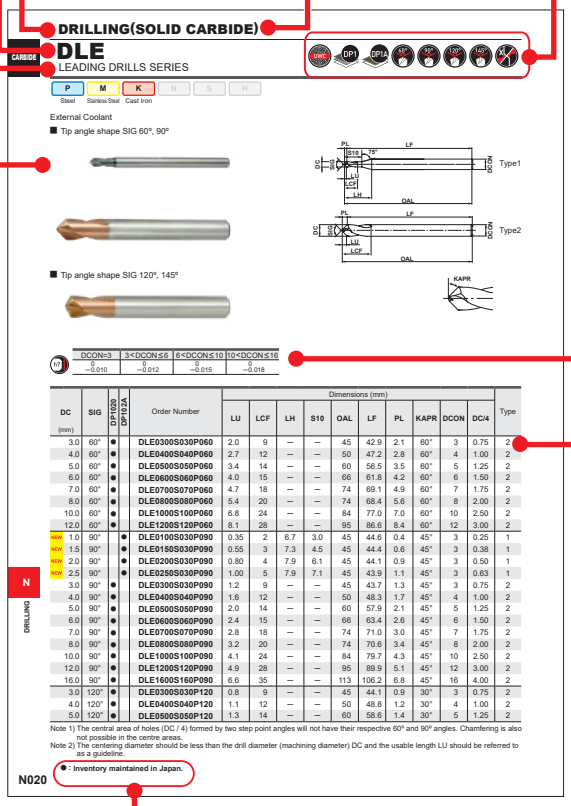
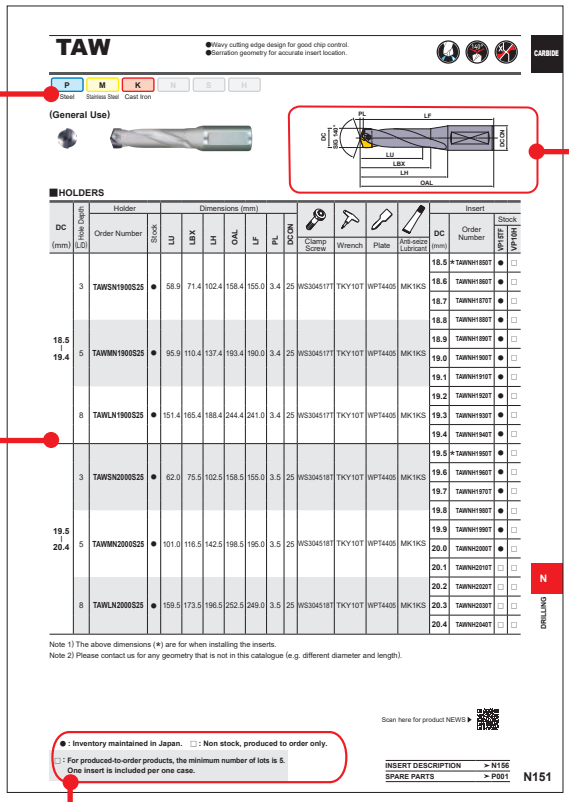
HOW TO READ THE STANDARD OF DRILLING TOOLS

●How this section page is organised

①Arranged in order of solid carbide drills, indexable type drills, brazed type drills and high-speed steel drills.

PHOTO OF PRODUCT
PRODUCT TITLE
PRODUCT CODE
PRODUCT SECTION
PRODUCT TYPE
PRODUCT INFORMATION ICONS
DIAMETER TOLERANCE GEOMETRY
SUITABLE WORKPIECE MATERIALS


DRILLING(SOLID CARBIDE)
DLE
LEADING DRILLS SERIES
P Steel M Stainless Steel K Cast Iron N S H
External Coolant
■ Tip angle shape SIG 60°, 90°
Type1
Type2
■ Tip angle shape SIG 120°, 145°
KAPR
DCON=3 | 3<DCON≤6 | 6<DCON≤10 | 10<DCON≤16
h5 | h5 | h5 | h5
0 −0.010 | 0 −0.012 | 0 −0.015 | 0 −0.018
DRILLING
N020
● : Inventory maintained in Japan.


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
DRILLING
N151
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

PRODUCT STANDARDS
indicates diameters, order numbers, stock status,numbers of teeth, dimensions, and spare parts for the title product.

LEGEND FOR STOCK STATUS MARK

●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

DRILL STANDARD

*Arranged in Alphabetical order

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

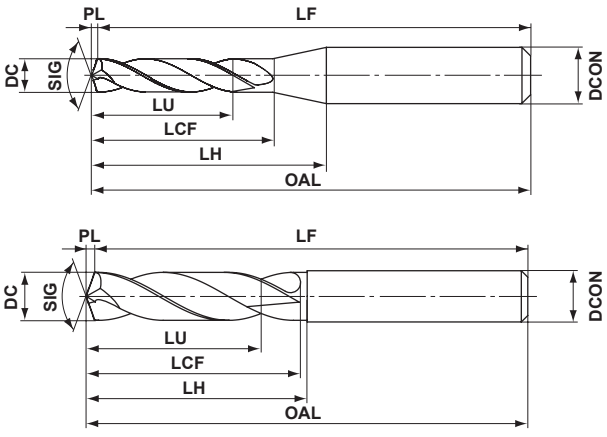
＊Other special types can be ordered.

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

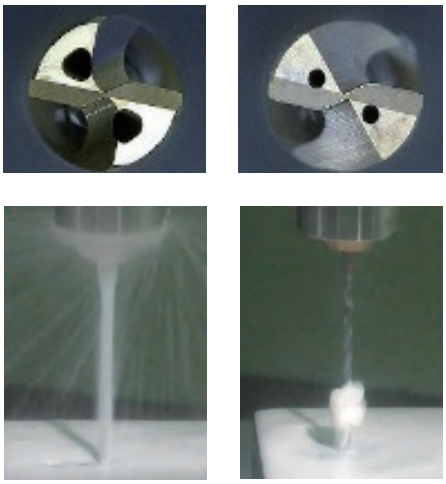
FAST, RELIABLE and ACCURATE
New standards enabled by the Five Technologies.

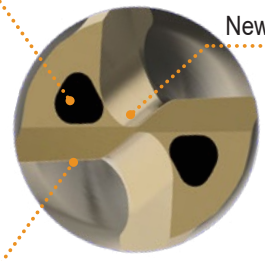
TRISTAR Drill Series

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

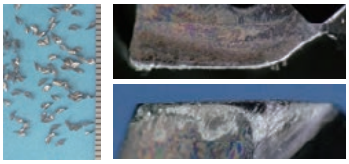
The new point thinning breaks chips into the optimum shape for a streamlined flow and achieves a much lower cutting resistance.

DVAS Conventional Product

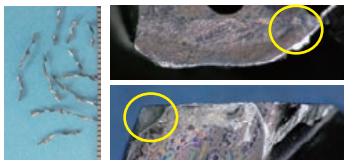
Tough and Sharp Cutting Edge Design

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

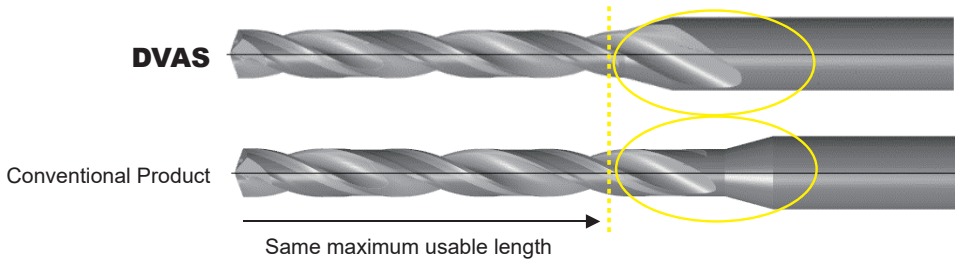


Conventional Product

<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

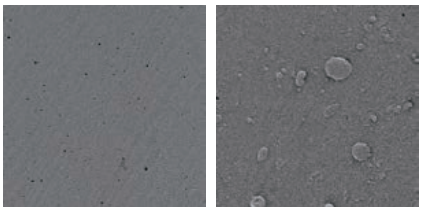
The short drill is designed for high rigidity and good chip evacuation by minimizing the neck length.



New Coated Grade **DP1120**

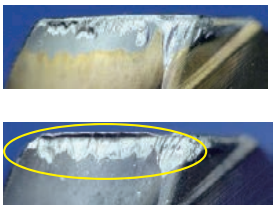
The outstanding surface smoothness prevents chip clogging which reduces breakage.
In addition, the excellent crater wear resistance maintains cutting edge sharpness which allows for a longer tool life.

Enlarged view of the flute surface.



DVAS Conventional Product

DVAS

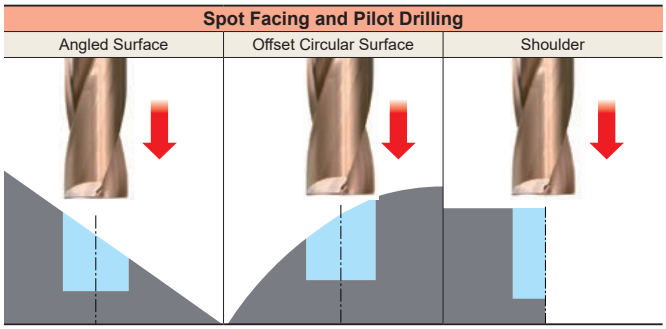


Conventional Product Large crater wear

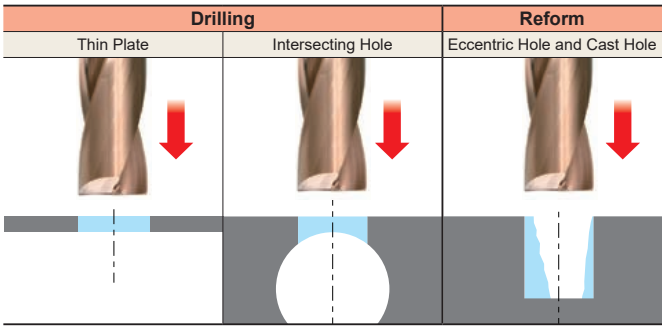
<Cutting Conditions>
Tool : DC=ø2mm, L/D=20
Cutting Speed : vc= 50m/min
Feed : fr= 0.06mm/rev
Cutting Mode : Wet cutting, water-soluble coolant, 2MPa
Number of Drilling : 500 holes

MFE Series Solid Carbide Flat Bottom Drills

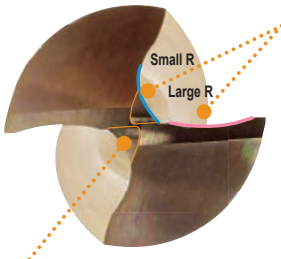
High Efficiency Drilling in Various Types of Machining



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

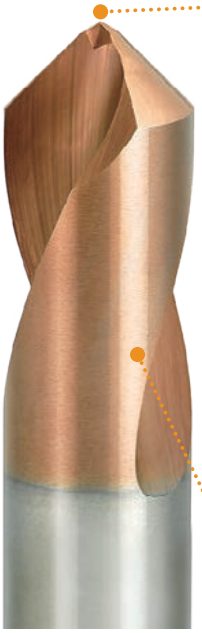
Smooth surface clearance provides reduced deflection and excellent position accuracy.

NEW

DLE / GKCD Solid Drills for Centering and Chamfering

Leading Drill Series

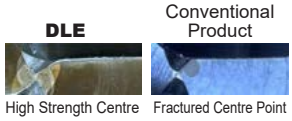
DLE



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**

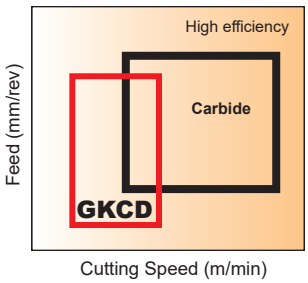
DP1020 grade offers excellent wear resistance and reduced friction for longer tool life over a wide range of applications.

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

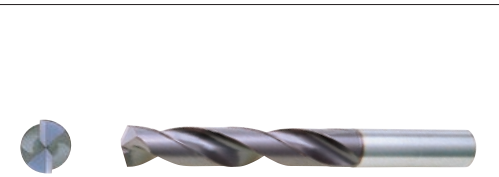
Different cutting conditions with carbide



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°	

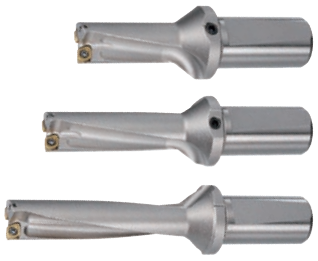
DRILL SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

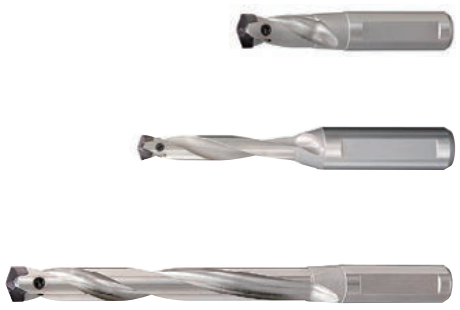
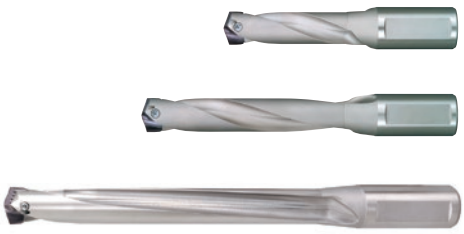
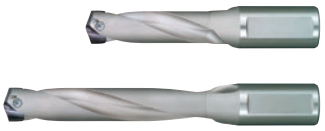
Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Workpiece Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
Solid Carbide Flat Bottom	MFE	ϕ0.75 –ϕ2.95	2	External	DP1A	◎	◎	◎	○				N025
		ϕ3.0 –ϕ20.0	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

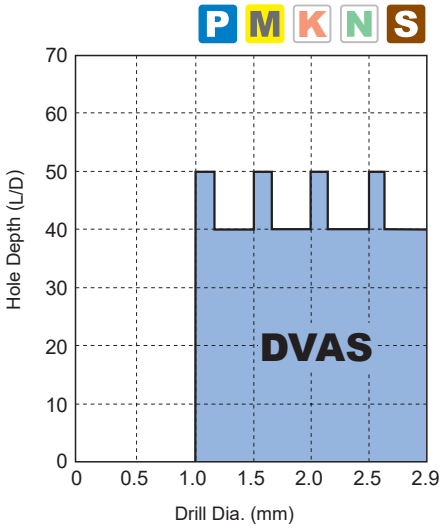
1st Recommenedation P M K N S H

2nd Recommenedation P M K N S H

■Carbide Solid Drills

DVAS Mini Size NEW

For Small Diameters

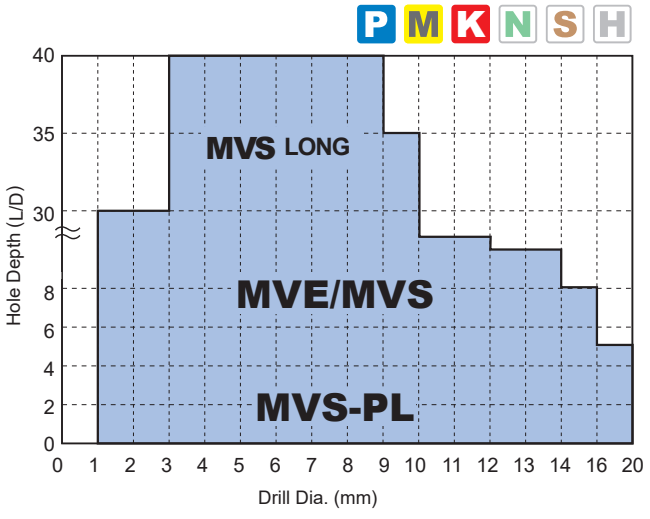


MVE/MVS

General Drilling

MVE

MVS

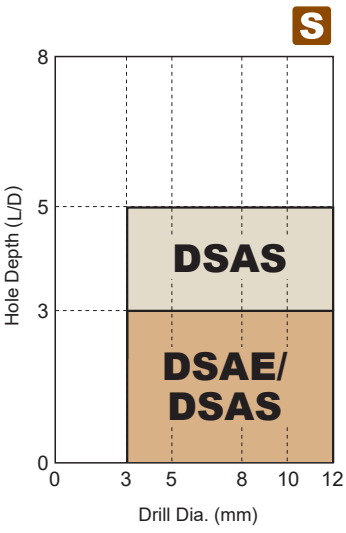


DSAE/DSAS NEW

For Heat Resistant Super Alloys

DSAE

DSAS

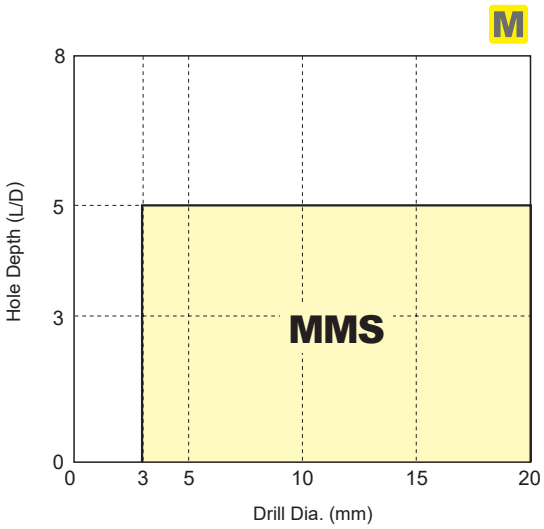


1st Recommenedation P M K N S H

2nd Recommenedation P M K N S H

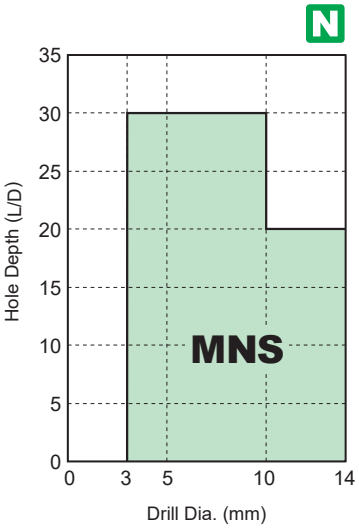
MMS

For Machining of Stainless Steel



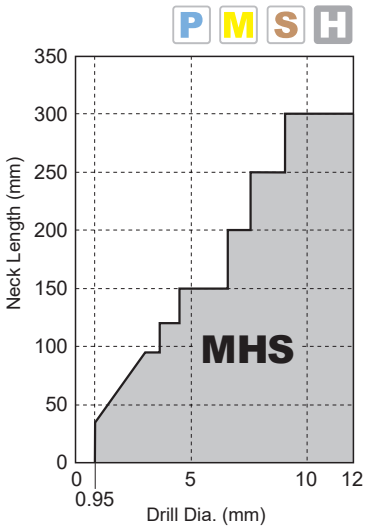
MNS

For Machining of Aluminium Alloys



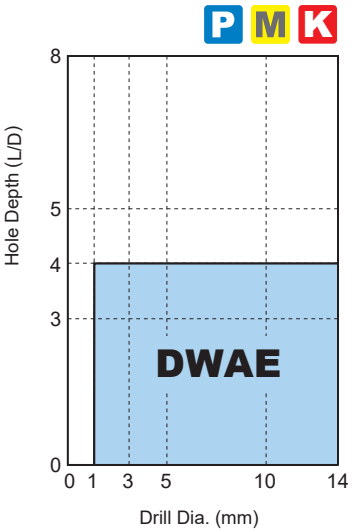
MHS

For Die & Mould Machining



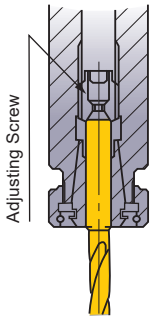
DWAE NEW

Swiss-Type Automatic and Small CNC Lathes



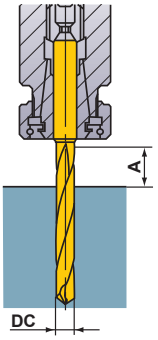
OPERATIONAL GUIDANCE

Securing the Drill



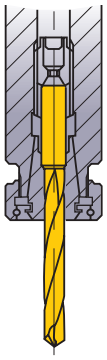
Thrust bearing type collet chuck holds the drill securely.

Drill Length



Ensure that the Dimension A is DC x 1.5 or more (when DC < 3mm, DC x 2.0 or more).

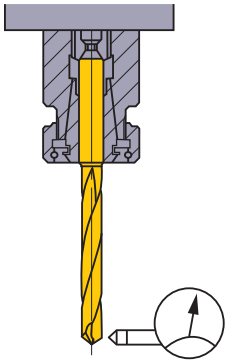
Drill Length



NG

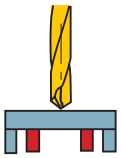
Do not clamp on the flutes.

Installation Tolerance

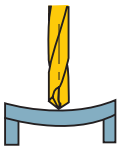


Run-out ≤ 0.03mm

Thin Workpiece

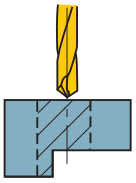


OK
Support if bending occurs



NG
Bending occurs

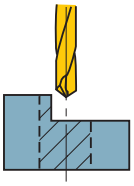
Interrupted Cutting



Machining is Possible

OK

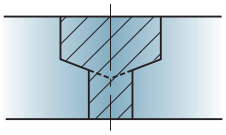
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

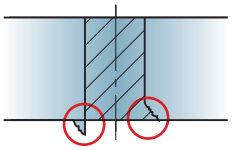
①Counter boring with an end mill prior to drilling required.

Stepped Holes



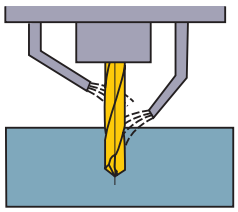
①Divide the two processes.
②Drill the thicker part first.
*Tools for counter boring and chamfering can be produced to order.

Burring and Workpiece Chipping



Decrease the feed rate at the end of through cutting.

Coolant Type (External)

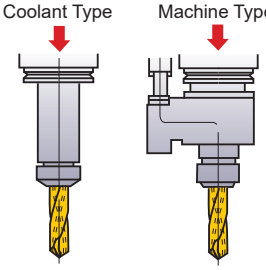


Two coolant positions, at the end and at the centre are ideal.

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.

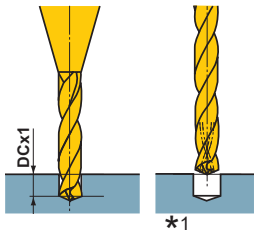
Coolant Handling

<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.

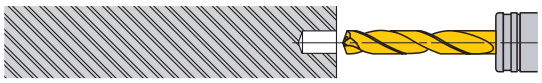
■ NOTES ON USE (For DC<3mm)

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

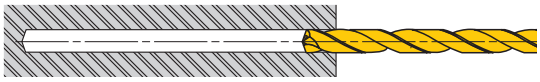
2. Deep hole drilling (incorporating pilot hole)

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



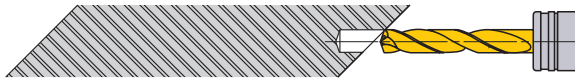
①After drilling, lower the cutting revolution about 0.5—1mm short of the hole end. (Cutting speed of around 20—30m/min)
②Retract the drill to the starting point of the pilot hole at a feed rate of 3000mm/min.
③Extract the drill according to the same conditions as when inserting the drill into the pilot hole.

INTERRUPED DRILLING ●Drilling and breaking through on irregular faces or angles

1. Spot facing

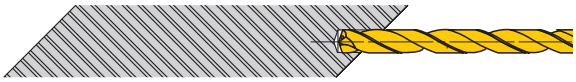
①When drilling a deep hole on an inclined surface, it is recommended to use a MFE drill or end mill for drilling the pilot hole.
②It is essential for the pilot hole to have good accuracy.
③Drill depth : Approx DC×1.

2. Machining a Pilot Hole



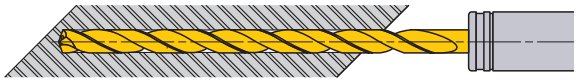
①Use recommended pilot drills when drilling pilot holes.
*Please check each product's page for pilot drills.
②It is essential for the pilot hole to have good accuracy.
③Drill depth : Approx DC×1–2. (Adjust the pilot hole depth according to the length of the long type drill.)
*When L/D=50, the depth of the hole is DCx7

3. Deep hole drilling (incorporating pilot hole)



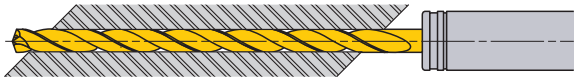
①Insert drill into the pilot hole at low speeds. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Insert the drill until around 0.5mm to 1mm short of the bottom of the pilot hole.

4. Drill the deep hole



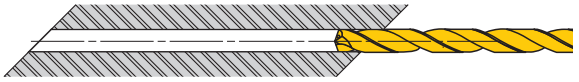
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

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

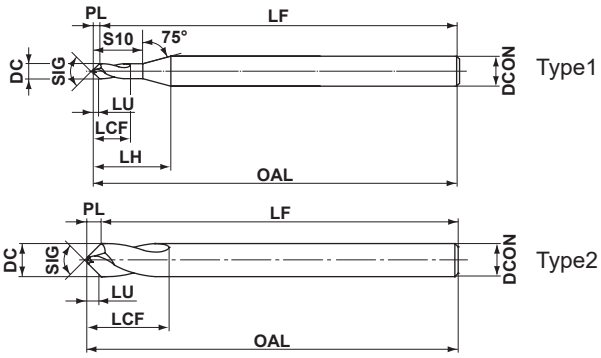
DLE

LEADING DRILLS SERIES

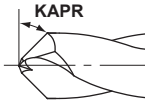
P Steel | M Stainless Steel | K Cast Iron | N | S | H

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

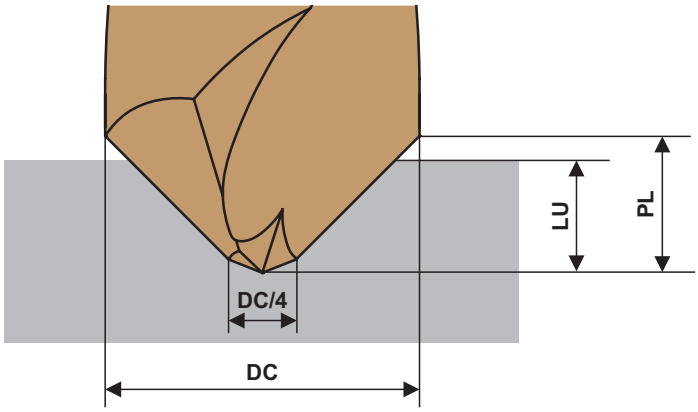
Note 1) The central area of holes (DC / 4) formed by two step point angles will not have their respective 60º and 90º angles. Chamfering is also not possible in the centre areas.

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.

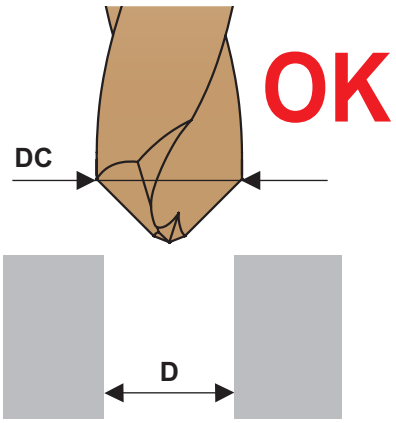


DLE
LEADING DRILL SERIES

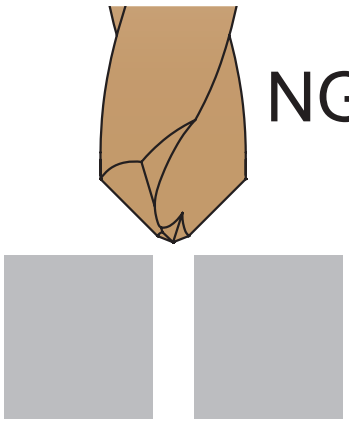
Drill Diameter Selection

When Chamfering

Select a tool diameter (DC) that is larger than the pilot hole diameter (D) and less than twice the pilot hole diameter.

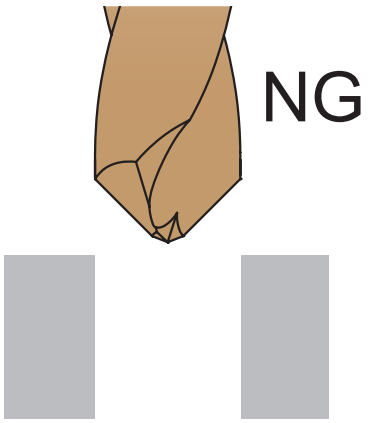


Example) When pilot hole diameter D is 5mm:
Drill diameter **DC** should be greater than 6 mm but less than 10 mm. Select a **DC** of 6 mm, 7 mm, or 8 mm.



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.

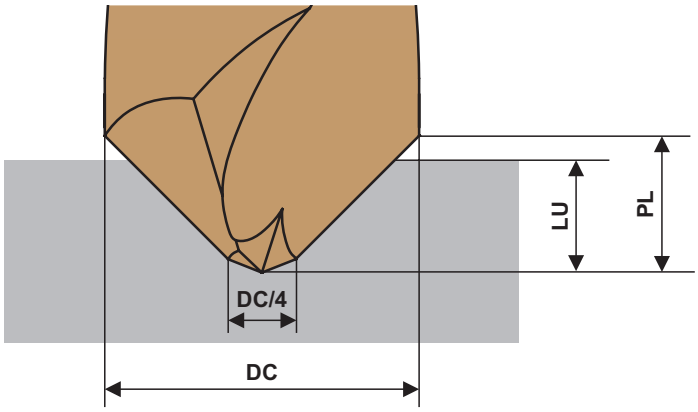


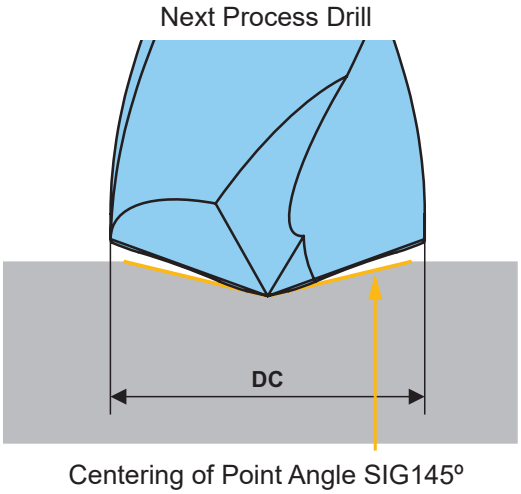
If DC is a drill diameter equal to D:

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)

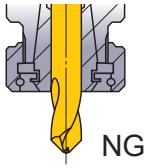
Note 1) Select a tool diameter (DC) that is larger than the pilot hole diameter (D) and less than twice the pilot hole diameter.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When 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

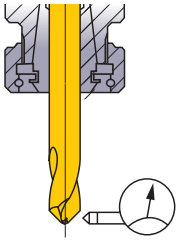
Collet chuck holds the drill securely.

Drill Length



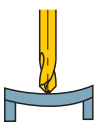
Do not clamp on the flutes.

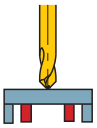
Installation Tolerance



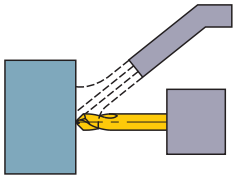
Run-out ≤ 0.03mm

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).

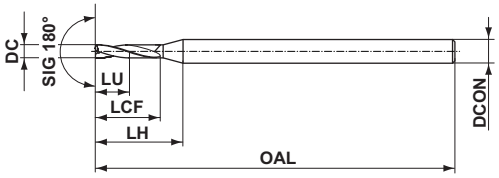
MFE for Small Diameter
SOLID CARBIDE FLAT BOTTOM DRILLS

- 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

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MFE

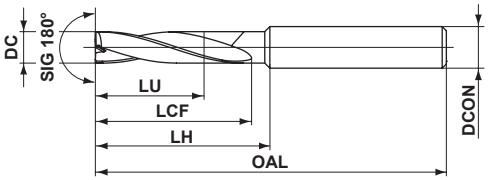
SOLID CARBIDE FLAT BOTTOM DRILLS

- Sharp cutting edges with long tool life
- Combination of different radius sizes provides strong cutting edge and excellent chip control

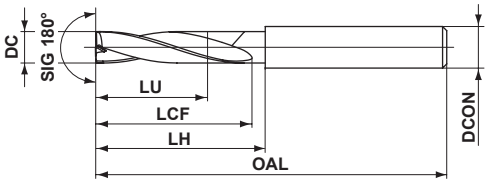
UWC DP1 180° X

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

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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

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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.**

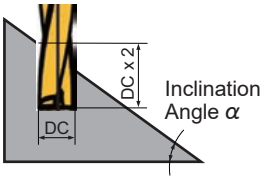
ISO13399 ➢ N002

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.

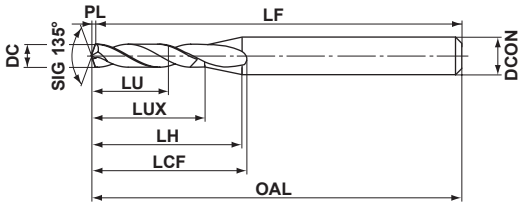
UWC | DP1A | 135° | XR (DC<2.0) | X (DC≥2.0)

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

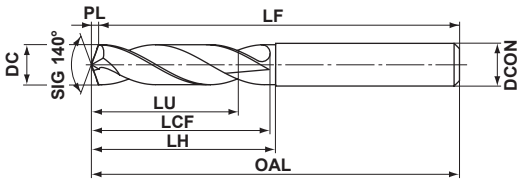
WSTAR DRILLS

- 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

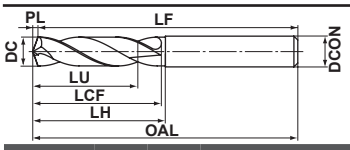
DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
3.0	2	●	DWAE0300X02S030	6.5	12.5	14.5	45.5	45	0.5	3	1
3.0	4	●	DWAE0300X04S030	12.5	21.5	23.5	55.5	55	0.5	3	1
3.1	2	●	DWAE0310X02S040	6.8	12.6	14.6	55.6	55	0.6	4	1
3.1	4	●	DWAE0310X04S040	13.0	21.6	23.6	60.6	60	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.



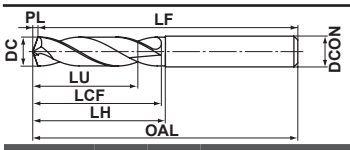
DC (mm)	Hole Depth (L/D)	DP102A	Order Number	Dimensions (mm)							Type
				LU	LCF	LH	OAL	LF	PL	DCON	
6.7	2	●	**DWAE0670X02S070**	14.6	28.2	30.2	75.2	74	1.2	7	1
6.7	4	●	**DWAE0670X04S070**	28.0	46.2	48.2	84.2	83	1.2	7	1
6.8	2	●	**DWAE0680X02S070**	14.8	28.2	30.2	75.2	74	1.2	7	1
6.8	4	●	**DWAE0680X04S070**	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

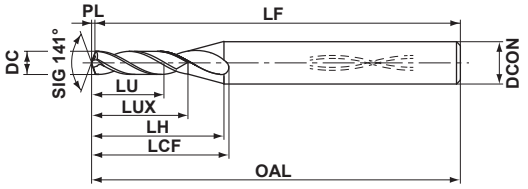
Note 1) The above cutting conditions are when water-soluble coolant is used. For stainless steel, water-insoluble coolant is recommended.
Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication (excluding the recommended cutting conditions of for stainless 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

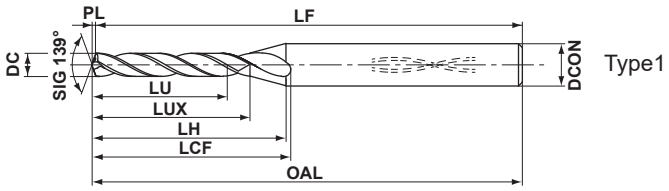
- Large coolant holes reduce tool damage due to the improved cooling effect thereby greatly improving tool life.
- Tough, sharp cutting edge design.

UWC DP1 139° XR

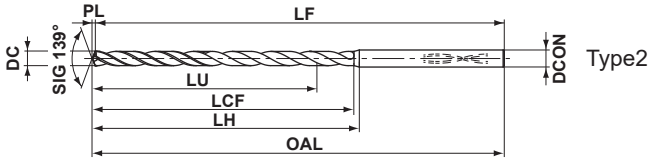
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

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.

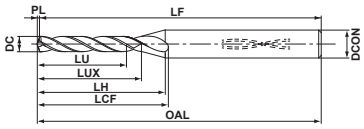
DC (mm)	Hole Depth (L/D)	DP1120	Order Number	Dimensions (mm) LU	LUX	LCF	LH	OAL	LF	PL	DCON	Type
1.0	7	●	DVAS0100X07S040	7.2	8.2	13.6	13.8	55	54.8	0.2	4	1
1.0	12	●	DVAS0100X12S040	12.2	13.2	18.6	18.8	58	57.8	0.2	4	1
1.0	20	●	DVAS0100X20S040	20.2	–	23.2	28.8	67	66.8	0.2	4	2
1.0	25	●	DVAS0100X25S040	25.2	–	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

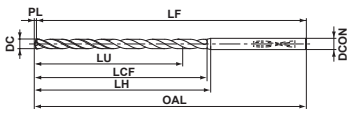
TRISTAR Drills

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.

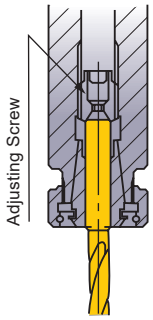
(3) Drill the deep hole using DVAS○○○○X50S040.

DVAS NEW Mini Size

TRISTAR Drills

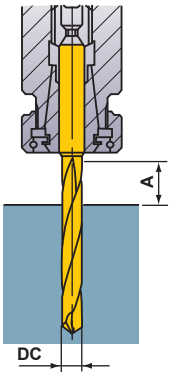
OPERATIONAL GUIDANCE

Drill Holding



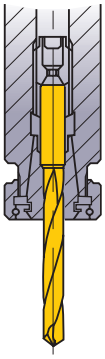
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

Drill Installation



NG

Do not clamp on the flutes.

Coolant Pressure

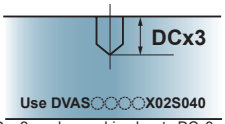
Adjust the coolant pressure according to the type and concentration of coolant.

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.

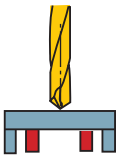
L/D>40

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.

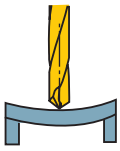
Drill Dia. DC	Fine Mesh Filter
DC<2mm	≤ 10μm
DC<3mm	≤ 20μm

Thin Workpiece



Support if bending occurs

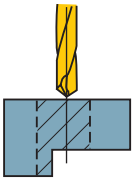
OK



Bending occurs

NG

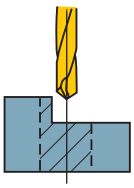
Interrupted Cutting



One Process

OK

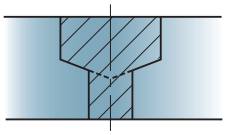
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

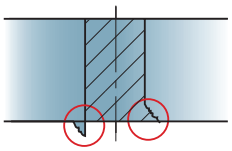
①Spot face with an end mill prior to drilling.

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

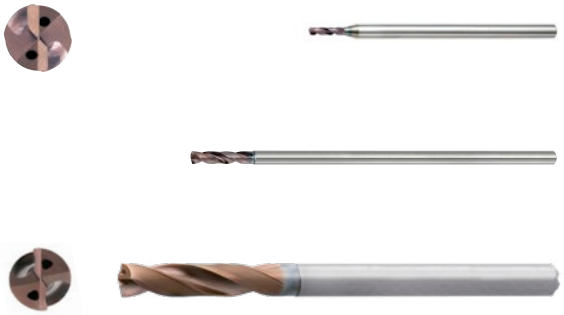
● For machining pilot holes.

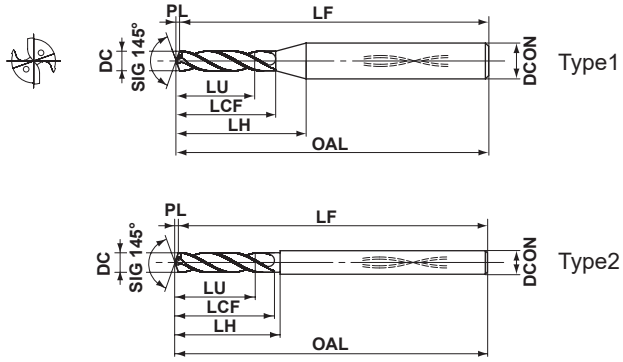
UWC DP1 145° X Z

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.

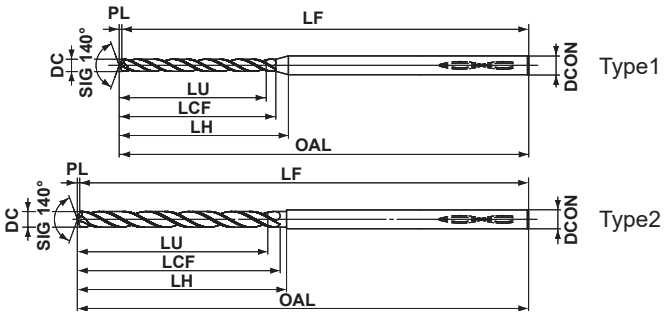
DRILLING(SOLID CARBIDE)

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)

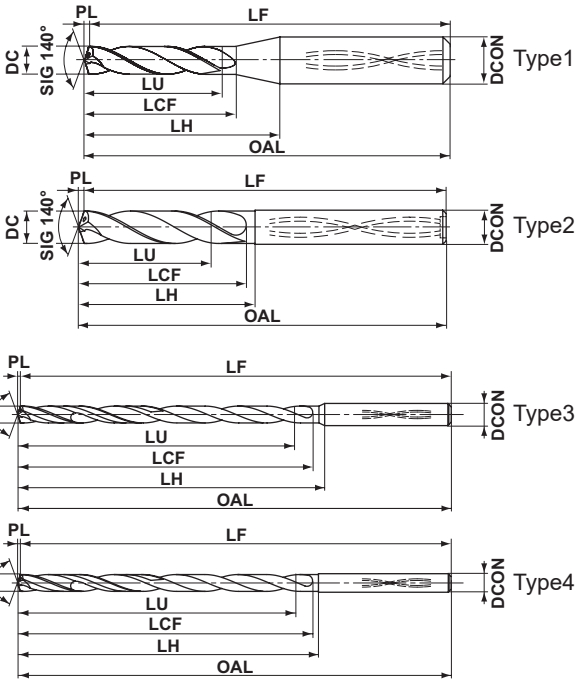
MVS

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

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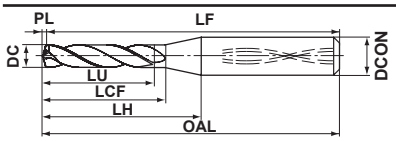
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
4.0	30	●	MVS0400X30S040	120.7	132.7	135.7	183.7	183	0.7	4	3
4.0	35	●	MVS0400X35S040	140.7	152.7	155.7	203.7	203	0.7	4	3
4.0	40	●	MVS0400X40S040	160.7	172.7	175.7	223.7	223	0.7	4	3
4.1	3	●	MVS0410X03S050	13.0	25.7	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

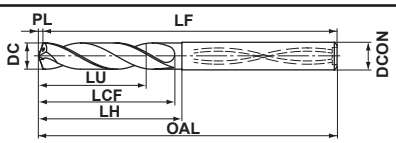
Note 1) The coolant hole of ø5mm or less will have a round shape. (L/D=3,5,8 is ø6mm or less)

● : 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

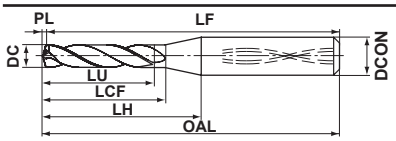
WSTAR DRILLS

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

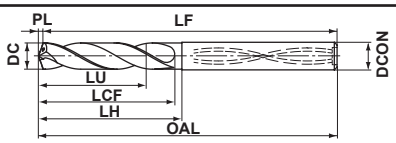
Note 1) The coolant hole of ø5mm or less will have a round shape. (L/D=3,5,8 is ø6mm or less)

● : 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

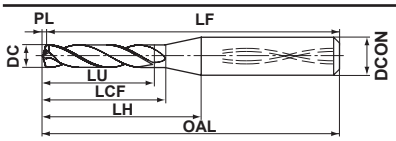
MVS

WSTAR DRILLS

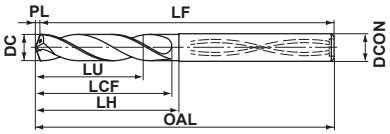
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
7.3	5	●	MVS0730X05S080	37.8	61.3	65.3	119.3	118	1.3	8	2
7.3	8	●	MVS0730X08S080	59.7	84.3	89.3	143.3	142	1.3	8	2
7.3	10	●	MVS0730X10S080	74.3	99.3	102.3	156.3	155	1.3	8	4
7.3	15	●	MVS0730X15S080	110.8	136.3	139.3	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

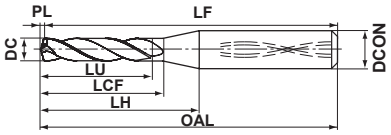
WSTAR DRILLS

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

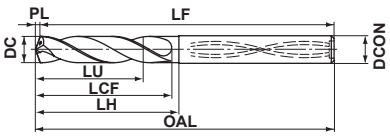
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
9.4	15	●	MVS0940X15S100	142.7	172.7	175.7	230.7	229	1.7	10	4
9.4	20	●	MVS0940X20S100	189.7	220.7	223.7	278.7	277	1.7	10	4
9.4	25	●	MVS0940X25S100	236.7	267.7	270.7	325.7	324	1.7	10	4
9.4	30	●	MVS0940X30S100	283.7	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

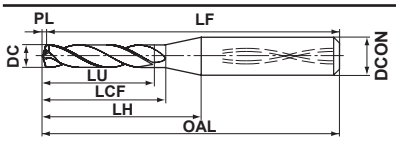
WSTAR DRILLS

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

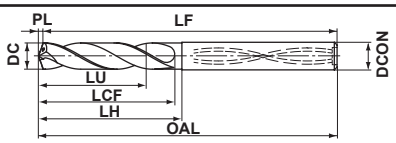
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
11.5	20	●	MVS1150X20S120	232.1	267.1	270.1	332.1	330	2.1	12	4
11.5	25	●	MVS1150X25S120	289.6	324.1	327.1	389.1	387	2.1	12	4
11.6	3	●	MVS1160X03S120	36.9	62.1	62.1	124.1	122	2.1	12	2
11.6	5	●	MVS1160X05S120	60.1	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

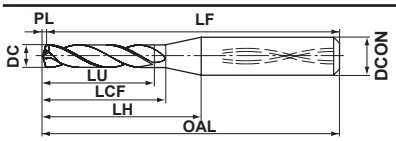
MVS

WSTAR DRILLS

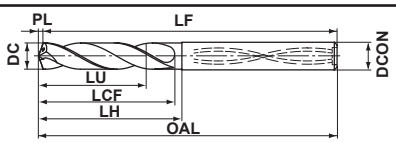
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
13.3	20	□	MVS1330X20S140	268.4	313.4	316.4	380.4	378	2.4	14	4
13.4	3	●	MVS1340X03S140	42.6	69.9	72.4	136.4	134	2.4	14	2
13.4	5	●	MVS1340X05S140	69.4	110.4	114.4	178.4	176	2.4	14	2
13.4	8	□	MVS1340X08S140	109.6	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

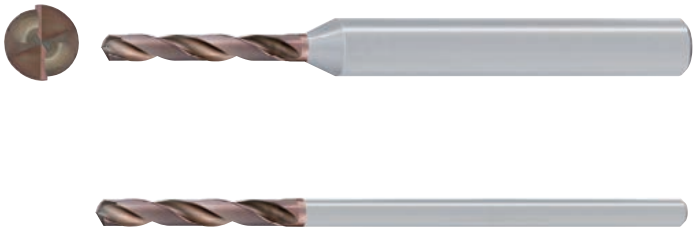
WSTAR DRILLS

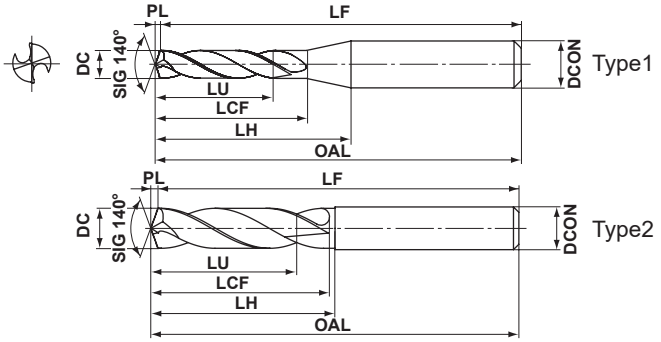
- PVD coated carbide grade DP1020 achieves long life with wide range of workpiece materials.
- The unique wavy cutting edge provides excellent sharpness and rigidity and helps to control wear at the periphery.

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

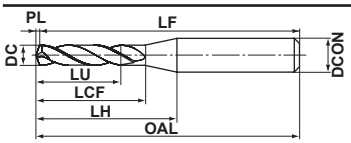
MVE

WSTAR DRILLS

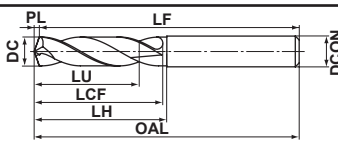
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
7.9	2	●	MVE0790X02S080	17.2	38.4	38.4	80.4	79	1.4	8	2
7.9	3	●	MVE0790X03S080	25.1	49.4	49.4	91.4	90	1.4	8	2
8.0	2	●	MVE0800X02S080	17.5	38.5	38.5	80.5	79	1.5	8	2
8.0	3	●	MVE0800X03S080	25.5	49.5	49.5	91.5	90	1.5	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

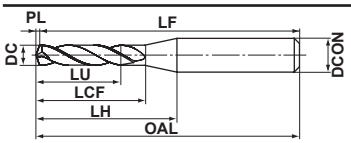
WSTAR DRILLS

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

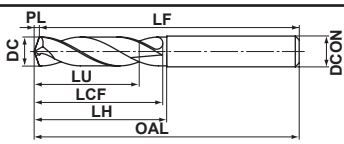
DC (mm)	Hole Depth (L/D)	DP1020	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON	Type
15.9	2	□	MVE1590X02S160	34.7	60.9	60.9	117.9	115	2.9	16	2
15.9	3	●	MVE1590X03S160	50.6	98.9	98.9	162.9	160	2.9	16	2
16.0	2	●	MVE1600X02S160	34.9	60.9	60.9	117.9	115	2.9	16	2
16.0	3	●	MVE1600X03S160	50.9	98.9	98.9	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.

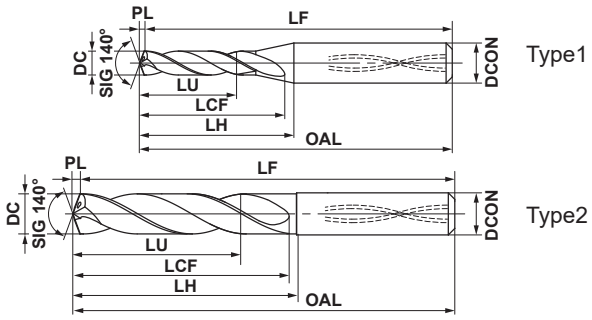
Solid Carbide Drill for Machining Heat Resistant Super Alloys

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.**

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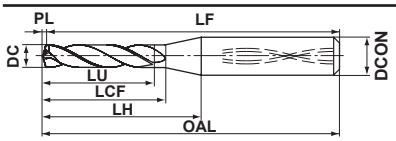
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N081

DSAS NEW

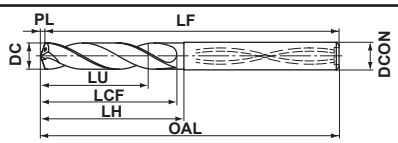
Solid Carbide Drill for Machining Heat Resistant Super Alloys

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

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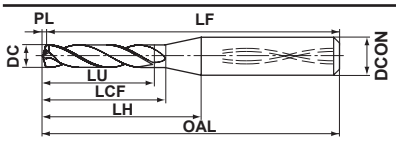
DSAS NEW

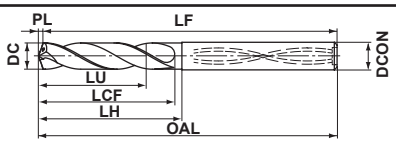
Solid Carbide Drill for Machining Heat Resistant Super Alloys

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

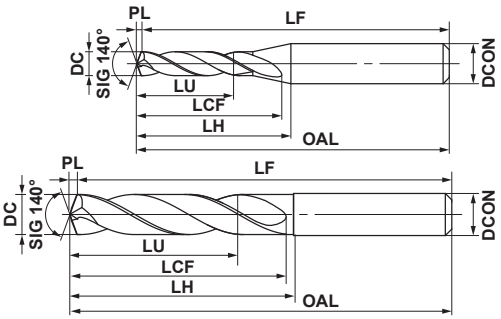
UWC | DP9 | 140° | X

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

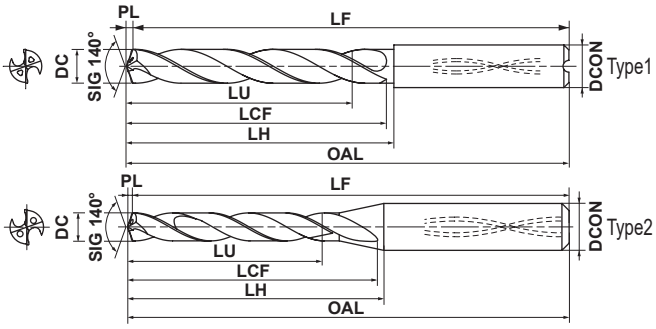
WSTAR DRILLS

●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

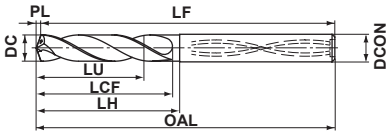
WSTAR DRILLS

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

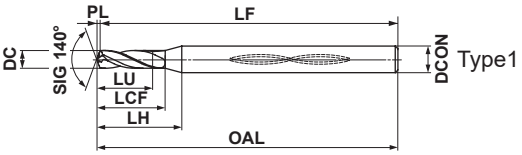
DRILLING(SOLID CARBIDE)

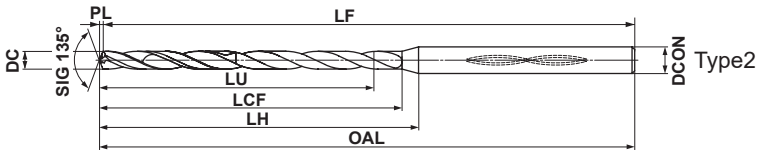
MHS
WSTAR DRILLS

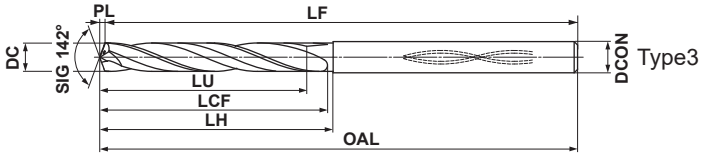
- Solid carbide drills for die & mould machining
- High backling strength and unique double margin.
- Non-step drilling with long tool life for high hardness steel, 35HRC-55HRC

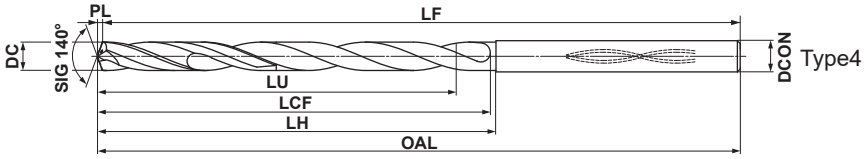
P Steel | M Stainless Steel | K | N | S Heat Resistant Alloy | H Hardened Steel

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

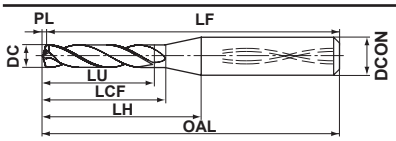
WSTAR DRILLS

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

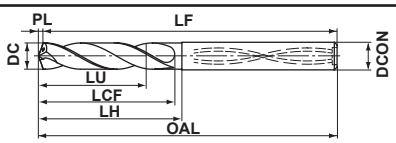
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : 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

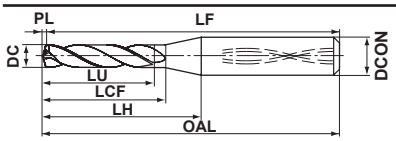
WSTAR DRILLS

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

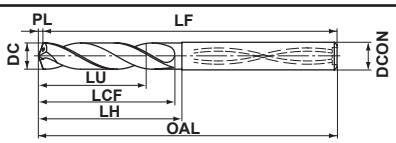
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : 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
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

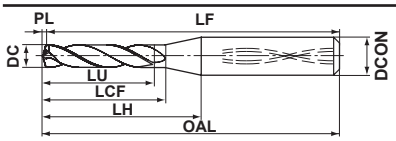
WSTAR DRILLS

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

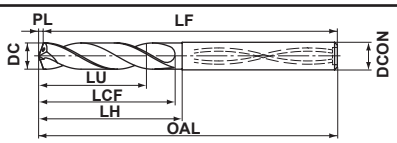
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : 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

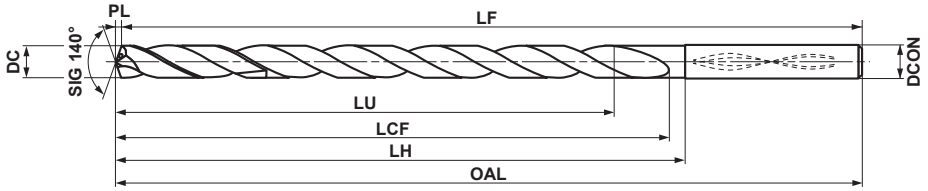
WSTAR DRILLS

- 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

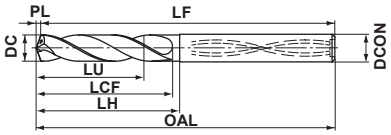
DC (mm)	Hole Depth (L/D)	TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
6.8	5	●	MNS0680LB	35.2	57.2	57.2	110.2	109	1.2	7
6.8	10	□	MNS0680X10DB	69.2	92.2	95.2	148.2	147	1.2	7
6.8	20	□	MNS0680X20DB	137.2	162.2	165.2	218.2	217	1.2	7
6.8	30	□	MNS0680X30DB	205.2	232.2	235.2	288.2	287	1.2	7
6.9	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.

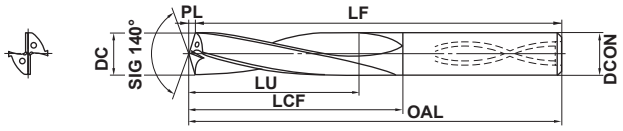
DRILLING(SOLID CARBIDE)

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.

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□ : 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

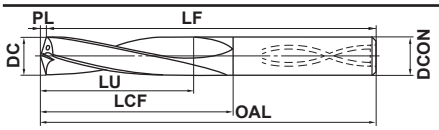
MAS

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

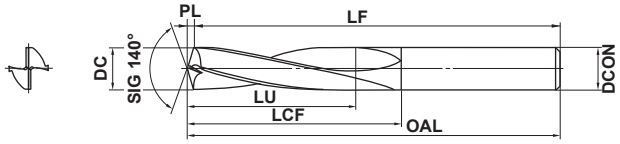
DRILLING(SOLID CARBIDE)

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

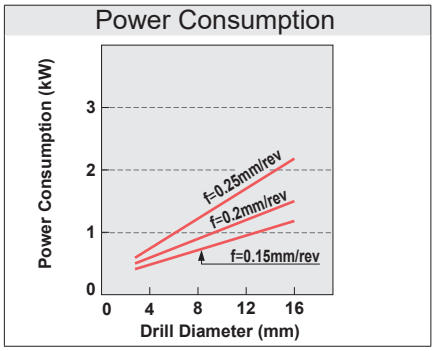
Type		Workpiece Material	Drill Dia. ϕ3.0—ϕ6.0		Drill Dia. ϕ6.1—ϕ10.0		Drill Dia. ϕ10.1—ϕ16.0	
			Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
MAE	N	Aluminium Alloy Casting	90 (40—140)	0.15 (0.05—0.3)	100 (50—150)	0.2 (0.1—0.3)	120 (60—170)	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)

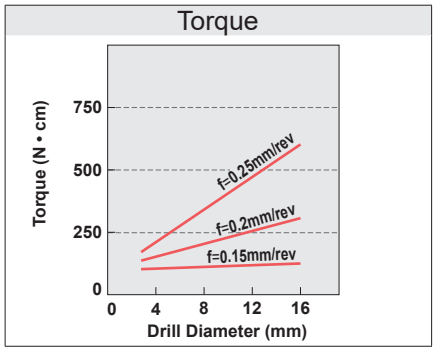
■ APPLIED OUTER DIAMETER FOR PILOT HOLE

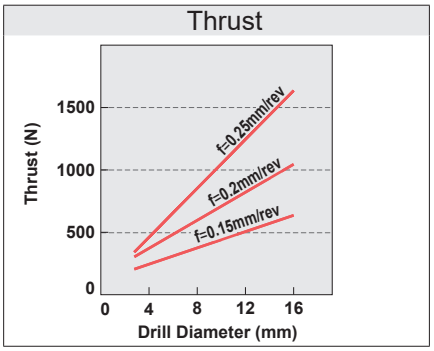
Thread Size	Thread Tapping			Rolled Thread Tapping		
	Drill Diameter (**DC**)	Hole Diameter Tolerance		Drill Diameter (**DC**)	Hole Diameter Tolerance	
		max.	min.		max.	min.
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.70
M5x0.8	**4.2**	4.134	4.334	**4.60**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.50**	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%)

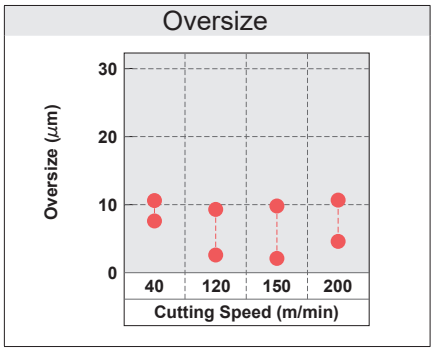


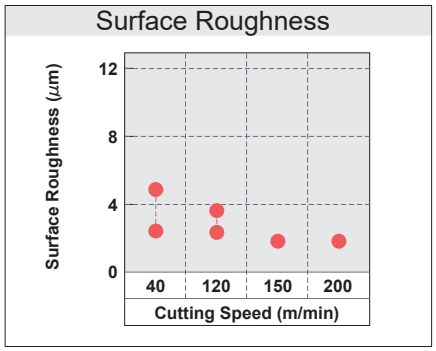


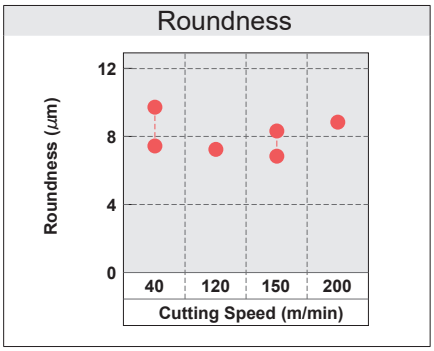


MACHINED HOLE ACCURACY

Tool : MAS1100MB Workpiece : JIS AC4B-T6 Feed : 0.35mm/rev Drilled Depth : 33mm WSO (10%)







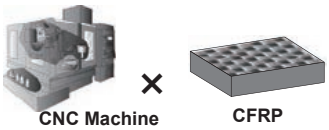
MCC

CNC Machine/For CFRP

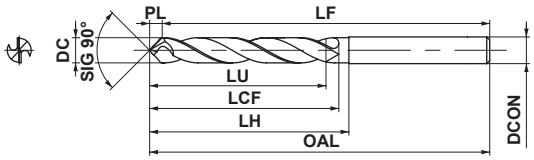
●The 90° cutting angle thoroughly reduces thrust and minimizes delamination.

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

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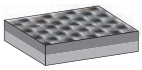
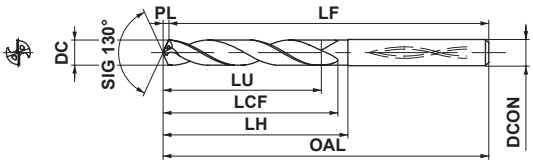


CFRP+Al

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

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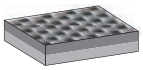
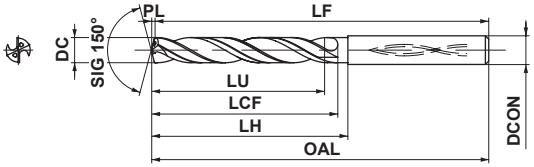


CFRP+Ti

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

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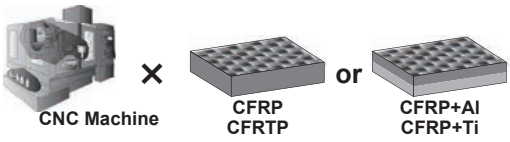
MCW

●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.

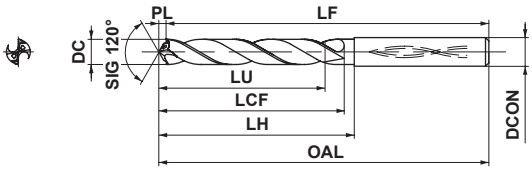
CNC Machine/CFRP and Stack Material High Precision

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.

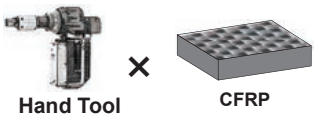
MCCH

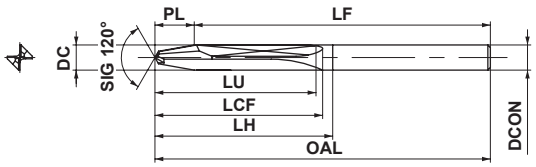
Hand Tool/For CFRP

●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.**

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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

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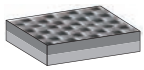
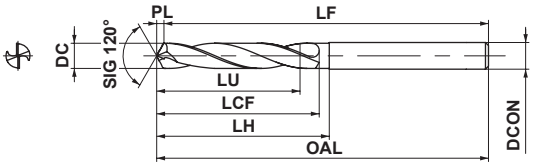


CFRP+Al



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

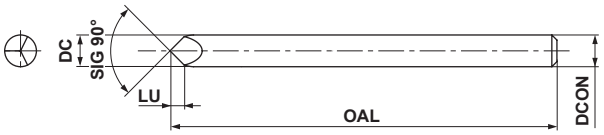
Hole Diameter		Drill Diameter		Hole Depth	Order Number	DT2030	Dimensions (mm)						
*AWG	Inch (inch)	DC (mm)	Inch (inch)	(L/D)			LU	LCF	LH	OAL	LF	PL	DCON
#40	—	2.5	.0985	15	**MCAH0250X15S030**	●	38.2	50	50	100	99.3	0.7	3
#30	—	3.26	.1285	15	**MCAH0326X15S040**	●	49.8	50	50	100	99.1	0.9	4
#20	—	4.1	.1615	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.**

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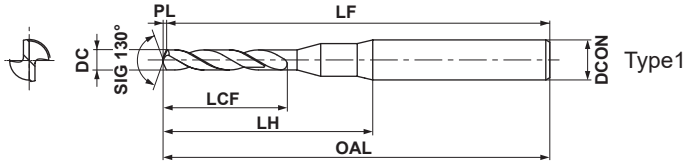
MSE

MIRACLE MINI STAR DRILL

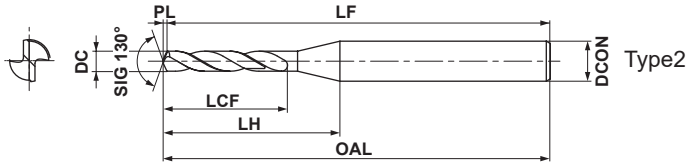
- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

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.

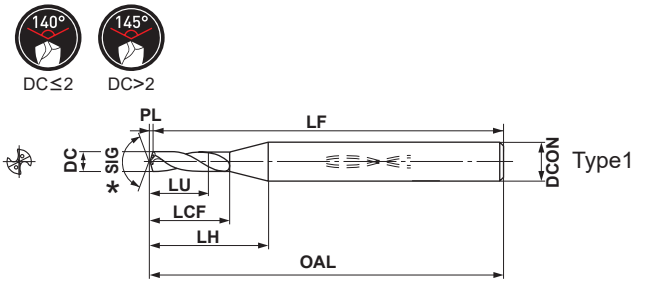
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

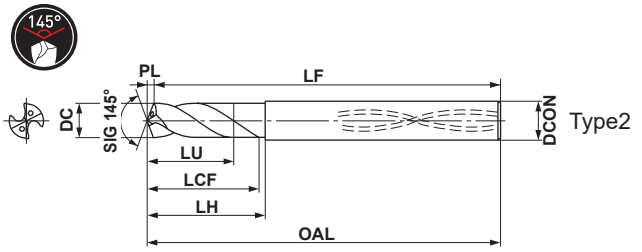
	0.5≤DC<1	1≤DC<2.95
	+0.009 0	+0.014 0
DCON=3		
h6	0 −0.006	

Internal Coolant

SB Type

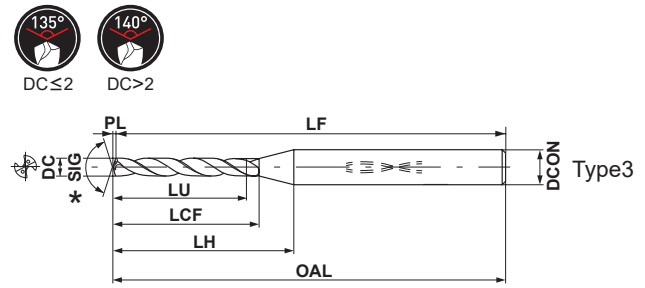
(Drill for machining of pilot hole)



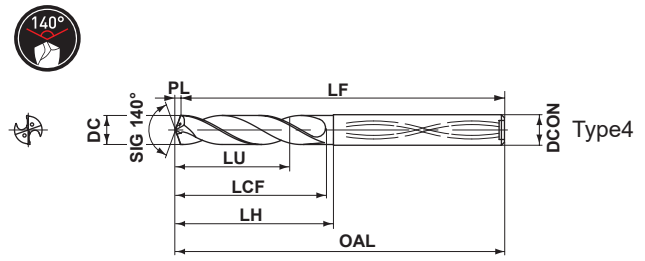


LB/XB Type

	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.

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MWS

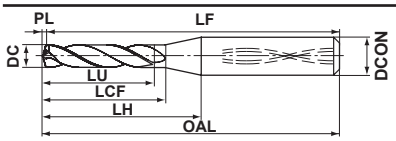
WSTAR DRILLS

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

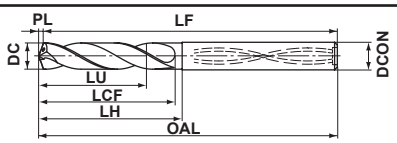
Note 1) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : 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)

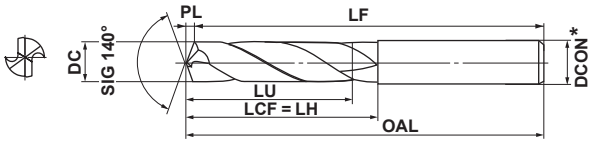
MZE

●A wide groove width provides good chip discharge.

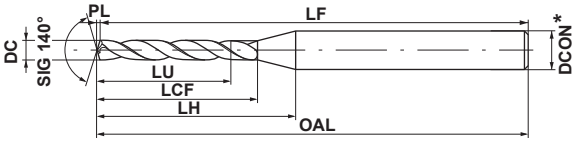
UWC VP 140° X

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

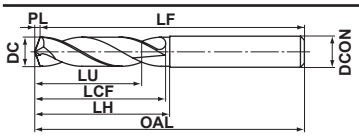
MZE

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)

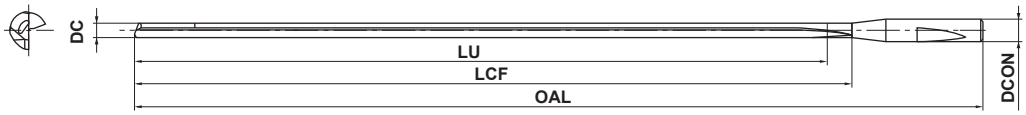
MGS

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

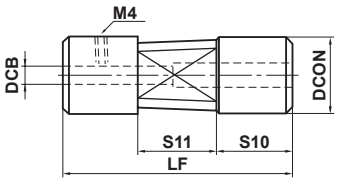
Note 1) MGS drills are suitable for use with shrink fit holders.

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.

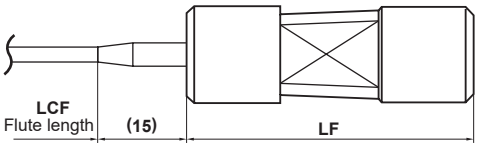
● : Inventory maintained in Japan.

■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.

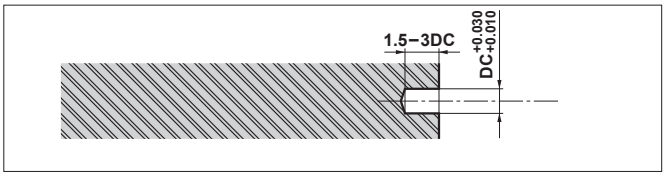
Note 2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.

Note 3) For safety and success, high pressure coolant is required. (Minimum coolant pressure=1,000PSI)

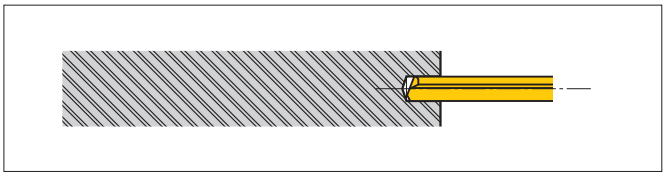
SPECIAL APPLICATION NOTES

- 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)

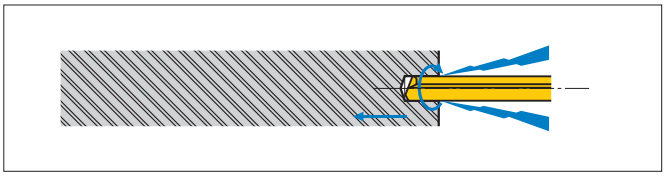
HOW TO USE



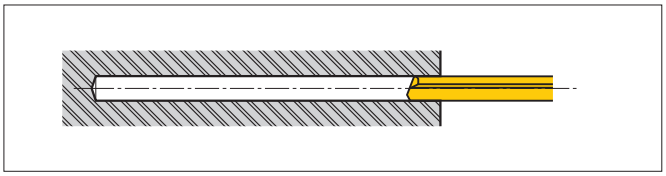
1. Machining a Pilot Hole
   - The diameter of the pilot hole is +0.01 to +0.03mm for the diameter of the MGS drill.
   - The depth of the hole needs to be 1.5 to 3 times that of diameter of the pilot hole.
   - MVE / MVS drills are ideal for drilling pilot holes.



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

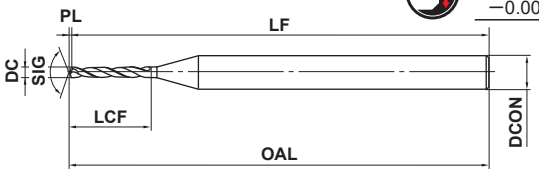
P M K **N** S H

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

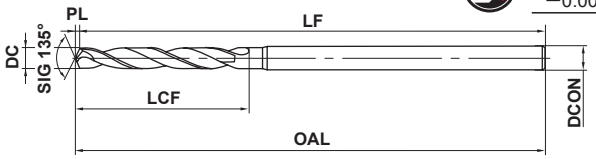
P M K **N** S H

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°

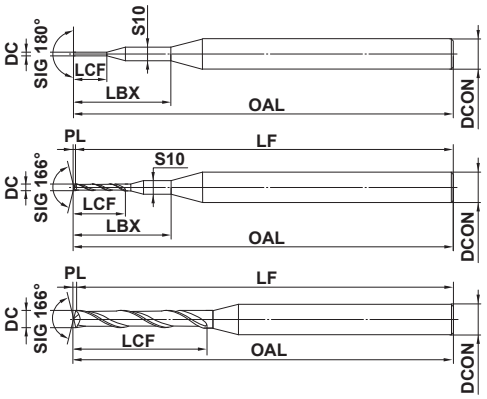
DC<0.07 DC≥0.07

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

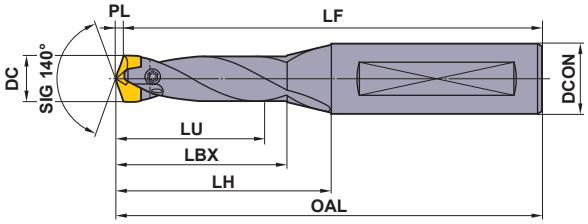
Note 1) Depending on the type of machine, it is possible to apply cutting speeds over 20000min^{-1}.
Note 2) Use water-soluble coolant or grinding fluid when working.
Note 3) The intermediate diameter revolution is not tabulated. It is matched to the large diameter side and closest drill diameter conditions 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

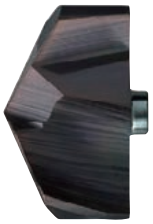
DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	W Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
15.5 – 16.4	1.5	STAWSS1600S20	●	26.1	36.8	52.8	102.8	100	2.8	20	TIP10W	15.5	* STAWN1550T	●	
												15.6	STAWN1560T	●	
												15.7	STAWN1570T	●	
	3	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	●	

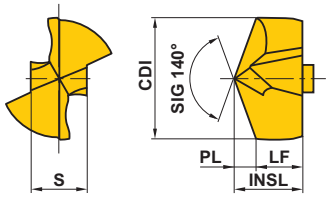
Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : 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	

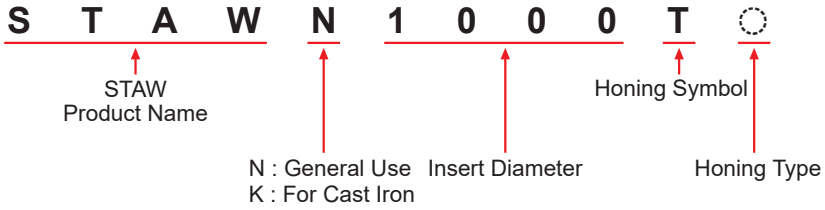
● : Inventory maintained in Japan.

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

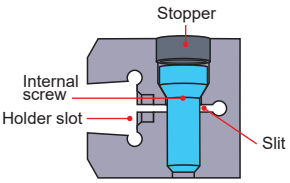
NOTES ON USE

■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.



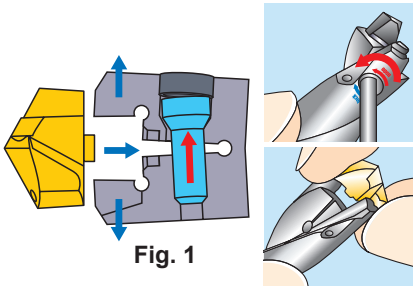


Fig. 1

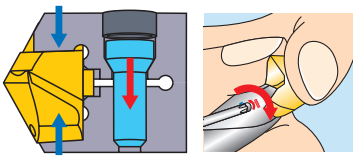
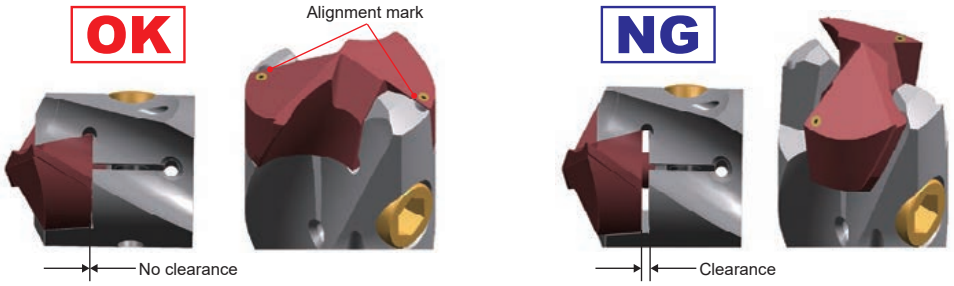


Fig. 2

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

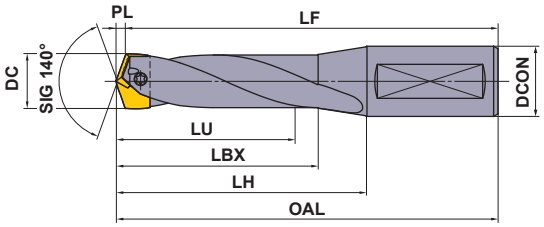
Note 1) The parts are packaged in the form of internal screw, stopper and operation manual. Please replace the parts in accordance with the operation manual.

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.
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Scan here for product NEWS ▶

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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	□	□

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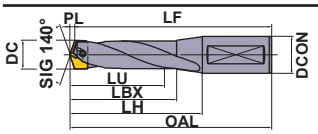

DC (mm)	Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock VP10H
23.5 — 24.4	3	TAWSN2400S32	●	74.8	90.6	114.6	174.6	170.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.5	*TAWNH2350T	●	□
															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	□	□

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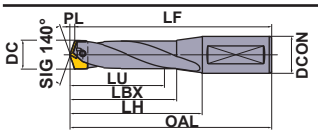


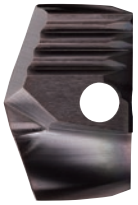
DC (mm)	Hole Depth (L/D)	Holder Order Number	Holder Stock	LU	LBX	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Insert Stock VP15TF	Insert Stock VP10H
29.5 — 30.4	3	TAWSN3000S32	●	93.9	109.6	130.6	190.6	185.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	＊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	□	□

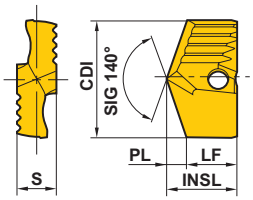
INSERT DESCRIPTION ➤ N156
SPARE PARTS ➤ P001

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	

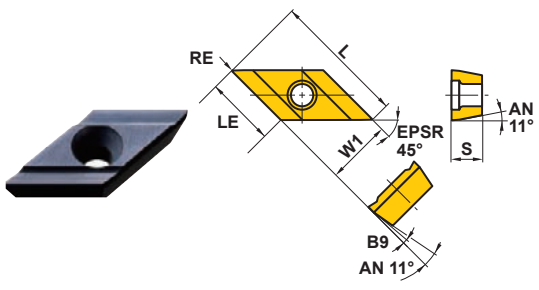
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : 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

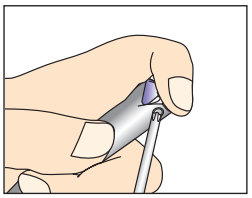


Fig. 1

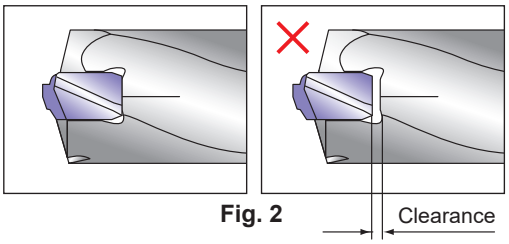


Fig. 2

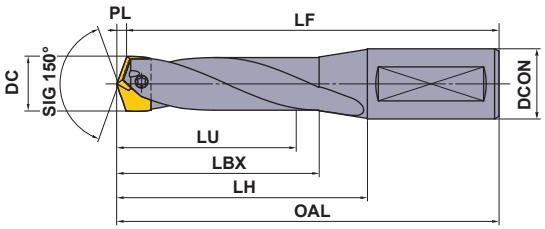
INSERT REPLACEMENT

- ●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)

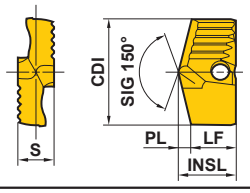


HOLDERS

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 ▶

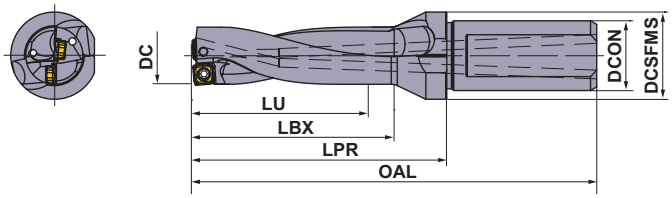
SPARE PARTS ➤ P001

CARBIDE

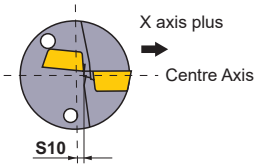
MVX

- 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

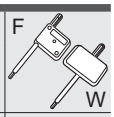


	Machining Tolerance(Guide)(mm)		
L/D	ø14.0—ø33.0	ø33.5—ø47.0	ø48.0—ø63.0
2D, 3D	0 + 0.25	0 + 0.3	0 + 0.3
4D, 5D	0 + 0.35	0 + 0.4	0 + 0.45
6D	0 + 0.45	0 + 0.6	

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

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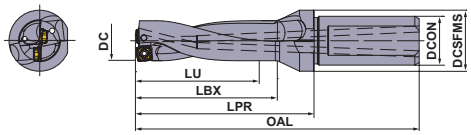
INSERT DESCRIPTION ➤ N167
SPARE PARTS ➤ P001

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

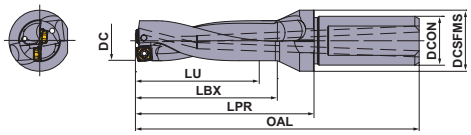
INSERT DESCRIPTION ➢ N167
SPARE PARTS ➢ P001

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)	–	–

USAGE NOTE ➤N178

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.

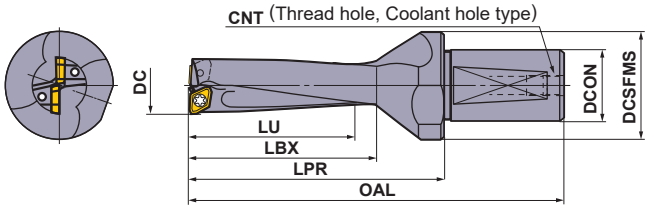
USAGE NOTE ➤ N178

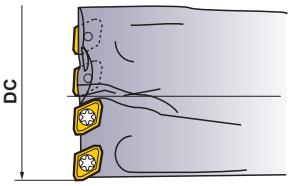
TAFS/TAFM/TAFL

- 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)

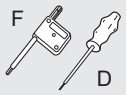
DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LBX	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	F Wrench
12.0	2	TAFS1200F20	●	2	24	29	39	82	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
12.0	3	TAFM1200F20	●	2	36	41	51	94	20	25	PT1/8	GCMT040204-U○	TS2	TKY06F
12.5	2	TAFS1250F20	●	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.

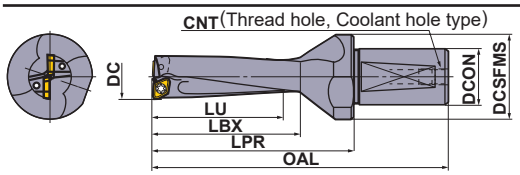
INSERT DESCRIPTION ➤ N175
SPARE PARTS ➤ P001

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.

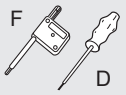


DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)							Insert Number	Clamp Screw	D Wrench
					LU	LBX	LPR	OAL	DCON	DCSFMS	CNT			
28.0	4	**TAFL2800F32**	▲	2	112	123	137	192	32	42	PT1/8	**GPMT11T308-U○**	TS4	TKY15D
28.5	2	**TAFS2850F32**	▲	2	57	67	81	136	32	42	PT1/8	**GPMT11T308-U○**	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

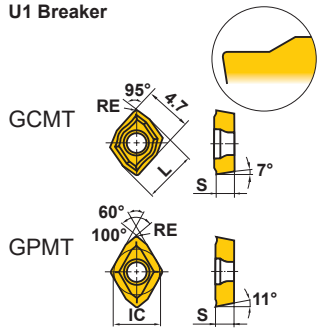
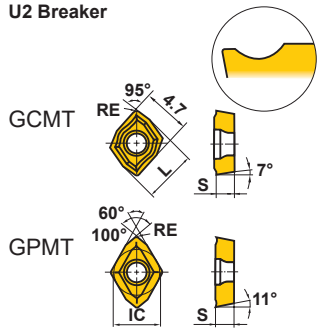
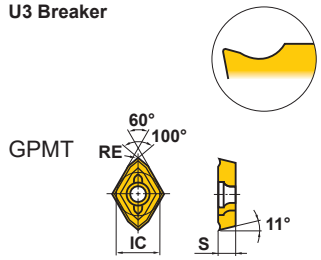
DC (mm)	Hole Depth (L/D)	Order Number	Stock	Number of Teeth	Dimensions (mm)							Insert Number	 Clamp Screw	 Wrench
					LU	LBX	LPR	OAL	DCON	DCSFMS	CNT			
47.0	3	**TAFM4700F40**	▲	2	141	160	171	236	40	54	PT1/4	**GPMT140408-U○**	TS55	TKY25D
48.0	2	**TAFS4800F40**	▲	2	96	115	126	191	40	54	PT1/4	**GPMT140408-U○**	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

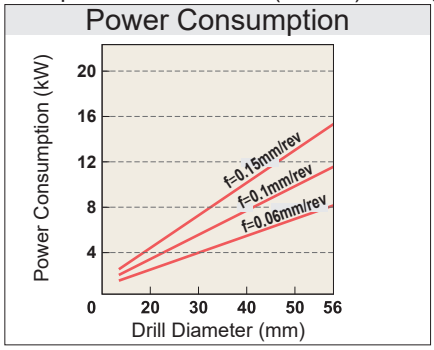
RECOMMENDED CUTTING CONDITIONS

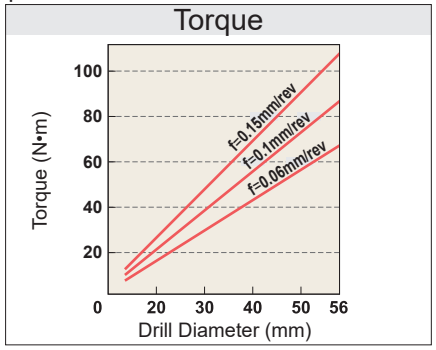
Workpiece Material		Hardness	Cutting Speed (m/min) For L/D=2,3 (ϕ12–ϕ14.5)	Cutting Speed (m/min) For L/D=2,3 (ϕ15–)	Cutting Speed (m/min) For L/D=4 (ϕ16–)	Breaker	Feed (mm/rev) Drill Diameter (mm) ϕ12–ϕ14.5	ϕ15–ϕ22.5	ϕ23–ϕ34	ϕ35–ϕ48	ϕ49–ϕ56
P	Mild Steel	≤180HB	150 (100–200)	200 (150–300)	140 (100–200)	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)

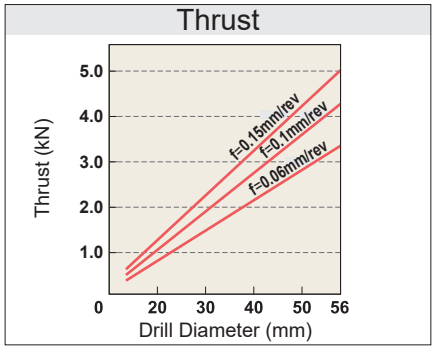
Note 1) When using drills for L/D= 4, the feed should be reduced to 80% of the above recommendations.

■CUTTING RESISTANCE

Workpiece : JIS SCM440(220HB) Cutting Speed : 150m/min Insert : U2 Breaker



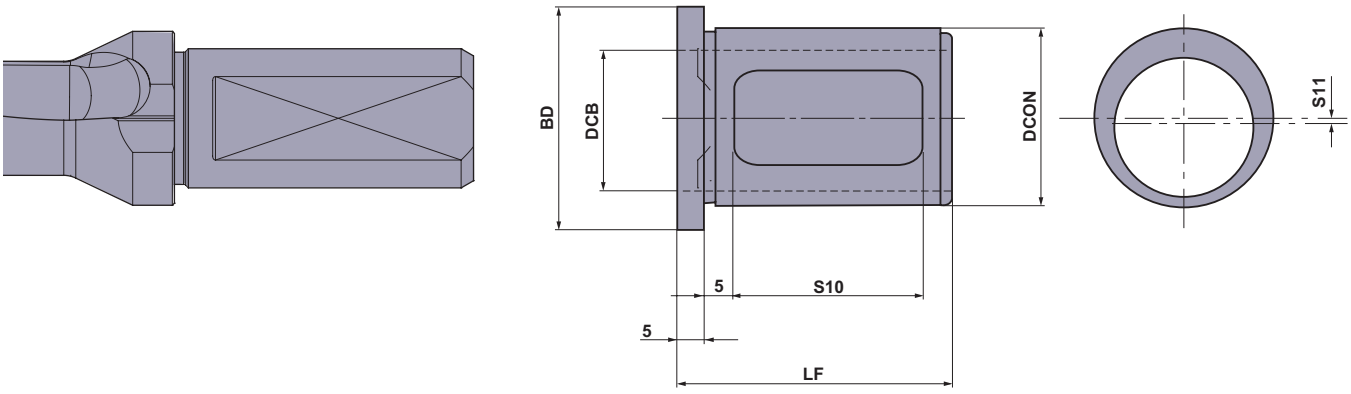




USAGE NOTE ➤ N179

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.**

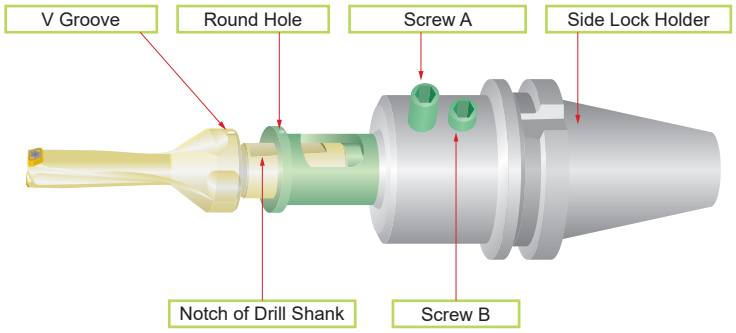
JUST FIT SLEEVE [JFS]

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.

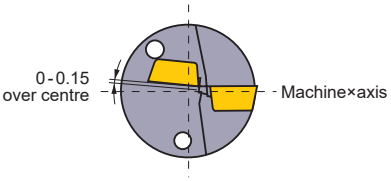


APPLICATION OF MVX TYPE DRILL

●Use on a Lathe

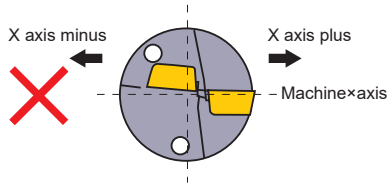
(1)The outer insert and machine X axis must be set to be parallel. The drill is designed so that when the drill centre and the machine spindle centre are aligned then the inner insert height is 0-0.15mm lower.

*The inner insert may fracture if the centre height of the inner insert is higher than the machine X axis.

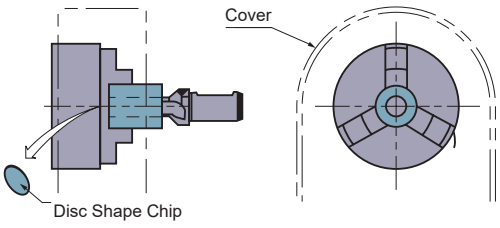


(2)By off setting it is possible to adjust the hole diameter. To do this adjust in the positive X axis direction (hole oversize direction). For the amount of possible adjustment please refer to the dimensions list.

*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.

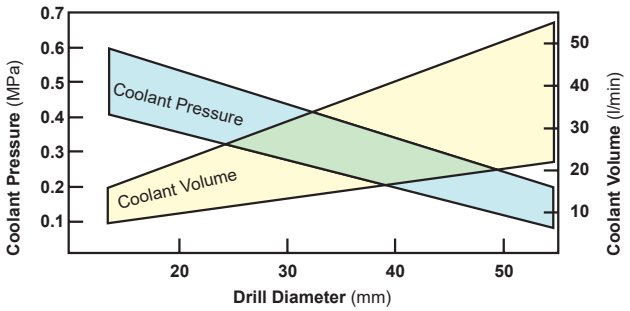


APPLICATION OF TAF TYPE DRILL

●Please ensure the highest rigidity possible exists in both machine set up and workholding.

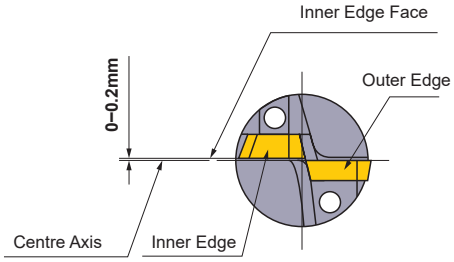
●Refer to the following graph on the right for coolant pressure and volume. Coolant is an important factor in the efficient use of these drills.

●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.

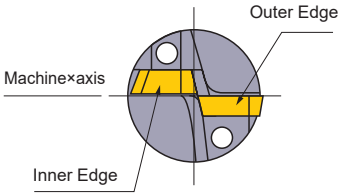


●Use on a Lathe

(1)The inner cutting edge must be positioned between 0—0.2mm over centre.

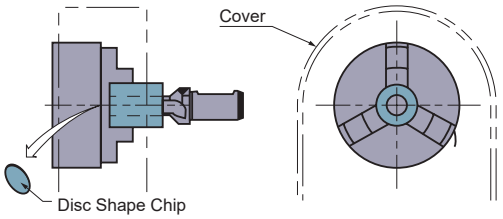


(2)To adjust the hole diameter by off-setting the drill, the outer cutting edge and machine axis must be set to be parallel.



(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.

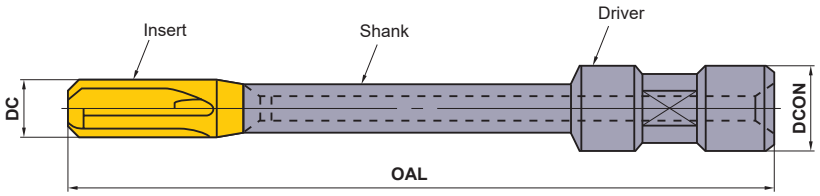
(4)When through hole drilling on a lathe the disc produced by the drill exiting the workpiece may be expelled at high velocity.
To reduce the danger of injury or damage a cover guard is highly recommended.



GUN REAMER

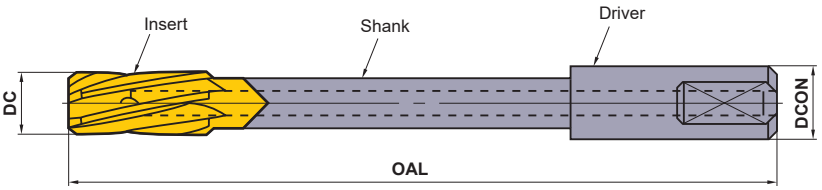
●Straight Reamer Type

●Reamer Diameter : ϕ6.0—ϕ30.0
●Number of teeth : 1, 2, 3, 4, 6



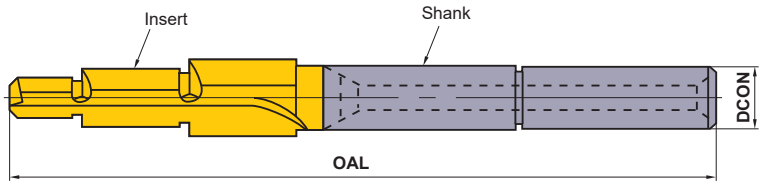
●Spiral Reamer Type

●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

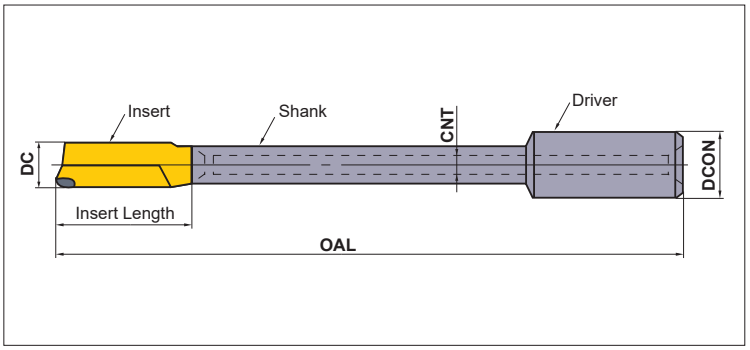


■ORDERING METHOD

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

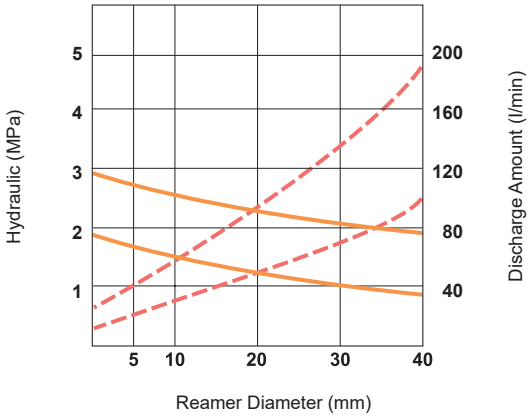
*Please contact us for any geometry (different diameter of reamer, insert length, tool length, number of teeth) that is not in this list.

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

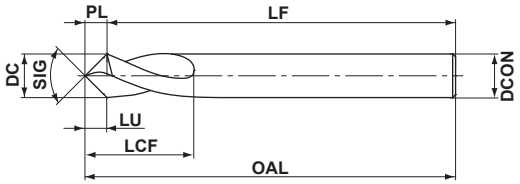
DRILLING(HSS TYPE)

GKCD NEW

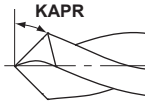
Leading Drill Series, Cobalt HSS

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

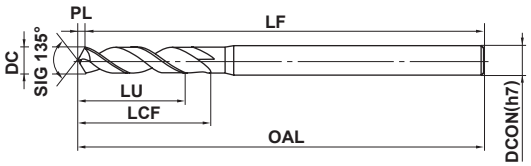
Workpiece Material	Austenitic Stainless Steel (≤200HB) JIS SUS304, SUS316 etc.		Gray Cast Iron (≤350MPa) JIS FC300 etc.		Ductile Cast Iron (≤450MPa) JIS FCD450 etc.	
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)	Revolution (min^{-1})	Feed (mm/rev)
3.0	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.

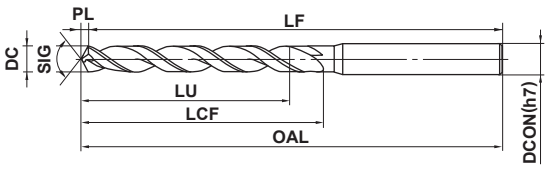
DRILLING(HSS MILLING SHANK DRILLS)

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

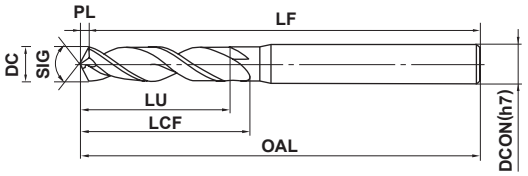
Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDS,VAPDM is recommended for the workpiece 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	●

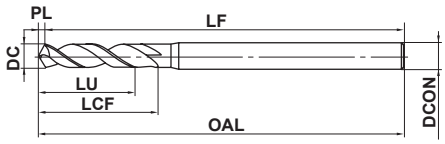
VAPDS

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

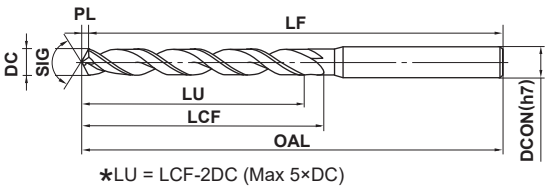
Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDSSUS are recommended for austenitic stainless 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 ▶

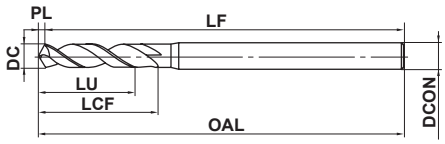
VAPDM

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

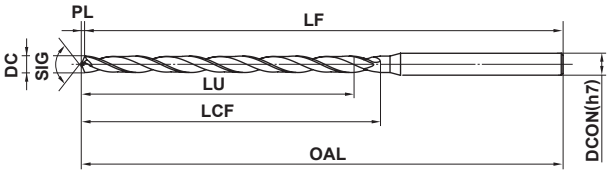
Note 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
Note 2) Please use a collet type drill chuck or a milling chuck.
Note 3) Use sufficient cutting fluid.
Note 4) VAPDMSUS are recommended for austenitic stainless 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.

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VAPDJ

Semi long, High precision

RECOMMENDED CUTTING CONDITIONS

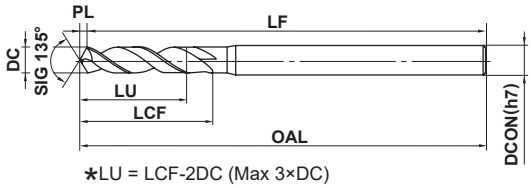
Workpiece material	Mild Steel AISI 1010 etc.		Carbon Steel, Alloy Steel Gray Cast Iron AISI 1045, AISI 4140, AISI No 45 B etc.		Alloy Tool Steel (Low-hardness Materials) Ferritic Stainless Steel Martensitic Stainless Steel AISI D2, AISI 430, AISI 420, AISI 440 etc.		Alloy Tool Steel (─40HRC) AISI H13 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.

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ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N205

VAPDSSUS

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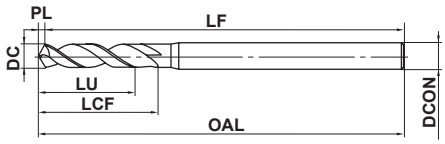
Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
VAPDSSUSD0207	2.07	12.4	60.4	60	0.4	3	●
VAPDSSUSD0210	2.10	12.4	60.4	60	0.4	3	●
VAPDSSUSD0211	2.11	12.4	60.4	60	0.4	3	●
VAPDSSUSD0212	2.12	12.4	60.4	60	0.4	3	●
VAPDSSUSD0215	2.15	12.5	60.5	60	0.5	3	●
VAPDSSUSD0220	2.20	12.5	60.5	60	0.5	3	●
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

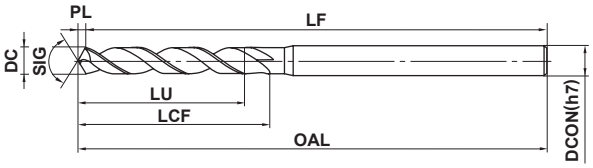
DRILLING(HSS TYPE)

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

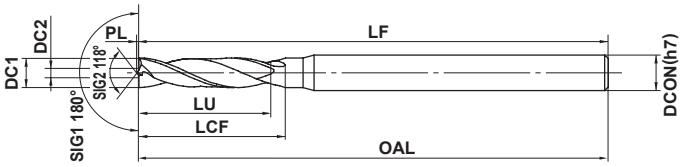
Workpiece Material	Stainless Steel				Carbon Steel, Alloy Steel Cast Iron Copper, Copper Alloys		Structural Steel Aluminium Alloys	
	Austenitic AISI 304, AISI 316		Martensitic Ferritic AISI 430		AISI 1049, SCM, FC			
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	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.

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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

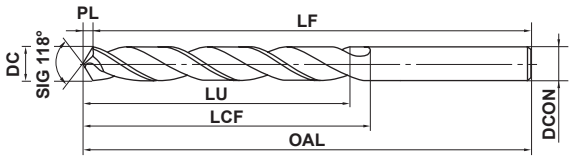
Note 1) The cutting conditions table above assumes that the hole depth is DC×3 and there is no preprepared hole. If the depth of the hole is DC×1 or less, it is possible to increase the rotation speed by around 1.2 times.
Note 2) Machining without a pilot hole is recommended. If there is a pilot hole, 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)

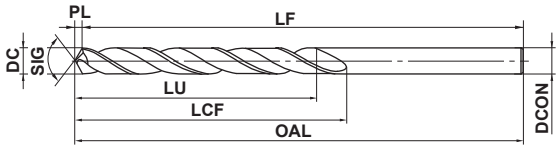
GSD

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	●

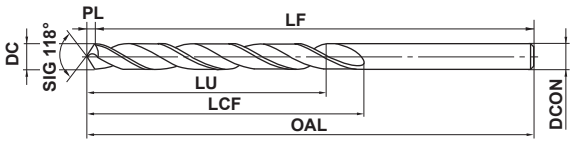
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

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	●

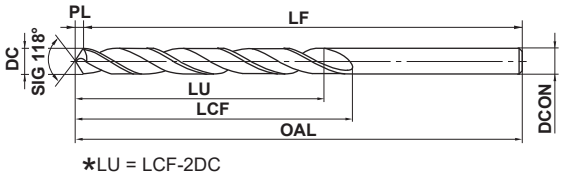
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

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.

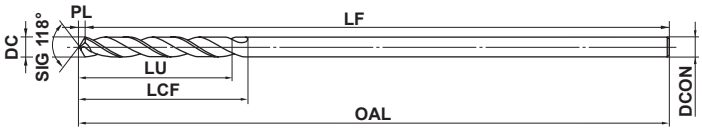
CUTTING CONDITIONS ➤ N245

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.

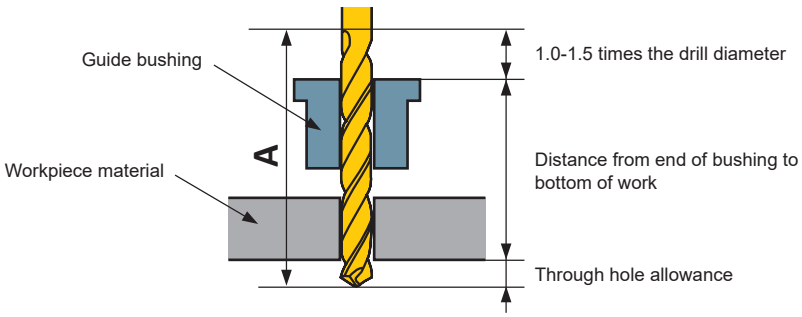
ISO13399 ➢ N002

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.



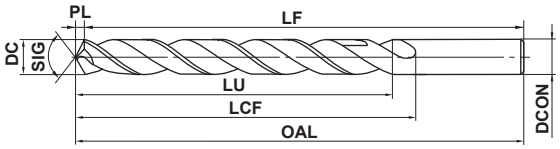
DRILLING(HSS TYPE)

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	●

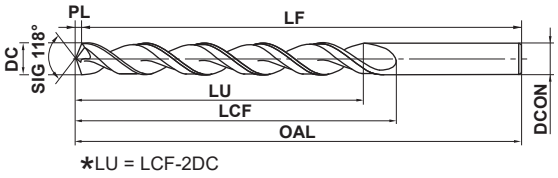
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N245

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	●

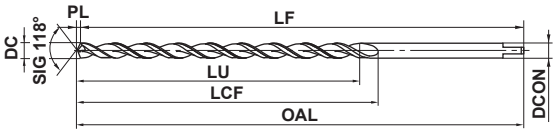
Order Number	Dimensions (mm)						Stock
	DC	LCF	OAL	LF	PL	DCON	
GWSSD1060	10.6	103.2	140.2	137	3.2	10.6	●
GWSSD1070	10.7	103.2	140.2	137	3.2	10.7	●
GWSSD1080	10.8	106.2	143.2	140	3.2	10.8	●
GWSSD1090	10.9	106.3	143.3	140	3.3	10.9	●
GWSSD1100	11.0	106.3	143.3	140	3.3	11.0	●
GWSSD1110	11.1	106.3	143.3	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

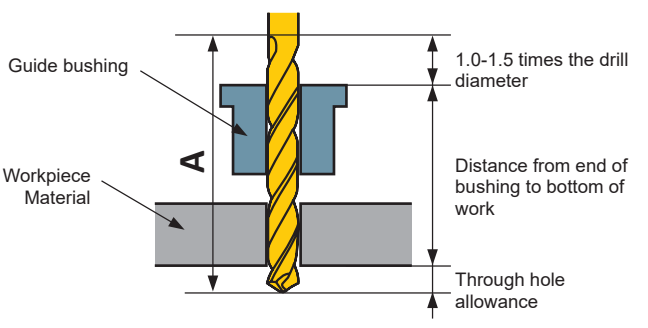
Workpiece Material	Stainless steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	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).

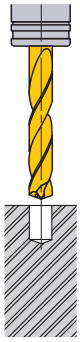
N

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.

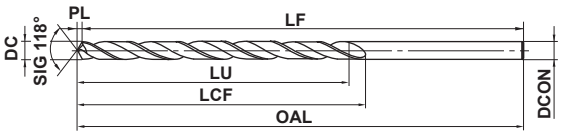
②It is essential for the pilot hole to have good accuracy.

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.

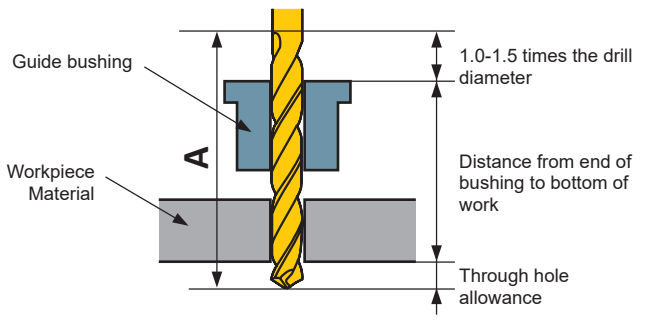
RECOMMENDED CUTTING CONDITIONS

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

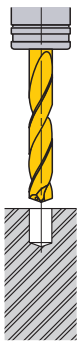
Workpiece Material	Stainless Steel				Copper Alloys, Brass		Aluminium Alloys	
	Martensitic Ferritic AISI 430		Austenitic AISI 304 Precipitation-Hardening ASTM 630					
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)	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.

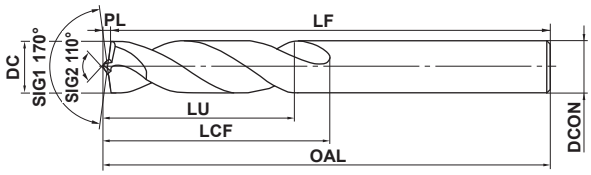
③Drill depth : Approx DC×1—DC×2.

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	●

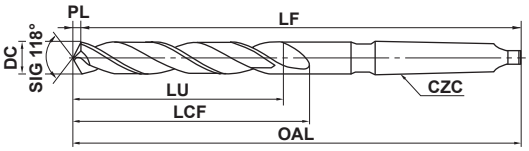
● : Inventory maintained in Japan.

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

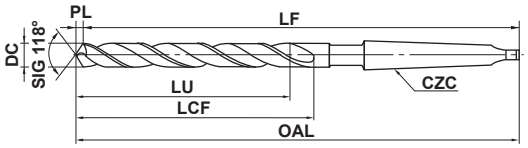
DRILLING(HSS TYPE)

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	●

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CUTTING CONDITIONS ➤ N245

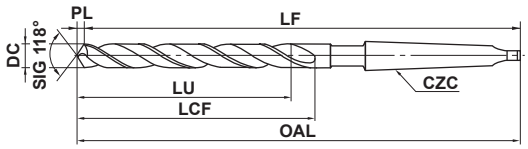
TD

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

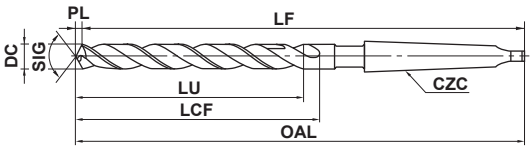
DRILLING(HSS TYPE)

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

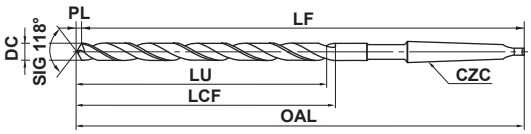
DRILLING(HSS TYPE)

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.

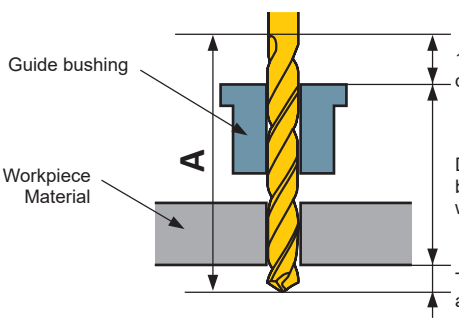
RECOMMENDED CUTTING CONDITIONS

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.

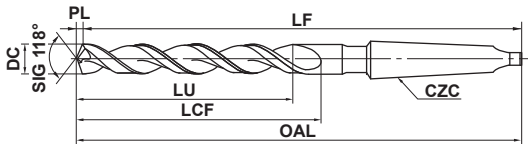
③Drill depth : Approx DC×1—DC×2.

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.

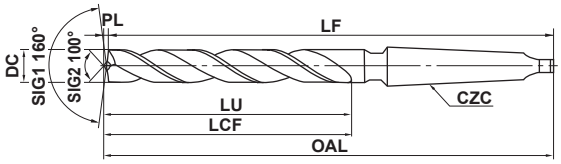
CUTTING CONDITIONS ➤ N244

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	●

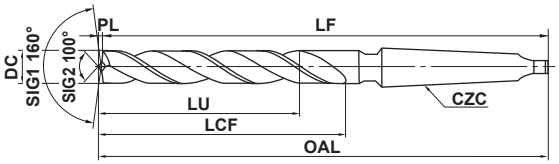
ISO13399 ➤ N002
CUTTING CONDITIONS ➤ N244

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	●

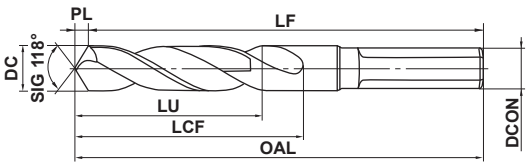
● : Inventory maintained in Japan.

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