4	90.4	89	1.4	4.7	●
GSDD0480	4.8	52.4	90.4	89	1.4	4.8	●
GSDD0490	4.9	52.5	93.5	92	1.5	4.9	●
GSDD0500	5.0	52.5	93.5	92	1.5	5.0	●
GSDD0510	5.1	52.5	93.5	92	1.5	5.1	●
GSDD0520	5.2	52.6	96.6	95	1.6	5.2	●
GSDD0530	5.3	52.6	96.6	95	1.6	5.3	●
GSDD0540	5.4	57.6	96.6	95	1.6	5.4	●
GSDD0550	5.5	57.7	96.7	95	1.7	5.5	●
GSDD0560	5.6	57.7	99.7	98	1.7	5.6	●
GSDD0570	5.7	57.7	99.7	98	1.7	5.7	●
GSDD0580	5.8	57.7	99.7	98	1.7	5.8	●
GSDD0590	5.9	57.8	99.8	98	1.8	5.9	●
GSDD0600	6.0	57.8	103.8	102	1.8	6.0	●
GSDD0610	6.1	63.8	103.8	102	1.8	6.1	●
GSDD0620	6.2	63.9	103.9	102	1.9	6.2	●
GSDD0630	6.3	63.9	103.9	102	1.9	6.3	●
GSDD0640	6.4	63.9	106.9	105	1.9	6.4	●
GSDD0650	6.5	64.0	107.0	105	2.0	6.5	●
GSDD0660	6.6	64.0	107.0	105	2.0	6.6	●
GSDD0670	6.7	64.0	107.0	105	2.0	6.7	●
GSDD0680	6.8	69.0	107.0	105	2.0	6.8	●
GSDD0690	6.9	69.1	107.1	105	2.1	6.9	●
GSDD0700	7.0	69.1	107.1	105	2.1	7.0	●
GSDD0710	7.1	69.1	110.1	108	2.1	7.1	●
GSDD0720	7.2	69.2	110.2	108	2.2	7.2	●
GSDD0730	7.3	69.2	110.2	108	2.2	7.3	●
GSDD0740	7.4	69.2	113.2	111	2.2	7.4	●
GSDD0750	7.5	69.3	113.3	111	2.3	7.5	●
GSDD0760	7.6	75.3	113.3	111	2.3	7.6	●
GSDD0770	7.7	75.3	116.3	114	2.3	7.7	●
GSDD0780	7.8	75.3	116.3	114	2.3	7.8	●
GSDD0790	7.9	75.4	116.4	114	2.4	7.9	●
GSDD0800	8.0	75.4	116.4	114	2.4	8.0	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GSDD0810	8.1	75.4	119.4	117	2.4	8.1	●
GSDD0820	8.2	75.5	119.5	117	2.5	8.2	●
GSDD0830	8.3	75.5	119.5	117	2.5	8.3	●
GSDD0840	8.4	75.5	123.5	121	2.5	8.4	●
GSDD0850	8.5	75.6	123.6	121	2.6	8.5	●
GSDD0860	8.6	81.6	123.6	121	2.6	8.6	●
GSDD0870	8.7	81.6	123.6	121	2.6	8.7	●
GSDD0880	8.8	81.6	126.6	124	2.6	8.8	●
GSDD0890	8.9	81.7	126.7	124	2.7	8.9	●
GSDD0900	9.0	81.7	126.7	124	2.7	9.0	●
GSDD0910	9.1	81.7	126.7	124	2.7	9.1	●
GSDD0920	9.2	81.8	129.8	127	2.8	9.2	●
GSDD0930	9.3	81.8	129.8	127	2.8	9.3	●
GSDD0940	9.4	81.8	129.8	127	2.8	9.4	●
GSDD0950	9.5	81.9	129.9	127	2.9	9.5	●
GSDD0960	9.6	87.9	132.9	130	2.9	9.6	●
GSDD0970	9.7	87.9	132.9	130	2.9	9.7	●
GSDD0980	9.8	87.9	132.9	130	2.9	9.8	●
GSDD0990	9.9	88.0	133.0	130	3.0	9.9	●
GSDD1000	10.0	88.0	133.0	130	3.0	10.0	●
GSDD1010	10.1	88.0	136.0	133	3.0	10.1	●
GSDD1020	10.2	88.1	136.1	133	3.1	10.2	●
GSDD1030	10.3	88.1	136.1	133	3.1	10.3	●
GSDD1040	10.4	88.1	136.1	133	3.1	10.4	●
GSDD1050	10.5	88.2	140.2	137	3.2	10.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GSDD1060	10.6	88.2	140.2	137	3.2	10.6	●
GSDD1070	10.7	95.2	140.2	137	3.2	10.7	●
GSDD1080	10.8	95.2	143.2	140	3.2	10.8	●
GSDD1090	10.9	95.3	143.3	140	3.3	10.9	●
GSDD1100	11.0	95.3	143.3	140	3.3	11.0	●
GSDD1110	11.1	95.3	143.3	140	3.3	11.1	●
GSDD1120	11.2	95.4	146.4	143	3.4	11.2	●
GSDD1130	11.3	95.4	146.4	143	3.4	11.3	●
GSDD1140	11.4	95.4	146.4	143	3.4	11.4	●
GSDD1150	11.5	95.5	146.5	143	3.5	11.5	●
GSDD1160	11.6	95.5	149.5	146	3.5	11.6	●
GSDD1170	11.7	95.5	149.5	146	3.5	11.7	●
GSDD1180	11.8	95.6	149.6	146	3.6	11.8	●
GSDD1190	11.9	102.6	149.6	146	3.6	11.9	●
GSDD1200	12.0	102.6	152.6	149	3.6	12.0	●
GSDD1210	12.1	102.6	152.6	149	3.6	12.1	●
GSDD1220	12.2	102.7	152.7	149	3.7	12.2	●
GSDD1230	12.3	102.7	152.7	149	3.7	12.3	●
GSDD1240	12.4	102.7	155.7	152	3.7	12.4	●
GSDD1250	12.5	102.8	155.8	152	3.8	12.5	●
GSDD1260	12.6	102.8	155.8	152	3.8	12.6	●
GSDD1270	12.7	102.8	155.8	152	3.8	12.7	●
GSDD1280	12.8	102.9	155.9	152	3.9	12.8	●
GSDD1290	12.9	102.9	155.9	152	3.9	12.9	●
GSDD1300	13.0	102.9	155.9	152	3.9	13.0	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

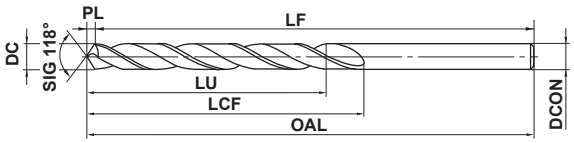
DRILLING(HSS TYPE)

SD

Straight Shank

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

0.2≤DC<1	1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤17.5
0 −0.012	0 −0.014	0 −0.018	0 −0.022	0 −0.027

●For general drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD0020	0.2	2.6	19.1	19	0.06	0.2	●
SDD0030	0.3	3.1	19.1	19	0.09	0.3	●
SDD0040	0.4	5.1	20.1	20	0.12	0.4	●
SDD0050	0.5	6.2	22.2	22	0.15	0.5	●
SDD0060	0.6	7.2	24.2	24	0.18	0.6	●
SDD0070	0.7	10.2	32.2	32	0.21	0.7	●
SDD0080	0.8	11.2	34.2	34	0.24	0.8	●
SDD0090	0.9	13.3	36.3	36	0.27	0.9	●
SDD0100	1.0	18.3	40.3	40	0.3	1.0	●
SDD0110	1.1	20.3	42.3	42	0.3	1.1	●
SDD0120	1.2	20.4	42.4	42	0.4	1.2	●
SDD0130	1.3	22.4	45.4	45	0.4	1.3	●
SDD0140	1.4	23.4	48.4	48	0.4	1.4	●
SDD0150	1.5	23.5	48.5	48	0.5	1.5	●
SDD0160	1.6	25.5	50.5	50	0.5	1.6	●
SDD0170	1.7	25.5	50.5	50	0.5	1.7	●
SDD0180	1.8	28.5	52.5	52	0.5	1.8	●
SDD0190	1.9	28.6	52.6	52	0.6	1.9	●
SDD0200	2.0	29.6	55.6	55	0.6	2.0	●
SDD0210	2.1	29.6	55.6	55	0.6	2.1	●
SDD0220	2.2	33.7	58.7	58	0.7	2.2	●
SDD0230	2.3	33.7	58.7	58	0.7	2.3	●
SDD0240	2.4	35.7	61.7	61	0.7	2.4	●
SDD0250	2.5	35.8	61.8	61	0.8	2.5	●
SDD0260	2.6	37.8	64.8	64	0.8	2.6	●
SDD0270	2.7	37.8	64.8	64	0.8	2.7	●
SDD0280	2.8	39.8	67.8	67	0.8	2.8	●
SDD0290	2.9	42.9	71.9	71	0.9	2.9	●
SDD0300	3.0	42.9	71.9	71	0.9	3.0	●
SDD0310	3.1	42.9	71.9	71	0.9	3.1	●
SDD0320	3.2	43.0	72.0	71	1.0	3.2	●
SDD0330	3.3	46.0	74.0	73	1.0	3.3	●
SDD0340	3.4	46.0	74.0	73	1.0	3.4	●
SDD0350	3.5	46.1	74.1	73	1.1	3.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD0360	3.6	49.1	77.1	76	1.1	3.6	●
SDD0370	3.7	49.1	77.1	76	1.1	3.7	●
SDD0380	3.8	49.1	77.1	76	1.1	3.8	●
SDD0390	3.9	52.2	80.2	79	1.2	3.9	●
SDD0400	4.0	55.2	84.2	83	1.2	4.0	●
SDD0410	4.1	55.2	84.2	83	1.2	4.1	●
SDD0420	4.2	55.3	84.3	83	1.3	4.2	●
SDD0430	4.3	55.3	84.3	83	1.3	4.3	●
SDD0440	4.4	57.3	87.3	86	1.3	4.4	●
SDD0450	4.5	57.4	87.4	86	1.4	4.5	●
SDD0460	4.6	57.4	87.4	86	1.4	4.6	●
SDD0470	4.7	60.4	90.4	89	1.4	4.7	●
SDD0480	4.8	60.4	90.4	89	1.4	4.8	●
SDD0490	4.9	63.5	93.5	92	1.5	4.9	●
SDD0500	5.0	63.5	93.5	92	1.5	5.0	●
SDD0510	5.1	63.5	93.5	92	1.5	5.1	●
SDD0520	5.2	65.6	96.6	95	1.6	5.2	●
SDD0530	5.3	65.6	96.6	95	1.6	5.3	●
SDD0540	5.4	65.6	96.6	95	1.6	5.4	●
SDD0550	5.5	65.7	96.7	95	1.7	5.5	●
SDD0560	5.6	68.7	99.7	98	1.7	5.6	●
SDD0570	5.7	68.7	99.7	98	1.7	5.7	●
SDD0580	5.8	68.7	99.7	98	1.7	5.8	●
SDD0590	5.9	68.8	99.8	98	1.8	5.9	●
SDD0600	6.0	71.8	103.8	102	1.8	6.0	●
SDD0610	6.1	71.8	103.8	102	1.8	6.1	●
SDD0620	6.2	71.9	103.9	102	1.9	6.2	●
SDD0630	6.3	71.9	103.9	102	1.9	6.3	●
SDD0640	6.4	74.9	106.9	105	1.9	6.4	●
SDD0650	6.5	75.0	107.0	105	2.0	6.5	●
SDD0660	6.6	75.0	107.0	105	2.0	6.6	●
SDD0670	6.7	75.0	107.0	105	2.0	6.7	●
SDD0680	6.8	75.0	107.0	105	2.0	6.8	●
SDD0690	6.9	75.1	107.1	105	2.1	6.9	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD0700	7.0	75.1	107.1	105	2.1	7.0	●
SDD0710	7.1	77.1	110.1	108	2.1	7.1	●
SDD0720	7.2	77.2	110.2	108	2.2	7.2	●
SDD0730	7.3	77.2	110.2	108	2.2	7.3	●
SDD0740	7.4	80.2	113.2	111	2.2	7.4	●
SDD0750	7.5	80.3	113.3	111	2.3	7.5	●
SDD0760	7.6	80.3	113.3	111	2.3	7.6	●
SDD0770	7.7	83.3	116.3	114	2.3	7.7	●
SDD0780	7.8	83.3	116.3	114	2.3	7.8	●
SDD0790	7.9	83.4	116.4	114	2.4	7.9	●
SDD0800	8.0	83.4	116.4	114	2.4	8.0	●
SDD0810	8.1	86.4	119.4	117	2.4	8.1	●
SDD0820	8.2	86.5	119.5	117	2.5	8.2	●
SDD0830	8.3	86.5	119.5	117	2.5	8.3	●
SDD0840	8.4	89.5	123.5	121	2.5	8.4	●
SDD0850	8.5	89.6	123.6	121	2.6	8.5	●
SDD0860	8.6	89.6	123.6	121	2.6	8.6	●
SDD0870	8.7	89.6	123.6	121	2.6	8.7	●
SDD0880	8.8	91.6	126.6	124	2.6	8.8	●
SDD0890	8.9	91.7	126.7	124	2.7	8.9	●
SDD0900	9.0	91.7	126.7	124	2.7	9.0	●
SDD0910	9.1	91.7	126.7	124	2.7	9.1	●
SDD0920	9.2	94.8	129.8	127	2.8	9.2	●
SDD0930	9.3	94.8	129.8	127	2.8	9.3	●
SDD0940	9.4	94.8	129.8	127	2.8	9.4	●
SDD0950	9.5	94.9	129.9	127	2.9	9.5	●
SDD0960	9.6	97.9	132.9	130	2.9	9.6	●
SDD0970	9.7	97.9	132.9	130	2.9	9.7	●
SDD0980	9.8	97.9	132.9	130	2.9	9.8	●
SDD0990	9.9	98.0	133.0	130	3.0	9.9	●
SDD1000	10.0	98.0	133.0	130	3.0	10.0	●
SDD1010	10.1	101.0	136.0	133	3.0	10.1	●
SDD1020	10.2	101.1	136.1	133	3.1	10.2	●
SDD1030	10.3	101.1	136.1	133	3.1	10.3	●
SDD1040	10.4	101.1	136.1	133	3.1	10.4	●
SDD1050	10.5	103.2	140.2	137	3.2	10.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD1060	10.6	103.2	140.2	137	3.2	10.6	●
SDD1070	10.7	103.2	140.2	137	3.2	10.7	●
SDD1080	10.8	106.2	143.2	140	3.2	10.8	●
SDD1090	10.9	106.3	143.3	140	3.3	10.9	●
SDD1100	11.0	106.3	143.3	140	3.3	11.0	●
SDD1110	11.1	106.3	143.3	140	3.3	11.1	●
SDD1120	11.2	109.4	146.4	143	3.4	11.2	●
SDD1130	11.3	109.4	146.4	143	3.4	11.3	●
SDD1140	11.4	109.4	146.4	143	3.4	11.4	●
SDD1150	11.5	109.5	146.5	143	3.5	11.5	●
SDD1160	11.6	112.5	149.5	146	3.5	11.6	●
SDD1170	11.7	112.5	149.5	146	3.5	11.7	●
SDD1180	11.8	112.6	149.6	146	3.6	11.8	●
SDD1190	11.9	112.6	149.6	146	3.6	11.9	●
SDD1200	12.0	114.6	152.6	149	3.6	12.0	●
SDD1210	12.1	114.6	152.6	149	3.6	12.1	●
SDD1220	12.2	114.7	152.7	149	3.7	12.2	●
SDD1230	12.3	114.7	152.7	149	3.7	12.3	●
SDD1240	12.4	117.7	155.7	152	3.7	12.4	●
SDD1250	12.5	117.8	155.8	152	3.8	12.5	●
SDD1260	12.6	117.8	155.8	152	3.8	12.6	●
SDD1270	12.7	117.8	155.8	152	3.8	12.7	●
SDD1280	12.8	117.9	155.9	152	3.9	12.8	●
SDD1290	12.9	117.9	155.9	152	3.9	12.9	●
SDD1300	13.0	117.9	155.9	152	3.9	13.0	●
SDD1350	13.5	126.1	172.1	168	4.1	13.5	●
SDD1400	14.0	126.2	172.2	168	4.2	14.0	●
SDD1450	14.5	126.4	172.4	168	4.4	14.5	●
SDD1500	15.0	136.5	185.5	181	4.5	15.0	●
SDD1550	15.5	136.7	185.7	181	4.7	15.5	●
SDD1600	16.0	136.8	185.8	181	4.8	16.0	●
SDD1650	16.5	137.0	186.0	181	5.0	16.5	●
SDD1700	17.0	148.1	199.1	194	5.1	17.0	●
SDD1750	17.5	148.3	199.3	194	5.3	17.5	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

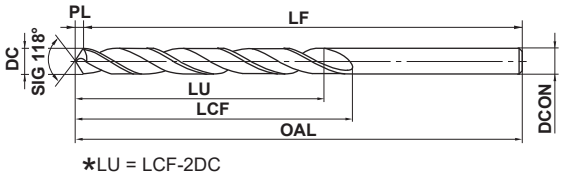
DRILLING(HSS TYPE)

SD

Straight Shank, 1/100mm

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

0.25≤DC≤5.95 $^{0}_{-0.007}$

●The diameter tolerance is 0—0.007mm.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD0025	0.25	3.1	19.1	19	0.08	0.25	●
SDD0035	0.35	4.1	19.1	19	0.11	0.35	●
SDD0045	0.45	5.1	20.1	20	0.14	0.45	●
SDD0055	0.55	7.2	24.2	24	0.17	0.55	●
SDD0065	0.65	8.2	26.2	26	0.20	0.65	●
SDD0075	0.75	11.2	34.2	34	0.23	0.75	●
SDD0085	0.85	13.3	36.3	36	0.26	0.85	●
SDD0095	0.95	18.3	40.3	40	0.29	0.95	●
SDD0105	1.05	20.3	42.3	42	0.3	1.05	●
SDD0115	1.15	20.4	42.4	42	0.4	1.15	●
SDD0125	1.25	22.4	45.4	45	0.4	1.25	●
SDD0135	1.35	23.4	48.4	48	0.4	1.35	●
SDD0145	1.45	23.4	48.4	48	0.4	1.45	●
SDD0155	1.55	25.5	50.5	50	0.5	1.55	●
SDD0165	1.65	25.5	50.5	50	0.5	1.65	●
SDD0175	1.75	28.5	52.5	52	0.5	1.75	●
SDD0185	1.85	28.6	52.6	52	0.6	1.85	●
SDD0195	1.95	29.6	55.6	55	0.6	1.95	●
SDD0205	2.05	29.6	55.6	55	0.6	2.05	●
SDD0215	2.15	29.7	55.7	55	0.7	2.15	●
SDD0225	2.25	33.7	58.7	58	0.7	2.25	●
SDD0235	2.35	33.7	58.7	58	0.7	2.35	●
SDD0245	2.45	35.7	61.7	61	0.7	2.45	●
SDD0255	2.55	37.8	64.8	64	0.8	2.55	●
SDD0265	2.65	37.8	64.8	64	0.8	2.65	●
SDD0275	2.75	39.8	67.8	67	0.8	2.75	●
SDD0285	2.85	39.9	67.9	67	0.9	2.85	●
SDD0295	2.95	42.9	71.9	71	0.9	2.95	●
SDD0305	3.05	42.9	71.9	71	0.9	3.05	●
SDD0315	3.15	43.0	72.0	71	1.0	3.15	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDD0325	3.25	43.0	72.0	71	1.0	3.25	●
SDD0335	3.35	46.0	74.0	73	1.0	3.35	●
SDD0345	3.45	46.0	74.0	73	1.0	3.45	●
SDD0355	3.55	46.1	74.1	73	1.1	3.55	●
SDD0365	3.65	49.1	77.1	76	1.1	3.65	●
SDD0375	3.75	49.1	77.1	76	1.1	3.75	●
SDD0385	3.85	52.2	80.2	79	1.2	3.85	●
SDD0395	3.95	52.2	80.2	79	1.2	3.95	●
SDD0405	4.05	55.2	84.2	83	1.2	4.05	●
SDD0415	4.15	55.3	84.3	83	1.3	4.15	●
SDD0425	4.25	55.3	84.3	83	1.3	4.25	●
SDD0435	4.35	55.3	84.3	83	1.3	4.35	●
SDD0445	4.45	57.3	87.3	86	1.3	4.45	●
SDD0455	4.55	57.4	87.4	86	1.4	4.55	●
SDD0465	4.65	60.4	90.4	89	1.4	4.65	●
SDD0475	4.75	60.4	90.4	89	1.4	4.75	●
SDD0485	4.85	60.5	90.5	89	1.5	4.85	●
SDD0495	4.95	63.5	93.5	92	1.5	4.95	●
SDD0505	5.05	63.5	93.5	92	1.5	5.05	●
SDD0515	5.15	63.6	93.6	92	1.6	5.15	●
SDD0525	5.25	65.6	96.6	95	1.6	5.25	●
SDD0535	5.35	65.6	96.6	95	1.6	5.35	●
SDD0545	5.45	65.6	96.6	95	1.6	5.45	●
SDD0555	5.55	65.7	96.7	95	1.7	5.55	●
SDD0565	5.65	68.7	99.7	98	1.7	5.65	●
SDD0575	5.75	68.7	99.7	98	1.7	5.75	●
SDD0585	5.85	68.8	99.8	98	1.8	5.85	●
SDD0595	5.95	68.8	99.8	98	1.8	5.95	●

● : Inventory maintained in Japan.

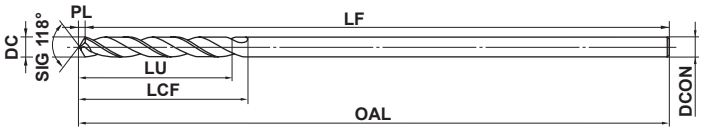
CUTTING CONDITIONS ➤ N245

SDLS

Long Shank Straight Drill

HSS 118° X DC≥2

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		



*LU = LCF-2DC

1≤DC≤3	3<DC≤6	6<DC≤10
0 −0.014	0 −0.018	0 −0.022

- It is recommended to use when long overall length is demanded for preventing collision with workpiece with high rigidity.
- For both machining centre and manually operated machines.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDLSD0100A100	1.0	12.3	100.3	100	0.3	1.0	●
SDLSD0110A100	1.1	14.3	100.3	100	0.3	1.1	●
SDLSD0120A100	1.2	16.4	100.4	100	0.4	1.2	●
SDLSD0130A100	1.3	16.4	100.4	100	0.4	1.3	●
SDLSD0140A100	1.4	18.4	100.4	100	0.4	1.4	●
SDLSD0150A100	1.5	18.5	100.5	100	0.5	1.5	●
SDLSD0160A100	1.6	20.5	100.5	100	0.5	1.6	●
SDLSD0170A100	1.7	20.5	100.5	100	0.5	1.7	●
SDLSD0180A100	1.8	22.5	100.5	100	0.5	1.8	●
SDLSD0190A100	1.9	22.6	100.6	100	0.6	1.9	●
SDLSD0200A100	2.0	23.6	100.6	100	0.6	2.0	●
SDLSD0210A150	2.1	23.6	150.6	150	0.6	2.1	●
SDLSD0220A150	2.2	26.7	150.7	150	0.7	2.2	●
SDLSD0230A150	2.3	26.7	150.7	150	0.7	2.3	●
SDLSD0240A150	2.4	29.7	150.7	150	0.7	2.4	●
SDLSD0250A150	2.5	29.8	150.8	150	0.8	2.5	●
SDLSD0260A150	2.6	29.8	150.8	150	0.8	2.6	●
SDLSD0270A150	2.7	32.8	150.8	150	0.8	2.7	●
SDLSD0280A150	2.8	32.8	150.8	150	0.8	2.8	●
SDLSD0290A150	2.9	32.9	150.9	150	0.9	2.9	●
SDLSD0300A150	3.0	32.9	150.9	150	0.9	3.0	●
SDLSD0310A150	3.1	35.9	150.9	150	0.9	3.1	●
SDLSD0320A150	3.2	36.0	151.0	150	1.0	3.2	●
SDLSD0330A150	3.3	36.0	151.0	150	1.0	3.3	●
SDLSD0340A150	3.4	39.0	151.0	150	1.0	3.4	●
SDLSD0350A150	3.5	39.1	151.1	150	1.1	3.5	●
SDLSD0360A200	3.6	39.1	201.1	200	1.1	3.6	●
SDLSD0370A200	3.7	39.1	201.1	200	1.1	3.7	●
SDLSD0380A200	3.8	43.1	201.1	200	1.1	3.8	●
SDLSD0390A200	3.9	43.2	201.2	200	1.2	3.9	●
SDLSD0400A200	4.0	43.2	201.2	200	1.2	4.0	●
SDLSD0410A200	4.1	43.2	201.2	200	1.2	4.1	●
SDLSD0420A200	4.2	43.3	201.3	200	1.3	4.2	●
SDLSD0430A200	4.3	47.3	201.3	200	1.3	4.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDLSD0440A200	4.4	47.3	201.3	200	1.3	4.4	●
SDLSD0450A200	4.5	47.4	201.4	200	1.4	4.5	●
SDLSD0460A200	4.6	47.4	201.4	200	1.4	4.6	●
SDLSD0470A200	4.7	47.4	201.4	200	1.4	4.7	●
SDLSD0480A200	4.8	52.4	201.4	200	1.4	4.8	●
SDLSD0490A200	4.9	52.5	201.5	200	1.5	4.9	●
SDLSD0500A200	5.0	52.5	201.5	200	1.5	5.0	●
SDLSD0510A200	5.1	52.5	201.5	200	1.5	5.1	●
SDLSD0520A200	5.2	52.6	201.6	200	1.6	5.2	●
SDLSD0530A200	5.3	52.6	201.6	200	1.6	5.3	●
SDLSD0540A200	5.4	57.6	201.6	200	1.6	5.4	●
SDLSD0550A200	5.5	57.7	201.7	200	1.7	5.5	●
SDLSD0560A200	5.6	57.7	201.7	200	1.7	5.6	●
SDLSD0570A200	5.7	57.7	201.7	200	1.7	5.7	●
SDLSD0580A200	5.8	57.7	201.7	200	1.7	5.8	●
SDLSD0590A200	5.9	57.8	201.8	200	1.8	5.9	●
SDLSD0600A200	6.0	57.8	201.8	200	1.8	6.0	●
SDLSD0610A250	6.1	63.8	251.8	250	1.8	6.1	●
SDLSD0620A250	6.2	63.9	251.9	250	1.9	6.2	●
SDLSD0630A250	6.3	63.9	251.9	250	1.9	6.3	●
SDLSD0640A250	6.4	63.9	251.9	250	1.9	6.4	●
SDLSD0650A250	6.5	64.0	252.0	250	2.0	6.5	●
SDLSD0660A250	6.6	64.0	252.0	250	2.0	6.6	●
SDLSD0670A250	6.7	64.0	252.0	250	2.0	6.7	●
SDLSD0680A250	6.8	69.0	252.0	250	2.0	6.8	●
SDLSD0690A250	6.9	69.1	252.1	250	2.1	6.9	●
SDLSD0700A250	7.0	69.1	252.1	250	2.1	7.0	●
SDLSD0710A250	7.1	69.1	252.1	250	2.1	7.1	●
SDLSD0720A250	7.2	69.2	252.2	250	2.2	7.2	●
SDLSD0730A250	7.3	69.2	252.2	250	2.2	7.3	●
SDLSD0740A250	7.4	69.2	252.2	250	2.2	7.4	●
SDLSD0750A250	7.5	69.3	252.3	250	2.3	7.5	●
SDLSD0760A250	7.6	75.3	252.3	250	2.3	7.6	●
SDLSD0770A250	7.7	75.3	252.3	250	2.3	7.7	●

SDLS

Long Shank Straight Drill

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDLSD0780A250	7.8	75.3	252.3	250	2.3	7.8	●
SDLSD0790A250	7.9	75.4	252.4	250	2.4	7.9	●
SDLSD0800A250	8.0	75.4	252.4	250	2.4	8.0	●
SDLSD0810A250	8.1	75.4	252.4	250	2.4	8.1	●
SDLSD0820A250	8.2	75.5	252.5	250	2.5	8.2	●
SDLSD0830A250	8.3	75.5	252.5	250	2.5	8.3	●
SDLSD0840A250	8.4	75.5	252.5	250	2.5	8.4	●
SDLSD0850A250	8.5	75.6	252.6	250	2.6	8.5	●
SDLSD0860A250	8.6	81.6	252.6	250	2.6	8.6	●
SDLSD0870A250	8.7	81.6	252.6	250	2.6	8.7	●
SDLSD0880A250	8.8	81.6	252.6	250	2.6	8.8	●
SDLSD0890A250	8.9	81.7	252.7	250	2.7	8.9	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
SDLSD0900A250	9.0	81.7	252.7	250	2.7	9.0	●
SDLSD0910A250	9.1	81.7	252.7	250	2.7	9.1	●
SDLSD0920A250	9.2	81.8	252.8	250	2.8	9.2	●
SDLSD0930A250	9.3	81.8	252.8	250	2.8	9.3	●
SDLSD0940A250	9.4	81.8	252.8	250	2.8	9.4	●
SDLSD0950A250	9.5	81.9	252.9	250	2.9	9.5	●
SDLSD0960A250	9.6	87.9	252.9	250	2.9	9.6	●
SDLSD0970A250	9.7	87.9	252.9	250	2.9	9.7	●
SDLSD0980A250	9.8	87.9	252.9	250	2.9	9.8	●
SDLSD0990A250	9.9	88.0	253.0	250	3.0	9.9	●
SDLSD1000A250	10.0	88.0	253.0	250	3.0	10.0	●

● : Inventory maintained in Japan.

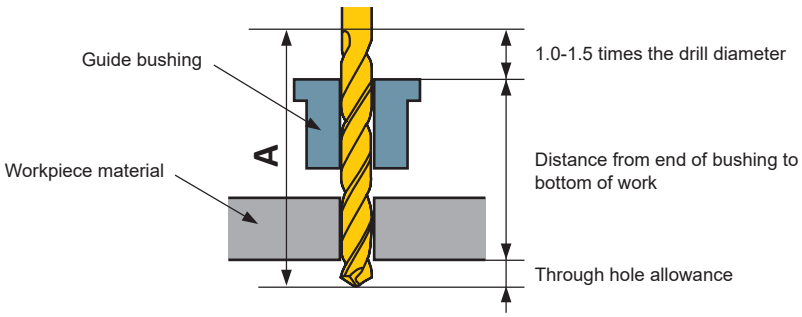
ISO13399 ➢ N002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel (≤180HB), Carbon Steel, Alloy Steel(180−250HB) ASTM A36, AISI 1010 AISI 1045, AISI 4140 etc				Alloy Tool Steel (≤30HRC) AISI H13, AISI L6 etc				Alloy Tool Steel (<40HRC) AISI H13, AISI L6 etc				Gray Cast Iron (≤350MPa) No 45 B etc			
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)
1.0	16	5000	0.02	100	13	4000	0.01	40	9	2800	0.007	15	16	5000	0.02	100
1.5	20	4200	0.03	125	15	3200	0.02	60	10	2100	0.01	20	20	4200	0.03	125
2.0	20	3200	0.05	160	16	2500	0.03	75	11	1800	0.02	35	20	3200	0.05	160
3.0	20	2100	0.1	210	17	1800	0.06	105	11	1200	0.04	45	22	2300	0.1	230
4.0	20	1600	0.12	190	17	1350	0.08	105	11	900	0.06	50	22	1750	0.12	210
5.0	20	1300	0.14	180	17	1100	0.1	110	11	700	0.08	55	22	1400	0.14	195
6.0	20	1050	0.17	175	17	900	0.12	105	11	600	0.1	60	22	1150	0.18	205
7.0	20	900	0.19	170	17	780	0.14	105	11	500	0.11	55	22	1000	0.19	190
8.0	20	800	0.2	160	17	670	0.15	100	11	450	0.12	50	22	890	0.2	175
9.0	20	700	0.21	145	17	600	0.16	95	11	400	0.13	50	22	780	0.21	160
10.0	20	650	0.22	140	17	540	0.17	90	11	350	0.14	45	22	700	0.22	150

Workpiece Material	Ferritic and Martensitic Stainless Steel (≤200HB) AISI 410, AISI 430 etc				Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc				Copper, Copper Alloys				Aluminium Alloys (Si<5%)			
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)
1.0	13	4000	0.02	80	9	3000	0.02	60	16	5000	0.02	100	22	7000	0.04	280
1.5	14	3000	0.03	90	9	2000	0.03	60	20	4200	0.03	125	28	6000	0.06	360
2.0	14	2200	0.05	110	9	1500	0.04	60	20	3200	0.05	160	30	4800	0.08	380
3.0	15	1600	0.07	110	9	1000	0.06	60	20	2100	0.1	210	40	4200	0.13	545
4.0	15	1200	0.11	130	9	700	0.08	55	20	1600	0.12	190	40	3200	0.16	510
5.0	15	950	0.13	120	9	600	0.09	50	20	1300	0.14	180	40	2550	0.2	510
6.0	15	800	0.14	110	10	530	0.1	50	20	1050	0.18	185	40	2100	0.23	480
7.0	15	700	0.15	105	10	450	0.11	45	20	900	0.19	170	40	1800	0.25	450
8.0	15	600	0.16	95	10	400	0.13	50	20	800	0.2	160	40	1600	0.28	445
9.0	15	520	0.17	85	10	360	0.14	50	20	700	0.21	145	40	1400	0.3	420
10.0	15	480	0.18	85	10	310	0.15	45	20	650	0.22	140	40	1280	0.33	420

Note 1) The intermediate diameter revolution is not tabulated. It is matched to the large diameter side and closest drill diameter conditions or by calculating the cutting speed of the closest drill diameter. Set the feed rate per revolution to a suitable value with the recommended feed rate of the closest drill diameter as the standard.
Note 2) Lower the revolution and feed rate accordingly, when the workpiece material is not rigid or there are restrictions on the machine.
Note 3) When drilling holes greater than 3 x drill diameter hole depths, please use a peck feed.
Note 4) The above cutting conditions are guidelines for when the tool protrusion length is about twice the groove length. If the protrusion length is longer, lower the cutting conditions.
Note 5) Use of water-soluble cutting fluid is recommended. Please reduce the revolution when using water-insoluble cutting fluid.
Note 6) Use sufficient cutting fluid. Please reduce the revolution when insufficient cutting fluid.
Note 7) When using a guide bush, please confirm the flute length > A. In case of short flute length, please conduct machining without the bush. And, when not being able to dismount the bush, please use LSD or GWSL.



DRILLING(HSS TYPE)

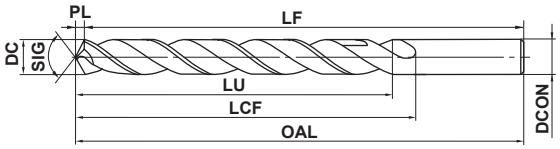
KSD

Cobalt HSS, For stainless steel

CO HSS | 125° DC<2 | 118° DC≥2 | XR DC≥2

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

●Sharp edge geometry for stainless steel up to 200HB.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
KSDD0100	1.0	12.3	40.3	40	0.3	1.0	●
KSDD0110	1.1	14.3	42.3	42	0.3	1.1	●
KSDD0120	1.2	16.3	42.3	42	0.3	1.2	●
KSDD0130	1.3	16.3	45.3	45	0.3	1.3	●
KSDD0140	1.4	18.4	48.4	48	0.4	1.4	●
KSDD0150	1.5	18.4	48.4	48	0.4	1.5	●
KSDD0160	1.6	20.4	50.4	50	0.4	1.6	●
KSDD0170	1.7	20.4	50.4	50	0.4	1.7	●
KSDD0180	1.8	22.5	52.5	52	0.5	1.8	●
KSDD0190	1.9	22.5	52.5	52	0.5	1.9	●
KSDD0200	2.0	29.6	55.6	55	0.6	2.0	●
KSDD0210	2.1	29.6	55.6	55	0.6	2.1	●
KSDD0220	2.2	33.7	58.7	58	0.7	2.2	●
KSDD0230	2.3	33.7	58.7	58	0.7	2.3	●
KSDD0240	2.4	35.7	61.7	61	0.7	2.4	●
KSDD0250	2.5	35.8	61.8	61	0.8	2.5	●
KSDD0260	2.6	37.8	64.8	64	0.8	2.6	●
KSDD0270	2.7	37.8	64.8	64	0.8	2.7	●
KSDD0280	2.8	39.8	67.8	67	0.8	2.8	●
KSDD0290	2.9	42.9	71.9	71	0.9	2.9	●
KSDD0300	3.0	42.9	71.9	71	0.9	3.0	●
KSDD0310	3.1	42.9	71.9	71	0.9	3.1	●
KSDD0320	3.2	43.0	72.0	71	1.0	3.2	●
KSDD0330	3.3	46.0	74.0	73	1.0	3.3	●
KSDD0340	3.4	46.0	74.0	73	1.0	3.4	●
KSDD0350	3.5	46.1	74.1	73	1.1	3.5	●
KSDD0360	3.6	49.1	77.1	76	1.1	3.6	●
KSDD0370	3.7	49.1	77.1	76	1.1	3.7	●
KSDD0380	3.8	49.1	77.1	76	1.1	3.8	●
KSDD0390	3.9	52.2	80.2	79	1.2	3.9	●
KSDD0400	4.0	55.2	84.2	83	1.2	4.0	●
KSDD0410	4.1	55.2	84.2	83	1.2	4.1	●
KSDD0420	4.2	55.3	84.3	83	1.3	4.2	●
KSDD0430	4.3	55.3	84.3	83	1.3	4.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
KSDD0440	4.4	57.3	87.3	86	1.3	4.4	●
KSDD0450	4.5	57.4	87.4	86	1.4	4.5	●
KSDD0460	4.6	57.4	87.4	86	1.4	4.6	●
KSDD0470	4.7	60.4	90.4	89	1.4	4.7	●
KSDD0480	4.8	60.4	90.4	89	1.4	4.8	●
KSDD0490	4.9	63.5	93.5	92	1.5	4.9	●
KSDD0500	5.0	63.5	93.5	92	1.5	5.0	●
KSDD0510	5.1	63.5	93.5	92	1.5	5.1	●
KSDD0520	5.2	65.6	96.6	95	1.6	5.2	●
KSDD0530	5.3	65.6	96.6	95	1.6	5.3	●
KSDD0540	5.4	65.6	96.6	95	1.6	5.4	●
KSDD0550	5.5	65.7	96.7	95	1.7	5.5	●
KSDD0560	5.6	68.7	99.7	98	1.7	5.6	●
KSDD0570	5.7	68.7	99.7	98	1.7	5.7	●
KSDD0580	5.8	68.7	99.7	98	1.7	5.8	●
KSDD0590	5.9	68.8	99.8	98	1.8	5.9	●
KSDD0600	6.0	71.8	103.8	102	1.8	6.0	●
KSDD0610	6.1	71.8	103.8	102	1.8	6.1	●
KSDD0620	6.2	71.9	103.9	102	1.9	6.2	●
KSDD0630	6.3	71.9	103.9	102	1.9	6.3	●
KSDD0640	6.4	74.9	106.9	105	1.9	6.4	●
KSDD0650	6.5	75.0	107.0	105	2.0	6.5	●
KSDD0660	6.6	75.0	107.0	105	2.0	6.6	●
KSDD0670	6.7	75.0	107.0	105	2.0	6.7	●
KSDD0680	6.8	75.0	107.0	105	2.0	6.8	●
KSDD0690	6.9	75.1	107.1	105	2.1	6.9	●
KSDD0700	7.0	75.1	107.1	105	2.1	7.0	●
KSDD0710	7.1	77.1	110.1	108	2.1	7.1	●
KSDD0720	7.2	77.2	110.2	108	2.2	7.2	●
KSDD0730	7.3	77.2	110.2	108	2.2	7.3	●
KSDD0740	7.4	80.2	113.2	111	2.2	7.4	●
KSDD0750	7.5	80.3	113.3	111	2.3	7.5	●
KSDD0760	7.6	80.3	113.3	111	2.3	7.6	●
KSDD0770	7.7	83.3	116.3	114	2.3	7.7	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
KSDD0780	7.8	83.3	116.3	114	2.3	7.8	●
KSDD0790	7.9	83.4	116.4	114	2.4	7.9	●
KSDD0800	8.0	83.4	116.4	114	2.4	8.0	●
KSDD0810	8.1	86.4	119.4	117	2.4	8.1	●
KSDD0820	8.2	86.5	119.5	117	2.5	8.2	●
KSDD0830	8.3	86.5	119.5	117	2.5	8.3	●
KSDD0840	8.4	89.5	123.5	121	2.5	8.4	●
KSDD0850	8.5	89.6	123.6	121	2.6	8.5	●
KSDD0860	8.6	89.6	123.6	121	2.6	8.6	●
KSDD0870	8.7	89.6	123.6	121	2.6	8.7	●
KSDD0880	8.8	91.6	126.6	124	2.6	8.8	●
KSDD0890	8.9	91.7	126.7	124	2.7	8.9	●
KSDD0900	9.0	91.7	126.7	124	2.7	9.0	●
KSDD0910	9.1	91.7	126.7	124	2.7	9.1	●
KSDD0920	9.2	94.8	129.8	127	2.8	9.2	●
KSDD0930	9.3	94.8	129.8	127	2.8	9.3	●
KSDD0940	9.4	94.8	129.8	127	2.8	9.4	●
KSDD0950	9.5	94.9	129.9	127	2.9	9.5	●
KSDD0960	9.6	97.9	132.9	130	2.9	9.6	●
KSDD0970	9.7	97.9	132.9	130	2.9	9.7	●
KSDD0980	9.8	97.9	132.9	130	2.9	9.8	●
KSDD0990	9.9	98.0	133.0	130	3.0	9.9	●
KSDD1000	10.0	98.0	133.0	130	3.0	10.0	●
KSDD1010	10.1	101.0	136.0	133	3.0	10.1	●
KSDD1020	10.2	101.1	136.1	133	3.1	10.2	●
KSDD1030	10.3	101.1	136.1	133	3.1	10.3	●
KSDD1040	10.4	101.1	136.1	133	3.1	10.4	●
KSDD1050	10.5	103.2	140.2	137	3.2	10.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
KSDD1060	10.6	103.2	140.2	137	3.2	10.6	●
KSDD1070	10.7	103.2	140.2	137	3.2	10.7	●
KSDD1080	10.8	106.2	143.2	140	3.2	10.8	●
KSDD1090	10.9	106.3	143.3	140	3.3	10.9	●
KSDD1100	11.0	106.3	143.3	140	3.3	11.0	●
KSDD1110	11.1	106.3	143.3	140	3.3	11.1	●
KSDD1120	11.2	109.4	146.4	143	3.4	11.2	●
KSDD1130	11.3	109.4	146.4	143	3.4	11.3	●
KSDD1140	11.4	109.4	146.4	143	3.4	11.4	●
KSDD1150	11.5	109.5	146.5	143	3.5	11.5	●
KSDD1160	11.6	112.5	149.5	146	3.5	11.6	●
KSDD1170	11.7	112.5	149.5	146	3.5	11.7	●
KSDD1180	11.8	112.5	149.5	146	3.5	11.8	●
KSDD1190	11.9	112.6	149.6	146	3.6	11.9	●
KSDD1200	12.0	114.6	152.6	149	3.6	12.0	●
KSDD1210	12.1	114.6	152.6	149	3.6	12.1	●
KSDD1220	12.2	114.7	152.7	149	3.7	12.2	●
KSDD1230	12.3	114.7	152.7	149	3.7	12.3	●
KSDD1240	12.4	117.7	155.7	152	3.7	12.4	●
KSDD1250	12.5	117.8	155.8	152	3.8	12.5	●
KSDD1260	12.6	117.8	155.8	152	3.8	12.6	●
KSDD1270	12.7	117.8	155.8	152	3.8	12.7	●
KSDD1280	12.8	117.8	155.8	152	3.8	12.8	●
KSDD1290	12.9	117.9	155.9	152	3.9	12.9	●
KSDD1300	13.0	117.9	155.9	152	3.9	13.0	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

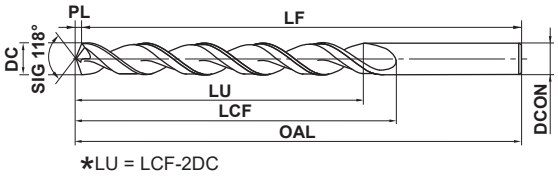
DRILLING(HSS TYPE)

GWSS

TiN, For Deep Hole, Straight Shank

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

●Suitable for general and deep hole drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSSD0100	1.0	18.3	40.3	40	0.3	1.0	●
GWSSD0110	1.1	20.3	42.3	42	0.3	1.1	●
GWSSD0120	1.2	20.4	42.4	42	0.4	1.2	●
GWSSD0130	1.3	22.4	45.4	45	0.4	1.3	●
GWSSD0140	1.4	23.4	48.4	48	0.4	1.4	●
GWSSD0150	1.5	23.5	48.5	48	0.5	1.5	●
GWSSD0160	1.6	25.5	50.5	50	0.5	1.6	●
GWSSD0170	1.7	25.5	50.5	50	0.5	1.7	●
GWSSD0180	1.8	28.5	52.5	52	0.5	1.8	●
GWSSD0190	1.9	28.6	52.6	52	0.6	1.9	●
GWSSD0200	2.0	29.6	55.6	55	0.6	2.0	●
GWSSD0210	2.1	29.6	55.6	55	0.6	2.1	●
GWSSD0220	2.2	33.7	58.7	58	0.7	2.2	●
GWSSD0230	2.3	33.7	58.7	58	0.7	2.3	●
GWSSD0240	2.4	35.7	61.7	61	0.7	2.4	●
GWSSD0250	2.5	35.8	61.8	61	0.8	2.5	●
GWSSD0260	2.6	37.8	64.8	64	0.8	2.6	●
GWSSD0270	2.7	37.8	64.8	64	0.8	2.7	●
GWSSD0280	2.8	39.8	67.8	67	0.8	2.8	●
GWSSD0290	2.9	42.9	71.9	71	0.9	2.9	●
GWSSD0300	3.0	42.9	71.9	71	0.9	3.0	●
GWSSD0310	3.1	42.9	71.9	71	0.9	3.1	●
GWSSD0320	3.2	43.0	72.0	71	1.0	3.2	●
GWSSD0330	3.3	46.0	74.0	73	1.0	3.3	●
GWSSD0340	3.4	46.0	74.0	73	1.0	3.4	●
GWSSD0350	3.5	46.1	74.1	73	1.1	3.5	●
GWSSD0360	3.6	49.1	77.1	76	1.1	3.6	●
GWSSD0370	3.7	49.1	77.1	76	1.1	3.7	●
GWSSD0380	3.8	49.1	77.1	76	1.1	3.8	●
GWSSD0390	3.9	52.2	80.2	79	1.2	3.9	●
GWSSD0400	4.0	55.2	84.2	83	1.2	4.0	●
GWSSD0410	4.1	55.2	84.2	83	1.2	4.1	●
GWSSD0420	4.2	55.3	84.3	83	1.3	4.2	●
GWSSD0430	4.3	55.3	84.3	83	1.3	4.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSSD0440	4.4	57.3	87.3	86	1.3	4.4	●
GWSSD0450	4.5	57.4	87.4	86	1.4	4.5	●
GWSSD0460	4.6	57.4	87.4	86	1.4	4.6	●
GWSSD0470	4.7	60.4	90.4	89	1.4	4.7	●
GWSSD0480	4.8	60.4	90.4	89	1.4	4.8	●
GWSSD0490	4.9	63.5	93.5	92	1.5	4.9	●
GWSSD0500	5.0	63.5	93.5	92	1.5	5.0	●
GWSSD0510	5.1	63.5	93.5	92	1.5	5.1	●
GWSSD0520	5.2	65.6	96.6	95	1.6	5.2	●
GWSSD0530	5.3	65.6	96.6	95	1.6	5.3	●
GWSSD0540	5.4	65.6	96.6	95	1.6	5.4	●
GWSSD0550	5.5	65.7	96.7	95	1.7	5.5	●
GWSSD0560	5.6	68.7	99.7	98	1.7	5.6	●
GWSSD0570	5.7	68.7	99.7	98	1.7	5.7	●
GWSSD0580	5.8	68.7	99.7	98	1.7	5.8	●
GWSSD0590	5.9	68.8	99.8	98	1.8	5.9	●
GWSSD0600	6.0	71.8	103.8	102	1.8	6.0	●
GWSSD0610	6.1	71.8	103.8	102	1.8	6.1	●
GWSSD0620	6.2	71.9	103.9	102	1.9	6.2	●
GWSSD0630	6.3	71.9	103.9	102	1.9	6.3	●
GWSSD0640	6.4	74.9	106.9	105	1.9	6.4	●
GWSSD0650	6.5	75.0	107.0	105	2.0	6.5	●
GWSSD0660	6.6	75.0	107.0	105	2.0	6.6	●
GWSSD0670	6.7	75.0	107.0	105	2.0	6.7	●
GWSSD0680	6.8	75.0	107.0	105	2.0	6.8	●
GWSSD0690	6.9	75.1	107.1	105	2.1	6.9	●
GWSSD0700	7.0	75.1	107.1	105	2.1	7.0	●
GWSSD0710	7.1	77.1	110.1	108	2.1	7.1	●
GWSSD0720	7.2	77.2	110.2	108	2.2	7.2	●
GWSSD0730	7.3	77.2	110.2	108	2.2	7.3	●
GWSSD0740	7.4	80.2	113.2	111	2.2	7.4	●
GWSSD0750	7.5	80.3	113.3	111	2.3	7.5	●
GWSSD0760	7.6	80.3	113.3	111	2.3	7.6	●
GWSSD0770	7.7	83.3	116.3	114	2.3	7.7	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSSD0780	7.8	83.3	116.3	114	2.3	7.8	●
GWSSD0790	7.9	83.4	116.4	114	2.4	7.9	●
GWSSD0800	8.0	83.4	116.4	114	2.4	8.0	●
GWSSD0810	8.1	86.4	119.4	117	2.4	8.1	●
GWSSD0820	8.2	86.5	119.5	117	2.5	8.2	●
GWSSD0830	8.3	86.5	119.5	117	2.5	8.3	●
GWSSD0840	8.4	89.5	123.5	121	2.5	8.4	●
GWSSD0850	8.5	89.6	123.6	121	2.6	8.5	●
GWSSD0860	8.6	89.6	123.6	121	2.6	8.6	●
GWSSD0870	8.7	89.6	123.6	121	2.6	8.7	●
GWSSD0880	8.8	91.6	126.6	124	2.6	8.8	●
GWSSD0890	8.9	91.7	126.7	124	2.7	8.9	●
GWSSD0900	9.0	91.7	126.7	124	2.7	9.0	●
GWSSD0910	9.1	91.7	126.7	124	2.7	9.1	●
GWSSD0920	9.2	94.8	129.8	127	2.8	9.2	●
GWSSD0930	9.3	94.8	129.8	127	2.8	9.3	●
GWSSD0940	9.4	94.8	129.8	127	2.8	9.4	●
GWSSD0950	9.5	94.9	129.9	127	2.9	9.5	●
GWSSD0960	9.6	97.9	132.9	130	2.9	9.6	●
GWSSD0970	9.7	97.9	132.9	130	2.9	9.7	●
GWSSD0980	9.8	97.9	132.9	130	2.9	9.8	●
GWSSD0990	9.9	98.0	133.0	130	3.0	9.9	●
GWSSD1000	10.0	98.0	133.0	130	3.0	10.0	●
GWSSD1010	10.1	101.0	136.0	133	3.0	10.1	●
GWSSD1020	10.2	101.1	136.1	133	3.1	10.2	●
GWSSD1030	10.3	101.1	136.1	133	3.1	10.3	●
GWSSD1040	10.4	101.1	136.1	133	3.1	10.4	●
GWSSD1050	10.5	103.2	140.2	137	3.2	10.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSSD1060	10.6	103.2	140.2	137	3.2	10.6	●
GWSSD1070	10.7	103.2	140.2	137	3.2	10.7	●
GWSSD1080	10.8	106.2	143.2	140	3.2	10.8	●
GWSSD1090	10.9	106.3	143.3	140	3.3	10.9	●
GWSSD1100	11.0	106.3	143.3	140	3.3	11.0	●
GWSSD1110	11.1	106.3	143.3	140	3.3	11.1	●
GWSSD1120	11.2	109.4	146.4	143	3.4	11.2	●
GWSSD1130	11.3	109.4	146.4	143	3.4	11.3	●
GWSSD1140	11.4	109.4	146.4	143	3.4	11.4	●
GWSSD1150	11.5	109.5	146.5	143	3.5	11.5	●
GWSSD1160	11.6	112.5	149.5	146	3.5	11.6	●
GWSSD1170	11.7	112.5	149.5	146	3.5	11.7	●
GWSSD1180	11.8	112.5	149.5	146	3.5	11.8	●
GWSSD1190	11.9	112.6	149.6	146	3.6	11.9	●
GWSSD1200	12.0	114.6	152.6	149	3.6	12.0	●
GWSSD1210	12.1	114.6	152.6	149	3.6	12.1	●
GWSSD1220	12.2	114.7	152.7	149	3.7	12.2	●
GWSSD1230	12.3	114.7	152.7	149	3.7	12.3	●
GWSSD1240	12.4	117.7	155.7	152	3.7	12.4	●
GWSSD1250	12.5	117.8	155.8	152	3.8	12.5	●
GWSSD1260	12.6	117.8	155.8	152	3.8	12.6	●
GWSSD1270	12.7	117.8	155.8	152	3.8	12.7	●
GWSSD1280	12.8	117.8	155.8	152	3.8	12.8	●
GWSSD1290	12.9	117.9	155.9	152	3.9	12.9	●
GWSSD1300	13.0	117.9	155.9	152	3.9	13.0	●

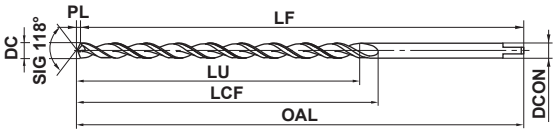
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

GWSL

TiN, Extra Long

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

2≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

●Suitable for extra deep hole drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSLD0200A125	2.0	80.6	125.6	125	0.6	2.0	●
GWSLD0200A160	2.0	100.6	160.6	160	0.6	2.0	●
GWSLD0210A125	2.1	80.6	125.6	125	0.6	2.1	●
GWSLD0210A160	2.1	100.6	160.6	160	0.6	2.1	●
GWSLD0220A125	2.2	80.7	125.7	125	0.7	2.2	●
GWSLD0220A160	2.2	100.7	160.7	160	0.7	2.2	●
GWSLD0230A125	2.3	80.7	125.7	125	0.7	2.3	●
GWSLD0230A160	2.3	100.7	160.7	160	0.7	2.3	●
GWSLD0240A125	2.4	80.7	125.7	125	0.7	2.4	●
GWSLD0240A160	2.4	100.7	160.7	160	0.7	2.4	●
GWSLD0250A125	2.5	80.8	125.8	125	0.8	2.5	●
GWSLD0250A160	2.5	100.8	160.8	160	0.8	2.5	●
GWSLD0260A125	2.6	80.8	125.8	125	0.8	2.6	●
GWSLD0260A160	2.6	100.8	160.8	160	0.8	2.6	●
GWSLD0270A125	2.7	80.8	125.8	125	0.8	2.7	●
GWSLD0270A160	2.7	100.8	160.8	160	0.8	2.7	●
GWSLD0280A125	2.8	80.8	125.8	125	0.8	2.8	●
GWSLD0280A160	2.8	100.8	160.8	160	0.8	2.8	●
GWSLD0290A125	2.9	80.9	125.9	125	0.9	2.9	●
GWSLD0290A160	2.9	100.9	160.9	160	0.9	2.9	●
GWSLD0300A125	3.0	80.9	125.9	125	0.9	3.0	●
GWSLD0300A160	3.0	100.9	160.9	160	0.9	3.0	●
GWSLD0300A200	3.0	125.9	200.9	200	0.9	3.0	●
GWSLD0310A160	3.1	100.9	160.9	160	0.9	3.1	●
GWSLD0310A200	3.1	125.9	200.9	200	0.9	3.1	●
GWSLD0320A160	3.2	101.0	161.0	160	1.0	3.2	●
GWSLD0320A200	3.2	126.0	201.0	200	1.0	3.2	●
GWSLD0330A160	3.3	101.0	161.0	160	1.0	3.3	●
GWSLD0330A200	3.3	126.0	201.0	200	1.0	3.3	●
GWSLD0340A160	3.4	101.0	161.0	160	1.0	3.4	●
GWSLD0340A200	3.4	126.0	201.0	200	1.0	3.4	●
GWSLD0350A160	3.5	101.1	161.1	160	1.1	3.5	●
GWSLD0350A200	3.5	126.1	201.1	200	1.1	3.5	●
GWSLD0360A160	3.6	101.1	161.1	160	1.1	3.6	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSLD0360A200	3.6	126.1	201.1	200	1.1	3.6	●
GWSLD0370A160	3.7	101.1	161.1	160	1.1	3.7	●
GWSLD0370A200	3.7	126.1	201.1	200	1.1	3.7	●
GWSLD0380A160	3.8	101.1	161.1	160	1.1	3.8	●
GWSLD0380A200	3.8	126.1	201.1	200	1.1	3.8	●
GWSLD0390A160	3.9	101.2	161.2	160	1.2	3.9	●
GWSLD0390A200	3.9	126.2	201.2	200	1.2	3.9	●
GWSLD0400A160	4.0	101.2	161.2	160	1.2	4.0	●
GWSLD0400A200	4.0	126.2	201.2	200	1.2	4.0	●
GWSLD0400A250	4.0	161.2	251.2	250	1.2	4.0	●
GWSLD0410A160	4.1	101.2	161.2	160	1.2	4.1	●
GWSLD0410A200	4.1	126.2	201.2	200	1.2	4.1	●
GWSLD0410A250	4.1	161.2	251.2	250	1.2	4.1	●
GWSLD0420A160	4.2	101.3	161.3	160	1.3	4.2	●
GWSLD0420A200	4.2	126.3	201.3	200	1.3	4.2	●
GWSLD0420A250	4.2	161.3	251.3	250	1.3	4.2	●
GWSLD0430A160	4.3	101.3	161.3	160	1.3	4.3	●
GWSLD0430A200	4.3	126.3	201.3	200	1.3	4.3	●
GWSLD0430A250	4.3	161.3	251.3	250	1.3	4.3	●
GWSLD0440A160	4.4	101.3	161.3	160	1.3	4.4	●
GWSLD0440A200	4.4	126.3	201.3	200	1.3	4.4	●
GWSLD0440A250	4.4	161.3	251.3	250	1.3	4.4	●
GWSLD0450A160	4.5	101.4	161.4	160	1.4	4.5	●
GWSLD0450A200	4.5	126.4	201.4	200	1.4	4.5	●
GWSLD0450A250	4.5	161.4	251.4	250	1.4	4.5	●
GWSLD0460A160	4.6	101.4	161.4	160	1.4	4.6	●
GWSLD0460A200	4.6	126.4	201.4	200	1.4	4.6	●
GWSLD0460A250	4.6	161.4	251.4	250	1.4	4.6	●
GWSLD0470A160	4.7	101.4	161.4	160	1.4	4.7	●
GWSLD0470A200	4.7	126.4	201.4	200	1.4	4.7	●
GWSLD0470A250	4.7	161.4	251.4	250	1.4	4.7	●
GWSLD0480A160	4.8	101.4	161.4	160	1.4	4.8	●
GWSLD0480A200	4.8	126.4	201.4	200	1.4	4.8	●
GWSLD0480A250	4.8	161.4	251.4	250	1.4	4.8	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSLD0490A160	4.9	101.5	161.5	160	1.5	4.9	●
GWSLD0490A200	4.9	126.5	201.5	200	1.5	4.9	●
GWSLD0490A250	4.9	161.5	251.5	250	1.5	4.9	●
GWSLD0500A160	5.0	101.5	161.5	160	1.5	5.0	●
GWSLD0500A200	5.0	126.5	201.5	200	1.5	5.0	●
GWSLD0500A250	5.0	161.5	251.5	250	1.5	5.0	●
GWSLD0510A160	5.1	101.5	161.5	160	1.5	5.1	●
GWSLD0510A200	5.1	126.5	201.5	200	1.5	5.1	●
GWSLD0510A250	5.1	161.5	251.5	250	1.5	5.1	●
GWSLD0520A160	5.2	101.6	161.6	160	1.6	5.2	●
GWSLD0520A200	5.2	126.6	201.6	200	1.6	5.2	●
GWSLD0520A250	5.2	161.6	251.6	250	1.6	5.2	●
GWSLD0530A160	5.3	101.6	161.6	160	1.6	5.3	●
GWSLD0530A200	5.3	126.6	201.6	200	1.6	5.3	●
GWSLD0530A250	5.3	161.6	251.6	250	1.6	5.3	●
GWSLD0540A160	5.4	101.6	161.6	160	1.6	5.4	●
GWSLD0540A200	5.4	126.6	201.6	200	1.6	5.4	●
GWSLD0540A250	5.4	161.6	251.6	250	1.6	5.4	●
GWSLD0550A160	5.5	101.7	161.7	160	1.7	5.5	●
GWSLD0550A200	5.5	126.7	201.7	200	1.7	5.5	●
GWSLD0550A250	5.5	161.7	251.7	250	1.7	5.5	●
GWSLD0560A160	5.6	101.7	161.7	160	1.7	5.6	●
GWSLD0560A200	5.6	126.7	201.7	200	1.7	5.6	●
GWSLD0560A250	5.6	161.7	251.7	250	1.7	5.6	●
GWSLD0570A160	5.7	101.7	161.7	160	1.7	5.7	●
GWSLD0570A200	5.7	126.7	201.7	200	1.7	5.7	●
GWSLD0570A250	5.7	161.7	251.7	250	1.7	5.7	●
GWSLD0580A160	5.8	101.7	161.7	160	1.7	5.8	●
GWSLD0580A200	5.8	126.7	201.7	200	1.7	5.8	●
GWSLD0580A250	5.8	161.7	251.7	250	1.7	5.8	●
GWSLD0590A160	5.9	101.8	161.8	160	1.8	5.9	●
GWSLD0590A200	5.9	126.8	201.8	200	1.8	5.9	●
GWSLD0590A250	5.9	161.8	251.8	250	1.8	5.9	●
GWSLD0600A160	6.0	101.8	161.8	160	1.8	6.0	●
GWSLD0600A200	6.0	126.8	201.8	200	1.8	6.0	●
GWSLD0600A250	6.0	161.8	251.8	250	1.8	6.0	●
GWSLD0600A315	6.0	201.8	316.8	315	1.8	6.0	●
GWSLD0650A160	6.5	102.0	162.0	160	2.0	6.5	●
GWSLD0650A200	6.5	127.0	202.0	200	2.0	6.5	●
GWSLD0650A250	6.5	162.0	252.0	250	2.0	6.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSLD0650A315	6.5	202.0	317.0	315	2.0	6.5	●
GWSLD0680A160	6.8	102.0	162.0	160	2.0	6.8	●
GWSLD0680A200	6.8	127.0	202.0	200	2.0	6.8	●
GWSLD0680A250	6.8	162.0	252.0	250	2.0	6.8	●
GWSLD0680A315	6.8	202.0	317.0	315	2.0	6.8	●
GWSLD0700A160	7.0	102.1	162.1	160	2.1	7.0	●
GWSLD0700A200	7.0	127.1	202.1	200	2.1	7.0	●
GWSLD0700A250	7.0	162.1	252.1	250	2.1	7.0	●
GWSLD0700A315	7.0	202.1	317.1	315	2.1	7.0	●
GWSLD0750A200	7.5	127.3	202.3	200	2.3	7.5	●
GWSLD0750A250	7.5	162.3	252.3	250	2.3	7.5	●
GWSLD0750A315	7.5	202.3	317.3	315	2.3	7.5	●
GWSLD0800A200	8.0	127.4	202.4	200	2.4	8.0	●
GWSLD0800A250	8.0	162.4	252.4	250	2.4	8.0	●
GWSLD0800A315	8.0	202.4	317.4	315	2.4	8.0	●
GWSLD0850A200	8.5	142.6	202.6	200	2.6	8.5	●
GWSLD0850A250	8.5	162.6	252.6	250	2.6	8.5	●
GWSLD0850A315	8.5	202.6	317.6	315	2.6	8.5	●
GWSLD0900A200	9.0	142.7	202.7	200	2.7	9.0	●
GWSLD0900A250	9.0	162.7	252.7	250	2.7	9.0	●
GWSLD0900A315	9.0	202.7	317.7	315	2.7	9.0	●
GWSLD0950A200	9.5	142.9	202.9	200	2.9	9.5	●
GWSLD0950A250	9.5	162.9	252.9	250	2.9	9.5	●
GWSLD0950A315	9.5	202.9	317.9	315	2.9	9.5	●
GWSLD1000A200	10.0	143.0	203.0	200	3.0	10.0	●
GWSLD1000A250	10.0	163.0	253.0	250	3.0	10.0	●
GWSLD1000A315	10.0	203.0	318.0	315	3.0	10.0	●
GWSLD1050A250	10.5	163.2	253.2	250	3.2	10.5	●
GWSLD1050A315	10.5	203.2	318.2	315	3.2	10.5	●
GWSLD1100A250	11.0	163.3	253.3	250	3.3	11.0	●
GWSLD1100A315	11.0	203.3	318.3	315	3.3	11.0	●
GWSLD1150A250	11.5	163.5	253.5	250	3.5	11.5	●
GWSLD1150A315	11.5	203.5	318.5	315	3.5	11.5	●
GWSLD1200A250	12.0	163.6	253.6	250	3.6	12.0	●
GWSLD1200A315	12.0	203.6	318.6	315	3.6	12.0	●
GWSLD1250A250	12.5	163.8	253.8	250	3.8	12.5	●
GWSLD1250A315	12.5	203.8	318.8	315	3.8	12.5	●
GWSLD1300A250	13.0	163.9	253.9	250	3.9	13.0	●
GWSLD1300A315	13.0	203.9	318.9	315	3.9	13.0	●

HSS

GWSL

TiN, Extra Long

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel SS Carbon Steel S-C (−25HRC)		Alloy Steel SCM Tool Steel SK (−35HRC)		Alloy Steel SCM Die Steel SKD (−40HRC)		Cast Iron FC	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
2.0	4700	0.05	3600	0.03	2400	0.02	4700	0.05
3.0	3200	0.10	2400	0.08	1800	0.05	3500	0.10
6.0	1600	0.18	1200	0.15	900	0.13	1750	0.18
8.0	1200	0.20	900	0.18	680	0.15	1300	0.20
10.0	960	0.22	720	0.20	550	0.18	1100	0.22
12.0	800	0.24	600	0.22	450	0.20	880	0.24
13.0	730	0.26	550	0.23	400	0.21	800	0.26

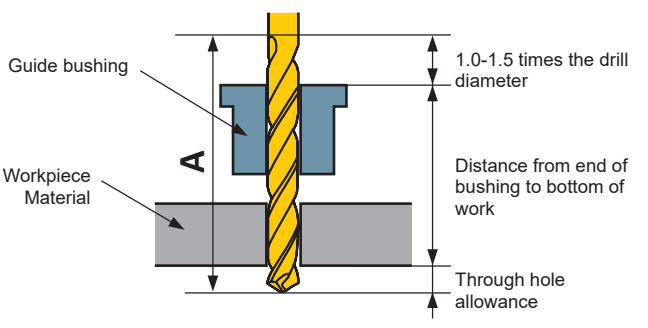
Workpiece Material	Stainless steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
2.0	2500	0.05	2300	0.04	4700	0.05	6000	0.08
3.0	1900	0.10	1500	0.07	3200	0.10	5500	0.13
6.0	950	0.18	750	0.10	1600	0.18	3100	0.23
8.0	700	0.20	530	0.13	1200	0.20	2300	0.28
10.0	560	0.22	420	0.15	960	0.22	1900	0.33
12.0	460	0.24	340	0.17	800	0.24	1600	0.38
13.0	420	0.25	300	0.18	730	0.25	1450	0.40

Note 1) Please reduce the cutting conditions when drilling deep holes.
Note 2) This table only shows standard cutting conditions with water-soluble cutting fluids. Please make corrections or adjustments depending on the application.
Note 3) High-speed long drills have lower rigidity than carbide long drills. In order to prevent problems due to deflection and bending of the drill, please use guide bushes and pilot holes (DC×1 to DC×2) when using.
Note 4) When using guide bushes, please select a drill so that the groove length > A dimension (shown below).

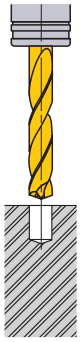
N

DRILLING

Guide Bushing



Machining a Pilot Hole



①The tip angle of the drill for drilling pilot holes should not be smaller than the 118°tip angle of the long drill. Violet Precision Drill (S) VAPDS is recommended.

②It is essential for the pilot hole to have good accuracy.

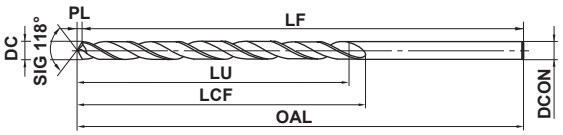
③Drill depth : Approx DC×1—DC×2.

LSD

Extra Long

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

1≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

●Widely used for deep hole drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
LSDD0100A100	1.0	25.3	100.3	100	0.3	1.0	●
LSDD0100A150	1.0	25.3	150.3	150	0.3	1.0	●
LSDD0110A100	1.1	25.3	100.3	100	0.3	1.1	●
LSDD0110A150	1.1	25.3	150.3	150	0.3	1.1	●
LSDD0120A100	1.2	25.4	100.4	100	0.4	1.2	●
LSDD0120A150	1.2	25.4	150.4	150	0.4	1.2	●
LSDD0130A100	1.3	30.4	100.4	100	0.4	1.3	●
LSDD0130A150	1.3	30.4	150.4	150	0.4	1.3	●
LSDD0140A100	1.4	30.4	100.4	100	0.4	1.4	●
LSDD0140A150	1.4	30.4	150.4	150	0.4	1.4	●
LSDD0150A100	1.5	30.5	100.5	100	0.5	1.5	●
LSDD0150A150	1.5	30.5	150.5	150	0.5	1.5	●
LSDD0160A100	1.6	40.5	100.5	100	0.5	1.6	●
LSDD0160A150	1.6	40.5	150.5	150	0.5	1.6	●
LSDD0170A100	1.7	40.5	100.5	100	0.5	1.7	●
LSDD0170A150	1.7	40.5	150.5	150	0.5	1.7	●
LSDD0180A100	1.8	40.5	100.5	100	0.5	1.8	●
LSDD0180A150	1.8	40.5	150.5	150	0.5	1.8	●
LSDD0190A100	1.9	40.6	100.6	100	0.6	1.9	●
LSDD0190A150	1.9	40.6	150.6	150	0.6	1.9	●
LSDD0200A100	2.0	50.6	100.6	100	0.6	2.0	●
LSDD0200A125	2.0	65.6	125.6	125	0.6	2.0	●
LSDD0200A150	2.0	75.6	150.6	150	0.6	2.0	●
LSDD0210A100	2.1	50.6	100.6	100	0.6	2.1	●
LSDD0210A150	2.1	75.6	150.6	150	0.6	2.1	●
LSDD0220A100	2.2	50.7	100.7	100	0.7	2.2	●
LSDD0220A150	2.2	75.7	150.7	150	0.7	2.2	●
LSDD0230A100	2.3	50.7	100.7	100	0.7	2.3	●
LSDD0230A150	2.3	75.7	150.7	150	0.7	2.3	●
LSDD0240A100	2.4	50.7	100.7	100	0.7	2.4	●
LSDD0240A150	2.4	75.7	150.7	150	0.7	2.4	●
LSDD0250A100	2.5	50.8	100.8	100	0.8	2.5	●
LSDD0250A125	2.5	65.8	125.8	125	0.8	2.5	●
LSDD0250A150	2.5	75.8	150.8	150	0.8	2.5	●
LSDD0260A100	2.6	50.8	100.8	100	0.8	2.6	●
LSDD0260A150	2.6	75.8	150.8	150	0.8	2.6	●
LSDD0270A100	2.7	50.8	100.8	100	0.8	2.7	●
LSDD0270A150	2.7	75.8	150.8	150	0.8	2.7	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
LSDD0280A100	2.8	50.8	100.8	100	0.8	2.8	●
LSDD0280A150	2.8	75.8	150.8	150	0.8	2.8	●
LSDD0290A100	2.9	50.9	100.9	100	0.9	2.9	●
LSDD0290A150	2.9	75.9	150.9	150	0.9	2.9	●
LSDD0300A100	3.0	50.9	100.9	100	0.9	3.0	●
LSDD0300A125	3.0	65.9	125.9	125	0.9	3.0	●
LSDD0300A150	3.0	75.9	150.9	150	0.9	3.0	●
LSDD0300A200	3.0	100.9	200.9	200	0.9	3.0	●
LSDD0310A150	3.1	75.9	150.9	150	0.9	3.1	●
LSDD0310A200	3.1	100.9	200.9	200	0.9	3.1	●
LSDD0320A125	3.2	66.0	126.0	125	1.0	3.2	●
LSDD0320A150	3.2	76.0	151.0	150	1.0	3.2	●
LSDD0320A200	3.2	101.0	201.0	200	1.0	3.2	●
LSDD0320A250	3.2	131.0	251.0	250	1.0	3.2	●
LSDD0330A150	3.3	76.0	151.0	150	1.0	3.3	●
LSDD0330A200	3.3	101.0	201.0	200	1.0	3.3	●
LSDD0340A150	3.4	76.0	151.0	150	1.0	3.4	●
LSDD0340A200	3.4	101.0	201.0	200	1.0	3.4	●
LSDD0350A125	3.5	66.1	126.1	125	1.1	3.5	●
LSDD0350A150	3.5	76.1	151.1	150	1.1	3.5	●
LSDD0350A200	3.5	101.1	201.1	200	1.1	3.5	●
LSDD0350A250	3.5	131.1	251.1	250	1.1	3.5	●
LSDD0360A150	3.6	76.1	151.1	150	1.1	3.6	●
LSDD0360A200	3.6	101.1	201.1	200	1.1	3.6	●
LSDD0370A150	3.7	76.1	151.1	150	1.1	3.7	●
LSDD0370A200	3.7	101.1	201.1	200	1.1	3.7	●
LSDD0380A150	3.8	76.1	151.1	150	1.1	3.8	●
LSDD0380A200	3.8	101.1	201.1	200	1.1	3.8	●
LSDD0390A150	3.9	76.2	151.2	150	1.2	3.9	●
LSDD0390A200	3.9	101.2	201.2	200	1.2	3.9	●
LSDD0400A125	4.0	71.2	126.2	125	1.2	4.0	●
LSDD0400A150	4.0	76.2	151.2	150	1.2	4.0	●
LSDD0400A200	4.0	101.2	201.2	200	1.2	4.0	●
LSDD0400A250	4.0	131.2	251.2	250	1.2	4.0	●
LSDD0410A150	4.1	76.2	151.2	150	1.2	4.1	●
LSDD0410A200	4.1	101.2	201.2	200	1.2	4.1	●
LSDD0420A150	4.2	76.3	151.3	150	1.3	4.2	●
LSDD0420A200	4.2	101.3	201.3	200	1.3	4.2	●

● : Inventory maintained in Japan.

LSD

Extra Long

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
LSDD0430A150	4.3	76.3	151.3	150	1.3	4.3	●
LSDD0430A200	4.3	101.3	201.3	200	1.3	4.3	●
LSDD0440A150	4.4	76.3	151.3	150	1.3	4.4	●
LSDD0440A200	4.4	101.3	201.3	200	1.3	4.4	●
LSDD0450A125	4.5	71.4	126.4	125	1.4	4.5	●
LSDD0450A150	4.5	76.4	151.4	150	1.4	4.5	●
LSDD0450A200	4.5	101.4	201.4	200	1.4	4.5	●
LSDD0450A250	4.5	131.4	251.4	250	1.4	4.5	●
LSDD0460A150	4.6	91.4	151.4	150	1.4	4.6	●
LSDD0460A200	4.6	101.4	201.4	200	1.4	4.6	●
LSDD0470A150	4.7	91.4	151.4	150	1.4	4.7	●
LSDD0470A200	4.7	101.4	201.4	200	1.4	4.7	●
LSDD0480A150	4.8	91.4	151.4	150	1.4	4.8	●
LSDD0480A200	4.8	101.4	201.4	200	1.4	4.8	●
LSDD0490A150	4.9	91.5	151.5	150	1.5	4.9	●
LSDD0490A200	4.9	101.5	201.5	200	1.5	4.9	●
LSDD0500A150	5.0	91.5	151.5	150	1.5	5.0	●
LSDD0500A200	5.0	101.5	201.5	200	1.5	5.0	●
LSDD0500A250	5.0	131.5	251.5	250	1.5	5.0	●
LSDD0500A300	5.0	151.5	301.5	300	1.5	5.0	●
LSDD0510A200	5.1	101.5	201.5	200	1.5	5.1	●
LSDD0510A250	5.1	131.5	251.5	250	1.5	5.1	●
LSDD0520A200	5.2	101.6	201.6	200	1.6	5.2	●
LSDD0520A250	5.2	131.6	251.6	250	1.6	5.2	●
LSDD0530A200	5.3	101.6	201.6	200	1.6	5.3	●
LSDD0530A250	5.3	131.6	251.6	250	1.6	5.3	●
LSDD0540A200	5.4	101.6	201.6	200	1.6	5.4	●
LSDD0540A250	5.4	131.6	251.6	250	1.6	5.4	●
LSDD0550A150	5.5	91.7	151.7	150	1.7	5.5	●
LSDD0550A200	5.5	101.7	201.7	200	1.7	5.5	●
LSDD0550A250	5.5	131.7	251.7	250	1.7	5.5	●
LSDD0550A300	5.5	151.7	301.7	300	1.7	5.5	●
LSDD0560A200	5.6	101.7	201.7	200	1.7	5.6	●
LSDD0560A250	5.6	131.7	251.7	250	1.7	5.6	●
LSDD0570A200	5.7	101.7	201.7	200	1.7	5.7	●
LSDD0570A250	5.7	131.7	251.7	250	1.7	5.7	●
LSDD0580A200	5.8	101.7	201.7	200	1.7	5.8	●
LSDD0580A250	5.8	131.7	251.7	250	1.7	5.8	●
LSDD0590A200	5.9	101.8	201.8	200	1.8	5.9	●
LSDD0590A250	5.9	131.8	251.8	250	1.8	5.9	●
LSDD0600A150	6.0	91.8	151.8	150	1.8	6.0	●
LSDD0600A200	6.0	101.8	201.8	200	1.8	6.0	●
LSDD0600A250	6.0	131.8	251.8	250	1.8	6.0	●
LSDD0600A300	6.0	151.8	301.8	300	1.8	6.0	●
LSDD0640A200	6.4	121.9	201.9	200	1.9	6.4	●
LSDD0650A150	6.5	92.0	152.0	150	2.0	6.5	●
LSDD0650A200	6.5	122.0	202.0	200	2.0	6.5	●
LSDD0650A250	6.5	132.0	252.0	250	2.0	6.5	●
LSDD0650A300	6.5	152.0	302.0	300	2.0	6.5	●
LSDD0700A150	7.0	92.1	152.1	150	2.1	7.0	●
LSDD0700A200	7.0	122.1	202.1	200	2.1	7.0	●
LSDD0700A250	7.0	132.1	252.1	250	2.1	7.0	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
LSDD0700A300	7.0	152.1	302.1	300	2.1	7.0	●
LSDD0750A150	7.5	92.3	152.3	150	2.3	7.5	●
LSDD0750A200	7.5	122.3	202.3	200	2.3	7.5	●
LSDD0750A250	7.5	132.3	252.3	250	2.3	7.5	●
LSDD0750A300	7.5	152.3	302.3	300	2.3	7.5	●
LSDD0800A150	8.0	92.4	152.4	150	2.4	8.0	●
LSDD0800A200	8.0	122.4	202.4	200	2.4	8.0	●
LSDD0800A250	8.0	132.4	252.4	250	2.4	8.0	●
LSDD0800A300	8.0	152.4	302.4	300	2.4	8.0	●
LSDD0850A200	8.5	122.6	202.6	200	2.6	8.5	●
LSDD0850A250	8.5	132.6	252.6	250	2.6	8.5	●
LSDD0850A300	8.5	182.6	302.6	300	2.6	8.5	●
LSDD0850A350	8.5	202.6	352.6	350	2.6	8.5	●
LSDD0900A200	9.0	122.7	202.7	200	2.7	9.0	●
LSDD0900A250	9.0	132.7	252.7	250	2.7	9.0	●
LSDD0900A300	9.0	182.7	302.7	300	2.7	9.0	●
LSDD0900A350	9.0	202.7	352.7	350	2.7	9.0	●
LSDD0950A200	9.5	122.9	202.9	200	2.9	9.5	●
LSDD0950A250	9.5	132.9	252.9	250	2.9	9.5	●
LSDD0950A300	9.5	182.9	302.9	300	2.9	9.5	●
LSDD0950A350	9.5	202.9	352.9	350	2.9	9.5	●
LSDD1000A200	10.0	123.0	203.0	200	3.0	10.0	●
LSDD1000A250	10.0	133.0	253.0	250	3.0	10.0	●
LSDD1000A300	10.0	183.0	303.0	300	3.0	10.0	●
LSDD1000A350	10.0	203.0	353.0	350	3.0	10.0	●
LSDD1050A200	10.5	123.2	203.2	200	3.2	10.5	●
LSDD1050A250	10.5	133.2	253.2	250	3.2	10.5	●
LSDD1050A300	10.5	183.2	303.2	300	3.2	10.5	●
LSDD1050A350	10.5	203.2	353.2	350	3.2	10.5	●
LSDD1100A200	11.0	123.3	203.3	200	3.3	11.0	●
LSDD1100A250	11.0	133.3	253.3	250	3.3	11.0	●
LSDD1100A300	11.0	183.3	303.3	300	3.3	11.0	●
LSDD1100A350	11.0	203.3	353.3	350	3.3	11.0	●
LSDD1150A200	11.5	123.5	203.5	200	3.5	11.5	●
LSDD1150A250	11.5	133.5	253.5	250	3.5	11.5	●
LSDD1150A300	11.5	183.5	303.5	300	3.5	11.5	●
LSDD1150A350	11.5	203.5	353.5	350	3.5	11.5	●
LSDD1200A200	12.0	123.6	203.6	200	3.6	12.0	●
LSDD1200A250	12.0	133.6	253.6	250	3.6	12.0	●
LSDD1200A300	12.0	183.6	303.6	300	3.6	12.0	●
LSDD1200A350	12.0	203.6	353.6	350	3.6	12.0	●
LSDD1250A200	12.5	123.8	203.8	200	3.8	12.5	●
LSDD1250A250	12.5	133.8	253.8	250	3.8	12.5	●
LSDD1250A300	12.5	183.8	303.8	300	3.8	12.5	●
LSDD1250A350	12.5	203.8	353.8	350	3.8	12.5	●
LSDD1300A200	13.0	123.9	203.9	200	3.9	13.0	●
LSDD1300A250	13.0	133.9	253.9	250	3.9	13.0	●
LSDD1300A300	13.0	183.9	303.9	300	3.9	13.0	●
LSDD1300A350	13.0	203.9	353.9	350	3.9	13.0	●

● : Inventory maintained in Japan.

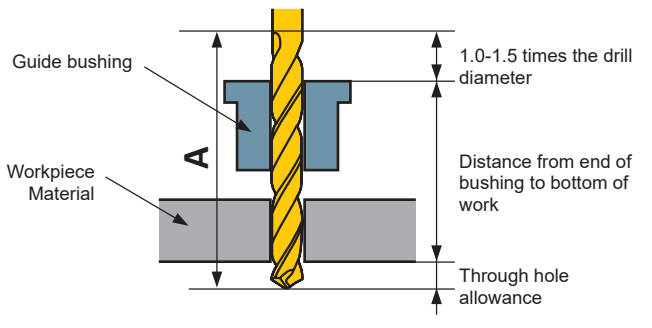
RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel SS Carbon Steel S-C (−25HRC)		Alloy Steel SCM Tool Steel SK (−35HRC)		Alloy Steel SCM Die Steel SKD (−40HRC)		Cast Iron FC	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
1.0	5000	0.02	4000	0.01	2800	0.008	5000	0.02
2.0	3000	0.05	2500	0.03	1800	0.02	3000	0.05
3.0	2100	0.10	1800	0.08	1200	0.05	2300	0.10
6.0	1100	0.18	900	0.15	600	0.13	1100	0.18
8.0	800	0.20	670	0.18	450	0.15	900	0.20
10.0	650	0.22	540	0.20	350	0.18	700	0.22
12.0	520	0.24	450	0.22	300	0.20	600	0.24
13.0	480	0.26	410	0.23	280	0.21	540	0.26

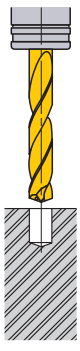
Workpiece Material	Stainless Steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
1.0	4000	0.02	3000	0.02	5000	0.02	7000	0.04
2.0	2200	0.05	1500	0.04	3000	0.05	5000	0.08
3.0	1600	0.10	1000	0.07	2100	0.10	4200	0.13
6.0	800	0.18	530	0.10	1100	0.18	2100	0.23
8.0	600	0.20	400	0.13	800	0.20	1600	0.28
10.0	480	0.22	310	0.15	650	0.22	1200	0.33
12.0	400	0.24	250	0.17	520	0.24	1000	0.38
13.0	370	0.25	200	0.18	480	0.25	970	0.40

Note 1) Please reduce the cutting conditions when drilling deep holes.
Note 2) This table only shows standard cutting conditions with water-soluble cutting fluids. Please make corrections or adjustments depending on the application.
Note 3) High-speed long drills have lower rigidity than carbide long drills. In order to prevent problems due to deflection and bending of the drill, please use guide bushes and pilot holes (DC×1 to DC×2) when using.
Note 4) When using guide bushes, please select a drill so that the groove length > A dimension (shown below).

Guide bushing



Machining a Pilot Hole



①The tip angle of the drill for drilling pilot holes should not be smaller than the 118°tip angle of the long drill. Violet Precision Drill (S) VAPDS is recommended.

②It is essential for the pilot hole to have good accuracy.

③Drill depth : Approx DC×1—DC×2.

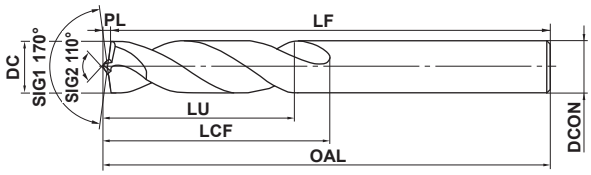
DRILLING(HSS TYPE)

EPSS

Plate Pal

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU : Max 1×DC

2≤DC≤3	3<DC≤6	6<DC≤10	10<DC≤13
0 −0.014	0 −0.018	0 −0.022	0 −0.027

●Special cutting edge geometry to prevent through hole burrs.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
EPSSD0200	2.0	17	48.3	48	0.3	2.0	●
EPSSD0210	2.1	17	48.3	48	0.3	2.1	●
EPSSD0220	2.2	17	48.3	48	0.3	2.2	●
EPSSD0230	2.3	17	48.3	48	0.3	2.3	●
EPSSD0240	2.4	17	48.3	48	0.3	2.4	●
EPSSD0250	2.5	17	48.4	48	0.4	2.5	●
EPSSD0260	2.6	17	48.4	48	0.4	2.6	●
EPSSD0270	2.7	17	48.4	48	0.4	2.7	●
EPSSD0280	2.8	17	48.4	48	0.4	2.8	●
EPSSD0290	2.9	17	48.4	48	0.4	2.9	●
EPSSD0300	3.0	17	48.5	48	0.5	3.0	●
EPSSD0310	3.1	17	48.5	48	0.5	3.1	●
EPSSD0320	3.2	17	48.5	48	0.5	3.2	●
EPSSD0330	3.3	17	48.5	48	0.5	3.3	●
EPSSD0340	3.4	19	51.5	51	0.5	3.4	●
EPSSD0350	3.5	19	51.6	51	0.6	3.5	●
EPSSD0360	3.6	19	51.6	51	0.6	3.6	●
EPSSD0370	3.7	19	51.6	51	0.6	3.7	●
EPSSD0380	3.8	21	54.6	54	0.6	3.8	●
EPSSD0390	3.9	21	54.6	54	0.6	3.9	●
EPSSD0400	4.0	21	54.6	54	0.6	4.0	●
EPSSD0410	4.1	21	54.6	54	0.6	4.1	●
EPSSD0420	4.2	21	54.6	54	0.6	4.2	●
EPSSD0430	4.3	23	57.6	57	0.6	4.3	●
EPSSD0440	4.4	23	57.6	57	0.6	4.4	●
EPSSD0450	4.5	23	57.7	57	0.7	4.5	●
EPSSD0460	4.6	23	57.7	57	0.7	4.6	●
EPSSD0470	4.7	23	57.7	57	0.7	4.7	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
EPSSD0480	4.8	24	60.7	60	0.7	4.8	●
EPSSD0490	4.9	24	60.7	60	0.7	4.9	●
EPSSD0500	5.0	24	60.8	60	0.8	5.0	●
EPSSD0510	5.1	24	60.8	60	0.8	5.1	●
EPSSD0520	5.2	24	60.8	60	0.8	5.2	●
EPSSD0530	5.3	24	60.8	60	0.8	5.3	●
EPSSD0540	5.4	26	64.8	64	0.8	5.4	●
EPSSD0550	5.5	26	64.9	64	0.9	5.5	●
EPSSD0600	6.0	26	65.0	64	1.0	6.0	●
EPSSD0650	6.5	29	69.0	68	1.0	6.5	●
EPSSD0680	6.8	32	73.1	72	1.1	6.8	●
EPSSD0700	7.0	32	73.1	72	1.1	7.0	●
EPSSD0750	7.5	32	73.2	72	1.2	7.5	●
EPSSD0800	8.0	34	77.3	76	1.3	8.0	●
EPSSD0820	8.2	34	77.3	76	1.3	8.2	●
EPSSD0850	8.5	34	77.4	76	1.4	8.5	●
EPSSD0900	9.0	37	82.5	81	1.5	9.0	●
EPSSD0950	9.5	37	82.6	81	1.6	9.5	●
EPSSD1000	10.0	40	87.6	86	1.6	10.0	●
EPSSD1020	10.2	40	87.6	86	1.6	10.2	●
EPSSD1030	10.3	40	87.6	86	1.6	10.3	●
EPSSD1050	10.5	40	87.7	86	1.7	10.5	●
EPSSD1100	11.0	43	92.8	91	1.8	11.0	●
EPSSD1150	11.5	43	92.9	91	1.9	11.5	●
EPSSD1200	12.0	47	100.0	98	2.0	12.0	●
EPSSD1250	12.5	47	100.0	98	2.0	12.5	●
EPSSD1300	13.0	47	100.2	98	2.2	13.0	●

● : Inventory maintained in Japan.

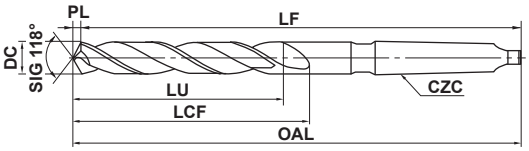
GTD

TiN

HSS G 118° XR

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

DC=6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤40
0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

● Original manufacturing and coating technology for improved performance.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GTDD0600M1	6.0	56.8	149.8	148	1.8	MT.1	●
GTDD0650M1	6.5	63.0	154.0	152	2.0	MT.1	●
GTDD0660M1	6.6	63.0	157.0	155	2.0	MT.1	●
GTDD0680M1	6.8	69.0	157.0	155	2.0	MT.1	●
GTDD0700M1	7.0	69.1	157.1	155	2.1	MT.1	●
GTDD0720M1	7.2	69.2	160.2	158	2.2	MT.1	●
GTDD0750M1	7.5	69.3	160.3	158	2.3	MT.1	●
GTDD0770M1	7.7	74.3	164.3	162	2.3	MT.1	●
GTDD0780M1	7.8	74.3	164.3	162	2.3	MT.1	●
GTDD0800M1	8.0	74.4	164.4	162	2.4	MT.1	●
GTDD0820M1	8.2	74.5	170.5	168	2.5	MT.1	●
GTDD0850M1	8.5	74.6	170.6	168	2.6	MT.1	●
GTDD0880M1	8.8	80.6	174.6	172	2.6	MT.1	●
GTDD0900M1	9.0	80.7	174.7	172	2.7	MT.1	●
GTDD0950M1	9.5	80.9	177.9	175	2.9	MT.1	●
GTDD0970M1	9.7	86.9	180.9	178	2.9	MT.1	●
GTDD0980M1	9.8	86.9	180.9	178	2.9	MT.1	●
GTDD1000M1	10.0	87.0	181.0	178	3.0	MT.1	●
GTDD1030M1	10.3	87.1	185.1	182	3.1	MT.1	●
GTDD1050M1	10.5	87.2	185.2	182	3.2	MT.1	●
GTDD1080M1	10.8	93.2	188.2	185	3.2	MT.1	●
GTDD1100M1	11.0	93.3	188.3	185	3.3	MT.1	●
GTDD1150M1	11.5	93.5	191.5	188	3.5	MT.1	●
GTDD1200M1	12.0	100.6	195.6	192	3.6	MT.1	●
GTDD1250M1	12.5	100.8	198.8	195	3.8	MT.1	●
GTDD1300M1	13.0	100.9	201.9	198	3.9	MT.1	●
GTDD1350M1	13.5	107.1	206.1	202	4.1	MT.1	●
GTDD1400M1	14.0	107.2	209.2	205	4.2	MT.1	●
GTDD1450M2	14.5	113.4	226.4	222	4.4	MT.2	●
GTDD1500M2	15.0	113.5	229.5	225	4.5	MT.2	●
GTDD1550M2	15.5	119.7	232.7	228	4.7	MT.2	●
GTDD1600M2	16.0	119.8	234.8	230	4.8	MT.2	●
GTDD1650M2	16.5	124.0	237.0	232	5.0	MT.2	●
GTDD1700M2	17.0	124.1	240.1	235	5.1	MT.2	●
GTDD1750M2	17.5	129.3	245.3	240	5.3	MT.2	●
GTDD1800M2	18.0	129.4	245.4	240	5.4	MT.2	●
GTDD1850M2	18.5	134.6	250.6	245	5.6	MT.2	●
GTDD1900M2	19.0	134.7	250.7	245	5.7	MT.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GTDD1950M2	19.5	138.9	255.9	250	5.9	MT.2	●
GTDD2000M2	20.0	139.0	256.0	250	6.0	MT.2	●
GTDD2050M2	20.5	144.2	261.2	255	6.2	MT.2	●
GTDD2100M2	21.0	144.3	261.3	255	6.3	MT.2	●
GTDD2150M2	21.5	149.5	266.5	260	6.5	MT.2	●
GTDD2150M3	21.5	149.5	286.5	280	6.5	MT.3	●
GTDD2200M2	22.0	149.6	266.6	260	6.6	MT.2	●
GTDD2200M3	22.0	149.6	286.6	280	6.6	MT.3	●
GTDD2250M2	22.5	153.8	271.8	265	6.8	MT.2	●
GTDD2250M3	22.5	153.8	291.8	285	6.8	MT.3	●
GTDD2300M2	23.0	153.9	271.9	265	6.9	MT.2	●
GTDD2300M3	23.0	153.9	291.9	285	6.9	MT.3	●
GTDD2350M3	23.5	154.1	292.1	285	7.1	MT.3	●
GTDD2400M3	24.0	159.2	292.2	285	7.2	MT.3	●
GTDD2450M3	24.5	159.4	292.4	285	7.4	MT.3	●
GTDD2500M3	25.0	159.5	292.5	285	7.5	MT.3	●
GTDD2550M3	25.5	163.7	292.7	285	7.7	MT.3	●
GTDD2600M3	26.0	163.8	292.8	285	7.8	MT.3	●
GTDD2650M3	26.5	164.0	298.0	290	8.0	MT.3	●
GTDD2700M3	27.0	169.1	298.1	290	8.1	MT.3	●
GTDD2750M3	27.5	169.3	303.3	295	8.3	MT.3	●
GTDD2800M3	28.0	169.4	303.4	295	8.4	MT.3	●
GTDD2850M3	28.5	173.6	308.6	300	8.6	MT.3	●
GTDD2900M3	29.0	173.7	308.7	300	8.7	MT.3	●
GTDD2950M3	29.5	173.9	313.9	305	8.9	MT.3	●
GTDD3000M3	30.0	174.0	314.0	305	9.0	MT.3	●
GTDD3050M3	30.5	179.2	319.2	310	9.2	MT.3	●
GTDD3100M3	31.0	179.3	319.3	310	9.3	MT.3	●
GTDD3150M3	31.5	179.5	324.5	315	9.5	MT.3	●
GTDD3200M3	32.0	183.6	324.6	315	9.6	MT.3	●
GTDD3300M4	33.0	183.9	354.9	345	9.9	MT.4	●
GTDD3400M4	34.0	189.2	360.2	350	10.2	MT.4	●
GTDD3500M4	35.0	189.5	360.5	350	10.5	MT.4	●
GTDD3600M4	36.0	193.8	365.8	355	10.8	MT.4	●
GTDD3700M4	37.0	194.1	366.1	355	11.1	MT.4	●
GTDD3800M4	38.0	198.4	371.4	360	11.4	MT.4	●
GTDD3900M4	39.0	198.7	371.7	360	11.7	MT.4	●
GTDD4000M4	40.0	199.0	377.0	365	12.0	MT.4	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

DRILLING(HSS TYPE)

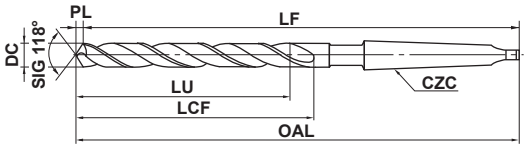
TD

Taper Shank

DC>40

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤50	50<DC≤75
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039	0 −0.046

●For general drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD0300M1	3.0	38.9	115.9	115	0.9	MT.1	●
TDD0310M1	3.1	45.9	122.9	122	0.9	MT.1	●
TDD0320M1	3.2	46.0	123.0	122	1.0	MT.1	●
TDD0330M1	3.3	46.0	123.0	122	1.0	MT.1	●
TDD0340M1	3.4	46.0	123.0	122	1.0	MT.1	●
TDD0350M1	3.5	46.1	123.1	122	1.1	MT.1	●
TDD0360M1	3.6	51.1	129.1	128	1.1	MT.1	●
TDD0370M1	3.7	51.1	129.1	128	1.1	MT.1	●
TDD0380M1	3.8	51.1	129.1	128	1.1	MT.1	●
TDD0390M1	3.9	51.2	129.2	128	1.2	MT.1	●
TDD0400M1	4.0	51.2	129.2	128	1.2	MT.1	●
TDD0410M1	4.1	56.2	136.2	135	1.2	MT.1	●
TDD0420M1	4.2	56.3	136.3	135	1.3	MT.1	●
TDD0430M1	4.3	56.3	136.3	135	1.3	MT.1	●
TDD0440M1	4.4	56.3	136.3	135	1.3	MT.1	●
TDD0450M1	4.5	56.4	136.4	135	1.4	MT.1	●
TDD0460M1	4.6	61.4	141.4	140	1.4	MT.1	●
TDD0470M1	4.7	61.4	141.4	140	1.4	MT.1	●
TDD0480M1	4.8	61.4	141.4	140	1.4	MT.1	●
TDD0490M1	4.9	61.5	141.5	140	1.5	MT.1	●
TDD0500M1	5.0	61.5	141.5	140	1.5	MT.1	●
TDD0510M1	5.1	66.5	146.5	145	1.5	MT.1	●
TDD0520M1	5.2	66.6	146.6	145	1.6	MT.1	●
TDD0530M1	5.3	66.6	146.6	145	1.6	MT.1	●
TDD0540M1	5.4	66.6	146.6	145	1.6	MT.1	●
TDD0550M1	5.5	66.7	146.7	145	1.7	MT.1	●
TDD0560M1	5.6	69.7	149.7	148	1.7	MT.1	●
TDD0570M1	5.7	69.7	149.7	148	1.7	MT.1	●
TDD0580M1	5.8	69.7	149.7	148	1.7	MT.1	●
TDD0590M1	5.9	69.8	149.8	148	1.8	MT.1	●
TDD0600M1	6.0	69.8	149.8	148	1.8	MT.1	●
TDD0610M1	6.1	73.8	153.8	152	1.8	MT.1	●
TDD0620M1	6.2	73.9	153.9	152	1.9	MT.1	●
TDD0630M1	6.3	73.9	153.9	152	1.9	MT.1	●
TDD0640M1	6.4	73.9	153.9	152	1.9	MT.1	●
TDD0650M1	6.5	74.0	154.0	152	2.0	MT.1	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD0660M1	6.6	77.0	157.0	155	2.0	MT.1	●
TDD0670M1	6.7	77.0	157.0	155	2.0	MT.1	●
TDD0680M1	6.8	77.0	157.0	155	2.0	MT.1	●
TDD0690M1	6.9	77.1	157.1	155	2.1	MT.1	●
TDD0700M1	7.0	77.1	157.1	155	2.1	MT.1	●
TDD0710M1	7.1	80.1	160.1	158	2.1	MT.1	●
TDD0720M1	7.2	80.2	160.2	158	2.2	MT.1	●
TDD0730M1	7.3	80.2	160.2	158	2.2	MT.1	●
TDD0740M1	7.4	80.2	160.2	158	2.2	MT.1	●
TDD0750M1	7.5	80.3	160.3	158	2.3	MT.1	●
TDD0760M1	7.6	84.3	164.3	162	2.3	MT.1	●
TDD0770M1	7.7	84.3	164.3	162	2.3	MT.1	●
TDD0780M1	7.8	84.3	164.3	162	2.3	MT.1	●
TDD0790M1	7.9	84.4	164.4	162	2.4	MT.1	●
TDD0800M1	8.0	84.4	164.4	162	2.4	MT.1	●
TDD0810M1	8.1	87.4	170.4	168	2.4	MT.1	●
TDD0820M1	8.2	87.5	170.5	168	2.5	MT.1	●
TDD0830M1	8.3	87.5	170.5	168	2.5	MT.1	●
TDD0840M1	8.4	87.5	170.5	168	2.5	MT.1	●
TDD0850M1	8.5	87.6	170.6	168	2.6	MT.1	●
TDD0860M1	8.6	90.6	174.6	172	2.6	MT.1	●
TDD0870M1	8.7	90.6	174.6	172	2.6	MT.1	●
TDD0880M1	8.8	90.6	174.6	172	2.6	MT.1	●
TDD0890M1	8.9	90.7	174.7	172	2.7	MT.1	●
TDD0900M1	9.0	90.7	174.7	172	2.7	MT.1	●
TDD0910M1	9.1	94.7	177.7	175	2.7	MT.1	●
TDD0920M1	9.2	94.8	177.8	175	2.8	MT.1	●
TDD0930M1	9.3	94.8	177.8	175	2.8	MT.1	●
TDD0940M1	9.4	94.8	177.8	175	2.8	MT.1	●
TDD0950M1	9.5	94.9	177.9	175	2.9	MT.1	●
TDD0960M1	9.6	97.9	180.9	178	2.9	MT.1	●
TDD0970M1	9.7	97.9	180.9	178	2.9	MT.1	●
TDD0980M1	9.8	97.9	180.9	178	2.9	MT.1	●
TDD0990M1	9.9	98.0	181.0	178	3.0	MT.1	●
TDD1000M1	10.0	98.0	181.0	178	3.0	MT.1	●
TDD1010M1	10.1	101.0	185.0	182	3.0	MT.1	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD1020M1	10.2	101.1	185.1	182	3.1	MT.1	●
TDD1030M1	10.3	101.1	185.1	182	3.1	MT.1	●
TDD1040M1	10.4	101.1	185.1	182	3.1	MT.1	●
TDD1050M1	10.5	101.2	185.2	182	3.2	MT.1	●
TDD1060M1	10.6	105.2	188.2	185	3.2	MT.1	●
TDD1070M1	10.7	105.2	188.2	185	3.2	MT.1	●
TDD1080M1	10.8	105.2	188.2	185	3.2	MT.1	●
TDD1090M1	10.9	105.3	188.3	185	3.3	MT.1	●
TDD1100M1	11.0	105.3	188.3	185	3.3	MT.1	●
TDD1110M1	11.1	108.3	191.3	188	3.3	MT.1	●
TDD1120M1	11.2	108.4	191.4	188	3.4	MT.1	●
TDD1130M1	11.3	108.4	191.4	188	3.4	MT.1	●
TDD1140M1	11.4	108.4	191.4	188	3.4	MT.1	●
TDD1150M1	11.5	108.5	191.5	188	3.5	MT.1	●
TDD1160M1	11.6	111.5	195.5	192	3.5	MT.1	●
TDD1170M1	11.7	111.5	195.5	192	3.5	MT.1	●
TDD1180M1	11.8	111.5	195.5	192	3.5	MT.1	●
TDD1190M1	11.9	111.6	195.6	192	3.6	MT.1	●
TDD1200M1	12.0	111.6	195.6	192	3.6	MT.1	●
TDD1210M1	12.1	115.6	198.6	195	3.6	MT.1	●
TDD1220M1	12.2	115.7	198.7	195	3.7	MT.1	●
TDD1230M1	12.3	115.7	198.7	195	3.7	MT.1	●
TDD1240M1	12.4	115.7	198.7	195	3.7	MT.1	●
TDD1250M1	12.5	115.8	198.8	195	3.8	MT.1	●
TDD1260M1	12.6	118.8	201.8	198	3.8	MT.1	●
TDD1270M1	12.7	118.8	201.8	198	3.8	MT.1	●
TDD1280M1	12.8	118.8	201.8	198	3.8	MT.1	●
TDD1290M1	12.9	118.9	201.9	198	3.9	MT.1	●
TDD1300M1	13.0	118.9	201.9	198	3.9	MT.1	●
TDD1310M1	13.1	121.9	205.9	202	3.9	MT.1	●
TDD1320M1	13.2	122.0	206.0	202	4.0	MT.1	●
TDD1330M1	13.3	122.0	206.0	202	4.0	MT.1	●
TDD1340M1	13.4	122.0	206.0	202	4.0	MT.1	●
TDD1350M1	13.5	122.1	206.1	202	4.1	MT.1	●
TDD1360M1	13.6	126.1	209.1	205	4.1	MT.1	●
TDD1370M1	13.7	126.1	209.1	205	4.1	MT.1	●
TDD1380M1	13.8	126.1	209.1	205	4.1	MT.1	●
TDD1390M1	13.9	126.2	209.2	205	4.2	MT.1	●
TDD1400M1	14.0	126.2	209.2	205	4.2	MT.1	●
TDD1410M2	14.1	126.2	226.2	222	4.2	MT.2	●
TDD1420M2	14.2	126.3	226.3	222	4.3	MT.2	●
TDD1430M2	14.3	126.3	226.3	222	4.3	MT.2	●
TDD1440M2	14.4	126.3	226.3	222	4.3	MT.2	●
TDD1450M2	14.5	126.4	226.4	222	4.4	MT.2	●
TDD1460M2	14.6	129.4	229.4	225	4.4	MT.2	●
TDD1470M2	14.7	129.4	229.4	225	4.4	MT.2	●
TDD1480M2	14.8	129.4	229.4	225	4.4	MT.2	●
TDD1490M2	14.9	129.5	229.5	225	4.5	MT.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD1500M2	15.0	129.5	229.5	225	4.5	MT.2	●
TDD1510M2	15.1	132.5	232.5	228	4.5	MT.2	●
TDD1520M2	15.2	132.6	232.6	228	4.6	MT.2	●
TDD1530M2	15.3	132.6	232.6	228	4.6	MT.2	●
TDD1540M2	15.4	132.6	232.6	228	4.6	MT.2	●
TDD1550M2	15.5	132.7	232.7	228	4.7	MT.2	●
TDD1560M2	15.6	134.7	234.7	230	4.7	MT.2	●
TDD1570M2	15.7	134.7	234.7	230	4.7	MT.2	●
TDD1580M2	15.8	134.7	234.7	230	4.7	MT.2	●
TDD1590M2	15.9	134.8	234.8	230	4.8	MT.2	●
TDD1600M2	16.0	134.8	234.8	230	4.8	MT.2	●
TDD1610M2	16.1	136.8	236.8	232	4.8	MT.2	●
TDD1620M2	16.2	136.9	236.9	232	4.9	MT.2	●
TDD1630M2	16.3	136.9	236.9	232	4.9	MT.2	●
TDD1640M2	16.4	136.9	236.9	232	4.9	MT.2	●
TDD1650M2	16.5	137.0	237.0	232	5.0	MT.2	●
TDD1660M2	16.6	140.0	240.0	235	5.0	MT.2	●
TDD1670M2	16.7	140.0	240.0	235	5.0	MT.2	●
TDD1680M2	16.8	140.0	240.0	235	5.0	MT.2	●
TDD1690M2	16.9	140.1	240.1	235	5.1	MT.2	●
TDD1700M2	17.0	140.1	240.1	235	5.1	MT.2	●
TDD1710M2	17.1	145.1	245.1	240	5.1	MT.2	●
TDD1720M2	17.2	145.2	245.2	240	5.2	MT.2	●
TDD1730M2	17.3	145.2	245.2	240	5.2	MT.2	●
TDD1740M2	17.4	145.2	245.2	240	5.2	MT.2	●
TDD1750M2	17.5	145.3	245.3	240	5.3	MT.2	●
TDD1760M2	17.6	145.3	245.3	240	5.3	MT.2	●
TDD1770M2	17.7	145.3	245.3	240	5.3	MT.2	●
TDD1780M2	17.8	145.3	245.3	240	5.3	MT.2	●
TDD1790M2	17.9	145.4	245.4	240	5.4	MT.2	●
TDD1800M2	18.0	145.4	245.4	240	5.4	MT.2	●
TDD1810M2	18.1	150.4	250.4	245	5.4	MT.2	●
TDD1820M2	18.2	150.5	250.5	245	5.5	MT.2	●
TDD1830M2	18.3	150.5	250.5	245	5.5	MT.2	●
TDD1840M2	18.4	150.5	250.5	245	5.5	MT.2	●
TDD1850M2	18.5	150.6	250.6	245	5.6	MT.2	●
TDD1860M2	18.6	150.6	250.6	245	5.6	MT.2	●
TDD1870M2	18.7	150.6	250.6	245	5.6	MT.2	●
TDD1880M2	18.8	150.6	250.6	245	5.6	MT.2	●
TDD1890M2	18.9	150.7	250.7	245	5.7	MT.2	●
TDD1900M2	19.0	150.7	250.7	245	5.7	MT.2	●
TDD1910M2	19.1	155.7	255.7	250	5.7	MT.2	●
TDD1920M2	19.2	155.8	255.8	250	5.8	MT.2	●
TDD1930M2	19.3	155.8	255.8	250	5.8	MT.2	●
TDD1940M2	19.4	155.8	255.8	250	5.8	MT.2	●
TDD1950M2	19.5	155.9	255.9	250	5.9	MT.2	●
TDD1960M2	19.6	155.9	255.9	250	5.9	MT.2	●
TDD1970M2	19.7	155.9	255.9	250	5.9	MT.2	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

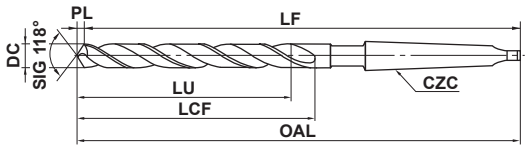
TD

Taper Shank

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD1980M2	19.8	155.9	255.9	250	5.9	MT.2	●
TDD1990M2	19.9	156.0	256.0	250	6.0	MT.2	●
TDD2000M2	20.0	156.0	256.0	250	6.0	MT.2	●
TDD2010M2	20.1	161.0	261.0	255	6.0	MT.2	●
TDD2020M2	20.2	161.1	261.1	255	6.1	MT.2	●
TDD2030M2	20.3	161.1	261.1	255	6.1	MT.2	●
TDD2040M2	20.4	161.1	261.1	255	6.1	MT.2	●
TDD2050M2	20.5	161.2	261.2	255	6.2	MT.2	●
TDD2060M2	20.6	161.2	261.2	255	6.2	MT.2	●
TDD2070M2	20.7	161.2	261.2	255	6.2	MT.2	●
TDD2080M2	20.8	161.2	261.2	255	6.2	MT.2	●
TDD2090M2	20.9	161.3	261.3	255	6.3	MT.2	●
TDD2100M2	21.0	161.3	261.3	255	6.3	MT.2	●
TDD2110M2	21.1	166.3	266.3	260	6.3	MT.2	●
TDD2120M2	21.2	166.4	266.4	260	6.4	MT.2	●
TDD2130M2	21.3	166.4	266.4	260	6.4	MT.2	●
TDD2140M2	21.4	166.4	266.4	260	6.4	MT.2	●
TDD2150M2	21.5	166.5	266.5	260	6.5	MT.2	●
TDD2160M2	21.6	166.5	266.5	260	6.5	MT.2	●
TDD2170M2	21.7	166.5	266.5	260	6.5	MT.2	●
TDD2180M2	21.8	166.5	266.5	260	6.5	MT.2	●
TDD2190M2	21.9	166.6	266.6	260	6.6	MT.2	●
TDD2200M2	22.0	166.6	266.6	260	6.6	MT.2	●
TDD2210M2	22.1	171.6	271.6	265	6.6	MT.2	●
TDD2220M2	22.2	171.7	271.7	265	6.7	MT.2	●
TDD2230M2	22.3	171.7	271.7	265	6.7	MT.2	●
TDD2240M2	22.4	171.7	271.7	265	6.7	MT.2	●
TDD2250M2	22.5	171.8	271.8	265	6.8	MT.2	●
TDD2260M2	22.6	171.8	271.8	265	6.8	MT.2	●
TDD2270M2	22.7	171.8	271.8	265	6.8	MT.2	●
TDD2280M2	22.8	171.8	271.8	265	6.8	MT.2	●
TDD2290M2	22.9	171.9	271.9	265	6.9	MT.2	●
TDD2300M2	23.0	171.9	271.9	265	6.9	MT.2	●
TDD2350M3	23.5	172.1	292.1	285	7.1	MT.3	●
TDD2400M3	24.0	172.2	292.2	285	7.2	MT.3	●
TDD2450M3	24.5	172.4	292.4	285	7.4	MT.3	●
TDD2500M3	25.0	172.5	292.5	285	7.5	MT.3	●
TDD2550M3	25.5	172.7	292.7	285	7.7	MT.3	●
TDD2600M3	26.0	172.8	292.8	285	7.8	MT.3	●
TDD2650M3	26.5	178.0	298.0	290	8.0	MT.3	●
TDD2700M3	27.0	178.1	298.1	290	8.1	MT.3	●
TDD2750M3	27.5	183.3	303.3	295	8.3	MT.3	●
TDD2800M3	28.0	183.4	303.4	295	8.4	MT.3	●
TDD2850M3	28.5	188.6	308.6	300	8.6	MT.3	●
TDD2900M3	29.0	188.7	308.7	300	8.7	MT.3	●
TDD2950M3	29.5	193.9	313.9	305	8.9	MT.3	●
TDD3000M3	30.0	194.0	314.0	305	9.0	MT.3	●
TDD3050M3	30.5	199.2	319.2	310	9.2	MT.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD3100M3	31.0	199.3	319.3	310	9.3	MT.3	●
TDD3150M3	31.5	204.5	324.5	315	9.5	MT.3	●
TDD3200M3	32.0	204.6	324.6	315	9.6	MT.3	●
TDD3250M4	32.5	209.8	354.8	345	9.8	MT.4	●
TDD3300M4	33.0	209.9	354.9	345	9.9	MT.4	●
TDD3350M4	33.5	215.1	360.1	350	10.1	MT.4	●
TDD3400M4	34.0	215.2	360.2	350	10.2	MT.4	●
TDD3450M4	34.5	215.4	360.4	350	10.4	MT.4	●
TDD3500M4	35.0	215.5	360.5	350	10.5	MT.4	●
TDD3550M4	35.5	220.7	365.7	355	10.7	MT.4	●
TDD3600M4	36.0	220.8	365.8	355	10.8	MT.4	●
TDD3650M4	36.5	221.0	366.0	355	11.0	MT.4	●
TDD3700M4	37.0	221.1	366.1	355	11.1	MT.4	●
TDD3750M4	37.5	226.3	371.3	360	11.3	MT.4	●
TDD3800M4	38.0	226.4	371.4	360	11.4	MT.4	●
TDD3850M4	38.5	226.6	371.6	360	11.6	MT.4	●
TDD3900M4	39.0	226.7	371.7	360	11.7	MT.4	●
TDD3950M4	39.5	231.9	376.9	365	11.9	MT.4	●
TDD4000M4	40.0	232.0	377.0	365	12.0	MT.4	●
TDD4050M4	40.5	232.2	377.2	365	12.2	MT.4	●
TDD4100M4	41.0	232.3	377.3	365	12.3	MT.4	●
TDD4150M4	41.5	237.5	382.5	370	12.5	MT.4	●
TDD4200M4	42.0	237.6	382.6	370	12.6	MT.4	●
TDD4250M4	42.5	237.8	382.8	370	12.8	MT.4	●
TDD4300M4	43.0	237.9	382.9	370	12.9	MT.4	●
TDD4350M4	43.5	243.1	388.1	375	13.1	MT.4	●
TDD4400M4	44.0	243.2	388.2	375	13.2	MT.4	●
TDD4450M4	44.5	243.4	388.4	375	13.4	MT.4	●
TDD4500M4	45.0	243.5	388.5	375	13.5	MT.4	●
TDD4550M4	45.5	248.7	393.7	380	13.7	MT.4	●
TDD4600M4	46.0	248.8	393.8	380	13.8	MT.4	●
TDD4650M4	46.5	249.0	394.0	380	14.0	MT.4	●
TDD4700M4	47.0	249.1	394.1	380	14.1	MT.4	●
TDD4750M4	47.5	254.3	399.3	385	14.3	MT.4	●
TDD4800M4	48.0	254.4	399.4	385	14.4	MT.4	●
TDD4850M4	48.5	254.6	399.6	385	14.6	MT.4	●
TDD4900M4	49.0	254.7	399.7	385	14.7	MT.4	●
TDD4950M4	49.5	259.9	404.9	390	14.9	MT.4	●
TDD5000M4	50.0	260.0	405.0	390	15.0	MT.4	●
TDD5100M5	51.0	260.3	440.3	425	15.3	MT.5	●
TDD5200M5	52.0	265.6	445.6	430	15.6	MT.5	●
TDD5300M5	53.0	265.9	445.9	430	15.9	MT.5	●
TDD5400M5	54.0	271.2	451.2	435	16.2	MT.5	●
TDD5500M5	55.0	271.5	451.5	435	16.5	MT.5	●
TDD5600M5	56.0	276.8	456.8	440	16.8	MT.5	●
TDD5700M5	57.0	277.1	457.1	440	17.1	MT.5	●
TDD5800M5	58.0	282.4	462.4	445	17.4	MT.5	●
TDD5900M5	59.0	282.7	462.7	445	17.7	MT.5	●

● : Inventory maintained in Japan.



Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD6000M5	60.0	288.0	468.0	450	18.0	MT.5	●
TDD6100M5	61.0	288.3	468.3	450	18.3	MT.5	●
TDD6200M5	62.0	293.6	473.6	455	18.6	MT.5	●
TDD6300M5	63.0	293.9	473.9	455	18.9	MT.5	●
TDD6400M5	64.0	299.2	479.2	460	19.2	MT.5	●
TDD6500M5	65.0	299.5	479.5	460	19.5	MT.5	●
TDD6600M5	66.0	304.8	484.8	465	19.8	MT.5	●
TDD6700M5	67.0	305.1	485.1	465	20.1	MT.5	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TDD6800M5	68.0	310.4	490.4	470	20.4	MT.5	●
TDD6900M5	69.0	310.7	490.7	470	20.7	MT.5	●
TDD7000M5	70.0	316.0	496.0	475	21.0	MT.5	●
TDD7100M5	71.0	316.3	496.3	475	21.3	MT.5	●
TDD7200M5	72.0	321.6	501.6	480	21.6	MT.5	●
TDD7300M5	73.0	321.9	501.9	480	21.9	MT.5	●
TDD7400M5	74.0	327.2	507.2	485	22.2	MT.5	●
TDD7500M5	75.0	327.5	507.5	485	22.5	MT.5	●

ISO13399 ➢ N002
CUTTING CONDITIONS ➢ N245

DRILLING(HSS TYPE)

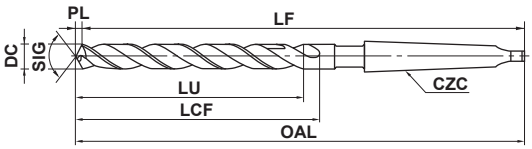
KTD

Cobalt HSS

CQ HSS | 118° DC<10,DC>35 | 128° 10≤DC≤35 | C 16<DC≤35 | S DC>35

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

5≤DC≤6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤50
0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

●Suitable for drilling difficult-to-cut materials.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
KTDD0500M1	5.0	61.5	141.5	140	1.5	MT.1	●
KTDD0550M1	5.5	66.7	146.7	145	1.7	MT.1	●
KTDD0600M1	6.0	69.8	149.8	148	1.8	MT.1	●
KTDD0650M1	6.5	74.0	154.0	152	2.0	MT.1	●
KTDD0700M1	7.0	77.1	157.1	155	2.1	MT.1	●
KTDD0750M1	7.5	80.3	160.3	158	2.3	MT.1	●
KTDD0800M1	8.0	84.4	164.4	162	2.4	MT.1	●
KTDD0850M1	8.5	87.6	170.6	168	2.6	MT.1	●
KTDD0900M1	9.0	90.7	174.7	172	2.7	MT.1	●
KTDD0950M1	9.5	94.9	177.9	175	2.9	MT.1	●
KTDD1000M1	10.0	97.4	180.4	178	2.4	MT.1	●
KTDD1010M1	10.1	100.5	184.5	182	2.5	MT.1	●
KTDD1020M1	10.2	100.5	184.5	182	2.5	MT.1	●
KTDD1030M1	10.3	100.5	184.5	182	2.5	MT.1	●
KTDD1040M1	10.4	100.5	184.5	182	2.5	MT.1	●
KTDD1050M1	10.5	100.6	184.6	182	2.6	MT.1	●
KTDD1060M1	10.6	104.6	187.6	185	2.6	MT.1	●
KTDD1070M1	10.7	104.6	187.6	185	2.6	MT.1	●
KTDD1080M1	10.8	104.6	187.6	185	2.6	MT.1	●
KTDD1090M1	10.9	104.7	187.7	185	2.7	MT.1	●
KTDD1100M1	11.0	104.7	187.7	185	2.7	MT.1	●
KTDD1150M1	11.5	107.8	190.8	188	2.8	MT.1	●
KTDD1200M1	12.0	110.9	194.9	192	2.9	MT.1	●
KTDD1210M2	12.1	115.0	215.0	212	3.0	MT.2	●
KTDD1220M2	12.2	115.0	215.0	212	3.0	MT.2	●
KTDD1250M2	12.5	115.0	215.0	212	3.0	MT.2	●
KTDD1300M2	13.0	118.2	218.2	215	3.2	MT.2	●
KTDD1310M2	13.1	121.2	221.2	218	3.2	MT.2	●
KTDD1320M2	13.2	121.2	221.2	218	3.2	MT.2	●
KTDD1350M2	13.5	121.3	221.3	218	3.3	MT.2	●
KTDD1370M2	13.7	125.3	225.3	222	3.3	MT.2	●
KTDD1380M2	13.8	125.4	225.4	222	3.4	MT.2	●
KTDD1390M2	13.9	125.4	225.4	222	3.4	MT.2	●
KTDD1400M2	14.0	125.4	225.4	222	3.4	MT.2	●
KTDD1410M2	14.1	125.4	225.4	222	3.4	MT.2	●
KTDD1420M2	14.2	125.5	225.5	222	3.5	MT.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
KTDD1430M2	14.3	125.5	225.5	222	3.5	MT.2	●
KTDD1440M2	14.4	125.5	225.5	222	3.5	MT.2	●
KTDD1450M2	14.5	125.5	225.5	222	3.5	MT.2	●
KTDD1470M2	14.7	128.6	228.6	225	3.6	MT.2	●
KTDD1500M2	15.0	128.7	228.7	225	3.7	MT.2	●
KTDD1550M2	15.5	131.8	231.8	228	3.8	MT.2	●
KTDD1600M2	16.0	133.9	233.9	230	3.9	MT.2	●
KTDD1620M2	16.2	136.0	236.0	232	4.0	MT.2	●
KTDD1650M2	16.5	136.0	236.0	232	4.0	MT.2	●
KTDD1670M2	16.7	139.1	239.1	235	4.1	MT.2	●
KTDD1700M2	17.0	139.1	239.1	235	4.1	MT.2	●
KTDD1750M2	17.5	144.3	244.3	240	4.3	MT.2	●
KTDD1770M2	17.7	144.3	244.3	240	4.3	MT.2	●
KTDD1800M2	18.0	144.4	244.4	240	4.4	MT.2	●
KTDD1850M2	18.5	149.5	249.5	245	4.5	MT.2	●
KTDD1900M2	19.0	149.6	249.6	245	4.6	MT.2	●
KTDD1950M2	19.5	154.8	254.8	250	4.8	MT.2	●
KTDD2000M2	20.0	154.9	254.9	250	4.9	MT.2	●
KTDD2050M3	20.5	160.0	280.0	275	5.0	MT.3	●
KTDD2100M3	21.0	160.1	280.1	275	5.1	MT.3	●
KTDD2150M3	21.5	165.2	285.2	280	5.2	MT.3	●
KTDD2200M3	22.0	165.4	285.4	280	5.4	MT.3	●
KTDD2250M3	22.5	170.5	290.5	285	5.5	MT.3	●
KTDD2300M3	23.0	170.6	290.6	285	5.6	MT.3	●
KTDD2350M3	23.5	170.7	290.7	285	5.7	MT.3	●
KTDD2400M3	24.0	170.9	290.9	285	5.9	MT.3	●
KTDD2450M3	24.5	171.0	291.0	285	6.0	MT.3	●
KTDD2500M3	25.0	171.1	291.1	285	6.1	MT.3	●
KTDD2550M3	25.5	171.2	291.2	285	6.2	MT.3	●
KTDD2600M3	26.0	171.3	291.3	285	6.3	MT.3	●
KTDD2650M3	26.5	176.5	296.5	290	6.5	MT.3	●
KTDD2700M3	27.0	176.6	296.6	290	6.6	MT.3	●
KTDD2750M4	27.5	181.7	326.7	320	6.7	MT.4	●
KTDD2800M4	28.0	181.8	326.8	320	6.8	MT.4	●
KTDD2850M4	28.5	187.0	332.0	325	7.0	MT.4	●
KTDD2900M4	29.0	187.1	332.1	325	7.1	MT.4	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
KTDD2950M4	29.5	192.2	337.2	330	7.2	MT.4	●
KTDD3000M4	30.0	192.3	337.3	330	7.3	MT.4	●
KTDD3050M4	30.5	197.4	342.4	335	7.4	MT.4	●
KTDD3100M4	31.0	197.6	342.6	335	7.6	MT.4	●
KTDD3150M4	31.5	202.7	347.7	340	7.7	MT.4	●
KTDD3200M4	32.0	202.8	347.8	340	7.8	MT.4	●
KTDD3300M4	33.0	208.0	353.0	345	8.0	MT.4	●
KTDD3400M4	34.0	213.3	358.3	350	8.3	MT.4	●
KTDD3500M4	35.0	213.5	358.5	350	8.5	MT.4	●
KTDD3600M4	36.0	220.8	365.8	355	10.8	MT.4	●
KTDD3700M4	37.0	221.1	366.1	355	11.1	MT.4	●
KTDD3800M4	38.0	226.4	371.4	360	11.4	MT.4	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
KTDD3900M4	39.0	226.7	371.7	360	11.7	MT.4	●
KTDD4000M4	40.0	232.0	377.0	365	12.0	MT.4	●
KTDD4100M4	41.0	232.3	377.3	365	12.3	MT.4	●
KTDD4200M4	42.0	237.6	382.6	370	12.6	MT.4	●
KTDD4300M4	43.0	237.9	382.9	370	12.9	MT.4	●
KTDD4400M4	44.0	243.2	388.2	375	13.2	MT.4	●
KTDD4500M4	45.0	243.5	388.5	375	13.5	MT.4	●
KTDD4600M4	46.0	248.8	393.8	380	13.8	MT.4	●
KTDD4700M4	47.0	249.1	394.1	380	14.1	MT.4	●
KTDD4800M4	48.0	254.4	399.4	385	14.4	MT.4	●
KTDD4900M4	49.0	254.7	399.7	385	14.7	MT.4	●
KTDD5000M4	50.0	260.0	405.0	390	15.0	MT.4	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

DRILLING(HSS TYPE)

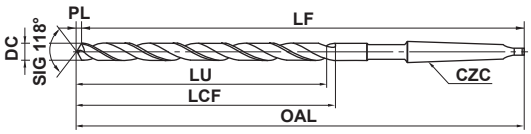
LTD

Extra Long

HSS 118° S DC>6

P Steel | M | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

DC=6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤40
0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

●For deep hole drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD0600A200M1	6.0	101.8	201.8	200	1.8	MT.1	●
LTDD0600A250M1	6.0	151.8	251.8	250	1.8	MT.1	●
LTDD0600A300M1	6.0	201.8	301.8	300	1.8	MT.1	●
LTDD0600A350M1	6.0	226.8	351.8	350	1.8	MT.1	●
LTDD0650A250M1	6.5	152.0	252.0	250	2.0	MT.1	●
LTDD0650A300M1	6.5	202.0	302.0	300	2.0	MT.1	●
LTDD0650A350M1	6.5	227.0	352.0	350	2.0	MT.1	●
LTDD0700A250M1	7.0	152.1	252.1	250	2.1	MT.1	●
LTDD0700A300M1	7.0	202.1	302.1	300	2.1	MT.1	●
LTDD0700A350M1	7.0	227.1	352.1	350	2.1	MT.1	●
LTDD0750A250M1	7.5	152.3	252.3	250	2.3	MT.1	●
LTDD0750A300M1	7.5	202.3	302.3	300	2.3	MT.1	●
LTDD0750A350M1	7.5	227.3	352.3	350	2.3	MT.1	●
LTDD0800A250M1	8.0	152.4	252.4	250	2.4	MT.1	●
LTDD0800A300M1	8.0	202.4	302.4	300	2.4	MT.1	●
LTDD0800A350M1	8.0	227.4	352.4	350	2.4	MT.1	●
LTDD0850A250M1	8.5	152.6	252.6	250	2.6	MT.1	●
LTDD0850A300M1	8.5	202.6	302.6	300	2.6	MT.1	●
LTDD0850A350M1	8.5	227.6	352.6	350	2.6	MT.1	●
LTDD0900A250M1	9.0	152.7	252.7	250	2.7	MT.1	●
LTDD0900A300M1	9.0	202.7	302.7	300	2.7	MT.1	●
LTDD0900A350M1	9.0	227.7	352.7	350	2.7	MT.1	●
LTDD0950A250M1	9.5	152.9	252.9	250	2.9	MT.1	●
LTDD0950A300M1	9.5	202.9	302.9	300	2.9	MT.1	●
LTDD0950A350M1	9.5	227.9	352.9	350	2.9	MT.1	●
LTDD0950A400M1	9.5	252.9	402.9	400	2.9	MT.1	●
LTDD1000A250M1	10.0	153.0	253.0	250	3.0	MT.1	●
LTDD1000A300M1	10.0	203.0	303.0	300	3.0	MT.1	●
LTDD1000A350M1	10.0	228.0	353.0	350	3.0	MT.1	●
LTDD1000A400M1	10.0	253.0	403.0	400	3.0	MT.1	●
LTDD1050A250M1	10.5	153.2	253.2	250	3.2	MT.1	●
LTDD1050A300M1	10.5	203.2	303.2	300	3.2	MT.1	●
LTDD1050A350M1	10.5	228.2	353.2	350	3.2	MT.1	●
LTDD1050A400M1	10.5	253.2	403.2	400	3.2	MT.1	●
LTDD1100A250M1	11.0	153.3	253.3	250	3.3	MT.1	●
LTDD1100A300M1	11.0	203.3	303.3	300	3.3	MT.1	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD1100A350M1	11.0	228.3	353.3	350	3.3	MT.1	●
LTDD1100A400M1	11.0	253.3	403.3	400	3.3	MT.1	●
LTDD1150A250M1	11.5	153.5	253.5	250	3.5	MT.1	●
LTDD1150A300M1	11.5	203.5	303.5	300	3.5	MT.1	●
LTDD1150A350M1	11.5	228.5	353.5	350	3.5	MT.1	●
LTDD1150A400M1	11.5	253.5	403.5	400	3.5	MT.1	●
LTDD1200A250M1	12.0	153.6	253.6	250	3.6	MT.1	●
LTDD1200A300M1	12.0	203.6	303.6	300	3.6	MT.1	●
LTDD1200A350M1	12.0	228.6	353.6	350	3.6	MT.1	●
LTDD1200A400M1	12.0	253.6	403.6	400	3.6	MT.1	●
LTDD1250A250M1	12.5	153.8	253.8	250	3.8	MT.1	●
LTDD1250A300M1	12.5	203.8	303.8	300	3.8	MT.1	●
LTDD1250A350M1	12.5	228.8	353.8	350	3.8	MT.1	●
LTDD1250A400M1	12.5	253.8	403.8	400	3.8	MT.1	●
LTDD1300A250M1	13.0	153.9	253.9	250	3.9	MT.1	●
LTDD1300A300M1	13.0	203.9	303.9	300	3.9	MT.1	●
LTDD1300A350M1	13.0	228.9	353.9	350	3.9	MT.1	●
LTDD1300A400M1	13.0	253.9	403.9	400	3.9	MT.1	●
LTDD1350A300M1	13.5	204.1	304.1	300	4.1	MT.1	●
LTDD1350A350M1	13.5	229.1	354.1	350	4.1	MT.1	●
LTDD1350A400M1	13.5	254.1	404.1	400	4.1	MT.1	●
LTDD1350A450M1	13.5	304.1	454.1	450	4.1	MT.1	●
LTDD1350A500M1	13.5	354.1	504.1	500	4.1	MT.1	●
LTDD1350A600M1	13.5	404.1	604.1	600	4.1	MT.1	●
LTDD1400A300M1	14.0	204.2	304.2	300	4.2	MT.1	●
LTDD1400A350M1	14.0	229.2	354.2	350	4.2	MT.1	●
LTDD1400A400M1	14.0	254.2	404.2	400	4.2	MT.1	●
LTDD1400A450M1	14.0	304.2	454.2	450	4.2	MT.1	●
LTDD1400A500M1	14.0	354.2	504.2	500	4.2	MT.1	●
LTDD1400A600M1	14.0	404.2	604.2	600	4.2	MT.1	●
LTDD1450A300M2	14.5	179.4	304.4	300	4.4	MT.2	●
LTDD1450A350M2	14.5	229.4	354.4	350	4.4	MT.2	●
LTDD1450A400M2	14.5	254.4	404.4	400	4.4	MT.2	●
LTDD1450A450M2	14.5	304.4	454.4	450	4.4	MT.2	●
LTDD1450A500M2	14.5	354.4	504.4	500	4.4	MT.2	●
LTDD1450A600M2	14.5	404.4	604.4	600	4.4	MT.2	●

● : Inventory maintained in Japan.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD1500A300M2	15.0	179.5	304.5	300	4.5	MT.2	●
LTDD1500A350M2	15.0	229.5	354.5	350	4.5	MT.2	●
LTDD1500A400M2	15.0	254.5	404.5	400	4.5	MT.2	●
LTDD1500A450M2	15.0	304.5	454.5	450	4.5	MT.2	●
LTDD1500A500M2	15.0	354.5	504.5	500	4.5	MT.2	●
LTDD1500A600M2	15.0	404.5	604.5	600	4.5	MT.2	●
LTDD1550A300M2	15.5	179.7	304.7	300	4.7	MT.2	●
LTDD1550A350M2	15.5	229.7	354.7	350	4.7	MT.2	●
LTDD1550A400M2	15.5	254.7	404.7	400	4.7	MT.2	●
LTDD1550A450M2	15.5	304.7	454.7	450	4.7	MT.2	●
LTDD1550A500M2	15.5	354.7	504.7	500	4.7	MT.2	●
LTDD1550A600M2	15.5	404.7	604.7	600	4.7	MT.2	●
LTDD1600A300M2	16.0	179.8	304.8	300	4.8	MT.2	●
LTDD1600A350M2	16.0	229.8	354.8	350	4.8	MT.2	●
LTDD1600A400M2	16.0	254.8	404.8	400	4.8	MT.2	●
LTDD1600A450M2	16.0	304.8	454.8	450	4.8	MT.2	●
LTDD1600A500M2	16.0	354.8	504.8	500	4.8	MT.2	●
LTDD1600A600M2	16.0	404.8	604.8	600	4.8	MT.2	●
LTDD1650A300M2	16.5	180.0	305.0	300	5.0	MT.2	●
LTDD1650A350M2	16.5	230.0	355.0	350	5.0	MT.2	●
LTDD1650A400M2	16.5	255.0	405.0	400	5.0	MT.2	●
LTDD1650A450M2	16.5	305.0	455.0	450	5.0	MT.2	●
LTDD1650A500M2	16.5	355.0	505.0	500	5.0	MT.2	●
LTDD1650A600M2	16.5	405.0	605.0	600	5.0	MT.2	●
LTDD1700A300M2	17.0	180.1	305.1	300	5.1	MT.2	●
LTDD1700A350M2	17.0	230.1	355.1	350	5.1	MT.2	●
LTDD1700A400M2	17.0	255.1	405.1	400	5.1	MT.2	●
LTDD1700A450M2	17.0	305.1	455.1	450	5.1	MT.2	●
LTDD1700A500M2	17.0	355.1	505.1	500	5.1	MT.2	●
LTDD1700A600M2	17.0	405.1	605.1	600	5.1	MT.2	●
LTDD1750A300M2	17.5	180.3	305.3	300	5.3	MT.2	●
LTDD1750A350M2	17.5	230.3	355.3	350	5.3	MT.2	●
LTDD1750A400M2	17.5	255.3	405.3	400	5.3	MT.2	●
LTDD1750A450M2	17.5	305.3	455.3	450	5.3	MT.2	●
LTDD1750A500M2	17.5	355.3	505.3	500	5.3	MT.2	●
LTDD1750A600M2	17.5	405.3	605.3	600	5.3	MT.2	●
LTDD1800A300M2	18.0	180.4	305.4	300	5.4	MT.2	●
LTDD1800A350M2	18.0	230.4	355.4	350	5.4	MT.2	●
LTDD1800A400M2	18.0	255.4	405.4	400	5.4	MT.2	●
LTDD1800A450M2	18.0	305.4	455.4	450	5.4	MT.2	●
LTDD1800A500M2	18.0	355.4	505.4	500	5.4	MT.2	●
LTDD1800A600M2	18.0	405.4	605.4	600	5.4	MT.2	●
LTDD1900A300M2	19.0	180.7	305.7	300	5.7	MT.2	●
LTDD1900A350M2	19.0	230.7	355.7	350	5.7	MT.2	●
LTDD1900A400M2	19.0	255.7	405.7	400	5.7	MT.2	●
LTDD1900A450M2	19.0	305.7	455.7	450	5.7	MT.2	●
LTDD1900A500M2	19.0	355.7	505.7	500	5.7	MT.2	●
LTDD1900A600M2	19.0	405.7	605.7	600	5.7	MT.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD2000A300M2	20.0	181.0	306.0	300	6.0	MT.2	●
LTDD2000A350M2	20.0	231.0	356.0	350	6.0	MT.2	●
LTDD2000A400M2	20.0	256.0	406.0	400	6.0	MT.2	●
LTDD2000A450M2	20.0	306.0	456.0	450	6.0	MT.2	●
LTDD2000A500M2	20.0	356.0	506.0	500	6.0	MT.2	●
LTDD2000A600M2	20.0	406.0	606.0	600	6.0	MT.2	●
LTDD2100A350M2	21.0	231.3	356.3	350	6.3	MT.2	●
LTDD2100A400M2	21.0	256.3	406.3	400	6.3	MT.2	●
LTDD2100A450M2	21.0	306.3	456.3	450	6.3	MT.2	●
LTDD2100A500M2	21.0	356.3	506.3	500	6.3	MT.2	●
LTDD2100A600M2	21.0	406.3	606.3	600	6.3	MT.2	●
LTDD2200A350M2	22.0	231.6	356.6	350	6.6	MT.2	●
LTDD2200A400M2	22.0	256.6	406.6	400	6.6	MT.2	●
LTDD2200A450M2	22.0	306.6	456.6	450	6.6	MT.2	●
LTDD2200A500M2	22.0	356.6	506.6	500	6.6	MT.2	●
LTDD2200A600M2	22.0	406.6	606.6	600	6.6	MT.2	●
LTDD2300A350M2	23.0	231.9	356.9	350	6.9	MT.2	●
LTDD2300A400M2	23.0	256.9	406.9	400	6.9	MT.2	●
LTDD2300A450M2	23.0	306.9	456.9	450	6.9	MT.2	●
LTDD2300A500M2	23.0	356.9	506.9	500	6.9	MT.2	●
LTDD2300A600M2	23.0	406.9	606.9	600	6.9	MT.2	●
LTDD2400A350M3	24.0	207.2	357.2	350	7.2	MT.3	●
LTDD2400A400M3	24.0	257.2	407.2	400	7.2	MT.3	●
LTDD2400A450M3	24.0	307.2	457.2	450	7.2	MT.3	●
LTDD2400A500M3	24.0	357.2	507.2	500	7.2	MT.3	●
LTDD2400A600M3	24.0	407.2	607.2	600	7.2	MT.3	●
LTDD2500A350M3	25.0	207.5	357.5	350	7.5	MT.3	●
LTDD2500A400M3	25.0	257.5	407.5	400	7.5	MT.3	●
LTDD2500A450M3	25.0	307.5	457.5	450	7.5	MT.3	●
LTDD2500A500M3	25.0	357.5	507.5	500	7.5	MT.3	●
LTDD2500A600M3	25.0	407.5	607.5	600	7.5	MT.3	●
LTDD2600A400M3	26.0	257.8	407.8	400	7.8	MT.3	●
LTDD2600A450M3	26.0	307.8	457.8	450	7.8	MT.3	●
LTDD2600A500M3	26.0	357.8	507.8	500	7.8	MT.3	●
LTDD2600A600M3	26.0	407.8	607.8	600	7.8	MT.3	●
LTDD2700A400M3	27.0	258.1	408.1	400	8.1	MT.3	●
LTDD2700A450M3	27.0	308.1	458.1	450	8.1	MT.3	●
LTDD2700A500M3	27.0	358.1	508.1	500	8.1	MT.3	●
LTDD2700A600M3	27.0	408.1	608.1	600	8.1	MT.3	●
LTDD2800A400M3	28.0	258.4	408.4	400	8.4	MT.3	●
LTDD2800A450M3	28.0	308.4	458.4	450	8.4	MT.3	●
LTDD2800A500M3	28.0	358.4	508.4	500	8.4	MT.3	●
LTDD2800A600M3	28.0	408.4	608.4	600	8.4	MT.3	●
LTDD2900A400M3	29.0	258.7	408.7	400	8.7	MT.3	●
LTDD2900A450M3	29.0	308.7	458.7	450	8.7	MT.3	●
LTDD2900A500M3	29.0	358.7	508.7	500	8.7	MT.3	●
LTDD2900A600M3	29.0	408.7	608.7	600	8.7	MT.3	●
LTDD3000A400M3	30.0	259.0	409.0	400	9.0	MT.3	●

LTD

Extra Long

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD3000A450M3	30.0	309.0	459.0	450	9.0	MT.3	●
LTDD3000A500M3	30.0	359.0	509.0	500	9.0	MT.3	●
LTDD3000A600M3	30.0	409.0	609.0	600	9.0	MT.3	●
LTDD3100A450M3	31.0	309.3	459.3	450	9.3	MT.3	●
LTDD3100A500M3	31.0	359.3	509.3	500	9.3	MT.3	●
LTDD3100A600M3	31.0	409.3	609.3	600	9.3	MT.3	●
LTDD3200A450M3	32.0	309.6	459.6	450	9.6	MT.3	●
LTDD3200A500M3	32.0	359.6	509.6	500	9.6	MT.3	●
LTDD3200A600M3	32.0	409.6	609.6	600	9.6	MT.3	●
LTDD3300A500M4	33.0	359.9	509.9	500	9.9	MT.4	●
LTDD3300A600M4	33.0	409.9	609.9	600	9.9	MT.4	●
LTDD3400A500M4	34.0	360.2	510.2	500	10.2	MT.4	●
LTDD3400A600M4	34.0	410.2	610.2	600	10.2	MT.4	●
LTDD3500A500M4	35.0	360.5	510.5	500	10.5	MT.4	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
LTDD3500A600M4	35.0	410.5	610.5	600	10.5	MT.4	●
LTDD3600A500M4	36.0	360.8	510.8	500	10.8	MT.4	●
LTDD3600A600M4	36.0	410.8	610.8	600	10.8	MT.4	●
LTDD3700A500M4	37.0	361.1	511.1	500	11.1	MT.4	●
LTDD3700A600M4	37.0	411.1	611.1	600	11.1	MT.4	●
LTDD3800A500M4	38.0	361.4	511.4	500	11.4	MT.4	●
LTDD3800A600M4	38.0	411.4	611.4	600	11.4	MT.4	●
LTDD3900A500M4	39.0	361.7	511.7	500	11.7	MT.4	●
LTDD3900A600M4	39.0	411.7	611.7	600	11.7	MT.4	●
LTDD4000A500M4	40.0	362.0	512.0	500	12.0	MT.4	●
LTDD4000A600M4	40.0	412.0	612.0	600	12.0	MT.4	●

● : Inventory maintained in Japan.

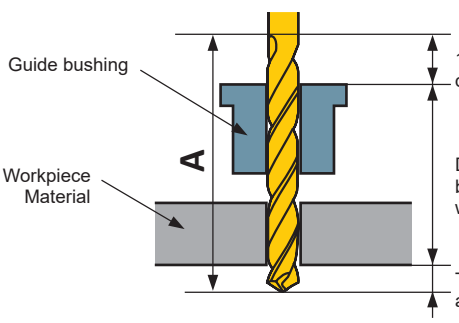
RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel SS Carbon Steel S-C (−25HRC)		Alloy Steel SCM Tool Steel SK (−35HRC)		Alloy Steel SCM Die Steel SKD (−40HRC)		Cast Iron FC	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
6.0	1100	0.18	900	0.15	600	0.13	1100	0.18
8.0	800	0.20	670	0.18	450	0.15	900	0.20
10.0	650	0.22	540	0.20	350	0.18	700	0.22
12.0	520	0.24	450	0.22	300	0.20	600	0.24
15.0	420	0.28	360	0.24	240	0.22	470	0.28
20.0	320	0.33	270	0.26	180	0.24	350	0.33
25.0	250	0.36	210	0.28	145	0.26	280	0.36
30.0	210	0.40	180	0.30	120	0.28	230	0.40
40.0	160	0.42	130	0.32	90	0.30	180	0.42

Workpiece Material	Stainless Steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
6.0	800	0.18	530	0.10	1100	0.18	2100	0.23
8.0	600	0.20	400	0.13	800	0.20	1600	0.28
10.0	480	0.22	310	0.15	650	0.22	1200	0.33
12.0	400	0.24	250	0.17	520	0.24	1000	0.38
15.0	320	0.26	170	0.20	420	0.26	850	0.42
20.0	240	0.28	130	0.23	320	0.28	630	0.45
25.0	190	0.32	100	0.24	250	0.32	500	0.48
30.0	160	0.35	85	0.25	210	0.35	400	0.50
40.0	120	0.38	65	0.28	160	0.38	300	0.52

Note 1) Please reduce the cutting conditions when drilling deep holes.
Note 2) This table only shows standard cutting conditions with water-soluble cutting fluids. Please make corrections or adjustments depending on the application.
Note 3) High-speed long drills have lower rigidity than carbide long drills. In order to prevent problems due to deflection and bending of the drill, please use guide bushes and pilot holes (DC×1 to DC×2) when using.
Note 4) When using guide bushes, please select a drill so that the groove length > A dimension (shown below).

Guide bushing



Machining a Pilot Hole



①The tip angle of the drill for drilling pilot holes should not be smaller than the 118°tip angle of the long drill. Violet Precision Drill (S) VAPDS is recommended.

②It is essential for the pilot hole to have good accuracy.

③Drill depth : Approx DC×1—DC×2.

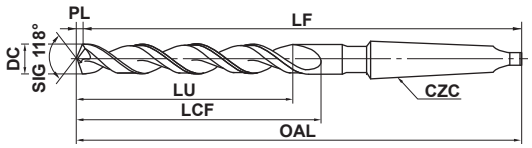
DRILLING(HSS TYPE)

GWTS

TiN, For Deep Hole, Taper Drill

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		





*LU = LCF-2DC

DC=6	6<DC≤10	10<DC≤18	18<DC≤30	30<DC≤32
0 −0.018	0 −0.022	0 −0.027	0 −0.033	0 −0.039

●Suitable for general and deep hole drilling.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GWTSD0600M1	6.0	69.8	149.8	148	1.8	MT.1	●
GWTSD0620M1	6.2	73.9	153.9	152	1.9	MT.1	●
GWTSD0650M1	6.5	74.0	154.0	152	2.0	MT.1	●
GWTSD0680M1	6.8	77.0	157.0	155	2.0	MT.1	●
GWTSD0690M1	6.9	77.1	157.1	155	2.1	MT.1	●
GWTSD0700M1	7.0	77.1	157.1	155	2.1	MT.1	●
GWTSD0720M1	7.2	80.2	160.2	158	2.2	MT.1	●
GWTSD0750M1	7.5	80.3	160.3	158	2.3	MT.1	●
GWTSD0780M1	7.8	84.3	164.3	162	2.3	MT.1	●
GWTSD0800M1	8.0	84.4	164.4	162	2.4	MT.1	●
GWTSD0820M1	8.2	87.5	170.5	168	2.5	MT.1	●
GWTSD0850M1	8.5	87.6	170.6	168	2.6	MT.1	●
GWTSD0880M1	8.8	90.6	174.6	172	2.6	MT.1	●
GWTSD0900M1	9.0	90.7	174.7	172	2.7	MT.1	●
GWTSD0920M1	9.2	94.8	177.8	175	2.8	MT.1	●
GWTSD0950M1	9.5	94.9	177.9	175	2.9	MT.1	●
GWTSD0980M1	9.8	97.9	180.9	178	2.9	MT.1	●
GWTSD1000M1	10.0	98.0	181.0	178	3.0	MT.1	●
GWTSD1020M1	10.2	101.1	185.1	182	3.1	MT.1	●
GWTSD1030M1	10.3	101.1	185.1	182	3.1	MT.1	●
GWTSD1050M1	10.5	101.2	185.2	182	3.2	MT.1	●
GWTSD1100M1	11.0	105.3	188.3	185	3.3	MT.1	●
GWTSD1150M1	11.5	108.5	191.5	188	3.5	MT.1	●
GWTSD1200M1	12.0	111.6	195.6	192	3.6	MT.1	●
GWTSD1220M2	12.2	115.7	215.7	212	3.7	MT.2	●
GWTSD1230M2	12.3	115.7	215.7	212	3.7	MT.2	●
GWTSD1250M2	12.5	115.8	215.8	212	3.8	MT.2	●
GWTSD1300M2	13.0	118.9	218.9	215	3.9	MT.2	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GWTSD1350M2	13.5	122.1	222.1	218	4.1	MT.2	●
GWTSD1400M2	14.0	126.2	226.2	222	4.2	MT.2	●
GWTSD1410M2	14.1	126.2	226.2	222	4.2	MT.2	●
GWTSD1420M2	14.2	126.3	226.3	222	4.3	MT.2	●
GWTSD1450M2	14.5	126.4	226.4	222	4.4	MT.2	●
GWTSD1500M2	15.0	129.5	229.5	225	4.5	MT.2	●
GWTSD1550M2	15.5	132.7	232.7	228	4.7	MT.2	●
GWTSD1600M2	16.0	134.8	234.8	230	4.8	MT.2	●
GWTSD1650M2	16.5	137.0	237.0	232	5.0	MT.2	●
GWTSD1700M2	17.0	140.1	240.1	235	5.1	MT.2	●
GWTSD1750M2	17.5	145.3	245.3	240	5.3	MT.2	●
GWTSD1800M2	18.0	145.4	245.4	240	5.4	MT.2	●
GWTSD1850M2	18.5	150.6	250.6	245	5.6	MT.2	●
GWTSD1900M2	19.0	150.7	250.7	245	5.7	MT.2	●
GWTSD1950M2	19.5	155.9	255.9	250	5.9	MT.2	●
GWTSD2000M2	20.0	156.0	256.0	250	6.0	MT.2	●
GWTSD2100M3	21.0	161.3	281.3	275	6.3	MT.3	●
GWTSD2200M3	22.0	166.6	286.6	280	6.6	MT.3	●
GWTSD2300M3	23.0	171.9	291.9	285	6.9	MT.3	●
GWTSD2400M3	24.0	172.2	292.2	285	7.2	MT.3	●
GWTSD2500M3	25.0	172.5	292.5	285	7.5	MT.3	●
GWTSD2600M3	26.0	172.8	292.8	285	7.8	MT.3	●
GWTSD2700M3	27.0	178.1	298.1	290	8.1	MT.3	●
GWTSD2800M4	28.0	183.4	328.4	320	8.4	MT.4	●
GWTSD2900M4	29.0	188.7	333.7	325	8.7	MT.4	●
GWTSD3000M4	30.0	194.0	339.0	330	9.0	MT.4	●
GWTSD3100M4	31.0	199.3	344.3	335	9.3	MT.4	●
GWTSD3200M4	32.0	204.6	349.6	340	9.6	MT.4	●

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N244

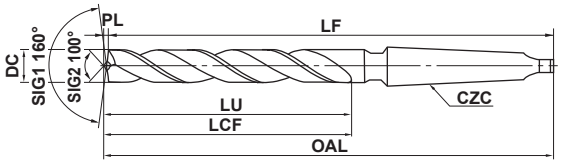
GTTD

TiN, For Steel Frames

P M K N S H

Steel





*LU = LCF-2DC

17≤DC≤18	18<DC≤30	30<DC≤32
0 −0.027	0 −0.033	0 −0.039

●Special point geometry for minimal through hole burrs.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GTTDD1800M3	18.0	140	263.0	260	3.0	MT.3	●
GTTDD2200M3	22.0	160	283.7	280	3.7	MT.3	●
GTTDD2300M3	23.0	165	288.8	285	3.8	MT.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
GTTDD2400M3	24.0	165	289.0	285	4.0	MT.3	●
GTTDD2500M3	25.0	165	289.1	285	4.1	MT.3	●
GTTDD2600M3	26.0	165	289.3	285	4.3	MT.3	●

ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

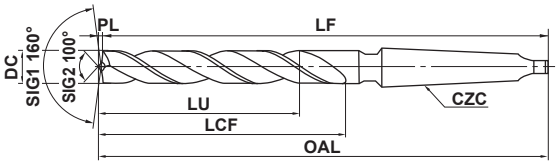
DRILLING(HSS TYPE)

TTD

For Steel Frames

P Steel | M | K | N | S | H





*LU = LCF-2DC

17≤DC≤18	18<DC≤30	30<DC≤32
0 −0.027	0 −0.033	0 −0.039

●Special point geometry for minimal through hole burrs.

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TTDD1700M3	17.0	135	257.9	255	2.9	MT.3	●
TTDD1750M3	17.5	140	263.0	260	3.0	MT.3	●
TTDD1800M3	18.0	140	263.0	260	3.0	MT.3	●
TTDD1900M3	19.0	145	268.2	265	3.2	MT.3	●
TTDD2000M3	20.0	150	273.3	270	3.3	MT.3	●
TTDD2150M3	21.5	160	283.6	280	3.6	MT.3	●
TTDD2200M3	22.0	160	283.7	280	3.7	MT.3	●
TTDD2250M3	22.5	165	288.8	285	3.8	MT.3	●
TTDD2300M3	23.0	165	288.8	285	3.8	MT.3	●
TTDD2350M3	23.5	165	289.0	285	4.0	MT.3	●

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	CZC	
TTDD2400M3	24.0	165	289.0	285	4.0	MT.3	●
TTDD2450M3	24.5	165	289.1	285	4.1	MT.3	●
TTDD2500M3	25.0	165	289.1	285	4.1	MT.3	●
TTDD2600M3	26.0	165	289.3	285	4.3	MT.3	●
TTDD2650M3	26.5	170	294.4	290	4.4	MT.3	●
TTDD2800M4	28.0	175	324.5	320	4.5	MT.4	●
TTDD3200M4	32.0	195	345.0	340	5.0	MT.4	●

● : Inventory maintained in Japan.

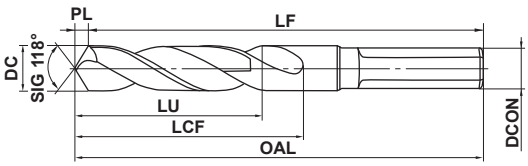
CUTTING CONDITIONS ➤ N245

3KD

Triangular Shank (Type 6.5)(Type 10)(Type 13)

P Steel | M | K Cast Iron | N Non-ferrous Metal | S | H





*LU = LCF-2DC

7≤DC≤10	10<DC≤18	18<DC≤26
0 −0.022	0 −0.027	0 −0.033

●3 shank types for portable power tools.

Type 6.5

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
3KD6D0700	7.0	37.1	77.1	75	2.1	6.5	●
3KD6D0750	7.5	37.3	77.3	75	2.3	6.5	●
3KD6D0800	8.0	37.4	77.4	75	2.4	6.5	●
3KD6D0850	8.5	37.6	77.6	75	2.6	6.5	●
3KD6D0900	9.0	37.7	77.7	75	2.7	6.5	●
3KD6D0950	9.5	37.9	77.9	75	2.9	6.5	●
3KD6D1000	10.0	53.0	93.0	90	3.0	6.5	●
3KD6D1050	10.5	53.2	93.2	90	3.2	6.5	●
3KD6D1100	11.0	53.3	93.3	90	3.3	6.5	●
3KD6D1150	11.5	53.5	93.5	90	3.5	6.5	●
3KD6D1200	12.0	53.6	93.6	90	3.6	6.5	●
3KD6D1250	12.5	53.8	93.8	90	3.8	6.5	●
3KD6D1300	13.0	53.9	93.9	90	3.9	6.5	●

Type 10

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
3KD10D1000	10.0	53.0	93.0	90	3.0	10	●
3KD10D1050	10.5	53.2	93.2	90	3.2	10	●
3KD10D1100	11.0	53.3	93.3	90	3.3	10	●
3KD10D1150	11.5	53.5	93.5	90	3.5	10	●
3KD10D1200	12.0	53.6	93.6	90	3.6	10	●
3KD10D1250	12.5	53.8	93.8	90	3.8	10	●
3KD10D1300	13.0	53.9	93.9	90	3.9	10	●
3KD10D1350	13.5	89.1	144.1	140	4.1	10	●
3KD10D1400	14.0	89.2	144.2	140	4.2	10	●
3KD10D1450	14.5	89.4	144.4	140	4.4	10	●
3KD10D1500	15.0	89.5	144.5	140	4.5	10	●
3KD10D1550	15.5	89.7	144.7	140	4.7	10	●
3KD10D1600	16.0	89.8	144.8	140	4.8	10	●

Type 13

Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
3KD13D1350	13.5	89.1	144.1	140	4.1	13	●
3KD13D1400	14.0	89.2	144.2	140	4.2	13	●
3KD13D1450	14.5	89.4	144.4	140	4.4	13	●
3KD13D1500	15.0	89.5	144.5	140	4.5	13	●
3KD13D1550	15.5	89.7	144.7	140	4.7	13	●
3KD13D1600	16.0	89.8	144.8	140	4.8	13	●
3KD13D1650	16.5	90.0	145.0	140	5.0	13	●
3KD13D1700	17.0	90.1	145.1	140	5.1	13	●
3KD13D1750	17.5	90.3	145.3	140	5.3	13	●
3KD13D1800	18.0	90.4	145.4	140	5.4	13	●
3KD13D1850	18.5	90.6	145.6	140	5.6	13	●
3KD13D1900	19.0	90.7	145.7	140	5.7	13	●
3KD13D1950	19.5	90.9	145.9	140	5.9	13	●
3KD13D2000	20.0	91.0	146.0	140	6.0	13	●
3KD13D2050	20.5	91.2	146.2	140	6.2	13	●
3KD13D2100	21.0	91.3	146.3	140	6.3	13	●
3KD13D2150	21.5	91.5	146.5	140	6.5	13	●
3KD13D2200	22.0	91.6	146.6	140	6.6	13	●
3KD13D2250	22.5	91.8	146.8	140	6.8	13	●
3KD13D2300	23.0	91.9	146.9	140	6.9	13	●
3KD13D2350	23.5	92.1	147.1	140	7.1	13	●
3KD13D2400	24.0	92.2	147.2	140	7.2	13	●
3KD13D2450	24.5	92.4	147.4	140	7.4	13	●
3KD13D2500	25.0	92.5	147.5	140	7.5	13	●
3KD13D2550	25.5	92.7	147.7	140	7.7	13	●
3KD13D2600	26.0	92.8	147.8	140	7.8	13	●

GSD GWSS GTD GWTS GTTD

TiN Coated Drills

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel SS Carbon Steel S-C (−25HRC)		Alloy Steel SCM Tool Steel SK (−35HRC)		Alloy Steel SCM Die Steel SKD (−40HRC)		Cast Iron FC	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	8000	0.01	7000	0.008	6000	0.005	8000	0.01
1.0	6000	0.02	5500	0.01	4500	0.008	6000	0.02
2.0	4700	0.05	3600	0.03	2400	0.02	4700	0.05
3.0	3200	0.10	2400	0.08	1800	0.05	3500	0.10
6.0	1600	0.18	1200	0.15	900	0.13	1750	0.18
8.0	1200	0.20	900	0.18	680	0.15	1300	0.20
10.0	960	0.22	720	0.20	550	0.18	1100	0.22
12.0	800	0.24	600	0.22	450	0.20	880	0.24
15.0	630	0.28	480	0.24	350	0.22	700	0.28
20.0	470	0.33	360	0.26	260	0.24	530	0.33
25.0	380	0.36	290	0.28	210	0.26	420	0.36
30.0	310	0.40	240	0.30	180	0.28	330	0.40

Workpiece Material	Stainless Steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	8000	0.01	6000	0.01	8000	0.01	10000	0.02
1.0	5000	0.02	4000	0.02	6000	0.02	7000	0.04
2.0	2500	0.05	2300	0.04	4700	0.05	6000	0.08
3.0	1900	0.10	1500	0.07	3200	0.10	5500	0.13
6.0	950	0.18	750	0.10	1600	0.18	3100	0.23
8.0	700	0.20	530	0.13	1200	0.20	2300	0.28
10.0	560	0.22	420	0.15	960	0.22	1900	0.33
12.0	460	0.24	340	0.17	800	0.24	1600	0.38
15.0	360	0.26	270	0.20	630	0.26	1300	0.42
20.0	270	0.28	200	0.23	470	0.28	950	0.45
25.0	210	0.32	160	0.24	380	0.32	750	0.48
30.0	180	0.35	135	0.25	310	0.35	630	0.50

Note 1) Please reduce the cutting conditions when drilling deep holes.
Note 2) This table only shows standard cutting conditions with water-soluble cutting fluids. Please make corrections or adjustments depending on the application.

Reduction rate of cutting conditions for hole drilling

Drilling Depth	Reduction Rate of Cutting Speed	Reduction Rate of Feed
4DC	10%	10%
5DC	10%	15%
6DC	20%	20%
7DC	20%	20%

Drilling Depth	Reduction Rate of Cutting Speed	Reduction Rate of Feed
8DC	30%	20%
10DC	30%	25%
15DC	40%	30%
20DC	40%	45%

DC : Drill dia.

SD KSD TD KTD TTD

Standard Drills

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Structural Steel SS Carbon Steel S-C (−25HRC)		Alloy Steel SCM Tool Steel SK (−35HRC)		Alloy Steel SCM Die Steel SKD (−40HRC)		Cast Iron FC	
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	6000	0.01	5000	0.008	4000	0.005	6000	0.01
1.0	5000	0.02	4000	0.01	2800	0.008	5000	0.02
2.0	3000	0.05	2500	0.03	1800	0.02	3000	0.05
3.0	2100	0.10	1800	0.08	1200	0.05	2300	0.10
6.0	1100	0.18	900	0.15	600	0.13	1100	0.18
8.0	800	0.20	670	0.18	450	0.15	900	0.20
10.0	650	0.22	540	0.20	350	0.18	700	0.22
12.0	520	0.24	450	0.22	300	0.20	600	0.24
15.0	420	0.28	360	0.24	240	0.22	470	0.28
20.0	320	0.33	270	0.26	180	0.24	350	0.33
25.0	250	0.36	210	0.28	145	0.26	280	0.36
30.0	210	0.40	180	0.30	120	0.28	230	0.40
40.0	160	0.42	130	0.32	90	0.30	180	0.42

Workpiece Material	Stainless Steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
0.5	5000	0.01	4000	0.01	6000	0.01	10000	0.02
1.0	4000	0.02	3000	0.02	5000	0.02	7000	0.04
2.0	2200	0.05	1500	0.04	3000	0.05	5000	0.08
3.0	1600	0.10	1000	0.07	2100	0.10	4200	0.13
6.0	800	0.18	530	0.10	1100	0.18	2100	0.23
8.0	600	0.20	400	0.13	800	0.20	1600	0.28
10.0	480	0.22	310	0.15	650	0.22	1200	0.33
12.0	400	0.24	250	0.17	520	0.24	1000	0.38
15.0	320	0.26	170	0.20	420	0.26	850	0.42
20.0	240	0.28	130	0.23	320	0.28	630	0.45
25.0	190	0.32	100	0.24	250	0.32	500	0.48
30.0	160	0.35	85	0.25	210	0.35	400	0.50
40.0	120	0.38	65	0.28	160	0.38	300	0.52

Note 1) Please reduce the cutting conditions when drilling deep holes.
Note 2) This table only shows standard cutting conditions with water-soluble cutting fluids. Please make corrections or adjustments depending on the application.

Reduction rate of cutting conditions for hole drilling

Drilling Depth	Reduction Rate of Cutting Speed	Reduction Rate of Feed
4DC	10%	10%
5DC	10%	15%
6DC	20%	20%
7DC	20%	20%

Drilling Depth	Reduction Rate of Cutting Speed	Reduction Rate of Feed
8DC	30%	20%
10DC	30%	25%
15DC	40%	30%
20DC	40%	45%

DC : Drill dia.

Memo

SPARE PARTS

EXAMPLES OF ORDER NUMBERS FOR CLAMP SCREWS, SET BOLTS, WRENCHES, etc. ··· P002

SPARE PARTS
- CLAMP SCREW ··· P004
- SET BOLT ··· P010
- ADJUSTMENT OF SCREWS AND NUTS ··· P011
- SHIM ··· P012
- SHIM PIN AND CLAMP LEVER ··· P015
- LOCK PIN ··· P016
- CLAMP BRIDGE ··· P016
- BREAKER PIECE ··· P016
- COOLANT NOZZLE ··· P017
- STOPPER ··· P017
- ANTI SEIZE LUBRICANT ··· P017

REPLACEMENT PARTS FOR OLD TYPE TOOLS
- TURNING HOLDERS ··· P018
- GROOVING/CUTTING OFF ··· P023
- BORING BARS ··· P024
- BORING UNITS ··· P027
- CARTRIDGE ··· P028
- FACE MILLS ··· P029
- INDEXABLE TYPE END MILLS ··· P035
- BALL NOSE END MILLS ··· P040
- INDEXABLE TYPE DRILLS ··· P042

STANDARD FOR NON-STOCK PARTS
- CLAMP SCREW ··· P046
- PLUG ··· P046
- STOP PLUG FOR NOZZLE ··· P046



EXAMPLES OF ORDER NUMBERS FOR CLAMP SCREWS, SET BOLTS, WRENCHES, etc.

■ Order Numbers for Clamp Screws and Set Bolts (Metric Coarse Right Screw Thread)

H SC 060 05

Length

Example	
Symbol	L
05	5
10	10
20	20
30	30

Screw Diameter

Example	
Symbol	d
050	M5
060	M6

Screw Head

Symbol		Manufacturer	
BH	Button Head	CHUUBURASHI CO. / UNBRAKO CO.	JIS Standard
BHA			
FC	Flat Head	CHUUBURASHI CO.	
SC	Socket Head		
PM	Pan Head		
FM	Flat Head		
SD	Set Screw (Cut Point)		
SP	Set Screw (Cone Point)		
SR	Set Screw (Dog Point)		
SS	Set Screw (Flat Point)		

Hexagonal Hole Dimensions

Symbol	Shape
H	

With Slot

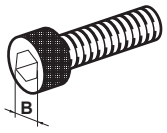
Symbol	Shape
S	

With Cross Hole

Symbol	Shape
C	

●Example of Hexagonal Hole

Diameter	Pitch	B Dimensions			
		HBH	HFC	HSC	HS○
M2	0.4	—	—	1.5	0.9
M2.5	0.45	—	—	2.0	1.3
M3	0.5	2.0	2.0	2.5	1.5
M4	0.7	2.5	2.5	3.0	2.0
M5	0.8	3.0	3.0	4.0	2.5
M6	1.0	4.0	4.0	5.0	3.0
M8	1.25	5.0	5.0	6.0	4.0
M10	1.5	6.0	6.0	8.0	5.0



■ IDENTIFICATION OF WRENCH

HKY **15** **R**

Wrench Sizes

Wrech Shapes

Symbol	Wrench
HKY	Hexagonal Wrench
TKY	Torx Wrench
TIP	Torx plus Wrench
GWY	For GW Holder
RKY	For FMAX
NKY	For Small Tools

Hexagonal Wrench



Symbol	B
15	1.5
20	2.0
25	2.5
30	3.0
35	3.5
40	4.0
50	5.0
60	6.0

Torx Wrench



Symbol	B	Drive Size
06	1.7	T6
08	2.3	T8
10	2.7	T10
15	3.3	T15
20	3.8	T20
25	4.4	T25
27	5.0	T27
30	5.5	T30

Torx plus Wrench



Symbol	B	Drive Size
06	1.8	6IP
07	2.1	7IP
08	2.4	8IP
10	2.8	10IP
15	3.4	15IP

R	Standard L Wrench	
L	Long L Wrench	
T	T Wrench	
F FS	Flag Wrench	
W	Flag Wrench	
D DS	Driver	
S	Pole Wrench	
S	Ring Wrench	

IMX **10** - **WR**

Symbol	Wrench
IMX	Wrench for IMX Series

Wrench Sizes



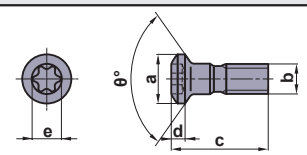
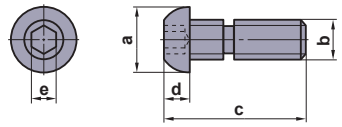
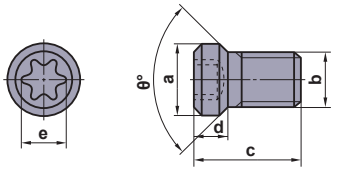
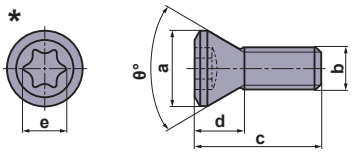
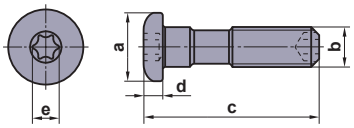
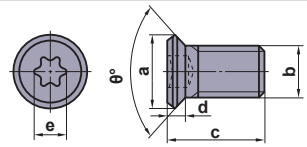
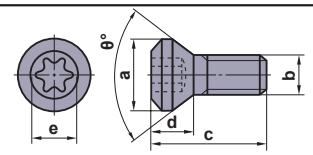
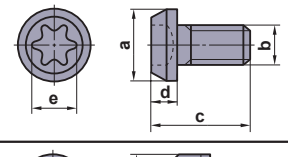
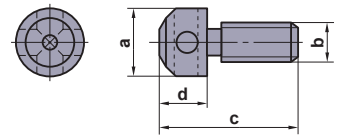
Symbol	B
10	8
12	10
16	13
20	16
25	20

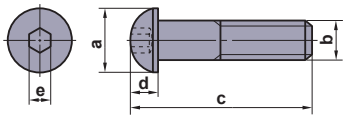
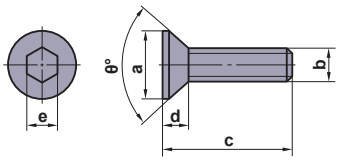
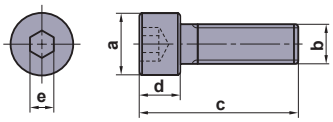
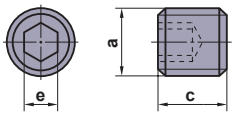
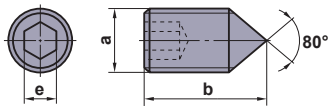
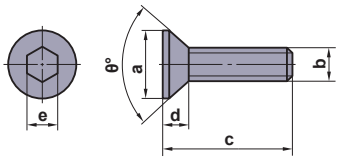
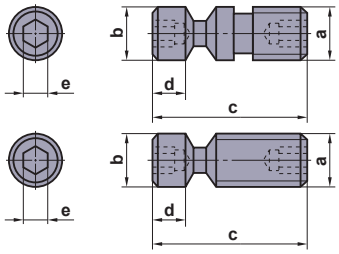
Wrech Shapes ; **WR**



SPARE PARTS

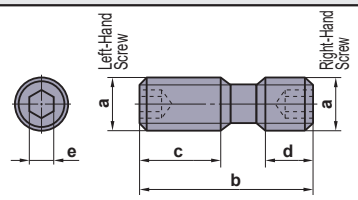
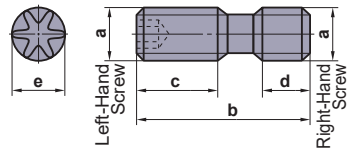
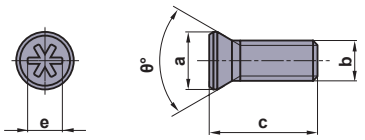
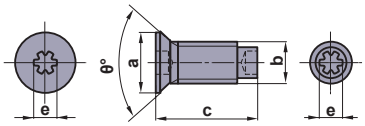
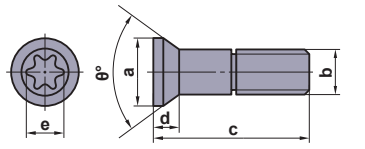
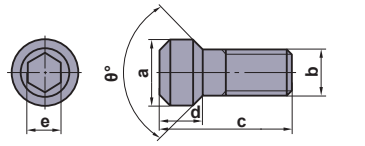
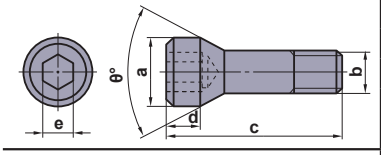
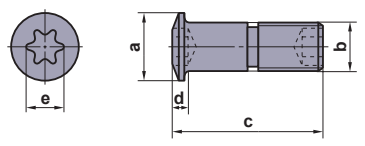
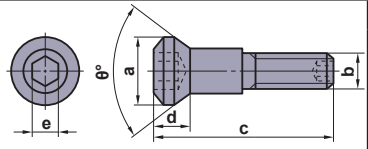
CLAMP SCREW

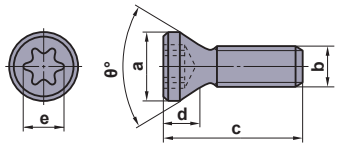
Shape	Order Number	Dimensions (mm) a	b	c	d	e	Angle θ°	Drive Size	Torque (N•m)	Tool Holder
	**AJS3010T10**	5.0	M3×0.5	10.0	1.5	2.8	120	T10	2.5	**SXZC**(➲C031), **AJX**(➲L230), **PMC**(➲L326)
	AJS4012T15	7.0	M4×0.7	12.0	2.2	3.4	120	T15	3.5	**AJX**(➲L230), **PMC**(➲L326)
	AJS5014T25	8.0	M5×0.8	14.0	2.7	4.5	120	T25	7.5	**AJX**(➲L230)
	**CS3**(For Use with C3)	7.0	M4×0.7	14.6	2.6	2.5	—	—	2.2	**FCTU1/2**(➲E034)
	CS4(For Use with C4)	9.0	M5×0.8	15.4	3.4	3.0	—	—	3.3	**FCTU1/2**(➲E034)
										This clamp screw is included with the clamp as a set.
	**CS200T**	3.2	M2×0.4	5.0	1.6	1.8	90	T6	0.6	**FSTU1/2**(➲E033), **SBR**(➲M017)
	CS250T	3.7	M2.5×0.45	6.0	1.8	2.4	90	T8	1.0	**FSTU1/2**(➲E033), **FA/VSP**(➲M013), **SBR**(➲M017)
	* **CS250560T**	3.9	M2.5×0.45	5.2	2.5	2.4	60	T8	1.0	**BRP**(➲L274)
	CS300890T	4.1	M3×0.5	8.0	2.1	2.4	90	T8	1.0	**FSTU1/2**(➲E033), **DCCCR**(➲L281), **STFP**(➲M011)
	* **CS350760T**	5.5	M3.5×0.6	7.0	4.0	3.4	60	T15	3.5	**BRP**(➲L274)
	* **CS350860T**	5.5	M3.5×0.6	8.4	4.0	3.4	60	T15	3.5	**BRP**(➲L274), **MMTI**(➲G032)
	CS350990T	4.8	M3.5×0.6	9.0	2.4	2.8	90	T10	2.5	**GY**(➲F017), **OCTACUT**(➲L258), **DCCCR**(➲L281)
* 	**CS401160T**	5.7	M4×0.7	11.0	4.5	3.4	60	T15	3.5	**VOX400**(➲L112)
	CS451190T	6.3	M4.5×0.75	11.0	2.9	3.9	90	T20	5.0	**SDJE, SDNE**(➲C032)
	CS501290T	7.0	M5×0.8	11.0	3.5	4.5	90	T25	7.5	**OCTACUT**(➲L258)
	* **CS5015060T**	7.2	M5×0.8	15.0	2.4	3.9	60	T20	5.0	**AHX640S**(➲L072)
	**DC0520T**	8.5	M5×0.8	22.5	2.5	3.4	—	T15	3.5	**DCLN**(➲C008), **A○○○-DTFN**(➲E022)
	DC0621T	10.5	M6×1.0	25.0	4.0	3.9	—	T20	5.0	**DCLN**(➲C008), **A○○○-DCLN**(➲E021)
	**FC400890T**	5.6	M4×0.7	7.5	1.3	2.8	90	T10	2.5	**STGE**(➲C033), **STFE**(➲C033, E051), **SMG**(➲F138)
	**GY05016S**	8.7	M5×0.8	16.0	3.5	3.9	90	T20	5.0	**GYAR/L20, GYAR/L25**(➲F087)
	**GY06013M**	12.0	M6×1.0	18.0	5.0	5.6	—	T30	6.0	**GYHR/L**(➲F023), **GYDR/L**(➲F087)
	**KS1**	7.0	M4×0.7	14.0	5.0	—	—	—	—	**PTFNR/L**(➲M007), **CSKPR**(➲M009)
	KS2	10.0	M6×1.0	18.0	7.0	—	—	—	—	**PTFNR/L**(➲M007), **CSKPR**(➲M009)
	KS1S	7.0	M4×0.7	14.0	5.0	—	—	—	—	**SBR**(➲M017)
	KS2S	10.0	M6×1.0	18.0	7.0	—	—	—	—	**SBR**(➲M017)

Shape	Order Number	Dimensions (mm)					Angle	Drive Size	Torque (N•m)	Tool Holder
		a	b	c	d	e	θ°			
 Includes products with the same shape as commercial products (JIS Standard).	**HBH06012**	10.5	M6×1.0	15.3	3.3	4.0	—	—	7.0	**PMF**(➲L328)
	HBH06020	10.5	M6×1.0	23.3	3.3	4.0	—	—	7.0	**MGH**(➲F136), **MTH**(➲G028)
	HBH08025	14.0	M8×1.25	29.4	4.4	5.0	—	—	9.0	**PTFN**(➲M007), **CSKP**(➲M009), **STGP**(➲M011)
	HBH08030	14.0	M8×1.25	34.4	4.4	5.0	—	—	9.0	**PTFN, PCLN**(➲M007)
	HBH08040	14.0	M8×1.25	48.4	4.4	5.0	—	—	9.0	**FF3000**(➲L098)
	**HFC03006**	6.0	M3×0.5	8.0	1.7	2.0	—	—	2.5	**MMTI**(➲G032)
	HFC03008	6.0	M3×0.5	8.5	1.7	2.0	—	—	2.5	**MMTE**(➲G023)
	HFC04008	8.0	M4×0.7	13.0	2.3	2.5	—	—	3.0	**MMTI**(➲G032)
	HFC04010	8.0	M4×0.7	16.0	2.3	2.5	—	—	3.0	**MMTE**(➲G023)
	**HSC02006**	3.8	M2×0.4	8.0	2.0	1.5	—	—	1.4	**FA0, FV0**(➲M013)
	HSC02506	4.5	M2.5×0.45	8.5	2.5	2.0	—	—	2.2	**FA1, FV1**(➲M013)
	HSC03010	5.5	M3×0.5	13.0	3.0	2.5	—	—	3.3	**FA2, FV2**(➲M013)
	HSC04012	7.0	M4×0.7	16.0	4.0	3.0	—	—	6.0	**FA3, FV3**(➲M013)
	HSC05012	8.5	M5×0.8	17.0	5.0	4.0	—	—	9.0	**SBH**(➲E032, G038, F143)
	HSC05016	8.5	M5×0.8	21.0	5.0	4.0	—	—	9.0	**FA4, FV4**(➲M013)
	HSC06020	10.0	M6×1.0	16.0	6.0	5.0	—	—	13.0	**PTFN**(➲M007), **STFP**(➲M011)
 Includes products with the same shape as commercial products (JIS Standard).	**HSS04004**	M4×0.7	—	4.0	—	2.0	—	—	1.6	**RBH**(➲E026, G039, F142)
	HSS04006	M4×0.7	—	6.0	—	2.0	—	—	1.6	**RBH**(➲E026, G039, F142)
	HSS04008	M4×0.7	—	8.0	—	2.0	—	—	1.6	**RBH**(➲E026, G039, F142)
	LLR1	M5×0.8	—	3.5	—	2.5	—	—	—	**PTFN, PTGN, PSKN**(➲M007)
	LLR2	M6×1.0	—	5.0	—	3.0	—	—	—	**PTFN, PSKN, PCLN**(➲M007)
	**HSP05008C**	M5×0.8	8.0	—	—	2.5	—	—	2.5	**PVJN**(➲C019), **DPVP**(➲E050)
	**HY-A1**	4.4	M3×0.5	7.0	2.1	2.0	82	—	1.5	**FA1**(➲M013)
	HY-V1	5.5	M3×0.5	7.0	2.5	2.0	82	—	1.5	**FV1**(➲M013)
	HY2	5.5	M3×0.5	10.0	2.5	2.0	82	—	1.5	**FA2, FV2**(➲M013)
	HY3	7.0	M3.5×0.6	12.0	2.9	2.0	82	—	1.5	**FA3, FV3**(➲M013)
	HY4	9.3	M5×0.8	16.0	3.6	3.0	82	—	3.3	**FA4, FV4**(➲M013)
 **LLCS103, LLCS105 LLCS125, LLCS205** The products with "☆" do not have a hexagonal hole at the end marked **a**. The products with "*****" do not have a hexagonal hole at the end marked **b**.	☆**LLCS103**	M3×0.5	4.0	11.0	4.6	2.0	—	—	1.5	**FAPN, FVPN**(➲M013)
	*** LLCS105**	M5×0.8	M5×0.8	10.0	1.5	2.0	—	—	1.5	**PSBN**(➲C012), **A○○○-PCLN**(➲E044)
	LLCS106	M6×1.0	6.0	16.5	3.5	2.5	—	—	2.2	**PCLN**(➲C008), **A○○○-PTFN**(➲E043)
	*** LLCS106S**	M6×1.0	6.0	13.4	0.7	2.5	—	—	2.2	**PSKN, PCLN, PSYN**(➲M007)
	LLCS108	M8×1.25	8.0	21.0	6.5	3.0	—	—	3.3	**PCLN**(➲C008), **DPTF**(➲E048)
	*** LLCS108S**	M8×1.25	8.0	16.5	2.0	3.0	—	—	3.3	**A○○○-PSKN**(➲E043), **PTFN**(➲M007)
	LLCS125	M5×0.8	M5×0.8	12.0	2.0	2.0	—	—	1.5	**A○○○-PDUN**(➲E044)
	LLCS205	M5×0.8	M5×0.8	16.0	4.0	2.0	—	—	1.5	**PRGC, PRDC**(➲C025)
	LLCS206	M6×1.0	6.0	26.0	13.0	2.5	—	—	2.2	**PTGN**(➲C016), **PTFN**(➲C017)
	LLCS306	M6×1.0	6.0	21.0	4.0	2.5	—	—	2.2	**PRGC, PRDC**(➲C025)
	LLCS310	M10×1.0	10.0	29.0	8.0	4.0	—	—	7.0	**PCLN**(➲C008), **PSBN**(➲C012), **PSSN**(➲C013)
	LLCS508	M8×1.0	8.0	24.0	6.5	3.0	—	—	3.3	**PCLN**(➲C008), **PSBN**(➲C012), **PSSN**(➲C013)

SPARE PARTS

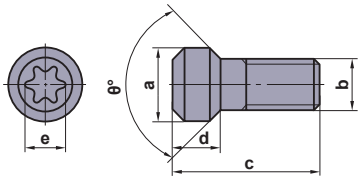
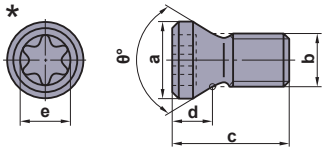
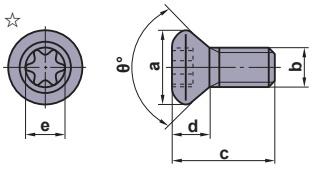
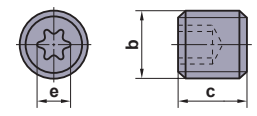
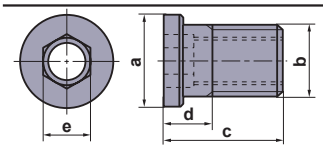
CLAMP SCREW

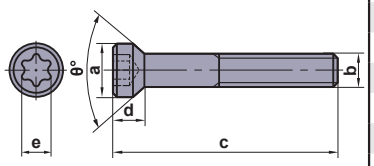
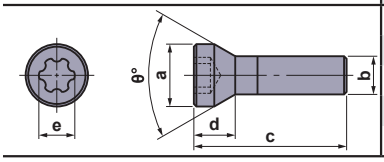
Shape	Order Number	Dimensions (mm) a	b	c	d	e	Angle θ°	Drive Size	Torque (N•m)	Tool Holder
 The products with "*" do not have a hexagonal hole at the end of Right-Hand Screw side.	**LS3**	M8×1.0	32.0	13.0	13.0	4.0	—	—	8.2	**FF3000**(➲L098)
	* **LS10**	M7×0.75	16.0	6.0	6.0	4.0	—	—	8.2	**FE404**(➲L339)
	* **LS14**	M7×0.75	24.0	10.0	10.0	4.0	—	—	7.8	**FP490**(➲L335), **FP590**(➲L337)
	LS25	M8×1.0	28.5	12.0	10.5	4.0	—	—	7.8	**MCLN**(➲C009), **MSBN**(➲C012), **MSSN**(➲C014)
	**LS10T**	M7×0.75	14.0	6.0	5.0	4.5	—	T25	8.0	**NF10000**(➲L097)
	LS15T	M7×0.75	18.0	7.0	7.0	4.5	—	T25	8.0	**AOX445**(➲L088)
	LS0622T	M6×0.75	22.0	8.0	8.0	3.4	—	T15	6.0	**AHX640W**(➲L081), **WSF406W**(➲L084)
	**NS251**	3.6	M2.5×0.45	7.0	—	2.2	60	—	0.7	**BTVH**(➲D016), **CSVH**(➲D027)
	NS401	5.8	M4×0.7	6.0	—	3.6	60	—	3.5	**CTAH-S**(➲D020)
	**NS402W**	5.85	M4×0.7	10.0	—	2.2	60	—	0.7	**BTAH**(➲D014), **CTAH**(➲D020), **CTBH**(➲D022)
	NS403W	5.85	M4×0.7	12.0	—	2.2	60	—	0.7	**BTAH**(➲D014), **CTAH**(➲D020), **CTBH**(➲D022)
	NS404W	5.80	M4×0.7	10.0	—	2.2	90	—	0.7	**GTAH, GTBH, GTCH**(➲D018)
	**RS3008T**	4.3	M3×0.35	8.6	2.0	2.4	61	T8	1.5	**SRF**(➲L300), **SUF**(➲L304)
	RS3510T	5.0	M3.5×0.35	10.0	2.3	2.8	61	T10	2.5	**SRF**(➲L300), **SUF**(➲L304)
	RS4015T	6.0	M4×0.5	14.0	2.7	3.4	61	T15	3.3	**SRF**(➲L300), **SUF**(➲L304)
	RS5020T	8.1	M5×0.5	16.4	3.6	3.9	61	T20	5.0	**SRF**(➲L300), **SUF**(➲L304)
	RS6025T	9.5	M6×0.75	21.5	4.2	4.5	61	T25	7.5	**SRF**(➲L300), **SUF**(➲L304)
	RS8030T	12.0	M8×0.75	25.0	5.0	5.6	61	T30	10.0	**SRF**(➲L300), **SUF**(➲L304)
	**S1**	3.5	M2×0.4	5.5	2.2	1.5	92	—	0.6	**FA0, FV0**(➲M013)
	**SD32**	12.0	M8×1.25	28.0	7.2	6.0	50	—	9.5	**DPVP**(➲E050)
	SD40	12.0	M8×1.25	36.0	7.2	6.0	50	—	9.5	**DPVP**(➲E050)
	**SETS51**	6.8	M5×0.8	14.8	1.5	3.4	—	T15	3.5	**MMTE**(➲G023), **MMTI**(➲G032)
	SETS61	8.0	M6×1.0	20.0	1.8	3.9	—	T20	5.0	**MMTE**(➲G023), **MMTI**(➲G032)
	**SLCS105**	10.0	M5×0.8	25.0	6.3	4.0	90	—	7.0	**MTJN**(➲C017), **A○○○MWLN**(➲E047)
	SLCS106	12.0	M6×1.0	32.0	6.2	4.0	90	—	7.0	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)

Shape	Order Number	Dimensions (mm)					Angle	Drive Size	Torque (N•m)	Tool Holder
		a	b	c	d	e	θ°			
	**TPS20**	2.70	M2×0.4	3.5	1.3	1.80	60	6IP	0.5	**ARX**(➲L270)
	TPS20-1	2.65	M2×0.4	4.7	2.4	1.80	60	6IP	0.6	**MVX**(➲N160)
	TPS22	3.00	M2.2×0.45	4.7	1.6	2.10	60	7IP	0.5	**ARX**(➲L270)
	TPS22S	3.00	M2.2×0.45	4.2	1.6	2.10	60	7IP	0.5	**ARX**(➲L270)
	TPS25	3.30	M2.5×0.45	5.5	1.7	2.10	60	7IP	1.0	**APX3000**(➲L137), **APX3K**(➲L142), **MVX**(➲N160)
	TPS25-1	3.30	M2.5×0.45	6.5	1.7	2.10	60	7IP	1.0	**APX3000**(➲L137), **APX3K**(➲L142)
	TPS27F1	3.70	M2.7×0.35	6.5	1.8	2.10	60	7IP	1.0	**VPX200**(➲L157, L159)
	TPS27F2	3.70	M2.7×0.35	8.0	1.8	2.10	60	7IP	1.0	**VPX200**(➲L157, L159)
	TPS3	3.90	M3×0.5	6.7	2.0	2.82	60	10IP	2.0	**MVX**(➲N161)
	TPS3R	4.60	M3×0.5	8.5	1.9	2.82	60	10IP	2.0	**WJX09**(➲L243)
	TPS3SB	4.40	M3×0.5	8.0	2.0	2.70	80	10IP	3.0	**AXD4000A**(➲L203)
	TPS35	5.30	M3.5×0.6	11.5	2.8	3.40	60	15IP	3.5	**ASX445**(➲L056), **ASX400**(➲L116), **PMR**(➲L330)
	TPS351	4.80	M3.5×0.6	7.2	2.4	2.82	60	10IP	2.5	**MVX**(➲N161)
	TPS351B	5.10	M3.5×0.6	7.2	2.3	2.82	60	10IP	2.5	**ARP**(➲L265)
	TPS4	5.30	M4×0.7	8.0	2.6	3.40	60	15IP	3.5	**APX4000**(➲L146), **ARP**(➲L265), **MVX**(➲N162)
	TPS40F1	5.30	M4×0.5	10.5	2.8	3.40	60	15IP	3.0	**VPX300**(➲L163)
	TPS43	5.30	M4×0.7	10.0	2.6	3.40	60	15IP	4.0	**APX4000**(➲L146), **APX4K**(➲L152), **MVX**(➲N163)
	TPS4R	6.40	M4×0.7	10.6	2.9	3.40	60	15IP	3.5	**WSX445**(➲L040)
	TPS54	6.80	M5×0.8	12.0	3.2	4.50	60	25IP	7.5	**MVX**(➲N164)

SPARE PARTS

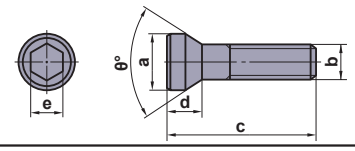
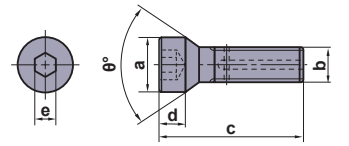
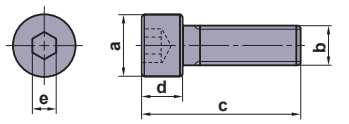
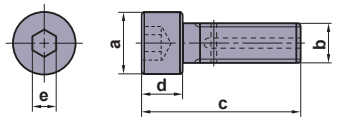
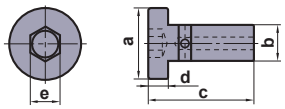
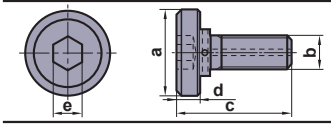
CLAMP SCREW

Shape	Order Number	Dimensions (mm) a	b	c	d	e	Angle θ°	Drive Size	Torque (N•m)	Tool Holder
	* TS16	2.5	M1.6×0.35	3.2	1.6	1.8	60	T6	0.6	C○○○SCLC(➲E024)
	TS2	2.7	M2×0.4	4.6	1.4	1.8	60	T6	0.6	FSWU(➲E016), C○○○SWUB(➲E024)
	TS202	2.7	M2×0.4	5.5	1.8	1.8	60	T6	0.6	SVLP(➲D012), FSVU(➲E018), FSVJ(➲E020)
	* TS2A	2.7	M2×0.4	4.5	1.2	1.8	60	T6	0.6	AQX(➲L220)
	TS2C	2.7	M2×0.4	3.8	1.4	1.8	60	T6	0.6	C○○○SWUB(➲E024), C○○○STUC(➲E025)
	☆TS2D	3.8	M2×0.4	5.3	1.9	1.8	82	T6	0.6	FSTUP(➲E010)
	TS21	2.7	M2×0.4	3.4	1.4	1.8	60	T6	0.6	C○○○SCLC(➲E024), FSWL(➲E035)
	* TS22	3.0	M2.2×0.45	5.0	1.2	1.8	60	T6	0.6	S/C○○○STFC(➲E036)
	* TS25	3.3	M2.5×0.45	5.5	1.7	2.4	60	T8	1.0	SCLC(➲C023), FSDUC(➲E012), FSL(➲F144)
	☆TS25D	4.4	M2.5×0.45	6.2	2.2	2.4	82	T8	1.0	FSTUP(➲E010)
	* TS25H	3.6	M2.5×0.45	5.5	2.0	2.4	60	T8	1.0	SRM2(➲L308)
	TS253	3.3	M2.5×0.45	4.5	1.7	2.4	60	T8	1.0	FSCL(➲E008), FSWU(➲E016)
	TS254	3.3	M2.5×0.45	7.0	1.7	2.4	60	T8	1.0	SCAC(➲D010), SDJC(➲D011), SH(➲D026)
	* TS255	3.5	M2.5×0.45	7.5	1.6	2.4	60	T8	1.0	SXZC(➲C031), SVLP, SVJB(➲D012)
	TS3	3.9	M3×0.5	6.0	2.0	2.4	60	T8	1.0	SRGC(➲C026), STGC(➲C028), TSMP(➲L320)
	TS304	3.9	M3×0.5	10.5	2.0	2.4	60	T8	1.5	VAS300(➲L132)
	TS3D	5.0	M3×0.5	6.0	2.3	2.8	82	T10	2.5	FSCLC, FSCLP(➲E008)
	* TS3SB	4.4	M3×0.5	8.0	2.0	2.4	80	T8	1.5	AXD4000(➲L194)
	TS3SBS	4.4	M3×0.5	6.5	2.0	2.4	80	T8	1.5	AXD4000(➲L194)
	☆TS31D	4.8	M3×0.5	7.2	2.2	2.8	82	T10	2.5	FSTUP(➲E010)
* 	* TS32	3.9	M3×0.5	7.5	2.0	2.4	60	T8	2.0	SVJC(➲D013), FSL(➲F144), SRM2(➲L308)
	* TS33	3.9	M3×0.5	6.7	2.0	2.4	60	T8	1.5	AQX(➲L220), AJX(➲L230), PMC(➲L326)
	* TS35D	5.3	M3.5×0.6	12.0	2.8	3.4	60	T15	3.5	FSVU(➲E018), H63TH-SVPB(➲H013)
	TS35R	5.7	M3.5×0.6	10.0	2.1	3.4	—	T15	3.5	AHX440S(➲L062), AHX475S(➲L068)
	TS351	4.8	M3.5×0.6	7.2	2.4	2.8	60	T10	2.5	AJX(➲L230), PMC(➲L326)
	TS352	4.8	M3.5×0.6	10.0	3.0	2.8	60	T10	2.5	VFX5(➲L293)
	TS4	5.4	M4×0.7	8.0	2.6	3.4	60	T15	3.5	FSWU(➲E016), FSWL(➲E035)
☆ 	TS406	5.4	M4×0.7	15.5	2.6	3.4	60	T15	3.5	VAS400(➲L132)
	TS407	5.4	M4×0.7	9.0	2.6	3.4	60	T15	3.5	GYH(➲F023), GYDR/L(➲F087), AQX(➲L220)
	TS4D	5.6	M4×0.7	7.7	2.5	3.4	82	T15	3.5	FSCL(➲E008), FSTUP(➲E010)
	TS43	5.4	M4×0.7	10.0	2.6	3.4	60	T15	3.5	SCLC(➲C023), AJX(➲L230), BRP(➲L275)
	TS44	5.4	M4×0.7	12.0	2.6	3.4	60	T15	3.5	SVJC(➲C029), SVPC(➲C030)
	TS450	5.9	M4.5×0.75	13.0	3.6	3.9	60	T20	5.0	VFX6(➲L297)
	* TS4SB	5.8	M4×0.7	9.0	2.7	3.4	80	T15	3.5	AXD7000(➲L208)
	* TS4SBL	5.8	M4×0.7	10.5	2.7	3.4	80	T15	3.5	GYS(➲F017), AXD7000(➲L208)
	* TS4SL	5.4	M4×0.7	8.0	2.4	3.4	80	T15	4.0	BXD4000(➲L216)
	TS5	6.8	M5×0.8	9.0	3.2	4.5	60	T25	7.5	SCLC(➲C023), S/C○○○SDUC(➲E037)
	TS5R	6.9	M5×0.8	12.0	3.5	3.9	60	T20	5.0	WWX400(➲L101), WJX(➲L251)
	TS52	6.8	M5×0.8	8.0	3.2	4.5	60	T25	7.5	CESP(➲L318)
	TS53	6.8	M5×0.8	16.0	3.2	4.5	60	T25	7.5	VAS500(➲L132)
	TS54	6.8	M5×0.8	12.0	3.2	4.5	60	T25	7.5	AJX(➲L230), BRP(➲L275)
	TS55	6.8	M5×0.8	10.5	3.2	4.5	60	T25	7.5	GYH(➲F023), GYD(➲F087), AQX(➲L220)
	* TS6S	8.5	M6×1.0	13.0	4.4	5.6	60	T30	10.0	AQX(➲L220), SRM2(➲L316)
	* TS6	8.5	M6×1.0	16.0	4.4	5.6	60	T30	10.0	SRM2(➲L316)
	TSS04005	—	M4×0.7	5.0	—	2.4	—	T8	—	PMF(➲L328)
	TSS04505S	—	M4.5×0.7	5.0	—	3.5	—	T10	3.5	FMAX(➲L089)
	TSS05006	—	M5×0.8	6.0	—	2.8	—	T10	—	CSKP(➲M009), STFP(➲M011)
	TSS06010	—	M6×1.0	10.0	—	3.9	—	T20	—	CSKP(➲M009), STFP(➲M011)
	TSS06012	—	M6×1.0	12.0	—	3.9	—	T20	—	STGP, STTP(➲M011)
	WCS503507H	6.3	M5×0.5	7.0	3.3	3.5	—	—	5.0	ASX445(➲L056), ASX400(➲L116), PMR(➲L330)

Shape	Order Number	Dimensions (mm)					Angle	Drive Size	Torque (N•m)	Tool Holder
		a	b	c	d	e	θ°			
	**WS304517T**	4.5	M3×0.5	16.5	3.4	2.8	60	T10	3.5	**TAW**(➲N151)
	WS304518T	4.5	M3×0.5	17.5	3.4	2.8	60	T10	3.5	**TAW**(➲N151)
	WS355520T	5.5	M3.5×0.6	19.5	3.9	3.4	60	T15	5.5	**TAW**(➲N152)
	WS355521T	5.5	M3.5×0.6	20.5	3.9	3.4	60	T15	5.5	**TAW**(➲N152)
	WS406023T	6.0	M4×0.7	22.0	4.4	4.5	60	T25	8.5	**TAW**(➲N153, N159)
	WS406024T	6.0	M4×0.7	23.0	4.4	4.5	60	T25	8.5	**TAW**(➲N153, N159)
	WS508026T	8.0	M5×0.8	25.0	5.2	5.1	60	T27	12.0	**TAW**(➲N154)
	WS508027T	8.0	M5×0.8	26.0	5.2	5.1	60	T27	12.0	**TAW**(➲N154)
	**WS203107TPS**	3.1	M2×0.25	7.3	1.70	1.80	60	6IP	1.0	**STAW**(➲N150)
	WS203108TPS	3.1	M2×0.25	8.3	1.90	1.80	60	6IP	1.0	**STAW**(➲N150)
	WS253909TPS	3.9	M2.5×0.35	9.5	2.40	2.40	60	8IP	2.0	**STAW**(➲N150)
	WS304912TPS	4.9	M3×0.35	12.0	3.25	2.82	60	10IP	2.5	**STAW**(➲N150)

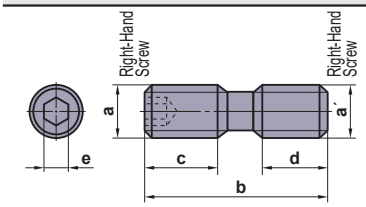
SPARE PARTS

SET BOLT

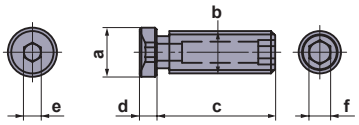
Shape	Order Number	Dimensions (mm) a	b	c	d	e	Angle θ°	Drive Size	Torque (N•m)	Tool Holder
	**BOES101**	15.0	M10×1.5	45.0	10.0	8.0	60	—	10.0	**OCTACUT**(➲L259)
	**HFF08033H**	11.0	M8×1.25	33.0	5.0	5.0	90	—	8.2	**WJX09**(➲L242)
	HFF08043H	11.0	M8×1.25	43.0	5.0	5.0	90	—	8.2	**AXD4000**(➲L195), **BXD**(➲L217)
	**HSC06016**	10.0	M6×1.0	22.0	6.0	5.0	—	—	13.0	**PTFN**(➲M007), **STFP**(➲M011)
	HSC06020	10.0	M6×1.0	31.0	6.0	5.0	—	—	13.0	**PTFN**(➲M007), **STFP**(➲M011)
	✻ **HSC08025H**	13.0	M8×1.25	24.0	8.0	6.0	—	—	24.0	**WSX445**(➲L041), **AHX440**(➲L063), **VPX200**(➲L158)
	✻ **HSC08030H**	13.0	M8×1.25	38.0	8.0	5.0	—	—	24.0	**FMAX**(➲L090), **APX3000**(➲L137), **APX4000**(➲L147)
	HSC08040	13.0	M8×1.25	48.0	8.0	6.0	—	—	24.0	**APX3K**(➲L143), **VPX300**(➲L166), **VFX5**(➲L293)
	HSC08045	13.0	M8×1.25	53.0	8.0	6.0	—	—	24.0	**VPX200**(➲L160)
	HSC08050	13.0	M8×1.25	58.0	8.0	6.0	—	—	24.0	**VPX200**(➲L160), **VPX300**(➲L166), **VFX5**(➲L293)
	✻ **HSC10030H**	16.0	M10×1.5	40.0	10.0	6.0	—	—	40.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX475**(➲L068)
	HSC10035	16.0	M10×1.5	45.0	10.0	8.0	—	—	44.0	**WWX400**(➲L102), **VFX5**(➲L293), **PMR**(➲L330)
	HSC10040	16.0	M10×1.5	50.0	10.0	8.0	—	—	44.0	**VPX300**(➲L166)
	HSC10045	16.0	M10×1.5	55.0	10.0	8.0	—	—	44.0	**APX3K**(➲L143), **VPX200**(➲L160), **VFX5**(➲L293)
	HSC10050	16.0	M10×1.5	60.0	10.0	8.0	—	—	44.0	**APX4K**(➲L153), **VPX300**(➲L166)
	HSC10055	16.0	M10×1.5	65.0	10.0	8.0	—	—	44.0	**VFX5**(➲L293)
	HSC10060	16.0	M10×1.5	70.0	10.0	8.0	—	—	44.0	**VPX300**(➲L166)
	HSC10070	16.0	M10×1.5	80.0	10.0	8.0	—	—	44.0	**ASPX**(➲L288)
	**HSC12035**	18.0	M12×1.75	47.0	12.0	10.0	—	—	80.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX475**(➲L068)
	✻ **HSC12035H**	18.0	M12×1.75	47.0	12.0	10.0	—	—	80.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX475**(➲L068)
	HSC12045	18.0	M12×1.75	57.0	12.0	10.0	—	—	80.0	**VFX5**(➲L293), **VFX6**(➲L297)
	HSC12050	18.0	M12×1.75	62.0	12.0	10.0	—	—	80.0	**VPX300**(➲L166)
	HSC12060	18.0	M12×1.75	72.0	12.0	10.0	—	—	80.0	**VPX300**(➲L166)
	HSC12070	18.0	M12×1.75	82.0	12.0	10.0	—	—	80.0	**APX4K**(➲L153), **VPX300**(➲L166), **SPX4**(➲L284)
	HSC16035	24.0	M16×2.0	51.0	16.0	14.0	—	—	150.0	**OCTACUT**(➲L259)
	HSC16040	24.0	M16×2.0	56.0	16.0	14.0	—	—	150.0	**VFX6**(➲L297), **PMR**(➲L330)
	✻ **HSC16040H**	24.0	M16×2.0	56.0	16.0	14.0	—	—	150.0	**AHX475**(➲L068), **APX3000**(➲L137), **APX4000**(➲L147)
	HSC16055	24.0	M16×2.0	71.0	16.0	14.0	—	—	150.0	**VPX300**(➲L166)
	HSC16065	24.0	M16×2.0	81.0	16.0	14.0	—	—	150.0	**VPX300**(➲L166), **SPX4**(➲L284)
	HSC16080	24.0	M16×2.0	96.0	16.0	14.0	—	—	150.0	**ASPX**(➲L288), **VFX5**(➲L293), **VFX6**(➲L297)
	HSC20040	30.0	M20×2.5	60.0	20.0	17.0	—	—	320.0	**VFX6**(➲L297)
	HSC20090	30.0	M20×2.5	110.0	20.0	17.0	—	—	320.0	**VFX6**(➲L297)
	**HSCX12030H**	24.0	M12×1.75	37.0	7.0	8.0	—	—	40.0	**FMAX**(➲L089)
	HSCX16035H	30.0	M16×2.0	44.0	9.0	12.0	—	—	100.0	**FMAX**(➲L091)
	HSCX16045H	30.0	M16×2.0	54.0	9.0	12.0	—	—	100.0	**FMAX**(➲L091)
	HSCX20035H	36.0	M20×2.5	46.0	11.0	14.0	—	—	180.0	**FMAX**(➲L091)
	**MBA16033H**	40.0	M16×2.0	43.0	10.0	14.0	—	—	150.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX640**(➲L071)
	MBA20040H	50.0	M20×2.5	54.0	14.0	17.0	—	—	320.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX475**(➲L068)
	MBA24045H	65.0	M24×3.0	59.0	14.0	17.0	—	—	520.0	**WSX445**(➲L041), **AHX440**(➲L063), **AHX475**(➲L068)

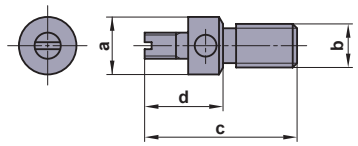
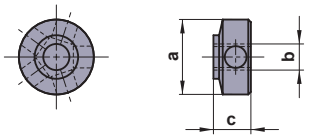
✻ With coolant hole.

Includes products with the same shape as commercial products (JIS Standard).

Shape	Order Number	Dimensions (mm) a	a′	b	c	d	e	Torque (N•m)	Tool Holder
	**HDS08030**	M8×0.75	M8×1.25	30.0	13.5	11.5	4.0	8.2	**OCTACUT**(➲L259), **BRP**(➲L276)
	HDS10031	M10×1.0	M10×1.5	31.0	14.0	12.0	5.0	9.0	**OCTACUT**(➲L259), **PMF**(➲L328)

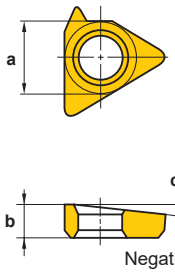
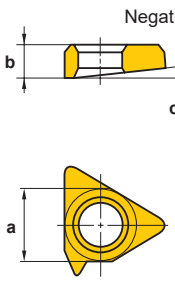
STANDARD FOR ADJUSTABLE SCREWS AND NUTS

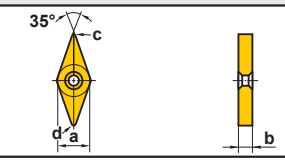
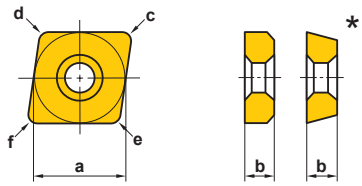
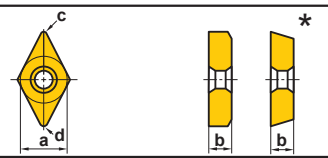
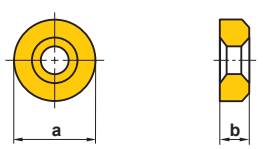
Shape	Order Number	Dimensions (mm)						Tool Holder
		a	b	c	d	e	f	
	**HVS060519**	5.8	M5×0.8	14.0	2.0	2.0	2.5	**HVF**(➲M002)

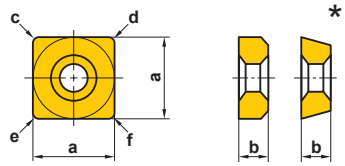
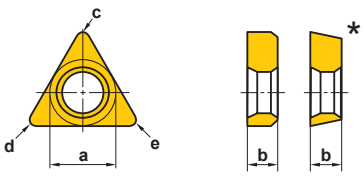
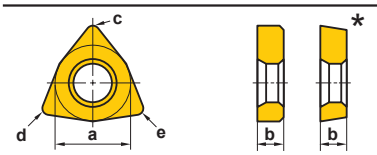
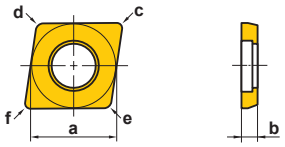
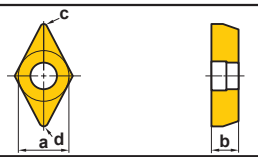
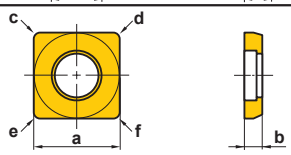
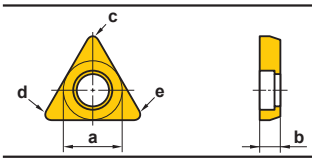
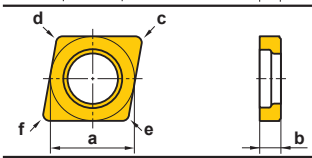
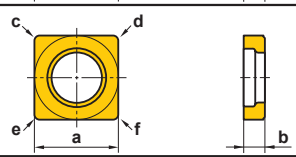
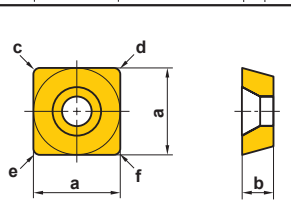
Shape	Order Number	Dimensions (mm)				Tool Holder
		a	b	c	d	
	**KSS2**	6.6	M5×0.8	17.5	9.0	**FMAX**(➲L089)
	**KSN3**	8.6	M3×0.35	4.3	—	**FMAX**(➲L089)

SPARE PARTS

SHIM

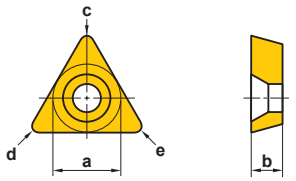
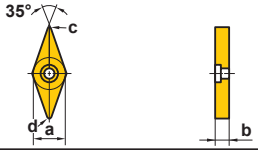
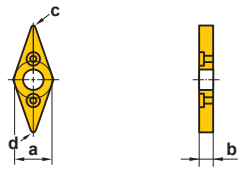
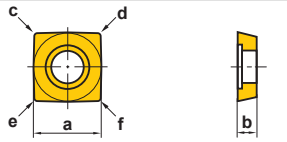
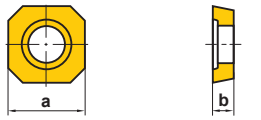
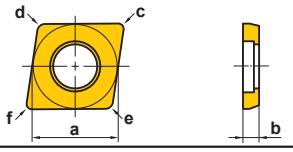
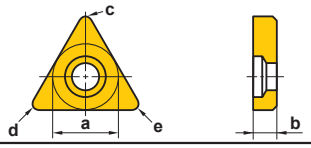
Shape	Order Number	Dimensions (mm) a	b	c	Tool Holder
	**CTE32TN15**	9.525	3.18	-3°	MMTE(➲G023)
	CTE32TN05	9.525	3.18	-2°	MMTE(➲G023)
	CTE32TP05	9.525	3.18	-1°	MMTE(➲G023)
	CTE32TP15	9.525	3.18	0°	MMTE(➲G023)
	CTE32TP25	9.525	3.18	1°	MMTE(➲G023)
	CTE32TP35	9.525	3.18	2°	MMTE(➲G023)
	CTE32TP45	9.525	3.18	3°	MMTE(➲G023)
	CTE43TN15	12.70	4.76	-3°	MMTE(➲G023)
	CTE43TN05	12.70	4.76	-2°	MMTE(➲G023)
	CTE43TP05	12.70	4.76	-1°	MMTE(➲G023)
	CTE43TP15	12.70	4.76	0°	MMTE(➲G023)
	CTE43TP25	12.70	4.76	1°	MMTE(➲G023)
	CTE43TP35	12.70	4.76	2°	MMTE(➲G023)
	CTE43TP45	12.70	4.76	3°	MMTE(➲G023)
	**CTI32TN15**	9.525	3.18	-3°	MMTI(➲G032)
	CTI32TN05	9.525	3.18	-2°	MMTI(➲G032)
	CTI32TP05	9.525	3.18	-1°	MMTI(➲G032)
	CTI32TP15	9.525	3.18	0°	MMTI(➲G032)
	CTI32TP25	9.525	3.18	1°	MMTI(➲G032)
	CTI32TP35	9.525	3.18	2°	MMTI(➲G032)
	CTI32TP45	9.525	3.18	3°	MMTI(➲G032)
	CTI43TN15	12.70	4.76	-3°	MMTI(➲G032)
	CTI43TN05	12.70	4.76	-2°	MMTI(➲G032)
	CTI43TP05	12.70	4.76	-1°	MMTI(➲G032)
	CTI43TP15	12.70	4.76	0°	MMTI(➲G032)
	CTI43TP25	12.70	4.76	1°	MMTI(➲G032)
	CTI43TP35	12.70	4.76	2°	MMTI(➲G032)
	CTI43TP45	12.70	4.76	3°	MMTI(➲G032)

Shape	Order Number	Dimensions (mm) a	b	c	d	e	f	Tool Holder
	**DCSVN32**	9.52	3.18	0.8	1.2	—	—	**DVJN**(➲C019), **DVVN**(➲C020), **DVPN**(➲C021)
	**LLSCN3T3**	9.52	3.97	0.4	0.4	0.8	0.8	**PCLN, DCLN**(➲C008)
	LLSCN33	9.52	4.76	0.4	0.4	0.8	0.8	**DCLN**(➲C008)
	LLSCN42	12.70	3.18	0.8	0.8	1.2	1.2	**PCLN, DCLN**(➲C008), **A○○○-DCLN**(➲E021)
	LLSCN53	15.87	4.76	1.2	1.2	1.6	1.6	**PCLN**(➲C008)
	LLSCN63	19.05	4.76	1.2	1.2	1.6	1.6	**PCLN**(➲C008)
	* **LLSCP42**	12.70	3.18	0.8	0.8	1.2	1.2	**A○○○-DCLN**(➲E021), **A○○○-PCLN**(➲E044)
	**LLSDN32**	9.52	3.18	0.8	1.2	—	—	**DDJN**(➲C010), **A○○○-PDUN**(➲E044)
	LLSDN42	12.70	3.18	0.8	1.2	—	—	**PDJN, DDJN**(➲C010), **A○○○-DDUN**(➲E021)
	LLSDN43	12.70	4.76	0.8	1.2	—	—	**PDJN, DDJN**(➲C010), **PDHN**(➲C011)
	* **LLSDP42**	12.70	3.18	0.8	1.2	—	—	**A○○○-DDUN**(➲E021)
	**LLSRN103**	8.3	3.18	—	—	—	—	**PRGC, PRDC**(➲C025)
	LLSRN123	9.8	3.18	—	—	—	—	**PRGC, PRDC**(➲C025)
	LLSRN164	13.6	4.76	—	—	—	—	**PRGC, PRDC**(➲C025)
	LLSRN204	17.3	4.76	—	—	—	—	**PRGC, PRDC**(➲C025)

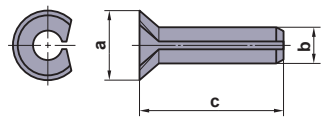
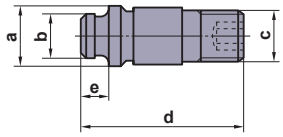
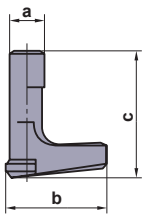
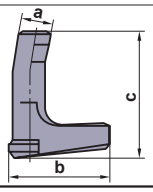
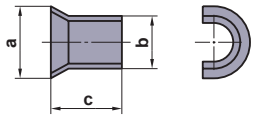
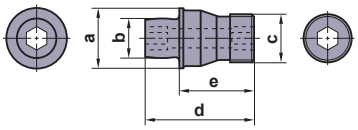
Shape	Order Number	Dimensions (mm)						Tool Holder
		a	b	c	d	e	f	
	**LLSSN33**	9.52	4.76	0.8	0.8	1.2	1.2	**PSBN**(➲C012), **PSDN**(➲C014)
	LLSSN42	12.70	3.18	0.8	0.8	1.2	1.6	**PSBN**(➲C012), **A○○○-DSKN**(➲E022)
	LLSSN53	15.87	4.76	1.2	1.2	1.6	1.6	**PSBN**(➲C012), **PSSN**(➲C013)
	LLSSN63	19.05	4.76	1.2	1.2	1.6	2.0	**PSBN**(➲C012), **PSSN**(➲C013)
	***LLSSP42**	12.70	3.18	0.8	0.8	1.2	1.6	**A○○○-DSKN**(➲E022)
	**LLSTN32**	9.52	3.18	0.4	0.8	1.2	—	**PTGN, DTGN**(➲C016), **A○○○-DTFN**(➲E022)
	LLSTN33	9.52	4.76	0.4	0.8	1.2	—	**PTGN, DTGN**(➲C016), **PTFN**(➲C017)
	LLSTN42	12.70	3.18	0.4	0.8	1.2	—	**PTGN**(➲C016), **A○○○PTFN**(➲E043)
	LLSTN53	15.87	4.76	0.8	1.2	1.6	—	**PTGN**(➲C016)
	***LLSTP32**	9.52	3.18	0.4	0.8	1.2	—	**A○○○-DTFN**(➲E022)
	**LLSWN32**	9.52	3.18	0.4	0.8	1.2	—	**PWLN, DWLN**(➲C022)
	LLSWN3T3	9.52	3.97	0.4	0.8	1.2	—	**PWLN, DWLN**(➲C022)
	LLSWN42	12.70	3.18	0.4	0.8	1.2	—	**DWLN**(➲C022), **A○○○-DWLN**(➲E023)
	***LLSWP32**	9.52	3.18	0.4	0.8	1.2	—	**A○○○-DWLN**(➲E023)
	***LLSWP42**	12.70	3.18	0.4	0.8	1.2	—	**A○○○-DWLN**(➲E023)
	**MLCP42**	12.58	3.18	1.2	1.2	1.2	1.2	**A○○○PCLN**(➲E044)
	**MLDP42**	12.56	3.18	1.2	1.2	—	—	**A○○○PDUN**(➲E044), **A○○○PDQN**(➲E045)
	**MLSP42**	12.63	3.18	1.2	1.2	1.2	1.2	**A○○○PSKN**(➲E043)
	**MLTP32**	9.50	3.18	1.2	1.2	1.2	—	**A○○○PTFN**(➲E043)
	**MSCN63**	18.8	4.76	1.6	1.6	1.6	1.6	**MCLN**(➲C009)
	**MSSN63**	18.8	4.76	1.6	1.6	1.6	1.6	**MSBN**(➲C012), **MSSN**(➲C014)
	**PS42**	11.46	3.18	0.2	0.2	0.6	1.0	**CSKP**(➲M009)

SPARE PARTS

SHIM

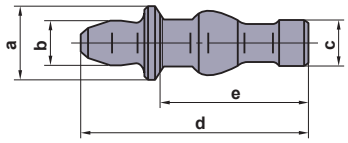
Shape	Order Number	Dimensions (mm)						Tool Holder
		a	b	c	d	e	f	
	**PT32**	8.28	3.18	0.2	0.2	0.6	—	**FCTU**(➲E034)
	**PV321**	9.52	3.18	0.4	0.4	—	—	**PVJN**(➲C019), **PVVN**(➲C020), **PVPN**(➲C021)
	PV322	9.52	3.18	0.8	0.8	—	—	**PVJN**(➲C019), **PVVN**(➲C020), **PVPN**(➲C021)
	PV323	9.52	3.18	1.2	1.2	—	—	**PVJN**(➲C019), **PVVN**(➲C020), **PVPN**(➲C021)
	**SPSVN32**	8.06	3.18	0.3	0.3	—	—	**SVJC**(➲C029), **SVPC**(➲C030), **FSVU**(➲E018)
	**STASX400N**	11.00	3.00	0.4	0.4	0.4	0.4	**ASX400**(➲L116)
	**STASX445N**	10.76	3.00	—	—	—	—	**ASX445**(➲L056)
	**STPMR4N**	10.46	3.00	1.2	1.2	1.2	1.2	**PMR**(➲L330)
	**WPSTN33**	9.30	4.76	0.8	0.4	1.2	—	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)
	WPSTN43	12.50	4.76	0.8	0.4	1.2	—	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)

SHIM PIN AND CLAMP LEVER

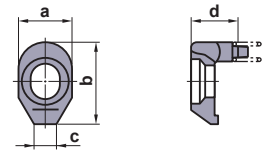
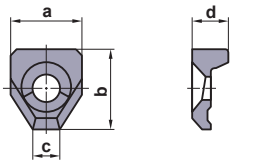
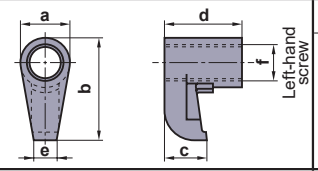
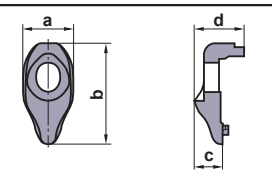
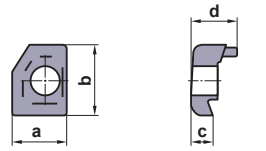
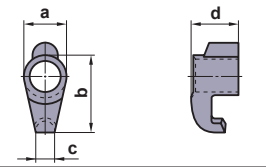
Shape	Order Number	Dimensions (mm)					Tool Holder
		a	b	c	d	e	
	**BCP141**	3.0	1.4	5.6	—	—	**SVJC**(➲C029), **SVPC**(➲C030), **FSVU**(➲E018)
	BCP201	4.3	2.0	7.4	—	—	**FCTU1**(➲E034)
	BCP202	4.3	2.0	6.4	—	—	**FCTU1, FCTU2**(➲E034)
	BCP251	4.8	2.5	7.4	—	—	**CSKP**(➲M009)
	**CCP33**	6.5	3.66	M5×0.8	18.5	3.0	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)
	CCP34	7.5	5.00	M6×1.0	18.5	3.0	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)
	CCP44	7.5	5.00	M5×0.8	14.2	3.0	**A○○○MWLN**(➲E047)
	**LLCL12S**	2.1	9.3	5.6	—	—	**PTGN**(➲C016), **PTFN**(➲M007), **FA/V**(➲M013)
	LLCL13	3.6	10.0	12.5	—	—	**PCLN**(➲C008), **A○○○PTFN**(➲E043)
	LLCL13S	3.6	10.0	7.8	—	—	**PSBN**(➲C012), **A○○○PCLN**(➲E044)
	LLCL14	4.7	13.4	13.2	—	—	**PCLN**(➲C008), **A○○○PSKN**(➲E043)
	LLCL14S	4.7	13.6	12.2	—	—	**PSKN, PSSN, PSYN, PCLN**(➲M007)
	LLCL23	3.6	12.0	11.5	—	—	**A○○○PDUN**(➲E044)
	LLCL23S	3.6	11.6	9.5	—	—	**A○○○PDUN**(➲E044)
	LLCL24	4.7	16.2	14.8	—	—	**PDJN**(➲C010), **A○○○PDUN**(➲E044)
	LLCL25	6.0	17.1	17.0	—	—	**PCLN**(➲C008), **PSBN**(➲C012), **PSSN**(➲C013)
	**LLCL110**	3.0	10.7	11.6	—	—	**PRGC, PRDC**(➲C025)
	LLCL112	3.5	13.0	13.5	—	—	**PRGC, PRDC**(➲C025), **H63TH-PRGC**(➲H012)
	LLCL116	4.5	18.5	18.0	—	—	**PRGC, PRDC**(➲C025)
	LLCL120	5.6	20.3	19.0	—	—	**PRGC, PRDC**(➲C025)
	**LLP13**	5.55	4.85	5.3	—	—	**PCLN**(➲C008), **A○○○-DVUN**(➲E023)
	LLP14	7.25	6.55	5.8	—	—	**PCLN**(➲C008), **A○○○-DWLN**(➲E023)
	LLP15	8.80	8.05	8.6	—	—	**PCLN**(➲C008), **PSBN**(➲C012), **PSSN**(➲C013)
	LLP16	10.85	9.85	11.1	—	—	**PCLN**(➲C008), **PSBN**(➲C012), **PSSN**(➲C013)
	LLP23	5.55	4.85	6.8	—	—	**DCLN**(➲C008), **DDJN**(➲C010), **PSBN**(➲C012)
	LLP24	7.25	6.55	9.1	—	—	**DDJN**(➲C010), **H63TH-DDJN**(➲H009)
	**MP6**	11.9	7.8	M10×1.0	22.1	15.0	**MCLN**(➲C009), **MSBN**(➲C012), **MSSN**(➲C014)

SPARE PARTS

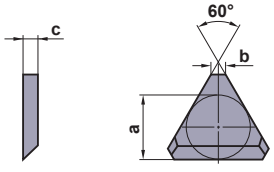
LOCK PIN

Shape	Order Number	Dimensions (mm) a	b	c	d	e	f	Tool Holder
	**P11S**	6.0	3.7	4.0	17.0	11.1	—	**PVJN**(➲C019), **PVVN**(➲C020), **DPVP**(➲E050)
	P21S	7.5	4.9	4.5	17.2	11.5	—	**DPT4**(➲F146), **DPT2**(➲G042)

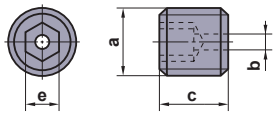
CLAMP BRIDGE

Shape	Order Number	Dimensions (mm) a	b	c	d	e	f	Tool Holder
	**AMS3**	7.0	12.0	3.0	3.3	—	—	**SXZC**(➲C031), **AJX09**(➲L230), **PMC**(➲L326)
	AMS4	9.0	13.5	3.0	3.8	—	—	**AJX12**(➲L230), **PMC**(➲L326)
	AMS5	10.0	15.0	3.5	5.0	—	—	**AJX14**(➲L230)
	**CCK13**	15.0	18.5	6.0	9.0	—	—	**MTJN**(➲C017), **A○○○MWLN**(➲E047)
	CCK14	19.0	22.0	8.0	9.5	—	—	**MTJN**(➲C017), **MTEN, MTQN**(➲C018)
	**CKW6**	10.9	22.5	9.2	16.8	5.0	M8×1.0	**MCLN**(➲C009), **MSBN**(➲C012), **MSSN**(➲C014)
	**DCK2211**	11.0	22.0	6.57	11.1	—	—	**DCLN**(➲C008), **A○○○-DTFN**(➲E022)
	DCK2613	13.0	26.5	7.35	12.9	—	—	**DCLN**(➲C008), **A○○○-DCLN**(➲E021)
	DCK3113	13.0	31.0	9.0	14.5	—	—	**DVJN**(➲C019), **A○○○-DVUN**(➲E023)
	**MTK1R/L**	13.0	17.5	5.0	12.0	—	—	**MGH**(➲F136), **MTH**, **MT1**(➲G028)
	**SETK51**	6.8	14.5	2.9	8.0	—	—	**MMTE**(➲G023), **MMTI**(➲G032)
	SETK61	8.9	18.1	4.1	8.6	—	—	**MMTE**(➲G023), **MMTI**(➲G032)

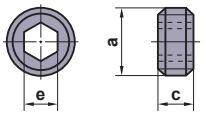
BREAKER PIECE

Shape	Order Number	Dimensions (mm) a	b	c	Inscribed Circle	Breaker Width	Tool Holder
	**CBT2N**	5.67	1.4	1.5	6.350	1.0	**FCTU1, FCTU2**(➲E034)
	CBT3F	8.53	1.4	2.5	9.525	1.5	**FCTU1, FCTU2**(➲E034)
							For positive inserts, the breaker width is 0.5mm larger than the figures in the list.

COOLANT NOZZLE

Shape	Order Number	Dimensions (mm)				Tool Holder
		a	b	c	e	
	**HSD04004H06**	M4x0.7	0.6	4.0	2.0	**ARP**(➲L265), **ASPX**(➲L288), **VFX5**(➲L293)
	HSD04004H08	M4x0.7	0.8	4.0	2.0	**ARP**(➲L265), **ASPX**(➲L288), **VFX5**(➲L293)
	HSD04004H12	M4x0.7	1.2	4.0	2.0	**ARP**(➲L265), **ASPX**(➲L288), **VFX5**(➲L293)
	HSD04004H16	M4x0.7	1.6	4.0	2.0	**ARP**(➲L265), **ASPX**(➲L288), **VFX5**(➲L293)

STOPPER

Shape	Order Number	Dimensions (mm)			Tool Holder
		a	c	e	
	**WS35LH**	3.47	1.7	2.0	**STAW**(➲N150)
	WS45LH	3.47	1.7	2.0	**STAW**(➲N150)
	WS55LH	3.47	1.7	2.0	**STAW**(➲N150)

ANTI SEIZE LUBRICANT

Shape	Order Number	Volume (g)	Tool Holder
	**MK1KS**	3	**WWX**(➲L101), **TAW**(➲N151)

REPLACEMENT PARTS FOR OLD TYPE TOOLS

*The "Parts Corresponding to Old Products" indicates the names of products that have been discontinued (consolidated), due to the release of new products and the part model numbers listed as accessories for the holder.
Please note that the "old product parts" may not be available after a certain period of time.

TURNING HOLDERS

CTCH, CTDH, CTEH TYPE HOLDER

Old Type Tool Number			
Shape	Size	Clamp Screw	Wrench
CTCHR/L	**1010-200**	NS501W	HKY25RS
	1212-200	NS501W	HKY25RS
CTDHR/L	**1616-230**	HBH06020	HKY40R
	1616-280	NS502W	HKY25R
	1616-350	HBH06020	HKY40R
CTEHR/L	**1616-230**	HBH06020	HKY40R
	1616-280	NS502W	HKY25R
	1616-350	HBH06020	HKY40R

EG TYPE HOLDER

Old Type Tool Number			
Shape	Size	Clamp Screw	Wrench
EGHR	**2020K03**	EGS06019	HKY30R
	2525M3	EGS06019	HKY30R
	2525M4	EGS08024	HKY40R
	2525M5	EGS08024	HKY40R
	2525M7	EGS08024	HKY40R
	2525M8	EGS08024	HKY40R

ET TYPE HOLDER

Old Type Tool Number							
Shape	Size	Clamp Bridge	Clamp Screw	Shim Screw	Shim	Breaker Piece	Wrench
ETHR	**2525M16**	CK341	LS2	CFM02008	PT32T1R PT32T2R	CBT3106 CBT3113 CBT3120	HKY40R
	2525M22	CK341	LS2	SFC02508	PT42TR	CBT4108 CBT4128	HKY40R

LL TYPE HOLDER

Old Type Tool Number						
Shape	Size	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PCFNR/L PCLNR/L PCBNR/L	**1616H09**	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
	2020K09	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
	2525M09	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
	2020K12	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
	2525M12	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
	2525M16	LLSCN53	LLP15	LLCL25	LLCS508	HKY30R
	3225P16	LLSCN53	LLP15	LLCL25	LLCS508	HKY30R
	4040R19	LLSCN63	LLP16	LLCL16	LLCS310	HKY40R
PDNNR/L	**1XM15**	LLSDN43	LLP14	LLCL24	LLCS308	HKY30R
	2XM15	LLSDN43	LLP14	LLCL24	LLCS308	HKY30R
PTANR/L PTBNR/L PTTNR/L PTGNR/L PTFNR/L	**1010E11**	–	–	LLCL12S	LLCS105	HKY20F
	1212F11	–	–	LLCL12S	LLCS105	HKY20F
	1616H16	LLSTN32	LLP13	LLCL13	LLCS106	HKY25R
	2020K16	LLSTN32	LLP13	LLCL13	LLCS106	HKY25R
	2525M16	LLSTN32	LLP13	LLCL13	LLCS206	HKY25R
	2525M22	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R
	3225P22	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R
	3232P22	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R
	4040R27	LLSTN53	LLP15	LLCL25	LLCS508	HKY30R
PSBNR/L PSSNR/L PSKNR/L	**3225P12**	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
	2525M15	LLSSN53	LLP15	LLCL25	LLCS508	HKY30R
	3232P15	LLSSN53	LLP15	LLCL25	LLCS508	HKY30R
	3232P19	LLSSN63	LLP16	LLCL16	LLCS310	HKY40R
	4040R19	LLSSN63	LLP16	LLCL16	LLCS310	HKY40R
	5050T25	LLSSN84	LLP18	LLCL18	LLCS112	HKY50R
PRGCR/L PRDCN	**2020K10**	LLSRN103	LLP13	LLCL110	LLCS205	HKY20R
	2020K12	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
	3225P12	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
	3225P16	LLSRN164	LLP24	LLCL116	LLCS306	HKY25R
	4040R25	LLSRN256	LLP16	LLCL125	LLCS410	HKY40R
	5050T32	LLSRN326	LLP18	LLCL132	LLCS112	HKY50R

MC TYPE HOLDER

Old Type Tool Number								
Shape	Size	Shim	Shim Pin	Clamp Bridge	Clamp Screw	Breaker Piece	Wrench	Spring
CTANR/L CTGNR/L	**1616**	CT22	BCP201	CK231	LS1	CBT2◌	HKY30R	–
	2020	CT32	BCP301	CK341	LS2	CBT3◌	HKY40R	–
	2525	CT32	BCP301	CK341	LS3	CBT3◌	HKY40R	–
CSTNR/L CSSNR/L	**1616**	CS32	BCP251	CK232	LS1	CBS3◌	HKY30R	–
	2020	CS42	BCP301	CK341	LS2	CBS4◌	HKY40R	–
	2525M43	CS42	BCP301	CK341	LS3	CBS4◌	HKY40R	–
CTAPR/L	**2020**	PT32	BCP201	CK341	LS2	CBT3◌	HKY40R	–
CSBPR/L CSSPR/L CSKPR/L	**1616**	PS31	BCP201	CK232	LS1	CBS3◌	HKY30R	–
	2020	PS42	BCP251	CK342	LS2	CBS4◌	HKY40R	–
CTCPR/L	**2020K16**	BPT322	BCP201	CCTC1	HSC06020	CBT3◌	HKY50R	MES3
	2525M16	BPT322	BCP201	CCTC1	HSC06020	CBT3◌	HKY50R	MES3
CTGPR/L CTFPR/L	**1616**	PT21	BCP141	CK231	LS1	CBT2N	HKY30R	–

REPLACEMENT PARTS FOR OLD TYPE TOOLS

MG TYPE HOLDER

Old Type Tool Number					
Shape	Size	Clamp Bridge	Clamp Screw	Spring	Wrench
MGHR/L	**2020K3333**	MTK1L/R	HBH06020	MES3	HKY40R
	2020K4447	MTK1L/R	HBH06020	MES3	HKY40R
	3232P5660	MTK2L/R	MGS6	MES3	HKY50R
	3232P5670	MTK2L/R	MGS6	MES3	HKY50R
	3232P5680	MTK2L/R	MGS6	MES3	HKY50R

MG2 TYPE HOLDER

Old Type Tool Number					
Shape	Size	Clamp Bridge	Clamp Screw	Spring	Wrench
MG2R/L	**2525M4315**	MTK1R/L	HBH06020	MES3	HKY40R
	2525M4323	MTK1R/L	HBH06020	MES3	HKY40R
	2525M4333	MTK1R/L	HBH06020	MES3	HKY40R

MH TYPE HOLDER

Old Type Tool Number							
Shape	Size	Shim	Shim Pin	Clamp Bridge	Clamp Screw	Stop Ring	Wrench
KKCR/L	**445**	MHS532R/L MHS533R/L MHS534R/L	SFC03010	MHK5NR/L	MHT1	CE8	HKY40R

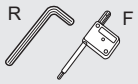
MP TYPE HOLDER

Old Type Tool Number						
Shape	Size	Shim	Lock Pin	Lock Screw	Stop Ring	Wrench
PVVNN PVPNR/L	**3225P16**	PV32◌	P11S	HSP05008C	E03	HKY25R

MT2 TYPE HOLDER

Old Type Tool Number					
Shape	Size	Clamp Bridge	Clamp Screw	Spring	Wrench
MT2R/L	**2525M4**	MTK1L/R	HBH06020	MES3	HKY40R

SET TYPE HOLDER

Old Type Tool Number							
Shape	Size	Clamp Bridge	Clamp Screw	Stop Ring	Shim Pin	Shim	Wrench
SETHR	**1616H16**	SETK51	SETS51	CR4	HFC03008	CT32T1	TKY15F HKY20R
	2020K16	SETK51	SETS51	CR4	HFC03008	CT32T1	TKY15F HKY20R
	2525M16	SETK51	SETS51	CR4	HFC03008	CT32T1	TKY15F HKY20R

SL TYPE HOLDER

Old Type Tool Number							
Shape	Size	Shim	Lock Pin	Nut	Clamp Wedge	Clamp Screw	Wrench
ETJNR/L ETQNR/L	**33K16S**	SLSTN33	SLP13	SLN13	SLCW13	SLCS105	HKY25R HKY40R
	44M16S	SLSTN33	SLP13	SLN13	SLCW13	SLCS105	HKY25R HKY40R
	44M22S	SLSTN43	SLP14	SLN14	SLCW14	SLCS106	HKY30R HKY40R
	54P22S	SLSTN43	SLP14	SLN14	SLCW14	SLCS106	HKY30R HKY40R
ETNNR/L	**64M22S**	SLSTN43	SLP14	SLN14	SLCW14	SLCS106	HKY30R HKY40R
	85M22S	SLSTN43	SLP14	SLN14	SLCW14	SLCS106	HKY30R HKY40R

SP TYPE HOLDER

Old Type Tool Number					
Shape	Size	Clamp Screw	Wrench	Shim	Shim Pin
SDJCR/L SDFCR/L SDXCR/L	**0808D07**	TS25	TKY08F	—	—
	1010E07	TS25	TKY08F	—	—
	1212F07	TS25	TKY08F	—	—
	1616H11	TS43	TKY15F	—	—
SVJCR/L SVVCN SVPCR/L	**0808D11**	TS25	TKY08F	—	—
	1010E11	TS25	TKY08F	—	—
	1212F16	TS43	TKY15F	—	—
	3225P16	TS44	TKY15R	SPSVN32	BCP141
SSBCR/L	**1616H09**	TS43	TKY15F	—	—
SRGCR/L SRXCR/L SRDCN	**0808D06**	TS25	TKY08F	—	—
	1010E06	TS25	TKY08F	—	—
	1212F06	TS25	TKY08F	—	—
	1010E08	TS3	TKY08F	—	—
	1212F08	TS3	TKY08F	—	—

SR TYPE HOLDER

Old Type Tool Number			
Shape	Size	Clamp Screw	Wrench
SRSGR/L	**2525M20**	TS5	TKY25F
SRSGN	**3225P20**	TS5	TKY25F

REPLACEMENT PARTS FOR OLD TYPE TOOLS

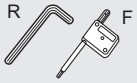
WP TYPE HOLDER (OLD TYPE PRODUCTS)

Old Type Tool Number									
Shape	Size	Shim	Shim Pin	Clamp Bridge	Clamp Screw	Side Lock Plate	Lock Screw	Spring	Wrench
MTJNR/L	**2020K16**	SLSTN33	CCP13	CCK13	SLCS105	CPT13	WPS1	MES2	HKY30R HKY40R
	2525M16	SLSTN33	CCP13	CCK13	SLCS105	CPT13	WPS1	MES2	HKY30R HKY40R
	2525M22	SLSTN43	CCP14	CCK14	SLCS106	CPT14	WPS1	MES3	HKY30R HKY40R
MTNNR/L	**5032M22**	SLSTN43	CCP14	CCK14	SLCS106	CPT14	WPS1	MES3	HKY30R HKY40R
MWLNR/L	**2020K08**	WPSWN43	CCP34	CCK13	SLCS105	CPT24	—	MES2	HKY30R HKY40R
	2525M08								
	3225P08								

WP TYPE HOLDER

Old Type Tool Number							—		
Shape	Size	Shim	Shim Pin	Clamp Bridge	Clamp Screw	Side Lock Plate	Lock Screw	Spring	Wrench
MTENN MTQNR/L	**2020K16N**	WPSTN33	CCP33	CCK13	SLCS105	CPT13	—	MES2	HKY25R HKY40R
	2525M16N	WPSTN33	CCP33	CCK13	SLCS105	CPT13	—	MES2	HKY25R HKY40R
	2525M22N	WPSTN43	CCP34	CCK14	SLCS106	CPT14	—	MES3	HKY30R HKY40R
MTNNR/L	**5032M22N**	WPSTN43	CCP34	CCK14	SLCS106	CPT14	—	MES3	HKY30TL HKY40R

AL TYPE HOLDER

Old Type Tool Number						
Shape	Size	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
PTGER/L PTFER/L	**2020K16**	LLSTE32	LLP13	LLCL131	LLCS106	HKY25R
	2525M16	LLSTE32	LLP13	LLCL131	LLCS106	HKY25R
SVVDN SVPDR/L	**1616H16**	—	—	—	FC400890T	TKY10F
	2020K16	—	—	—	FC400890T	TKY10F
	2525M16	—	—	—	FC400890T	TKY10F

GROOVING/CUTTING OFF

DG TYPE HOLDER

Old Type Tool Number					
	Clamp Bridge	Locator Screw	Wrench	Clamp Screw	Spring
DGHR/L 1616K2G	DGK2R/L	—	HKY40R	DGS51	MES2
DGHR/L 1616K3	DGK3R/L	—	HKY40R	DGS51	MES2
DGHR/L 1616K3G	DGK3R/L	—	HKY40R	DGS51	MES2
DGHR/L 1616KF3	DGK3R/L	—	HKY40R	DGS51	MES2
DGHR/L 2020K	—	HSC04014	HKY30R HKY40R	DGS51	MES2
DGHR/L 2020KFS	—	HSC04014	HKY30R HKY40R	DGS51	MES2
DGHR/L 2020KL	—	HSC04014	HKY30R HKY40R	DGS51	MES2
DGHR/L 2020KLS	—	HSC04014	HKY30R HKY40R	DGS51	MES2
DGHR/L 2020KS	—	HSC04014	HKY30R HKY40R	DGS51	MES2
DGHR/L 2525M	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525MC	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525MCS	—	HSC05010	HKY40R	DGS51	MES2
DGHR/L 2525MF	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525MFS	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525ML	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525MLS	—	HSC05012	HKY40R	DGS51	MES2
DGHR/L 2525MS	—	HSC05012	HKY40R	DGS51	MES2

HSK-T TOOLS (DG)

Old Type Tool Number				
	Locator Screw	Clamp Screw	Spring	Wrench
H63TH-DGHR/LS	HSC05012	DGS51	MES2	HKY40R
H63TH-DGHR/L	HSC05012	DGS51	MES2	HKY40R
H63TH-DGHN-H4	HSC05010	DGS51	MES2	HKY40R
H63TH-DGHN-H5	HSC05012	DGS51	MES2	HKY40R
H63TH-DGHN-H6	HSC05012	DGS51	MES2	HKY40R
H63TH-DGHN-L4	HSC05010	DGS51	MES2	HKY40R
H63TH-DGHN-L5	HSC05012	DGS51	MES2	HKY40R
H63TH-DGHN-L6	HSC05012	DGS51	MES2	HKY40R

UG HOLDER (BLADE TYPE)

Old Type Tool Number	
	Wrench
UGHN262	UGS1
UGHN263	UGS1
UGHN264	UGS1
UGHN265	UGS1
UGHN322	UGS1
UGHN323	UGS1
UGHN324	UGS1
UGHN325	UGS1

UG HOLDER (CORNER SHANK)

Old Type Tool Number	
	Wrench
UGHR/L1616H2	UGS1
UGHR/L1616H3	UGS1
UGHR/L2020K2A	UGS1
UGHR/L2020K2	UGS1
UGHR/L2020K3A	UGS1
UGHR/L2020K3	UGS1
UGHR/L2525M3	UGS1
UGHR/L2525M4	UGS1

TOOL BLOCK FOR UG HOLDER

Old Type Tool Number	Block			Shank	
					
	Clamp Bridge	Clamp Screw	Wrench	Set Bolt	Wrench
KGBN26-20	KGC1	LST15T	TKY25R	HSC08016	HKY60R
KGBN26-25	KGC1	LST15T	TKY25R	HSC08016	HKY60R
KGBN32-20	KGC1	LST15T	TKY25R	HSC08016	HKY60R
KGBN32-25	KGC1	LST15T	TKY25R	HSC08016	HKY60R

REPLACEMENT PARTS FOR OLD TYPE TOOLS

BORING BARS

COBRA (STEEL SHANK)

Old Type Tool Number		
	Clamp Screw	Wrench
S08HSTFPR09	TS253	TKY08F
S10KSTFPR09	TS25	TKY08F
S○○○STFPR11	TS3	TKY08F
S○○○STFPR16	TS4	TKY15F
S○○○SCLPR/L08	TS3	TKY08F
S○○○SCLPR/L09	TS4	TKY15F
S○○○SWLPR/L04	TS25	TKY08F
S○○○SWLPR/L06	TS4	TKY15F

COBRA (CARBIDE SHANK)

Old Type Tool Number		
	Clamp Screw	Wrench
E08KSTFPR09	TS253	TKY08F
E10MSTFPR09	TS25	TKY08F
E○○○STFPR11	TS3	TKY08F
E○○○SCLPR08	TS3	TKY08F
E○○○SCLPR09	TS4	TKY15F

D TYPE (FOR BORING)

Old Type Tool Number									
Shape	Size	Shim	Shim Pin	Clamp Lever	Clamp Screw	Clamp Set	Breaker Piece	Stop Ring	Wrench
DPSK	**132R/L**	LLSSN42	LLP14	LLCL14	LLCS108	—	—	—	HKY30R
	140R/L	LLSSN42	LLP14	LLCL14	LLCS108	—	—	—	HKY30R
	150R/L	LLSSN63	LLP16	LLCL16	LLCS110	—	—	—	HKY40R
	163R/L	LLSSN63	LLP16	LLCL16	LLCS110	—	—	—	HKY40R
DPTF	**150R/L**	LLSTN42	LLP14	LLCL14	LLCS108	—	—	—	HKY30R
	163R/L	LLSTN42	LLP14	LLCL14	LLCS108	—	—	—	HKY30R
DPDU	**132R/L**	LLSDN42	LLP14	LLCL24	LLCS108	—	—	—	HKY30R
DPDH	**140R/L**	LLSDN42	LLP14	LLCL24	LLCS108	—	—	—	HKY30R
DPDZ	* **150R/L**	LLSDN53	LLP15	LLCL15	LLCS208	—	—	—	HKY30R
DPCL	**150R/L**	LLSCN63	LLP16	LLCL16	LLCS110	—	—	—	HKY40R
	163R/L	LLSCN63	LLP16	LLCL16	LLCS110	—	—	—	HKY40R
DPVP	**150R/L**	PV322	P11S	—	HSP05008C	—	—	E03	HKY25R
DCTU	**132R/L**	PT32	BCP201	—	—	C4	CBT3N	—	HKY30R
	140R/L	PT42	BCP251	—	—	C5	CBT4F	—	HKY40R
	150R/L	PT42	BCP251	—	—	C5	CBT4F	—	HKY40R

*DPDH150R/L can be compatible with 140R/L.

D TYPE (FOR GROOVING AND THREADING)

Old Type Tool Number					
Shape	Size	Lock Pin	Lock Screw	Stop Ring	Wrench
DPT2	**132R**	P21S	HSP08014	E01	HKY40R
	140R	P21S	HSP08014	E01	HKY40R
DPT4	**132R**	P21S	HSP08014	E01	HKY40R
	140R	P21S	HSP08014	E01	HKY40R

F TYPE

Old Type Tool Number						
Shape	Size	Shim	Shim Pin	Clamp Set	Breaker Piece	Wrench
FCSK	116R/L	–	–	C3	CBS3	HKY25R
	120R/L	–	–	C3	CBS3	HKY25R
	125R/L	PS42	BCP252	C4	CBS4F	HKY30R
	132R/L	PS42	BCP251	C4	CBS4F	HKY30R
FCSK	216R/L	–	–	C3	CBS3	HKY25R
	220R/L	–	–	C3	CBS3	HKY25R
	225R/L	PS42	BCP252	C4	CBS4F	HKY30R
FCTU	232R/L	PT32	BCP201	C4	CBT3F	HKY30R

F TYPE (FOR GROOVING AND THREADING)

Old Type Tool Number								
Shape	Size	Clamp Bridge	Clamp Set	Clamp Screw	Shim	Shim Pin	Stop Ring	Wrench
FCL5	116R/L	LK1	–	HBH04012	–	–	–	HKY25R
	120R/L	LK1	–	HBH04012	–	–	–	HKY25R
	125R/L	LK1	–	HBH04012	–	–	–	HKY25R
	132R/L	LK1	–	HBH04012	–	–	–	HKY25R
	216R/L	LK1	–	HBH04012	–	–	–	HKY25R
	220R/L	LK1	–	HBH04012	–	–	–	HKY25R
	225R/L	LK1	–	HBH04012	–	–	–	HKY25R
NTF	M16R	–	C3	–	–	–	–	HKY25R
	Q20R	–	C4	–	–	–	–	HKY30R
	R25R	–	C4	–	–	–	–	HKY30R
	R216R	–	C3	–	–	–	–	HKY25R
	S220R	–	C4	–	–	–	–	HKY30R
	T225R	–	C4	–	–	–	–	HKY30R
SNTF	K16R11	–	–	TS25	–	–	–	TKY08F
	M16R	–	–	CS350860T	–	–	–	TKY15F
	P20R	SETK51	–	SETS51	CT32T1	HFC03008	CR4	TKY15F HKY20R
	R25R	SETK51	–	SETS51	CT32T1	HFC03008	CR4	TKY15F HKY20R
	M210R11	–	–	TS25	–	–	–	TKY08F
	Q212R11	–	–	TS25	–	–	–	TKY08F
	R216R	–	–	CS350860T	–	–	–	TKY15F
	S220R	SETK51	–	SETS51	CT32T1	HFC03008	CR4	TKY15F
	T225R	SETK51	–	SETS51	CT32T1	HFC03008	CR4	TKY15F
FCDG4	120R/L3M	–	BC5	–	–	–	–	TKY20R
	125R/L3M	–	BC5	–	–	–	–	TKY20R
	132R/L3M	–	BC5	–	–	–	–	TKY20R
	120R/L4M	–	BC5	–	–	–	–	TKY20R
	125R/L4M	–	BC5	–	–	–	–	TKY20R
	132R/L4M	–	BC5	–	–	–	–	TKY20R
	125R/L5M	–	BC5	–	–	–	–	TKY20R
	132R/L5M	–	BC5	–	–	–	–	TKY20R
FCDG4	120R/L4J	–	BC5	–	–	–	–	TKY20R
	125R/L4J	–	BC5	–	–	–	–	TKY20R
	132R/L4J	–	BC5	–	–	–	–	TKY20R
	125R/L5J	–	BC5	–	–	–	–	TKY20R
	132R/L5J	–	BC5	–	–	–	–	TKY20R

REPLACEMENT PARTS FOR OLD TYPE TOOLS

M TYPE

Old Type Tool Number								
	Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw	Wrench	Plug
A25RMWLNR/L08	—	—	CCK13	CPT24	MES2	SLCS105	HKY25R HKY40R	HGM-PT1/4
A32SMWLNR/L08	WPSWC43	CCP44	CCK13	CPT24	MES2	SLCS105	HKY25R HKY40R	HGM-PT3/8
A40TMWLNR/L08	WPSWC43	CCP44	CCK13	CPT24	MES2	SLCS105	HKY25R HKY40R	HGM-PT3/8

P TYPE

Old Type Tool Number						
	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug
A50UPSKNR/L19	LLSSP63	LLP16	LLCL16	LLCS310	HKY40R	HGM-PT3/8
A40TPCLNR/L16	LLSCN53	LLP15	LLCL25	LLCS508	HKY30R	HGM-PT3/8
A50UPCLNR/L19	LLSCP63	LLP16	LLCL16	LLCS310	HKY40R	HGM-PT3/8

S TYPE (CARBIDE SHANK)

Old Type Tool Number		
	Clamp Screw	Wrench
C○○○SSKCR/L09	TS4	TKY15F
C○○○SDUCR/L15	TS5	TKY25F
C○○○SVUCR/L11	TS25	TKY08F
C○○○SVUCR/L16	TS4	TKY15F
C○○○SCLCR/L12	TS5	TKY25F
C○○○SCZCR/L06	TS25	TKY08F
C○○○SCZCR/L09	TS4	TKY15F
C○○○SCZCR/L12	TS5	TKY25F
C○○○SDZCR11	TS4	TKY15F

S TYPE (STEEL SHANK)

Old Type Tool Number		
	Clamp Screw	Wrench
S○○○SSKCR/L12	TS5	TKY25F
S○○○SDQCR/L15	TS5	TKY25F
S○○○SCZCR/L06	TS25	TKY08F
S○○○SCZCR/L09	TS4	TKY15F
S○○○SCZCR/L12	TS5	TKY25F
S○○○SDZCR11	TS4	TKY15F

ARBOR FOR D-TYPE BORING BAR

Old Type Tool Number		
	Set Bolt	Wrench
B14550	SD50	HKY80R
B15050	SD50	HKY80R
B15563	SD63	HKY80R
B16363	SD63	HKY80R
B16563	SD63	HKY80R

BORING UNITS

UNIT

Old Type Tool Number				Bush	Washer	Leaf Spring
	Washer Screw	Bush Screw	Wrench			
NA1	HFC03008	HY-A1	HKY20R	The parts above are not sold separately as accuracy can only be guaranteed by having the complete set. Please contact us for questions about parts replacement.		
NV1	HFC03008	HY-V1	HKY20R			
NA2	HSC03010	HY2	HKY20R HKY25R			
NV2	HSC03010	HY2	HS-N2 HKY25R			
NA3	HSC04010	HY3	HKY20R HKY30R			
NV3	HSC04010	HY3	HKY20R HKY30R			
NA4	HSC05012	HY4	HKY30R HKY40R			
NV4	HSC05012	HY4	HKY30R HKY40R			

CARTRIDGE

Old Type Tool Number						
	Clamp Lever	Clamp Screw	Shim	Shim Pin	Spanner	Wrench
NASP11	—	CS250T	—	—	HR12	TKY08F
NVSP11	—	CS250T	—	—	HR12	TKY08F
NASP21	—	CS300890T	—	—	HR12	TKY08F
NVSP21	—	CS300890T	—	—	HR12	TKY08F
NAPN21	LLCL12S	LLCS103	—	—	HR12	HKY20F
NVPN21	LLCL12S	LLCS103	—	—	HR12	HKY20F
NASP31	—	CS300890T	—	—	HR34	TKY08F
NVSP31	—	CS300890T	—	—	HR34	TKY08F
NAPN31	LLCL12S	LLCS103	—	—	HR34	HKY20F
NVPN31	LLCL12S	LLCS103	—	—	HR34	HKY20F
NAPN41	LLCL13	LLCS106	LLSTN32	LLP13	HR34	HKY25F
NVPN41	LLCL13	LLCS106	LLSTN32	LLP13	HR34	HKY25F

REPLACEMENT PARTS FOR OLD TYPE TOOLS

CARTRIDGE

MK CARTRIDGE- NEGATIVE TYPE

Old Type Tool Number		CS CT		CBS CBT								
Shape	Size	Shim	Shim Pin	Chip Breaker			Clamp Bridge	Clamp Screw	Radial Screw	Axial Screw	Set Bolt	Wrench
				Roughing	General	Finishing						
K11R/L K12R/L K14R/L	33	CS42	BCP301	CBS4	CBS4N	CBS4F	CK341	LS2	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	CS62	BCP401	CBS6	CBS6N	CBS6F	CK342	LS3	HSS08016	KS2	KS14	HKY30R/40R/50R
K13R/L	33	CS42	BCP301	—	CBS4N	—	CK341	LS6(LS7)	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	CS62	BCP401	—	CBS6N	—	CK342	LS2	HSS08016	KS2	KS14	HKY30R/40R/50R
K21R/L K22R/L K23R/L K24R/L	33	CT32	BCP301	CBT3	CBT3N	CBT3F	CK341	LS2	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	CT42	BCP401	CBT4	CBT4N	CBT4F	CK341/2∗1	LS3	HSS08016	KS2	KS14	HKY30R/40R/50R

∗1 Use CK341 for K23R/L44 and K24R/L44.

MK CARTRIDGE- POSITIVE TYPE

Old Type Tool Number		PS PT		CBS CBT								
Shape	Size	Shim	Shim Pin	Chip Breaker			Clamp Bridge	Clamp Screw	Radial Screw	Axial Screw	Set Bolt	Wrench
				Roughing	General	Finishing						
H11R/L H12R/L H14R/L	00	—	—	—	CBS3	—	CK232	LS4	HSS04008	KS1	KS11	HKY20R/30R
	11	—	—	—	CBS3	—	CK232	LS4(LS5)	HSS06008	KS2	KS12	HKY30R/40R
	22	—	—	CBS4	CBS4N	CBS4F	CK341	LS6	HSS08012	KS2	KS13	HKY30R/40R
	33	PS42	BCP251	CBS4	CBS4N	CBS4F	CK341	LS6(LS7)	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	PS62	BCP301	CBS6	CBS6N	CBS6F	CK342	LS2	HSS08016	KS2	KS14	HKY30R/40R/50R
H13R/L	00	—	—	—	CBS3D	—	CK232	LS4	HSS04008	KS1	KS11	HKY20R/30R
	11	—	—	—	CBS3D	—	CK232	LS4(LS5)	HSS06008	KS2	KS12	HKY30R/40R
	22	—	—	—	CBS4D	—	CK341	LS6	HSS08012	KS2	KS13	HKY30R/40R
	33	PS42	BCP251	—	CBS4D	—	CK341	LS6(LS7)	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	PS62	BCP301	—	CBS6D	—	CK342	LS2	HSS08016	KS2	KS14	HKY30R/40R/50R
H21R/L H22R/L H23R/L H24R/L	00	—	—	CBT2	CBT2N	—	CK231	LS4	HSS04008	KS1	KS11	HKY20R/30R
	11	—	—	CBT2	CBT2N	—	CK231	LS4(LS5)	HSS06008	KS2	KS12	HKY30R/40R
	22	—	—	CBT3	CBT3N	CBT3F	CK341	LS6	HSS08012	KS2	KS13	HKY30R/40R
	33	—	—	CBT3	CBT3N	CBT3F	CK341	LS6(LS7)	HSS08012	KS2	KS14	HKY30R/40R/50R
	44	—	—	CBT4	CBT4N	CBT4F	CK341/2∗1	LS2	HSS08016	KS2	KS14	HKY30R/40R/50R

∗1 Use CK341 for H24R/L

LL TYPE CARTRIDGE

Old Type Tool Number									
Shape	Size	Shim	Shim Pin	Clamp Lever	Clamp Screw	Radial Screw	Axial Screw	Set Bolt	Wrench
PSYNR/L PSKNR/L PSSNR/L	20CA15	LLSSN53	LLP15	LLCL25	LLCS508S	LLR2	KS2	HSC08030	HKY30R

SS TYPE CARTRIDGE

Old Type Tool Number						
Shape	Size	Clamp Screw	Radial Screw	Axial Screw	Set Bolt	Wrench
SSYP	13R/L	S4	HSS05006	KS1	HSC06014	HKY25F
SSKP	17R/L	S5	HSS06006	KS3	HSC06014	HKY30F
SSSP	15R/L	S4	HSS05006	KS1	HSC06014	HKY25F
SSTP	22R/L	S5	HSS06006	KS2	HSC08020	HKY30F
STGP STFP STSP STTP	13R/L	S3	HSS04006	KS1	HSC06014	HKY25F
	17R/L	S4	HSS05006	KS1	HSC06014	HKY25F

FACE MILLS

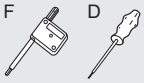
AF5000 TYPE

Old Type Tool Number						Recommended Cutter
	Wedge	Clamp Screw	Adjust Screw	Wrench	Wrench	
AF5000 Type	CWAF5R/L	LS10T	KS1S	TKY25T	HKY15R	**NF10000**(➔L096)

BAP300 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
BAP300 Type	TS25	TKY08F	**APX3000**(➔L136)

BAP400 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
BAP400-040A04R	TS43	TKY15F	**APX4000**(➔L146)
BAP400-050A05R	TS43	TKY15F	
BAP400-063A06R	TS43	TKY15F	
BAP400R0307C	TS43	TKY15F	
BAP400R0408D	TS43	TKY15F	
BAP400R0509E	TS43	TKY15D	
BAP400R0610E	TS43	TKY15D	

BF407 TYPE

Old Type Tool Number					Recommended Cutter
	Wedge	Clamp Screw	Setting Screw	Wrench	
BF407R0812K	CWSF407TR2	LS15T	CAS51T	TKY25T	**FMAX**(➔L089)
BF407R1016K	CWSF407TR2	LS15T	CAS51T	TKY25T	
BF407R1218P	CWSF407TR2	LS15T	CAS51T	TKY25T	

BN425 TYPE

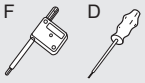
Old Type Tool Number				Recommended Cutter
	Wedge	Clamp Screw	Wrench	
BN425 Type	CWS43SNN	LS14T	TKY25T	**WSX445**(➔L040)

BOE TYPE

Old Type Tool Number						Recommended Cutter
	Set Bolt	Set Bolt	Clamp Screw	Wrench (Insert)	Wrench (Set Bolt)	
BOER0202B	LS21	—	CS501290T	TKY25T	HKY50R	**OCTACUT**(➔L258)
BOE-050A02R	LS20	—	CS501290T	TKY25T	HKY50R	
BOER2H03B	—	BOES101	CS501290T	TKY25T	HKY80R	
BOE-063A03R	—	BOES101	CS501290T	TKY25T	HKY80R	
BOER0304C	—	—	CS501290T	TKY25T	—	
BOER0405D	—	HSC16035	CS501290T	TKY25T	—	

REPLACEMENT PARTS FOR OLD TYPE TOOLS

BSX400 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
BSX400R05004A	TS43	TKY15F	**WWX400**(➲L100)
BSX400R06305A	TS43	TKY15F	
BSX400R08006C	TS43	TKY15F	
BSX400R10008D	TS43	TKY15F	
BSX400R12510E	TS43	TKY15D	
BSX400R16012E	TS43	TKY15D	

BSX500 TYPE

Old Type Tool Number					Recommended Cutter
	Clamp Screw	Shim Screw	Shim	Wrench	
BSX500 Type	CSF401260T	WCS604010H	STBS500N	TKY20D	**WWX400**(➲L100)

BXD7000 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
BXD7000 Type	TS5SL	TKY25D	**AXD7000**(➲L208)

BZC400 TYPE

Old Type Tool Number					Recommended Cutter
	Clamp Screw	Set Bolt	Wrench (Insert)	Wrench (Set Bolt)	
BZC400-032A03R	CS350990T	LS24	TKY10F	HKY40R	**WWX400**(➲L100)
BZC400-040A04R	CS350990T	—	TKY10F	—	
BZC400R0408D	CS350990T	—	TKY10F	—	

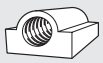
E404 TYPE

Old Type Tool Number									Recommended Cutter
	Locator	Locator Screw	Shim	Shim Screw	Wedge	Clamp Screw (Wedge)	Wrench	Wrench	
E404 Type	SSE41R	SPS1	SCD43	STS1	CWS3R/L	WS1	TKY10R	TKY25T	**FMAX**(➲L089)

FBP415 TYPE

Old Type Tool Number							Recommended Cutter
	Shim	Wedge-T	Clamp Screw	Shim Screw	Wrench (Insert)	Wrench (Shim)	
FBP415R0308C	STSP415R	CWSP415TR	LS10T	TS32	TKY25T	TKY08F	**WSF406**(➲L084)
FBP415R0410D							
FBP415R0514E							
FBP415R0618F							
FBP415R0822K							
FBP415R1028K							
FBP415R1234P							

FN548 TYPE

Old Type Tool Number				Wrench	Hexagonal Head	Recommended Cutter
	Wedge	Clamp Screw	Wrench			
FN548 Type	CWS4	LS14	HKY40T	120QSPK x 80 (KANNON-SEIKI CO.)	6.35□ x 4 (KYOKUTO MFG CO.)	–

LSE445 TYPE

Old Type Tool Number							Recommended Cutter
	Shim	Shim Screw	Wedge	Clamp Screw	Wrench (Insert)	Wrench (Shim)	
LSE445 Type	STBE445NF	CS300890T	CWSE445TR	LS15T	TKY25T	TKY08F	**WSX445**(➔L040)

MG300, 400 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
MG300 Type	CS350990T	TKY10F	–
MG400 Type	CS451190T	TKY20F	**WWX400**(➔L100)

MG345, 445 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
MG345 Type	CS350990T	TKY10F	**WSX445**(➔L040)
MG445 Type	CS451190T	TKY20F	

MGP445 TYPE

Old Type Tool Number			Recommended Cutter
	Clamp Screw	Wrench	
MGP445 Type	CS401160T	TKY15D	**WSX445**(➔L040)

MSD445 TYPE

Old Type Tool Number				Recommended Cutter
	Wedge	Clamp Screw	Wrench	
MSD445 Type	CWMSE445R2	LS15T	TKY25T	**WSX445**(➔L040)

MSE445 TYPE

Old Type Tool Number				Recommended Cutter
	Wedge	Clamp Screw	Wrench	
MSE445 Type	CWMSE445R2	LS15T	TKY25T	**WSX445**(➔L040)

NR10000 TYPE

Old Type Tool Number							Recommended Cutter
	Wedge	Clamp Screw	Adjusting Wedge	Adjusting Screw	Clamp Screw	Wrench	
NR10000 Type	CWAF10R2	LS10T	CWAF10N	LS15T	CSAF10	TKY25T	–

REPLACEMENT PARTS FOR OLD TYPE TOOLS

NSE300 TYPE

Old Type Tool Number	 Locator	 Wedge-T	 * Clamp Screw	 Locator Screw	 Wrench (Insert)	 Wrench (Locator)	 Set Bolt	Recommended Cutter
NSE300-050A04R **NSE300-063A05R**	SPTSE300R	CWTSE300TR	LS19T	TS32	TKY15T	TKY08F	–	**WWX400**(➲L100)
NSE300R0408D							HSC16035	
NSE300R0306C **NSE300R0510E** **NSE300R0612F**		CWNSE300TR	LS10T		TKY25T		–	
NSE300R504S32 **NSE300R635S32**		CWTSE300TR	LS19T		TKY15T			

* Clamp Torque (N • m) : LS10T=8.5, LS19T=5.0, TS32=1.0

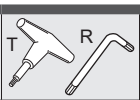
NSE400 TYPE

Old Type Tool Number	 Locator	 Wedge-T	 Clamp Screw	 Locator Screw	 Wrench (Insert)	 Wrench (Locator)	 Set Bolt	Recommended Cutter
NSE400R0306C	SPTSE400R	CWSE300TR	LS10TS	TS32	TKY25T	TKY08F	–	**WWX400**(➲L100)
NSE400R0407D							HSC16035	
NSE400R0508E **NSE400R0610F** **NSE400R503S32** **NSE400R634S32**							–	

P425, P525 TYPE

Old Type Tool Number	 Locator	 Locator Screw	 Shim	 Shim Screw	 Wedge	 Clamp Screw (Wedge)	 Wrench	 Wrench	Recommended Cutter
P425 Type	SSP41R	SPS1	SCP431R/L	STS1	CWS1R/L	WS1	TKY10R	TKY25T	**WSX445**(➲L040)
P525 Type	SSP51R	SPS1	SCP521R/L	STS1	CWS1R/L	WS1	TKY10R	TKY25T	

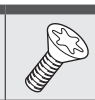
QBF407 TYPE

Old Type Tool Number	 Wedge	 Clamp Screw	 Setting Screw	 Guide Plate	 Stop Screw	 Wrench	Recommended Cutter
QBF407R0304Q	CWSF407TR1	LS15T	CAS51T	QPAR1	TFC04010	TKY20R TKY25T	–
QBF407R0406Q	CWSF407TR1	LS15T	CAS51T	QPAR1	TFC04010	TKY20R TKY25T	
QBF407R0508Q	CWSF407TR2	LS15T	CAS51T	QPAR1	TFC04010	TKY20R TKY25T	

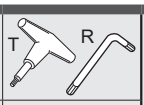
QBP415 TYPE

Old Type Tool Number	 Shim	 Shim Screw	 Wedge-T	 Clamp Screw	 Wrench	Recommended Cutter
QBP415 Type	STSP415R	TS32	QWGR1	LS10T	TKY25T	–

QF10000 TYPE

Old Type Tool Number	 Wedge	 Clamp Screw	 Guide Plate	 Stop Screw	 Adjusting Wedge	 Adjusting Screw	 Clamp Screw	Wrench	Recommended Cutter
QF10000 Type	CWAF10R3	LS15T	QPCR1	TFC04010	CWAF10N	LS10T	CSAF10	TKY20T TKY25T	–

QSE415 TYPE

Old Type Tool Number							Recommended Cutter
	Wedge	Clamp Screw	Setting Screw	Guide Plate	Stop Screw	Wrench	
QSE415 Type	CWSF407TR3	LS15T	CAS51T	QPAR1	TFC04010	TKY20R TKY25T	—

SE300 TYPE

Old Type Tool Number								Recommended Cutter
	Locator	Locator (Wiper)	Wedge-T	Wedge-S	Wedge-S (Wiper)	Clamp Screw	Wrench	
SE300 Type	SPSE300R	SPSEW300R	CWNSE300TR	CWSE300SN	CWSEW300SN	LS10T	TKY25T	**WWX400**(➲L100)

SE400 TYPE

Old Type Tool Number							Recommended Cutter
	Locator	Locator (Wiper)	Wedge-T	Wedge-S	Clamp Screw	Wrench	
SE400 Type	SPSE400R	SPSEW400R	CWSE400TN	CWSE400SN	LS15T (SE400R0304C:LS10T)	TKY25T	**WWX400**(➲L100)

SE415 TYPE

Old Type Tool Number					 *			Recommended Cutter
	Locator	Shim	Wedge-T	Wedge-S	Clamp Screw	Wrench	Set Bolt	
SE415R0304C **SE415R0306C**	SPSE415R	STSE415R	CWSE445TR	CWSE445SN	LS15T	TKY25T	HSC12035	—
SE415R0405D **SE415R0407D**							HSC16035	
SE415R0506E **I** **SE415R0611F**							—	

* Clamp Torque (N • m) : LS15T=8.5

SE515 TYPE

Old Type Tool Number					 *			Recommended Cutter
	Locator	Shim	Wedge-T	Wedge-S	Clamp Screw	Wrench	Set Bolt	
SE515R0405D **0407D**	SPSE515R	STSE515R	CWSE545TR	CWSE545SN	LS15T	TKY25T	HSC16035	—
SE515R0506E **I** **SE515R0611F**							—	

* Clamp Torque (N • m) : LS15T=8.0

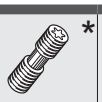
SE445 TYPE

Old Type Tool Number					 *			Recommended Cutter
	Locator	Shim	Wedge-T	Wedge-S	Clamp Screw	Wrench	Set Bolt	
SE445R/L03○○C	SPSE445R/L	STSE445R/L	CWSE445TR/L	CWSE445SN	LS15T	TKY25T	HSC12035	**WSX445**(➲L040)
SE445R/L04○○D							HSC16035	
SE445R/L0506E **I** **SE445R/L1214P**							—	

* Clamp Torque (N • m) : LS15T=8.5

REPLACEMENT PARTS FOR OLD TYPE TOOLS

SE545 TYPE

Old Type Tool Number	 Locator	 Shim	 Wedge-T	 Wedge-S	 * Clamp Screw	 Wrench	 Set Bolt	Recommended Cutter
SE545R0405D	SPSE545R	STSE545R	CWSE545TR	CWSE545SN	LS15T	TKY25T	HSC16035	**WSX445**(➲L040)
SE545R0506E ~ **SE545R1012K**							–	

* Clamp Torque (N • m) : LS15T=8.5

SG20 TYPE

Old Type Tool Number	 Locator	 Wedge-T	 Wedge-S	 * Clamp Screw	 Wrench	 Set Bolt	Recommended Cutter
SG20R0304C	SPSG20R	CWSG20TR	CWSG20SN	LS15T	TKY25T	–	–
SG20R0405D						HSC16035	
SG20R0506E ~ **SG20R0608F**						–	

* Clamp Torque (N • m) : LS15T=8.0

SHP400 TYPE

Old Type Tool Number	 Wedge-T	 Clamp Screw	 Locator Screw	 Wrench (Insert)	 Wrench (Locator)	Recommended Cutter
SHP400 Type	CWSE300TR/L	LS10T	TS32	TKY25T	TKY08F	**WWX400**(➲L100)

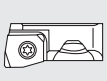
VIP400 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Cutter
VIP400 Type	CS501160T	TKY20F	**WWX400**(➲L100)

VIP445 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Cutter
VIP445 Type	CS501160T	TKY20F	**WSX445**(➲L040)

V10000 TYPE

Old Type Tool Number	 Cartridge	 * Cartridge Clamp Screw-A	 * Cartridge Clamp Screw-B	 * Insert Clamp Screw	 Run-out Adjust Screw	 Wrench	 Wrench	Recommended Cutter
V10000-063A04R ~ **V10000R0508E**	VCT13R	HBH06016	HBH04008	CS350790T	KS1	HKY25R HKY40R	TKY10R	**FMAX**(➲L089)

* Clamp Torque (N • m) : CS350790T=3.5, HBH06016=8.0, HBH04008=4.0

INDEXABLE TYPE END MILLS

BAE TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BAE500R161S16	TS42	TKY15F	**APX4000**(➲L146)
BAE500R201S20	TS42	TKY15F	
BAE500R252S25	TS42	TKY15F	
BAE500R323S32	TS4	TKY15F	
BAE500R403S32	TS4	TKY15F	
BAE500R504S32	TS4	TKY15F	
BAE600 Type	TS52	TKY25F	—

BAP300 TYPE (UNDERCUT) END MILL, BAP300 TYPE END MILL (FOR DEEP CUTTING)

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BAP300 End Mill	TS25	TKY08F	—

BAP400 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BAP400R252S25	TS4	TKY15F	**APX4000**(➲L146)
BAP400R323S32	TS43	TKY15F	
BAP400R404S32	TS43	TKY15F	
BAP400R505S32	TS43	TKY15F	
BAP400R636S32	TS43	TKY15F	

BAP400 (Long Cutting Edge Type) TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BAP400 (Long Cutting Edge Type)	TS43	TKY15F	**APX4000**(➲L146)

BAP3500 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BAP3500R161SA16○○	TS3	TKY08F	**APX3000**(➲L136)
BAP3500R161SN16○○	TS3	TKY08F	
BAP3500R202SA20○○	TS32	TKY08F	
BAP3500R202SN20○○	TS32	TKY08F	
BAP3500R253SA25○○	TS32	TKY08F	
BAP3500R253SN25○○	TS32	TKY08F	
BAP3500R324SA32○○	TS32	TKY08F	
BAP3500R324SN32○○	TS32	TKY08F	
BAP3500R405SA32○○	TS32	TKY08F	
BAP3500R405SN32○○	TS32	TKY08F	

REPLACEMENT PARTS FOR OLD TYPE TOOLS

BOE TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BOE Type	CS501290T	TKY25T	**OCTACUT**(➲L258)

BRE TYPE

Old Type Tool Number	 Clamp Screw	 Clamp Bridge	 Clamp Screw (Bridge)	 Spring	 Wrench	Recommended End Mill
BRE Type	TS5S	AMS5	BRS105	ASS3	TKY25R	**BRP**(➲L274)

BSP TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BSPR Type	CS451190T	TKY20F	—

BSX300 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BSX300 Type	TS32	TKY08F	**WWX400**(➲L103)

BSX400 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BSX400 Type	TS43	TKY15F	**WWX400**(➲L103)

BSX500 TYPE

Old Type Tool Number	 Clamp Screw	 Shim Screw	 Shim	 Wrench	Recommended End Mill
BSX500 Type	CSF401260T	WCS604010H	STBS500N	TKY20D	**WWX400**(➲L103)

BXD7000 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BXD7000R251SA25SA/B	TS5S	TKY25D	**AXD7000**(➲L208)
BXD7000R321SA32SA/B	TS5S	TKY25D	
BXD7000R402SA42SA/B	TS5SL	TKY25D	

BZC400 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
BZC400 Type	CS350990T	TKY10F	**APX4000**(➲L146)

CV TYPE

Old Type Tool Number						Recommended End Mill
	Clamp Screw	Clamp Bridge	Clamp Screw (Bridge)	Spring	Wrench	
CV10R253S32	TS4	AMS3	BRS103	ASS2	TKY15R	**BRP**(➲L274)
CV12R323S32	TS4	AMS3	BRS103	ASS2	TKY15R	
CV16R403S32	TS5	AMS5	BRS105	ASS3	TKY25R	

CV20 TYPE

Old Type Tool Number				Recommended End Mill
	Clamp Screw	Wedge	Wrench	
CV20R403S32	LS14T	CWCV20	TKY25T	—

DCSD, DCSN TYPE

Old Type Tool Number							Recommended End Mill
	Shim Screw	Clamp Screw	Shim Screw	Clamp Screw	Wrench	Wrench	
DCSDR2040SS	—	HS4S	—	DKS4	HKY30R	HKY25T	**SPX**(➲L283)
DCSDR2050SS	—	HS4S	—	DKS4	HKY30R	HKY25T	
DCSDR2063SN	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSDR2063LN	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSDR2080SN	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSDR2100SN	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSNR2063SN	JSS7	TS5L (HS5L)	JSS7	DKS5	HKY40R	TKY25T	
DCSNR2063LN	JSS7	TS5L (HS5L)	JSS7	DKS5	HKY40R	TKY25T	
DCSDR2040SB	—	HS4S	—	DKS4	HKY30R	HKY25T	
DCSDR2050SB	—	HS4S	—	DKS4	HKY30R	HKY25T	
DCSDR2063SB	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSDR2063LN	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSNR2063SB	JSS7	TS5L (HS5L)	JSS7	DKS5	HKY40R	TKY25T	
DCSDR2080SA	—	TS5S (HS5S)	—	DKS5	HKY40R	TKY25T	
DCSNR2080SA	JSS7	TS5L (HS5L)	JSS7	DKS5	HKY40R	TKY25T	

ECMP TYPE

Old Type Tool Number			Recommended End Mill
	Clamp Screw	Wrench	
ECMP252S25	TS4	TKY15R	—
ECMP322S32	TS5	TKY25R	
ECMP402S42	TS5	TKY25R	

FF3000 TYPE

Old Type Tool Number				Recommended End Mill
	Shim	Lock Pin	Wrench	
FF3000 Type	FFSS	FFP	HKY25L	—

REPLACEMENT PARTS FOR OLD TYPE TOOLS

FSTE TYPE

Old Type Tool Number						Recommended End Mill
	Locator	Wedge	Clamp Screw	Locator Screw	Wrench	
FSTE Type	TS441R	CWFSTE	LS10T	CPM03008	TKY25T	**WWX400**(➲L103)

PMR TYPE PLUNGING MILL

Old Type Tool Number		 *	 *				Recommended End Mill
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)	Set Bolt	
PMR608004A27R	STPMR6N	WCS604010H	CSF401260T	TKY20D	HKY40R	HSC12035	–
PMR608004DR	STPMR6N	WCS604010H	CSF401260T	TKY20D	HKY40R	HSC16040	

* Clamp Torque (N • m) : TPS35=3.5, WCS604010H=7.0

MG200, 300 TYPE

Old Type Tool Number			Recommended End Mill
	Clamp Screw	Wrench	
MG200 Type	CS300890T	TKY08F	–
MG300 Type	CS350990T	TKY10F	**WWX400**(➲L103)

MG245, 345 TYPE

Old Type Tool Number			Recommended End Mill
	Clamp Screw	Wrench	
MG245 Type	CS300890T	TKY08F	**WSX445**(➲L044)
MG345 Type	CS350990T	TKY10F	

MSE445 TYPE

Old Type Tool Number				Recommended End Mill
	Wedge	Clamp Screw	Wrench	
MSE445 Type	CWMSE445R1	LS15T	TKY25T	**WSX445**(➲L044)

NSE300 TYPE

Old Type Tool Number							Recommended End Mill
	Locator	Wedge-T	Clamp Screw	Locator Screw	Wrench (Insert)	Wrench (Locator)	
NSE300R504S32 **NSE300R635S32**	SPTSE300R	CWTSE300TR	LS19T	TS32	TKY15T	TKY08F	**WWX400**(➲L103)

NSE400 TYPE

Old Type Tool Number							Recommended End Mill
	Locator	Wedge-T	Clamp Screw	Locator Screw	Wrench (Insert)	Wrench (Locator)	
NSE400R503S32 **NSE400R634S32**	SPTSE400R	CWSE300TR	LS10TS	TS32	TKY25T	TKY08F	**WWX400**(➲L103)

SE300 TYPE

Old Type Tool Number						Recommended End Mill
	Locator	Wedge-T	Wedge-S	Clamp Screw	Wrench	
SE300 Type	SPSE300R	CWNSE300TR	CWSE300SN	LS10T	TKY25T	**WWX400**(➲L103)

SHP400 TYPE

Old Type Tool Number							Recommended End Mill
	Locator	Wedge-T	Clamp Screw	Locator Screw	Wrench (Insert)	Wrench (Locator)	
SHP400 Type	SPSHP400R	CWSE300TR	LS10T	TS32	TKY25T	TKY08F	**WWX400**(➲L103)

SRE TYPE

Old Type Tool Number					Recommended End Mill
	Clamp Screw	Clamp Bridge	Stop Ring	Wrench	
SRER100SS16	TS253	—	—	TKY08F	—
SRER120SS16	TS3	—	—	TKY08F	
SRER140SS16	TS3	—	—	TKY08F	
SRER160SS16	TS35	—	—	TKY10F	
SRER180SS20	TS35	—	—	TKY10F	
SRER200SS20	SRS5	SRK1R	CR4	TKY20F	
SRER200SL20	SRS5	SRK1R	CR4	TKY20F	
SRER250SS25	SRS5	SRK1R	CR4	TKY20F	
SRER250SL25	SRS5	SRK1R	CR4	TKY20F	
SRER300SS32	SRS5	SRK1R	CR4	TKY20F	
SRER300SL32	SRS5	SRK1R	CR4	TKY20F	

STLG TYPE

Old Type Tool Number			Recommended End Mill
	Clamp Screw	Wrench	
STLGR22S32	CS300890T	TKY08F	**KSMG**(➲L324)
STLGR38S32	CS350990T	TKY10F	

VIPER TYPE

Old Type Tool Number			Recommended End Mill
	Clamp Screw	Wrench	
VIPER Type	CS400990T	TKY15D	**SPX**(➲L283)

ZR TYPE

Old Type Tool Number	TS  CS		Recommended End Mill
	Clamp Screw	Wrench	
ZR202C/T	TS25	TKY08F	—
ZR252C/T	CS300890T	TKY08F	
ZR322C/T	CS300990T	TKY10F	
ZR402C/T	CS451190T	TKY20F	
ZR502C/T	CS451190T	TKY20F	

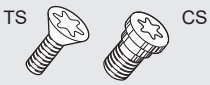
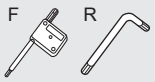
REPLACEMENT PARTS FOR OLD TYPE TOOLS

BALL NOSE END MILLS

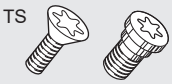
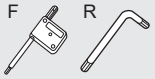
FBE2 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
FBE2200SM	CS300590T	TKY08R	**SRF**(➲L300)
FBE2250SM	CS350790T	TKY10R	
FBE2300SM	CS400990T	TKY15R	
FBE2200SF	CS300590T	TKY08R	
FBE2250SF	CS350790T	TKY10R	
FBE2300SF	CS400990T	TKY15R	

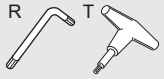
TBE1/TBE2 TYPE

Old Type Tool Number	 TS CS Clamp Screw		 F R Wrench				Recommended End Mill
	R	Peripheral	R		Peripheral		
TBE1100SS	TS3	—	TKY08F	—	—	—	—
TBE1100SM	TS3	—	TKY08F	—	—	—	
TBE1100S	TS3	—	TKY08F	—	—	—	
TBE1150S	CS300790TS	—	—	TKY10R	—	—	**SRM2**(➲L308)
TBE1200S	CS400990T	—	—	TKY15R	—	—	
TBE1250S	CS400990T	—	—	TKY15R	—	—	
TBE1300S	CS501290T	—	—	TKY25R	—	—	
TBE2150S	TS254	—	TKY08F	—	—	—	
TBE2150SM	TS254	—	—	—	—	—	
TBE2160S	TS254	—	—	—	—	—	
TBE2160SM	TS254	—	—	—	—	—	
TBE2200S	CS350790T	—	—	TKY10R	—	—	
TBE2200SM	CS350790T	—	—	TKY10R	—	—	
TBE2250S	CS400990T	—	—	TKY15R	—	—	
TBE2250SM	CS400990T	—	—	TKY15R	—	—	
TBE2300S	CS501290T	—	—	TKY25R	—	—	
TBE2300SM	CS501290T	—	—	TKY25R	—	—	
TBE1150SU	CS300790TS	—	—	TKY10R	—	—	
TBE1200SU	CS400990T	—	—	TKY15R	—	—	
TBE1250SU	CS400990T	—	—	TKY15R	—	—	
TBE1300SU	CS501290T	—	—	TKY25R	—	—	
TBE2150SU	TS254	—	TKY08F	—	—	—	
TBE2160SU	TS254	—	TKY08F	—	—	—	
TBE2200SU	CS350790T	—	—	TKY10R	—	—	
TBE2250SU	CS400990T	—	—	TKY15R	—	—	
TBE2300SU	CS501290T	—	—	TKY25R	—	—	
TBE1200SL	CS400990T	TS3	—	TKY15R	TKY08F	—	
TBE1250SL	CS400990T	TS3	—	TKY15R	TKY08F	—	
TBE1300SL	CS501290T	TS4	—	TKY25R	—	TKY15R	
TBE2200SL	CS350790T	CS350790T	—	TKY10R	—	TKY10R	
TBE2250SL	CS400990T	CS400990T	—	TKY15R	—	TKY15R	
TBE2300SL	CS501290T	CS400990T	—	TKY25R	—	TKY15R	
TBE1400SL	HFF06015	HS5	—	HKY50R	—	HKY30R	

TRM2 TYPE

Old Type Tool Number	 Clamp Screw		 Wrench		Recommended End Mill
	Inner, Outer	Peripheral	Inner, Outer	Peripheral	
TRM2200SM	CS300790TS	—	TKY10R	—	**SRM2**(➲L308)
TRM2250SM	CS400990T	—	TKY15R	—	
TRM2300SM	CS501290T	—	TKY25R	—	
TRM2200SL	CS300790TS	TS3	TKY10R	TKY08F	
TRM2250SL	CS400990T	TS3	TKY15R	TKY08F	
TRM2300SL	CS501290T	TS4	TKY25R	TKY15R	
TRM2200SF	CS300790TS	TS3	TKY10R	TKY08F	
TRM2250SF	CS400990T	TS3	TKY15R	TKY08F	
TRM2300SF	CS501290T	TS4	TKY25R	TKY15R	

TRM4 TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended End Mill
TRM4400SL	CS451190T	TKY20R	**SRM2-40/50** (➲L316)
TRM4500SL	CS501290T	TKY25T	
TRM4400SF	CS451190T	TKY20R	
TRM4500SF	CS501290T	TKY25T	

REPLACEMENT PARTS FOR OLD TYPE TOOLS

INDEXABLE TYPE DRILLS

TASS TYPE (STANDARD)

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Drill
TASS1600S32	TS202	TKY06F	**MVX** (➲N160)
TASS1700S32	TS202	TKY06F	
TASS1800S32	TS202	TKY06F	
TASS1900S32	TS202	TKY06F	
TASS2000S32	TS25	TKY08F	
TASS2100S32	TS25	TKY08F	
TASS2200S32	TS25	TKY08F	
TASS2300S32	TS25	TKY08F	
TASS2400S32	TS25	TKY08F	
TASS2500S32	TS32	TKY08F	
TASS2600S32	TS32	TKY08F	
TASS2700S32	TS32	TKY08F	
TASS2800S32	TS32	TKY08F	
TASS2900S32	TS32	TKY08F	
TASS3000S32	TS43	TKY15F	
TASS3100S32	TS43	TKY15F	
TASS3200S32	TS43	TKY15F	
TASS3300S40	TS43	TKY15F	
TASS3400S40	TS43	TKY15F	
TASS3500S40	TS43	TKY15F	
TASS3600S40	TS43	TKY15F	

TASS TYPE (FLANGE)

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Drill
TASS1600C20	TS202	TKY06F	**MVX** (➲N160)
TASS1650C20	TS202	TKY06F	
TASS1700C20	TS202	TKY06F	
TASS1750C20	TS202	TKY06F	
TASS1800C20	TS202	TKY06F	
TASS1850C20	TS202	TKY06F	
TASS1900C20	TS202	TKY06F	
TASS1950C20	TS202	TKY06F	
TASS2000C20	TS25	TKY08F	
TASS2100C25	TS25	TKY08F	
TASS2200C25	TS25	TKY08F	
TASS2300C25	TS25	TKY08F	
TASS2400C25	TS25	TKY08F	
TASS2500C25	TS32	TKY08F	
TASS2600C25	TS32	TKY08F	
TASS2700C25	TS32	TKY08F	
TASS2800C25	TS32	TKY08F	
TASS2900C25	TS32	TKY08F	
TASS3000C25	TS43	TKY15F	
TASS3100C32	TS43	TKY15F	
TASS3200C32	TS43	TKY15F	
TASS3300C32	TS43	TKY15F	
TASS3400C32	TS43	TKY15F	
TASS3500C32	TS43	TKY15F	
TASS3600C32	TS43	TKY15F	
TASS3700C32	TS43	TKY15F	
TASS3800C32	TS43	TKY15F	
TASS3900C32	TS43	TKY15F	
TASS4000C32	TS5	TKY25F	
TASS4100C32	TS5	TKY25F	
TASS4200C40	TS5	TKY25F	
TASS4300C40	TS5	TKY25F	
TASS4400C40	TS5	TKY25F	
TASS4500C40	TS5	TKY25F	
TASS4600C40	TS5	TKY25F	
TASS4700C40	TS5	TKY25F	
TASS4800C40	TS5	TKY25F	
TASS4900C40	TS5	TKY25F	
TASS5000C40	TS32	TKY08F	

TAGS TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Drill
TAGS1600F25	TS2	TKY06F	
TAGS1700F25	TS2	TKY06F	
TAGS1800F25	TS2	TKY06F	
TAGS1900F25	TS2	TKY06F	
TAGS2000F25	TS25	TKY08F	
TAGS2100F25	TS25	TKY08F	
TAGS2200F25	TS25	TKY08F	
TAGS2300F25	TS25	TKY08F	
TAGS2400F25	TS25	TKY08F	
TAGS2500F32	TS3	TKY08F	
TAGS2600F32	TS3	TKY08F	
TAGS2700F32	TS3	TKY08F	
TAGS2800F32	TS3	TKY08F	
TAGS2900F32	TS3	TKY08F	
TAGS3000F40	TS4	TKY15F	
TAGS3100F40	TS4	TKY15F	
TAGS3200F40	TS4	TKY15F	
TAGS3300F40	TS4	TKY15F	
TAGS3400F40	TS4	TKY15F	
TAGS3500F40	TS4	TKY15F	
TAGS3600F40	TS4	TKY15F	
TAGS3700F40	TS4	TKY15F	**MVX** (➲N160)
TAGS3800F40	TS4	TKY15F	
TAGS3900F40	TS4	TKY15F	
TAGS4000F40	TS5	TKY25F	
TAGS4100F40	TS5	TKY25F	
TAGS4200F40	TS5	TKY25F	
TAGS4300F40	TS5	TKY25F	
TAGS4400F40	TS5	TKY25F	
TAGS4500F40	TS5	TKY25F	
TAGS4600F40	TS5	TKY25F	
TAGS4700F40	TS5	TKY25F	
TAGS4800F40	TS5	TKY25F	
TAGS4900F40	TS5	TKY25F	
TAGS5000F40	TS3	TKY08F	
TAGS5100F40	TS3	TKY08F	
TAGS5200F40	TS3	TKY08F	
TAGS5300F40	TS3	TKY08F	
TAGS5400F40	TS3	TKY08F	
TAGS5500F40	TS4	TKY15F	
TAGS5600F40	TS4	TKY15F	
TAGS5700F40	TS4	TKY15F	
TAGS5800F40	TS4	TKY15F	
TAGS5900F40	TS4	TKY15F	

TAGM TYPE

Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Drill
TAGM1600F25	TS2	TKY06F	
TAGM1700F25	TS2	TKY06F	
TAGM1800F25	TS2	TKY06F	
TAGM1900F25	TS2	TKY06F	
TAGM2000F25	TS25	TKY08F	
TAGM2100F25	TS25	TKY08F	
TAGM2200F25	TS25	TKY08F	
TAGM2300F25	TS25	TKY08F	
TAGM2400F25	TS25	TKY08F	
TAGM2500F32	TS3	TKY08F	
TAGM2600F32	TS3	TKY08F	
TAGM2700F32	TS3	TKY08F	
TAGM2800F32	TS3	TKY08F	
TAGM2900F32	TS3	TKY08F	
TAGM3000F40	TS4	TKY15F	
TAGM3100F40	TS4	TKY15F	
TAGM3200F40	TS4	TKY15F	
TAGM3300F40	TS4	TKY15F	
TAGM3400F40	TS4	TKY15F	
TAGM3500F40	TS4	TKY15F	
TAGM3600F40	TS4	TKY15F	
TAGM3700F40	TS4	TKY15F	**MVX** (➲N160)
TAGM3800F40	TS4	TKY15F	
TAGM3900F40	TS4	TKY15F	
TAGM4000F40	TS5	TKY25F	
TAGM4100F40	TS5	TKY25F	
TAGM4200F40	TS5	TKY25F	
TAGM4300F40	TS5	TKY25F	
TAGM4400F40	TS5	TKY25F	
TAGM4500F40	TS5	TKY25F	
TAGM4600F40	TS5	TKY25F	
TAGM4700F40	TS5	TKY25F	
TAGM4800F40	TS5	TKY25F	
TAGM4900F40	TS5	TKY25F	
TAGM5000F40	TS3	TKY08F	
TAGM5100F40	TS3	TKY08F	
TAGM5200F40	TS3	TKY08F	
TAGM5300F40	TS3	TKY08F	
TAGM5400F40	TS3	TKY08F	
TAGM5500F40	TS4	TKY15F	
TAGM5600F40	TS4	TKY15F	
TAGM5700F40	TS4	TKY15F	
TAGM5800F40	TS4	TKY15F	
TAGM5900F40	TS4	TKY15F	

REPLACEMENT PARTS FOR OLD TYPE TOOLS

TAB TYPE

Old Type Tool Number	 Clamp Screw	 Plug	 Wrench	Recommended Drill
TAB1700S32	TS3	PT1/4	TKY08D	
TAB1800S32	TS3	PT1/4	TKY08D	
TAB1900S32	TS3	PT1/4	TKY08D	
TAB2000S32	TS32	PT1/4	TKY08D	
TAB2100S32	TS32	PT1/4	TKY08D	
TAB2200S32	TS32	PT1/4	TKY08D	
TAB2300S32	TS32	PT1/4	TKY08D	
TAB2400S32	TS32	PT1/4	TKY08D	
TAB2500S32	TS32	PT1/4	TKY08D	
TAB2600S32	TS4	PT1/4	TKY15D	
TAB2700S32	TS4	PT1/4	TKY15D	
TAB2800S32	TS4	PT1/4	TKY15D	
TAB2900S32	TS4	PT1/4	TKY15D	
TAB3000S32	TS4	PT1/4	TKY15D	
TAB3100S32	TS4	PT1/4	TKY15D	**MVX** (➲N160)
TAB3200S32	TS4	PT1/4	TKY15D	
TAB3300S40	TS5	PT1/4	TKY25D	
TAB3400S40	TS5	PT1/4	TKY25D	
TAB3500S40	TS5	PT1/4	TKY25D	
TAB3600S40	TS5	PT1/4	TKY25D	
TAB3700S40	TS5	PT1/4	TKY25D	
TAB3800S40	TS5	PT1/4	TKY25D	
TAB3900S40	TS5	PT1/4	TKY25D	
TAB4000S40	TS5	PT1/4	TKY25D	
TAB4100S40	TS5	PT1/4	TKY25D	
TAB4200S40	TS5	PT1/4	TKY25D	
TAB4300S40	TS5	PT1/4	TKY25D	
TAB4400S40	TS5	PT1/4	TKY25D	
TAB4500S40	TS5	PT1/4	TKY25D	

NPX TYPE

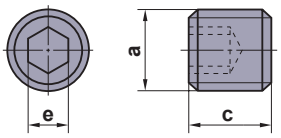
Old Type Tool Number	 Clamp Screw	 Wrench	Recommended Drill
NPXM2000S25	TS3	TKY08F	
NPXM2100S25	TS3	TKY08F	
NPXM2200S25	TS3	TKY08F	
NPXM2300S25	TS35	TKY10F	
NPXM2400S32	TS35	TKY10F	
NPXM2500S32	TS35	TKY10F	**TAW** (➲N151)
NPXM2600S32	TS35	TKY10F	
NPXM2700S32	TS4	TKY15F	
NPXM2800S32	TS4	TKY15F	
NPXM2900S32	TS4	TKY15F	
NPXM3000S32	TS4	TKY15F	

WSTAR INSERT TYPE DRILL (TAW TYPE)

Old Type Tool Number					Recommended Drill
	Clamp Screw	Wrench	Plate	Anti Seize Lubricant	
TAWSNH1400S16	WS254012T	TKY08W	WPT4405	MK1KS	
TAWMNH1400S16	WS254012T	TKY08W	WPT4405	MK1KS	
TAWLNH1400S16	WS254012T	TKY08W	WPT4405	MK1KS	
TAWSNH1500S20	WS254013T	TKY08W	WPT4405	MK1KS	
TAWMNH1500S20	WS254013T	TKY08W	WPT4405	MK1KS	
TAWLNH1500S20	WS254013T	TKY08W	WPT4405	MK1KS	
TAWSN1600S20	WS254014T	TKY08W	WPT4405	MK1KS	
TAWMN1600S20	WS254014T	TKY08W	WPT4405	MK1KS	**STAW**(➲N144)
TAWLN1600S20	WS254014T	TKY08W	WPT4405	MK1KS	
TAWSN1700S20	WS254015T	TKY08W	WPT4405	MK1KS	
TAWMN1700S20	WS254015T	TKY08W	WPT4405	MK1KS	
TAWLN1700S20	WS254015T	TKY08W	WPT4405	MK1KS	
TAWSN1800S20	WS254016T	TKY08W	WPT4405	MK1KS	
TAWMN1800S20	WS254016T	TKY08W	WPT4405	MK1KS	
TAWLN1800S20	WS254016T	TKY08W	WPT4405	MK1KS	

STANDARD FOR NON-STOCK PARTS

Compatible parts are available commercially (JIS Standard).
Please refer to the dimensions below and purchase required parts.



CLAMP SCREW

Holder Order Number	Page	Parts Order Number	Reference Dimensions (mm)			Torque (N•m)
			a	c	e	
H63TH-EV2525R/L-112	H019	HSS12025	M12×1.75	25.0	6.0	47.0
H100TH-EV3232R/L-180	H019	HSS14035	M14×2.0	35.0	6.0	53.0
H63TH-EN2525R/L-115	H020	HSS12030	M12×1.75	30.0	6.0	47.0
H100TH-EN3232R/L-130	H020	HSS14030	M14×2.0	30.0	6.0	53.0
H63TH-EV2020R/L-105-3	H021	HSS12030	M12×1.75	30.0	6.0	47.0
H63TH-B08-65	H021	HSS08010	M8×1.25	10.0	4.0	14.0
H63TH-B10-70	H021	HSS08012	M8×1.25	12.0	4.0	14.0
H63TH-B12-70	H021	HSS08012	M8×1.25	12.0	4.0	14.0
H63TH-B16-75	H021	HSS10016	M10×1.5	16.0	5.0	27.0
H63TH-B20-75	H021	HSS10016	M10×1.5	16.0	5.0	27.0
H63TH-B25-83	H021	HSS12016	M12×1.75	16.0	6.0	47.0
H63TH-B32-87	H021	HSS12016	M12×1.75	16.0	6.0	47.0
H63TH-B40-97	H021	HSS16012	M16×2.0	12.0	8.0	118.0
H100TH-B25-120	H022	HSS12016	M12×1.75	16.0	6.0	47.0
H100TH-B32-135	H022	HSS12018	M12×1.75	18.0	6.0	47.0
H100TH-B40-150	H022	HSS16020	M16×2.0	20.0	8.0	118.0
H100TH-B50-180	H022	HSS16020	M16×2.0	20.0	8.0	118.0
SL3208-90	H022	HSS06008	M6×1.0	8.0	3.0	5.9
SL3210-90	H022	HSS08008	M8x1.25	8.0	4.0	14.0
SL3212-90	H022	HSS08008	M8x1.25	8.0	4.0	14.0
SL3216-90	H022	HSS08006	M8x1.25	6.0	4.0	14.0
SL3220-90	H022	HSS08005	M8x1.25	5.0	4.0	14.0

PLUG

Holder Order Number	Page	Parts Order Number	Reference Dimensions (mm)			Torque (N•m)
			a	c	e	
H63TH-EV2525R/L-112	H019	HGM-PT1/8	1/8-28	7.0	5.0	—
H100TH-EV3232R/L-180	H019	HSS06006	M6×1.0	6.0	3.0	—
H63TH-EN2525R/L-115	H020	HSS06006	M6×1.0	6.0	3.0	—
H100TH-EN3232R/L-130	H020	HSS06006	M6×1.0	6.0	3.0	—
H63TH-EV2020R/L-105-3	H021	HSS06006	M6×1.0	6.0	3.0	—

STOP PLUG FOR NOZZLE

Holder Order Number	Page	Parts Order Number	Reference Dimensions (mm)			Torque (N•m)
			a	c	e	
H63TH-EV2020R/L-105-3	H021	HSS05012	M5×0.8	12.0	2.5	—

TECHNICAL DATA

LIST OF PROPERTY SYMBOLS COMPLYING WITH ISO13399 ····· Q002
TROUBLE SHOOTING FOR TURNING ····· Q006
CHIP CONTROL FOR TURNING ····· Q008
EFFECTS OF CUTTING CONDITIONS FOR TURNING ····· Q009
FUNCTION OF TOOL FEATURES FOR TURNING ····· Q011
FORMULAE FOR CUTTING POWER ····· Q015
TROUBLE SHOOTING FOR THREADING ····· Q016
DRILL DIAMETERS FOR PREPARED HOLES ····· Q017
TROUBLE SHOOTING FOR FACE MILLING ····· Q018
FUNCTION OF TOOL FEATURES FOR FACE MILLING ····· Q019
FORMULAE FOR FACE MILLING ····· Q022
TROUBLE SHOOTING FOR END MILLING ····· Q024
END MILL TERMINOLOGY ····· Q025
TYPES AND SHAPES OF END MILL ····· Q026
PITCH SELECTION OF PICK FEED ····· Q027
TROUBLE SHOOTING FOR DRILLING ····· Q028
DRILL WEAR AND CUTTING EDGE DAMAGE ····· Q029
DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS ····· Q030
FORMULAE FOR DRILLING ····· Q033
METALLIC MATERIALS CROSS REFERENCE LIST ····· Q034
DIE STEELS ····· Q038
SURFACE ROUGHNESS ····· Q040
HARDNESS COMPARISON TABLE ····· Q041
JIS FIT TOLERANCE HOLE ····· Q042
JIS FIT TOLERANCE SHAFT ····· Q044
HEXAGON SOCKET HEAD BOLT HOLE SIZE ····· Q046
TAPER STANDARD ····· Q047
INTERNATIONAL SYSTEM OF UNITS ····· Q048
TOOL WEAR AND DAMAGE ····· Q049
CUTTING TOOL MATERIALS ····· Q050
GRADE CHAIN ····· Q051
GRADES COMPARISON TABLE ····· Q052
INSERT CHIP BREAKER COMPARISON TABLE ····· Q058



LIST OF PROPERTY SYMBOLS COMPLYING WITH ISO13399

Alphabetical

Source: ISO13399 standard
URL : https://www.iso.org/search/x/query/13399

ISO13399 Property Symbols	Content
ADJLX	Adjustment limit maximum
ADJRG	Adjustment range
ALF	Clearance angle radial
ALP	Clearance angle axial
AN	Clearance angle major
ANN	Clearance angle minor
APMX	Depth of cut maximum
AS	Clearance angle wiper edge
ASP	Adjusting screw protrusion
AZ	Plunge depth maximum
B	Shank width
BBD	Balanced by design
BCH	Corner chamfer length
BD	Body diameter
BDX	Body diameter maximum
BHCC	Bolt hole circle count
BHTA	Body half taper angle
BMC	Body material code
BS	Wiper edge length
BSR	Wiper edge radius
CASC	Cartridge size code
CB	Chip breaker face count
CBDP	Connection bore depth
CBMD	Chip breaker manufacturers designation
CBP	Chip breaker property
CCMS	Connection code machine side
CCWS	Connection code workpiece side
CCP	Chamfer corner property
CDI	Insert cutting diameter
CDX	Cutting depth maximum
CEATC	Tool cutting edge angle type code
CECC	Cutting edge condition code
CEDC	Cutting edge count
CF	Spot chamfer
CHW	Corner chamfer width
CICT	Cutting item count
CNC	Corner count
CND	Coolant entry diameter
CNSC	Coolant entry style code
CNT	Coolant entry thread size
CP	Coolant pressure
CRE	Spot radius
CRKS	Connection retention knob thread size
CSP	Coolant supply property
CTP	Coating property
CTX	Cutting point translation X-direction
CTY	Cutting point translation Y-direction
CUTDIA	Work piece parting diameter maximum
CUB	Connection unit basis
CW	Cutting width
CWX	Cutting width maximum
CXD	Coolant exit diameter

ISO13399 Property Symbols	Content
CXSC	Coolant exit style code
CZC	Connection size code
D1	Fixing hole diameter
DAH	Diameter access hole
DAXN	Axial groove outside diameter minimum
DAXX	Axial groove outside diameter maximum
DBC	Diameter bolt circle
DC	Cutting diameter
DCB	Connection bore diameter
DCBN	Connection bore diameter minimum
DCBX	Connection bore diameter maximum
DCC	Design configuration style code
DCCB	Counterbore diameter connection bore
DCIN	Cutting diameter internal
DCINN	Cutting diameter internal minimum
DCINX	Cutting diameter internal maximum
DCN	Cutting diameter minimum
DCON	Connection diameter
DCONMS	Connection diameter machine side
DCONWS	Connection diameter workpiece side
DCSC	Cutting diameter size code
DCSFMS	Contact surface diameter machine side
DCX	Cutting diameter maximum
DF	Flange diameter
DHUB	Hub diameter
DMIN	Minimum bore diameter
DMM	Shank diameter
DN	Neck diameter
DRVA	Drive angle
EPSR	Insert included angle
FHA	Flute helix angle
FHCSA	Fixing hole countersunk angle
FHCSD	Fixing hole countersunk diameter
FLGT	Flange thickness
FMT	Form type
FXHLP	Fixing hole property
GAMF	Rake angle radial
GAMN	Rake angle normal
GAMO	Rake angle orthogonal
GAMP	Rake angle axial
GAN	Insert rake angle
H	Shank height
HA	Thread height theoretical
HAND	Hand
HBH	Head bottom offset height
HBKL	Head back offset length
HBKW	Head back offset width
HBL	Head bottom offset length
HC	Thread height actual
HF	Functional height
HHUB	Hub height
HTB	Body height
IC	Inscribed circle diameter
IFS	Insert mounting style code
IIC	Insert interface code
INSL	Insert length
KAPR	Tool cutting edge angle
KCH	Corner chamfer angle

LIST OF PROPERTY SYMBOLS COMPLYING WITH ISO13399

ISO13399 Property Symbols	Content
KRINS	Cutting edge angle major
KWL	Keyway length
KWW	Keyway width
KYP	Keyway property
L	Cutting edge length
LAMS	Inclination angle
LB	Body length
LBB	Chip breaker width
LBX	Body length maximum
LCCB	Counterbore depth connection bore
LCF	Length chip flute
LDRED	Reduced body diameter length
LE	Cutting edge effective length
LF	Functional length
LFA	A dimension on lf
LH	Head length
LPR	Protruding length
LS	Shank length
LSC	Clamping length
LSCN	Clamping length minimum
LSCX	Clamping length maximum
LTA	LTA length (length from MCS to CRP)
LU	Usable length
LUX	Usable length maximum
M	M-dimension
M2	Distance between the nominal inscribed circle and the corner of an insert that has the secondary included angle
MHA	Mounting hole angle
MHD	Mounting hole distance
MHH	Mounting hole height
MIID	Master insert identification
MTP	Clamping type code
NCE	Cutting end count
NOF	Flute count
NOI	Insert index count
NT	Tooth count
OAH	Overall height
OAL	Overall length
OAW	Overall width
PDPT	Profile depth insert
PDX	Profile distance ex
PDY	Profile distance ey
PFS	Profile style code
PL	Point length
PNA	Profile included angle
PSIR	Tool lead angle
PSIRL	Cutting edge angle major left hand
PSIRR	Cutting edge angle major right hand
RAL	Relief angle left hand
RAR	Relief angle right hand
RCP	Rounded corner property
RE	Corner radius
REL	Corner radius left hand
RER	Corner radius right hand
RMPX	Ramping angle maximum
RPMX	Rotational speed maximum
S	Insert thickness
S1	Insert thickness total

ISO13399 Property Symbols	Content
SC	Insert shape code
SDL	Step diameter length
SIG	Point angle
SSC	Insert seat size code
SX	Shank cross section shape code
TC	Tolerance class insert
TCE	Tipped cutting edge code
TCTR	Thread tolerance class
TD	Thread diameter
THFT	Thread form type
THL	Threading length
THLGTH	Thread length
THSC	Tool holder shape code
THUB	Hub thickness
TP	Thread pitch
TPI	Threads per inch
TPIN	Threads per inch minimum
TPIX	Threads per inch maximum
TPN	Thread pitch minimum
TPT	Thread profile type
TPX	Thread pitch maximum
TQ	Torque
TSYC	Tool style code
TTP	Thread type
ULDR	Usable length diameter ratio
UST	Unit system
W1	Insert width
WEP	Wiper edge property
WF	Functional width
WF2	Distance between the cutting reference point and the front seating surface of a turning tool
WFS	Functional width secondary
WT	Weight of item
ZEFF	Face effective cutting edge count
ZEFP	Peripheral effective cutting edge count
ZNC	Cutting edge centre count
ZNF	Face mounted insert count
ZNP	Peripheral mounted insert count

LIST OF REFERENCE SYMBOLS COMPLYING WITH ISO13399

ISO13399 Reference Symbols	Content
CIP	Coordinate system in process
CRP	Cutting reference point
CSW	Coordinate system workpiece side
MCS	Mounting coordinate system
PCS	Primary coordinate system

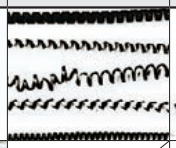
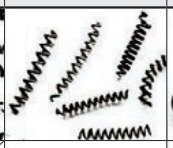
TROUBLE SHOOTING FOR TURNING

Trouble	Factors	Solution: Insert Grade Selection: Select a harder grade	Select a tougher grade	Select a grade with better thermal shock resistance	Select a grade with better adhesion resistance	Cutting Conditions: Cutting speed (Up ↗ / Down ↘)	Feed (Up ↗ / Down ↘)	Depth of cut (Up ↗ / Down ↘)	Coolant: Do not use water-soluble cutting fluid	Coolant: Determine dry or wet cutting	Style and Design of the Tool: Select chip breaker	Rake (Up ↗ / Down ↘)	Corner radius (Up ↗ / Down ↘)	Lead angle (Up ↗ / Down ↘)	Honing strengthens the cutting edge (Up ↗ / Down ↘)	Class of insert	Improve tool holder rigidity	Machine, Installation of Tool: Increase clamping rigidity of the tool and workpiece	Decrease holder overhang	Decrease power and machine backlash
Deterioration of Tool Life	Insert wear quickly generated																			
	Improper tool grade	●																		
	Improper cutting edge geometry										●	↗●	↗●	↗●	●↘					
	Improper cutting speed					●↘	↗●			● Wet										
	Chipping or fracturing of cutting edge																			
	Improper tool grade		●																	
	Improper cutting conditions						●↘	●↘												
	Lack of cutting edge strength.										●		↗●		↗●					
	Thermal crack occurs			●		●↘	●↘	●↘	●	● Dry										
	Build-up edge occurs				●	↗●	↗●		●	● Wet										
	Lack of rigidity																●	●	●	●
Out of Tolerance	Dimensions are not constant																			
	Poor insert accuracy															●				
	Large cutting resistance and cutting edge flank										●	●	●↘	●↘	●↘		●	●	●	●
	Necessary to adjust often because of over-size																			
	Improper tool grade	●																		
	Improper cutting conditions					●↘	↗●													
Deterioration of Surface Finish	Poor finished surface																			
	Welding occurs					↗●			●	● Wet										
	Improper cutting edge geometry										●		↗●							
	Chattering					●↘	●↘	●↘									●	●	●	●
Generation of Heat	Workpiece over heating can cause poor accuracy and short life of insert																			
	Improper cutting conditions					●↘	●↘	●↘												
	Improper cutting edge geometry										●	↗●			●↘					

Trouble		Solution / Factors	Insert Grade Selection: Select a harder grade	Insert Grade Selection: Select a tougher grade	Insert Grade Selection: Select a grade with better thermal shock resistance	Insert Grade Selection: Select a grade with better adhesion resistance	Cutting Conditions: Cutting speed (Up ↗ / Down ↘)	Cutting Conditions: Feed (Up ↗ / Down ↘)	Cutting Conditions: Depth of cut (Up ↗ / Down ↘)	Cutting Conditions: Coolant: Do not use water-soluble cutting fluid	Cutting Conditions: Coolant: Determine dry or wet cutting	Style and Design of the Tool: Select chip breaker	Style and Design of the Tool: Rake (Up ↗ / Down ↘)	Style and Design of the Tool: Corner radius (Up ↗ / Down ↘)	Style and Design of the Tool: Lead angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing strengthens the cutting edge (Up ↗ / Down ↘)	Style and Design of the Tool: Class of insert	Style and Design of the Tool: Improve tool holder rigidity	Machine, Installation of Tool: Increase clamping rigidity of the tool and workpiece	Machine, Installation of Tool: Decrease holder overhang	Machine, Installation of Tool: Decrease power and machine backlash
Burrs, Chipping etc.	Burrs (Steel, Aluminium)	Notch wear	●																		
		Improper cutting conditions					● ↘	↗ ●			● Wet										
		Improper cutting edge geometry										●	↗ ●	● ↘	● ↘	● ↘					
	Workpiece chipping (Cast iron)	Improper cutting conditions						● ↘	● ↘												
		Improper cutting edge geometry										●	↗ ●	↗ ●	↗ ●	● ↘					
		Vibration occurs																●	●	●	●
	Burrs (Mild steel)	Improper tool grade				●															
		Improper cutting conditions					↗ ●			●	● Wet										
		Improper cutting edge geometry										●	↗ ●			● ↘					
		Vibration occurs																●	●	●	●
Poor Chip Dispersal	Long chips	Improper cutting conditions					● ↘	↗ ●	↗ ●		● Wet										
		Large chip control range										●									
		Improper cutting edge geometry												● ↘	● ↘						
	Chips are short and scattered	Improper cutting conditions						● ↘	● ↘		● Dry										
		Small chip control range										●									
		Improper cutting edge geometry												↗ ●	↗ ●						

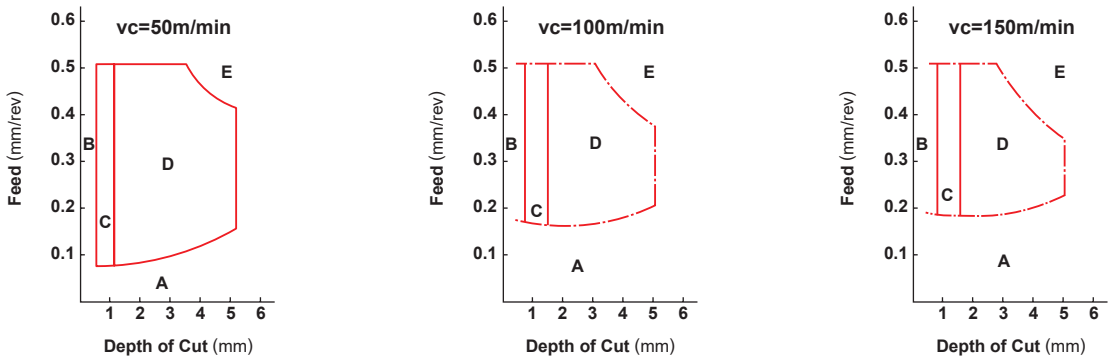
CHIP CONTROL FOR TURNING

■CHIP BREAKING CONDITIONS IN STEEL TURNING

Type	A Type	B Type	C Type	D Type	E Type
Small Depth of Cut d < 7mm					
Small Depth of Cut d=7−15mm					
Curl Length l	Curless	l ≥ 50mm	l ≤ 50mm 1−5 Curl	≒ 1 Curl	Less Than 1 Curl Half a Curl
Note	●Irregular continuous shape ●Tangle around tool and workpiece	●Regular continuous shape ●Long chips	Good	Good	●Chip scattering ●Chattering ●Poor finished surface ●Maximum

●Cutting speed and chip control range of chip breaker

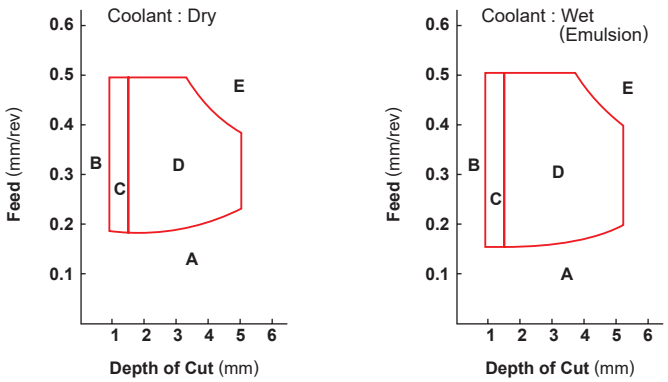
In general, when cutting speed increases, the chip control range tends to become narrower.



Workpiece : **S45C(180HB)** Tool : **MTJNR2525M16N**
Insert : **TNMG160408** Dry Cutting
Grade : **P10**Cemented Carbide

●Effects of coolant on the chip control range of a chip breaker

If the cutting speed is the same, the range of chip control differs according to whether coolant is used or not.



Workpiece : **S45C**
Cutting Conditions : **vc=100m/min**

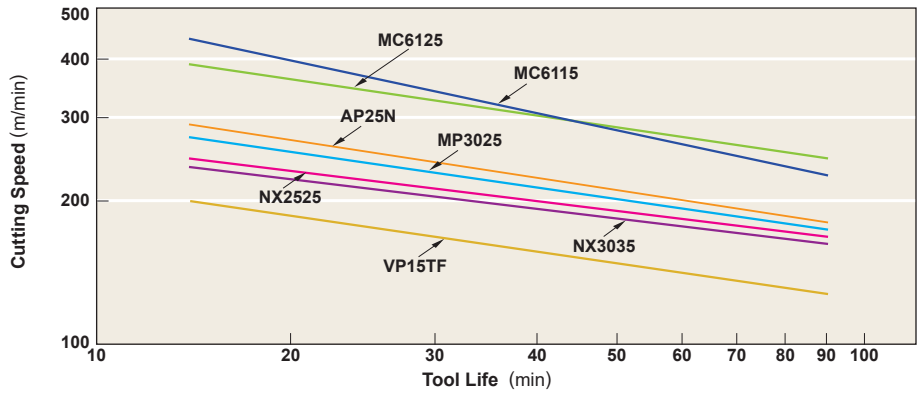
EFFECTS OF CUTTING CONDITIONS FOR TURNING

■EFFECTS OF CUTTING CONDITIONS

Ideal conditions for cutting are short cutting time, long tool life, and high cutting accuracy. In order to obtain these conditions, selection of efficient cutting conditions and tools, based on workpiece material, hardness, shape and machine capability is necessary.

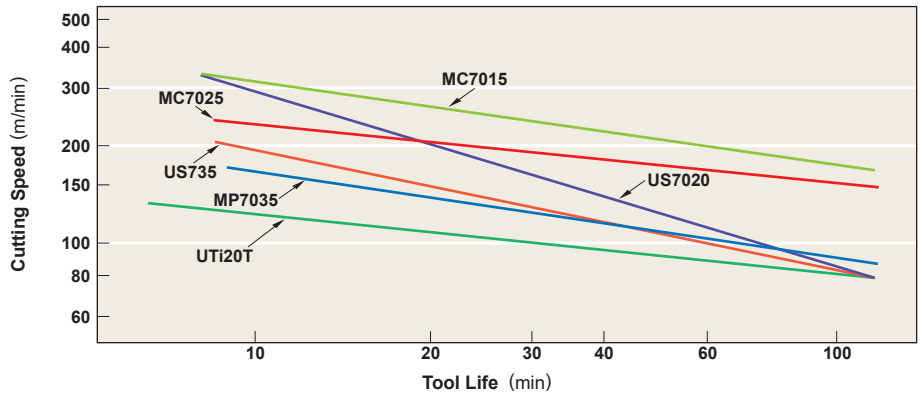
■CUTTING SPEED

Cutting speed effects tool life greatly. Increasing cutting speed increases cutting temperature and results in shortening tool life. Cutting speed varies depending on the type and hardness of the workpiece material. Selecting a tool grade suitable for the cutting speed is necessary.



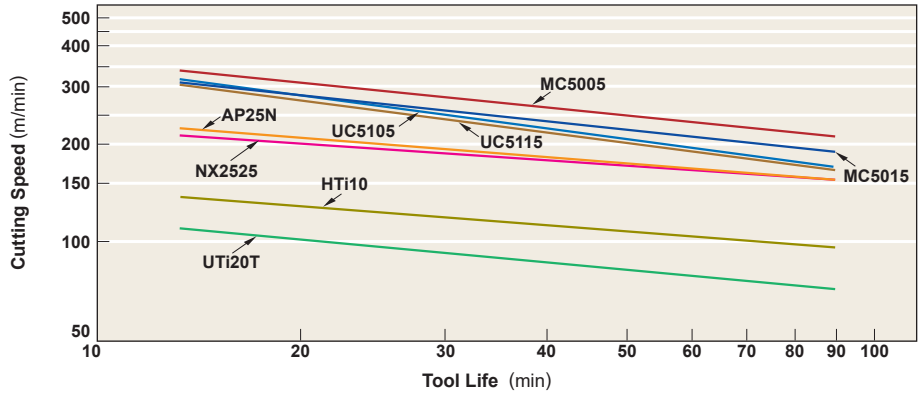
P Class Grade Tool Life

Workpiece : **JIS S45C 180HB**
Tool Life Standard : **VB = 0.3mm**
Depth of Cut : **1.5mm**
Feed : **0.3mm/rev**
Holder : **PCLNR2525M12**
Insert : **CNMG120408**
Dry Cutting



M Class Grade Tool Life

Workpiece : **JIS SUS304 200HB**
Tool Life Standard : **VB = 0.3mm**
Depth of Cut : **1.5mm**
Feed : **0.3mm/rev**
Holder : **PCLNR2525M12**
Insert : **CNMG120408-MA**
Dry Cutting



K Class Grade Tool Life

Workpiece : **JIS FC300 180HB**
Tool Life Standard : **VB = 0.3mm**
Depth of Cut : **1.5mm**
Feed : **0.3mm/rev**
Holder : **PCLNR2525M12**
Insert : **CNMG120408**
Dry Cutting

●Effects of Cutting Speed

1. Increasing cutting speed by 20% decreases tool life by 50%. Increasing cutting speed by 50% decreases tool life by 80%.
2. Cutting at low cutting speed (20−40m/min) tends to cause chattering. Thus, tool life is shortened.

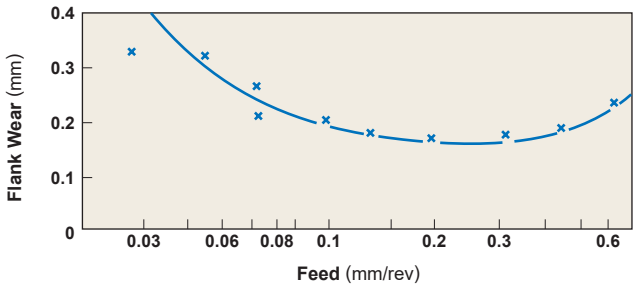
EFFECTS OF CUTTING CONDITIONS FOR TURNING

■FEED

When cutting with a general type holder, feed is the distance a holder moves per workpiece revolution. When milling, feed is the distance a machine table moves per cutter revolution divided by the number of inserts. Thus, it is indicated as feed per tooth. Feed rate relates to finished surface roughness.

●Effects of Feed

1. Decreasing feed rate results in flank wear and shortens tool life.
2. Increasing feed rate increases cutting temperature and flank wear. However, effects on the tool life is minimal compared to cutting speed.
3. Increasing feed rate improves machining efficiency.



Cutting Conditions Workpiece : **JIS SNCM431** Grade : **P10**
Insert : **0-0-5-5-35-35-0.3mm**
Depth of Cut **ap=1.0mm** Cutting Speed **vc=200m/min**
Cutting Time **Tc=10min**

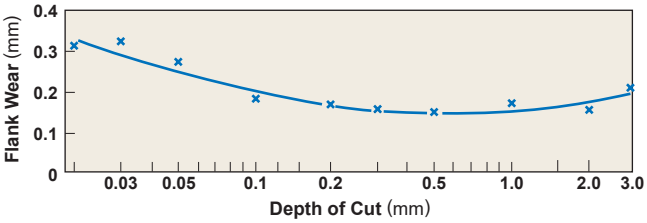
Feed and Flank Wear Relationship in Steel Turning

■DEPTH OF CUT

Depth of cut is determined according to the required stock removal, shape of workpiece, power and rigidity of the machine and tool rigidity.

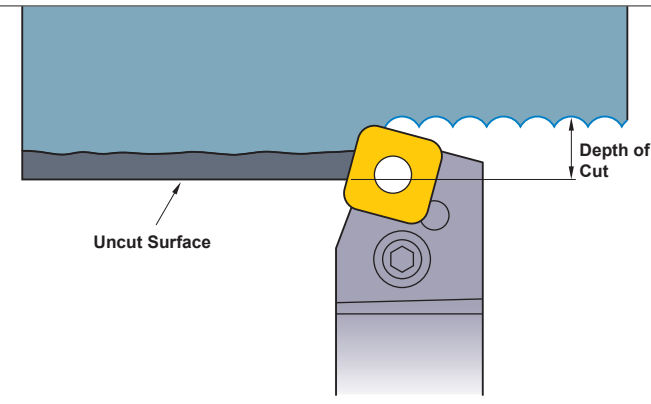
●Effects of Depth of Cut

1. Changing depth of cut doesn't effect tool life greatly.
2. Small depths of cut result in friction when cutting the hardened layer of a workpiece. Thus tool life is shortened.
3. When cutting uncut surfaces or cast iron surfaces, the depth of cut needs to be increased as much as the machine power allows in order to avoid cutting impure hard layers with the tip of cutting edge to prevent chipping and abnormal wear.



Cutting Conditions Workpiece : **JIS SNCM431** Grade : **P10**
Insert : **0-0-5-5-35-35-0.3mm**
Feed **f=0.20mm/rev** Cutting Speed **vc=200m/min**
Cutting Time **Tc=10min**

Depth of Cut and Flank Wear Relationship in Steel Turning

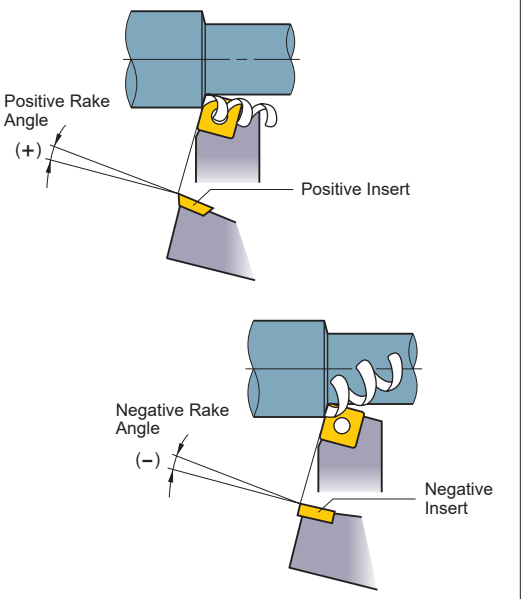


Roughing of Surface Layer that Includes Uncut Surface

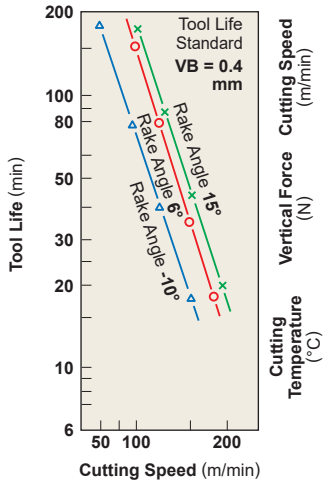
FUNCTION OF TOOL FEATURES FOR TURNING

■RAKE ANGLE

Rake angle is cutting edge angle that has a large effect on cutting resistance, chip disposal, cutting temperature and tool life.

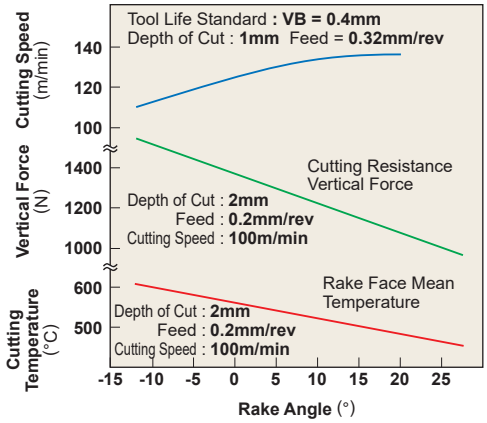


Chip Disposal and Rake Angle



Cutting Conditions
Grade : **P10**
Depth of Cut : **1mm** Feed : **0.32mm/rev**
Workpiece : **JIS SK5**

Rake Angle and Tool Life



Cutting Conditions
Workpiece : **JIS SK5** Grade : **P10**
Insert : **0-Var-5-5-20-20-0.5mm**
Dry Cutting

Effects of Rake Angle on Cutting Speed, Vertical Force, and Cutting Temperature

●Effects of Rake Angle

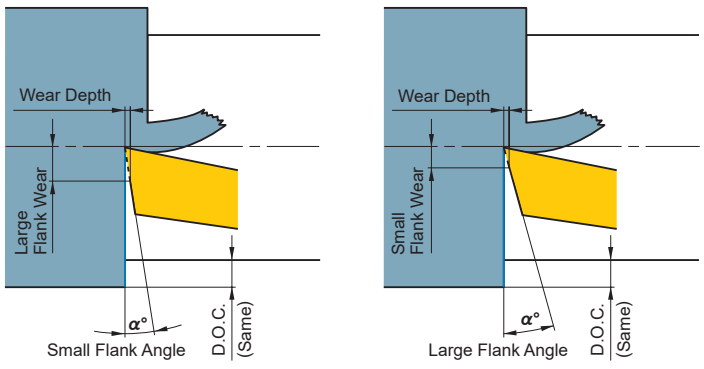
1. Increasing rake angle in the positive (+) direction improves sharpness.
2. Increasing rake angle by 1° in the positive (+) direction decreases cutting power by about 1%.
3. Increasing rake angle in the positive (+) direction lowers cutting edge strength and in the negative (-) direction increases cutting resistance.

When to Increase Rake Angle in the Negative (-) Direction
○ Hard workpieces.
○ When the cutting edge strength is required such as for uncut surfaces and interrupted cutting.

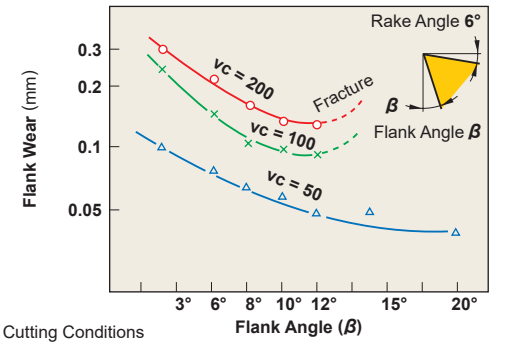
When to Increase Rake Angle in the Positive (+) Direction
○ Soft workpieces.
○ Workpiece is easily machined.
○ When the workpiece or the machine have poor rigidity.

■FLANK ANGLE

Flank angle prevents friction between flank face and workpiece resulting in smooth feed.



Flank angle creates a space between tool and workpiece. Flank angle relates to flank wear.



Cutting Conditions
Workpiece : **JIS SNCM431 (200HB)**
Grade : **P20** Insert : **0-6-β-β-20-20-0.5mm**
Depth of Cut : **1mm** Feed : **0.32mm/rev** Cutting Time : **20min**

Flank Angle and Flank Wear Relationship

●Effects of Rake Angle

1. Increasing flank angle decreases flank wear occurrence.
2. Increasing flank angle lowers cutting edge strength.

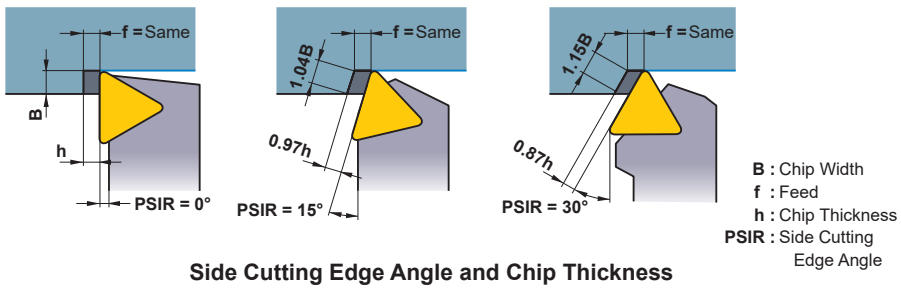
When to Decrease Flank Angle
○ Hard workpieces.
○ When cutting edge strength is required.

When to Increase Flank Angle
○ Soft workpieces.
○ Workpieces suffer from work hardening easily.

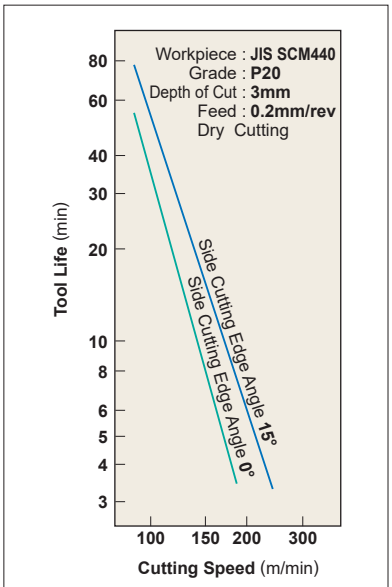
FUNCTION OF TOOL FEATURES FOR TURNING

■SIDE CUTTING EDGE ANGLE (LEAD ANGLE)

The side cutting edge angle reduces impact load and effects the amount of feed force, back force and chip thickness.



Side Cutting Edge Angle and Chip Thickness

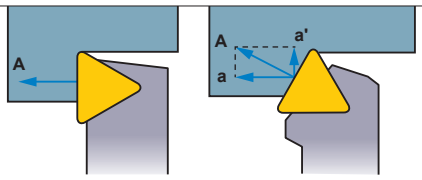


Side Cutting Edge and Tool Life

●Effects of Side Cutting Edge Angle (Lead Angle)

1. At the same feed rate, increasing the side cutting edge angle increases the chip contact length and decreases chip thickness. As a result, the cutting force is dispersed on a longer cutting edge and tool life is prolonged. (Refer to the chart.)
2. Increasing the side cutting edge angle increases force a'. Thus, thin, long workpieces suffer from bending in some cases.
3. Increasing the side cutting edge angle decreases chip control.
4. Increasing the side cutting edge angle decreases the chip thickness and increases chip width. Thus, breaking chips is difficult.

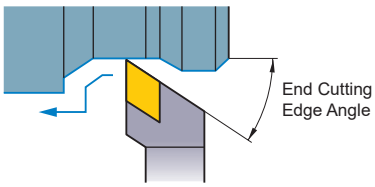
When to Decrease Lead Angle	When to Increase Lead Angle
○ Finishing with small depth of cut. ○ Thin, long workpieces. ○ When the machine has poor rigidity.	○ Hard workpieces which produce high cutting temperature. ○ When roughing a workpiece with large diameter. ○ When the machine has high rigidity.



Receive force A. Force A is divided into a and a'.

■END CUTTING EDGE ANGLE

The end cutting edge angle avoids interference between the machined surface and the tool (end cutting edge). Usually 5°–15°.

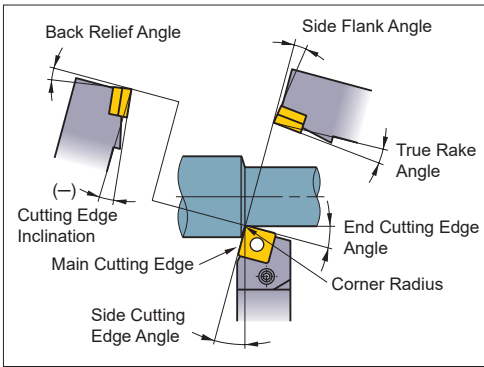


●Effects of End Cutting Edge Angle

1. Decreasing the end cutting edge angle increases cutting edge strength, but it also increases cutting edge temperature.
2. Decreasing the end cutting edge angle increases the back force and can result in chattering and vibration while machining.
3. Small end cutting edge angle for roughing and large angle for finishing are recommended.

■CUTTING EDGE INCLINATION

Cutting edge inclination indicates inclination of the rake face. During heavy cutting, the cutting edge receives an extremely large shock at the beginning of each cut. Cutting edge inclination keeps the cutting edge from receiving this shock and prevents fracturing. 3°–5° in turning and 10°–15° in milling are recommended.

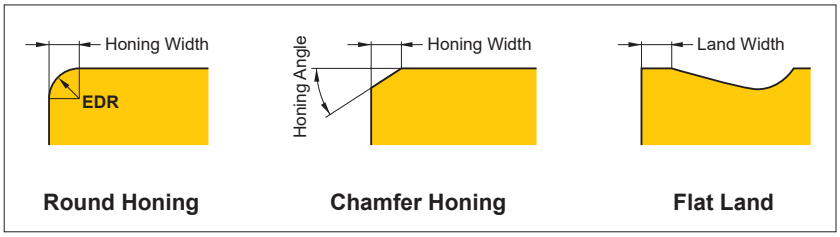


●Effects of Cutting Edge Inclination

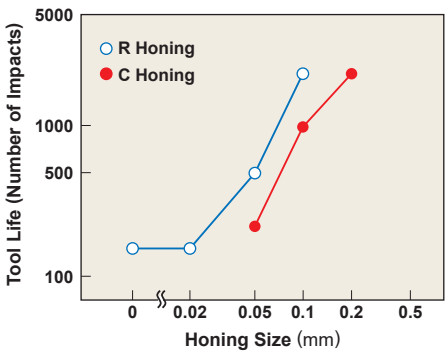
1. Negative (–) cutting edge inclination disposes chips in the workpiece direction, and positive (+) disposes chips in the opposite direction.
2. Negative (–) cutting edge inclination increases cutting edge strength, but it also increases the back force of cutting resistance. Thus, chattering can easily occur.

■HONING AND LAND

Honing and land are cutting edge shapes that maintain cutting edge strength.
Honing can be round or chamfer type. The optimal honing width is approximately 1/2 of the feed.
Land is the narrow flat area on the rake or flank face.

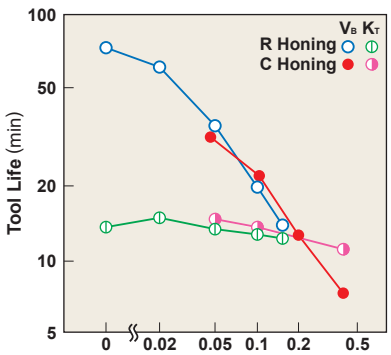


Round Honing **Chamfer Honing** **Flat Land**



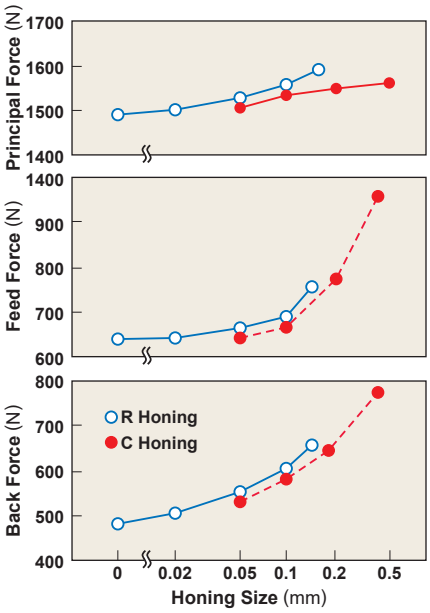
Workpiece : **JIS SNCM439 (280HB)**
Grade : **P10**
Cutting Conditions : **vc=200m/min ap=1.5mm f=0.335mm/rev**

Honing Size and Tool Life Due to Fracturing



Workpiece : **JIS SNCM439 (220HB)**
Grade : **P10**
Cutting Conditions : **vc=160m/min ap=1.5mm f=0.45mm/rev**

Honing Size and Tool Life Due to Wear



Workpiece : **JIS SNCM439 (220HB)**
Grade : **P10**
Cutting Conditions : **vc=100m/min ap=1.5mm f=0.425mm/rev**

Honing Size and Cutting Resistance

●Effects of Honing

1. Enlarging the honing increases cutting edge strength, tool life and reduces fracturing.
2. Enlarging the honing increases flank wear occurrence and shortens tool life. Honing size doesn't affect rake wear.
3. Enlarging the honing increases cutting resistance and chattering.

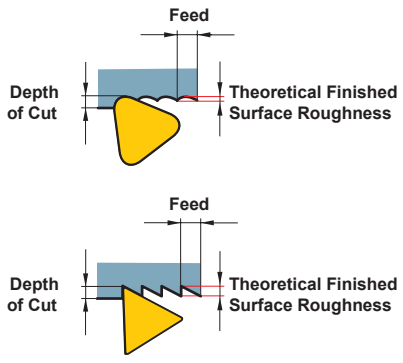
When to Decrease Honing Size	When to Increase Honing Size
○ When finishing with small depth of cut and small feed. ○ Soft workpieces. ○ When the workpiece or the machine have poor rigidity.	○ Hard workpieces. ○ When the cutting edge strength is required such as for uncut surfaces and interrupted cutting. ○ When the machine has high rigidity.

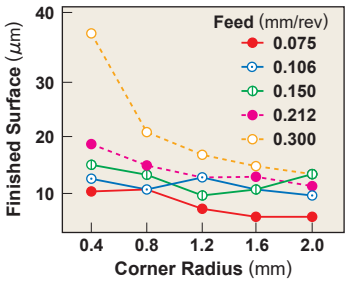
Note 1) Cemented carbide, coated diamond, and indexable cermet inserts have round honing as standard.

FUNCTION OF TOOL FEATURES FOR TURNING

■RADIUS

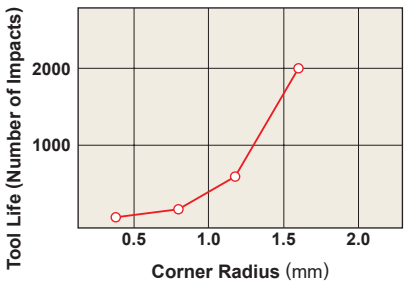
Radius effects the cutting edge strength and finished surface. In general, a corner radius 2−3 times the feed is recommended.





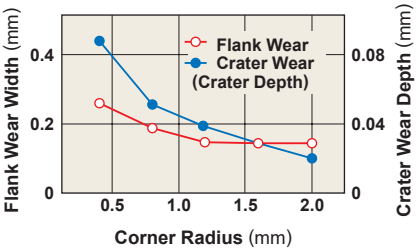
Workpiece : **JIS SNCM439 (200HB)**
Grade : **P20**
Cutting Conditions : **vc=120m/min ap=0.5mm**

Corner Radius and Finished Surface



Workpiece : **JIS SNCM440 (280HB)**
Grade : **P10**
Cutting Conditions : **vc=100m/min ap=2mm f=0.335mm/rev**

Corner Radius Size and Tool Life Due to Fracturing



Workpiece : **JIS SNCM439 (200HB)**
Grade : **P10**
Cutting Conditions : **vc=140m/min ap=2mm f=0.212mm/rev Tc=10min**

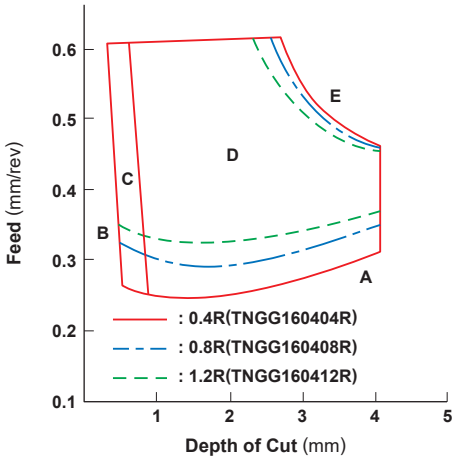
Corner Radius Size and Tool Wear

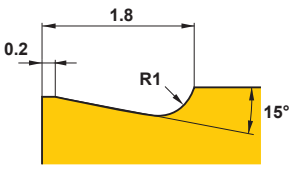
●Effects of Corner Radius

1. Increasing the corner radius improves the surface finish.
2. Increasing the corner radius improves cutting edge strength.
3. Increasing the corner radius too much increases the cutting resistance and causes chattering.
4. Increasing the corner radius decreases flank and rake wear.
5. Increasing the corner radius too much results in poor chip control.

When to Decrease Corner Radius	When to Increase Corner Radius
○Finishing with small depth of cut. ○Thin, long workpieces. ○When the machine has poor rigidity.	○When the cutting edge strength is required such as in intrrupted cutting and uncut surface cutting. ○When roughing a workpiece with large diameter. ○When the machine has high rigidity.

●Corner Radius and Chip Control Range





Workpiece : **JIS S45C (180HB)**
Insert : **TNGG160404R TNGG160408R TNGG160412R (P10)**
Holder : **ETJNR33K16 (Side Cutting Edge angle 3°)**
Cutting Speed : **vc=100m/min**
Dry Cutting

*Refer to Q008 for "Shape of Chips in Steel Turning" for A, B, C, D, E in the graph above.

FORMULAE FOR CUTTING POWER

■CUTTING POWER (Pc)

$$Pc = \frac{ap \cdot f \cdot vc \cdot Kc}{60 \times 10^3 \times \eta} \ (kW)$$

Pc (kW) : Actual Cutting Power
ap (mm) : Depth of Cut
f (mm/rev) : Feed per Revolution
vc (m/min) : Cutting Speed
Kc (MPa) : Specific Cutting Force
η : (Machine Coefficient)

(Problem) What is the cutting power required for machining mild steel at cutting speed 120m/min with depth of cut 3mm and feed 0.2mm/rev (Machine coefficient 80%) ?

(Answer) Substitute the specific cutting force Kc=3100MPa into the formula.

$$Pc = \frac{3 \times 0.2 \times 120 \times 3100}{60 \times 10^3 \times 0.8} = 4.65(kW)$$

● Kc

Workpiece Material	Tensile Strength(MPa) and Hardness	Specific Cutting Force Kc (MPa)				
		0.1 (mm/rev)	0.2 (mm/rev)	0.3 (mm/rev)	0.4 (mm/rev)	0.6 (mm/rev)
Mild Steel	**520**	3610	3100	2720	2500	2280
Medium Steel	**620**	3080	2700	2570	2450	2300
Hard Steel	**720**	4050	3600	3250	2950	2640
Tool Steel	**670**	3040	2800	2630	2500	2400
Tool Steel	**770**	3150	2850	2620	2450	2340
Chrome Manganese Steel	**770**	3830	3250	2900	2650	2400
Chrome Manganese Steel	**630**	4510	3900	3240	2900	2630
Chrome Molybdenum Steel	**730**	4500	3900	3400	3150	2850
Chrome Molybdenum Steel	**600**	3610	3200	2880	2700	2500
Nickel Chrome Molybdenum Steel	**900**	3070	2650	2350	2200	1980
Nickel Chrome Molybdenum Steel	**352HB**	3310	2900	2580	2400	2200
Hard Cast Iron	**46HRC**	3190	2800	2600	2450	2270
Meehanite Cast Iron	**360**	2300	1930	1730	1600	1450
Grey Cast Iron	**200HB**	2110	1800	1600	1400	1330

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot Dm \cdot n}{1000} \ (m/min)$$

vc (m/min) : Cutting Speed
Dm (mm) : Workpiece Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed

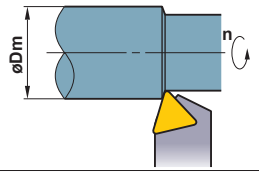
*Divide by 1000 to change to m from mm.

(Problem) What is the cutting speed when main axis spindle speed is 700min^{-1} and external diameter is ϕ50 ?

(Answer) Substitute π=3.14, Dm=50, n=700 into the formula.

$$vc = \frac{\pi \cdot Dm \cdot n}{1000} = \frac{3.14 \times 50 \times 700}{1000} = 110m/min$$

Cutting speed is 110m/min.



■FEED (f)

$$f = \frac{l}{n} \ (mm/rev)$$

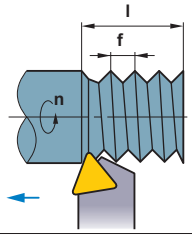
f (mm/rev) : Feed per Revolution
l (mm/min) : Cutting Length per Min.
n (min^{-1}) : Main Axis Spindle Speed

(Problem) What is the feed per revolution when main axis spindle speed is 500min^{-1} and cutting length per minute is 120mm/min ?

(Answer) Substitute n=500, l=120 into the formula.

$$f = \frac{l}{n} = \frac{120}{500} = 0.24mm/rev$$

The answer is 0.24mm/rev.



■CUTTING TIME (Tc)

$$Tc = \frac{lm}{l} \ (min)$$

Tc (min) : Cutting Time
lm (mm) : Workpiece Length
l (mm/min) : Cutting Length per Min.

(Problem) What is the cutting time when 100mm workpiece is machined at 1000min^{-1} with feed = 0.2mm/rev ?

(Answer) First, calculate the cutting length per min. from the feed and spindle speed.

$$l = f \times n = 0.2 \times 1000 = 200mm/min$$

Substitute the answer above into the formula.

$$Tc = \frac{lm}{l} = \frac{100}{200} = 0.5min$$

0.5 x 60=30 (sec.) The answer is 30 sec.

■THEORETICAL FINISHED SURFACE ROUGHNESS (h)

$$h = \frac{f^2}{8RE} \times 1000(\mu m)$$

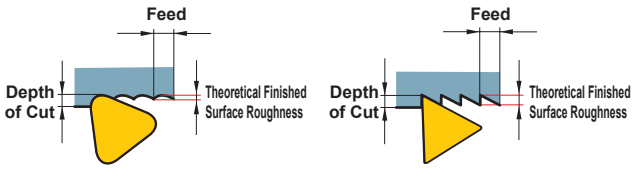
h (μm) : Finished Surface Roughness
f (mm/rev) : Feed per Revolution
RE(mm) : Insert Corner Radius

(Problem) What is the theoretical finished surface roughness when the insert corner radius is 0.8mm and feed is 0.2mm/rev ?

(Answer) Substitute f=0.2mm/rev, RE=0.8 into the formula.

$$h = \frac{0.2^2}{8 \times 0.8} \times 1000 = 6.25\mu m$$

The theoretical finished surface roughness is 6μm.



TROUBLE SHOOTING FOR THREADING

Problems	Observation	Causes	Solutions
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert centre height at 0mm.
			Check holder inclination (Lateral).
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.
		Lack of insert wear or plastic deformation resistance.	Refer to "Quickly generated flank wear." and "Large plastic deformation." below.
Poor surface finish.	Surface damage.	Chips wrap around or clog the work pieces.	Change to flank infeed and control the chip discharge direction.
			Change to an M-class insert with a 3-D chip breaker.
		The side of the insert cutting edge interferes with the workpiece.	Check the lead angle and select an appropriate shim.
	Surface tears.	Built-up edge (Welding).	Increase cutting speed.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Decrease depth of cut per pass.
	Surface vibrations.	Cutting speed too high.	Decrease the cutting speed.
		Insufficient work piece or tool clamping.	Re-check work piece and tool clamping. (Chuck pressure, clamping allowance)
		Incorrect tool installation.	Set the insert centre height at 0mm.
Short tool life.	Flank wear quickly generated.	Cutting speed too high.	Decrease the cutting speed.
		Too many passes causes abrasive wear.	Reduce the number of passes.
		Small depth of cut for the finishing pass.	Do not re-cut at 0mm depth of cut, larger than 0.05mm depth of cut is recommended.
	Non-uniform wear of the right and left sides of the cutting edge.	The work piece lead angle and the tool lead angle do not match.	Check the work piece lead angle and select an appropriate shim.
	Chipping and fracture.	Cutting speed too low.	Increase cutting speed.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.
		Unstable clamping.	Check work piece deflection.
			Shorten tool overhang.
			Recheck work piece and tool clamping. (Chuck pressure, clamping allowance)
		Chip packing.	Increase coolant pressure to blow away chips.
			Change the tool pass to control chips. (Lengthen each pass to allow the coolant to clear the chips.
			Change from standard internal cutting to back turning to prevent chip jamming.
		Non-chamfered work pieces causes high resistance at the start of each pass.	Chamfer the workpiece entry and exit faces.
	Large plastic deformation.	High cutting speed and large heat generation.	Decrease the cutting speed.
		Lack of coolant supply.	Check coolant is supply is sufficient.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.

DRILL DIAMETERS FOR PREPARED HOLES

●Metric Coarse Screw Thread

Nominal	Drill Diameter	
	HSS	Carbide
M1 ×0.25	0.75	0.75
M1.1×0.25	0.85	0.85
M1.2×0.25	0.95	0.95
M1.4×0.3	1.10	1.10
M1.6×0.35	1.25	1.30
M1.7×0.35	1.35	1.40
M1.8×0.35	1.45	1.50
M2 ×0.4	1.60	1.65
M2.2×0.45	1.75	1.80
M2.3×0.4	1.90	1.95
M2.5×0.45	2.10	2.15
M2.6×0.45	2.15	2.20
M3 ×0.5	2.50	2.55
M3.5×0.6	2.90	2.95
M4 ×0.7	3.3	3.4
M4.5×0.75	3.8	3.9
M5 ×0.8	4.2	4.3
M6 ×1.0	5.0	5.1
M7 ×1.0	6.0	6.1
M8 ×1.25	6.8	6.9
M9 ×1.25	7.8	7.9
M10 ×1.5	8.5	8.6
M11 ×1.5	9.5	9.7
M12 ×1.75	10.3	10.5
M14 ×2.0	12.0	12.2
M16 ×2.0	14.0	14.2
M18 ×2.5	15.5	15.7
M20 ×2.5	17.5	17.7
M22 ×2.5	19.5	19.7
M24 ×3.0	21.0	—
M27 ×3.0	24.0	—
M30 ×3.5	26.5	—
M33 ×3.5	29.5	—
M36 ×4.0	32.0	—
M39 ×4.0	35.0	—
M42 ×4.5	37.5	—
M45 ×4.5	40.5	—
M48 ×5.0	43.0	—

●Metric Fine Screw Thread

Nominal	Drill Diameter	
	HSS	Carbide
M1 ×0.2	0.80	0.80
M1.1×0.2	0.90	0.90
M1.2×0.2	1.00	1.00
M1.4×0.2	1.20	1.20
M1.6×0.2	1.40	1.40
M1.8×0.2	1.60	1.60
M2 ×0.25	1.75	1.75
M2.2×0.25	1.95	2.00
M2.5×0.35	2.20	2.20
M3 ×0.35	2.70	2.70
M3.5×0.35	3.20	3.20
M4 ×0.5	3.50	3.55
M4.5×0.5	4.00	4.05
M5 ×0.5	4.50	4.55
M5.5×0.5	5.00	5.05
M6 ×0.75	5.30	5.35
M7 ×0.75	6.30	6.35
M8 ×1.0	7.00	7.10
M8 ×0.75	7.30	7.35
M9 ×1.0	8.00	8.10
M9 ×0.75	8.30	8.35
M10 ×1.25	8.80	8.90
M10 ×1.0	9.00	9.10
M10 ×0.75	9.30	9.35
M11 ×1.0	10.0	10.1
M11 ×0.75	10.3	10.3
M12 ×1.5	10.5	10.7
M12 ×1.25	10.8	10.9
M12 ×1.0	11.0	11.1
M14 ×1.5	12.5	12.7
M14 ×1.0	13.0	13.1
M15 ×1.5	13.5	13.7
M15 ×1.0	14.0	14.1
M16 ×1.5	14.5	14.7
M16 ×1.0	15.0	15.1
M17 ×1.5	15.5	15.7
M17 ×1.0	16.0	16.1
M18 ×2.0	16.0	16.3
M18 ×1.5	16.5	16.7
M18 ×1.0	17.0	17.1

Nominal	Drill Diameter	
	HSS	Carbide
M20 ×2.0	18.0	18.3
M20 ×1.5	18.5	18.7
M20 ×1.0	19.0	19.1
M22 ×2.0	20.0	—
M22 ×1.5	20.5	—
M22 ×1.0	21.0	—
M24 ×2.0	22.0	—
M24 ×1.5	22.5	—
M24 ×1.0	23.0	—
M25 ×2.0	23.0	—
M25 ×1.5	23.5	—
M25 ×1.0	24.0	—
M26 ×1.5	24.5	—
M27 ×2.0	25.0	—
M27 ×1.5	25.5	—
M27 ×1.0	26.0	—
M28 ×2.0	26.0	—
M28 ×1.5	26.5	—
M28 ×1.0	27.0	—
M30 ×3.0	27.0	—
M30 ×2.0	28.0	—
M30 ×1.5	28.5	—
M30 ×1.0	29.0	—
M32 ×2.0	30.0	—
M32 ×1.5	30.5	—
M33 ×3.0	30.0	—
M33 ×2.0	31.0	—
M33 ×1.5	31.5	—
M35 ×1.5	33.5	—
M36 ×3.0	33.0	—
M36 ×2.0	34.0	—
M36 ×1.5	34.5	—
M38 ×1.5	36.5	—
M39 ×3.0	36.0	—
M39 ×2.0	37.0	—
M39 ×1.5	37.5	—
M40 ×3.0	37.0	—
M40 ×2.0	38.0	—
M40 ×1.5	38.5	—
M42 ×4.0	38.0	—

Nominal	Drill Diameter	
	HSS	Carbide
M42 ×3.0	39.0	—
M42 ×2.0	40.0	—
M42 ×1.5	40.5	—
M45 ×4.0	41.0	—
M45 ×3.0	42.0	—
M45 ×2.0	43.0	—
M45 ×1.5	43.5	—
M48 ×4.0	44.0	—
M48 ×3.0	45.0	—
M48 ×2.0	46.0	—
M48 ×1.5	46.5	—
M50 ×3.0	47.0	—
M50 ×2.0	48.0	—
M50 ×1.5	48.5	—

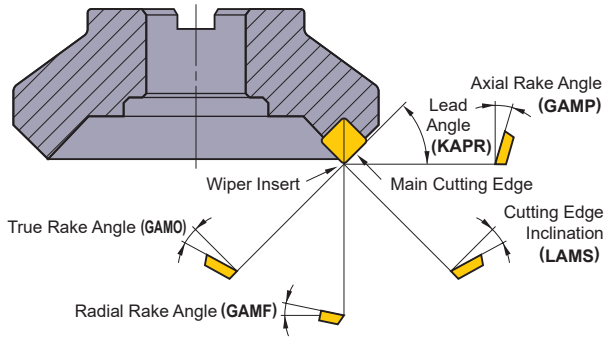
Note 1) When using the drill diameters shown in this table, that the processed hole should be measured since the size accuracy of a drill hole may change due to the drilling condition, and that if found to be inappropriate for a prepared hole, the drill diameter must be corrected accordingly.

TROUBLE SHOOTING FOR FACE MILLING

Trouble		Factors	Insert Grade Selection: Select a harder grade	Insert Grade Selection: Select a tougher grade	Insert Grade Selection: Select a grade with better thermal shock resistance	Insert Grade Selection: Select a grade with better adhesion resistance	Cutting Conditions: Cutting speed (Up ↗ / Down ↘)	Cutting Conditions: Feed (Up ↗ / Down ↘)	Cutting Conditions: Depth of cut (Up ↗ / Down ↘)	Cutting Conditions: Engage angle (↗ Up)	Cutting Conditions: Coolant: Do not use water-soluble cutting fluid	Cutting Conditions: Coolant: Determine dry or wet cutting	Style and Design of the Tool: Rake (Up ↗ / Down ↘)	Style and Design of the Tool: Corner angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing strengthens the cutting edge (Up ↗ / Down ↘)	Style and Design of the Tool: Cutter diameter (Up ↗ / Down ↘)	Style and Design of the Tool: Number of teeth (Smaller ↘ / Larger ↗)	Style and Design of the Tool: Wider chip pocket	Style and Design of the Tool: Use of a wiper insert	Style and Design of the Tool: Improve run-out accuracy	Style and Design of the Tool: Cutter rigidity	Machine, Installation of Tool: Increase clamping rigidity of the tool and workpiece	Machine, Installation of Tool: Decrease overhang	Machine, Installation of Tool: Decrease power and machine backlash
Deterioration of Tool Life	Insert wear quickly generated	Improper tool grade	●																					
		Improper cutting edge geometry											↗●	↗●	↘●					●				
		Improper cutting speed					↘●					● Wet												
	Chipping or fracturing of cutting edge	Improper tool grade		●																				
		Improper cutting conditions						↘●	↘●															
		Lack of cutting edge strength.													↗●									
		Thermal crack occurs			●		↘●	↘●	↘●		●	● Dry												
		Build-up edge occurs				●	↗●	↗●			●	● Wet												
		Lack of rigidity																			●	●	●	●
Deterioration of Surface Finish	Poor finished surface	Improper cutting conditions	●				↘●	↘●	↘●															
		Welding occurs				●	↗●				●	● Wet	↗●		↘●									
		Poor run-out accuracy																	●	●				
		Chattering					↘●	↘●	↘●	↗●			↗●		↘●		↘●				●	●	●	●
	Not parallel or irregular surface	Workpiece bending						↘●	↘●				↗●	↘●	↘●		↘●					●		
		Tool clearance																			●	●	●	●
		Large back force											↗●	↘●	↘●		↘●							
Burr, Workpiece Chipping	Burrs, chipping	Chip thickness is too large					↗●	↘●	↘●															
		Cutter diameter is too large								↗●						↘●								
		Low sharpness											↗●		↘●									
		A large corner angle												↘●										
	Workpiece edge chipping	Improper cutting conditions						↘●	↘●															
		Low sharpness											↗●		↘●									
		A small corner angle												↗●										
		Chattering					↘●	↘●	↘●	↗●			↗●		↘●		↘●				●	●	●	●
Chip Control	Poor chip dispersal, chip jamming and chip packing	Welding occurs					↗●																	
		Chip thickness is too thin					↗●	↗●																
		Cutter diameter is too small														↘●								
		Poor chip disposal									●	● Wet					↘●	●						

FUNCTION OF TOOL FEATURES FOR FACE MILLING

■FUNCTION OF EACH CUTTING EDGE ANGLE IN FACE MILLING

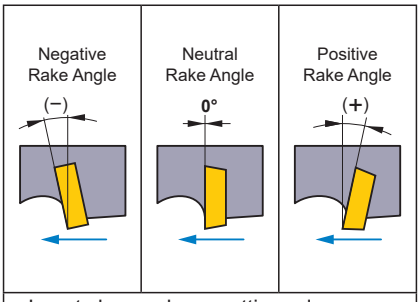


Each Cutting Edge Angle in Face Milling

Type of Angle	Symbol	Function	Effect
Axial Rake Angle	GAMP	Determines chip disposal direction.	**Positive** : Excellent machinability.
Radial Rake Angle	GAMF	Determines sharpness.	**Negative** : Excellent chip disposal.
Lead Angle	KAPR	Determines chip thickness.	**Small** : Thin chips and small cutting impact. Large back force.
True Rake Angle	GAMO	Determines actual sharpness.	**Positive (large)** : Excellent machinability. Minimal welding. **Negative (large)** : Poor machinability. Strong cutting edge.
Cutting Edge Inclination	LAMS	Determines chip disposal direction.	**Positive (large)** : Excellent chip disposal. Low cutting edge strength.

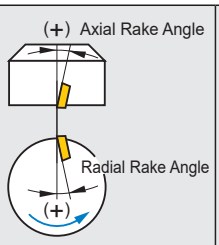
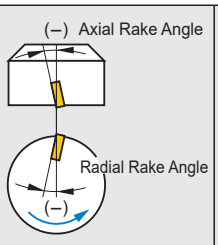
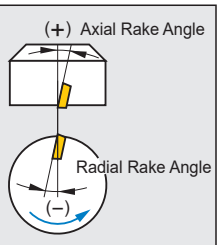
■STANDARD INSERTS

● Positive and Negative Rake Angle

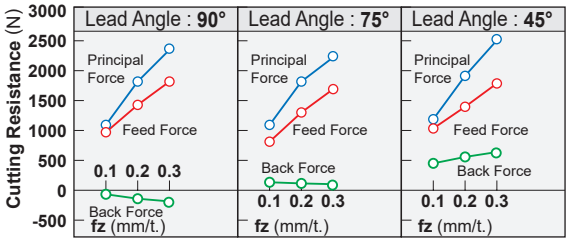


· Insert shape whose cutting edge precedes is a positive rake angle.
· Insert shape whose cutting edge follows is a negative rake angle.

● Standard Cutting Edge Shape

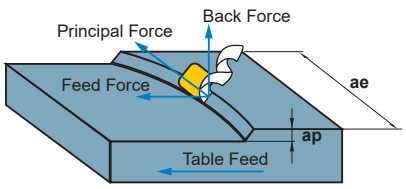
Standard Cutting Edge Combinations		 Double Positive (DP Edge Type)	 Double Negative (DN Edge Type)	 Negative/Positive (NP Edge Type)
Axial Rake Angle (GAMP)		Positive (+)	Negative (−)	Positive (+)
Radial Rake Angle (GAMF)		Positive (+)	Negative (−)	Negative (−)
Insert Used		Positive Insert (One Sided Use)	Negative Insert (Double-Sided Use)	Positive Insert (One Sided Use)
Workpiece Material	Steel	●	–	●
	Cast Iron	–	●	●
	Aluminium Alloy	●	–	–
	Difficult-to-Cut Material	●	–	●

■LEAD ANGLE (KAPR) AND CUTTING CHARACTERISTICS



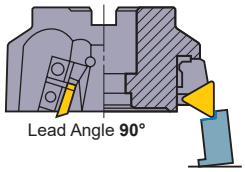
Workpiece : **JIS SCM440 (281HB)**
Tool : **ø125mm** Single Insert
Cutting Conditions : **vc=125.6m/min ap=4mm ae=110mm**

Cutting Resistance Comparison between Different Insert Shapes

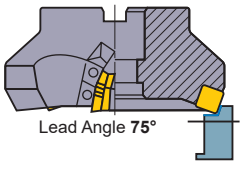


Three Cutting Resistance Forces in Milling

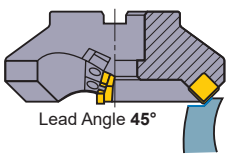
Lead Angle 0°
Back force is in the minus direction. Lifts the workpiece when workpiece clamp rigidity is low.



Lead Angle 15°
Lead angle 75° is recommended for face milling of workpieces with low rigidity such as thin workpieces.



Lead Angle 45°
The largest back force.
Bends thin workpieces and lowers cutting accuracy.
*Prevents workpiece edge chipping when cast iron cutting.



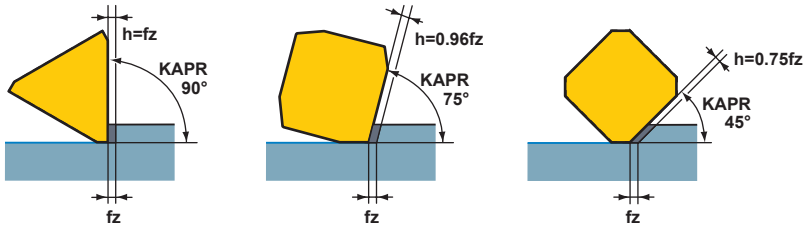
* Principal force : Force is in the opposite direction of face milling rotation.
* Back force : Force that pushes in the axial direction.
* Feed force : Force is in the feed direction and is caused by table feed.

FUNCTION OF TOOL FEATURES FOR FACE MILLING

■APPROACH ANGLE AND THE TOOL LIFE

● Approach Angle and Chip Thickness

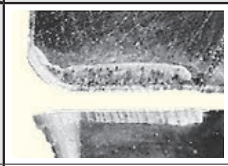
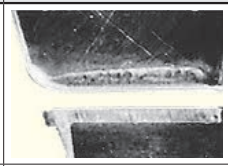
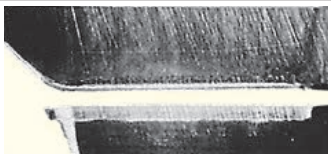
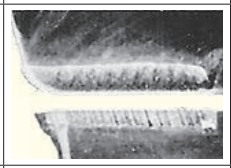
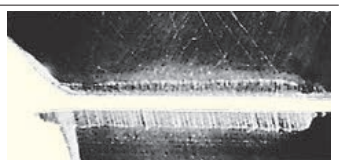
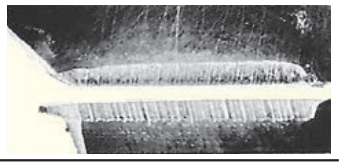
When the depth of cut and feed per tooth, fz, are fixed, the smaller the lead angle (KAPR) is, then the thinner the chip thickness (h) becomes (for a 45° KAPR, it is approx. 75% that of a 90° KAPR). This can be seen in below. Therefore as the KAPR increases, the cutting resistance decreases resulting in longer tool life. Note however, if the chip thickness is too large then the cutting resistance can increase leading to vibrations and shortened tool life.



Effects on chip thickness due to the variation of lead angles

● Approach Angle and Face Wear

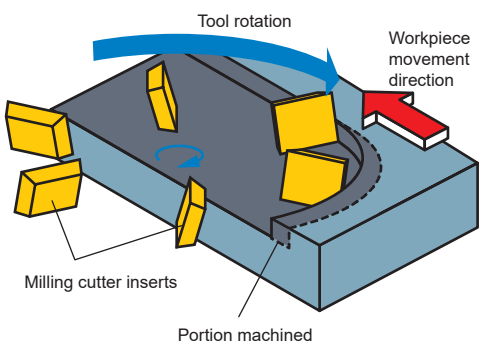
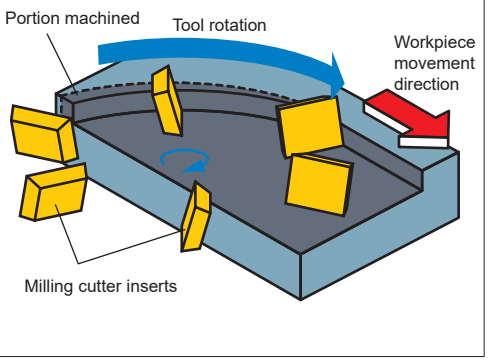
Below shows wear patterns for different lead angles. When comparing crater wear for 90° and 45° lead angles, it can be clearly seen that the ctater wear for 90° lead angle is larger.

	Lead Angle **90°**	Lead Angle **75°**	Lead Angle **45°**
vc=100m/min Tc=69min			
vc=125m/min Tc=55min			
vc=160m/min Tc=31min			

Workpiece : **SNCM439 287HB**
Tools : **DC=125mm**
Insert : **M20**Cemented Carbide
Cutting Conditions : **ap=3.0mm**
ae=110mm
fz=0.2mm/t.
Dry Cutting

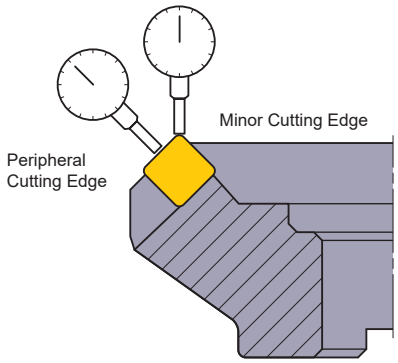
■UP AND DOWN CUT (CLIMB) MILLING

When choosing a method to machine, up cutting or down cut milling (climb milling) is decided by the conditions of the machine tool, the milling cutter and the application. However, it is said that in terms of tool life, down cut (climb) milling is more advantageous.

Up Cut	Down Cut
	

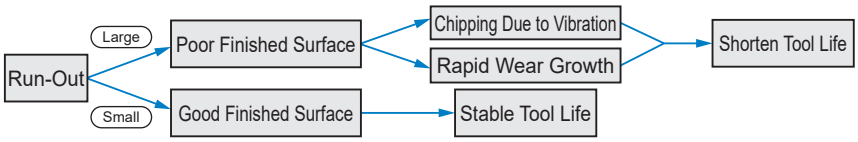
■FINISHED SURFACE

● Cutting Edge Run-Out Accuracy

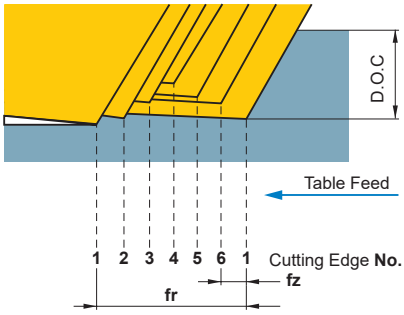


Cutting Edge Run-Out and Accuracy in Face Milling

Cutting edge run-out accuracy of indexable inserts on the cutter body greatly affects the surface finish and tool life.



● Improve Finished Surface Roughness



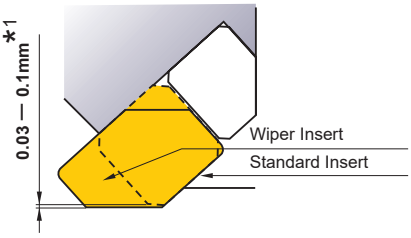
fz : Feed per Tooth
fr : Feed per Revolution

Sub Cutting Edge Run-Out and Finished Surface

Since Mitsubishi Materials' normal sub cutting edge width is 1.4mm, and the sub cutting edges are set parallel to the face of a milling cutter, theoretically the finished surface accuracy should be maintained even if run-out accuracy is low.

Actual Problems	Countermeasure
· Cutting edge run-out. · Sub cutting edge inclination. · Milling cutter body accuracy. · Spare parts accuracy. · Welding, vibration, chattering.	Wiper Insert

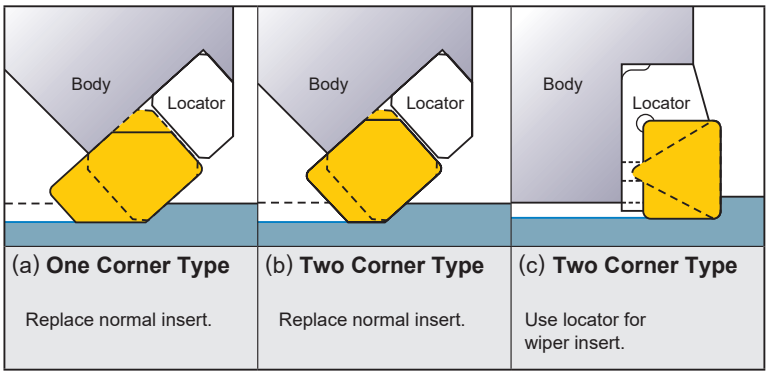
* Machine a surface that has already been per-machined in order to produce smooth finished surface.



· Replace one or two normal inserts with wiper inserts.
· Wiper inserts be set to protrude by 0.03—0.1mm from the standard inserts.

*1.Value depends on the cutting edge and insert combination.

● How to Set a Wiper Insert



(a) **One Corner Type**	(b) **Two Corner Type**	(c) **Two Corner Type**
Replace normal insert.	Replace normal insert.	Use locator for wiper insert.

· Sub cutting edge length has to be longer than the feed per revolution.
* Too long sub cutting edge causes chattering.
· When the cutter diameter is large and feed per revolution is longer than the sub cutting edge of the wiper insert, use two or three wiper inserts.
· When using more than 1 wiper inserts, eliminate run-out of wiper inserts.
· Use a high hardness grade (high wear resistance) for wiper inserts.

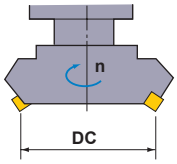
FORMULAE FOR FACE MILLING

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{1000} \text{ (m/min)}$$

vc (m/min) : Cutting Speed
π (3.14) : Pi
DC (mm) : Cutter Diameter
n (min^{-1}) : Main Axis Spindle Speed

*Divide by 1000 to change to m from mm.



(Problem) What is the cutting speed when main axis spindle speed is 350min^{-1} and the cutter diameter is ϕ125 ?

(Answer) Substitute π=3.14, DC=125, n=350 into the formula.

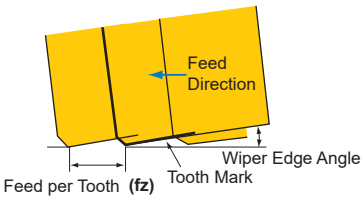
$$vc = \frac{\pi \cdot DC \cdot n}{1000} = \frac{3.14 \times 125 \times 350}{1000} = 137.4 \text{m/min}$$

The cutting speed is 137.4m/min.

■FEED PER TOOTH (fz)

$$fz = \frac{vf}{z \cdot n} \text{ (mm/t.)}$$

fz (mm/t.) : Feed per Tooth
z : Insert Number
vf (mm/min) : Table Feed per Min.
n (min^{-1}) : Main Axis Spindle Speed (Feed per Revolution **fr = z x fz**)



(Problem) What is the feed per tooth when the main axis spindle speed is 500min^{-1}, number of insert is 10, and table feed is 500mm/min ?

(Answer) Substitute the above figures into the formula.

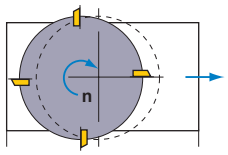
$$fz = \frac{vf}{z \times n} = \frac{500}{10 \times 500} = 0.1 \text{mm/t.}$$

The answer is 0.1mm/t.

■TABLE FEED (vf)

$$vf = fz \cdot z \cdot n \text{ (mm/min)}$$

vf (mm/min) : Table Feed per Min.
z : Insert Number
fz (mm/t.) : Feed per Tooth
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the table feed when feed per tooth is 0.1mm/t., number of insert is 10, and main axis spindle speed is 500min^{-1}?

(Answer) Substitute the above figures into the formula.

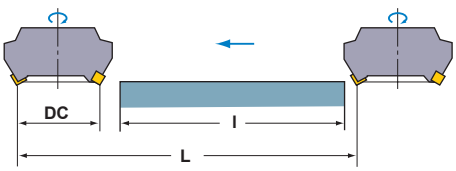
$$vf = fz \times z \times n = 0.1 \times 10 \times 500 = 500 \text{mm/min}$$

The table feed is 500mm/min.

■CUTTING TIME (Tc)

$$Tc = \frac{L}{vf} \text{ (min)}$$

Tc (min) : Cutting Time
vf (mm/min) : Table Feed per Min.
L (mm) : Total Table Feed Length (Workpiece Length: (**l**)+Cutter Diameter : (**DC**))



(Problem) What is the cutting time required for finishing 100mm width and 300mm length surface of a cast iron (JIS FC200) block when the cutter diameter is ϕ200mm, the number of inserts is 16, the cutting speed is 125m/min, and feed per tooth is 0.25mm. (spindle speed is 200min^{-1})

(Answer) Calculate table feed per min vf=0.25×16×200=800mm/min
Calculate total table feed length. L=300+200=500mm
Substitute the above answers into the formula.

$$Tc = \frac{500}{800} = 0.625 \text{ (min)}$$

0.625×60=37.5 (sec). The answer is 37.5 sec.

■CUTTING POWER (Pc)

$$Pc = \frac{ap \cdot ae \cdot vf \cdot Kc}{60 \times 10^6 \times \eta}$$

Pc (kW)	: Actual Cutting Power	**ap (mm)**	: Depth of Cut
ae (mm)	: Cutting Width	**vf (mm/min)**	: Table Feed per Min.
Kc (MPa)	: Specific Cutting Force	**η**	: (Machine Coefficient)

(Problem) What is the cutting power required for milling tool steel at a cutting speed of 80m/min. With depth of cut 2mm, cutting width 80mm, and table feed 280mm/min by ϕ250 cutter with 12 inserts. Machine coefficient 80%.

(Answer) First, calculate the spindle speed in order to obtain feed per tooth.

$$n = \frac{1000vc}{\pi DC} = \frac{1000 \times 80}{3.14 \times 250} = 101.91 min^{-1}$$

Feed per Tooth $$fz = \frac{vf}{z \times n} = \frac{280}{12 \times 101.9} = 0.228 mm/t.$$

Substitute the specific cutting force into the formula.

$$Pc = \frac{2 \times 80 \times 280 \times 1800}{60 \times 10^6 \times 0.8} = 1.68\ kW$$

● Kc

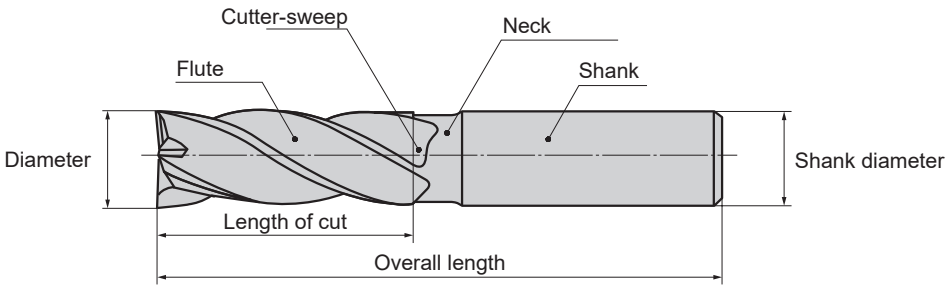
Workpiece Material	Tensile Strength (MPa) and Hardness	Specific Cutting Force Kc (MPa)				
		0.1mm/t.	0.2mm/t.	0.3mm/t.	0.4mm/t.	0.6mm/t.
Mild Steel	**520**	2200	1950	1820	1700	1580
Medium Steel	**620**	1980	1800	1730	1600	1570
Hard Steel	**720**	2520	2200	2040	1850	1740
Tool Steel	**670**	1980	1800	1730	1700	1600
Tool Steel	**770**	2030	1800	1750	1700	1580
Chrome Manganese Steel	**770**	2300	2000	1880	1750	1660
Chrome Manganese Steel	**630**	2750	2300	2060	1800	1780
Chrome Molybdenum Steel	**730**	2540	2250	2140	2000	1800
Chrome Molybdenum Steel	**600**	2180	2000	1860	1800	1670
Nickel Chrome Molybdenum Steel	**940**	2000	1800	1680	1600	1500
Nickel Chrome Molybdenum Steel	**352HB**	2100	1900	1760	1700	1530
Austenitic Stainless Steel	**155HB**	2030	1970	1900	1770	1710
Cast Iron	**520**	2800	2500	2320	2200	2040
Hard Cast Iron	**46HRC**	3000	2700	2500	2400	2200
Meehanite Cast Iron	**360**	2180	2000	1750	1600	1470
Grey Cast Iron	**200HB**	1750	1400	1240	1050	970
Brass	**500**	1150	950	800	700	630
Light Alloy (Al-Mg)	**160**	580	480	400	350	320
Light Alloy (Al-Si)	**200**	700	600	490	450	390
Light Alloy (Al-Zn-Mg-Cu)	**570**	880	840	840	810	720

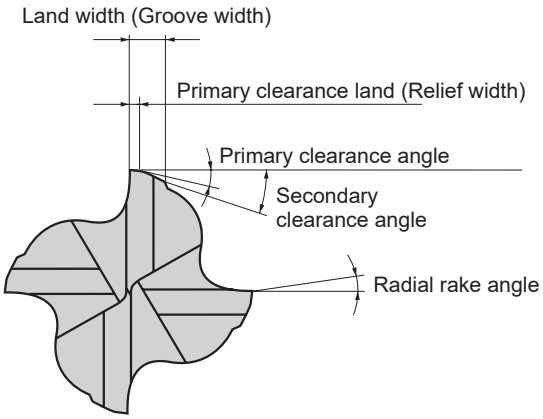
TROUBLE SHOOTING FOR END MILLING

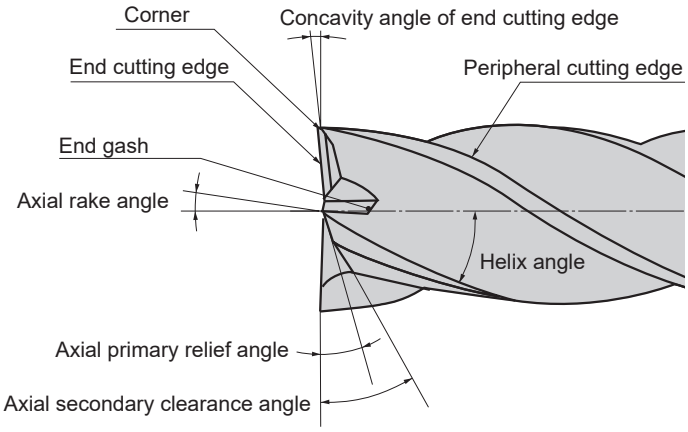
Trouble	Factors	Solution: Insert Grade Selection — Coated tool	Cutting Conditions — Cutting speed (Up↗ / Down↘)	Feed (Up↗ / Down↘)	Depth of cut (Up↗ / Down↘)	Pick feed (↘ Down)	Down cut	Use air blow	Coolant — Increase coolant quantity	Coolant — Do not use water-soluble cutting fluid	Coolant — Determine dry or wet cutting	Style and Design of the Tool — Helix angle (Up↗ Larger / Down↘ Smaller)	Insert number (Up↗ Larger / Down↘ Smaller)	Concavity angle of end cutting edge (Up↗ Larger / Down↘ Smaller)	Tool diameter (Up↗ Larger / Down↘ Smaller)	Cutter rigidity	Wider chip pocket	Machine, Installation of Tool — Shorten tool overhang	Increase tool installation accuracy	Increase spindle collet run-out accuracy	Collet inspection and exchange	Increase chuck clamping power	Increase work clamping rigidity
Deterioration of Tool Life	Large peripheral cutting edge wear	Uncoated end mill is used											↗●										
		A small number of cutting edges											↗●										
		Improper cutting conditions	●↘							●													
		Up cut milling is used					Down Cut																
	Severe chipping	Improper cutting conditions																					
		Fragile cutting edge														●							
		Insufficient clamping force																			●	●	
		Low clamping rigidity																●	●	●	●	●	●
	Breakage during cutting	Improper cutting conditions			●↘																		
		Low end mill rigidity													↗●	●							
		Overhang longer than necessary			●↘													●					
		Chip jamming							●								●						
Deterioration of Surface Finish	Vibration during cutting	Improper cutting conditions	●↘	●↘																			
		Low end mill rigidity										↗●	↗●		↗●	●							
		Low clamping rigidity																●	●	●	●	●	●
	Poor surface finish on walls	Large cutting edge wear	●																				
		Improper cutting conditions	●↘		●↘																		
		Chip packing.						●	●		Wet												
	Poor surface finish on faces	The end cutting edge does not have a concave angle		●↘	●↘									↗●									
		Large pick feed				●↘																	
	Out of vertical	Large cutting edge wear	●																				
		Improper cutting conditions		●↘	●↘																		
		Lack of end mill rigidty										↗●	↗●		↗●	●							
	Poor dimensional accuracy	Improper cutting conditions	●↘	●↘	●↘																		
		Low clamping rigidity																●	●	●	●	●	●
Burrs, Chipping, etc.	Burr or chipping occurs	Improper cutting conditions		●↘	●↘																		
		Large helix angle										●↘											
	Quick bur formation	Notch wear	●																				
		Improper cutting conditions	●↘	↗●																			
Poor Chip Dispersal	Chip packing	Metal removal too large		●↘	●↘																		
		Lack of chip pocket											●↘				●						

END MILL TERMINOLOGY

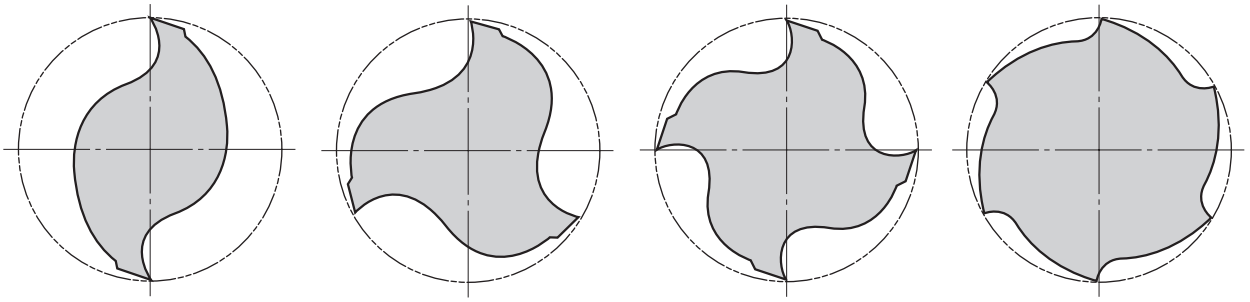
■END MILL TERMINOLOGY







■COMPARISON OF SECTIONAL SHAPE AREA OF CHIP POCKET



2-flutes
50%

3-flutes
45%

4-flutes
40%

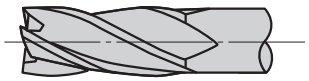
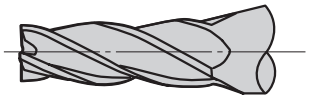
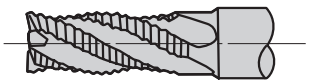
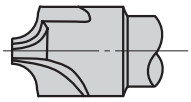
6-flutes
20%

■CHARACTERISTICS AND APPLICATIONS OF DIFFERENT-NUMBER-OF-FLUTE END MILLS

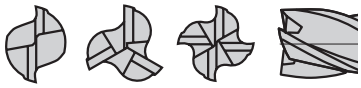
		2-flutes	3-flutes	4-flutes	6-flutes
Feature	Advantage	Chip disposability is excellent. Suitable for sinking. Low cutting resistance.	Chip disposability is excellent. Suitable for sinking.	High rigidity	High rigidity. Superior cutting edge durability.
	Fault	Low rigidity	Diameter is not easily measured.	Chip disposability is poor.	Chip disposability is poor.
Usage		Slotting, side milling, sinking etc. Wide range of use.	Slotting, side milling Heavy cutting, finishing	Shallow slotting, side milling Finishing	High Hardness Material Shallow slotting, side milling

TYPES AND SHAPES OF END MILL

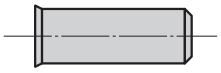
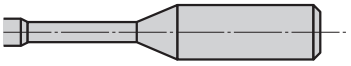
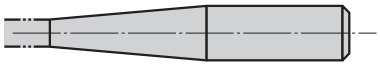
■Peripheral Cutting Edge

Kind	Shape	Feature
Ordinary Flute		Ordinary flute type is most generally used for the slotting, side milling, and the shoulder milling, etc. Can be used for roughing, semi-finishing, and the finishing.
Tapered Flute		A tapered fute is used for milling mould drafts and angled faces.
Roughing Flute		Because a roughing tooth has a wave-like form and produces small chips. Cutting resistance is low, and is suitable for roughing. Not suitable for finishing. The tooth face is re-grindable.
Formed Flute		A corner radius cutter is shown. An infinite range of form cutters can be produced.

■End Cutting Edge

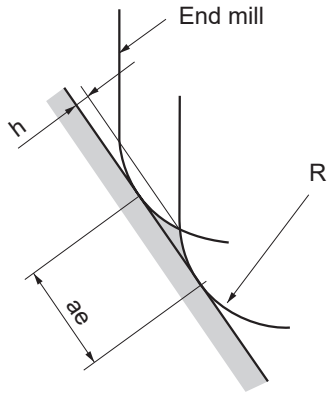
Kind	Shape	Feature
Square End (Centre With Hole)		This is generally used for slotting, side milling, and shoulder milling. Sinking is not possible. Grinding is centre supported, making re-grinding accurate.
Square End (Centre Cut)		It is generally used for slotting, side milling, and shoulder milling. Vertical cutting can be performed. Re-grinding is possible.
Ball End		Suitable for profile machining and pick feed milling.
End Radius		For corner radius milling and contouring. Efficient small corner radius milling due to large diameter and small corner radius.

■Shank and Neck Parts

Kind	Shape	Feature
Standard (Straight Shank)		For general use.
Long Shank		For deep slotting and has a long shank, so that adjustment of the overhang is possible.
Long Neck		For deep slotting and small diameter end mills, also suitable for boring.
Taper Neck		For best performance in deep slotting and on mould drafts.

PITCH SELECTION OF PICK FEED

■PICK FEED MILLING (CONTOURING) WITH BALL NOSE END MILLS AND END MILLS WITH CORNER RADIUS



$$h = R \cdot \left[1 - \cos \left\{ \sin^{-1} \left(\frac{ae}{2R} \right) \right\} \right]$$

R : Radius of Ball Nose(RE), Corner Radius(RE)

ae : Pick Feed

h : Cusp Height

■CORNER R OF END MILLS AND CUSP HEIGHT BY PICK FEED

Unit : mm

ae / R	Pick Feed									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.5	0.003	0.010	0.023	0.042	0.067	0.100	–	–	–	–
1	0.001	0.005	0.011	0.020	0.032	0.046	0.063	0.083	0.107	–
1.5	0.001	0.003	0.008	0.013	0.021	0.030	0.041	0.054	0.069	0.086
2	0.001	0.003	0.006	0.010	0.016	0.023	0.031	0.040	0.051	0.064
2.5	0.001	0.002	0.005	0.008	0.013	0.018	0.025	0.032	0.041	0.051
3		0.002	0.004	0.007	0.010	0.015	0.020	0.027	0.034	0.042
4		0.001	0.003	0.005	0.008	0.011	0.015	0.020	0.025	0.031
5		0.001	0.002	0.004	0.006	0.009	0.012	0.016	0.020	0.025
6		0.001	0.002	0.003	0.005	0.008	0.010	0.013	0.017	0.021
8			0.001	0.003	0.004	0.006	0.008	0.010	0.013	0.016
10			0.001	0.002	0.003	0.005	0.006	0.008	0.010	0.013
12.5			0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010

ae / R	Pick Feed									
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0.5	–	–	–	–	–	–	–	–	–	–
1	–	–	–	–	–	–	–	–	–	–
1.5	0.104	–	–	–	–	–	–	–	–	–
2	0.077	0.092	0.109	–	–	–	–	–	–	–
2.5	0.061	0.073	0.086	0.100	–	–	–	–	–	–
3	0.051	0.061	0.071	0.083	0.095	0.109	–	–	–	–
4	0.038	0.045	0.053	0.062	0.071	0.081	0.091	0.103	–	–
5	0.030	0.036	0.042	0.049	0.057	0.064	0.073	0.082	0.091	0.101
6	0.025	0.030	0.035	0.041	0.047	0.054	0.061	0.068	0.076	0.084
8	0.019	0.023	0.026	0.031	0.035	0.040	0.045	0.051	0.057	0.063
10	0.015	0.018	0.021	0.025	0.028	0.032	0.036	0.041	0.045	0.050
12.5	0.012	0.014	0.017	0.020	0.023	0.026	0.029	0.032	0.036	0.040

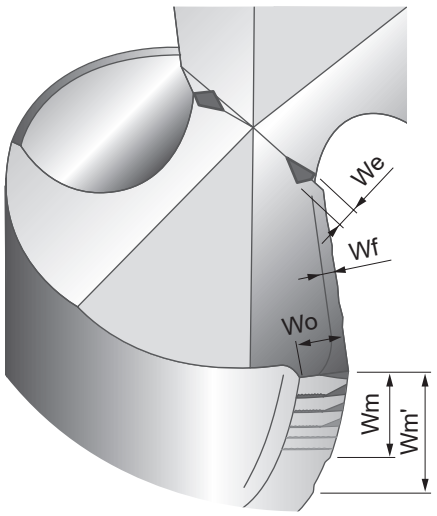
TROUBLE SHOOTING FOR DRILLING

Trouble		Factors	Cutting Conditions: Cutting speed Up ↗ Down ↘	Cutting Conditions: Feed Up ↗ Down ↘	Lower feed at initial cutting	Lower feed when breaking through	Step feed	Increase accuracy of prep-hole and depth	Coolant: Increase oil ratio	Coolant: Increase volume	Coolant: Increase coolant pressure	Style and Design of the Tool: Chisel width Up ↗ Down ↘	Style and Design of the Tool: Honing width Up ↗ Down ↘	Style and Design of the Tool: Core thickness Up ↗ Down ↘	Shorten flute length	Decrease lip height	Use internal coolant type drill	Change to a drill with X type thinning	Machine, Installation of Tool: Increase tool installation accuracy	Machine, Installation of Tool: Shorten tool overhang	Machine, Installation of Tool: Flat workpiece face	Machine, Installation of Tool: Increase work clamping rigidity	Machine, Installation of Tool: Reduce machine backlash and increase rigidity
Deterioration of Tool Life	Drill breakage	Lack of drill rigidity												●	●								
		Improper cutting conditions		● ↘																			
		Large deflection of the tool holder																●					●
		Workpiece face is inclined																		●			
	Large wear at the peripheral cutting edge and along the land	Improper cutting conditions	● ↘																				
		An increase in temperature at the cutting point							●	●							●						
		Poor run-out accuracy																●					
	Chipping of the peripheral cutting edge	Improper cutting conditions		● ↘			●																
		Large deflection of the tool holder																●					●
		chattering, vibration											● ↘						●		●		●
	Chisel edge chipping	The chisel edge width is too wide										● ↘											
		Poor entry			●																		
		Chattering, vibration											● ↘						●		●		●
Deterioration of Hole Accuracy	Hole diameter increases	Lack of drill rigidity												●	●								
		Improper drill geometry														●							
	Hole diameter becomes smaller	An increase in temperature at the cutting point							●	●							●						
		Improper cutting conditions	● ↘																				
		Improper drill geometry														●							
	Poor straightness	Lack of drill rigidity												●	●								
		Large deflection of the tool holder																●					●
		Poor guiding properties						●															
	Poor hole positioning accuracy, roundness and surface finish	Lack of drill rigidity												●	●								
		Poor entry															●						
		Improper cutting conditions			●																		
		Large deflection of the tool holder																●					●
Burrs	Burrs at the hole exit	Improper drill geometry											● ↘										
		Improper cutting conditions				●																	
Poor Chip Dispersal	Long chips	Improper cutting conditions		● ↗				●															
		Poor chip disposal								●	●			● ↘			●						
	Chip jamming	Improper cutting conditions	● ↘	● ↘				●															
		Poor chip disposal								●	●			● ↘			●						

DRILL WEAR AND CUTTING EDGE DAMAGE

■DRILL WEAR CONDITION

The table below shows a simple drawing depicting the wear of a drill's cutting edge. The generation and the amount of wear differ according to the workpiece materials and cutting conditions used. But generally, the peripheral wear is largest and determines a drill tool life. When regrinding, the flank wear at the point needs to be ground away completely. Therefore, if there is large wear more material needs to be ground away to renew the cutting edge.



We : **Chisel edge wear width**

Wf : **Flank Wear (The middle of the cutting edge)**

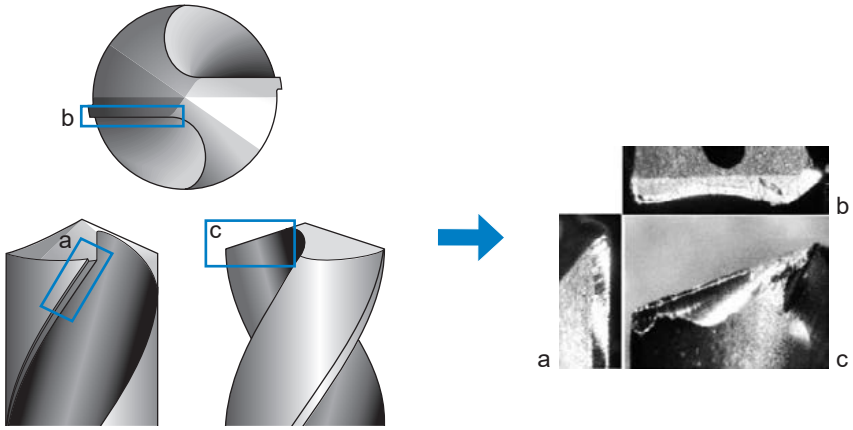
Wo : **Outer corner wear width**

Wm : **Margin wear width**

Wm' : **Margin wear width (Leading edge)**

■CUTTING EDGE DAMAGE

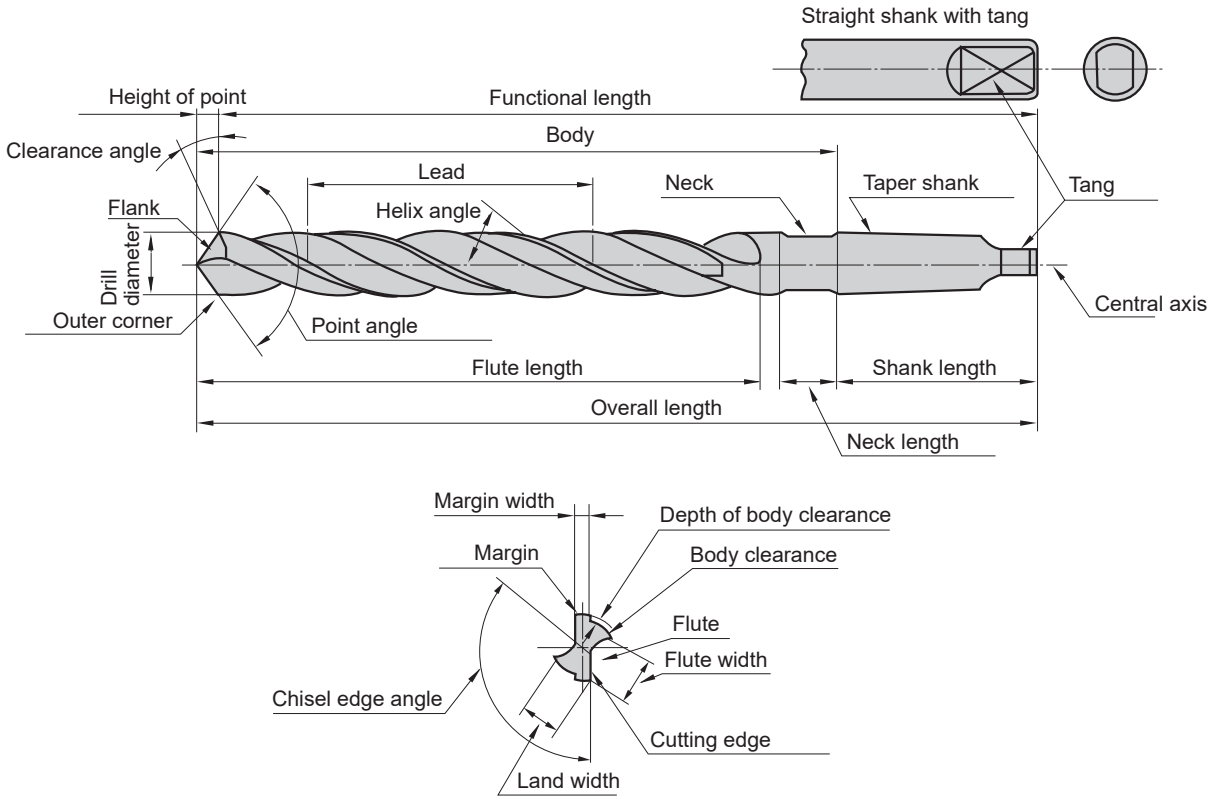
When drilling, the cutting edge of the drill can suffer from chipping, fracture and abnormal damage. In such cases, it is important to take a closer look at the damage, investigate the cause and take countermeasures.



Cutting edge damage

DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

■NAMES OF EACH PART OF A DRILL



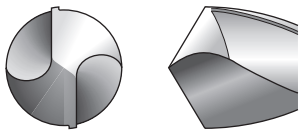
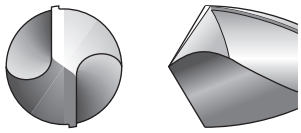
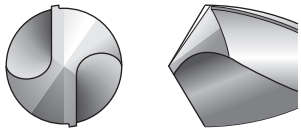
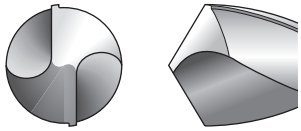
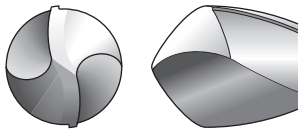
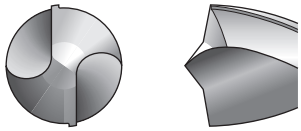
■SHAPE SPECIFICATION AND CUTTING CHARACTERISTICS

Helix Angle	Is the inclination of the flute with respect to the axial direction of a drill, which corresponds to the rake angle of a bit. The rake angle of a drill differs according to the position of the cutting edge, and it decreases greatly as the circumference approaches the centre.The chisel edge has a negative rake angle, crushing the work. **High-hardness material** **Small** ◀·· **Rake angle** ··▶ **Large** **Soft material** (Aluminium, etc.)
Flute Length	It is determined by depth of hole, bush length, and regrinding allowance. Since the influence on the tool life is great, it is necessary to minimize it as much as possible.
Point Angle	In general, the angle is 118° which is set differently to various applications. **Soft material with good machinability** **Small** ◀·· **Point angle** ··▶ **Large** **For hard material and high efficiency machining**
Web Thickness	It is an important element that determines the rigidity and chip raking performance of a drill. The web thickness is set according to applications. Small cutting resistance Low rigidity Good chip raking performance Machinable material **Thin** ◀·· **Web thickness** ··▶ **Thick** Large cutting resistance High rigidity Poor chip raking performance High-hardness material, cross hole drilling, etc.
Margin	The tip determines the drill diameter and functions as a drill guide during drilling. The margin width is determined in consideration of friction during hole drilled. **Poor guiding performance** **Small** ◀·· **Margin width** ··▶ **Large** **Good guiding performance**
Diameter Back Taper	To reduce friction with the inside of the drilled hole, the portion from the tip to the shank is tapered slightly. The degree is usually represented by the quantity of reduction in the diameter with respect to the flute length, which is approx. 0.04—0.1mm. It is set at a larger value for high efficiency drills and the workpiece material that allows drilled holes.

■CUTTING EDGE GEOMETRY AND ITS INFLUENCE

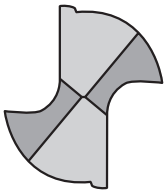
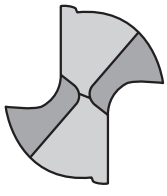
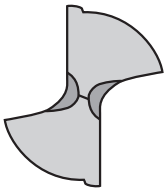
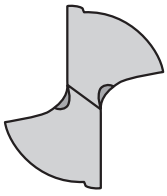
As shown in the table below, it is possible to select the most suitable cutting edge geometry for different applications. If the most suitable cutting edge geometry is selected then higher machining efficiency and higher hole accuracy can be obtained.

●Cutting Edge Shapes

Grinding Name	Shape	Features and Effect	Application
Conical		• The flank is conical and the clearance angle increases toward the centre of the drill.	• General Use
Flat		• The flank is flat. • Easy grinding.	• Mainly for small diameter drills.
Three Flank Angles		• As there is no chisel edge, the results are high centripetal force and small hole oversize. • Requires a special grinding machine. • Surface grinding of three sides.	• For drilling operations that require high hole accuracy and positioning accuracy.
Spiral Point		• To increase the clearance angle near the centre of the drill, conical grinding combined with irregular helix. • S type chisel edge with high centripetal force and machining accuracy.	• For drilling that requires high accuracy.
Radial Lip		• The cutting edge is ground radial with the aim of dispersing load. • High machining accuracy and finished surface roughness. • For through holes, small burrs on the base. • Requires a special grinding machine.	• Cast Iron, Aluminium Alloy • For cast iron plates. • Steel
Centre Point Drill		• This geometry has two-stage point angle for better concentricity and a reduction in shock when exiting the workpiece.	• For thin sheet drilling.

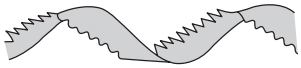
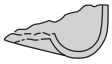
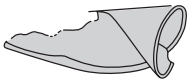
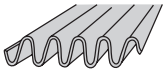
■WEB THINNING

The rake angle of the cutting edge of a drill reduces toward the centre, and it changes into a negative angle at the chisel edge. During drilling, the centre of a drill crushes the work, generating 50−70% of the cutting resistance. Web thinning is very effective for reduction in the cutting resistance of a drill, early removal of cut chips at the chisel edge, and better initial bite.

Shape	 **X type**	 **XR type**	 **S type**	 **N type**
Features	The thrust load substantially reduces, and the bite performance improves. This is effective when the web is thick.	The initial performance is slightly inferior to that of the X type, but the cutting edge is hard and the applicable range of work is wide.	Popular design, easy cutting type.	Effective when the web is comparatively thick.
Major Applications	General drilling and deep hole drilling.	Long life. General drilling and stainless steel drilling.	General drilling for steel, cast iron, and non-ferrous metal.	Deep hole drilling.

DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

■DRILLING CHIPS

Types of Chips	Shape	Features and Ease of Raking
Conical Spiral		Fan-shaped chips cut by the cutting edge are curved by the flute. Chips of this type are produced when the feeding rate of ductile material is small. If the chip breaks after several turns, the chip raking performance is satisfactory.
Long Pitch		The generated chip comes out without coiling. It will easily coil around the drill.
Fan		This is a chip broken by the restraint caused by the drill flute and the wall of a drilled hole. It is generated when the feed rate is high.
Segment		A conical spiral chip that is broken before the chip grows into the long-pitch shape by the restraint caused by the wall of the drilled hole due to the insufficiency of ductility. Excellent chip disposal and chip discharge.
Zigzag		A chip that is buckled and folded because of the shape of flute and the characteristics of the material. It easily causes chip packing at the flute.
Needle		Chips broken by vibration or broken when brittle material is curled with a small radius. The raking performance is satisfactory, but these chips can pack closely creating.

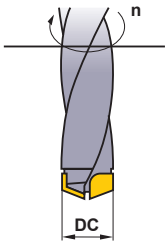
FORMULAE FOR DRILLING

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{1000} \text{ (m/min)}$$

vc (m/min) : Cutting Speed
π (3.14) : Pi
DC (mm) : Drill Diameter
n (min^{-1}) : Main Axis Spindle Speed

*Divide by 1,000 to change to m from mm.



(Problem) What is the cutting speed when main axis spindle speed is 1350min^{-1} and drill diameter is 12mm ?

(Answer) Substitute π=3.14, DC=12, n=1350 into the formula

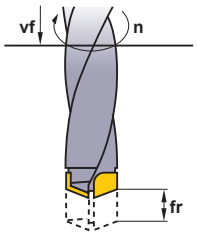
$$vc = \frac{\pi \cdot DC \cdot n}{1000} = \frac{3.14 \times 12 \times 1350}{1000} = 50.9 \text{m/min}$$

The cutting speed is 50.9m/min.

■FEED OF THE MAIN SPINDLE (vf)

$$vf = fr \cdot n \text{ (mm/min)}$$

vf (mm/min) : Feed Speed of the Main Spindle (Z axis)
fr (mm/rev) : Feed per Revolution
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the spindle feed (vf) when the feed per revolution is 0.2mm/rev and main axis spindle speed is 1350min^{-1} ?

(Answer) Substitute fr=0.2, n=1350 into the formula

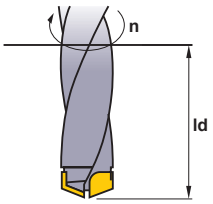
$$vf = fr \times n = 0.2 \times 1350 = 270 \text{mm/min}$$

The spindle feed is 270mm/min.

■DRILLING TIME (Tc)

$$Tc = \frac{ld \cdot i}{n \cdot fr}$$

Tc (min) : Drilling Time
n (min^{-1}) : Spindle Speed
ld (mm) : Hole Depth
fr (mm/rev) : Feed per Revolution
i : Number of Holes



(Problem) What is the drilling time required for drilling a 30mm length hole in alloy steel (JIS SCM440) at a cutting speed of 50m/min and a feed 0.15mm/rev ?

(Answer) Spindle Speed $n = \frac{50 \times 1000}{15 \times 3.14} = 1061.57 \text{min}^{-1}$

$$Tc = \frac{30 \times 1}{1061.57 \times 0.15} = 0.188$$

$$= 0.188 \times 60 \fallingdotseq 11.3 \text{ sec}$$

METALLIC MATERIALS CROSS REFERENCE LIST

CARBON STEEL

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
STKM 12A STKM 12C	1.0038	RSt.37-2	4360 40 C	–	E 24-2 Ne	–	–	1311	A570.36	15
–	1.0401	C15	080M15	–	CC12	C15, C16	F.111	1350	1015	15
–	1.0402	C22	050A20	2C	CC20	C20, C21	F.112	1450	1020	20
SUM22	1.0715	9SMn28	230M07	1A	S250	CF9SMn28	F.2111 11SMn28	1912	1213	Y15
SUM22L	1.0718	9SMnPb28	–	–	S250Pb	CF9SMnPb28	11SMnPb28	1914	12L13	–
–	1.0722	10SPb20	–	–	10PbF2	CF10Pb20	10SPb20	–	–	–
–	1.0736	9SMn36	240M07	1B	S300	CF9SMn36	12SMn35	–	1215	Y13
–	1.0737	9SMnPb36	–	–	S300Pb	CF9SMnPb36	12SMnP35	1926	12L14	–
S15C	1.1141	Ck15	080M15	32C	XC12	C16	C15K	1370	1015	15
S25C	1.1158	Ck25	–	–	–	–	–	–	1025	25
–	1.8900	StE380	4360 55 E	–	–	FeE390KG	–	2145	A572-60	–
–	1.0501	C35	060A35	–	CC35	C35	F.113	1550	1035	35
–	1.0503	C45	080M46	–	CC45	C45	F.114	1650	1045	45
–	1.0726	35S20	212M36	8M	35MF4	–	F210G	1957	1140	–
–	1.1157	40Mn4	150M36	15	35M5	–	–	–	1039	40Mn
SMn438(H)	1.1167	36Mn5	–	–	40M5	–	36Mn5	2120	1335	35Mn2
SCMn1	1.1170	28Mn6	150M28	14A	20M5	C28Mn	–	–	1330	30Mn
S35C	1.1183	Cf35	060A35	–	XC38TS	C36	–	1572	1035	35Mn
S45C	1.1191	Ck45	080M46	–	XC42	C45	C45K	1672	1045	Ck45
S50C	1.1213	C50	060A52	–	XC48TS	C53	–	1674	1050	50
–	1.0535	C55	070M55	9	–	C55	–	1655	1055	55
–	1.0601	C60	080A62	43D	CC55	C60	–	–	1060	60
S55C	1.1203	Ck55	070M55	–	XC55	C50	C55K	–	1055	55
S58C	1.1221	Ck60	080A62	43D	XC60	C60	–	1678	1060	60Mn
–	1.1274	Ck101	060A96	–	XC100	–	F.5117	1870	1095	–
SK3	1.1545	C105W1	BW1A	–	Y105	C36KU	F.5118	1880	W1	–
SUP4	1.1545	C105W1	BW2	–	Y120	C120KU	F.515	2900	W210	–

ALLOY STEEL

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SM400A, SM400B SM400C	1.0144	St.44.2	4360 43 C	–	E28-3	–	–	1412	A573-81	–
SM490A, SM490B SM490C	1.0570	St52-3	4360 50 B	–	E36-3	Fe52BFN Fe52CFN	–	2132	–	–
–	1.0841	St52-3	150M19	–	20MC5	Fe52	F.431	2172	5120	–
–	1.0904	55Si7	250A53	45	55S7	55Si8	56Si7	2085	9255	55Si2Mn
–	1.0961	60SiCr7	–	–	60SC7	60SiCr8	60SiCr8	–	9262	–
SUJ2	1.3505	100Cr6	534A99	31	100C6	100Cr6	F.131	2258	ASTM 52100	GCr15
–	1.5415	15Mo3	1501-240	–	15D3	16Mo3KW	16Mo3	2912	ASTM A204Gr.A	–
–	1.5423	16Mo5	1503-245-420	–	–	16Mo5	16Mo5	–	4520	–
–	1.5622	14Ni6	–	–	16N6	14Ni6	15Ni6	–	ASTM A350LF5	–
–	1.5662	X8Ni9	1501-509-510	–	–	X10Ni9	XBNi09	–	ASTM A353	–
SNC236	1.5710	36NiCr6	640A35	111A	35NC6	–	–	–	3135	–
SNC415(H)	1.5732	14NiCr10	–	–	14NC11	16NiCr11	15NiCr11	–	3415	–
SNC815(H)	1.5752	14NiCr14	655M13	36A	12NC15	–	–	–	3415, 3310	–
SNCM220(H)	1.6523	21NiCrMo2	805M20	362	20NCD2	20NiCrMo2	20NiCrMo2	2506	8620	–
SNCM240	1.6546	40NiCrMo22	311-Type 7	–	–	40NiCrMo2(KB)	40NiCrMo2	–	8740	–
–	1.6587	17CrNiMo6	820A16	–	18NCD6	–	14NiCrMo13	–	–	–
SCr415(H)	1.7015	15Cr3	523M15	–	12C3	–	–	–	5015	15Cr

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SCr440	1.7045	42Cr4	–	–	–	–	42Cr4	2245	5140	40Cr
SUP9(A)	1.7176	55Cr3	527A60	48	55C3	–	–	–	5155	20CrMn
SCM415(H)	1.7262	15CrMo5	–	–	12CD4	–	12CrMo4	2216	–	–
–	1.7335	13CrMo4 4	1501-620Gr27	–	15CD3.5 15CD4.5	14CrMo45	14CrMo45	–	ASTM A182 F11, F12	–
–	1.7380	10CrMo910	1501-622 Gr31, 45	–	12CD9 12CD10	12CrMo9 12CrMo10	TU.H	2218	ASTM A182 F.22	–
–	1.7715	14MoV63	1503-660-440	–	–	–	13MoCrV6	–	–	–
–	1.8523	39CrMoV13 9	897M39	40C	–	36CrMoV12	–	–	–	–
–	1.6511	36CrNiMo4	816M40	110	40NCD3	38NiCrMo4(KB)	35NiCrMo4	–	9840	–
–	1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)	–	2541	4340	40CrNiMoA
SCr430(H)	1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)	35Cr4	–	5132	35Cr
SCr440(H)	1.7035	41Cr4	530M40	18	42C4	41Cr4	42Cr4	–	5140	40Cr
–	1.7131	16MnCr5	(527M20)	–	16MC5	16MnCr5	16MnCr5	2511	5115	18CrMn
SCM420 SCM430	1.7218	25CrMo4	1717CDS110 708M20	–	25CD4	25CrMo4(KB)	55Cr3	2225	4130	30CrMn
SCM432 SCCRM3	1.7220	34CrMo4	708A37	19B	35CD4	35CrMo4	34CrMo4	2234	4137 4135	35CrMo
SCM 440	1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4	42CrMo4	2244	4140 4142	40CrMoA
SCM440(H)	1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4	42CrMo4	2244	4140	42CrMo 42CrMnMo
–	1.7361	32CrMo12	722M24	40B	30CD12	32CrMo12	F.124.A	2240	–	–
SUP10	1.8159	50CrV4	735A50	47	50CV4	50CrV4	51CrV4	2230	6150	50CrVA
–	1.8509	41CrAlMo7	905M39	41B	40CAD6 40CAD2	41CrAlMo7	41CrAlMo7	2940	–	–
–	1.2067	100Cr6	BL3	–	Y100C6	–	100Cr6	–	L3	CrV, 9SiCr
SKS31 SKS2, SKS3	1.2419	105WCr6	–	–	105WC13	100WCr6 107WCr5KU	105WCr5	2140	–	CrWMo
SKT4	1.2713	55NiCrMoV6	BH224/5	–	55NCDV7	–	F.520.S	–	L6	5CrNiMo
–	1.5662	X8Ni9	1501-509	–	–	X10Ni9	XBNi09	–	ASTM A353	–
–	1.5680	12Ni19	–	–	Z18N5	–	–	–	2515	–
–	1.6657	14NiCrMo134	832M13	36C	–	15NiCrMo13	14NiCrMo131	–	–	–
SKD1	1.2080	X210Cr12	BD3	–	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	–	D3 ASTM D3	Cr12
SKD11	1.2601	X153CrMoV12	BD2	–	–	X160CrMoV12	–	–	D2	Cr12MoV
SKD12	1.2363	X100CrMoV5	BA2	–	Z100CDV5	X100CrMoV5	F.5227	2260	A2	Cr5Mo1V
SKD61	1.2344	X40CrMoV51 X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	2242	H13 ASTM H13	4Cr5MoSiV1
SKD2	1.2436	X210CrW12	–	–	–	X215CrW121KU	X210CrW12	2312	–	–
–	1.2542	45WCrV7	BS1	–	–	45WCrV8KU	45WCrSi8	2710	S1	–
SKD5	1.2581	X30WCrV93	BH21	–	Z30WCV9	X28W09KU	X30WCrV9	–	H21	30WCrV9
–	1.2601	X165CrMoV12	–	–	–	X165CrMoW12KU	X160CrMoV12	2310	–	–
SKS43	1.2833	100V1	BW2	–	Y1105V	–	–	–	W210	V
SKH3	1.3255	S 18-1-2-5	BT4	–	Z80WKCV	X78WCo1805KU	HS18-1-1-5	–	T4	W18Cr4VCo5
SKH2	1.3355	S 18-0-1	BT1	–	Z80WCV	X75W18KU	HS18-0-1	–	T1	–
SCMnH/1	1.3401	G-X120Mn12	Z120M12	–	Z120M12	XG120Mn12	X120MN12	–	–	–
SUH1	1.4718	X45CrSi93	401S45	52	Z45CS9	X45CrSi8	F.322	–	HW3	X45CrSi93
SUH3	1.3343	S6-5-2	4959BA2	–	Z40CSD10	15NiCrMo13	–	2715	D3	–
SKH9, SKH51	1.3343	S6/5/2	BM2	–	Z85WDCV	HS6-5-2-2	F.5603	2722	M2	–
–	1.3348	S 2-9-2	–	–	–	HS2-9-2	HS2-9-2	2782	M7	–
SKH55	1.3243	S6/5/2/5	BM35	–	6-5-2-5	HS6-5-2-5	F.5613	2723	M35	–

METALLIC MATERIALS CROSS REFERENCE LIST

STAINLESS STEEL (FERRITIC,MARTENSITIC)

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SUS403	1.4000	X7Cr13	403S17	–	Z6C13	X6Cr13	F.3110	2301	403	OCr13 1Cr12
–	1.4001	X7Cr14	–	–	–	–	F.8401	–	–	–
SUS416	1.4005	X12CrS13	416S21	–	Z11CF13	X12CrS13	F.3411	2380	416	–
SUS410	1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13	F.3401	2302	410	1Cr13
SUS430	1.4016	X8Cr17	430S15	60	Z8C17	X8Cr17	F.3113	2320	430	1Cr17
SCS2	1.4027	G-X20Cr14	420C29	56B	Z20C13M	–	–	–	–	–
SUS420J2	1.4034	X46Cr13	420S45	56D	Z40CM Z38C13M	X40Cr14	F.3405	2304	–	4Cr13
–	1.4003	–	405S17	–	Z8CA12	X6CrAl13	–	–	405	–
–	1.4021	–	420S37	–	Z8CA12	X20Cr13	–	2303	420	–
SUS431	1.4057	X22CrNi17	431S29	57	Z15CNi6.02	X16CrNi16	F.3427	2321	431	1Cr17Ni2
SUS430F	1.4104	X12CrMoS17	–	–	Z10CF17	X10CrS17	F.3117	2383	430F	Y1Cr17
SUS434	1.4113	X6CrMo17	434S17	–	Z8CD17.01	X8CrMo17	–	2325	434	1Cr17Mo
SCS5	1.4313	X5CrNi134	425C11	–	Z4CND13.4M	(G)X6CrNi304	–	2385	CA6-NM	–
SUS405	1.4724	X10CrA113	403S17	–	Z10C13	X10CrA112	F.311	–	405	OCr13Al
SUS430	1.4742	X10CrA118	430S15	60	Z10CAS18	X8Cr17	F.3113	–	430	Cr17
SUH4	1.4747	X80CrNiSi20	443S65	59	Z80CSN20.02	X80CrSiNi20	F.320B	–	HNV6	–
SUH446	1.4762	X10CrA124	–	–	Z10CAS24	X16Cr26	–	2322	446	2Cr25N
SUH35	1.4871	X53CrMnNiN219	349S54	–	Z52CMN21.09	X53CrMnNiN219	–	–	EV8	5Cr2Mn9Ni4N
–	1.4521	X1CrMoTi182	–	–	–	–	–	2326	S44400	–
–	1.4922	X20CrMoV12-1	–	–	–	X20CrMoNi1201	–	2317	–	–
–	1.4542	–	–	–	Z7CNU17-04	–	–	–	630	–

STAINLESS STEEL (AUSTENITIC)

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SUS304L	1.4306	X2CrNi1911	304S11	–	Z2CN18.10	X2CrNi18.11	–	2352	304L	OCr19Ni10
SUS304	1.4350	X5CrNi189	304S11	58E	Z6CN18.09	X5CrNi1810	F.3551 F.3541 F.3504	2332	304	OCr18Ni9
SUS303	1.4305	X12CrNiS188	303S21	58M	Z10CNF18.09	X10CrNiS18.09	F.3508	2346	303	1Cr18Ni9MoZr
SUS304L	–	–	304C12	–	Z3CN19.10	–	–	2333	–	–
SCS19	1.4306	X2CrNi189	304S12	–	Z2CrNi1810	X2CrNi18.11	F.3503	2352	304L	–
SUS301	1.4310	X12CrNi177	–	–	Z12CN17.07	X12CrNi1707	F.3517	2331	301	Cr17Ni7
SUS304LN	1.4311	X2CrNiN1810	304S62	–	Z2CN18.10	–	–	2371	304LN	–
SUS316	1.4401	X5CrNiMo1810	316S16	58J	Z6CND17.11	X5CrNiMo1712	F.3543	2347	316	0Cr17Ni11Mo2
SCS13	1.4308	G-X6CrNi189	304C15	–	Z6CN18.10M	–	–	–	–	–
SCS14	1.4408	G-X6CrNiMo1810	316C16	–	–	–	F.8414	–	–	–
SCS22	1.4581	G-X5CrNiMoNb1810	318C17	–	Z4CNDNb1812M	XG8CrNiMo1811	–	–	–	–
SUS316LN	1.4429	X2CrNiMoN1813	–	–	Z2CND17.13	–	–	2375	316LN	OCr17Ni13Mo
–	1.4404	–	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2348	316L	–
SCS16 SUS316L	1.4435	X2CrNiMo1812	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2353	316L	OCr27Ni12Mo3
–	1.4436	–	316S13	–	Z6CND18-12-03	X8CrNiMo1713	–	2343, 2347	316	–
SUS317L	1.4438	X2CrNiMo1816	317S12	–	Z2CND19.15	X2CrNiMo1816	–	2367	317L	OOCr19Ni13Mo
–	1.4539	X1NiCrMo	–	–	Z6CNT18.10	–	–	2562	UNS V 0890A	–
SUS321	1.4541	X10CrNiTi189	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553 F.3523	2337	321	1Cr18NI9Ti
SUS347	1.4550	X10CrNiNb189	347S17	58F	Z6CNNb18.10	X6CrNiNb1811	F.3552 F.3524	2338	347	1Cr18Ni11Nb
–	1.4571	X10CrNiMoTi1810	320S17	58J	Z6CNDT17.12	X6CrNiMoTi1712	F.3535	2350	316Ti	Cr18Ni12Mo2T
–	1.4583	X10CrNiMoNb1812	–	–	Z6CNDNb1713B	X6CrNiMoNb1713	–	–	318	Cr17Ni12Mo3Mb

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SUH309	1.4828	X15CrNiSi2012	309S24	–	Z15CNS20.12	X6CrNi2520	–	–	309	1Cr23Ni13
SUH310	1.4845	X12CrNi2521	310S24	–	Z12CN2520	X6CrNi2520	F.331	2361	310S	OCr25Ni20
SCS17	1.4406	X10CrNi18.08	–	58C	Z1NCDU25.20	–	F.8414	2370	308	–
–	1.4418	X4CrNiMo165	–	–	Z6CND16-04-01	–	–	–	–	–
–	1.4568 1.4504	–	316S111	–	Z8CNA17-07	X2CrNiMo1712	–	–	17-7PH	–
–	1.4563	–	–	–	Z1NCDU31-27-03 Z1CNDU20-18-06AZ	–	–	2584 2378	NO8028 S31254	–
SUS321	1.4878	X12CrNiTi189	321S32	58B, 58C	Z6CNT18.12B	X6CrNiTi18 11	F.3523	–	321	1Cr18Ni9Ti

HEAT RESISTANT STEELS

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
SUH330	1.4864	X12NiCrSi3616	–	–	Z12NCS35.16	–	–	–	330	–
SCH15	1.4865	G-X40NiCrSi3818	330C11	–	–	XG50NiCr3919	–	–	HT, HT 50	–

GRAY CAST IRON

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
–	–	–	–	–	–	–	–	0100	–	–
FC100	–	GG 10	–	–	Ft 10 D	–	–	0110	No 20 B	–
FC150	0.6015	GG 15	Grade 150	–	Ft 15 D	G15	FG15	0115	No 25 B	HT150
FC200	0.6020	GG 20	Grade 220	–	Ft 20 D	G20	–	0120	No 30 B	HT200
FC250	0.6025	GG 25	Grade 260	–	Ft 25 D	G25	FG25	0125	No 35 B	HT250
–	–	–	–	–	–	–	–	–	No 40 B	–
FC300	0.6030	GG 30	Grade 300	–	Ft 30 D	G30	FG30	0130	No 45 B	HT300
FC350	0.6035	GG 35	Grade 350	–	Ft 35 D	G35	FG35	0135	No 50 B	HT350
–	0.6040	GG 40	Grade 400	–	Ft 40 D	–	–	0140	No 55 B	HT400
–	0.6660	GGL NiCr202	L-NiCuCr202	–	L-NC 202	–	–	0523	A436 Type 2	–

DUCTILE CAST IRON

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
FCD400	0.7040	GGG 40	SNG 420/12	–	FCS 400-12	GS 370-17	FGE 38-17	07 17-02	60-40-18	QT400-18
–	–	GGG 40.3	SNG 370/17	–	FGS 370-17	–	–	07 17-12	–	–
–	0.7033	GGG 35.3	–	–	–	–	–	07 17-15	–	–
FCD500	0.7050	GGG 50	SNG 500/7	–	FGS 500-7	GS 500	FGE 50-7	07 27-02	80-55-06	QT500-7
–	0.7660	GGG NiCr202	Grade S6	–	S-NC202	–	–	07 76	A43D2	–
–	–	GGG NiMn137	L-NiMn 137	–	L-MN 137	–	–	07 72	–	–
FCD600	–	GGG 60	SNG 600/3	–	FGS 600-3	–	–	07 32-03	–	QT600-3
FCD700	0.7070	GGG 70	SNG 700/2	–	FGS 700-2	GS 700-2	FGS 70-2	07 37-01	100-70-03	QT700-18

MALLEABLE CAST IRON

Japan	Germany		U.K.		France	Italy	Spain	Sweden	USA	China
JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	AISI/SAE	GB
FCMB310	–	–	8 290/6	–	MN 32-8	–	–	08 14	–	–
FCMW330	–	GTS-35	B 340/12	–	MN 35-10	–	–	08 15	32510	–
FCMW370	0.8145	GTS-45	P 440/7	–	Mn 450	GMN45	–	08 52	40010	–
FCMP490	0.8155	GTS-55	P 510/4	–	MP 50-5	GMN55	–	08 54	50005	–
FCMP540	–	GTS-65	P 570/3	–	MP 60-3	–	–	08 58	70003	–
FCMP590	0.8165	GTS-65-02	P 570/3	–	Mn 650-3	GMN 65	–	08 56	A220-70003	–
FCMP690	–	GTS-70-02	P 690/2	–	Mn 700-2	GMN 70	–	08 62	A220-80002	–

DIE STEELS

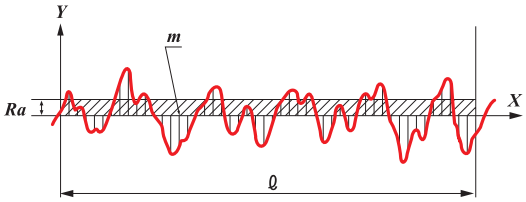
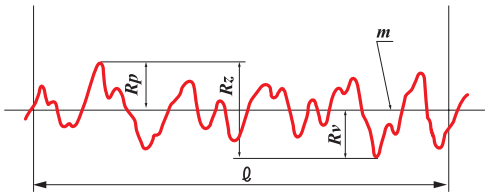
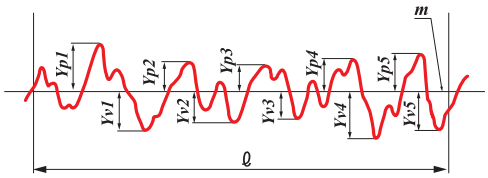
Classification	JIS (Others)	Aichi Steel Works	Uddeholm	Kobe Steel	Sumitomo Metal Industries	Daido Steel	Nippon Koshuha	Hitachi Metals	Mitsubishi Steel Manufacturing
Carbon Steel for Machine Structure	S50C	AUK1		KTSM2A	SD10	PDS1	KPM1		MT50C
	I			KTSM21	SD17	PXZ			
	S55C			KTSM22	SD21				
Alloy Steel for Machine Structure	SCM440	AUK11		KTSM3A	SD61	PDS3			
	I			KTSM31					
	SCM445		HOLDAX						
Carbon Tool Steel	SK3	SK3				YK3	K3	YC3	
Alloy Tool Steel (For Cold Working)	SKS3	SKS3				GOA	KS3	SGT	
	SKS31					GO31	K31		
	SKS93	SK301				YK30	K3M	YCS3	
	SKD1						KD1	CRD	
	SKD11	SKD11		KAD181		DC11	KD11	SLD	
	SKD11	AUD11				DC3	KD11V	SLD2	
	SKD11						KDQ		
	SKD12		RIGOR			DC12	KD12	SCD	
		SX4							
		SX44							
		SX105V					FH5		
		TCD							
						DC53	KD21	SLD8	
						PD613			
						GO4		ACD37	
						GO5		HMD5	
						GO40F		HPM2T	
								YSM	
								HPM31	
								HMD1	
							KDM5	HMD5	
							KD11S	ACD6	
								ACD8	
								ACD9	
Alloy Tool Steel (For Cold Working and Others)	(P20)		IMPAX	KTSM3M		PX5	KPM30	HPM2	MT24M
	(P20)							HPM7	
	(P21)			KTSM40EF		NAK55	KAP	HPM1	
				KTSM40E		NAK80	KAP2	HPM50	
						GLD2		CENA1	
Alloy Tool Steel (For Hot Working)	SKD4					DH4	KD4	YDC	
	SKD5					DH5	KD5	HDC	
	SKD6					DH6	KD6		
	SKD61	SKD61	Over M Suprem			DHA1	KDA	DAC	
	SKD61						MFA		
	SKD62	SKD62				DH62	KDB	DBC	
	SKT4					GFA	KTV	DM	
	SKD7					DH72	KDH1	YEM	
	(H10)					DH73			
	SKD8					DH41	KDF	MDC	
			QRO80M						
								YHD40	
						DH71			
						DH42			
						DH21			
							KDW		
							KDHM		
							AE31		
								YEM4	
								YHD50	
	SKT4	SKT4A						YHD26	
	6F4	MPH							
	SKT4								
						DH31	KDA1	DAC3	
							KDA5	DAC10	
								DAC40	
						GF78		DAC45	
						DH76		DAC55	
							TD3		
						DH2F	KDAS	FDAC	
								YHD3	
								MDC–K	
								YEM–K	

Classification	JIS (Others)	Aichi Steel Works	Uddeholm	Kobe Steel	Sumitomo Metal Industries	Daido Steel	Nippon Koshuha	Hitachi Metals	Mitsubishi Steel Manufacturing
High-Speed Tool Steel	SKH51					MH51	H51	YXM1	
	SKH55					MH55	HM35	YXM4	
	SKH57					MH57	MV10	XVC5	
						MH8	NK4	YXM60	
						MH24			
						MH7V1			
						MH64			
						VH54	HV2	XVC11	
							HM3	YXM7	
						MH85	KDMV	YXR3	
						MH88	HM9TL	YXR4	
								YXR7	
								YXR35	
Powder High-Speed Tool Steel			ASP23	KHA32		DEX20		HAP10	
			ASP30	KHA30		DEX40		HAP40	
				KHA3VN		DEX60		HAP50	
				KHA30N		DEX70		HAP63	
				KHA33N		DEX80		HAP72	
				KHA50					
				KHA77					
			ASP60	KHA60					
Stainless Steel	SUS403					GLD1			
	SUS420		STAVAX			S—STAR	KSP1	HPM38	
	SUS440C		ELMAX (Powder)	KAS440 (Powder)		SUS440C	KSP3		
	SUS420							SUS420	
	SUS630					NAK101	U630	PSL	
	(414)								
Maraging Steel						MAS1C	KMS18—20	YAG	DMG300
Heat Resistant Alloy								HRNC	

SURFACE ROUGHNESS

SURFACE ROUGHNESS

(From JIS B 0601-1994)

Type	Code	Determination	Determination Example (Figure)
Arithmetical Mean Roughness	Ra	Ra means the value obtained by the following formula and expressed in micrometer (μm) when sampling only the reference length from the roughness curve in the direction of the mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by y=f(x): $Ra=\frac{1}{\ell}\int_0^{\ell}\lvert f(x)\rvert dx$	
Maximum Height	Rz	Rz shall be that only when the reference length is sampled from the roughness curve in the direction of the mean line, the distance between the top profile peak line and the bottom profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (μm). Note) When finding Rz, a portion without an exceptionally high peak or low valley, which may be regarded as a flaw, is selected as the sampling length. $Rz=R_P+Rv$	
Ten-Point Mean Roughness	RzJIS	RzJIS shall be that only when the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (Yp) and the depths of five deepest profile valleys (Yv) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (μm). $Rz_{JIS}=\frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$	 $Yp1,Yp2,Yp3,Yp4,Yp5$: altitudes of the five highest profile peaks of the sampled portion corresponding to the reference length l. $Yv1,Yv2,Yv3,Yv4,Yv5$: altitudes of the five deepest profile valleys of the sampled portion corresponding to the reference length l.

■RELATIONSHIP BETWEEN ARITHMETICAL MEAN (Ra) AND CONVENTIONAL DESIGNATION (REFERENCE DATA)

Arithmetical Mean Roughness Ra		Max. Height Rz	Ten-Point Mean Roughness RzJIS	Sampling Length for Rz • RzJIS l (mm)	Conventional Finish Mark
Standard Series	Cutoff Value λc (mm)	Standard Series			
0.012 a	0.08	0.05s	0.05z	0.08	▽▽▽▽
0.025 a	0.25	0.1 s	0.1 z		
0.05 a		0.2 s	0.2 z	0.25	
0.1 a	0.8	0.4 s	0.4 z		
0.2 a		0.8 s	0.8 z	0.8	
0.4 a		1.6 s	1.6 z		▽▽▽
0.8 a		3.2 s	3.2 z		
1.6 a		6.3 s	6.3 z		
3.2 a	2.5	12.5 s	12.5 z	2.5	▽▽
6.3 a		25 s	25 z		
12.5 a	8	50 s	50 z		▽
25 a		100 s	100 z	8	
50 a		200 s	200 z		–
100 a	–	400 s	400 z	–	

*The correlation among the three is shown for convenience and is not exact.
*Ra: The evaluation length of Rz and RzJIS is the cutoff value and sampling length multiplied by 5, respectively.

HARDNESS COMPARISON TABLE

HARDNESS CONVERSION NUMBERS OF STEEL

Brinell Hardness (HB) 10mm Ball,Load: 3,000 kgf		Vickers Hardness	Rockwell Hardness				Shore Hardness	Tensile Strength (Approx.)
Standard Ball	Tungsten Carbide Ball		A Scale, Load:60kgf, Diamond Point	B Scale, Load:100kgf, 1/16" Ball	C Scale, Load:150kgf, Diamond Point	D Scale, Load:100kgf, Diamond Point		
		(HV)	(HRA)	(HRB)	(HRC)	(HRD)	(HS)	Mpa
—	—	940	85.6	—	68.0	76.9	97	—
—	—	920	85.3	—	67.5	76.5	96	—
—	—	900	85.0	—	67.0	76.1	95	—
—	(767)	880	84.7	—	66.4	75.7	93	—
—	(757)	860	84.4	—	65.9	75.3	92	—
—	(745)	840	84.1	—	65.3	74.8	91	—
—	(733)	820	83.8	—	64.7	74.3	90	—
—	(722)	800	83.4	—	64.0	73.8	88	—
—	(712)	—	—	—	—	—	—	—
—	(710)	780	83.0	—	63.3	73.3	87	—
—	(698)	760	82.6	—	62.5	72.6	86	—
—	(684)	740	82.2	—	61.8	72.1	—	—
—	(682)	737	82.2	—	61.7	72.0	84	—
—	(670)	720	81.8	—	61.0	71.5	83	—
—	(656)	700	81.3	—	60.1	70.8	—	—
—	(653)	697	81.2	—	60.0	70.7	81	—
—	(647)	690	81.1	—	59.7	70.5	—	—
—	(638)	680	80.8	—	59.2	70.1	80	—
—	630	670	80.6	—	58.8	69.8	—	—
—	627	667	80.5	—	58.7	69.7	79	—
—	—	677	80.7	—	59.1	70.0	—	—
—	601	640	79.8	—	57.3	68.7	77	—
—	—	640	79.8	—	57.3	68.7	—	—
—	578	615	79.1	—	56.0	67.7	75	—
—	—	607	78.8	—	55.6	67.4	—	—
—	555	591	78.4	—	54.7	66.7	73	2055
—	—	579	78.0	—	54.0	66.1	—	2015
—	534	569	77.8	—	53.5	65.8	71	1985
—	—	533	77.1	—	52.5	65.0	—	1915
—	514	547	76.9	—	52.1	64.7	70	1890
(495)	—	539	76.7	—	51.6	64.3	—	1855
—	—	530	76.4	—	51.1	63.9	—	1825
	495	528	76.3	—	51.0	63.8	68	1820
(477)	—	516	75.9	—	50.3	63.2	—	1780
—	—	508	75.6	—	49.6	62.7	—	1740
	477	508	75.6	—	49.6	62.7	66	1740
(461)	—	495	75.1	—	48.8	61.9	—	1680
—	—	491	74.9	—	48.5	61.7	—	1670
	461	491	74.9	—	48.5	61.7	65	1670
444	—	474	74.3	—	47.2	61.0	—	1595
—	—	472	74.2	—	47.1	60.8	—	1585
—	444	472	74.2	—	47.1	60.8	63	1585

Brinell Hardness (HB) 10mm Ball,Load: 3,000 kgf		Vickers Hardness	Rockwell Hardness				Shore Hardness	Tensile Strength (Approx.)
Standard Ball	Tungsten Carbide Ball		A Scale, Load:60kgf, Diamond Point	B Scale, Load:100kgf, 1/16" Ball	C Scale, Load:150kgf, Diamond Point	D Scale, Load:100kgf, Diamond Point		
		(HV)	(HRA)	(HRB)	(HRC)	(HRD)	(HS)	Mpa
429	429	455	73.4	—	45.7	59.7	61	1510
415	415	440	72.8	—	44.5	58.8	59	1460
401	401	425	72.0	—	43.1	57.8	58	1390
388	388	410	71.4	—	41.8	56.8	56	1330
375	375	396	70.6	—	40.4	55.7	54	1270
363	363	383	70.0	—	39.1	54.6	52	1220
352	352	372	69.3	(110.0)	37.9	53.8	51	1180
341	341	360	68.7	(109.0)	36.6	52.8	50	1130
331	331	350	68.1	(108.5)	35.5	51.9	48	1095
321	321	339	67.5	(108.0)	34.3	51.0	47	1060
311	311	328	66.9	(107.5)	33.1	50.0	46	1025
302	302	319	66.3	(107.0)	32.1	49.3	45	1005
293	293	309	65.7	(106.0)	30.9	48.3	43	970
285	285	301	65.3	(105.5)	29.9	47.6	—	950
277	277	292	64.6	(104.5)	28.8	46.7	41	925
269	269	284	64.1	(104.0)	27.6	45.9	40	895
262	262	276	63.6	(103.0)	26.6	45.0	39	875
255	255	269	63.0	(102.0)	25.4	44.2	38	850
248	248	261	62.5	(101.0)	24.2	43.2	37	825
241	241	253	61.8	100	22.8	42.0	36	800
235	235	247	61.4	99.0	21.7	41.4	35	785
229	229	241	60.8	98.2	20.5	40.5	34	765
223	223	234	—	97.3	(18.8)	—	—	—
217	217	228	—	96.4	(17.5)	—	33	725
212	212	222	—	95.5	(16.0)	—	—	705
207	207	218	—	94.6	(15.2)	—	32	690
201	201	212	—	93.8	(13.8)	—	31	675
197	197	207	—	92.8	(12.7)	—	30	655
192	192	202	—	91.9	(11.5)	—	29	640
187	187	196	—	90.7	(10.0)	—	—	620
183	183	192	—	90.0	(9.0)	—	28	615
179	179	188	—	89.0	(8.0)	—	27	600
174	174	182	—	87.8	(6.4)	—	—	585
170	170	178	—	86.8	(5.4)	—	26	570
167	167	175	—	86.0	(4.4)	—	—	560
163	163	171	—	85.0	(3.3)	—	25	545
156	156	163	—	82.9	(0.9)	—	—	525
149	149	156	—	80.8	—	—	23	505
143	143	150	—	78.7	—	—	22	490
137	137	143	—	76.4	—	—	21	460
131	131	137	—	74.0	—	—	—	450
126	126	132	—	72.0	—	—	20	435
121	121	127	—	69.8	—	—	19	415
116	116	122	—	67.6	—	—	18	400
111	111	117	—	65.7	—	—	15	385

Note 1) Above list is the same as that at AMS Metals Hand book with tensile strength in approximate metric value and Brinell hardness over a recommended range.

Note 2) 1MPa=1N/mm^2

Note 3) Figures in ( ) are rarely used and are included for reference. This list has been taken from JIS Handbook Steel I.

JIS FIT TOLERANCE TABLE (HOLE)

Classification of Standard Dimensions (mm)		Class of Geometrical Tolerance Zone of Holes														
>	≤	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7
—	3	+180 +140	+85 +60	+100 +60	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0
3	6	+188 +140	+100 +70	+118 +70	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0
6	10	+208 +150	+116 +80	+138 +80	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0
10	14	+220 +150	+138 +95	+165 +95	+77 +50	+93 +50	+120 +50	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	+17 +6	+24 +6	+11 0	+18 0
14	18																
18	24	+244 +160	+162 +110	+194 +110	+98 +65	+117 +65	+149 +65	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	+20 +7	+28 +7	+13 0	+21 0
24	30																
30	40	+270 +170	+182 +120	+220 +120	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25
40	50	+280 +180	+192 +130	+230 +130	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0
50	65	+310 +190	+214 +140	+260 +140	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30
65	80	+320 +200	+224 +150	+270 +150	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0
80	100	+360 +220	+257 +170	+310 +170	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35
100	120	+380 +240	+267 +180	+320 +180	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0
120	140	+420 +260	+300 +200	+360 +200													
140	160	+440 +280	+310 +210	+370 +210	+208 +145	+245 +145	+305 +145	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0
160	180	+470 +310	+330 +230	+390 +230													
180	200	+525 +340	+355 +240	+425 +240													
200	225	+565 +380	+375 +260	+445 +260	+242 +170	+285 +170	+355 +170	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0
225	250	+605 +420	+395 +280	+465 +280													
250	280	+690 +480	+430 +300	+510 +300	+271 +190	+320 +190	+400 +190	+162 +110	+191 +110	+240 +110	+88 +56	+108 +56	+137 +56	+49 +17	+69 +17	+32 0	+52 0
280	315	+750 +540	+460 +330	+540 +330													
315	355	+830 +600	+500 +360	+590 +360	+299 +210	+350 +210	+440 +210	+182 +125	+214 +125	+265 +125	+98 +62	+119 +62	+151 +62	+54 +18	+75 +18	+36 0	+57 0
355	400	+910 +680	+540 +400	+630 +400													
400	450	+1010 +760	+595 +440	+690 +440	+327 +230	+385 +230	+480 +230	+198 +135	+232 +135	+290 +135	+108 +68	+131 +68	+165 +68	+60 +20	+83 +20	+40 0	+63 0
450	500	+1090 +840	+635 +480	+730 +480													

Note) Values shown in the upper portion of respective lines are upper dimensional tolerance, while values shown in the lower portion of respective lines are lower dimensional tolerance.

Units : μm

Class of Geometrical Tolerance Zone of Holes																
H8	**H9**	**H10**	**JS6**	**JS7**	**K6**	**K7**	**M6**	**M7**	**N6**	**N7**	**P6**	**P7**	**R7**	**S7**	**T7**	**U7**	**X7**
+14 0	+25 0	+40 0	±3	±5	0 −6	0 −10	−2 −8	−2 −12	−4 −10	−4 −14	−6 −12	−6 −16	−10 −20	−14 −24	—	−18 −28	−20 −30
+18 0	+30 0	+48 0	±4	±6	+2 −6	+3 −9	−1 −9	0 −12	−5 −13	−4 −16	−9 −17	−8 −20	−11 −23	−15 −27	—	−19 −31	−24 −36
+22 0	+36 0	+58 0	±4.5	±7	+2 −7	+5 −10	−3 −12	0 −15	−7 −16	−4 −19	−12 −21	−9 −24	−13 −28	−17 −32	—	−22 −37	−28 −43
+27 0	+43 0	+70 0	±5.5	±9	+2 −9	+6 −12	−4 −15	0 −18	−9 −20	−5 −23	−15 −26	−11 −29	−16 −34	−21 −39	—	−26 −44	−33 −51 −38 −56
+33 0	+52 0	+84 0	±6.5	±10	+2 −11	+6 −15	−4 −17	0 −21	−11 −24	−7 −28	−18 −31	−14 −35	−20 −41	−27 −48	— −33 −54	−33 −54 −40 −61	−46 −67 −56 −77
+39 0	+62 0	+100 0	±8	±12	+3 −13	+7 −18	−4 −20	0 −25	−12 −28	−8 −33	−21 −37	−17 −42	−25 −50	−34 −59	−39 −64 −45 −70	−51 −76 −61 −86	—
+46 0	+74 0	+120 0	±9.5	±15	+4 −15	+9 −21	−5 −24	0 −30	−14 −33	−9 −39	−26 −45	−21 −51	−30 −60 −32 −62	−42 −72 −48 −78	−55 −85 −64 −94	−76 −106 −91 −121	—
+54 0	+87 0	+140 0	±11	±17	+4 −18	+10 −25	−6 −28	0 −35	−16 −38	−10 −45	−30 −52	−24 −59	−38 −73 −41 −76	−58 −93 −66 −101	−78 −113 −91 −126	−111 −146 −131 −166	—
+63 0	+100 0	+160 0	±12.5	±20	+4 −21	+12 −28	−8 −33	0 −40	−20 −45	−12 −52	−36 −61	−28 −68	−48 −88 −50 −90 −53 −93	−77 −117 −85 −125 −93 −133	−107 −147 −119 −159 −131 −171	—	—
+72 0	+115 0	+185 0	±14.5	±23	+5 −24	+13 −33	−8 −37	0 −46	−22 −51	−14 −60	−41 −70	−33 −79	−60 −106 −63 −109 −67 −113	−105 −151 −113 −159 −123 −169	—	—	—
+81 0	+130 0	+210 0	±16	±26	+5 −27	+16 −36	−9 −41	0 −52	−25 −57	−14 −66	−47 −79	−36 −88	−74 −126 −78 −130	—	—	—	—
+89 0	+140 0	+230 0	±18	±28	+7 −29	+17 −40	−10 −46	0 −57	−26 −62	−16 −73	−51 −87	−41 −98	−87 −144 −93 −150	—	—	—	—
+97 0	+155 0	+250 0	±20	±31	+8 −32	+18 −45	−10 −50	0 −63	−27 −67	−17 −80	−55 −95	−45 −108	−103 −166 −109 −172	—	—	—	—

JIS FIT TOLERANCE TABLE (SHAFTS)

Classification of Standard Dimensions (mm)		Class of Geometrical Tolerance Zone of Shafts													
>	≤	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7
—	3	−140 −165	−60 −85	−20 −34	−20 −45	−14 −24	−14 −28	−14 −39	−6 −12	−6 −16	−6 −20	−2 −6	−2 −8	0 −4	0 −6	0 −10
3	6	−140 −170	−70 −100	−30 −48	−30 −60	−20 −32	−20 −38	−20 −50	−10 −18	−10 −22	−10 −28	−4 −9	−4 −12	0 −5	0 −8	0 −12
6	10	−150 −186	−80 −116	−40 −62	−40 −76	−25 −40	−25 −47	−25 −61	−13 −22	−13 −28	−13 −35	−5 −11	−5 −14	0 −6	0 −9	0 −15
10	14	−150 −193	−95 −138	−50 −77	−50 −93	−32 −50	−32 −59	−32 −75	−16 −27	−16 −34	−16 −43	−6 −14	−6 −17	0 −8	0 −11	0 −18
14	18															
18	24	−160 −212	−110 −162	−65 −98	−65 −117	−40 −61	−40 −73	−40 −92	−20 −33	−20 −41	−20 −53	−7 −16	−7 −20	0 −9	0 −13	0 −21
24	30															
30	40	−170 −232	−120 −182	−80 −119	−80 −142	−50 −75	−50 −89	−50 −112	−25 −41	−25 −50	−25 −64	−9 −20	−9 −25	0 −11	0 −16	0 −25
40	50	−180 −242	−130 −192													
50	65	−190 −264	−140 −214	−100 −146	−100 −174	−60 −90	−60 −106	−60 −134	−30 −49	−30 −60	−30 −76	−10 −23	−10 −29	0 −13	0 −19	0 −30
65	80	−200 −274	−150 −224													
80	100	−220 −307	−170 −257	−120 −174	−120 −207	−72 −107	−72 −126	−72 −159	−36 −58	−36 −71	−36 −90	−12 −27	−12 −34	0 −15	0 −22	0 −35
100	120	−240 −327	−180 −267													
120	140	−260 −360	−200 −300	−145 −208	−145 −245	−85 −125	−85 −148	−85 −185	−43 −68	−43 −83	−43 −106	−14 −32	−14 −39	0 −18	0 −25	0 −40
140	160	−280 −380	−210 −310													
160	180	−310 −410	−230 −330													
180	200	−340 −455	−240 −355	−170 −242	−170 −285	−100 −146	−100 −172	−100 −215	−50 −79	−50 −96	−50 −122	−15 −35	−15 −44	0 −20	0 −29	0 −46
200	225	−380 −495	−260 −375													
225	250	−420 −535	−280 −395													
250	280	−480 −610	−300 −430	−190 −271	−190 −320	−110 −162	−110 −191	−110 −240	−56 −88	−56 −108	−56 −137	−17 −40	−17 −49	0 −23	0 −32	0 −52
280	315	−540 −670	−330 −460													
315	355	−600 −740	−360 −500	−210 −299	−210 −350	−125 −182	−125 −214	−125 −265	−62 −98	−62 −119	−62 −151	−18 −43	−18 −54	0 −25	0 −36	0 −57
355	400	−680 −820	−400 −540													
400	450	−760 −915	−440 −595	−230 −327	−230 −385	−135 −198	−135 −232	−135 −290	−68 −108	−68 −131	−68 −165	−20 −47	−20 −60	0 −27	0 −40	0 −63
450	500	−840 −995	−480 −635													

Note) Values shown in the upper portion of respective lines are upper dimensional tolerance, while values shown in the lower portion of respective lines are lower dimensional tolerance.

Units : μm

Class of Geometrical Tolerance Zone of Shafts

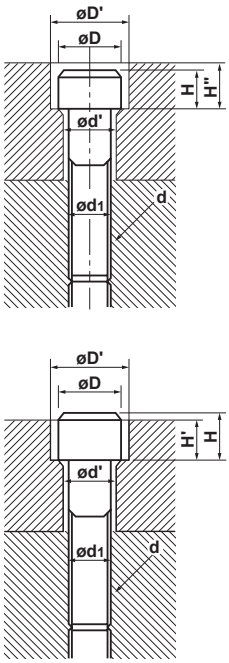
h8	h9	js5	js6	js7	k5	k6	m5	m6	n6	p6	r6	s6	t6	u6	x6
0 −14	0 −25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+10 +4	+12 +6	+16 +10	+20 +14	—	+24 +18	+26 +20
0 −18	0 −30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +19	—	+31 +23	+36 +28
0 −22	0 −36	±3	±4.5	±7	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+32 +23	—	+37 +28	+43 +34
0 −27	0 −43	±4	±5.5	±9	+9 +1	+12 +1	+15 +7	+18 +7	+23 +12	+29 +18	+34 +23	+39 +28	—	+44 +33	+51 +40 +56 +45
0 −33	0 −52	±4.5	±6.5	±10	+11 +2	+15 +2	+17 +8	+21 +8	+28 +15	+35 +22	+41 +28	+48 +35	— +54 +41	+54 +41 +61 +48	+67 +54 +77 +64
0 −39	0 −62	±5.5	±8	±12	+13 +2	+18 +2	+20 +9	+25 +9	+33 +17	+42 +26	+50 +34	+59 +43	+64 +48 +70 +54	+76 +60 +86 +70	—
0 −46	0 −74	±6.5	±9.5	±15	+15 +2	+21 +2	+24 +11	+30 +11	+39 +20	+51 +32	+60 +41 +62 +43	+72 +53 +78 +59	+85 +66 +94 +75	+106 +87 +121 +102	—
0 −54	0 −87	±7.5	±11	±17	+18 +3	+25 +3	+28 +13	+35 +13	+45 +23	+59 +37	+73 +51 +76 +54	+93 +71 +101 +79	+113 +91 +126 +104	+146 +124 +166 +144	—
0 −63	0 −100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27	+68 +43	+88 +63 +90 +65 +93 +68	+117 +92 +125 +100 +133 +108	+147 +122 +159 +134 +171 +146	—	—
0 −72	0 −115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31	+79 +50	+106 +77 +109 +80 +113 +84	+151 +122 +159 +130 +169 +140	—	—	—
0 −81	0 −130	±11.5	±16	±26	+27 +4	+36 +4	+43 +20	+52 +20	+66 +34	+88 +56	+126 +94 +130 +98	—	—	—	—
0 −89	0 −140	±12.5	±18	±28	+29 +4	+40 +4	+46 +21	+57 +21	+73 +37	+98 +62	+144 +108 +150 +114	—	—	—	—
0 −97	0 −155	±13.5	±20	±31	+32 +5	+45 +5	+50 +23	+63 +23	+80 +40	+108 +68	+166 +126 +172 +132	—	—	—	—

HEXAGON SOCKET HEAD BOLT HOLE SIZE

DIMENSIONS OF COUNTERBORING FOR HEXAGON SOCKET HEAD CAP SCREW AND BOLT HOLE

Unit : mm

Nominal dimensions of thread d	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
d_1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
d'	3.4	4.5	5.5	6.6	9	11	14	16	18	20	22	24	26	30	33
D	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
D'	6.5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H'	2.7	3.6	4.6	5.5	7.4	9.2	11	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H"	3.3	4.4	5.4	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32



TAPER STANDARD

Fig.1
Bolt Grip Taper

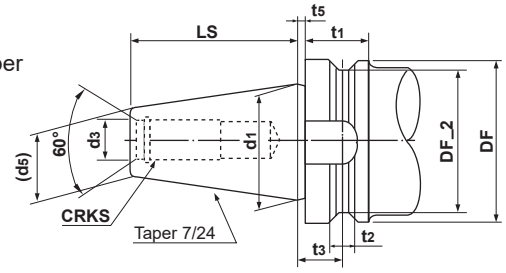
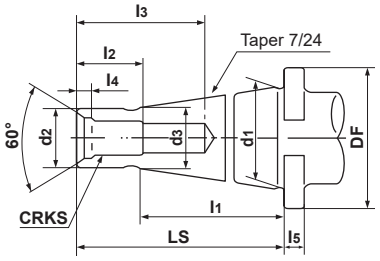


Fig.2
National Taper



●Table 1 Bolt Grip Taper (Fig.1)

Bearing Number	DF	DF_2	t1	t2	t3	t5	d1	d3	LS	CRKS	d5
BT35	53	43	20	10	13.0	2	38.1	13	56.5	M12×1.75	21.62
BT40	63	53	25	10	16.6	2	44.45	17	65.4	M16×2	25.3
BT45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	33.1
BT50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	40.1
BT60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	60.7

●Table 2 National Taper (Fig.2)

Bearing Number	d1	d2	LS	l1	CRKS		l2	l3	d3	l4	DF	l5
					Metric Screw	Wit Screw						
NT30	31.75	17.4	70	50	M12	W 1/2	24	50	16.5	6	50	8
NT40	44.45	25.3	95	67	M16	W 5/8	30	70	24	7	63	10
NT50	69.85	39.6	130	105	M24	W 1	45	90	38	11	100	13
NT60	107.95	60.2	210	165	M30	W 1¹/4	56	110	58	12	170	15

Fig.3
Morse Taper
(Shank with Tongue)

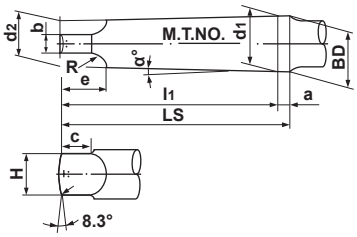
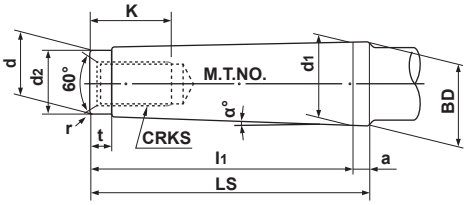


Fig.4
Morse Taper
(Shank with Screw)



●Table 3 Shank with Tongue (Fig.3)

Morse Taper Number	α°	d1	a	BD	d2	H	l1	LS	b	c	e	R	r
0	1°29′27″	9.045	3	9.201	6.104	6	56.5	59.5	3.9	6.5	10.5	4	1
1	1°25′43″	12.065	3.5	12.240	8.972	8.7	62.0	65.5	5.2	8.5	13.5	5	1.2
2	1°25′50″	17.780	5	18.030	14.034	13.5	75.0	80.0	6.3	10	16	6	1.6
3	1°26′16″	23.825	5	24.076	19.107	18.5	94.0	99	7.9	13	20	7	2
4	1°29′15″	31.267	6.5	31.605	25.164	24.5	117.5	124	11.9	16	24	8	2.5
5	1°30′26″	44.399	6.5	44.741	36.531	35.7	149.5	156	15.9	19	29	10	3
6	1°29′36″	63.348	8	63.765	52.399	51.0	210.0	218	19	27	40	13	4
7	1°29′22″	83.058	10	83.578	68.185	66.8	286.0	296	28.6	35	54	19	5

●Table 4 Shank with Screw (Fig.4)

Morse Taper Number	α°	d1	a	BD	d	d2	l1	LS	t	r	CRKS	K
0	1°29′27″	9.045	3	9.201	6.442	6	50	53	4	0.2	—	—
1	1°25′43″	12.065	3.5	12.240	9.396	9	53.5	57	5	0.2	M6	16
2	1°25′50″	17.780	5	18.030	14.583	14	64	69	5	0.2	M10	24
3	1°26′16″	23.825	5	24.076	19.759	19	81	86	7	0.6	M12	28
4	1°29′15″	31.267	6.5	31.605	25.943	25	102.5	109	9	1.0	M16	32
5	1°30′26″	44.399	6.5	44.741	37.584	35.7	129.5	136	9	2.5	M20	40
6	1°29′36″	63.348	8	63.765	53.859	51	182	190	12	4.0	M24	50
7	1°29′22″	83.058	10	83.578	70.052	65	250	260	18.5	5.0	M33	80

INTERNATIONAL SYSTEM OF UNITS

■UNIT CONVERSION TABLE for EASIER CHANGE into SI UNITS (Bold type Indicates SI unit)

●Pressure

Pa	**kPa**	**MPa**	bar	kgf/cm^2	atm	mmH$_2$O	mmHg or Torr
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}	9.86923×10^{-6}	1.01972×10^{-1}	7.50062×10^{-3}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}	9.86923×10^{-3}	1.01972×10^{2}	7.50062
1×10^{6}	1×10^{3}	1	1×10	1.01972×10	9.86923	1.01972×10^{5}	7.50062×10^{3}
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972	9.86923×10^{-1}	1.01972×10^{4}	7.50062×10^{2}
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1	9.67841×10^{-1}	1×10^{4}	7.35559×10^{2}
1.01325×10^{5}	1.01325×10^{2}	1.01325×10^{-1}	1.01325	1.03323	1	1.03323×10^{4}	7.60000×10^{2}
9.80665	9.80665×10^{-3}	9.80665×10^{-6}	9.80665×10^{-5}	1×10^{-4}	9.67841×10^{-5}	1	7.35559×10^{-2}
1.33322×10^{2}	1.33322×10^{-1}	1.33322×10^{-4}	1.33322×10^{-3}	1.35951×10^{-3}	1.31579×10^{-3}	1.35951×10	1

Note 1) 1Pa=1N/m^2

●Force

N	dyn	kgf
1	1×10^{5}	1.01972×10^{-1}
1×10^{-5}	1	1.01972×10^{-6}
9.80665	9.80665×10^{5}	1

●Stress

Pa	**MPa** or **N/mm^2**	kgf/mm^2	kgf/cm^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10
9.80665×10^{6}	9.80665	1	1×10^{2}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1

Note 1) 1Pa=1N/m^2

●Work / Energy / Quantity of Heat

J	kW•h	kgf•m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.600×10^{6}	1	3.67098×10^{5}	8.6000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

Note 1) 1J=1W•s, 1J=1N•m
1cal=4.18605J
(By the law of weights and measures)

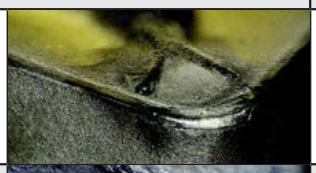
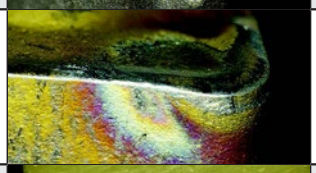
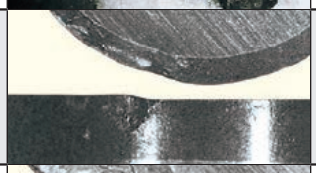
●Power (Rate of Production / Motive Power) /Heat Flow Rate

W	kgf•m/s	PS	kcal/h
1	1.01972×10^{-1}	1.35962×10^{-3}	8.6000×10^{-1}
9.80665	1	1.33333×10^{-2}	8.43371
7.355×10^{2}	7.5×10	1	6.32529×10^{2}
1.16279	1.18572×10^{-1}	1.58095×10^{-3}	1

Note 1) 1W=1J/s, PS:French horse power
1PS=0.7355kW
(By the enforcement act for the law of weights and measures)
1cal=4.18605J

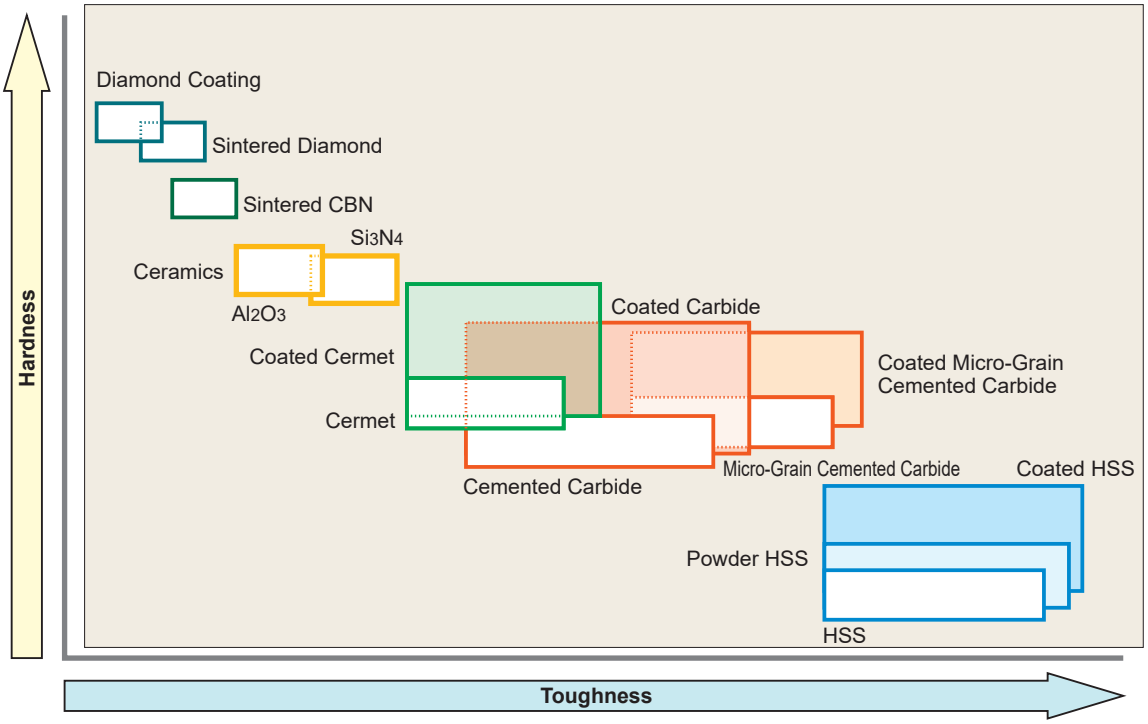
TOOL WEAR AND DAMAGE

CAUSES AND COUNTERMEASURES

Tool Damage Form		Cause	Countermeasure
Flank Wear		• Tool grade is too soft. • Cutting speed is too high. • Flank angle is too small. • Feed rate is extremely low.	• Tool grade with high wear resistance. • Lower cutting speed. • Increase flank angle. • Increase feed rate.
Crater Wear		• Tool grade is too soft. • Cutting speed is too high. • Feed rate is too high.	• Tool grade with high wear resistance. • Lower cutting speed. • Lower feed rate.
Chipping		• Tool grade is too hard. • Feed rate is too high. • Lack of cutting edge strength. • Lack of shank or holder rigidity.	• Tool grade with high toughness. • Lower feed rate. • Increase honing. (Round honing is to be changed to chamfer honing.) • Use large shank size.
Fracture		• Tool grade is too hard. • Feed rate is too high. • Lack of cutting edge strength. • Lack of shank or holder rigidity.	• Tool grade with high toughness. • Lower feed rate. • Increase honing. (Round honing is to be changed to chamfer honing.) • Use large shank size.
Plastic Deformation		• Tool grade is too soft. • Cutting speed is too high. • Depth of cut and feed rate are too large. • Cutting temperature is high.	• Tool grade with high wear resistance. • Lower cutting speed. • Decrease depth of cut and feed rate. • Tool grade with high thermal conductivity.
Thermal Cracks		• Expansion or shrinkage due to cutting heat. • Tool grade is too hard. *Especially in milling.	• Dry cutting. (For wet cutting, flood workpiece with cutting fluid) • Tool grade with high toughness.
Notching		• Hard surfaces such as uncut surfaces, chilled parts and machining hardened layer. • Friction caused by jagged shape chips. (Caused by small vibration)	• Tool grade with high wear resistance. • Increase rake angle to improve sharpness.
Welding		• Cutting speed is low. • Poor sharpness. • Unsuitable grade.	• Increase cutting speed. (For JIS S45C, cutting speed 80m/min.) • Increase rake angle. • Tool grade with low affinity. (Coated grade, cermet grade)
Flaking		• Cutting edge welding and adhesion. • Poor chip disposal.	• Increase rake angle to improve sharpness. • Enlarge chip pocket.
Flank Wear Fracture *Damage for polycrystallines		• Damage due to the lack of strength of a curved cutting edge.	• Increase honing. • Tool grade with high toughness.
Crater Wear Fracture *Damage for polycrystallines		• Tool grade is too soft. • Cutting resistance is too high and causes high cutting heat.	• Decrease honing. • Tool grade with high wear resistance.

CUTTING TOOL MATERIALS

The table below shows the relationship between various tool materials, in relation with hardness on a vertical axis and toughness on a horizontal axis. Today, cemented carbide, coated carbide and TiC-TiN-based cermet are key tool materials in the market. This is because they have the best balance of hardness and toughness.

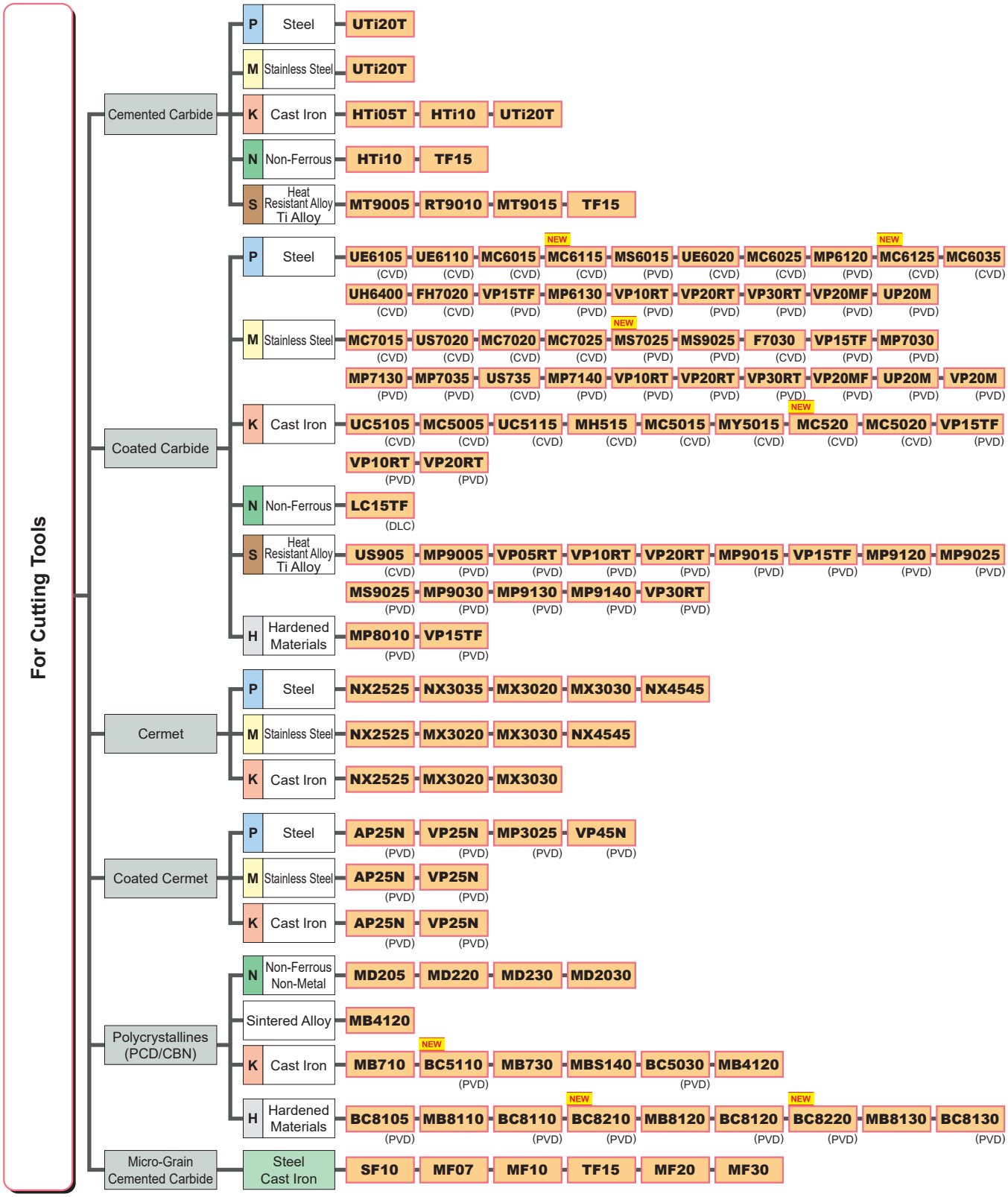


GRADE CHARACTERISTICS

Hard Materials	Hardness (HV)	Energy Formation (kcal/g·atom)	Solubility in Iron (%.1250℃)	Thermal Conductivity (W/m·k)	Thermal Expansion (x 10^{-6}/k)*	Tool Material
Diamond	>9000	–	Highly Soluble	2100	3.1	Sintered Diamond
CBN	>4500	–	–	1300	4.7	Sintered CBN
Si_3N_4	1600	–	–	100	3.4	Ceramics
Al_2O_3	2100	-100	≒0	29	7.8	Ceramics Cemented Carbide
TiC	3200	-35	< 0.5	21	7.4	Cermet Coated Carbide
TiN	2500	-50	–	29	9.4	Cermet Coated Carbide
TaC	1800	-40	0.5	21	6.3	Cemented Carbide
WC	2100	-10	7	121	5.2	Cemented Carbide

*1W/m•K=2.39×10^{-3}cal/cm•sec•℃

GRADE CHAIN


For Cutting Tools
Cemented Carbide
P Steel
UTi20T
M Stainless Steel
UTi20T
K Cast Iron
HTi05T
HTi10
UTi20T
N Non-Ferrous
HTi10
TF15
S Heat Resistant Alloy Ti Alloy
MT9005
RT9010
MT9015
TF15
Coated Carbide
P Steel
UE6105 (CVD)
UE6110 (CVD)
MC6015 (CVD)
NEW MC6115 (CVD)
MS6015 (PVD)
UE6020 (CVD)
MC6025 (CVD)
MP6120 (PVD)
NEW MC6125 (CVD)
MC6035 (CVD)
UH6400 (CVD)
FH7020 (CVD)
VP15TF (PVD)
MP6130 (PVD)
VP10RT (PVD)
VP20RT (PVD)
VP30RT (PVD)
VP20MF (PVD)
UP20M (PVD)
M Stainless Steel
MC7015 (CVD)
US7020 (CVD)
MC7020 (CVD)
MC7025 (CVD)
NEW MS7025 (PVD)
MS9025 (PVD)
F7030 (CVD)
VP15TF (PVD)
MP7030 (PVD)
MP7130 (PVD)
MP7035 (PVD)
US735 (CVD)
MP7140 (PVD)
VP10RT (PVD)
VP20RT (PVD)
VP30RT (PVD)
VP20MF (PVD)
UP20M (PVD)
VP20M (PVD)
K Cast Iron
UC5105 (CVD)
MC5005 (CVD)
UC5115 (CVD)
MH515 (CVD)
MC5015 (CVD)
MY5015 (CVD)
NEW MC520 (CVD)
MC5020 (CVD)
VP15TF (PVD)
VP10RT (PVD)
VP20RT (PVD)
N Non-Ferrous
LC15TF (DLC)
S Heat Resistant Alloy Ti Alloy
US905 (CVD)
MP9005 (PVD)
VP05RT (PVD)
VP10RT (PVD)
VP20RT (PVD)
MP9015 (PVD)
VP15TF (PVD)
MP9120 (PVD)
MP9025 (PVD)
MS9025 (PVD)
MP9030 (PVD)
MP9130 (PVD)
MP9140 (PVD)
VP30RT (PVD)
H Hardened Materials
MP8010 (PVD)
VP15TF (PVD)
Cermet
P Steel
NX2525
NX3035
MX3020
MX3030
NX4545
M Stainless Steel
NX2525
MX3020
MX3030
NX4545
K Cast Iron
NX2525
MX3020
MX3030
Coated Cermet
P Steel
AP25N (PVD)
VP25N (PVD)
MP3025 (PVD)
VP45N (PVD)
M Stainless Steel
AP25N (PVD)
VP25N (PVD)
K Cast Iron
AP25N (PVD)
VP25N (PVD)
Polycrystallines (PCD/CBN)
N Non-Ferrous Non-Metal
MD205
MD220
MD230
MD2030
Sintered Alloy
MB4120
K Cast Iron
MB710
NEW BC5110 (PVD)
MB730
MBS140
BC5030 (PVD)
MB4120
H Hardened Materials
BC8105 (PVD)
MB8110
BC8110 (PVD)
NEW BC8210 (PVD)
MB8120
BC8120 (PVD)
NEW BC8220 (PVD)
MB8130
BC8130 (PVD)
Micro-Grain Cemented Carbide
Steel Cast Iron
SF10
MF07
MF10
TF15
MF20
MF30

GRADES COMPARISON TABLE

CEMENTED CARBIDE

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Iscar
Turning	P	P01										
		P10		ST10P	TH10			WS10				IC70
		P20	UTi20T	ST20E	KS20			EX35				IC70 IC50M
		P30	UTi20T	A30 A30N	UX30 KS15F			EX35				IC50M IC54
		P40		ST40E	TX40			EX35				IC54
	M	M10		EH510	TH10			WA10B		KU10 K313 K68	890	IC07
		M20	UTi20T	EH520	KS20			EX35		KU10 K313 K68	HX 883	IC07 IC08 IC20
		M30	UTi20T	A30 A30N	UX30			EX35				IC08 IC20 IC28
		M40			TU40							IC28
	K	K01	HTi05T	H1 H2	KS05F			WH01 WH05		KU10 K313 K68		
		K10	HTi10	EH510	TH10	KW10 GW15	KT9	WH10		KU10 K313 K68	890	IC20
		K20	UTi20T	G10E H10E EH520	KS15F KS20	GW25	KT9	WH20	H13A	KU10 K313 K68	HX	IC20
		K30	UTi20T	G10E H10E							883	
	N	N01		H1 H2	KS05F	GW05 KW10			H10			
		N10	HTi10	EH510	TH10	KW10 GW15	KT9	WH10	H10 HBA	KU10 K313 K68	890	IC08 IC20
		N20		G10E EH520	KS15F		KT9	WH20	H10 HBA	KU10 K313 K68	HX KX	IC08 IC20
		N30									883	
	S	S01	MT9005			SW05						
		S10	MT9005 RT9010 MT9015	EH510	KS05F TH10	SW10		WH13S	H10A H10F H13A	KU10 K313 K68	HX 883	IC07 IC08
		S20	RT9010 TF15	EH520	KS15F KS20	SW25				KU10 K313 K68	883	IC07 IC08
		S30	TF15									
Milling	P	P10										
		P20	UTi20T	A30N				EX35		K125M		IC50M IC28
		P30	UTi20T	A30N	UX30			EX35	SM30	GX		IC50M IC28
		P40						EX35				IC28
	M	M10										
		M20	UTi20T	A30N				EX35				IC08 IC20
		M30	UTi20T	A30N				EX35	SM30			IC08 IC28
		M40										IC28
	K	K01	HTi05T							K115M,K313		
		K10	HTi10	G10E	TH10	KW10 GW25	KT9	WH10		K115M K313		IC20
		K20	UTi20T	G10E		GW25	FZ15	WH20	H13A		HX	IC20
		K30	UTi20T									

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

MICRO-GRAIN

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools
Cutting Tools	Z	Z01	**SF10 MF07 MF10**	F0	F MD05F MD1508		FZ05 FB05 FB10	NM08	PN90 6UF,H3F 8UF,H6F		
		Z10	**HTi10 MF20**	XF1 F1 AFU	MD10 MD0508 MD07F	FW30	FZ10 FZ15 FB15	NM10 NM12 NM15	H10F		890
		Z20	**TF15 MF30**	AF0 SF2 AF1	EM10 MD20 G1F		FZ15 FB15 FB20	BRM20 EF20N	H15F		890 883
		Z30		A1 CC			FZ20 FB20	NM25 NM40			883

CERMET

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Iscar
Turning	P	P01	**AP25N* VP25N***	T1000A	NS520 GT720*	CCX* TN610 PV710* PV30*						IC20N IC520N*
		P10	**NX2525 AP25N* VP25N***	T1500A T1500Z*	NS520 NS9530 GT9530* AT9530*	CCX* TN60 TN610 PV710* TN620 PV720*	CX75	CZ25*	CT5015 GC1525*	KT315 KT125	TP1020 TP1030* CM CMP*	IC20N IC520N* IC530N*
		P20	**NX2525 AP25N* VP25N* NX3035 MP3025***	T1500A T1500Z* T2500A T2500Z* T3000Z*	NS9530 GT9530* AT9530*	TN60 TN620 PV720* TN6020	CX75 PX90*	CH550	GC1525*	KT325 KT1120 KT5020*	TP1020 TP1030*	IC20N IC520N* IC30N IC530N* IC75T
		P30	**MP3025* VP45N***	T3000Z*		PV730* PV90*	PX90*					IC75T
	M	M10	**NX2525 AP25N* VP25N***	T1000A T1500Z*		TN60 TN620 PV720* TN6020		CZ25*	GC1525*	KT125	TP1020 TP1030* CM CMP*	
		M20	**NX2525 AP25N* VP25N***	T1500A T1500Z*		TN90 TN6020 TN620 PV720* PV90*		CH550				
		M30				PV730*						
	K	K01	**NX2525 AP25N***	T1000A	NS520 GT720*	CCX* PV7005*						
		K10	**NX2525 AP25N***		NS520 NS9530 GT9530*	CCX* PV7005* TN60		CZ25*	CT5015	KT325 KT125		
		K20	**NX2525 AP25N***					CH550				
Milling	P	P10	**NX2525**			TN620M TN60	CX75	MZ1000*			C15M	IC30N
		P20	**MX3020 NX2525**	T250A T2500A		TN100M TN620M TN60	CX75 CX90	CH550 CH7030 MZ1000*	CT530	KT530M HT7 KT605M	C15M MP1020	IC30N
		P30	**MX3030 NX4545**	T4500A	NS740		CX90	CH7035				IC30N
	M	M10	**NX2525**			TN60						IC30N
		M20	**MX3020 NX2525**	T250A T2500A		TN100M	CX75		CT530	KT530M HT7 KT605M	C15M	IC30N
		M30	**MX3030 NX4545**	T4500A								
	K	K01										
		K10	**NX2525**			TN60	CX75					
		K20	**NX2525**				CX75			KT530M HT7		

*Coated Cermet

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

GRADES COMPARISON TABLE

CVD COATED GRADE

	ISO		MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Iscar
	Classification	Symbol										
Turning	P	P01	MC6115 UE6105	AC810P AC8015P	T9105 T9205	CA510 CA5505	JC110V	HG8010	GC4305 GC4415	KCP05B KCP05	TP0501 TP1501	IC9150 IC8150 IC428
		P10	MC6115 UE6105 MC6015 UE6110 MY5015 MC6125	AC810P AC8020P	T9205 T9105 T9115 T9215	CA510 CA5505 CA515 CA5515	JC110V JC215V	HG8010 HG8025 GM8020	GC4315 GC4325 GC4415	KCP10B KCP10 KCP25	TP1501 TP2501	IC9150 IC8150 IC8250
		P20	MC6115 MC6015 UE6110 MC6125 MC6025 UE6020 MY5015	AC8020P AC820P AC2000 AC8025P	T9115 T9125 T9215 T9225	CA025P CA515 CA5515 CA525 CA5525 CR9025	JC110V JC215V	HG8025 GM8020 GM25	GC4315 GC4325 GC4425	KCP25B KCP30B KCP25	TP2501	IC8250 IC9250 IC8350
		P30	MC6125 MC6025 UE6020 MC6035 UH6400	AC6030M AC8035P AC830P AC630M	T9125 T9135 T9225 T9235	CA025P CA525 CA5525 CA530 CA5535 CR9025	JC215V JC325V	GM25 GM8035	GC4325 GC4335 GC4425	KCP30B KCP30	TP3501	IC8350 IC9250 IC9350
		P40	MC6035 UH6400	AC6030M AC8035P AC630M AC830P	T9135 T9235	CA530 CA5535	JC325V	GM8035 GX30	GC4335	KCP40 KCP40B	TP3501 TP40	IC9350
	M	M10	MC7015 US7020	AC610M AC6020M	T6120 T6215	CA6515			GC2015 GC2220	KCM15B KCM15	TM1501 TM2000	IC6015 IC8250
		M20	MC7015 US7020 MC7025	AC6020M AC610M AC6030M AC630M	T6120 T6215	CA6515 CA6525		HG8025 GM25	GC2015 GC2220	KCM15 KCM25B KCP40B	TM2000 TM2501	IC8150 IC6015
		M30	MC7025 US735	AC6030M AC630M	T6130	CA6525		GM8035 GX30	GC2025	KCM35B KCP40	TM4000 TM3501	IC8250 IC6025
		M40	US735	AC6030M AC630M				GX30	GC2025	KCM35B	TM4000 TM3501	IC6025
	K	K01	MC5005 UC5105	AC405K AC410K AC4010K	T505 T515 T5105	CA4505 CA4010 CA310	JC050W JC105V	HX3505	GC3205 GC3210	KCK05B KCK05	TK0501 TH1500	IC5005
		K10	MC5015 MH515 UC5115 MY5015	AC405K AC4010K AC410K AC4015K AC415K	T515 T5115	CA315 CA4515 CA4010 CA4115		HX3515 HG8010	GC3205 GC3210	KCK15B KCK15 KCK20 KC9315 KCK20B	TK0501 TK1501	IC5005 IC5010 IC428
		K20	MC5015 MH515 UC5115 UE6110 MY5015	AC4015K AC415K AC420K AC8025P	T5115 T5125	CA320 CA4515 CA4115 CA4120		HG8025 GM8020	GC3225	KCK20B KCK20 KCPK05	TK1501	IC5010 IC8150
		K30	UE6110	AC8025P	T5125			HG8025 GM8020	GC3225	KCPK05		
	S	S01	MV9005 US905			CA6515 CA6525		HS9105 HS9115	S05F S205			
Milling	P	P10	MV1020	ACP2000 XCU2500 ACP100							MP1501	IC5400
		P20	MV1020 MC7020 F7030	ACP2000 ACP3000 XCU2500 ACP100	T3130 T3225			GX2140 GF30	GC4220		MP1501 MP2501 T25M	IC5500
		P30	MV1020 MC7020 F7030	ACP3000 XCU2500 ACP100	T3130 T3225			GX2140 GX2160 GF30	GC4330 GC4230	KCPK30 KC930M	MP1501 MP2501 TM25 T350	IC5500
		P40						GX2030 GX2160	GC4340 GC4240	KC935M KC530M	MM4500 T350M	
	M	M10		XCU2500								
		M20	MC7020 F7030	ACP100 ACM200 XCU2500	T3130 T3225	CA6535		AX2040 GX2140		KC925M	MP2501 MS2500 T25M T350M	
		M30	MV1020 MC7020 F7030	ACP100 XCU2500 ACM200	T3130 T3225	CA6535		AX2040 GX2140 GX2160 GX30	GC2040	KC930M	MP2501 T25M T350M	IC5820
		M40						GX2160		KC930M KC935M	MM4500 T350M	
	K	K01										
		K10	MV1020 MC520 MC5020	XCK2000 ACK200	T1215 T1115	CA420M	JC605W	GX2120				
		K20	MV1020 MC520 MC5020	ACK200 XCK2500 XCK2000 ACK200	T1115		JC605W	GX2120	GC3220 GC3330 K20W	KC915M	MP1501	IC5100
		K30							GC3330 GC3040	KC920M KC925M KCPK30 KC930M KC935M	MP1501	IC5100 DT7150

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

PVD COATED GRADE

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Iscar
Turning	P	P01										
		P10	**VP10MF MS6015**		AH710	PR1705 PR930 PR1025 PR1115 PR1225 PR1725			GC1125	KCU10 KT315 KC5010 KC5510 KU10T KTP10	CP200 TS2000	IC250 IC507 IC570 IC807 IC907 IC908
		P20	**VP10RT VP20RT VP15TF VP20MF MS6015**		AH725 AH120 J740 SH730 SH725	PR930 PR1025 PR1725 PR1115 PR1225 PR1425 PR1535		IP2000	GC1525 GC1125 GC15	KT315 KCS10 KCU10 KC5025 KC5525 KU25T KTP10	TS2500	IC1007 IC250 IC308 IC507 IC807 IC808 IC907 IC908 IC1008 IC1028 IC3028
		P30	**VP10RT VP20RT VP15TF VP20MF MS7025**	AC1030U AC530U	AH725 AH120 SH730 GH730 GH130 AH740 J740 SH725 AH7025	PR1025 PR1725 PR1225 PR1425 PR1535 PR1625		IP3000	GC1125	KCU25 KC5525 KU25T	CP500	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028
		P40			AH740	PR1535					CP500 CP600	IC228 IC328 IC528 IC928 IC1008 IC1028 IC3028
	M	M01				PR1725	JC5003				CP200 TS2000	
		M10	**VP10MF**		AH8005 AH630	PR1025 PR1225 PR930 PR1725	JC5003 JC8015 JC5015	IP050S	GC1525 GC1115 GC15 GC1125 GC1105	KCS10 KCU10 KC5010	CP200 TS2000 TS2500	IC354 IC507 IC520 IC807 IC907 IC1007 IC5080T
		M20	**VP10RT VP20RT VP15TF VP20MF MS7025 MS9025**	AC1030U AC530U AC6040M	AH725 AH120 SH730 AH630 SH725 AH8015 AH7025	PR1025 PR1225 PR930 PR1535 PR1725	JC5015 JC8015 JC5118	IP100S	GC1525 GC1115 GC15 GC1125	KCU25 KC5025 KCU10 KC5010 KCS10	TS2500 CP500 CP600	IC354 IC808 IC908 IC1008 IC1028 IC3028 IC5080T
		M30	**VP10RT VP20RT VP15TF VP20M VP20MF MS7025 MP7035**	AC530U AC1030U AC6040M	AH725 AH120 SH730 J740 AH645 SH725	PR1025 PR1725 PR1535 PR1225	JC5118		GC1125 GC2035	KC5025 KCU25	CP500 CP600	IC228 IC250 IC328 IC330 IC1008 IC1028 IC9080T
		M40	**MP7035**	AC530U AC6040M AC1030U	AH645	PR1535 PR1225			GC2035		CP600	IC328 IC928 IC1008 IC1028 IC3028 IC9080T
	K	K01										
		K10		AC510U	GH110 AH110				GC15	KCU10 KCS10 KC5010 KC5510	CP200 TS2000	IC350 IC910 IC1008
		K20	**VP10RT VP20RT VP15TF**	AC1030U AC530U	AH7025 AH120					KCU15 KCU25	CP200 TS2000 TS2500	IC228 IC350 IC808 IC830 IC908 IC1007 IC1008
		K30	**VP10RT VP20RT VP15TF**		AH120 GH130					KCU25 KC5525	CP500	IC228 IC350 IC808 IC830 IC908 IC928 IC1007 IC1008
	S	S01	**MP9005 VP05RT**	AC510U AC5005S AC5015S	AH8005	PR005S PR015S	JC5003 JC8015 JC5015	JP9105			TH1000	IC507 IC804 IC807 IC907 IC5080T
		S10	**MP9005 MP9015 VP10RT**	AC5005S AC510U AC520U AC5015S AC5025S	AH8005 AH8015	PR005S PR015S	JC5003 JC5015 JC8015	JP9115	GC1105	KCU10 KC5010 KCS10	CP200 TS2000 TS2050 TS2500 TH1000	IC507 IC806 IC807 IC903 IC5080T
		S20	**MP9015 MT9015**	AC520U AC5015S AC5025S	AH7025 AH8015	PR015S PR1535	JC5015 JC5118		GC1105 GC1115 GC1125 GC15	KCU10 KCU25 KC5025 KCS10 KC5010	TS2000 TS2500 CP200	IC228 IC300 IC328 IC808 IC908 IC928 IC3028 IC806 IC9080T
		S30	**MS9025 MP9025 VP15TF VP20RT**	AC1030U	AH630 AH7025	PR015S PR1535	JC5118		GC1125	KCU25 KC5025	CP600	IC928 IC830
Milling	P	P01			AH710 AH110		JC8003	ATH80D JP4105				IC903
		P10		ACU2500	AH120 AH725	PR830 PR1225	JC8003 JC8015 JC5015 JC5118	PN15M PN215 PCA12M JP4115	GC1010 GC1130	KC505M KC715M KC510M KC515M		IC808 IC810 IC900 IC903 IC908 IC910 IC950 IC380

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

GRADES COMPARISON TABLE

PVD COATED GRADE

	ISO		MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Iscar
	Classification	Symbol										
Milling	P	P20	**MP6120 VP15TF**	ACU2500 ACP200	AH3225 AH725 AH120 GH330 AH9030 AH3135	PR830 PR1225 PR1230 PR1525	JC5015 JC8015 JC5118	CY9020 JP4120 CY150	GC1010 GC1030 GC1130 GC2030	KC522M KC525M KC527M KC610M KC620M KC635M KC715M KC720M KC730M	F25M MP3000	IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008 IC380
		P30	**MP6120 VP15TF MP6130 VP30RT**	ACU2500 ACP200 ACP300 ACP3000	AH120 AH130 AH6030 AH725 AH3225 AH3135 AH9130	PR1230 PR1525	JC8050 JC5040 JC5118	JS4045 CY250 CY250V CY25 HC844	GC1010 GC1030 GC2030 GC1130	KC735M KC725M KC530M KC537M	F25M MP3000 F30M MP2050	IC830 IC845 IC900 IC928 IC950 IC1008 IC380
		P40	**VP30RT**	ACP300	AH140	PR1525	JC8050 JC5040	JS4060 PTH30E PTH40H JS4060	GC2030 GC1030 GC1130	KC735M KC537M	F40M T60M	IC830 IC928 IC1008
	M	M01						PN08M PN208				IC907
		M10		ACU2500 ACM100	AH725	PR1225		PN15M PN215	GC1025 GC1030 GC1010 GC1130	KC715M KC515M		IC903
		M20	**VP15TF MP7130 MP7030 VP20RT**	ACU2500	AH725 AH3135 AH6030 AH130 AH3225 AH9130	PR830 PR1225 PR1525	JC5015 JC5118 JC8015	JP4120	GC1025 GC1030 GC1040 GC2030 S30T	KC610M KC635M KC730M KC720M KC522M KC525M	F25M MP3000	IC808 IC830 IC900 IC908 IC928 IC380 IC1008
		M30	**VP15TF MP7130 MP7030 VP20RT MP7140 VP30RT**	ACP300 ACM300 ACK300	AH130 AH9130 AH3135	PR830 PR1225 PR1525 PR1535	JC5015 JC8015 JC8050 JC5118	JS4045 CY250	S30T GC1040 GC2030	KC537M KC725M KC735M KC530M	F30M F40M MP3000 MP2050	IC328 IC330 IC380 IC830 IC882 IC928 IC1008 IC380
		M40	**MP7140 VP30RT**	ACM300	AH140	PR1525 PR1535	JC8050	PTH30E PTH40H JM4160			F40M MP2050	IC328 IC330 IC882 IC1008
	K	K01	**MP8010**		AH110		JC8003	ATH80D ATH08M TH308				IC380 IC900
		K10	**MP8010**	ACU2500 ACK3000	AH110 AH120	PR1210 PR1510	JC8015	ATH10E TH315 CY100H	GC1010	KC514M KC515M KC527M KC635M	MK2050	IC810 IC900 IC910 IC380
		K20	**VP15TF VP20RT**	ACU2500 ACK300 ACK3000	AH120 AH9130 AH9030	PR1210 PR1510	JC5015 JC8015	CY150 JP4120 CY9020 PTH13S	GC1010 GC1020	KC514M KC610M KC520M KC620M KC524M	MK2000 MK2050	IC810 IC910 IC928 IC950
		K30	**VP15TF VP20RT**	ACK300 ACK3000			JC5080 JC5015 JC8015	CY250 JS4045	GC1020	KC522M KC725M KC524M KC735M KC537M	MK2050	IC808 IC830 IC908 IC928 IC1008
	S	S01			AH110 AH710	PR905 PR1210	JC8003 JC8015 JC5118	PN08M PN208				IC907 IC908 IC808 IC903
		S10	**MP9120 VP15TF**	ACM100 ACU2500	AH120 AH725	PR1210 PR1535	JC8003 JC5015 JC8015 JC5118	JS1025 JP4120	GC1130 GC1010 GC1030 GC2030	KC510M	MS2050	IC903 IC907 IC908 IC840 IC910 IC808
		S20	**MP9120 VP15TF MP9130 MP9030**	ACK300 ACP300 ACU2500	AH725 AH6030 AH130	PR1210 PR1535	JC8015 JC5015 JC8050 JC5118	PTH30H	S30T GC2030 GC1030 GC1130	KC522M KC525M	MS2050 MP2050	IC300 IC908 IC808 IC900 IC830 IC928 IC328 IC330 IC840 IC882 IC380
		S30		ACM300	AH130	PR1535	JC8050 JC5118	JM4160	GC2030 GC1040	KC725M	MS2050 F40M KCSM40	IC830 IC882 IC928
	H	H01	**MP8010 VP05HT**		AH110 AH710		JC8003					IC903
		H10	**VP15TF VP10H**		AH110 AH120 AH710		JC6102 JC8008	JP4105 TH303 TH308 PTH08M ATH08M ATH80D	GC1130 GC1010 GC1030	KC505M KC510M	MH1000 F15M	IC900 IC808 IC907
		H20	**VP15TF**		AH120 AH725 AH9030		JC8015 JC5118	JP4115 TH315	GC1030 GC1130	KC635M	F15M	IC900 IC808 IC908 IC380
		H30						JP4120			MP3000 F30M	IC380 IC900 IC1008

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

CBN

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	Sandvik	Seco Tools
Turning	H	H01	**BC8105 BC8110 MB8110**	BNC100 BNX10 BN1000 BNC2010	BXM10 BX310	KBN05M KBN10M KBN510		CB7105	CBN060K
		H10	**BC8110 BC8210 BC8120 BC8220 MB8110 MB8120**	BNC160 BNX20 BN2000 BNC2020	BXM10 BX330 BX530	KBN05M KBN25M KBN525	JBN300	CB7115 CB7015	CBN010
		H20	**BC8210 BC8120 BC8220 MB8120**	BNC200 BNX25 BN250 BNC2020	BXM20 BXA20 BX360	KBN525 KBN05M KBN25M	JBN245	CB7125 CB7025 CB20	CBN150 CBN160C
		H30	**BC8130 MB8130**	BNC300 BN350	BXC50 BX380	KBN35M		CB7135 CB7525	CBN150 CBN160C
	S	S01	**MB730**	BN700 BN7000	M714B				CBN170
		S10		BNS8125	BX470, BX480				
		S20							
		S30							
	K	K01	**MB710 BC5110 MB5015**	BN500 BNC500	BX870 BX930 BX910				
		K10	**MB730 MB4120**	BN700 BN7500 BN7000	BX470 BX480	KBN60M	JBN795	CB7525	
		K20	**MB730 MB4120**	BN700 BN7000	BX480	KBN60M	JBN500		CBN200
		K30	**BC5030 MBS140**	BNS800 BNC8115, BNC8125	BX90S BXC90	KBN900		CB7925	CBN300 CBN400C CBN500
	Sintered Alloy		**MB4120**	BN7500 BN7000 BNC7115	BX470 BX480	KBN570 KBN70M			CBN200

PCD

	ISO Classification	ISO Symbol	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	Sandvik	Seco Tools
Turning	N	N01	**MD205***	DA90	DX180 DX160	KPD001	JDA30 JDA735	CD05	PCD05
		N10	**MD220**	DA150	DX140	KPD010		CD10	PCD10
		N20	**MD220**	DA2200	DX120		JDA715		PCD20
		N30	**MD230*** **MD2030**	DA1000	DX110	KPD230	JDA10		PCD30 PCD30M

* Non stock, produced to order only.

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

INSERT CHIP BREAKER COMPARISON TABLE

NEGATIVE INSERT TYPE

ISO Classification	Cutting Mode	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Walter	TaeguTec
P	Finish	FH, FP FY, FS	FA, FB FL	01* TF, 11 ZF	GP, PP, VF XP, XP-T, XF		FE	LC	FF	FF1, FF2	FP5	FA FX
	Light	LP SA, SH	SU LU, FE SX, SE	PS NS, 27 TSF, AS, TQ	PQ HQ, CQ	PF UR, UA, UT	BE B, BH, CE	XF PF MF	K LF, FN	MF2	MP3, FV5	FM FG
	Light (Mild Steel)	SY		17	XQ, XS							FC
	Light (With Wiper)	SW	LUW, SEW	FW, SW AFW, ASW	WF WP, WQ			WL, WF	FW	W-FF2 W-MF2	FW5, NF	WS
	Medium	MP MA MH	GU UG GE, UX	PM, NM, ZM TA, TM, AM, 28 DM, 33, 37, 38	PG, CJ, GS PS, HS PT	PG UB	CT, AB AH, AR AY, AE	PM QM, XM XMR	MP, P MN	MF3 MF5, M3 M5	MP5, MV5 MU5	PC, MP, FT MT
	Medium (With Wiper)	MW	GUW		WE			WMX, WM WR	MW, RW	W-M6, W-M3 W-MF5	MW5, NM	WT
	Rough	RP GH Std.	MU, MX, ME UZ	TH, THS Std.	PH GT Std.	UD GG	RE Y	PR, HM Std.	RN, RP	M6, MR6, MR7	RP5, RP7 RV5	RT Std.
	Heavy	HZ HL, HM, HX HV	MP HG, HP HU, HW, HF	TRS, 57 TU TUS, 65	PX	UC	HX HE, H	QR, PR HR, MR	MR, RP RM RH	R4, R5 R57, RR6, R7 R68, RR9	NRF HU5 NRR	RX, RH HD, HY, HT HZ, EH
M	Finish Light	SH, LM	SU, EF	SS	MQ, SK*		MP, AB, BH	XF, MF	FF, FP LF*	FF1, FF2 MF1	FM5	SF
	Medium	MS, GM MM, MA ES	EX, EG, UP GU HM	SA, SF SM S	MS, MU TK ST	SF, SZ SG	PV, DE, SE AH	MM QM, XM K	MS, MP UP	MF3 MF4 MF5, M3	MM5, RM5 MU5	ML EM, MM VF
	Heavy	GH, RM HL, HZ	EM, MU MP	TH, SH			AE	MR MR	MR, RP	M5, M6, R6 R56, RR6, R7 R8,PR9	HU5	
K	Finish Light	LK, MA		CF	KQ		VA, AH	KF	FN	MF2 M3, M4	MK5	FG
	Medium	MK, GK Std.	UZ, GZ, UX	CM Std.	KG, Std., C	PG	V, AE	KM	RP,UN	M5	RK5, MV7	MC
	Rough	RK			KH. GC, PH	GG	RE	KR, KRR		MR7	RK7 RV7	KT
	Heavy	Flat Top	Flat Top	CH, Flat Top	ZS, Flat Top	Flat Top	Flat Top		Flat Top	MR9 Flat Top	Flat Top	
S	Finish	FJ*	EF		MQ, SK*			SF	FS*, FF	MF1	FM5	FA
	Light	LS,MJ,MJ*	SU*	HRF				SGF*	LF*, MS, FN	MF3	NFT MS3	EA, SF
	Medium	MS MA	EG, EX, UP	HRM, 28 SA, HMM	SQ MS, MU, TK		VI	NGP*, SM QM	UP, P, NGP*	M1 M3	NMS, NMT MU5	
	Heavy	RS, GJ	MU		SG, SX			SR, SMR	RP	MR3 MR4	NRS, NRT HU5	ET

*Peripheral ground type insert.

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

7°POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Walter	TaeguTec
P	Finish	SMG*	FC*, SC*	JS*, 01*	CF*,CK* GQ*,GF* SKS*, SK*			UM*	LF*		FP2*	SA*
	Finish Light	FP, FV LP, SV	FB, FP, LU LB, SU	PF, PSF PS, PSS, TSF	GP, PP, VF XP		JQ	PF, UF	UF, 11 LF, FP	FF1 F1, MF2	PF4, FP4	FA, FX FG
	Light (With Wiper)	SW	LUW, SDW		WP			WF	FW	W-F1	PF	
	Medium	MV MP, Std.	GU MU	TM, 23 PM, 24	HQ, MF* XQ, GK	FT	JE	PM, UM PR, UR	MF, MP	M3 F2, M5	FP6, MP4 RP4	PC MT
	Medium (With Wiper)	MW		SW				WM	MW	W-MF2 W-M3	PM	WT
M	Finish | Light	FM LM	FC*,SI* LU LB, SU	PF, PSF PS, PSS	CF*,CK* GQ*,GF* MQ*,SK*		MP	MF, UF	LF, UF FP	F1, F2 MF2	FM2* FM4	FA FG
	Medium	MM Std.	GU, MU	PM	HQ, GK			MM, UM MR, UR	MP	M3 M5	FM6 MM4, RM4	PC MT
K	Medium	MK, Std. Flat Top	MU, Flat Top*	Flat Top, CM	Flat Top*			KF, KM, UM, KR	Flat Top	F1, M3, M5	FK6, MK4 RK4, RK6	MT
N	Medium	AZ*	AG* AW*	AL*	AP* AH*	ASF*,ALU* ACB*		AL*	HP*	AL*	FN2*, PM2* MN2*	FL*
S	Finish Light	FS*, LS* FS-P*, LS-P* FJ* LS, MS	SI* GU	Std.	CF*, CK* GQ*, GF* SK*, MQ			UM* UF, MF UM, MM	LF* HP*		FM2* FM4, FM6 MM4, RM4	SA*, FA, FG PC, MT

*Peripheral ground type insert.

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

11°POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	MITSUBISHI MATERIALS	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Sandvik	Kennametal	Seco Tools	Walter	TaeguTec
P	Finish Light	FV, SMG* SV	SI, FK. FB LU, LUW, LB SU,SF	01* PF, PSF PS, PSS, TSF	PP, GP, GF* SKS*, CF*, CK* PF*, XP		JQ	PF	UF, FP FW, LF		FP4	FG PC
	Medium	MV	GU, MU, US	PM TM, 23 24	HQ XQ	BM	JE	PM, UM	MF MP, MW		MP4	
M	Finish | Light	SMG* SV	SU	SS* PF, PS	GF*, CK* PF*, GP, CF* SKS*		MP	MF	HP* LF		FM4	PC
	Medium	MV	GU, MU, US	PM, Std.	HQ			MM			MM4	

*Peripheral ground type insert.

Note 1) The chart above is based on data from various publications and not authorized by each individual company.

Memo

Memo

MITSUBISHI MATERIALS

Overseas Sales Offices

JAPAN
MITSUBISHI MATERIALS CORPORATION
Metalworking Solutions Company
Overseas Sales Dept., Asian Region
Marunouchi Nijubashi Building 22F, 3-2-3,
Marunouchi, Chiyoda-ku, Tokyo 100-8117, JAPAN

CHINA
MITSUBISHI MATERIALS (SHANGHAI) CORPORATION
2101 Tower 1, Raffles City, 1133 Changning road,
Changning District, Shanghai, 200051, CHINA
TEL +86-21-6289-0022 FAX +86-21-6279-1180

THAILAND
MMC Hardmetal (Thailand) Co., Ltd.
622 Emporium Tower, Floor 22/1-4, Sukhumvit Road,
Klongton, Klongtoey, Bangkok 10110, THAILAND
TEL +66-2661-8170 FAX +66-2258-1790

INDIA
MMC HARDMETAL INDIA PVT. LTD.
Prasad Enclave, #118/119, 1st Floor, 2nd Stage,
5th main, BBMP Ward #11, (New #38), Industrial
Suburb, Yeshwanthpura, Bengaluru – 560 022,
Karnataka, India.
TEL +91-80-2204-3600

USA
MITSUBISHI MATERIALS U.S.A. CORPORATION
3535 Hyland Avenue, Suite 200, Costa Mesa,
CA 92626, USA
TEL +1-714-352-6100 FAX +1-714-668-1320

MEXICO
MMC METAL DE MEXICO, S.A. DE C.V.
Av. La Cañada No.16, Parque Industrial Bernardo
Quintana, El Marques, Querétaro CP 76246,
México
TEL +52-442-192-6800 FAX +52-442-221-6134

BRAZIL
MMC METAL DO BRASIL LTDA.
Rua Cincinato Braga, 340, 13°Andar, Conj. 131/132,
Bela Vista, CEP 01333-010, São Paulo-SP, Brazil
TEL +55-11-3506-5600 FAX +55-11-3506-5688

GERMANY
MMC HARTMETALL GmbH
Comeniusstr. 2, 40670 Meerbusch, GERMANY
TEL +49-2159-91890 FAX +49-2159-918966

UNITED KINGDOM
MMC HARDMETAL U.K.LTD
Mitsubishi house, Galena Close, Tamworth Staffs,
B77 4AS, U.K.
TEL +44-1827-312312 FAX +44-1827-312314

FRANCE
MMC METAL FRANCE S.A.R.L.
6, Rue Jacques Monod, 91400, Orsay, FRANCE
TEL +33-1-69-35-53-53 FAX +33-1-69-35-53-50

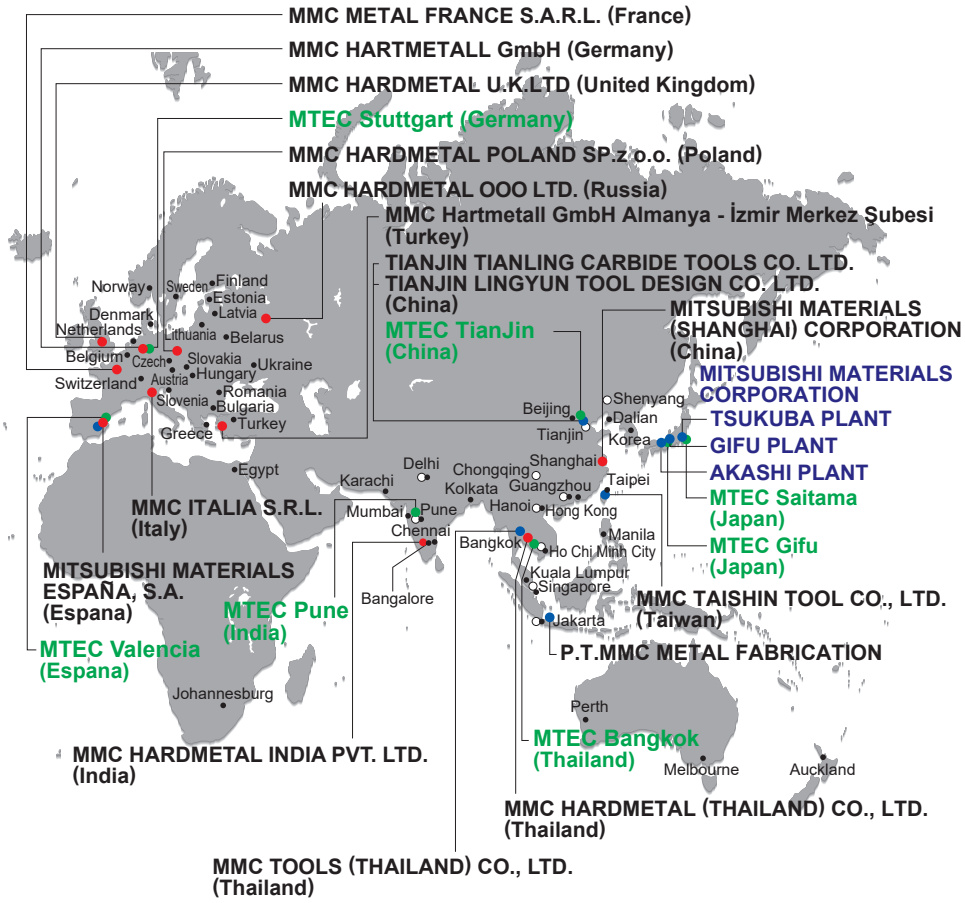
SPAIN
MITSUBISHI MATERIALS ESPAÑA,S.A.
Calle Emperador 2, 46136, Museros, Valencia, SPAIN
TEL +34-96-144-1711 FAX +34-96-144-3786

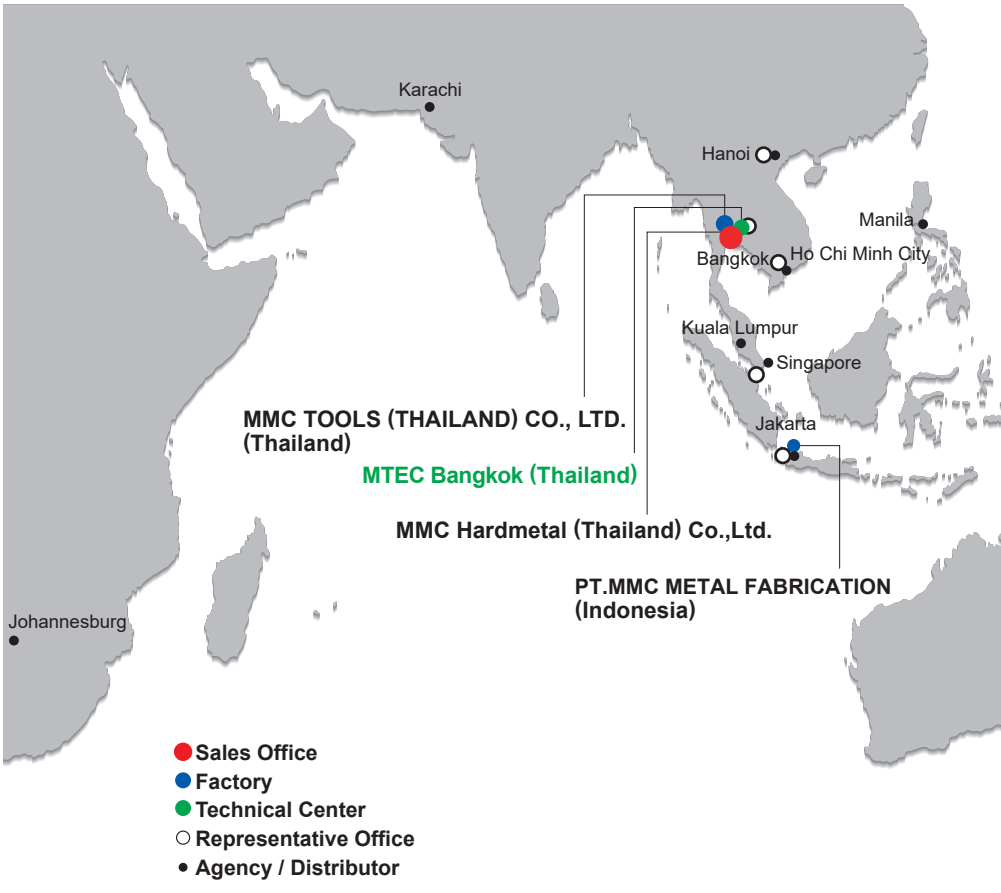
ITALY
MMC ITALIA S.R.L
Via Montefeltro 6/A, 20156 Milano, ITALY
TEL +39-02-93-77-03-1 FAX +39-02-93-58-90-93

RUSSIA
MMC HARDMETAL OOO LTD.
Electrozavodskaya, str. 24, building 3, 107023,
Moscow, RUSSIA
TEL +7-495-72558-85 FAX +7-495-98139-79

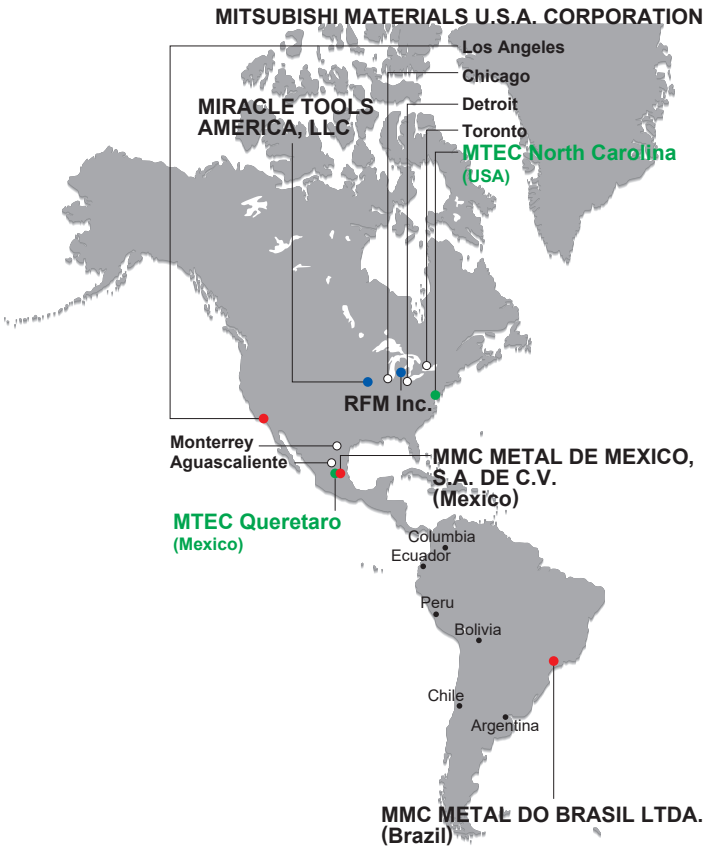
POLAND
MMC HARDMETAL POLAND Sp.z o.o.
Al. Armii Krajowej 61, 50-541 Wroclaw, POLAND
TEL +48-71-335-16-20 FAX +48-71-335-16-21

TURKEY
MMC Hartmetall GmbH Almanya - İzmir Merkez Şubesi
Adalet Mahallesi Anadolu Caddesi No: 41-1 /
15001 35530 Bayraklı/İzmir, Turkey
TEL +90-232-501500 FAX +90-232-5015007





www.mitsubishicarbide.com



MITSUBISHI MATERIALS CORPORATION

Regional Sales Offices

MMC Hardmetal (Thailand) Co.,Ltd.
622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klongton, Klongtoey, Bangkok 10110, THAILAND
TEL +66-2661-8170 FAX +66-2258-1790

Engineering Center and Amata Nakorn Branch
700/843 Moo 5, Tambon Nongkakha, Amphur Phanthong, Chonburi 20160, Thailand
TEL +66-3821-0728 FAX +66-3821-0732

Rayong Branch
789/283 Moo 1 Lifespace Building Floor 4 Room no. B405 Nong Kham, Sriracha, Chonburi 20230, Thailand

Singapore Branch
33 Ubi Avenue 3, #05-14 Vertex, Tower B, Singapore 408868
TEL +65-6634-8250 FAX +65-6634-8257

Hanoi Representative Office
403A, 4th Floor, The 6-Storey Block, Thang Long Ford Building, 105 Lang Ha Street, Dong Da District, Hanoi, Vietnam
TEL +84-24-3772-8362 FAX +84-24-3772-8299

Ho Chi Minh Representative Office
Ho Chi Minh Representative Office
1205 12th Floor, Saigon Riverside Office Center 2A-4A Ton Duc Thang Street, District 1, Ho Chi Minh City, Vietnam
TEL +84-28-3829-7700 FAX +84-28-3824-3344

Indonesia Representative Office
MM2100 Industrial Town, Jl. Jawa Blok GG-6 No.2 Jatiwangi, Cikarang, Bekasi, Indonesia 17520
TEL +62-21-2214-3639 FAX +62-21-2214-3745


MITSUBISHI MATERIALS TSUKUBA PLANT (JAPAN)


MITSUBISHI MATERIALS GIFU PLANT (JAPAN)




MITSUBISHI MATERIALS AKASHI PLANT (JAPAN)

DIA EDGE

YOUR GLOBAL CRAFTSMAN STUDIO

MITSUBISHI MATERIALS CORPORATION

MMC Hardmetal (Thailand) Co.,Ltd.
622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klongton, Klongtoey, Bangkok 10110, Thailand
TEL +66-2661-8170 FAX +66-2258-1790

Engineering Center and Amata Nakorn Branch
700/843 Moo 5, Tambon Nongkakha, Amphur Phanthong, Chonburi 20160, Thailand
TEL +66-3821-0728 FAX +66-3821-0732

Rayong Branch
789/283 Moo 1 Lifespace Building Floor 4 Room no. B405 Nong Kham, Sriracha, Chonburi 20230, Thailand

Singapore Branch
33 Ubi Avenue 3, #05-14 Vertex, Tower B, Singapore 408868
TEL +65-6634-8250 FAX +65-6634-8257

Hanoi Representative Office
403A, 4th Floor, The 6-Storey Block, Thang Long Ford Building, 105 Lang Ha Street, Dong Da District, Hanoi, Vietnam
TEL +84-24-3772-8362 FAX +84-24-3772-8299

Ho Chi Minh Representative Office
1205 12th Floor, Saigon Riverside Office Center 2A-4A Ton Duc Thang Street, District 1, Ho Chi Minh City, Vietnam
TEL +84-28-3829-7700 FAX +84-28-3824-3344

Indonesia Representative Office
MM2100 Industrial Town, Jl. Jawa Blok GG-6 No.2 Jatiwangi, Cikarang, Bekasi, Indonesia 17520
TEL +62-21-2214-3639 FAX +62-21-2214-3745

http://www.carbide.mht.co.th/

EXP-22-B001
2023.1A