HOW TO READ THE STANDARD OF DRILLING TOOLS

●How this section page is organized

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

PHOTO OF PRODUCT

PRODUCT TITLE

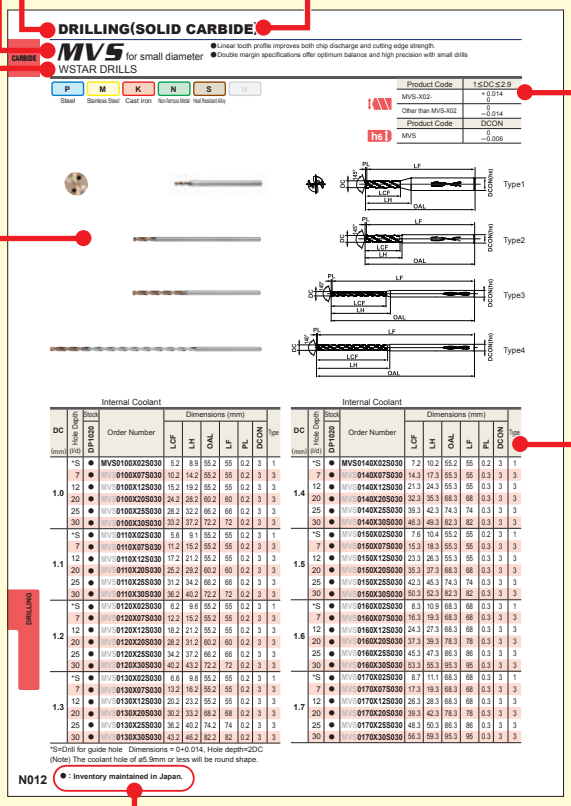
PRODUCT CODE

PRODUCT SECTION

PRODUCT TYPE

DIAMETER TOLERANCE GEOMETRY

SUITABLE WORK MATERIALS


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

Product Code	1≤DC≤2.9
MVS-X02-	+0.014 / 0
Other than MVS-X02	0 / −0.014
Product Code	DCON
MVS	0 / −0.006

Type1 Type2 Type3 Type4

Internal Coolant

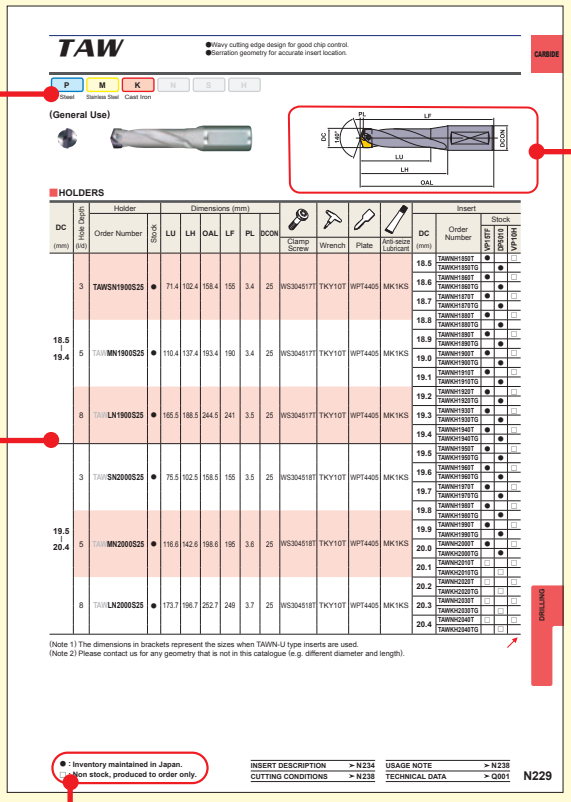
DC (mm)	Hole Depth (Ø4)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.0	*S	●	MVS0100X02S030	5.2	8.9	55.2	55	0.2	3	1
	7	●	MVS0100X07S030	10.2	14.2	55.2	55	0.2	3	3
	12	●	MVS0100X12S030	15.2	19.2	55.2	55	0.2	3	3
	20	●	MVS0100X20S030	24.2	28.2	60.2	60	0.2	3	3
	25	●	MVS0100X25S030	28.2	32.2	66.2	66	0.2	3	3
	30	●	MVS0100X30S030	33.2	37.2	72.2	72	0.2	3	3
1.1	*S	●	MVS0110X02S030	5.6	9.1	55.2	55	0.2	3	1
	7	●	MVS0110X07S030	11.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0110X12S030	17.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0110X20S030	25.2	29.2	60.2	60	0.2	3	3
	25	●	MVS0110X25S030	31.2	34.2	66.2	66	0.2	3	3
	30	●	MVS0110X30S030	36.2	40.2	72.2	72	0.2	3	3
1.2	*S	●	MVS0120X02S030	6.2	9.6	55.2	55	0.2	3	1
	7	●	MVS0120X07S030	12.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0120X12S030	18.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0120X20S030	28.2	31.2	60.2	60	0.2	3	3
	25	●	MVS0120X25S030	34.2	37.2	66.2	66	0.2	3	3
	30	●	MVS0120X30S030	40.2	43.2	72.2	72	0.2	3	3
1.3	*S	●	MVS0130X02S030	6.6	9.8	55.2	55	0.2	3	1
	7	●	MVS0130X07S030	13.2	16.2	55.2	55	0.2	3	3
	12	●	MVS0130X12S030	20.2	23.2	55.2	55	0.2	3	3
	20	●	MVS0130X20S030	30.2	33.2	68.2	68	0.2	3	3
	25	●	MVS0130X25S030	36.2	40.2	74.2	74	0.2	3	3
	30	●	MVS0130X30S030	43.2	46.2	82.2	82	0.2	3	3

Internal Coolant

DC (mm)	Hole Depth (Ø4)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.4	*S	●	MVS0140X02S030	7.2	10.2	55.2	55	0.2	3	1
	7	●	MVS0140X07S030	14.3	17.3	55.3	55	0.3	3	3
	12	●	MVS0140X12S030	21.3	24.3	55.3	55	0.3	3	3
	20	●	MVS0140X20S030	32.3	35.3	68.3	68	0.3	3	3
	25	●	MVS0140X25S030	39.3	42.3	74.3	74	0.3	3	3
	30	●	MVS0140X30S030	46.3	49.3	82.3	82	0.3	3	3
1.5	*S	●	MVS0150X02S030	7.6	10.4	55.2	55	0.2	3	1
	7	●	MVS0150X07S030	15.3	18.3	55.3	55	0.3	3	3
	12	●	MVS0150X12S030	23.3	26.3	55.3	55	0.3	3	3
	20	●	MVS0150X20S030	35.3	37.3	68.3	68	0.3	3	3
	25	●	MVS0150X25S030	42.3	45.3	74.3	74	0.3	3	3
	30	●	MVS0150X30S030	50.3	52.3	82.3	82	0.3	3	3
1.6	*S	●	MVS0160X02S030	8.3	10.9	68.3	68	0.3	3	1
	7	●	MVS0160X07S030	16.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0160X12S030	24.3	27.3	68.3	68	0.3	3	3
	20	●	MVS0160X20S030	37.3	39.3	78.3	78	0.3	3	3
	25	●	MVS0160X25S030	45.3	47.3	86.3	86	0.3	3	3
	30	●	MVS0160X30S030	53.3	55.3	95.3	95	0.3	3	3
1.7	*S	●	MVS0170X02S030	8.7	11.1	68.3	68	0.3	3	1
	7	●	MVS0170X07S030	17.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0170X12S030	26.3	28.3	68.3	68	0.3	3	3
	20	●	MVS0170X20S030	39.3	42.3	78.3	78	0.3	3	3
	25	●	MVS0170X25S030	48.3	50.3	86.3	86	0.3	3	3
	30	●	MVS0170X30S030	56.3	59.3	95.3	95	0.3	3	3

*S=Drill for guide hole Dimensions = 0+0.014, Hole depth=2DC
(Note) The coolant hole of ø5.9mm or less will be round shape.

N012 ● : 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

DC (mm)	Hole Depth (Ø3)	Holder Order Number	Stock	Dimensions (mm) LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant
18.5 – 19.4	3	TAWSN1900S25	●	71.4	102.4	158.4	155	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS
	5	TAWMN1900S25	●	110.4	137.4	193.4	190	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS
	8	TAWLN1900S25	●	165.5	188.5	244.5	241	3.5	25	WS304517T	TKY10T	WPT4405	MK1KS
19.5 – 20.4	3	TAWSN2000S25	●	75.5	102.5	158.5	155	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS
	5	TAWMN2000S25	●	116.6	142.6	198.6	195	3.6	25	WS304518T	TKY10T	WPT4405	MK1KS
	8	TAWLN2000S25	●	173.7	196.7	252.7	249	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS

DC (mm)	Insert Order Number	Stock VP15TF	DP5010	VP10H
18.5	TAWNH1850T	●		□
	TAWNH1850TG			□
18.6	TAWNH1860T	●		□
	TAWNH1860TG		●	
18.7	TAWNH1870T	●		□
	TAWNH1870TG		●	
18.8	TAWNH1880T	●		□
	TAWNH1880TG		●	
18.9	TAWNH1890T	●		□
	TAWNH1890TG		●	
19.0	TAWNH1900T	●		□
	TAWNH1900TG		●	
19.1	TAWNH1910T	●		□
	TAWNH1910TG		●	
19.2	TAWNH1920T	●		□
	TAWNH1920TG		●	
19.3	TAWNH1930T	●		□
	TAWNH1930TG		●	
19.4	TAWNH1940T	●		□
	TAWNH1940TG		●	
19.5	TAWNH1950T	●		□
	TAWNH1950TG		●	
19.6	TAWNH1960T	●		□
	TAWNH1960TG		●	
19.7	TAWNH1970T	●		□
	TAWNH1970TG		●	
19.8	TAWNH1980T	●		□
	TAWNH1980TG		●	
19.9	TAWNH1990T	●		□
	TAWNH1990TG		●	
20.0	TAWNH2000T	●		□
	TAWNH2000TG		●	
20.1	TAWNH2010T	□		□
	TAWNH2010TG	□		□
20.2	TAWNH2020T	□		□
	TAWNH2020TG	□		□
20.3	TAWNH2030T	□		□
	TAWNH2030TG	□		□
20.4	TAWNH2040T	□		□
	TAWNH2040TG	□		□

(Note 1) The dimensions in brackets represent the sizes when TAWN-U type inserts are used.
(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.

INSERT DESCRIPTION ➤N234 | USAGE NOTE ➤N238
CUTTING CONDITIONS ➤N238 | TECHNICAL DATA ➤Q001

N229

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

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

●To Order : For solid-carbide or brazed drills, please specify ①order number and ②grade.
For indexable type drills, please specify ①order number for the drill.
For indexable type drill inserts, please specify ①insert number and ②insert grade.

DRILLING

IDENTIFICATION ····· N002
SYMBOL DESCRIPTIONS ····· N003
DRILLS SELECTION CHART ····· N004

DRILL STANDARD

SOLID CARBIDE

WSTAR DRILLS ····· N012
WSTAR DRILLS (FOR MACHINING OF STEEL AND CAST IRON) ··· N063
WSTAR DRILLS (FOR MACHINING OF STAINLESS STEEL) ··· N070
WSTAR DRILLS (FOR MACHINING OF ALUMINIUM ALLOYS) ··· N077
WSTAR DRILLS (FOR DIE & MOULD MACHINING) ··· N085
MZE/MZS DRILLS ····· N097
MSE DRILLS ····· N120
SOLID GUN DRILL ····· N124
MIRACLE DRILLS ····· N127
MAE/MAS DRILLS ····· N129

High-Speed Steel Solid Type

Violet coated precision drills ··· N137
VIOLET DRILLS ····· N162
HSS MILLING SHANK DRILLS ··· N135
STRAIGHT SHANK DRILLS ····· N166
TAPER SHANK DRILLS ····· N184
TRIANGULAR SHANK DRILLS ···· N197

BRAZED TYPE

BRS/BRM/BRK DRILLS ····· N200
BRSB/BRB DRILLS (FOR BRIDGE CONSTRUCTION) ····· N204
BRA/BRL DRILLS ····· N206

Exchangeable head

TAW DRILLS ····· N220

INDEXABLE TYPE

MVX TYPE DRILLS ····· N212
STAW ····· N220
TAW ····· N229
TAF TYPE DRILLS ····· N240
JUST FIT SLEEVE ····· N246

GUN DRILL • GUN REAMER ····· N249
Diamond coated drills ····· N252

*Arranged by Alphabetical order

N197 **3KD**
N206 **BRA**
N205 **BRB**
N208 **BRL**
N202 **BRM**
N204 **BRMB**
N200 **BRS**
N204 **BRSB**
N256 **DCBSS**
N254 **DCSSM**
N254 **DCSSS**
N183 **EPSS**
N166 **GSD**
N184 **GTD**
N195 **GTTD**
N178 **GWSL**
N176 **GWSS**
N191 **GWTS**
N246 **JFS**
N174 **KSD**
N189 **KTD**
N180 **LSD**
N192 **LTD**
N129 **MAE**
N129 **MAS**
N252 **MCS**
N125 **MGD**
N124 **MGS**
N085 **MHS**
N070 **MMS**
N077 **MNS**
N063 **MQS**
N120 **MSE**
N123 **MSP**
N024 **MVE**
N012 **MVS**
N212 **MVX**
N054 **MWE**
N032 **MWS**
N096 **MZE**
N096 **MZS**
N168 **SD**
N171 **SDLS**
N135 **SEPDM**
N220 **STAW**
N240 **TAF**
N229 **TAW**
N185 **TD**
N196 **TTD**
N142 **VAPDM**
N152 **VAPDMSUS**
N137 **VAPDS**
N159 **VAPDSCB**
N146 **VAPDSSUS**
N128 **VCHSM**
N127 **VCSSS**
N162 **VSD**
N164 **VTDS**

IDENTIFICATION

PRODUCT CODE OF DRILLS

MW E 0300 S A

Product name

- **MV** : New generation for general-purpose
- **MW** : General-purpose
- **MZ** : MZE/MZS Drills
- **MA** : MAE/MAS Drills
- **MS** : MSE Drills
- **MN** : For Machining of Aluminium Alloys
- **MH** : For die & mould machining
- **MM** : For Machining of Stainless Steel
- **MQ** : Steel • For high feed cast iron machining

Coolant

- **E** : External Coolant
- **S** : Internal Coolant

Diameter

ex.
0050 → ϕ0.5
0300 → ϕ3.0

l/d

- **S** : 2D
- **M** : 3D
- **L** : 5D (MAE, MAS : 6D)
- **X** : 12D
- **X＊＊D** : ＊＊D

Type of shank

- **A** : Straight shank
- **B** : Integral shank
- **S＊＊＊** : Shank Diameter (MV Series)

＊Other special types can be ordered.

VC S S S D0300 ＊＊＊

Product name

- **VC** : Miracle drills
- **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
- **B** : Blister packed drills
- **None** : High-Speed Steel

Applications

- **SD** : General-purpose straight drill
- **TD** : General-purpose taper drill
- **S** : For steel
- **H** : For high hardness
- **N** : For CN
- **PD** : For high-precision machining
- **U** : For stainless
- **T** : For steel frame
- **W** : For deep hole

Type of shank

- **S** : Straight
- **T** : Taper
- **3K** : Triangular
- **6K** : Hexagonal

Flute length

- **S** : Short
- **M** : Medium
- **L** : Long

Diameter

ex.
D0050 → ϕ0.5
D0300 → ϕ3.0

Others

- **A＊＊＊** : Overall Length
- **S＊＊** : Shank Diameter
- **M＊** : Taper size

＊Other special types can be ordered.

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.

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.

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 non coated products.

Angle and sharp corner edge

Point angle
Indicates drill point angle the tip.

DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page Number Dimensions	Page Number Cutting Conditions
Solid Drills	WSTAR DRILLS SERIES	New Generation for small diameter	MVS...X02 (NEW) MIRACLE SIGMA	ϕ1.0 −ϕ2.9	*S	Internal	○	◎	◎	○	○	○			N012	N022
			MVS...X07 (NEW) MIRACLE SIGMA		7	Internal	○	◎	◎	○	○	○				
			MVS...X12 (NEW) MIRACLE SIGMA		12	Internal	○	◎	◎	○	○	○				
			MVS...X20 (NEW) MIRACLE SIGMA		20	Internal	○	◎	◎	○	○	○				
			MVS...X25 (NEW) MIRACLE SIGMA		25	Internal	○	◎	◎	○	○	○				
			MVS...X30 (NEW) MIRACLE SIGMA		30	Internal	○	◎	◎	○	○	○				
		New generation for general-purpose	MVE...X02 MIRACLE SIGMA	ϕ3.0 −ϕ20.0	2	External	○	◎	○	◎	○	○	○		N024	N030
			MVE...X03 MIRACLE SIGMA		3	External	○	◎	○	◎	○	○	○			
			MVS...X03 MIRACLE SIGMA		3	Internal	○	◎	◎	◎	○	○			N012	N022
			MVS...X05 MIRACLE SIGMA		5	Internal	○	◎	◎	◎	○	○				
			MVS...X08 MIRACLE SIGMA		8	Internal	○	◎	◎	◎	○	○				
		For small Diameter	MWS...SB	ϕ0.5 −ϕ2.95	1	Internal	○	◎	◎	◎	○	○			N032	N047
			MWS...LB		5	Internal	○	◎	◎	◎	○	○			N032	N048
			MWS...XB		12	Internal	○	◎	◎	◎	○	○				N050
			MWS...X20DB	ϕ1.0 −ϕ2.95	20	Internal	○	◎	◎	◎	○	○			N032	N049
			MWS...X25DB		25	Internal	○	◎	◎	◎	○	○				
			MWS...X30DB		30	Internal	○	◎	◎	◎	○	○				

*S=Drill for guide hole Dimensions = 0+0.014, Hole depth=2DC

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material P: Steel	Work Material M: Stainless Steel	Work Material K: Cast Iron	Work Material N: Non-ferrous Metal	Work Material S: Heat Resistant Alloy	Work Material H: Hardened Steel	Shape	Page Number: Dimensions	Page Number: Cutting Conditions
Solid Drills	WSTAR DRILLS SERIES	General Drilling	MWE...SA/SB	ϕ3.0 −ϕ20.0	2	External	○	◎	○	◎	○	○	○		N054	N061
			MWE...MA/MB		3	External	○	◎	○	◎	○	○	○			
			MWS...MB	ϕ3.0 −ϕ25.0	3	Internal	○	◎	◎	◎	○	○			N032	N047
			MWS...LB		5	Internal	○	◎	◎	◎	○	○				
			MWS...X8DB	ϕ3.0 −ϕ16.0	8	Internal	○	◎	◎	◎	○	○				
		For deep hole	MWS...X10DB	ϕ3.0 −ϕ14.0	10	Internal	○	◎	◎	◎	○	○			N032	N050
			MWS...X15DB		15	Internal	○	◎	◎	◎	○	○				
			MWS...X20DB		20	Internal	○	◎	◎	◎	○	○				
			MWS...X25DB	ϕ3.0 −ϕ12.0	25	Internal	○	◎	◎	◎	○	○				
			MWS...X30DB	ϕ3.0 −ϕ10.0	30	Internal	○	◎	◎	◎	○	○				
		For Machining Of Steel And Cast Iron	MQS...X3DB	ϕ3.0 −ϕ20.0	3	Internal	○	◎		◎					N063	N067
			MQS...X5DB		5	Internal	○	◎		◎						
			MQS...X8DB	ϕ3.0 −ϕ16.0	8	Internal	○	◎		◎						
		For Machining Of Stainless Steel	MMS...X3DB	ϕ3.0 −ϕ20.0	3	Internal	○		◎						N070	N074
			MMS...X5DB		5	Internal	○		◎							

DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material P: Steel	Work Material M: Stainless Steel	Work Material K: Cast Iron	Work Material N: Non-ferrous Metal	Work Material S: Heat Resistant Alloy	Work Material H: Hardened Steel	Shape	Page Number: Dimensions	Page Number: Cutting Conditions
Solid Drills	WSTAR DRILLS SERIES	For Machining Of Aluminium Alloys	MNS...LB	ϕ3.0 –ϕ14.0	5	Internal	–				◎				N077	N082
			MNS...X10DB		10	Internal	–				◎					
			MNS...X20DB		20	Internal	–				◎					
			MNS...X30DB	ϕ3.0 –ϕ10.0	30	Internal	–				◎					
		For Die & Mould Machining	MHS...L020B -L300B	ϕ0.95 –ϕ12.0	1 –30	Internal	○	○	○			○	◎		N085	N093
	DIAMOND COATED DRILLS	For CFRP	MCS	ϕ4.366 –ϕ12.725	3	Internal	○	For CFRP							N252	N253
		For non-ferrous material	DCSSS	ϕ0.2 –ϕ2.0	–	External	–				○				N254	N255
			DCSSM	ϕ2.1 –ϕ3.0	–	External	–				○				N254	N255
		for hard brittle materials	DCBSS	ϕ0.05 –ϕ3.0	–	External	–	Hard brittle materials such as ceramics							N256	N257
	ZET1 DRILLS SERIES	General Drilling	MZE...SA/SB	ϕ1.0 –ϕ20.0	2	External	○/–	◎	○	◎	○	○	○		N096	N115
			MZE...MA	ϕ3.0 –ϕ20.0	3	External	○/–	◎	○	◎	○	○	○			
			MZS...MB	ϕ2.0 –ϕ20.0	3	Internal	○	◎	◎	◎	○	○			N096	N115
			MZS...LB	ϕ1.0 –ϕ20.0	5	Internal	○	◎	◎	◎	○	○				
			MZS...XB	ϕ1.0 –ϕ2.9	12	Internal	○	◎	◎	◎	○	○				
		With Chamfered Cutting Edges	MZE...SM	ϕ3.4 –ϕ10.3	2	External	○	◎	○	◎	○	○	○		N113	N115
			MZE...MM		3	External	○	◎	○	◎	○	○	○			
			MZS...SM	ϕ3.4 –ϕ10.3	2	Internal	○	◎	◎	◎	○	○			N113	N115
			MZS...MM		3	Internal	○	◎	◎	◎	○	○				

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page Number Dimensions	Page Number Cutting Conditions
Solid Drills	MIRACLE MINI STAR DRILL SERIES	For small Diameter	MSE...SB	φ0.1 –φ0.99	5 –12	External	○	◎	○	◎	○	○	○		N120	N121
			MSP0300SB	–	–	External	○	◎	○	◎	○	○	○		N123	N123
	MGS GUN DRILL SERIES	Deep Hole Drilling	MGS...SB	φ0.7 –φ3.0	–100	Internal	–	◎	◎	◎	◎	○	○		N124	N125
	MIRACLE DRILLS SERIES	Hardened Steel	VCSSS (3mm shank)	φ0.3 –φ2.4	5	External	○	○	○	○	○	○	◎		N127	N127
			VCHSM	φ2.5 –φ16.0	3	External	○					○	◎		N128	N128
	MAE/MAS DRILLS SERIES	Aluminium Alloy, Cast Iron	MAE...MB	φ3.0 –φ16.0	3	External	–			○	◎				N129	N134
			MAS...MB		3	Internal	–			○	◎					
			MAS...LB		6	Internal	–			○	◎					
Exchangeable-head Drills	WSTAR Insert Type Drill	General Drilling	STAWSS	φ10.0 –φ18.4	1.5	Internal	–	◎	○	◎	○				N220	N227
			STAWSN		3	Internal	–	◎	○	◎	○					
			STAWMN		5	Internal	–	◎	○	◎	○					
			STAWLN		8	Internal	–	◎	○	◎	○					
			TAWSN(H)	φ14.0 –φ30.4	3	Internal	–	◎	○	◎					N229	N238
			TAWMN(H)		5	Internal	–	◎	○	◎						
			TAWLN(H)		8	Internal	–	◎	○	◎						
		For Bridge Construction	TAWSB	φ24.5 –φ26.7	3	Internal	–	◎							N239	N239
			TAWMB		5	Internal	–	◎								

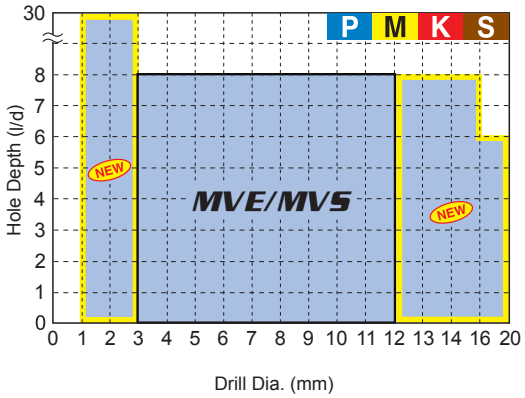
DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page Number Dimensions	Page Number Cutting Conditions
Brazed Drills	BRS/BRM DRILLS	General Drilling	BRS	ϕ14.0 −ϕ30.0	3	Internal	–	◎	◎	○					N200	N201
			BRM		5	Internal	–	◎	◎	○					N202	N203
	BRA/BRL DRILLS	For Bridge Construction	BRSB	ϕ24.5 −ϕ26.7	3	Internal	–	◎							N204	N205
			BRMB		5	Internal	–	◎							N204	N205
		General Drilling	BRA	ϕ8.0 −ϕ40.0	3	Internal	–	◎	○	○					N206	N210
		General Drilling (For turning)	BRL		3	Internal	–	◎	○	○					N208	N210
		For Bridge Construction	BRB	ϕ24.5 −ϕ26.7	3	Internal	–	◎							N205	N205
	GUN DRILL	Ultra Deep Holes	–	ϕ2.0 −ϕ30.3	–	Internal	–	◎	○	○	○				N249	–
	GUN REAMER	Ultra Deep Holes	–	ϕ6.0 −ϕ30.0	–	Internal	–	○	○	○	○				N250	–
	GUN REAMER with Diamond Compound	Ultra Deep Holes	–	ϕ6.0 −ϕ30.3	–	Internal	–			◎	◎				N251	–
Indexable Drills	MVX DRILLS SERIES	New generation for general-purpose	MVX...X2	ϕ17.0 −ϕ63.0	2	Internal	–	◎	○	◎					N212	N219
			MVX...X3		3	Internal	–	◎	○	◎						
			MVX...X4		4	Internal	–	◎	○	◎						
			MVX...X5		5	Internal	–	◎	○	◎						
			MVX...X6	ϕ17.0 −ϕ43.0	6	Internal	–	◎	○	◎						
	TAF DRILLS SERIES	General Drilling	TAFS	ϕ12.0 −ϕ56.0	2	Internal	–	◎	◎	◎					N240	N245
			TAFM		3	Internal	–	◎	◎	◎						
			TAFL	ϕ16.0 −ϕ34.0	4	Internal	–	◎	◎	◎						

WSTAR DRILLS SERIES

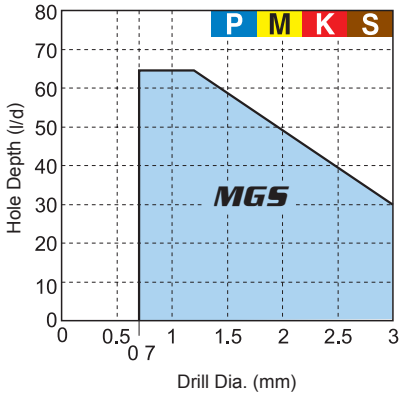
SOLID CARBIDE

MVE/MVS New generation for general-purpose



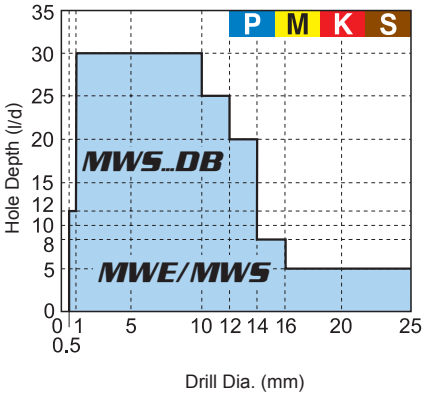
SOLID CARBIDE(For small diameter and deep hole)

MGS



SOLID CARBIDE (General Drilling)

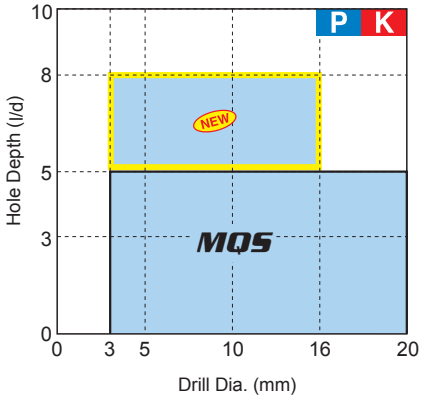
MWE/MWS,MWS...DB(SUPER LONG)



SOLID CARBIDE

MQS Highly efficient drilling, High-precision

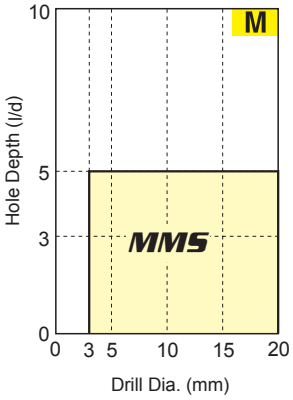
Steel • For high feed cast iron machining



SOLID CARBIDE

MMS Highly efficient drilling,Long tool life

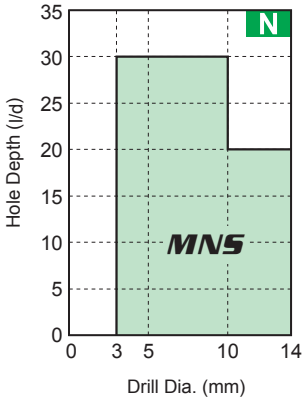
For machining of stainless steel



SOLID CARBIDE

MNS Highly efficient drilling

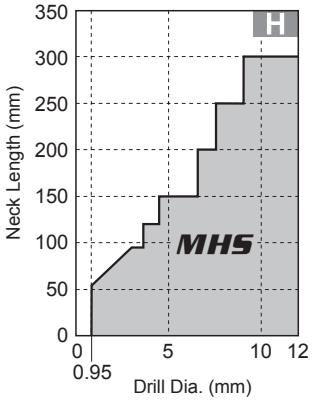
For machining of aluminium alloys



SOLID CARBIDE

MHS High-precision deep hole

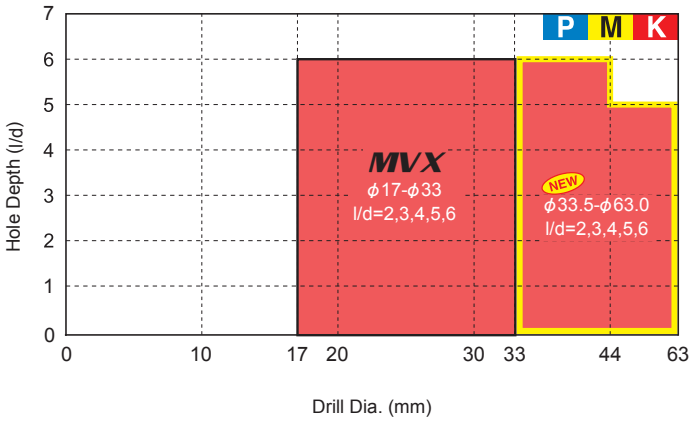
For die & mould machining



Indexable carbide drills

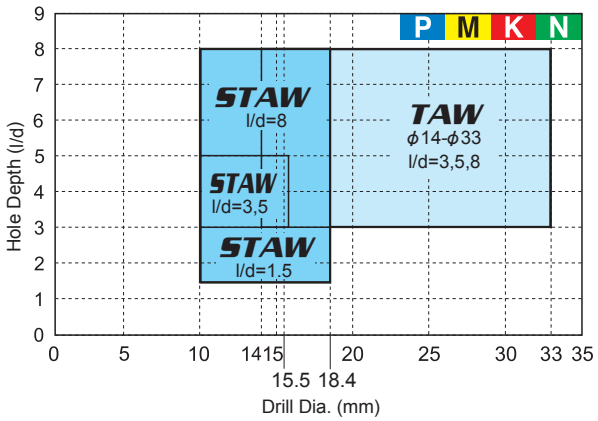
INDEXABLE TYPE

MVX



INDEXABLE HEAD

STAW,TAW



DRILLING

DRILLS SELECTION CHART HSS

Drill Type (Series Title)	Applications	Product Code	Size Range	Tool material	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page Number Dimensions	Page Number Cutting Conditions
VIOLET COATED DRILLS	General, High Precision	VAPDS	ϕ0.5 –ϕ13.0	High Grade, High Speed Steel	External	V	◎	○	○		○			N137	N141
		VAPDM	ϕ0.5 –ϕ32.0		External	V	◎	○	○		○			N142	N145
	General, High Precision Steel	VAPDSSUS	ϕ0.5 –ϕ20.0	Cobalt High Speed Steel	External	V	○	◎	○	○				N146	N158
		VAPDMSUS	ϕ0.5 –ϕ13.0		External	V	○	◎	○	○				N152	N158
	Spot Milling	VAPDSCB	ϕ3.0 –ϕ32.0	High Grade, High Speed Steel	External	V	◎	○	○	○				N159	N161
VIOLET DRILL	General Drilling	VSD	ϕ0.5 –ϕ13.0	High Speed Steel	External	V	◎	○	○					N162	N163
		VTDS	ϕ6.0 –ϕ32.0		External	V	◎	◎	○					N164	N165
SE High Precision Drill	General Drilling	SEPDM NEW	ϕ0.5 –ϕ4.0	High Speed Steel	External	–	◎		◎	○	○			N135	N136
STRAIGHT SHANK DRILL	General Drilling	GSD	ϕ0.5 –ϕ13.0	High Speed Steel	External	G	◎	○	○	○				N166	N198
		SD	ϕ0.2 –ϕ17.5		External	–	◎	○	○	○				N168	N199
		SD (1/100 Straight)	ϕ0.25 –ϕ5.95		External	–	◎	○	○	○				N170	N199
	Deep Hole Drilling	SDLS NEW	ϕ1.0 –ϕ10.0	High Speed Steel	External	–	◎		○	○	○			N171	N173
	General Drilling	KSD	ϕ1.0 –ϕ13.0	Cobalt High Speed Steel	External	–	◎	◎		○				N174	N199

Drill Type (Series Title)	Applications	Product Code	Size Range	Tool material	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page Number Dimensions	Page Number Cutting Conditions
STRAIGHT SHANK DRILL	Deep Hole Drilling	GWSS	ϕ1.0 –ϕ13.0	Cobalt High Speed Steel	External	G	◎	○	○	○				N176	N198
		GWSL	ϕ2.0 –ϕ13.0		External	G	◎	○	○	○				N178	N198
		LSD	ϕ1.0 –ϕ13.0	High Speed Steel	External	–	○		○	○				N180	N199
	Sheet Steel	EPSS	ϕ2.0 –ϕ13.0	High Speed Steel	External	–	○	○	○	○				N183	–
TAPER SHANK DRILL	General Drilling	GTD	ϕ6.0 –ϕ40.0	High Speed Steel	External	G	◎	○	○	○				N184	N198
		TD	ϕ3.0 –ϕ75.0		External	–	◎	○	○	○				N185	N199
		KTD	ϕ5.0 –ϕ50.0	Cobalt High Speed Steel	External	–	◎	○	○	○				N189	N199
	Deep Hole Drilling	GWTS	ϕ6.0 –ϕ32.0	Cobalt High Speed Steel	External	G	◎	○	○	○				N191	N198
		LTD	ϕ6.0 –ϕ40.0	High Speed Steel	External	–	○		○	○				N192	–
	For steel frame	GTTD	ϕ17.0 –ϕ32.0	High Speed Steel	External	G	◎							N195	N198
		TTD	ϕ17.0 –ϕ32.0	High Speed Steel	External	–	○							N196	N199
TRIANGULAR SHANK DRILL	For General-purpose Electric Drills	3KD	ϕ7.0 –ϕ26.0	High Speed Steel	External	–	○		○	○				N197	–

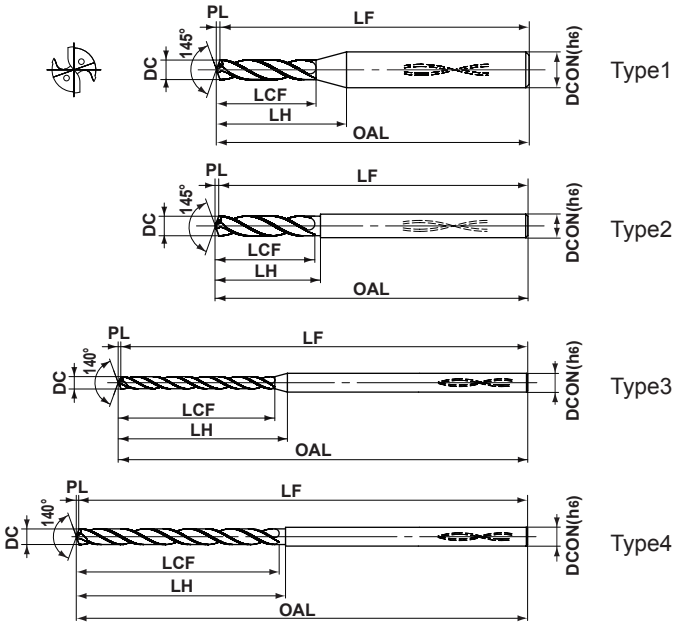
MVS for small diameter WSTAR DRILLS

- 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	

Product Code	1≤DC≤2.9
MVS-X02-	+0.014 / 0
Other than MVS-X02	0 / −0.014

Product Code	DCON
MVS	0 / −0.006



Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.0	*S	●	MVS0100X02S030	5.2	8.9	55.2	55	0.2	3	1
	7	●	MVS0100X07S030	10.2	14.2	55.2	55	0.2	3	3
	12	●	MVS0100X12S030	15.2	19.2	55.2	55	0.2	3	3
	20	●	MVS0100X20S030	24.2	28.2	60.2	60	0.2	3	3
	25	●	MVS0100X25S030	28.2	32.2	66.2	66	0.2	3	3
	30	●	MVS0100X30S030	33.2	37.2	72.2	72	0.2	3	3
1.1	*S	●	MVS0110X02S030	5.6	9.1	55.2	55	0.2	3	1
	7	●	MVS0110X07S030	11.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0110X12S030	17.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0110X20S030	25.2	29.2	60.2	60	0.2	3	3
	25	●	MVS0110X25S030	31.2	34.2	66.2	66	0.2	3	3
	30	●	MVS0110X30S030	36.2	40.2	72.2	72	0.2	3	3
1.2	*S	●	MVS0120X02S030	6.2	9.6	55.2	55	0.2	3	1
	7	●	MVS0120X07S030	12.2	15.2	55.2	55	0.2	3	3
	12	●	MVS0120X12S030	18.2	21.2	55.2	55	0.2	3	3
	20	●	MVS0120X20S030	28.2	31.2	60.2	60	0.2	3	3
	25	●	MVS0120X25S030	34.2	37.2	66.2	66	0.2	3	3
	30	●	MVS0120X30S030	40.2	43.2	72.2	72	0.2	3	3
1.3	*S	●	MVS0130X02S030	6.6	9.8	55.2	55	0.2	3	1
	7	●	MVS0130X07S030	13.2	16.2	55.2	55	0.2	3	3
	12	●	MVS0130X12S030	20.2	23.2	55.2	55	0.2	3	3
	20	●	MVS0130X20S030	30.2	33.2	68.2	68	0.2	3	3
	25	●	MVS0130X25S030	36.2	40.2	74.2	74	0.2	3	3
	30	●	MVS0130X30S030	43.2	46.2	82.2	82	0.2	3	3

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.4	*S	●	MVS0140X02S030	7.2	10.2	55.2	55	0.2	3	1
	7	●	MVS0140X07S030	14.3	17.3	55.3	55	0.3	3	3
	12	●	MVS0140X12S030	21.3	24.3	55.3	55	0.3	3	3
	20	●	MVS0140X20S030	32.3	35.3	68.3	68	0.3	3	3
	25	●	MVS0140X25S030	39.3	42.3	74.3	74	0.3	3	3
	30	●	MVS0140X30S030	46.3	49.3	82.3	82	0.3	3	3
1.5	*S	●	MVS0150X02S030	7.6	10.4	55.2	55	0.2	3	1
	7	●	MVS0150X07S030	15.3	18.3	55.3	55	0.3	3	3
	12	●	MVS0150X12S030	23.3	26.3	55.3	55	0.3	3	3
	20	●	MVS0150X20S030	35.3	37.3	68.3	68	0.3	3	3
	25	●	MVS0150X25S030	42.3	45.3	74.3	74	0.3	3	3
	30	●	MVS0150X30S030	50.3	52.3	82.3	82	0.3	3	3
1.6	*S	●	MVS0160X02S030	8.3	10.9	68.3	68	0.3	3	1
	7	●	MVS0160X07S030	16.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0160X12S030	24.3	27.3	68.3	68	0.3	3	3
	20	●	MVS0160X20S030	37.3	39.3	78.3	78	0.3	3	3
	25	●	MVS0160X25S030	45.3	47.3	86.3	86	0.3	3	3
	30	●	MVS0160X30S030	53.3	55.3	95.3	95	0.3	3	3
1.7	*S	●	MVS0170X02S030	8.7	11.1	68.3	68	0.3	3	1
	7	●	MVS0170X07S030	17.3	19.3	68.3	68	0.3	3	3
	12	●	MVS0170X12S030	26.3	28.3	68.3	68	0.3	3	3
	20	●	MVS0170X20S030	39.3	42.3	78.3	78	0.3	3	3
	25	●	MVS0170X25S030	48.3	50.3	86.3	86	0.3	3	3
	30	●	MVS0170X30S030	56.3	59.3	95.3	95	0.3	3	3

*S=Drill for guide hole Dimensions = 0+0.014, Hole depth=2DC
(Note) The coolant hole of ø5.9mm or less will be round shape.

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.8	*S	●	MVS0180X02S030	9.3	11.5	68.3	68	0.3	3	1
	7	●	MVS0180X07S030	18.3	20.3	68.3	68	0.3	3	3
	12	●	MVS0180X12S030	27.3	29.3	68.3	68	0.3	3	3
	20	●	MVS0180X20S030	41.3	44.3	84.3	84	0.3	3	3
	25	●	MVS0180X25S030	50.3	53.3	94.3	94	0.3	3	3
	30	●	MVS0180X30S030	59.3	62.3	102.3	102	0.3	3	3
1.9	*S	●	MVS0190X02S030	9.7	11.8	68.3	68	0.3	3	1
	7	●	MVS0190X07S030	19.3	21.3	68.3	68	0.3	3	3
	12	●	MVS0190X12S030	29.3	31.3	68.3	68	0.3	3	3
	20	●	MVS0190X20S030	44.3	46.3	84.3	84	0.3	3	3
	25	●	MVS0190X25S030	53.3	55.3	94.3	94	0.3	3	3
	30	●	MVS0190X30S030	63.3	65.3	102.3	102	0.3	3	3
2.0	*S	●	MVS0200X02S030	10.3	12.2	68.3	68	0.3	3	1
	7	●	MVS0200X07S030	20.4	22.4	68.4	68	0.4	3	3
	12	●	MVS0200X12S030	30.4	32.4	68.4	68	0.4	3	3
	20	●	MVS0200X20S030	46.4	48.4	84.4	84	0.4	3	3
	25	●	MVS0200X25S030	56.4	58.4	94.4	94	0.4	3	3
	30	●	MVS0200X30S030	66.4	68.4	102.4	102	0.4	3	3
2.1	*S	●	MVS0210X02S030	10.7	12.4	74.3	74	0.3	3	1
	7	●	MVS0210X07S030	21.4	23.4	74.4	74	0.4	3	3
	12	●	MVS0210X12S030	32.4	34.4	74.4	74	0.4	3	3
	20	●	MVS0210X20S030	48.4	50.4	94.4	94	0.4	3	3
	25	●	MVS0210X25S030	59.4	60.4	107.4	107	0.4	3	3
	30	●	MVS0210X30S030	69.4	71.4	118.4	118	0.4	3	3
2.2	*S	●	MVS0220X02S030	11.3	12.8	74.3	74	0.3	3	1
	7	●	MVS0220X07S030	22.4	23.4	74.4	74	0.4	3	3
	12	●	MVS0220X12S030	33.4	34.4	74.4	74	0.4	3	3
	20	●	MVS0220X20S030	51.4	52.4	94.4	94	0.4	3	3
	25	●	MVS0220X25S030	62.4	63.4	107.4	107	0.4	3	3
	30	●	MVS0220X30S030	73.4	74.4	118.4	118	0.4	3	3
2.3	*S	●	MVS0230X02S030	11.8	13.1	74.4	74	0.4	3	1
	7	●	MVS0230X07S030	23.4	24.4	74.4	74	0.4	3	3
	12	●	MVS0230X12S030	35.4	36.4	74.4	74	0.4	3	3
	20	●	MVS0230X20S030	53.4	54.4	94.4	94	0.4	3	3
	25	●	MVS0230X25S030	64.4	66.4	107.4	107	0.4	3	3
	30	●	MVS0230X30S030	76.4	77.4	118.4	118	0.4	3	3
2.4	*S	●	MVS0240X02S030	12.4	13.5	74.4	74	0.4	3	1
	7	●	MVS0240X07S030	24.4	25.4	74.4	74	0.4	3	3
	12	●	MVS0240X12S030	36.4	37.4	74.4	74	0.4	3	3
	20	●	MVS0240X20S030	55.4	56.4	94.4	94	0.4	3	3
	25	●	MVS0240X25S030	67.4	68.4	107.4	107	0.4	3	3
	30	●	MVS0240X30S030	79.4	80.4	118.4	118	0.4	3	3
2.5	*S	●	MVS0250X02S030	12.8	13.7	74.4	74	0.4	3	1
	7	●	MVS0250X07S030	25.5	26.5	74.5	74	0.5	3	3
	12	●	MVS0250X12S030	38.5	39.5	74.5	74	0.5	3	3
	20	●	MVS0250X20S030	58.5	59.5	94.5	94	0.5	3	3
	25	●	MVS0250X25S030	70.5	71.5	107.5	107	0.5	3	3
	30	●	MVS0250X30S030	83.5	84.5	118.5	118	0.5	3	3

*S=Drill for guide hole Dimensions = 0+0.014, Hole depth=2DC
(Note) The coolant hole of ø5.9mm or less will be round shape.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.6	*S	●	MVS0260X02S030	13.4	13.4	81.4	81	0.4	3	2
	7	●	MVS0260X07S030	26.5	26.5	81.5	81	0.5	3	4
	12	●	MVS0260X12S030	39.5	39.5	81.5	81	0.5	3	4
	20	●	MVS0260X20S030	60.5	60.5	103.5	103	0.5	3	4
	25	●	MVS0260X25S030	73.5	73.5	117.5	117	0.5	3	4
	30	●	MVS0260X30S030	86.5	86.5	132.5	132	0.5	3	4
2.7	*S	●	MVS0270X02S030	13.8	13.8	81.4	81	0.4	3	2
	7	●	MVS0270X07S030	27.5	27.5	81.5	81	0.5	3	4
	12	●	MVS0270X12S030	41.5	41.5	81.5	81	0.5	3	4
	20	●	MVS0270X20S030	62.5	62.5	103.5	103	0.5	3	4
	25	●	MVS0270X25S030	76.5	76.5	117.5	117	0.5	3	4
	30	●	MVS0270X30S030	89.5	89.5	132.5	132	0.5	3	4
2.8	*S	●	MVS0280X02S030	14.4	14.4	81.4	81	0.4	3	2
	7	●	MVS0280X07S030	28.5	28.5	81.5	81	0.5	3	4
	12	●	MVS0280X12S030	42.5	42.5	81.5	81	0.5	3	4
	20	●	MVS0280X20S030	64.5	64.5	103.5	103	0.5	3	4
	25	●	MVS0280X25S030	78.5	78.5	117.5	117	0.5	3	4
	30	●	MVS0280X30S030	92.5	92.5	132.5	132	0.5	3	4
2.9	*S	●	MVS0290X02S030	14.9	14.9	81.5	81	0.5	3	2
	7	●	MVS0290X07S030	29.5	29.5	81.5	81	0.5	3	4
	12	●	MVS0290X12S030	44.5	44.5	81.5	81	0.5	3	4
	20	●	MVS0290X20S030	67.5	67.5	103.5	103	0.5	3	4
	25	●	MVS0290X25S030	81.5	81.5	117.5	117	0.5	3	4
	30	●	MVS0290X30S030	96.5	96.5	132.5	132	0.5	3	4

CUTTING CONDITIONS ➤ N022
TECHNICAL DATA ➤ Q001

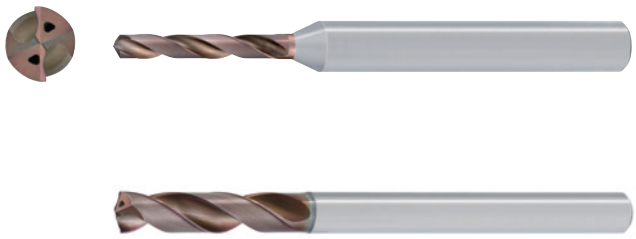
MVS

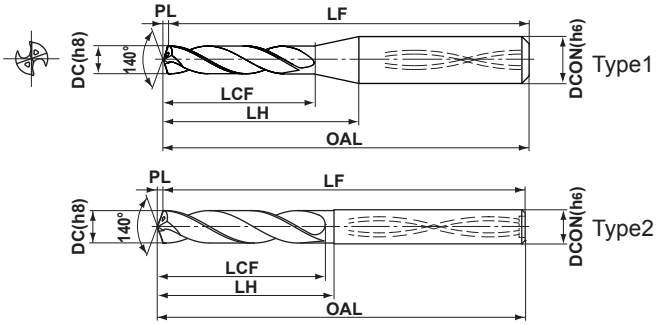
WSTAR DRILLS

- New grade DP1020 offers long tool life for a wide range of work materials.
- Unique coolant supply technology, TRI-cooling offers high machining efficiency. (on drills over ø6)

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

	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
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013





Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	MVS0300X03S030	21.5	21.5	72.5	72	0.5	3	2
	3	●	MVS0300X03S060	21.5	24.7	72.5	72	0.5	6	1
	5	●	MVS0300X05S030	28.5	28.5	81.5	81	0.5	3	2
	5	●	MVS0300X05S060	28.5	31.7	81.5	81	0.5	6	1
	8	●	MVS0300X08S030	35.5	35.5	81.5	81	0.5	3	2
	8	●	MVS0300X08S060	35.5	38.7	81.5	81	0.5	6	1
3.1	3	●	MVS0310X03S040	21.6	23.6	76.6	76	0.6	4	2
	3	●	MVS0310X03S060	21.6	24.7	76.6	76	0.6	6	1
	5	●	MVS0310X05S040	32.6	32.6	87.6	87	0.6	4	2
	5	●	MVS0310X05S060	32.6	35.7	87.6	87	0.6	6	1
	8	●	MVS0310X08S040	41.6	41.6	87.6	87	0.6	4	2
	8	●	MVS0310X08S060	41.6	44.7	87.6	87	0.6	6	1
3.2	3	●	MVS0320X03S040	21.6	23.6	76.6	76	0.6	4	2
	3	●	MVS0320X03S060	21.6	24.6	76.6	76	0.6	6	1
	5	●	MVS0320X05S040	32.6	32.6	87.6	87	0.6	4	2
	5	●	MVS0320X05S060	32.6	35.6	87.6	87	0.6	6	1
	8	●	MVS0320X08S040	41.6	41.6	87.6	87	0.6	4	2
	8	●	MVS0320X08S060	41.6	44.6	87.6	87	0.6	6	1
3.3	3	●	MVS0330X03S040	21.6	23.6	76.6	76	0.6	4	2
	3	●	MVS0330X03S060	21.6	24.5	76.6	76	0.6	6	1
	5	●	MVS0330X05S040	32.6	32.6	87.6	87	0.6	4	2
	5	●	MVS0330X05S060	32.6	35.5	87.6	87	0.6	6	1
	8	●	MVS0330X08S040	41.6	41.6	87.6	87	0.6	4	2
	8	●	MVS0330X08S060	41.6	44.5	87.6	87	0.6	6	1
3.4	3	●	MVS0340X03S040	21.6	23.6	76.6	76	0.6	4	2
	3	●	MVS0340X03S060	21.6	24.4	76.6	76	0.6	6	1
	5	●	MVS0340X05S040	32.6	32.6	87.6	87	0.6	4	2
	5	●	MVS0340X05S060	32.6	35.4	87.6	87	0.6	6	1
	8	●	MVS0340X08S040	41.6	41.6	87.6	87	0.6	4	2
	8	●	MVS0340X08S060	41.6	44.4	87.6	87	0.6	6	1
3.5	3	●	MVS0350X03S040	21.6	23.6	76.6	76	0.6	4	2
	3	●	MVS0350X03S060	21.6	24.3	76.6	76	0.6	6	1
	5	●	MVS0350X05S040	32.6	32.6	87.6	87	0.6	4	2
	5	●	MVS0350X05S060	32.6	35.3	87.6	87	0.6	6	1
	8	●	MVS0350X08S040	41.6	41.6	87.6	87	0.6	4	2
	8	●	MVS0350X08S060	41.6	44.3	87.6	87	0.6	6	1

(Note) The coolant hole of ø5.9mm or less will be round shape.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.6	3	●	MVS0360X03S040	23.7	23.7	80.7	80	0.7	4	2
	3	●	MVS0360X03S060	23.7	26.3	80.7	80	0.7	6	1
	5	●	MVS0360X05S040	36.7	36.7	92.7	92	0.7	4	2
	5	●	MVS0360X05S060	36.7	39.3	92.7	92	0.7	6	1
	8	●	MVS0360X08S040	46.7	46.7	92.7	92	0.7	4	2
	8	●	MVS0360X08S060	46.7	49.3	92.7	92	0.7	6	1
3.7	3	●	MVS0370X03S040	23.7	23.7	80.7	80	0.7	4	2
	3	●	MVS0370X03S060	23.7	26.2	80.7	80	0.7	6	1
	5	●	MVS0370X05S040	36.7	36.7	92.7	92	0.7	4	2
	5	●	MVS0370X05S060	36.7	39.2	92.7	92	0.7	6	1
	8	●	MVS0370X08S040	46.7	46.7	92.7	92	0.7	4	2
	8	●	MVS0370X08S060	46.7	49.2	92.7	92	0.7	6	1
3.8	3	●	MVS0380X03S040	23.7	23.7	80.7	80	0.7	4	2
	3	●	MVS0380X03S060	23.7	26.1	80.7	80	0.7	6	1
	5	●	MVS0380X05S040	36.7	36.7	92.7	92	0.7	4	2
	5	●	MVS0380X05S060	36.7	39.1	92.7	92	0.7	6	1
	8	●	MVS0380X08S040	46.7	46.7	92.7	92	0.7	4	2
	8	●	MVS0380X08S060	46.7	49.1	92.7	92	0.7	6	1
3.9	3	●	MVS0390X03S040	23.7	23.7	80.7	80	0.7	4	2
	3	●	MVS0390X03S060	23.7	26.0	80.7	80	0.7	6	1
	5	●	MVS0390X05S040	36.7	36.7	92.7	92	0.7	4	2
	5	●	MVS0390X05S060	36.7	39.0	92.7	92	0.7	6	1
	8	●	MVS0390X08S040	46.7	46.7	92.7	92	0.7	4	2
	8	●	MVS0390X08S060	46.7	49.0	92.7	92	0.7	6	1
4.0	3	●	MVS0400X03S040	23.7	23.7	80.7	80	0.7	4	2
	3	●	MVS0400X03S060	23.7	25.8	80.7	80	0.7	6	1
	5	●	MVS0400X05S040	36.7	36.7	92.7	92	0.7	4	2
	5	●	MVS0400X05S060	36.7	38.8	92.7	92	0.7	6	1
	8	●	MVS0400X08S040	46.7	46.7	92.7	92	0.7	4	2
	8	●	MVS0400X08S060	46.7	48.8	92.7	92	0.7	6	1
4.1	3	●	MVS0410X03S050	25.7	25.7	86.7	86	0.7	5	2
	3	●	MVS0410X03S060	25.7	27.7	86.7	86	0.7	6	1
	5	●	MVS0410X05S050	40.7	40.7	100.7	100	0.7	5	2
	5	●	MVS0410X05S060	40.7	42.7	100.7	100	0.7	6	1
	8	●	MVS0410X08S050	52.7	52.7	100.7	100	0.7	5	2
	8	●	MVS0410X08S060	52.7	54.7	100.7	100	0.7	6	1

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.2	3	●	MVS0420X03S050	25.8	25.8	86.8	86	0.8	5	2
	3	●	MVS0420X03S060	25.8	27.7	86.8	86	0.8	6	1
	5	●	MVS0420X05S050	40.8	40.8	100.8	100	0.8	5	2
	5	●	MVS0420X05S060	40.8	42.7	100.8	100	0.8	6	1
	8	●	MVS0420X08S050	52.8	52.8	100.8	100	0.8	5	2
	8	●	MVS0420X08S060	52.8	54.7	100.8	100	0.8	6	1
4.3	3	●	MVS0430X03S050	25.8	25.8	86.8	86	0.8	5	2
	3	●	MVS0430X03S060	25.8	27.6	86.8	86	0.8	6	1
	5	●	MVS0430X05S050	40.8	40.8	100.8	100	0.8	5	2
	5	●	MVS0430X05S060	40.8	42.6	100.8	100	0.8	6	1
	8	●	MVS0430X08S050	52.8	52.8	100.8	100	0.8	5	2
	8	●	MVS0430X08S060	52.8	54.6	100.8	100	0.8	6	1
4.4	3	●	MVS0440X03S050	25.8	25.8	86.8	86	0.8	5	2
	3	●	MVS0440X03S060	25.8	27.5	86.8	86	0.8	6	1
	5	●	MVS0440X05S050	40.8	40.8	100.8	100	0.8	5	2
	5	●	MVS0440X05S060	40.8	42.5	100.8	100	0.8	6	1
	8	●	MVS0440X08S050	52.8	52.8	100.8	100	0.8	5	2
	8	●	MVS0440X08S060	52.8	54.5	100.8	100	0.8	6	1
4.5	3	●	MVS0450X03S050	25.8	25.8	86.8	86	0.8	5	2
	3	●	MVS0450X03S060	25.8	27.4	86.8	86	0.8	6	1
	5	●	MVS0450X05S050	40.8	40.8	100.8	100	0.8	5	2
	5	●	MVS0450X05S060	40.8	42.4	100.8	100	0.8	6	1
	8	●	MVS0450X08S050	52.8	52.8	100.8	100	0.8	5	2
	8	●	MVS0450X08S060	52.8	54.4	100.8	100	0.8	6	1
4.6	3	●	MVS0460X03S050	28.3	28.3	90.8	90	0.8	5	2
	3	●	MVS0460X03S060	28.3	31.3	90.8	90	0.8	6	2
	5	●	MVS0460X05S050	44.8	44.8	105.8	105	0.8	5	2
	5	●	MVS0460X05S060	44.8	47.8	105.8	105	0.8	6	2
	8	●	MVS0460X08S050	57.8	57.8	105.8	105	0.8	5	2
	8	●	MVS0460X08S060	57.8	60.8	105.8	105	0.8	6	2
4.7	3	●	MVS0470X03S050	28.4	28.4	90.9	90	0.9	5	2
	3	●	MVS0470X03S060	28.4	31.4	90.9	90	0.9	6	2
	5	●	MVS0470X05S050	44.9	44.9	105.9	105	0.9	5	2
	5	●	MVS0470X05S060	44.9	47.9	105.9	105	0.9	6	2
	8	●	MVS0470X08S050	57.9	57.9	105.9	105	0.9	5	2
	8	●	MVS0470X08S060	57.9	60.9	105.9	105	0.9	6	2
4.8	3	●	MVS0480X03S050	28.4	28.4	90.9	90	0.9	5	2
	3	●	MVS0480X03S060	28.4	31.4	90.9	90	0.9	6	2
	5	●	MVS0480X05S050	44.9	44.9	105.9	105	0.9	5	2
	5	●	MVS0480X05S060	44.9	47.9	105.9	105	0.9	6	2
	8	●	MVS0480X08S050	57.9	57.9	105.9	105	0.9	5	2
	8	●	MVS0480X08S060	57.9	60.9	105.9	105	0.9	6	2
4.9	3	●	MVS0490X03S050	28.4	28.4	90.9	90	0.9	5	2
	3	●	MVS0490X03S060	28.4	31.4	90.9	90	0.9	6	2
	5	●	MVS0490X05S050	44.9	44.9	105.9	105	0.9	5	2
	5	●	MVS0490X05S060	44.9	47.9	105.9	105	0.9	6	2
	8	●	MVS0490X08S050	57.9	57.9	105.9	105	0.9	5	2
	8	●	MVS0490X08S060	57.9	60.9	105.9	105	0.9	6	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
5.0	3	●	MVS0500X03S050	28.4	28.4	90.9	90	0.9	5	2
	3	●	MVS0500X03S060	28.4	31.4	90.9	90	0.9	6	2
	5	●	MVS0500X05S050	44.9	44.9	105.9	105	0.9	5	2
	5	●	MVS0500X05S060	44.9	47.9	105.9	105	0.9	6	2
	8	●	MVS0500X08S050	57.9	57.9	105.9	105	0.9	5	2
	8	●	MVS0500X08S060	57.9	60.9	105.9	105	0.9	6	2
5.1	3	●	MVS0510X03S060	28.4	30.9	82.9	82	0.9	6	2
	5	●	MVS0510X05S060	44.9	48.9	100.9	100	0.9	6	2
	8	●	MVS0510X08S060	61.9	66.9	118.9	118	0.9	6	2
5.2	3	●	MVS0520X03S060	28.4	30.9	82.9	82	0.9	6	2
	5	●	MVS0520X05S060	44.9	48.9	100.9	100	0.9	6	2
	8	●	MVS0520X08S060	61.9	66.9	118.9	118	0.9	6	2
5.3	3	●	MVS0530X03S060	28.5	31.0	83.0	82	1.0	6	2
	5	●	MVS0530X05S060	45.0	49.0	101.0	100	1.0	6	2
	8	●	MVS0530X08S060	62.0	67.0	119.0	118	1.0	6	2
5.4	3	●	MVS0540X03S060	28.5	31.0	83.0	82	1.0	6	2
	5	●	MVS0540X05S060	45.0	49.0	101.0	100	1.0	6	2
	8	●	MVS0540X08S060	62.0	67.0	119.0	118	1.0	6	2
5.5	3	●	MVS0550X03S060	28.5	31.0	83.0	82	1.0	6	2
	5	●	MVS0550X05S060	45.0	49.0	101.0	100	1.0	6	2
	8	●	MVS0550X08S060	62.0	67.0	119.0	118	1.0	6	2
5.6	3	●	MVS0560X03S060	31.0	31.0	83.0	82	1.0	6	2
	5	●	MVS0560X05S060	49.0	49.0	101.0	100	1.0	6	2
	8	●	MVS0560X08S060	67.0	67.0	119.0	118	1.0	6	2
5.7	3	●	MVS0570X03S060	31.0	31.0	83.0	82	1.0	6	2
	5	●	MVS0570X05S060	49.0	49.0	101.0	100	1.0	6	2
	8	●	MVS0570X08S060	67.0	67.0	119.0	118	1.0	6	2
5.8	3	●	MVS0580X03S060	31.1	31.1	83.1	82	1.1	6	2
	5	●	MVS0580X05S060	49.1	49.1	101.1	100	1.1	6	2
	8	●	MVS0580X08S060	67.1	67.1	119.1	118	1.1	6	2
5.9	3	●	MVS0590X03S060	31.1	31.1	83.1	82	1.1	6	2
	5	●	MVS0590X05S060	49.1	49.1	101.1	100	1.1	6	2
	8	●	MVS0590X08S060	67.1	67.1	119.1	118	1.1	6	2
6.0	3	●	MVS0600X03S060	31.1	31.1	83.1	82	1.1	6	2
	5	●	MVS0600X05S060	49.1	49.1	101.1	100	1.1	6	2
	8	●	MVS0600X08S060	67.1	67.1	119.1	118	1.1	6	2
6.1	3	●	MVS0610X03S070	33.6	36.1	89.1	88	1.1	7	2
	3	●	MVS0610X03S080	33.6	36.1	89.1	88	1.1	8	2
	5	●	MVS0610X05S070	53.1	57.1	110.1	109	1.1	7	2
	5	●	MVS0610X05S080	53.1	57.1	110.1	109	1.1	8	2
	8	●	MVS0610X08S070	73.1	78.1	131.1	130	1.1	7	2
	8	●	MVS0610X08S080	73.1	78.1	131.1	130	1.1	8	2
6.2	3	●	MVS0620X03S070	33.6	36.1	89.1	88	1.1	7	2
	3	●	MVS0620X03S080	33.6	36.1	89.1	88	1.1	8	2
	5	●	MVS0620X05S070	53.1	57.1	110.1	109	1.1	7	2
	5	●	MVS0620X05S080	53.1	57.1	110.1	109	1.1	8	2
	8	●	MVS0620X08S070	73.1	78.1	131.1	130	1.1	7	2
	8	●	MVS0620X08S080	73.1	78.1	131.1	130	1.1	8	2

CUTTING CONDITIONS ➤ N022
TECHNICAL DATA ➤ Q001

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WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.3	3	●	MVS0630X03S070	33.6	36.1	89.1	88	1.1	7	2
	3	●	MVS0630X03S080	33.6	36.1	89.1	88	1.1	8	2
	5	●	MVS0630X05S070	53.1	57.1	110.1	109	1.1	7	2
	5	●	MVS0630X05S080	53.1	57.1	110.1	109	1.1	8	2
	8	●	MVS0630X08S070	73.1	78.1	131.1	130	1.1	7	2
	8	●	MVS0630X08S080	73.1	78.1	131.1	130	1.1	8	2
6.4	3	●	MVS0640X03S070	33.7	36.2	89.2	88	1.2	7	2
	3	●	MVS0640X03S080	33.7	36.2	89.2	88	1.2	8	2
	5	●	MVS0640X05S070	53.2	57.2	110.2	109	1.2	7	2
	5	●	MVS0640X05S080	53.2	57.2	110.2	109	1.2	8	2
	8	●	MVS0640X08S070	73.2	78.2	131.2	130	1.2	7	2
	8	●	MVS0640X08S080	73.2	78.2	131.2	130	1.2	8	2
6.5	3	●	MVS0650X03S070	33.7	36.2	89.2	88	1.2	7	2
	3	●	MVS0650X03S080	33.7	36.2	89.2	88	1.2	8	2
	5	●	MVS0650X05S070	53.2	57.2	110.2	109	1.2	7	2
	5	●	MVS0650X05S080	53.2	57.2	110.2	109	1.2	8	2
	8	●	MVS0650X08S070	73.2	78.2	131.2	130	1.2	7	2
	8	●	MVS0650X08S080	73.2	78.2	131.2	130	1.2	8	2
6.6	3	●	MVS0660X03S070	36.2	36.2	89.2	88	1.2	7	2
	3	●	MVS0660X03S080	36.2	38.2	89.2	88	1.2	8	2
	5	●	MVS0660X05S070	57.2	57.2	110.2	109	1.2	7	2
	5	●	MVS0660X05S080	57.2	59.2	110.2	109	1.2	8	2
	8	●	MVS0660X08S070	78.2	78.2	131.2	130	1.2	7	2
	8	●	MVS0660X08S080	78.2	80.2	131.2	130	1.2	8	2
6.7	3	●	MVS0670X03S070	36.2	36.2	89.2	88	1.2	7	2
	3	●	MVS0670X03S080	36.2	38.2	89.2	88	1.2	8	2
	5	●	MVS0670X05S070	57.2	57.2	110.2	109	1.2	7	2
	5	●	MVS0670X05S080	57.2	59.2	110.2	109	1.2	8	2
	8	●	MVS0670X08S070	78.2	78.2	131.2	130	1.2	7	2
	8	●	MVS0670X08S080	78.2	80.2	131.2	130	1.2	8	2
6.8	3	●	MVS0680X03S070	36.2	36.2	89.2	88	1.2	7	2
	3	●	MVS0680X03S080	36.2	38.2	89.2	88	1.2	8	2
	5	●	MVS0680X05S070	57.2	57.2	110.2	109	1.2	7	2
	5	●	MVS0680X05S080	57.2	59.2	110.2	109	1.2	8	2
	8	●	MVS0680X08S070	78.2	78.2	131.2	130	1.2	7	2
	8	●	MVS0680X08S080	78.2	80.2	131.2	130	1.2	8	2
6.9	3	●	MVS0690X03S070	36.3	36.3	89.3	88	1.3	7	2
	3	●	MVS0690X03S080	36.3	38.3	89.3	88	1.3	8	2
	5	●	MVS0690X05S070	57.3	57.3	110.3	109	1.3	7	2
	5	●	MVS0690X05S080	57.3	59.3	110.3	109	1.3	8	2
	8	●	MVS0690X08S070	78.3	78.3	131.3	130	1.3	7	2
	8	●	MVS0690X08S080	78.3	80.3	131.3	130	1.3	8	2
7.0	3	●	MVS0700X03S070	36.3	36.3	89.3	88	1.3	7	2
	3	●	MVS0700X03S080	36.3	38.3	89.3	88	1.3	8	2
	5	●	MVS0700X05S070	57.3	57.3	110.3	109	1.3	7	2
	5	●	MVS0700X05S080	57.3	59.3	110.3	109	1.3	8	2
	8	●	MVS0700X08S070	78.3	78.3	131.3	130	1.3	7	2
	8	●	MVS0700X08S080	78.3	80.3	131.3	130	1.3	8	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.1	3	●	MVS0710X03S080	38.8	41.3	95.3	94	1.3	8	2
	5	●	MVS0710X05S080	61.3	65.3	119.3	118	1.3	8	2
	8	●	MVS0710X08S080	84.3	89.3	143.3	142	1.3	8	2
7.2	3	●	MVS0720X03S080	38.8	41.3	95.3	94	1.3	8	2
	5	●	MVS0720X05S080	61.3	65.3	119.3	118	1.3	8	2
	8	●	MVS0720X08S080	84.3	89.3	143.3	142	1.3	8	2
7.3	3	●	MVS0730X03S080	38.8	41.3	95.3	94	1.3	8	2
	5	●	MVS0730X05S080	61.3	65.3	119.3	118	1.3	8	2
	8	●	MVS0730X08S080	84.3	89.3	143.3	142	1.3	8	2
7.4	3	●	MVS0740X03S080	38.8	41.3	95.3	94	1.3	8	2
	5	●	MVS0740X05S080	61.3	65.3	119.3	118	1.3	8	2
	8	●	MVS0740X08S080	84.3	89.3	143.3	142	1.3	8	2
7.5	3	●	MVS0750X03S080	38.9	41.4	95.4	94	1.4	8	2
	5	●	MVS0750X05S080	61.4	65.4	119.4	118	1.4	8	2
	8	●	MVS0750X08S080	84.4	89.4	143.4	142	1.4	8	2
7.6	3	●	MVS0760X03S080	41.4	41.4	95.4	94	1.4	8	2
	5	●	MVS0760X05S080	65.4	65.4	119.4	118	1.4	8	2
	8	●	MVS0760X08S080	89.4	89.4	143.4	142	1.4	8	2
7.7	3	●	MVS0770X03S080	41.4	41.4	95.4	94	1.4	8	2
	5	●	MVS0770X05S080	65.4	65.4	119.4	118	1.4	8	2
	8	●	MVS0770X08S080	89.4	89.4	143.4	142	1.4	8	2
7.8	3	●	MVS0780X03S080	41.4	41.4	95.4	94	1.4	8	2
	5	●	MVS0780X05S080	65.4	65.4	119.4	118	1.4	8	2
	8	●	MVS0780X08S080	89.4	89.4	143.4	142	1.4	8	2
7.9	3	●	MVS0790X03S080	41.4	41.4	95.4	94	1.4	8	2
	5	●	MVS0790X05S080	65.4	65.4	119.4	118	1.4	8	2
	8	●	MVS0790X08S080	89.4	89.4	143.4	142	1.4	8	2
8.0	3	●	MVS0800X03S080	41.5	41.5	95.5	94	1.5	8	2
	5	●	MVS0800X05S080	65.5	65.5	119.5	118	1.5	8	2
	8	●	MVS0800X08S080	89.5	89.5	143.5	142	1.5	8	2
8.1	3	●	MVS0810X03S090	44.0	46.5	101.5	100	1.5	9	2
	3	●	MVS0810X03S100	44.0	46.5	101.5	100	1.5	10	2
	5	●	MVS0810X05S090	69.5	73.5	128.5	127	1.5	9	2
	5	●	MVS0810X05S100	69.5	73.5	128.5	127	1.5	10	2
	8	●	MVS0810X08S090	95.5	100.5	155.5	154	1.5	9	2
	8	●	MVS0810X08S100	95.5	100.5	155.5	154	1.5	10	2
8.2	3	●	MVS0820X03S090	44.0	46.5	101.5	100	1.5	9	2
	3	●	MVS0820X03S100	44.0	46.5	101.5	100	1.5	10	2
	5	●	MVS0820X05S090	69.5	73.5	128.5	127	1.5	9	2
	5	●	MVS0820X05S100	69.5	73.5	128.5	127	1.5	10	2
	8	●	MVS0820X08S090	95.5	100.5	155.5	154	1.5	9	2
	8	●	MVS0820X08S100	95.5	100.5	155.5	154	1.5	10	2
8.3	3	●	MVS0830X03S090	44.0	46.5	101.5	100	1.5	9	2
	3	●	MVS0830X03S100	44.0	46.5	101.5	100	1.5	10	2
	5	●	MVS0830X05S090	69.5	73.5	128.5	127	1.5	9	2
	5	●	MVS0830X05S100	69.5	73.5	128.5	127	1.5	10	2
	8	●	MVS0830X08S090	95.5	100.5	155.5	154	1.5	9	2
	8	●	MVS0830X08S100	95.5	100.5	155.5	154	1.5	10	2

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.4	3	●	MVS0840X03S090	44.0	46.5	101.5	100	1.5	9	2
	3	●	MVS0840X03S100	44.0	46.5	101.5	100	1.5	10	2
	5	●	MVS0840X05S090	69.5	73.5	128.5	127	1.5	9	2
	5	●	MVS0840X05S100	69.5	73.5	128.5	127	1.5	10	2
	8	●	MVS0840X08S090	95.5	100.5	155.5	154	1.5	9	2
	8	●	MVS0840X08S100	95.5	100.5	155.5	154	1.5	10	2
8.5	3	●	MVS0850X03S090	44.0	46.5	101.5	100	1.5	9	2
	3	●	MVS0850X03S100	44.0	46.5	101.5	100	1.5	10	2
	5	●	MVS0850X05S090	69.5	73.5	128.5	127	1.5	9	2
	5	●	MVS0850X05S100	69.5	73.5	128.5	127	1.5	10	2
	8	●	MVS0850X08S090	95.5	100.5	155.5	154	1.5	9	2
	8	●	MVS0850X08S100	95.5	100.5	155.5	154	1.5	10	2
8.6	3	●	MVS0860X03S090	46.6	46.6	101.6	100	1.6	9	2
	3	●	MVS0860X03S100	46.6	48.6	101.6	100	1.6	10	2
	5	●	MVS0860X05S090	73.6	73.6	128.6	127	1.6	9	2
	5	●	MVS0860X05S100	73.6	75.6	128.6	127	1.6	10	2
	8	●	MVS0860X08S090	100.6	100.6	155.6	154	1.6	9	2
	8	●	MVS0860X08S100	100.6	102.6	155.6	154	1.6	10	2
8.7	3	●	MVS0870X03S090	46.6	46.6	101.6	100	1.6	9	2
	3	●	MVS0870X03S100	46.6	48.6	101.6	100	1.6	10	2
	5	●	MVS0870X05S090	73.6	73.6	128.6	127	1.6	9	2
	5	●	MVS0870X05S100	73.6	75.6	128.6	127	1.6	10	2
	8	●	MVS0870X08S090	100.6	100.6	155.6	154	1.6	9	2
	8	●	MVS0870X08S100	100.6	102.6	155.6	154	1.6	10	2
8.8	3	●	MVS0880X03S090	46.6	46.6	101.6	100	1.6	9	2
	3	●	MVS0880X03S100	46.6	48.6	101.6	100	1.6	10	2
	5	●	MVS0880X05S090	73.6	73.6	128.6	127	1.6	9	2
	5	●	MVS0880X05S100	73.6	75.6	128.6	127	1.6	10	2
	8	●	MVS0880X08S090	100.6	100.6	155.6	154	1.6	9	2
	8	●	MVS0880X08S100	100.6	102.6	155.6	154	1.6	10	2
8.9	3	●	MVS0890X03S090	46.6	46.6	101.6	100	1.6	9	2
	3	●	MVS0890X03S100	46.6	48.6	101.6	100	1.6	10	2
	5	●	MVS0890X05S090	73.6	73.6	128.6	127	1.6	9	2
	5	●	MVS0890X05S100	73.6	75.6	128.6	127	1.6	10	2
	8	●	MVS0890X08S090	100.6	100.6	155.6	154	1.6	9	2
	8	●	MVS0890X08S100	100.6	102.6	155.6	154	1.6	10	2
9.0	3	●	MVS0900X03S090	46.6	46.6	101.6	100	1.6	9	2
	3	●	MVS0900X03S100	46.6	48.6	101.6	100	1.6	10	2
	5	●	MVS0900X05S090	73.6	73.6	128.6	127	1.6	9	2
	5	●	MVS0900X05S100	73.6	75.6	128.6	127	1.6	10	2
	8	●	MVS0900X08S090	100.6	100.6	155.6	154	1.6	9	2
	8	●	MVS0900X08S100	100.6	102.6	155.6	154	1.6	10	2
9.1	3	●	MVS0910X03S100	49.2	51.7	107.7	106	1.7	10	2
	5	●	MVS0910X05S100	77.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0910X08S100	106.7	111.7	167.7	166	1.7	10	2
9.2	3	●	MVS0920X03S100	49.2	51.7	107.7	106	1.7	10	2
	5	●	MVS0920X05S100	77.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0920X08S100	106.7	111.7	167.7	166	1.7	10	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
9.3	3	●	MVS0930X03S100	49.2	51.7	107.7	106	1.7	10	2
	5	●	MVS0930X05S100	77.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0930X08S100	106.7	111.7	167.7	166	1.7	10	2
9.4	3	●	MVS0940X03S100	49.2	51.7	107.7	106	1.7	10	2
	5	●	MVS0940X05S100	77.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0940X08S100	106.7	111.7	167.7	166	1.7	10	2
9.5	3	●	MVS0950X03S100	49.2	51.7	107.7	106	1.7	10	2
	5	●	MVS0950X05S100	77.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0950X08S100	106.7	111.7	167.7	166	1.7	10	2
9.6	3	●	MVS0960X03S100	51.7	51.7	107.7	106	1.7	10	2
	5	●	MVS0960X05S100	81.7	81.7	137.7	136	1.7	10	2
	8	●	MVS0960X08S100	111.7	111.7	167.7	166	1.7	10	2
9.7	3	●	MVS0970X03S100	51.8	51.8	107.8	106	1.8	10	2
	5	●	MVS0970X05S100	81.8	81.8	137.8	136	1.8	10	2
	8	●	MVS0970X08S100	111.8	111.8	167.8	166	1.8	10	2
9.8	3	●	MVS0980X03S100	51.8	51.8	107.8	106	1.8	10	2
	5	●	MVS0980X05S100	81.8	81.8	137.8	136	1.8	10	2
	8	●	MVS0980X08S100	111.8	111.8	167.8	166	1.8	10	2
9.9	3	●	MVS0990X03S100	51.8	51.8	107.8	106	1.8	10	2
	5	●	MVS0990X05S100	81.8	81.8	137.8	136	1.8	10	2
	8	●	MVS0990X08S100	111.8	111.8	167.8	166	1.8	10	2
10.0	3	●	MVS1000X03S100	51.8	51.8	107.8	106	1.8	10	2
	5	●	MVS1000X05S100	81.8	81.8	137.8	136	1.8	10	2
	8	●	MVS1000X08S100	111.8	111.8	167.8	166	1.8	10	2
10.1	3	●	MVS1010X03S110	54.3	56.8	117.8	116	1.8	11	2
	3	●	MVS1010X03S120	54.3	56.8	117.8	116	1.8	12	2
	5	●	MVS1010X05S110	85.8	89.8	150.8	149	1.8	11	2
	5	●	MVS1010X05S120	85.8	89.8	150.8	149	1.8	12	2
	8	●	MVS1010X08S110	117.8	122.8	183.8	182	1.8	11	2
	8	●	MVS1010X08S120	117.8	122.8	183.8	182	1.8	12	2
10.2	3	●	MVS1020X03S110	54.4	56.9	117.9	116	1.9	11	2
	3	●	MVS1020X03S120	54.4	56.9	117.9	116	1.9	12	2
	5	●	MVS1020X05S110	85.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1020X05S120	85.9	89.9	150.9	149	1.9	12	2
	8	●	MVS1020X08S110	117.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1020X08S120	117.9	122.9	183.9	182	1.9	12	2
10.3	3	●	MVS1030X03S110	54.4	56.9	117.9	116	1.9	11	2
	3	●	MVS1030X03S120	54.4	56.9	117.9	116	1.9	12	2
	5	●	MVS1030X05S110	85.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1030X05S120	85.9	89.9	150.9	149	1.9	12	2
	8	●	MVS1030X08S110	117.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1030X08S120	117.9	122.9	183.9	182	1.9	12	2
10.4	3	●	MVS1040X03S110	54.4	56.9	117.9	116	1.9	11	2
	3	●	MVS1040X03S120	54.4	56.9	117.9	116	1.9	12	2
	5	●	MVS1040X05S110	85.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1040X05S120	85.9	89.9	150.9	149	1.9	12	2
	8	●	MVS1040X08S110	117.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1040X08S120	117.9	122.9	183.9	182	1.9	12	2

DRILLING

CUTTING CONDITIONS ➤ N022
TECHNICAL DATA ➤ Q001

MVS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.5	3	●	MVS1050X03S110	54.4	56.9	117.9	116	1.9	11	2
	3	●	MVS1050X03S120	54.4	56.9	117.9	116	1.9	12	2
	5	●	MVS1050X05S110	85.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1050X05S120	85.9	89.9	150.9	149	1.9	12	2
	8	●	MVS1050X08S110	117.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1050X08S120	117.9	122.9	183.9	182	1.9	12	2
10.6	3	●	MVS1060X03S110	56.9	56.9	117.9	116	1.9	11	2
	3	●	MVS1060X03S120	56.9	57.9	117.9	116	1.9	12	2
	5	●	MVS1060X05S110	89.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1060X05S120	89.9	90.9	150.9	149	1.9	12	2
	8	●	MVS1060X08S110	122.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1060X08S120	122.9	123.9	183.9	182	1.9	12	2
10.7	3	●	MVS1070X03S110	56.9	56.9	117.9	116	1.9	11	2
	3	●	MVS1070X03S120	56.9	57.9	117.9	116	1.9	12	2
	5	●	MVS1070X05S110	89.9	89.9	150.9	149	1.9	11	2
	5	●	MVS1070X05S120	89.9	90.9	150.9	149	1.9	12	2
	8	●	MVS1070X08S110	122.9	122.9	183.9	182	1.9	11	2
	8	●	MVS1070X08S120	122.9	123.9	183.9	182	1.9	12	2
10.8	3	●	MVS1080X03S110	57.0	57.0	118.0	116	2.0	11	2
	3	●	MVS1080X03S120	57.0	58.0	118.0	116	2.0	12	2
	5	●	MVS1080X05S110	90.0	90.0	151.0	149	2.0	11	2
	5	●	MVS1080X05S120	90.0	91.0	151.0	149	2.0	12	2
	8	●	MVS1080X08S110	123.0	123.0	184.0	182	2.0	11	2
	8	●	MVS1080X08S120	123.0	124.0	184.0	182	2.0	12	2
10.9	3	●	MVS1090X03S110	57.0	57.0	118.0	116	2.0	11	2
	3	●	MVS1090X03S120	57.0	58.0	118.0	116	2.0	12	2
	5	●	MVS1090X05S110	90.0	90.0	151.0	149	2.0	11	2
	5	●	MVS1090X05S120	90.0	91.0	151.0	149	2.0	12	2
	8	●	MVS1090X08S110	123.0	123.0	184.0	182	2.0	11	2
	8	●	MVS1090X08S120	123.0	124.0	184.0	182	2.0	12	2
11.0	3	●	MVS1100X03S110	57.0	57.0	118.0	116	2.0	11	2
	3	●	MVS1100X03S120	57.0	58.0	118.0	116	2.0	12	2
	5	●	MVS1100X05S110	90.0	90.0	151.0	149	2.0	11	2
	5	●	MVS1100X05S120	90.0	91.0	151.0	149	2.0	12	2
	8	●	MVS1100X08S110	123.0	123.0	184.0	182	2.0	11	2
	8	●	MVS1100X08S120	123.0	124.0	184.0	182	2.0	12	2
11.1	3	●	MVS1110X03S120	59.5	62.0	124.0	122	2.0	12	2
	5	●	MVS1110X05S120	94.0	98.0	160.0	158	2.0	12	2
	8	●	MVS1110X08S120	129.0	134.0	196.0	194	2.0	12	2
11.2	3	●	MVS1120X03S120	59.5	62.0	124.0	122	2.0	12	2
	5	●	MVS1120X05S120	94.0	98.0	160.0	158	2.0	12	2
	8	●	MVS1120X08S120	129.0	134.0	196.0	194	2.0	12	2
11.3	3	●	MVS1130X03S120	59.6	62.1	124.1	122	2.1	12	2
	5	●	MVS1130X05S120	94.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1130X08S120	129.1	134.1	196.1	194	2.1	12	2
11.4	3	●	MVS1140X03S120	59.6	62.1	124.1	122	2.1	12	2
	5	●	MVS1140X05S120	94.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1140X08S120	129.1	134.1	196.1	194	2.1	12	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
11.5	3	●	MVS1150X03S120	59.6	62.1	124.1	122	2.1	12	2
	5	●	MVS1150X05S120	94.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1150X08S120	129.1	134.1	196.1	194	2.1	12	2
11.6	3	●	MVS1160X03S120	62.1	62.1	124.1	122	2.1	12	2
	5	●	MVS1160X05S120	98.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1160X08S120	134.1	134.1	196.1	194	2.1	12	2
11.7	3	●	MVS1170X03S120	62.1	62.1	124.1	122	2.1	12	2
	5	●	MVS1170X05S120	98.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1170X08S120	134.1	134.1	196.1	194	2.1	12	2
11.8	3	●	MVS1180X03S120	62.1	62.1	124.1	122	2.1	12	2
	5	●	MVS1180X05S120	98.1	98.1	160.1	158	2.1	12	2
	8	●	MVS1180X08S120	134.1	134.1	196.1	194	2.1	12	2
11.9	3	●	MVS1190X03S120	62.2	62.2	124.2	122	2.2	12	2
	5	●	MVS1190X05S120	98.2	98.2	160.2	158	2.2	12	2
	8	●	MVS1190X08S120	134.2	134.2	196.2	194	2.2	12	2
12.0	3	●	MVS1200X03S120	62.2	62.2	124.2	122	2.2	12	2
	5	●	MVS1200X05S120	98.2	98.2	160.2	158	2.2	12	2
	8	●	MVS1200X08S120	134.2	134.2	196.2	194	2.2	12	2
NEW 12.1	3	●	MVS1210X03S130	64.7	67.2	130.2	128	2.2	13	2
	3	□	MVS1210X03S140	64.7	67.2	130.2	128	2.2	14	2
	5	●	MVS1210X05S130	102.2	106.2	169.2	167	2.2	13	2
	5	□	MVS1210X05S140	102.2	106.2	169.2	167	2.2	14	2
	8	□	MVS1210X08S130	140.2	145.2	208.2	206	2.2	13	2
	8	□	MVS1210X08S140	140.2	145.2	208.2	206	2.2	14	2
NEW 12.2	3	●	MVS1220X03S130	64.7	67.2	130.2	128	2.2	13	2
	3	□	MVS1220X03S140	64.7	67.2	130.2	128	2.2	14	2
	5	●	MVS1220X05S130	102.2	106.2	169.2	167	2.2	13	2
	5	□	MVS1220X05S140	102.2	106.2	169.2	167	2.2	14	2
	8	□	MVS1220X08S130	140.2	145.2	208.2	206	2.2	13	2
	8	□	MVS1220X08S140	140.2	145.2	208.2	206	2.2	14	2
NEW 12.3	3	●	MVS1230X03S130	64.7	67.2	130.2	128	2.2	13	2
	3	□	MVS1230X03S140	64.7	67.2	130.2	128	2.2	14	2
	5	●	MVS1230X05S130	102.2	106.2	169.2	167	2.2	13	2
	5	□	MVS1230X05S140	102.2	106.2	169.2	167	2.2	14	2
	8	□	MVS1230X08S130	140.2	145.2	208.2	206	2.2	13	2
	8	□	MVS1230X08S140	140.2	145.2	208.2	206	2.2	14	2
NEW 12.4	3	●	MVS1240X03S130	64.8	67.3	130.3	128	2.3	13	2
	3	□	MVS1240X03S140	64.8	67.3	130.3	128	2.3	14	2
	5	●	MVS1240X05S130	102.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1240X05S140	102.3	106.3	169.3	167	2.3	14	2
	8	□	MVS1240X08S130	140.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1240X08S140	140.3	145.3	208.3	206	2.3	14	2
NEW 12.5	3	●	MVS1250X03S130	64.8	67.3	130.3	128	2.3	13	2
	3	□	MVS1250X03S140	64.8	67.3	130.3	128	2.3	14	2
	5	●	MVS1250X05S130	102.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1250X05S140	102.3	106.3	169.3	167	2.3	14	2
	8	●	MVS1250X08S130	140.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1250X08S140	140.3	145.3	208.3	206	2.3	14	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
12.6	3	●	MVS1260X03S130	67.3	67.3	130.3	128	2.3	13	2
	3	□	MVS1260X03S140	67.3	67.3	130.3	128	2.3	14	2
	5	●	MVS1260X05S130	106.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1260X05S140	106.3	106.3	169.3	167	2.3	14	2
	8	□	MVS1260X08S130	145.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1260X08S140	145.3	145.3	208.3	206	2.3	14	2
12.7	3	●	MVS1270X03S130	67.3	67.3	130.3	128	2.3	13	2
	3	□	MVS1270X03S140	67.3	67.3	130.3	128	2.3	14	2
	5	●	MVS1270X05S130	106.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1270X05S140	106.3	106.3	169.3	167	2.3	14	2
	8	□	MVS1270X08S130	145.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1270X08S140	145.3	145.3	208.3	206	2.3	14	2
12.8	3	●	MVS1280X03S130	67.3	67.3	130.3	128	2.3	13	2
	3	□	MVS1280X03S140	67.3	67.3	130.3	128	2.3	14	2
	5	●	MVS1280X05S130	106.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1280X05S140	106.3	106.3	169.3	167	2.3	14	2
	8	□	MVS1280X08S130	145.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1280X08S140	145.3	145.3	208.3	206	2.3	14	2
12.9	3	●	MVS1290X03S130	67.3	67.3	130.3	128	2.3	13	2
	3	□	MVS1290X03S140	67.3	67.3	130.3	128	2.3	14	2
	5	●	MVS1290X05S130	106.3	106.3	169.3	167	2.3	13	2
	5	□	MVS1290X05S140	106.3	106.3	169.3	167	2.3	14	2
	8	□	MVS1290X08S130	145.3	145.3	208.3	206	2.3	13	2
	8	□	MVS1290X08S140	145.3	145.3	208.3	206	2.3	14	2
13.0	3	●	MVS1300X03S130	67.4	67.4	130.4	128	2.4	13	2
	3	□	MVS1300X03S140	67.4	67.4	130.4	128	2.4	14	2
	5	●	MVS1300X05S130	106.4	106.4	169.4	167	2.4	13	2
	5	□	MVS1300X05S140	106.4	106.4	169.4	167	2.4	14	2
	8	●	MVS1300X08S130	145.4	145.4	208.4	206	2.4	13	2
	8	□	MVS1300X08S140	145.4	145.4	208.4	206	2.4	14	2
13.1	3	●	MVS1310X03S140	69.9	72.4	136.4	134	2.4	14	2
	5	●	MVS1310X05S140	110.4	114.4	178.4	176	2.4	14	2
	8	□	MVS1310X08S140	151.4	156.4	220.4	218	2.4	14	2
13.2	3	●	MVS1320X03S140	69.9	72.4	136.4	134	2.4	14	2
	5	●	MVS1320X05S140	110.4	114.4	178.4	176	2.4	14	2
	8	□	MVS1320X08S140	151.4	156.4	220.4	218	2.4	14	2
13.3	3	●	MVS1330X03S140	69.9	72.4	136.4	134	2.4	14	2
	5	●	MVS1330X05S140	110.4	114.4	178.4	176	2.4	14	2
	8	□	MVS1330X08S140	151.4	156.4	220.4	218	2.4	14	2
13.4	3	●	MVS1340X03S140	69.9	72.4	136.4	134	2.4	14	2
	5	●	MVS1340X05S140	110.4	114.4	178.4	176	2.4	14	2
	8	□	MVS1340X08S140	151.4	156.4	220.4	218	2.4	14	2
13.5	3	●	MVS1350X03S140	70.0	72.5	136.5	134	2.5	14	2
	5	●	MVS1350X05S140	110.5	114.5	178.5	176	2.5	14	2
	8	●	MVS1350X08S140	151.5	156.5	220.5	218	2.5	14	2
13.6	3	●	MVS1360X03S140	72.5	72.5	136.5	134	2.5	14	2
	5	●	MVS1360X05S140	114.5	114.5	178.5	176	2.5	14	2
	8	□	MVS1360X08S140	156.5	156.5	220.5	218	2.5	14	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.7	3	●	MVS1370X03S140	72.5	72.5	136.5	134	2.5	14	2
	5	●	MVS1370X05S140	114.5	114.5	178.5	176	2.5	14	2
	8	□	MVS1370X08S140	156.5	156.5	220.5	218	2.5	14	2
13.8	3	●	MVS1380X03S140	72.5	72.5	136.5	134	2.5	14	22
	5	●	MVS1380X05S140	114.5	114.5	178.5	176	2.5	14	2
	8	□	MVS1380X08S140	156.5	156.5	220.5	218	2.5	14	2
13.9	3	●	MVS1390X03S140	72.5	72.5	136.5	134	2.5	14	2
	5	●	MVS1390X05S140	114.5	114.5	178.5	176	2.5	14	2
	8	□	MVS1390X08S140	156.5	156.5	220.5	218	2.5	14	2
14.0	3	●	MVS1400X03S140	72.5	72.5	136.5	134	2.5	14	2
	5	●	MVS1400X05S140	114.5	114.5	178.5	176	2.5	14	2
	8	●	MVS1400X08S140	156.5	156.5	220.5	218	2.5	14	2
14.1	3	●	MVS1410X03S150	75.1	77.6	142.6	140	2.6	15	2
	3	□	MVS1410X03S160	75.1	77.6	142.6	140	2.6	16	2
	5	●	MVS1410X05S150	118.6	122.6	187.6	185	2.6	15	2
	5	□	MVS1410X05S160	118.6	122.6	187.6	185	2.6	16	2
	8	□	MVS1410X08S150	162.6	167.6	227.6	225	2.6	15	2
	8	□	MVS1410X08S160	162.6	167.6	227.6	225	2.6	16	2
14.2	3	●	MVS1420X03S150	75.1	77.6	142.6	140	2.6	15	2
	3	□	MVS1420X03S160	75.1	77.6	142.6	140	2.6	16	2
	5	●	MVS1420X05S150	118.6	122.6	187.6	185	2.6	15	2
	5	□	MVS1420X05S160	118.6	122.6	187.6	185	2.6	16	2
	8	●	MVS1420X08S150	162.6	167.6	227.6	225	2.6	15	2
	8	□	MVS1420X08S160	162.6	167.6	227.6	225	2.6	16	2
14.3	3	●	MVS1430X03S150	75.1	77.6	142.6	140	2.6	15	2
	3	□	MVS1430X03S160	75.1	77.6	142.6	140	2.6	16	2
	5	●	MVS1430X05S150	118.6	122.6	187.6	185	2.6	15	2
	5	□	MVS1430X05S160	118.6	122.6	187.6	185	2.6	16	2
	8	□	MVS1430X08S150	162.6	167.6	227.6	225	2.6	15	2
	8	□	MVS1430X08S160	162.6	167.6	227.6	225	2.6	16	2
14.4	3	●	MVS1440X03S150	75.1	77.6	142.6	140	2.6	15	2
	3	□	MVS1440X03S160	75.1	77.6	142.6	140	2.6	16	2
	5	●	MVS1440X05S150	118.6	122.6	187.6	185	2.6	15	2
	5	□	MVS1440X05S160	118.6	122.6	187.6	185	2.6	16	2
	8	□	MVS1440X08S150	162.6	167.6	227.6	225	2.6	15	2
	8	□	MVS1440X08S160	162.6	167.6	227.6	225	2.6	16	2
14.5	3	●	MVS1450X03S150	75.1	77.6	142.6	140	2.6	15	2
	3	□	MVS1450X03S160	75.1	77.6	142.6	140	2.6	16	2
	5	●	MVS1450X05S150	118.6	122.6	187.6	185	2.6	15	2
	5	□	MVS1450X05S160	118.6	122.6	187.6	185	2.6	16	2
	8	●	MVS1450X08S150	162.6	167.6	227.6	225	2.6	15	2
	8	□	MVS1450X08S160	162.6	167.6	227.6	225	2.6	16	2
14.6	3	●	MVS1460X03S150	77.7	77.7	142.7	140	2.7	15	2
	3	□	MVS1460X03S160	77.7	77.7	142.7	140	2.7	16	2
	5	●	MVS1460X05S150	122.7	122.7	187.7	185	2.7	15	2
	5	□	MVS1460X05S160	122.7	122.7	187.7	185	2.7	16	2
	8	□	MVS1460X08S150	167.7	167.7	227.7	225	2.7	15	2
	8	□	MVS1460X08S160	167.7	167.7	227.7	225	2.7	16	2

DRILLING

CUTTING CONDITIONS ➤ N022
TECHNICAL DATA ➤ Q001

MVS

WSTAR DRILLS

Internal Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
14.7	3	●	MVS1470X03S150	77.7	77.7	142.7	140	2.7	15	2
	3	□	MVS1470X03S160	77.7	77.7	142.7	140	2.7	16	2
	5	●	MVS1470X05S150	122.7	122.7	187.7	185	2.7	15	2
	5	□	MVS1470X05S160	122.7	122.7	187.7	185	2.7	16	2
	8	□	MVS1470X08S150	167.7	167.7	227.7	225	2.7	15	2
	8	□	MVS1470X08S160	167.7	167.7	227.7	225	2.7	16	2
14.8	3	●	MVS1480X03S150	77.7	77.7	142.7	140	2.7	15	2
	3	□	MVS1480X03S160	77.7	77.7	142.7	140	2.7	16	2
	5	●	MVS1480X05S150	122.7	122.7	187.7	185	2.7	15	2
	5	□	MVS1480X05S160	122.7	122.7	187.7	185	2.7	16	2
	8	□	MVS1480X08S150	167.7	167.7	227.7	225	2.7	15	2
	8	□	MVS1480X08S160	167.7	167.7	227.7	225	2.7	16	2
14.9	3	●	MVS1490X03S150	77.7	77.7	142.7	140	2.7	15	2
	3	□	MVS1490X03S160	77.7	77.7	142.7	140	2.7	16	2
	5	●	MVS1490X05S150	122.7	122.7	187.7	185	2.7	15	2
	5	□	MVS1490X05S160	122.7	122.7	187.7	185	2.7	16	2
	8	□	MVS1490X08S150	167.7	167.7	227.7	225	2.7	15	2
	8	□	MVS1490X08S160	167.7	167.7	227.7	225	2.7	16	2
15.0	3	●	MVS1500X03S150	77.7	77.7	142.7	140	2.7	15	2
	3	□	MVS1500X03S160	77.7	77.7	142.7	140	2.7	16	2
	5	●	MVS1500X05S150	122.7	122.7	187.7	185	2.7	15	2
	5	□	MVS1500X05S160	122.7	122.7	187.7	185	2.7	16	2
	8	●	MVS1500X08S150	167.7	167.7	227.7	225	2.7	15	2
	8	□	MVS1500X08S160	167.7	167.7	227.7	225	2.7	16	2
15.1	3	●	MVS1510X03S160	80.2	82.7	147.7	145	2.7	16	2
	5	●	MVS1510X05S160	126.7	130.7	195.7	193	2.7	16	2
	8	□	MVS1510X08S160	173.7	183.7	243.7	241	2.7	16	2
15.2	3	●	MVS1520X03S160	80.3	82.8	147.8	145	2.8	16	2
	5	●	MVS1520X05S160	126.8	130.8	195.8	193	2.8	16	2
	8	□	MVS1520X08S160	173.8	183.8	243.8	241	2.8	16	2
15.3	3	●	MVS1530X03S160	80.3	82.8	147.8	145	2.8	16	2
	5	●	MVS1530X05S160	126.8	130.8	195.8	193	2.8	16	2
	8	□	MVS1530X08S160	173.8	183.8	243.8	241	2.8	16	2
15.4	3	●	MVS1540X03S160	80.3	82.8	147.8	145	2.8	16	2
	5	●	MVS1540X05S160	126.8	130.8	195.8	193	2.8	16	2
	8	□	MVS1540X08S160	173.8	183.8	243.8	241	2.8	16	2
15.5	3	●	MVS1550X03S160	80.3	82.8	147.8	145	2.8	16	2
	5	●	MVS1550X05S160	126.8	130.8	195.8	193	2.8	16	2
	8	●	MVS1550X08S160	173.8	183.8	243.8	241	2.8	16	2
15.6	3	●	MVS1560X03S160	82.8	82.8	147.8	145	2.8	16	2
	5	●	MVS1560X05S160	130.8	130.8	195.8	193	2.8	16	2
	8	□	MVS1560X08S160	178.8	183.8	243.8	241	2.8	16	2
15.7	3	●	MVS1570X03S160	82.9	82.9	147.9	145	2.9	16	2
	5	●	MVS1570X05S160	130.9	130.9	195.9	193	2.9	16	2
	8	□	MVS1570X08S160	178.9	183.9	243.9	241	2.9	16	2
15.8	3	●	MVS1580X03S160	82.9	82.9	147.9	145	2.9	16	2
	5	●	MVS1580X05S160	130.9	130.9	195.9	193	2.9	16	2
	8	□	MVS1580X08S160	178.9	183.9	243.9	241	2.9	16	2

Internal Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
15.9	3	●	MVS1590X03S160	82.9	82.9	147.9	145	2.9	16	2
	5	●	MVS1590X05S160	130.9	130.9	195.9	193	2.9	16	2
	8	□	MVS1590X08S160	178.9	183.9	243.9	241	2.9	16	2
16.0	3	●	MVS1600X03S160	82.9	82.9	147.9	145	2.9	16	2
	5	●	MVS1600X05S160	130.9	130.9	195.9	193	2.9	16	2
	8	●	MVS1600X08S160	178.9	183.9	243.9	241	2.9	16	2
16.1	3	□	MVS1610X03S170	85.4	87.9	152.9	150	2.9	17	2
	3	□	MVS1610X03S180	85.4	87.9	152.9	150	2.9	18	2
	5	□	MVS1610X05S170	134.9	138.9	203.9	201	2.9	17	2
	5	□	MVS1610X05S180	134.9	138.9	203.9	201	2.9	18	2
16.2	3	□	MVS1620X03S170	85.4	87.9	152.9	150	2.9	17	2
	3	□	MVS1620X03S180	85.4	87.9	152.9	150	2.9	18	2
	5	□	MVS1620X05S170	134.9	138.9	203.9	201	2.9	17	2
	5	□	MVS1620X05S180	134.9	138.9	203.9	201	2.9	18	2
16.3	3	□	MVS1630X03S170	85.5	88.0	153.0	150	3.0	17	2
	3	□	MVS1630X03S180	85.5	88.0	153.0	150	3.0	18	2
	5	□	MVS1630X05S170	135.0	139.0	204.0	201	3.0	17	2
	5	□	MVS1630X05S180	135.0	139.0	204.0	201	3.0	18	2
16.4	3	□	MVS1640X03S170	85.5	88.0	153.0	150	3.0	17	2
	3	□	MVS1640X03S180	85.5	88.0	153.0	150	3.0	18	2
	5	□	MVS1640X05S170	135.0	139.0	204.0	201	3.0	17	2
	5	□	MVS1640X05S180	135.0	139.0	204.0	201	3.0	18	2
16.5	3	●	MVS1650X03S170	85.5	88.0	153.0	150	3.0	17	2
	3	□	MVS1650X03S180	85.5	88.0	153.0	150	3.0	18	2
	5	●	MVS1650X05S170	135.0	139.0	204.0	201	3.0	17	2
	5	□	MVS1650X05S180	135.0	139.0	204.0	201	3.0	18	2
16.6	3	□	MVS1660X03S170	88.0	88.0	153.0	150	3.0	17	2
	3	□	MVS1660X03S180	88.0	88.0	153.0	150	3.0	18	2
	5	□	MVS1660X05S170	139.0	139.0	204.0	201	3.0	17	2
	5	□	MVS1660X05S180	139.0	139.0	204.0	201	3.0	18	2
16.7	3	□	MVS1670X03S170	88.0	88.0	153.0	150	3.0	17	2
	3	□	MVS1670X03S180	88.0	88.0	153.0	150	3.0	18	2
	5	□	MVS1670X05S170	139.0	139.0	204.0	201	3.0	17	2
	5	□	MVS1670X05S180	139.0	139.0	204.0	201	3.0	18	2
16.8	3	□	MVS1680X03S170	88.1	88.1	153.1	150	3.1	17	2
	3	□	MVS1680X03S180	88.1	88.1	153.1	150	3.1	18	2
	5	□	MVS1680X05S170	139.1	139.1	204.1	201	3.1	17	2
	5	□	MVS1680X05S180	139.1	139.1	204.1	201	3.1	18	2
16.9	3	□	MVS1690X03S170	88.1	88.1	153.1	150	3.1	17	2
	3	□	MVS1690X03S180	88.1	88.1	153.1	150	3.1	18	2
	5	□	MVS1690X05S170	139.1	139.1	204.1	201	3.1	17	2
	5	□	MVS1690X05S180	139.1	139.1	204.1	201	3.1	18	2
17.0	3	●	MVS1700X03S170	88.1	88.1	153.1	150	3.1	17	2
	3	□	MVS1700X03S180	88.1	88.1	153.1	150	3.1	18	2
	5	●	MVS1700X05S170	139.1	139.1	204.1	201	3.1	17	2
	5	□	MVS1700X05S180	139.1	139.1	204.1	201	3.1	18	2
17.1	3	□	MVS1710X03S180	90.6	93.1	158.1	155	3.1	18	2
	5	□	MVS1710X05S180	143.1	147.1	212.1	209	3.1	18	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

Internal Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.2	3	□	MVS1720X03S180	90.6	93.1	158.1	155	3.1	18	2
	5	□	MVS1720X05S180	143.1	147.1	212.1	209	3.1	18	2
17.3	3	□	MVS1730X03S180	90.6	93.1	158.1	155	3.1	18	2
	5	□	MVS1730X05S180	143.1	147.1	212.1	209	3.1	18	2
17.4	3	□	MVS1740X03S180	90.7	93.2	158.2	155	3.2	18	2
	5	□	MVS1740X05S180	143.2	147.2	212.2	209	3.2	18	2
17.5	3	●	MVS1750X03S180	90.7	93.2	158.2	155	3.2	18	2
	5	●	MVS1750X05S180	143.2	147.2	212.2	209	3.2	18	2
17.6	3	□	MVS1760X03S180	93.2	93.2	158.2	155	3.2	18	2
	5	□	MVS1760X05S180	147.2	147.2	212.2	209	3.2	18	2
17.7	3	□	MVS1770X03S180	93.2	93.2	158.2	155	3.2	18	2
	5	□	MVS1770X05S180	147.2	147.2	212.2	209	3.2	18	2
17.8	3	□	MVS1780X03S180	93.2	93.2	158.2	155	3.2	18	2
	5	□	MVS1780X05S180	147.2	147.2	212.2	209	3.2	18	2
17.9	3	□	MVS1790X03S180	93.3	93.3	158.3	155	3.3	18	2
	5	□	MVS1790X05S180	147.3	147.3	212.3	209	3.3	18	2
18.0	3	●	MVS1800X03S180	93.3	93.3	158.3	155	3.3	18	2
	5	●	MVS1800X05S180	147.3	147.3	212.3	209	3.3	18	2
18.1	3	□	MVS1810X03S190	95.8	98.3	163.3	160	3.3	19	2
	3	□	MVS1810X03S200	95.8	98.3	163.3	160	3.3	20	2
	5	□	MVS1810X05S190	151.3	155.3	220.3	217	3.3	19	2
	5	□	MVS1810X05S200	151.3	155.3	220.3	217	3.3	20	2
18.2	3	□	MVS1820X03S190	95.8	98.3	163.3	160	3.3	19	2
	3	□	MVS1820X03S200	95.8	98.3	163.3	160	3.3	20	2
	5	□	MVS1820X05S190	151.3	155.3	220.3	217	3.3	19	2
	5	□	MVS1820X05S200	151.3	155.3	220.3	217	3.3	20	2
18.3	3	□	MVS1830X03S190	95.8	98.3	163.3	160	3.3	19	2
	3	□	MVS1830X03S200	95.8	98.3	163.3	160	3.3	20	2
	5	□	MVS1830X05S190	151.3	155.3	220.3	217	3.3	19	2
	5	□	MVS1830X05S200	151.3	155.3	220.3	217	3.3	20	2
18.4	3	□	MVS1840X03S190	95.8	98.3	163.3	160	3.3	19	2
	3	□	MVS1840X03S200	95.8	98.3	163.3	160	3.3	20	2
	5	□	MVS1840X05S190	151.3	155.3	220.3	217	3.3	19	2
	5	□	MVS1840X05S200	151.3	155.3	220.3	217	3.3	20	2
18.5	3	●	MVS1850X03S190	95.9	98.4	163.4	160	3.4	19	2
	3	□	MVS1850X03S200	95.9	98.4	163.4	160	3.4	20	2
	5	●	MVS1850X05S190	151.4	155.4	220.4	217	3.4	19	2
	5	□	MVS1850X05S200	151.4	155.4	220.4	217	3.4	20	2
18.6	3	□	MVS1860X03S190	98.4	98.4	163.4	160	3.4	19	2
	3	□	MVS1860X03S200	98.4	98.4	163.4	160	3.4	20	2
	5	□	MVS1860X05S190	155.4	155.4	220.4	217	3.4	19	2
	5	□	MVS1860X05S200	155.4	155.4	220.4	217	3.4	20	2
18.7	3	□	MVS1870X03S190	98.4	98.4	163.4	160	3.4	19	2
	3	□	MVS1870X03S200	98.4	98.4	163.4	160	3.4	20	2
	5	□	MVS1870X05S190	155.4	155.4	220.4	217	3.4	19	2
	5	□	MVS1870X05S200	155.4	155.4	220.4	217	3.4	20	2

Internal Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
18.8	3	□	MVS1880X03S190	98.4	98.4	163.4	160	3.4	19	2
	3	□	MVS1880X03S200	98.4	98.4	163.4	160	3.4	20	2
	5	□	MVS1880X05S190	155.4	155.4	220.4	217	3.4	19	2
	5	□	MVS1880X05S200	155.4	155.4	220.4	217	3.4	20	2
18.9	3	□	MVS1890X03S190	98.4	98.4	163.4	160	3.4	19	2
	3	□	MVS1890X03S200	98.4	98.4	163.4	160	3.4	20	2
	5	□	MVS1890X05S190	155.4	155.4	220.4	217	3.4	19	2
	5	□	MVS1890X05S200	155.4	155.4	220.4	217	3.4	20	2
19.0	3	●	MVS1900X03S190	98.5	98.5	163.5	160	3.5	19	2
	3	□	MVS1900X03S200	98.5	98.5	163.5	160	3.5	20	2
	5	●	MVS1900X05S190	155.5	155.5	220.5	217	3.5	19	2
	5	□	MVS1900X05S200	155.5	155.5	220.5	217	3.5	20	2
19.1	3	□	MVS1910X03S200	101.0	103.5	168.5	165	3.5	20	2
	5	□	MVS1910X05S200	159.5	163.5	228.5	225	3.5	20	2
19.2	3	□	MVS1920X03S200	101.0	103.5	168.5	165	3.5	20	2
	5	□	MVS1920X05S200	159.5	163.5	228.5	225	3.5	20	2
19.3	3	□	MVS1930X03S200	101.0	103.5	168.5	165	3.5	20	2
	5	□	MVS1930X05S200	159.5	163.5	228.5	225	3.5	20	2
19.4	3	□	MVS1940X03S200	101.0	103.5	168.5	165	3.5	20	2
	5	□	MVS1940X05S200	159.5	163.5	228.5	225	3.5	20	2
19.5	3	●	MVS1950X03S200	101.0	103.5	168.5	165	3.5	20	2
	5	●	MVS1950X05S200	159.5	163.5	228.5	225	3.5	20	2
19.6	3	□	MVS1960X03S200	103.6	103.6	168.6	165	3.6	20	2
	5	□	MVS1960X05S200	163.6	163.6	228.6	225	3.6	20	2
19.7	3	□	MVS1970X03S200	103.6	103.6	168.6	165	3.6	20	2
	5	□	MVS1970X05S200	163.6	163.6	228.6	225	3.6	20	2
19.8	3	□	MVS1980X03S200	103.6	103.6	168.6	165	3.6	20	2
	5	□	MVS1980X05S200	163.6	163.6	228.6	225	3.6	20	2
19.9	3	□	MVS1990X03S200	103.6	103.6	168.6	165	3.6	20	2
	5	□	MVS1990X05S200	163.6	163.6	228.6	225	3.6	20	2
20.0	3	●	MVS2000X03S200	103.6	103.6	168.6	165	3.6	20	2
	5	●	MVS2000X05S200	163.6	163.6	228.6	225	3.6	20	2

CUTTING CONDITIONS ➢ N022
TECHNICAL DATA ➢ Q001

MVS
WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Work 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	S*,7DC	15900	0.04 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
	≥12D	15900	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5	S*,7DC	10600	0.05 (0.03—0.08)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
	≥12D	10600	0.05 (0.02—0.08)	8400	0.05 (0.03—0.08)	6300	0.05 (0.02—0.08)
2.0	S*,7DC	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
	≥12D	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5	S*,7DC	7600	0.09 (0.05—0.13)	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
	≥12D	7600	0.09 (0.06—0.13)	6300	0.09 (0.06—0.13)	6300	0.08 (0.05—0.13)
3.2	3DC,5DC,8DC	8900	0.1 (0.06—0.13)	7900	0.1 (0.06—0.13)	6900	0.1 (0.06—0.13)
4.0	3DC,5DC,8DC	7900	0.12 (0.08—0.16)	7100	0.12 (0.08—0.16)	6300	0.11 (0.07—0.14)
5.0	3DC,5DC,8DC	6300	0.15 (0.10—0.20)	5700	0.15 (0.10—0.20)	5000	0.14 (0.09—0.18)
6.3	3DC,5DC,8DC	5500	0.2 (0.13—0.26)	5000	0.2 (0.13—0.26)	4500	0.18 (0.11—0.24)
8.0	3DC,5DC,8DC	4700	0.23 (0.18—0.28)	4300	0.23 (0.18—0.28)	3900	0.21 (0.16—0.25)
10.0	3DC,5DC,8DC	4100	0.27 (0.22—0.32)	3800	0.27 (0.22—0.32)	3500	0.23 (0.19—0.27)
12.0	3DC,5DC,8DC	3700	0.3 (0.26—0.34)	3400	0.3 (0.26—0.34)	3100	0.26 (0.22—0.29)
16.0	3DC,5DC,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,8DC	2500	0.35 (0.30—0.40)	2200	0.35 (0.30—0.40)	2000	0.3 (0.26—0.34)

Work 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	S*,7DC	9500	0.03 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
	≥12D	9500	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5	S*,7DC	6300	0.05 (0.03—0.07)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
	≥12D	6300	0.05 (0.02—0.08)	8400	0.05 (0.03—0.08)	6300	0.05 (0.02—0.08)
2.0	S*,7DC	4700	0.06 (0.04—0.08)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
	≥12D	4700	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5	S*,7DC	5000	0.08 (0.05—0.10)	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
	≥12D	3800	0.08 (0.05—0.12)	6300	0.09 (0.06—0.13)	6300	0.08 (0.05—0.12)
3.2	3DC,5DC,8DC	3900	0.08 (0.06—0.10)	8900	0.1 (0.06—0.13)	6400	0.1 (0.06—0.13)
4.0	3DC,5DC,8DC	3100	0.09 (0.06—0.11)	7900	0.12 (0.08—0.16)	5100	0.12 (0.08—0.16)
5.0	3DC,5DC,8DC	2500	0.11 (0.08—0.14)	6300	0.15 (0.10—0.20)	4100	0.15 (0.10—0.20)
6.3	3DC,5DC,8DC	2500	0.14 (0.09—0.18)	5500	0.2 (0.13—0.26)	3500	0.2 (0.13—0.26)
8.0	3DC,5DC,8DC	1900	0.15 (0.10—0.19)	4700	0.25 (0.18—0.31)	2700	0.23 (0.18—0.28)
10.0	3DC,5DC,8DC	1500	0.16 (0.12—0.20)	4100	0.29 (0.22—0.35)	2200	0.27 (0.22—0.32)
12.0	3DC,5DC,8DC	1500	0.18 (0.15—0.21)	3700	0.32 (0.26—0.37)	2300	0.3 (0.26—0.34)
16.0	3DC,5DC,8DC	1100	0.19 (0.14—0.24)	3100	0.35 (0.28—0.42)	1700	0.33 (0.28—0.38)
20.0	3DC,5DC,8DC	900	0.21 (0.15—0.26)	2500	0.37 (0.30—0.44)	1500	0.35 (0.30—0.40)

S*=2DC for cutting a guide hole

Work Material		Aluminium Alloy (Si<5%)		Heat Resistant Alloy 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	**S*,7DC**	19000	0.05 (0.03—0.08)	3100	0.02 (0.01—0.03)
	≥12DC	15900	0.05 (0.03—0.08)	3100	0.02 (0.01—0.03)
1.5	**S*,7DC**	16900	0.07 (0.05—0.12)	2100	0.03 (0.02—0.04)
	≥12DC	14800	0.08 (0.05—0.12)	2100	0.03 (0.02—0.04)
2.0	**S*,7DC**	14300	0.1 (0.06—0.15)	2300	0.04 (0.03—0.05)
	≥12DC	12700	0.11 (0.06—0.15)	2300	0.04 (0.03—0.05)
2.5	**S*,7DC**	12700	0.13 (0.08—0.20)	1900	0.05 (0.04—0.06)
	≥12DC	11400	0.14 (0.08—0.20)	1900	0.05 (0.04—0.06)
3.2	**3DC,5DC,8DC**	11900	0.23 (0.10—0.35)	1900	0.07 (0.05—0.09)
4.0	**3DC,5DC,8DC**	9500	0.24 (0.12—0.35)	1500	0.09 (0.06—0.11)
5.0	**3DC,5DC,8DC**	7600	0.25 (0.15—0.35)	1200	0.11 (0.08—0.14)
6.3	**3DC,5DC,8DC**	7500	0.35 (0.20—0.50)	1200	0.13 (0.09—0.16)
8.0	**3DC,5DC,8DC**	5900	0.35 (0.20—0.50)	900	0.14 (0.11—0.17)
10.0	**3DC,5DC,8DC**	4700	0.5 (0.20—0.80)	700	0.15 (0.12—0.17)
12.0	**3DC,5DC,8DC**	4200	0.5 (0.20—0.80)	600	0.16 (0.13—0.18)
16.0	**3DC,5DC,8DC**	3100	0.6 (0.20—1.00)	400	0.18 (0.14—0.21)
20.0	**3DC,5DC,8DC**	2700	0.6 (0.20—1.00)	400	0.19 (0.15—0.22)

S*=2DC for cutting a guide hole

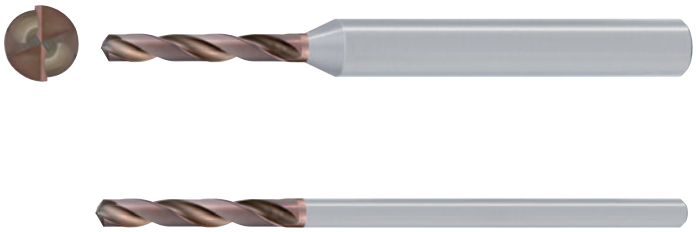
MVE

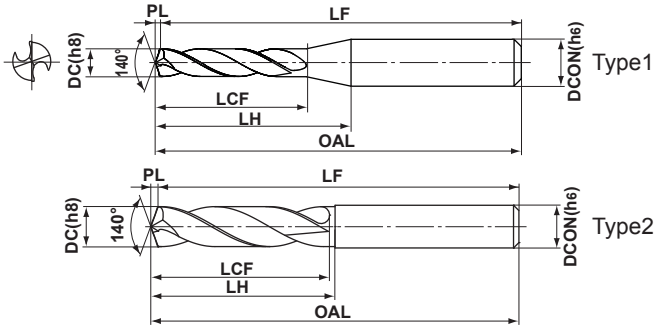
WSTAR DRILLS

- New grade DP1020 offers long tool life for a wide range of work materials.
- The unique wavy cutting edge provides excellent sharpness and rigidity and helps to control wear at the periphery.

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

	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
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013





External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.0	2	●	MVE0300X02S030	16.5	16.5	55.5	55	0.5	3	2
	2	●	MVE0300X02S060	16.5	19.7	55.5	55	0.5	6	1
	3	●	MVE0300X03S030	21.5	21.5	60.5	60	0.5	3	2
	3	●	MVE0300X03S060	21.5	24.7	60.5	60	0.5	6	1
3.1	2	●	MVE0310X02S040	18.6	20.6	55.6	55	0.6	4	2
	2	●	MVE0310X02S060	18.6	21.7	55.6	55	0.6	6	1
	3	●	MVE0310X03S040	24.6	26.6	60.6	60	0.6	4	2
	3	●	MVE0310X03S060	24.6	27.7	60.6	60	0.6	6	1
3.2	2	●	MVE0320X02S040	18.6	20.6	55.6	55	0.6	4	2
	2	●	MVE0320X02S060	18.6	21.6	55.6	55	0.6	6	1
	3	●	MVE0320X03S040	24.6	26.6	60.6	60	0.6	4	2
	3	●	MVE0320X03S060	24.6	27.6	60.6	60	0.6	6	1
3.3	2	●	MVE0330X02S040	18.6	20.6	55.6	55	0.6	4	2
	2	●	MVE0330X02S060	18.6	21.5	55.6	55	0.6	6	1
	3	●	MVE0330X03S040	24.6	26.6	60.6	60	0.6	4	2
	3	●	MVE0330X03S060	24.6	27.5	60.6	60	0.6	6	1
3.4	2	●	MVE0340X02S040	18.6	20.6	55.6	55	0.6	4	2
	2	●	MVE0340X02S060	18.6	21.4	55.6	55	0.6	6	1
	3	●	MVE0340X03S040	24.6	26.6	60.6	60	0.6	4	2
	3	●	MVE0340X03S060	24.6	27.4	60.6	60	0.6	6	1
3.5	2	●	MVE0350X02S040	18.6	20.6	55.6	55	0.6	4	2
	2	●	MVE0350X02S060	18.6	21.3	55.6	55	0.6	6	1
	3	●	MVE0350X03S040	24.6	26.6	60.6	60	0.6	4	2
	3	●	MVE0350X03S060	24.6	27.3	60.6	60	0.6	6	1
3.6	2	●	MVE0360X02S040	20.7	20.7	55.7	55	0.7	4	2
	2	●	MVE0360X02S060	20.7	23.3	55.7	55	0.7	6	1
	3	●	MVE0360X03S040	27.7	27.7	60.7	60	0.7	4	2
	3	●	MVE0360X03S060	27.7	30.3	60.7	60	0.7	6	1
3.7	2	●	MVE0370X02S040	20.7	20.7	55.7	55	0.7	4	2
	2	●	MVE0370X02S060	20.7	23.2	55.7	55	0.7	6	1
	3	●	MVE0370X03S040	27.7	27.7	60.7	60	0.7	4	2
	3	●	MVE0370X03S060	27.7	30.2	60.7	60	0.7	6	1
3.8	2	●	MVE0380X02S040	20.7	20.7	55.7	55	0.7	4	2
	2	●	MVE0380X02S060	20.7	23.1	55.7	55	0.7	6	1
	3	●	MVE0380X03S040	27.7	27.7	60.7	60	0.7	4	2
	3	●	MVE0380X03S060	27.7	30.1	60.7	60	0.7	6	1
3.9	2	●	MVE0390X02S040	20.7	20.7	55.7	55	0.7	4	2
	2	●	MVE0390X02S060	20.7	23.0	55.7	55	0.7	6	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.9	3	●	MVE0390X03S040	27.7	27.7	60.7	60	0.7	4	2
	3	●	MVE0390X03S060	27.7	30.0	60.7	60	0.7	6	1
4.0	2	●	MVE0400X02S040	20.7	20.7	55.7	55	0.7	4	2
	2	●	MVE0400X02S060	20.7	22.8	55.7	55	0.7	6	1
	3	●	MVE0400X03S040	27.7	27.7	60.7	60	0.7	4	2
	3	●	MVE0400X03S060	27.7	29.8	60.7	60	0.7	6	1
4.1	2	●	MVE0410X02S050	22.7	24.7	62.7	62	0.7	5	2
	2	●	MVE0410X02S060	22.7	24.7	62.7	62	0.7	6	1
	3	●	MVE0410X03S050	29.7	31.7	68.7	68	0.7	5	2
	3	●	MVE0410X03S060	29.7	31.7	68.7	68	0.7	6	1
4.2	2	●	MVE0420X02S050	22.8	24.8	62.8	62	0.8	5	2
	2	●	MVE0420X02S060	22.8	24.7	62.8	62	0.8	6	1
	3	●	MVE0420X03S050	29.8	31.8	68.8	68	0.8	5	2
	3	●	MVE0420X03S060	29.8	31.7	68.8	68	0.8	6	1
4.3	2	●	MVE0430X02S050	22.8	24.8	62.8	62	0.8	5	2
	2	●	MVE0430X02S060	22.8	24.6	62.8	62	0.8	6	1
	3	●	MVE0430X03S050	29.8	31.8	68.8	68	0.8	5	2
	3	●	MVE0430X03S060	29.8	31.6	68.8	68	0.8	6	1
4.4	2	●	MVE0440X02S050	22.8	24.8	62.8	62	0.8	5	2
	2	●	MVE0440X02S060	22.8	24.5	62.8	62	0.8	6	1
	3	●	MVE0440X03S050	29.8	31.8	68.8	68	0.8	5	2
	3	●	MVE0440X03S060	29.8	31.5	68.8	68	0.8	6	1
4.5	2	●	MVE0450X02S050	22.8	24.8	62.8	62	0.8	5	2
	2	●	MVE0450X02S060	22.8	24.4	62.8	62	0.8	6	1
	3	●	MVE0450X03S050	29.8	31.8	68.8	68	0.8	5	2
	3	●	MVE0450X03S060	29.8	31.4	68.8	68	0.8	6	1
4.6	2	●	MVE0460X02S050	24.8	24.8	62.8	62	0.8	5	2
	2	●	MVE0460X02S060	24.8	27.8	62.8	62	0.8	6	2
	3	●	MVE0460X03S050	32.8	32.8	68.8	68	0.8	5	2
	3	●	MVE0460X03S060	32.8	35.8	68.8	68	0.8	6	2
4.7	2	●	MVE0470X02S050	24.9	24.9	62.9	62	0.9	5	2
	2	●	MVE0470X02S060	24.9	27.9	62.9	62	0.9	6	2
	3	●	MVE0470X03S050	32.9	32.9	68.9	68	0.9	5	2
	3	●	MVE0470X03S060	32.9	35.9	68.9	68	0.9	6	2
4.8	2	●	MVE0480X02S050	24.9	24.9	62.9	62	0.9	5	2
	2	●	MVE0480X02S060	24.9	27.9	62.9	62	0.9	6	2
	3	●	MVE0480X03S050	32.9	32.9	68.9	68	0.9	5	2
	3	●	MVE0480X03S060	32.9	35.9	68.9	68	0.9	6	2

● : Inventory maintained in Japan.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.9	2	●	MVE0490X02S050	24.9	24.9	62.9	62	0.9	5	2
	2	●	MVE0490X02S060	24.9	27.9	62.9	62	0.9	6	2
	3	●	MVE0490X03S050	32.9	32.9	68.9	68	0.9	5	2
	3	●	MVE0490X03S060	32.9	35.9	68.9	68	0.9	6	2
5.0	2	●	MVE0500X02S050	24.9	24.9	62.9	62	0.9	5	2
	2	●	MVE0500X02S060	24.9	27.9	62.9	62	0.9	6	2
	3	●	MVE0500X03S050	32.9	32.9	68.9	68	0.9	5	2
	3	●	MVE0500X03S060	32.9	35.9	68.9	68	0.9	6	2
5.1	2	●	MVE0510X02S060	26.9	28.9	66.9	66	0.9	6	2
	3	●	MVE0510X03S060	34.9	36.9	74.9	74	0.9	6	2
5.2	2	●	MVE0520X02S060	26.9	28.9	66.9	66	0.9	6	2
	3	●	MVE0520X03S060	34.9	36.9	74.9	74	0.9	6	2
5.3	2	●	MVE0530X02S060	27.0	29.0	67.0	66	1.0	6	2
	3	●	MVE0530X03S060	35.0	37.0	75.0	74	1.0	6	2
5.4	2	●	MVE0540X02S060	27.0	29.0	67.0	66	1.0	6	2
	3	●	MVE0540X03S060	35.0	37.0	75.0	74	1.0	6	2
5.5	2	●	MVE0550X02S060	27.0	29.0	67.0	66	1.0	6	2
	3	●	MVE0550X03S060	35.0	37.0	75.0	74	1.0	6	2
5.6	2	●	MVE0560X02S060	29.0	29.0	67.0	66	1.0	6	2
	3	●	MVE0560X03S060	37.0	37.0	75.0	74	1.0	6	2
5.7	2	●	MVE0570X02S060	29.0	29.0	67.0	66	1.0	6	2
	3	●	MVE0570X03S060	37.0	37.0	75.0	74	1.0	6	2
5.8	2	●	MVE0580X02S060	29.1	29.1	67.1	66	1.1	6	2
	3	●	MVE0580X03S060	37.1	37.1	75.1	74	1.1	6	2
5.9	2	●	MVE0590X02S060	29.1	29.1	67.1	66	1.1	6	2
	3	●	MVE0590X03S060	37.1	37.1	75.1	74	1.1	6	2
6.0	2	●	MVE0600X02S060	29.1	29.1	67.1	66	1.1	6	2
	3	●	MVE0600X03S060	37.1	37.1	75.1	74	1.1	6	2
6.1	2	●	MVE0610X02S070	32.1	35.1	75.1	74	1.1	7	2
	2	●	MVE0610X02S080	32.1	35.1	75.1	74	1.1	8	2
	3	●	MVE0610X03S070	42.1	45.1	84.1	83	1.1	7	2
	3	●	MVE0610X03S080	42.1	45.1	84.1	83	1.1	8	2
6.2	2	●	MVE0620X02S070	32.1	35.1	75.1	74	1.1	7	2
	2	●	MVE0620X02S080	32.1	35.1	75.1	74	1.1	8	2
	3	●	MVE0620X03S070	42.1	45.1	84.1	83	1.1	7	2
	3	●	MVE0620X03S080	42.1	45.1	84.1	83	1.1	8	2
6.3	2	●	MVE0630X02S070	32.1	35.1	75.1	74	1.1	7	2
	2	●	MVE0630X02S080	32.1	35.1	75.1	74	1.1	8	2
	3	●	MVE0630X03S070	42.1	45.1	84.1	83	1.1	7	2
	3	●	MVE0630X03S080	42.1	45.1	84.1	83	1.1	8	2
6.4	2	●	MVE0640X02S070	32.2	35.2	75.2	74	1.2	7	2
	2	●	MVE0640X02S080	32.2	35.2	75.2	74	1.2	8	2
	3	●	MVE0640X03S070	42.2	45.2	84.2	83	1.2	7	2
	3	●	MVE0640X03S080	42.2	45.2	84.2	83	1.2	8	2
6.5	2	●	MVE0650X02S070	32.2	35.2	75.2	74	1.2	7	2
	2	●	MVE0650X02S080	32.2	35.2	75.2	74	1.2	8	2
	3	●	MVE0650X03S070	42.2	45.2	84.2	83	1.2	7	2
	3	●	MVE0650X03S080	42.2	45.2	84.2	83	1.2	8	2
6.6	2	●	MVE0660X02S070	35.2	35.2	75.2	74	1.2	7	2
	2	●	MVE0660X02S080	35.2	37.2	75.2	74	1.2	8	2
	3	●	MVE0660X03S070	44.2	44.2	84.2	83	1.2	7	2
	3	●	MVE0660X03S080	44.2	46.2	84.2	83	1.2	8	2

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.7	2	●	MVE0670X02S070	35.2	35.2	75.2	74	1.2	7	2
	2	●	MVE0670X02S080	35.2	37.2	75.2	74	1.2	8	2
	3	●	MVE0670X03S070	44.2	44.2	84.2	83	1.2	7	2
	3	●	MVE0670X03S080	44.2	46.2	84.2	83	1.2	8	2
6.8	2	●	MVE0680X02S070	35.2	35.2	75.2	74	1.2	7	2
	2	●	MVE0680X02S080	35.2	37.2	75.2	74	1.2	8	2
	3	●	MVE0680X03S070	44.2	44.2	84.2	83	1.2	7	2
	3	●	MVE0680X03S080	44.2	46.2	84.2	83	1.2	8	2
6.9	2	●	MVE0690X02S070	35.3	35.3	75.3	74	1.3	7	2
	2	●	MVE0690X02S080	35.3	37.3	75.3	74	1.3	8	2
	3	●	MVE0690X03S070	44.3	44.3	84.3	83	1.3	7	2
	3	●	MVE0690X03S080	44.3	46.3	84.3	83	1.3	8	2
7.0	2	●	MVE0700X02S070	35.3	35.3	75.3	74	1.3	7	2
	2	●	MVE0700X02S080	35.3	37.3	75.3	74	1.3	8	2
	3	●	MVE0700X03S070	44.3	44.3	84.3	83	1.3	7	2
	3	●	MVE0700X03S080	44.3	46.3	84.3	83	1.3	8	2
7.1	2	●	MVE0710X02S080	35.3	38.3	80.3	79	1.3	8	2
	3	●	MVE0710X03S080	46.3	49.3	91.3	90	1.3	8	2
7.2	2	●	MVE0720X02S080	35.3	38.3	80.3	79	1.3	8	2
	3	●	MVE0720X03S080	46.3	49.3	91.3	90	1.3	8	2
7.3	2	●	MVE0730X02S080	35.3	38.3	80.3	79	1.3	8	2
	3	●	MVE0730X03S080	46.3	49.3	91.3	90	1.3	8	2
7.4	2	●	MVE0740X02S080	35.3	38.3	80.3	79	1.3	8	2
	3	●	MVE0740X03S080	46.3	49.3	91.3	90	1.3	8	2
7.5	2	●	MVE0750X02S080	35.4	38.4	80.4	79	1.4	8	2
	3	●	MVE0750X03S080	46.4	49.4	91.4	90	1.4	8	2
7.6	2	●	MVE0760X02S080	38.4	38.4	80.4	79	1.4	8	2
	3	●	MVE0760X03S080	49.4	49.4	91.4	90	1.4	8	2
7.7	2	●	MVE0770X02S080	38.4	38.4	80.4	79	1.4	8	2
	3	●	MVE0770X03S080	49.4	49.4	91.4	90	1.4	8	2
7.8	2	●	MVE0780X02S080	38.4	38.4	80.4	79	1.4	8	2
	3	●	MVE0780X03S080	49.4	49.4	91.4	90	1.4	8	2
7.9	2	●	MVE0790X02S080	38.4	38.4	80.4	79	1.4	8	2
	3	●	MVE0790X03S080	49.4	49.4	91.4	90	1.4	8	2
8.0	2	●	MVE0800X02S080	38.5	38.5	80.5	79	1.5	8	2
	3	●	MVE0800X03S080	49.5	49.5	91.5	90	1.5	8	2
8.1	2	●	MVE0810X02S090	38.5	41.5	85.5	84	1.5	9	2
	2	●	MVE0810X02S100	38.5	41.5	85.5	84	1.5	10	2
	3	●	MVE0810X03S090	54.5	57.5	99.5	98	1.5	9	2
	3	●	MVE0810X03S100	54.5	57.5	99.5	98	1.5	10	2
8.2	2	●	MVE0820X02S090	38.5	41.5	85.5	84	1.5	9	2
	2	●	MVE0820X02S100	38.5	41.5	85.5	84	1.5	10	2
	3	●	MVE0820X03S090	54.5	57.5	99.5	98	1.5	9	2
	3	●	MVE0820X03S100	54.5	57.5	99.5	98	1.5	10	2
8.3	2	●	MVE0830X02S090	38.5	41.5	85.5	84	1.5	9	2
	2	●	MVE0830X02S100	38.5	41.5	85.5	84	1.5	10	2
	3	●	MVE0830X03S090	54.5	57.5	99.5	98	1.5	9	2
	3	●	MVE0830X03S100	54.5	57.5	99.5	98	1.5	10	2
8.4	2	●	MVE0840X02S090	38.5	41.5	85.5	84	1.5	9	2
	2	●	MVE0840X02S100	38.5	41.5	85.5	84	1.5	10	2
	3	●	MVE0840X03S090	54.5	57.5	99.5	98	1.5	9	2
	3	●	MVE0840X03S100	54.5	57.5	99.5	98	1.5	10	2

CUTTING CONDITIONS ➤ N030
TECHNICAL DATA ➤ Q001

MVE

WSTAR DRILLS

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.5	2	●	MVE0850X02S090	38.5	41.5	85.5	84	1.5	9	2
	2	●	MVE0850X02S100	38.5	41.5	85.5	84	1.5	10	2
	3	●	MVE0850X03S090	54.5	57.5	99.5	98	1.5	9	2
	3	●	MVE0850X03S100	54.5	57.5	99.5	98	1.5	10	2
8.6	2	●	MVE0860X02S090	41.6	41.6	85.6	84	1.6	9	2
	2	●	MVE0860X02S100	41.6	43.6	85.6	84	1.6	10	2
	3	●	MVE0860X03S090	56.6	56.6	99.6	98	1.6	9	2
	3	●	MVE0860X03S100	56.6	58.6	99.6	98	1.6	10	2
8.7	2	●	MVE0870X02S090	41.6	41.6	85.6	84	1.6	9	2
	2	●	MVE0870X02S100	41.6	43.6	85.6	84	1.6	10	2
	3	●	MVE0870X03S090	56.6	56.6	99.6	98	1.6	9	2
	3	●	MVE0870X03S100	56.6	58.6	99.6	98	1.6	10	2
8.8	2	●	MVE0880X02S090	41.6	41.6	85.6	84	1.6	9	2
	2	●	MVE0880X02S100	41.6	43.6	85.6	84	1.6	10	2
	3	●	MVE0880X03S090	56.6	56.6	99.6	98	1.6	9	2
	3	●	MVE0880X03S100	56.6	58.6	99.6	98	1.6	10	2
8.9	2	●	MVE0890X02S090	41.6	41.6	85.6	84	1.6	9	2
	2	●	MVE0890X02S100	41.6	43.6	85.6	84	1.6	10	2
	3	●	MVE0890X03S090	56.6	56.6	99.6	98	1.6	9	2
	3	●	MVE0890X03S100	56.6	58.6	99.6	98	1.6	10	2
9.0	2	●	MVE0900X02S090	41.6	41.6	85.6	84	1.6	9	2
	2	●	MVE0900X02S100	41.6	43.6	85.6	84	1.6	10	2
	3	●	MVE0900X03S090	56.6	56.6	99.6	98	1.6	9	2
	3	●	MVE0900X03S100	56.6	58.6	99.6	98	1.6	10	2
9.1	2	●	MVE0910X02S100	41.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0910X03S100	59.7	62.7	106.7	105	1.7	10	2
9.2	2	●	MVE0920X02S100	41.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0920X03S100	59.7	62.7	106.7	105	1.7	10	2
9.3	2	●	MVE0930X02S100	41.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0930X03S100	59.7	62.7	106.7	105	1.7	10	2
9.4	2	●	MVE0940X02S100	41.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0940X03S100	59.7	62.7	106.7	105	1.7	10	2
9.5	2	●	MVE0950X02S100	41.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0950X03S100	59.7	62.7	106.7	105	1.7	10	2
9.6	2	●	MVE0960X02S100	44.7	44.7	90.7	89	1.7	10	2
	3	●	MVE0960X03S100	61.7	61.7	106.7	105	1.7	10	2
9.7	2	●	MVE0970X02S100	44.8	44.8	90.8	89	1.8	10	2
	3	●	MVE0970X03S100	61.8	61.8	106.8	105	1.8	10	2
9.8	2	●	MVE0980X02S100	44.8	44.8	90.8	89	1.8	10	2
	3	●	MVE0980X03S100	61.8	61.8	106.8	105	1.8	10	2
9.9	2	●	MVE0990X02S100	44.8	44.8	90.8	89	1.8	10	2
	3	●	MVE0990X03S100	61.8	61.8	106.8	105	1.8	10	2
10.0	2	●	MVE1000X02S100	44.8	44.8	90.8	89	1.8	10	2
	3	●	MVE1000X03S100	61.8	61.8	106.8	105	1.8	10	2
10.1	2	●	MVE1010X02S110	44.8	47.8	96.8	95	1.8	11	2
	2	●	MVE1010X02S120	44.8	47.8	96.8	95	1.8	12	2
	3	●	MVE1010X03S110	67.8	70.8	115.8	114	1.8	11	2
	3	●	MVE1010X03S120	67.8	70.8	115.8	114	1.8	12	2
10.2	2	●	MVE1020X02S110	44.9	47.9	96.9	95	1.9	11	2
	2	●	MVE1020X02S120	44.9	47.9	96.9	95	1.9	12	2
	3	●	MVE1020X03S110	67.9	70.9	115.9	114	1.9	11	2
	3	●	MVE1020X03S120	67.9	70.9	115.9	114	1.9	12	2

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.3	2	●	MVE1030X02S110	44.9	47.9	96.9	95	1.9	11	2
	2	●	MVE1030X02S120	44.9	47.9	96.9	95	1.9	12	2
	3	●	MVE1030X03S110	67.9	70.9	115.9	114	1.9	11	2
	3	●	MVE1030X03S120	67.9	70.9	115.9	114	1.9	12	2
10.4	2	●	MVE1040X02S110	44.9	47.9	96.9	95	1.9	11	2
	2	●	MVE1040X02S120	44.9	47.9	96.9	95	1.9	12	2
	3	●	MVE1040X03S110	67.9	70.9	115.9	114	1.9	11	2
	3	●	MVE1040X03S120	67.9	70.9	115.9	114	1.9	12	2
10.5	2	●	MVE1050X02S110	44.9	47.9	96.9	95	1.9	11	2
	2	●	MVE1050X02S120	44.9	47.9	96.9	95	1.9	12	2
	3	●	MVE1050X03S110	67.9	70.9	115.9	114	1.9	11	2
	3	●	MVE1050X03S120	67.9	70.9	115.9	114	1.9	12	2
10.6	2	●	MVE1060X02S110	48.9	48.9	96.9	95	1.9	11	2
	2	●	MVE1060X02S120	48.9	49.9	96.9	95	1.9	12	2
	3	●	MVE1060X03S110	69.9	69.9	115.9	114	1.9	11	2
	3	●	MVE1060X03S120	69.9	70.9	115.9	114	1.9	12	2
10.7	2	●	MVE1070X02S110	48.9	48.9	96.9	95	1.9	11	2
	2	●	MVE1070X02S120	48.9	49.9	96.9	95	1.9	12	2
	3	●	MVE1070X03S110	69.9	69.9	115.9	114	1.9	11	2
	3	●	MVE1070X03S120	69.9	70.9	115.9	114	1.9	12	2
10.8	2	●	MVE1080X02S110	49.0	49.0	97.0	95	2.0	11	2
	2	●	MVE1080X02S120	49.0	50.0	97.0	95	2.0	12	2
	3	●	MVE1080X03S110	70.0	70.0	116.0	114	2.0	11	2
	3	●	MVE1080X03S120	70.0	71.0	116.0	114	2.0	12	2
10.9	2	●	MVE1090X02S110	49.0	49.0	97.0	95	2.0	11	2
	2	●	MVE1090X02S120	49.0	50.0	97.0	95	2.0	12	2
	3	●	MVE1090X03S110	70.0	70.0	116.0	114	2.0	11	2
	3	●	MVE1090X03S120	70.0	71.0	116.0	114	2.0	12	2
11.0	2	●	MVE1100X02S110	49.0	49.0	97.0	95	2.0	11	2
	2	●	MVE1100X02S120	49.0	50.0	97.0	95	2.0	12	2
	3	●	MVE1100X03S110	70.0	70.0	116.0	114	2.0	11	2
	3	●	MVE1100X03S120	70.0	71.0	116.0	114	2.0	12	2
11.1	2	●	MVE1110X02S120	49.0	52.0	97.0	95	2.0	12	2
	3	●	MVE1110X03S120	73.0	76.0	123.0	121	2.0	12	2
11.2	2	●	MVE1120X02S120	49.0	52.0	97.0	95	2.0	12	2
	3	●	MVE1120X03S120	73.0	76.0	123.0	121	2.0	12	2
11.3	2	●	MVE1130X02S120	49.1	52.1	97.1	95	2.1	12	2
	3	●	MVE1130X03S120	73.1	76.1	123.1	121	2.1	12	2
11.4	2	●	MVE1140X02S120	49.1	52.1	97.1	95	2.1	12	2
	3	●	MVE1140X03S120	73.1	76.1	123.1	121	2.1	12	2
11.5	2	●	MVE1150X02S120	49.1	52.1	97.1	95	2.1	12	2
	3	●	MVE1150X03S120	73.1	76.1	123.1	121	2.1	12	2
11.6	2	●	MVE1160X02S120	49.1	49.1	97.1	95	2.1	12	2
	3	●	MVE1160X03S120	75.1	75.1	123.1	121	2.1	12	2
11.7	2	●	MVE1170X02S120	49.1	49.1	97.1	95	2.1	12	2
	3	●	MVE1170X03S120	75.1	75.1	123.1	121	2.1	12	2
11.8	2	●	MVE1180X02S120	49.1	49.1	97.1	95	2.1	12	2
	3	●	MVE1180X03S120	75.1	75.1	123.1	121	2.1	12	2
11.9	2	●	MVE1190X02S120	49.2	49.2	97.2	95	2.2	12	2
	3	●	MVE1190X03S120	75.2	75.2	123.2	121	2.2	12	2
12.0	2	●	MVE1200X02S120	49.2	49.2	97.2	95	2.2	12	2
	3	●	MVE1200X03S120	75.2	75.2	123.2	121	2.2	12	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

External Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
12.1	2	●	MVE1210X02S130	53.2	56.2	104.2	102	2.2	13	2
	2	□	MVE1210X02S140	53.2	56.2	104.2	102	2.2	14	2
	3	●	MVE1210X03S130	78.2	81.2	139.2	137	2.2	13	2
	3	□	MVE1210X03S140	78.2	81.2	139.2	137	2.2	14	2
12.2	2	●	MVE1220X02S130	53.2	56.2	104.2	102	2.2	13	2
	2	□	MVE1220X02S140	53.2	56.2	104.2	102	2.2	14	2
	3	●	MVE1220X03S130	78.2	81.2	139.2	137	2.2	13	2
	3	□	MVE1220X03S140	78.2	81.2	139.2	137	2.2	14	2
12.3	2	●	MVE1230X02S130	53.2	56.2	104.2	102	2.2	13	2
	2	□	MVE1230X02S140	53.2	56.2	104.2	102	2.2	14	2
	3	●	MVE1230X03S130	78.2	81.2	139.2	137	2.2	13	2
	3	□	MVE1230X03S140	78.2	81.2	139.2	137	2.2	14	2
12.4	2	●	MVE1240X02S130	53.3	56.3	104.3	102	2.3	13	2
	2	□	MVE1240X02S140	53.3	56.3	104.3	102	2.3	14	2
	3	●	MVE1240X03S130	78.3	81.3	139.3	137	2.3	13	2
	3	□	MVE1240X03S140	78.3	81.3	139.3	137	2.3	14	2
12.5	2	●	MVE1250X02S130	53.3	56.3	104.3	102	2.3	13	2
	2	□	MVE1250X02S140	53.3	56.3	104.3	102	2.3	14	2
	3	●	MVE1250X03S130	78.3	81.3	139.3	137	2.3	13	2
	3	□	MVE1250X03S140	78.3	81.3	139.3	137	2.3	14	2
12.6	2	●	MVE1260X02S130	53.3	53.3	104.3	102	2.3	13	2
	2	□	MVE1260X02S140	53.3	53.3	104.3	102	2.3	14	2
	3	●	MVE1260X03S130	80.3	80.3	139.3	137	2.3	13	2
	3	□	MVE1260X03S140	80.3	80.3	139.3	137	2.3	14	2
12.7	2	●	MVE1270X02S130	53.3	53.3	104.3	102	2.3	13	2
	2	□	MVE1270X02S140	53.3	53.3	104.3	102	2.3	14	2
	3	●	MVE1270X03S130	80.3	80.3	139.3	137	2.3	13	2
	3	□	MVE1270X03S140	80.3	80.3	139.3	137	2.3	14	2
12.8	2	●	MVE1280X02S130	53.3	53.3	104.3	102	2.3	13	2
	2	□	MVE1280X02S140	53.3	53.3	104.3	102	2.3	14	2
	3	●	MVE1280X03S130	80.3	80.3	139.3	137	2.3	13	2
	3	□	MVE1280X03S140	80.3	80.3	139.3	137	2.3	14	2
12.9	2	●	MVE1290X02S130	53.3	53.3	104.3	102	2.3	13	2
	2	□	MVE1290X02S140	53.3	53.3	104.3	102	2.3	14	2
	3	●	MVE1290X03S130	80.3	80.3	139.3	137	2.3	13	2
	3	□	MVE1290X03S140	80.3	80.3	139.3	137	2.3	14	2
13.0	2	●	MVE1300X02S130	53.4	53.4	104.4	102	2.4	13	2
	2	□	MVE1300X02S140	53.4	53.4	104.4	102	2.4	14	2
	3	●	MVE1300X03S130	80.4	80.4	139.4	137	2.4	13	2
	3	□	MVE1300X03S140	80.4	80.4	139.4	137	2.4	14	2
13.1	2	●	MVE1310X02S140	56.4	59.4	109.4	107	2.4	14	2
	3	●	MVE1310X03S140	86.4	89.4	149.4	147	2.4	14	2
13.2	2	●	MVE1320X02S140	56.4	59.4	109.4	107	2.4	14	2
	3	●	MVE1320X03S140	86.4	89.4	149.4	147	2.4	14	2
13.3	2	●	MVE1330X02S140	56.4	59.4	109.4	107	2.4	14	2
	3	●	MVE1330X03S140	86.4	89.4	149.4	147	2.4	14	2
13.4	2	●	MVE1340X02S140	56.4	59.4	109.4	107	2.4	14	2
	3	●	MVE1340X03S140	86.4	89.4	149.4	147	2.4	14	2
13.5	2	●	MVE1350X02S140	56.5	59.5	109.5	107	2.5	14	2
	3	●	MVE1350X03S140	86.5	89.5	149.5	147	2.5	14	2
13.6	2	●	MVE1360X02S140	56.5	56.5	109.5	107	2.5	14	2
	3	●	MVE1360X03S140	88.5	88.5	149.5	147	2.5	14	2

External Coolant

NEW DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.7	2	●	MVE1370X02S140	56.5	56.5	109.5	107	2.5	14	2
	3	●	MVE1370X03S140	88.5	88.5	149.5	147	2.5	14	2
13.8	2	●	MVE1380X02S140	56.5	56.5	109.5	107	2.5	14	2
	3	●	MVE1380X03S140	88.5	88.5	149.5	147	2.5	14	2
13.9	2	●	MVE1390X02S140	56.5	56.5	109.5	107	2.5	14	2
	3	●	MVE1390X03S140	88.5	88.5	149.5	147	2.5	14	2
14.0	2	●	MVE1400X02S140	56.5	56.5	109.5	107	2.5	14	2
	3	●	MVE1400X03S140	88.5	88.5	149.5	147	2.5	14	2
14.1	2	●	MVE1410X02S150	58.6	61.6	113.6	111	2.6	15	2
	2	□	MVE1410X02S160	58.6	61.6	113.6	111	2.6	16	2
	3	●	MVE1410X03S150	91.6	94.6	155.6	153	2.6	15	2
	3	□	MVE1410X03S160	91.6	94.6	155.6	153	2.6	16	2
14.2	2	●	MVE1420X02S150	58.6	61.6	113.6	111	2.6	15	2
	2	□	MVE1420X02S160	58.6	61.6	113.6	111	2.6	16	2
	3	●	MVE1420X03S150	91.6	94.6	155.6	153	2.6	15	2
	3	□	MVE1420X03S160	91.6	94.6	155.6	153	2.6	16	2
14.3	2	□	MVE1430X02S150	58.6	61.6	113.6	111	2.6	15	2
	2	□	MVE1430X02S160	58.6	61.6	113.6	111	2.6	16	2
	3	●	MVE1430X03S150	91.6	94.6	155.6	153	2.6	15	2
	3	□	MVE1430X03S160	91.6	94.6	155.6	153	2.6	16	2
14.4	2	□	MVE1440X02S150	58.6	61.6	113.6	111	2.6	15	2
	2	□	MVE1440X02S160	58.6	61.6	113.6	111	2.6	16	2
	3	●	MVE1440X03S150	91.6	94.6	155.6	153	2.6	15	2
	3	□	MVE1440X03S160	91.6	94.6	155.6	153	2.6	16	2
14.5	2	●	MVE1450X02S150	58.6	61.6	113.6	111	2.6	15	2
	2	□	MVE1450X02S160	58.6	61.6	113.6	111	2.6	16	2
	3	●	MVE1450X03S150	91.6	94.6	155.6	153	2.6	15	2
	3	□	MVE1450X03S160	91.6	94.6	155.6	153	2.6	16	2
14.6	2	□	MVE1460X02S150	58.7	58.7	113.7	111	2.7	15	2
	2	□	MVE1460X02S160	58.7	58.7	113.7	111	2.7	16	2
	3	●	MVE1460X03S150	93.7	93.7	155.7	153	2.7	15	2
	3	□	MVE1460X03S160	93.7	93.7	155.7	153	2.7	16	2
14.7	2	□	MVE1470X02S150	58.7	58.7	113.7	111	2.7	15	2
	2	□	MVE1470X02S160	58.7	58.7	113.7	111	2.7	16	2
	3	●	MVE1470X03S150	93.7	93.7	155.7	153	2.7	15	2
	3	□	MVE1470X03S160	93.7	93.7	155.7	153	2.7	16	2
14.8	2	□	MVE1480X02S150	58.7	58.7	113.7	111	2.7	15	2
	2	□	MVE1480X02S160	58.7	58.7	113.7	111	2.7	16	2
	3	●	MVE1480X03S150	93.7	93.7	155.7	153	2.7	15	2
	3	□	MVE1480X03S160	93.7	93.7	155.7	153	2.7	16	2
14.9	2	□	MVE1490X02S150	58.7	58.7	113.7	111	2.7	15	2
	2	□	MVE1490X02S160	58.7	58.7	113.7	111	2.7	16	2
	3	●	MVE1490X03S150	93.7	93.7	155.7	153	2.7	15	2
	3	□	MVE1490X03S160	93.7	93.7	155.7	153	2.7	16	2
15.0	2	●	MVE1500X02S150	58.7	58.7	113.7	111	2.7	15	2
	2	□	MVE1500X02S160	58.7	58.7	113.7	111	2.7	16	2
	3	●	MVE1500X03S150	93.7	93.7	155.7	153	2.7	15	2
	3	□	MVE1500X03S160	93.7	93.7	155.7	153	2.7	16	2
15.1	2	□	MVE1510X02S160	60.7	63.7	117.7	115	2.7	16	2
	3	●	MVE1510X03S160	96.7	99.7	162.7	160	2.7	16	2
15.2	2	●	MVE1520X02S160	60.8	63.8	117.8	115	2.8	16	2
	3	●	MVE1520X03S160	96.8	99.8	162.8	160	2.8	16	2

CUTTING CONDITIONS ➤ N030
TECHNICAL DATA ➤ Q001

MVE

WSTAR DRILLS

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
15.3	2	□	MVE1530X02S160	60.8	63.8	117.8	115	2.8	16	2
	3	●	MVE1530X03S160	96.8	99.8	162.8	160	2.8	16	2
15.4	2	□	MVE1540X02S160	60.8	63.8	117.8	115	2.8	16	2
	3	●	MVE1540X03S160	96.8	99.8	162.8	160	2.8	16	2
15.5	2	●	MVE1550X02S160	60.8	63.8	117.8	115	2.8	16	2
	3	●	MVE1550X03S160	96.8	99.8	162.8	160	2.8	16	2
15.6	2	□	MVE1560X02S160	60.8	60.8	117.8	115	2.8	16	2
	3	●	MVE1560X03S160	98.8	98.8	162.8	160	2.8	16	2
15.7	2	□	MVE1570X02S160	60.9	60.9	117.9	115	2.9	16	2
	3	●	MVE1570X03S160	98.9	98.9	162.9	160	2.9	16	2
15.8	2	□	MVE1580X02S160	60.9	60.9	117.9	115	2.9	16	2
	3	●	MVE1580X03S160	98.9	98.9	162.9	160	2.9	16	2
15.9	2	□	MVE1590X02S160	60.9	60.9	117.9	115	2.9	16	2
	3	●	MVE1590X03S160	98.9	98.9	162.9	160	2.9	16	2
16.0	2	●	MVE1600X02S160	60.9	60.9	117.9	115	2.9	16	2
	3	●	MVE1600X03S160	98.9	98.9	162.9	160	2.9	16	2
16.1	2	□	MVE1610X02S170	62.9	62.9	121.9	119	2.9	17	2
	2	□	MVE1610X02S180	62.9	62.9	121.9	119	2.9	18	2
	3	□	MVE1610X03S170	104.9	104.9	169.9	167	2.9	17	2
	3	□	MVE1610X03S180	104.9	104.9	169.9	167	2.9	18	2
16.2	2	●	MVE1620X02S170	62.9	62.9	121.9	119	2.9	17	2
	2	□	MVE1620X02S180	62.9	62.9	121.9	119	2.9	18	2
	3	□	MVE1620X03S170	104.9	104.9	169.9	167	2.9	17	2
	3	□	MVE1620X03S180	104.9	104.9	169.9	167	2.9	18	2
16.3	2	●	MVE1630X02S170	63.0	63.0	122.0	119	3.0	17	2
	2	□	MVE1630X02S180	63.0	63.0	122.0	119	3.0	18	2
	3	□	MVE1630X03S170	105.0	105.0	170.0	167	3.0	17	2
	3	□	MVE1630X03S180	105.0	105.0	170.0	167	3.0	18	2
16.4	2	□	MVE1640X02S170	63.0	63.0	122.0	119	3.0	17	2
	2	□	MVE1640X02S180	63.0	63.0	122.0	119	3.0	18	2
	3	□	MVE1640X03S170	105.0	105.0	170.0	167	3.0	17	2
	3	□	MVE1640X03S180	105.0	105.0	170.0	167	3.0	18	2
16.5	2	●	MVE1650X02S170	63.0	63.0	122.0	119	3.0	17	2
	2	□	MVE1650X02S180	63.0	63.0	122.0	119	3.0	18	2
	3	●	MVE1650X03S170	105.0	105.0	170.0	167	3.0	17	2
	3	□	MVE1650X03S180	105.0	105.0	170.0	167	3.0	18	2
16.6	2	□	MVE1660X02S170	63.0	63.0	122.0	119	3.0	17	2
	2	□	MVE1660X02S180	63.0	63.0	122.0	119	3.0	18	2
	3	□	MVE1660X03S170	105.0	105.0	170.0	167	3.0	17	2
	3	□	MVE1660X03S180	105.0	105.0	170.0	167	3.0	18	2
16.7	2	□	MVE1670X02S170	63.0	63.0	122.0	119	3.0	17	2
	2	□	MVE1670X02S180	63.0	63.0	122.0	119	3.0	18	2
	3	□	MVE1670X03S170	105.0	105.0	170.0	167	3.0	17	2
	3	□	MVE1670X03S180	105.0	105.0	170.0	167	3.0	18	2
16.8	2	□	MVE1680X02S170	63.1	63.1	122.1	119	3.1	17	2
	2	□	MVE1680X02S180	63.1	63.1	122.1	119	3.1	18	2
	3	□	MVE1680X03S170	105.1	105.1	170.1	167	3.1	17	2
	3	□	MVE1680X03S180	105.1	105.1	170.1	167	3.1	18	2
16.9	2	□	MVE1690X02S170	63.1	63.1	122.1	119	3.1	17	2
	2	□	MVE1690X02S180	63.1	63.1	122.1	119	3.1	18	2
	3	□	MVE1690X03S170	105.1	105.1	170.1	167	3.1	17	2
	3	□	MVE1690X03S180	105.1	105.1	170.1	167	3.1	18	2

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.0	2	●	MVE1700X02S170	63.1	63.1	122.1	119	3.1	17	2
	2	□	MVE1700X02S180	63.1	63.1	122.1	119	3.1	18	2
	3	●	MVE1700X03S170	105.1	105.1	170.1	167	3.1	17	2
	3	□	MVE1700X03S180	105.1	105.1	170.1	167	3.1	18	2
17.1	2	□	MVE1710X02S180	65.1	65.1	126.1	123	3.1	18	2
	3	□	MVE1710X03S180	105.1	105.1	170.1	167	3.1	18	2
17.2	2	□	MVE1720X02S180	65.1	65.1	126.1	123	3.1	18	2
	3	□	MVE1720X03S180	105.1	105.1	170.1	167	3.1	18	2
17.3	2	□	MVE1730X02S180	65.1	65.1	126.1	123	3.1	18	2
	3	□	MVE1730X03S180	105.1	105.1	170.1	167	3.1	18	2
17.4	2	□	MVE1740X02S180	65.2	65.2	126.2	123	3.2	18	2
	3	□	MVE1740X03S180	105.2	105.2	170.2	167	3.2	18	2
17.5	2	●	MVE1750X02S180	65.2	65.2	126.2	123	3.2	18	2
	3	●	MVE1750X03S180	105.2	105.2	170.2	167	3.2	18	2
17.6	2	□	MVE1760X02S180	65.2	65.2	126.2	123	3.2	18	2
	3	□	MVE1760X03S180	105.2	105.2	170.2	167	3.2	18	2
17.7	2	□	MVE1770X02S180	65.2	65.2	126.2	123	3.2	18	2
	3	□	MVE1770X03S180	105.2	105.2	170.2	167	3.2	18	2
17.8	2	●	MVE1780X02S180	65.2	65.2	126.2	123	3.2	18	2
	3	□	MVE1780X03S180	105.2	105.2	170.2	167	3.2	18	2
17.9	2	□	MVE1790X02S180	65.3	65.3	126.3	123	3.3	18	2
	3	□	MVE1790X03S180	105.3	105.3	170.3	167	3.3	18	2
18.0	2	●	MVE1800X02S180	65.3	65.3	126.3	123	3.3	18	2
	3	●	MVE1800X03S180	105.3	105.3	170.3	167	3.3	18	2
18.1	2	□	MVE1810X02S190	67.3	67.3	130.3	127	3.3	19	2
	2	□	MVE1810X02S200	67.3	67.3	130.3	127	3.3	20	2
	3	□	MVE1810X03S190	117.3	117.3	182.3	179	3.3	19	2
	3	□	MVE1810X03S200	117.3	117.3	182.3	179	3.3	20	2
18.2	2	□	MVE1820X02S190	67.3	67.3	130.3	127	3.3	19	2
	2	□	MVE1820X02S200	67.3	67.3	130.3	127	3.3	20	2
	3	□	MVE1820X03S190	117.3	117.3	182.3	179	3.3	19	2
	3	□	MVE1820X03S200	117.3	117.3	182.3	179	3.3	20	2
18.3	2	□	MVE1830X02S190	67.3	67.3	130.3	127	3.3	19	2
	2	□	MVE1830X02S200	67.3	67.3	130.3	127	3.3	20	2
	3	□	MVE1830X03S190	117.3	117.3	182.3	179	3.3	19	2
	3	□	MVE1830X03S200	117.3	117.3	182.3	179	3.3	20	2
18.4	2	□	MVE1840X02S190	67.3	67.3	130.3	127	3.3	19	2
	2	□	MVE1840X02S200	67.3	67.3	130.3	127	3.3	20	2
	3	□	MVE1840X03S190	117.3	117.3	182.3	179	3.3	19	2
	3	□	MVE1840X03S200	117.3	117.3	182.3	179	3.3	20	2
18.5	2	●	MVE1850X02S190	67.4	67.4	130.4	127	3.4	19	2
	2	□	MVE1850X02S200	67.4	67.4	130.4	127	3.4	20	2
	3	●	MVE1850X03S190	117.4	117.4	182.4	179	3.4	19	2
	3	□	MVE1850X03S200	117.4	117.4	182.4	179	3.4	20	2
18.6	2	□	MVE1860X02S190	67.4	67.4	130.4	127	3.4	19	2
	2	□	MVE1860X02S200	67.4	67.4	130.4	127	3.4	20	2
	3	□	MVE1860X03S190	117.4	117.4	182.4	179	3.4	19	2
	3	□	MVE1860X03S200	117.4	117.4	182.4	179	3.4	20	2
18.7	2	□	MVE1870X02S190	67.4	67.4	130.4	127	3.4	19	2
	2	□	MVE1870X02S200	67.4	67.4	130.4	127	3.4	20	2
	3	□	MVE1870X03S190	117.4	117.4	182.4	179	3.4	19	2
	3	□	MVE1870X03S200	117.4	117.4	182.4	179	3.4	20	2

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock DP1020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
18.8	2	□	MVE1880X02S190	67.4	67.4	130.4	127	3.4	19	2
	2	□	MVE1880X02S200	67.4	67.4	130.4	127	3.4	20	2
	3	□	MVE1880X03S190	117.4	117.4	182.4	179	3.4	19	2
	3	□	MVE1880X03S200	117.4	117.4	182.4	179	3.4	20	2
18.9	2	□	MVE1890X02S190	67.4	67.4	130.4	127	3.4	19	2
	2	□	MVE1890X02S200	67.4	67.4	130.4	127	3.4	20	2
	3	□	MVE1890X03S190	117.4	117.4	182.4	179	3.4	19	2
	3	□	MVE1890X03S200	117.4	117.4	182.4	179	3.4	20	2
19.0	2	●	MVE1900X02S190	67.5	67.5	130.5	127	3.5	19	2
	2	□	MVE1900X02S200	67.5	67.5	130.5	127	3.5	20	2
	3	●	MVE1900X03S190	117.5	117.5	182.5	179	3.5	19	2
	3	□	MVE1900X03S200	117.5	117.5	182.5	179	3.5	20	2
19.1	2	□	MVE1910X02S200	69.5	69.5	134.5	131	3.5	20	2
	3	□	MVE1910X03S200	117.5	117.5	182.5	179	3.5	20	2
19.2	2	□	MVE1920X02S200	69.5	69.5	134.5	131	3.5	20	2
	3	□	MVE1920X03S200	117.5	117.5	182.5	179	3.5	20	2
19.3	2	□	MVE1930X02S200	69.5	69.5	134.5	131	3.5	20	2
	3	□	MVE1930X03S200	117.5	117.5	182.5	179	3.5	20	2
19.4	2	□	MVE1940X02S200	69.5	69.5	134.5	131	3.5	20	2
	3	□	MVE1940X03S200	117.5	117.5	182.5	179	3.5	20	2
19.5	2	●	MVE1950X02S200	69.5	69.5	134.5	131	3.5	20	2
	3	●	MVE1950X03S200	117.5	117.5	182.5	179	3.5	20	2
19.6	2	□	MVE1960X02S200	69.6	69.6	134.6	131	3.6	20	2
	3	□	MVE1960X03S200	117.6	117.6	182.6	179	3.6	20	2
19.7	2	□	MVE1970X02S200	69.6	69.6	134.6	131	3.6	20	2
	3	□	MVE1970X03S200	117.6	117.6	182.6	179	3.6	20	2
19.8	2	□	MVE1980X02S200	69.6	69.6	134.6	131	3.6	20	2
	3	□	MVE1980X03S200	117.6	117.6	182.6	179	3.6	20	2
19.9	2	□	MVE1990X02S200	69.6	69.6	134.6	131	3.6	20	2
	3	□	MVE1990X03S200	117.6	117.6	182.6	179	3.6	20	2
20.0	2	●	MVE2000X02S200	69.6	69.6	134.6	131	3.6	20	2
	3	●	MVE2000X03S200	117.6	117.6	182.6	179	3.6	20	2

MVE

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

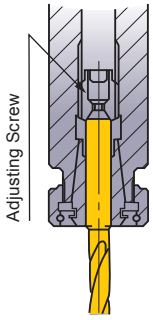
Work Material	Mild Steel (≤180HB) AISI 1010 etc			Carbon steel, Alloy steel (180—280HB) AISI 1045, AISI 4140 etc			Carbon steel, Alloy steel (280—350HB) AISI 4340 etc		
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (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)

Work 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)

Work Material	Aluminium Alloy (Si<5%)			Heat Resistant Alloy 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)

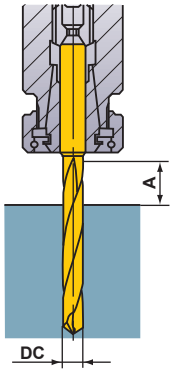
OPERATIONAL GUIDANCE

Drill Holding



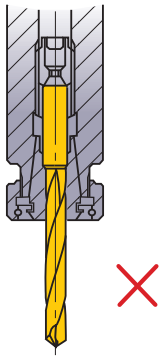
Thrust bearing type collet chuck holds the drill securely.

Drill Length



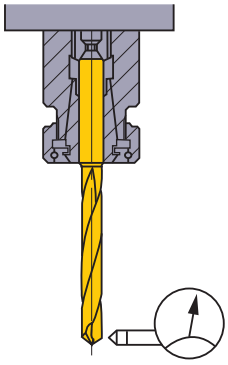
A ≥ DC x 1.5

Drill Installation



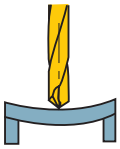
Do not clamp on the flutes.

Installation Tolerance

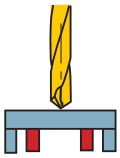


Run-out ≤ 0.03mm

Thin Workpiece

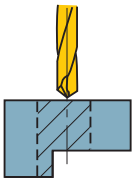


If Bending Occurs



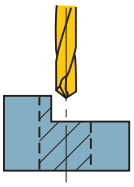
Support the Workpiece

Interrupted Cutting



One Process

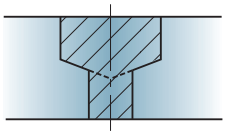
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

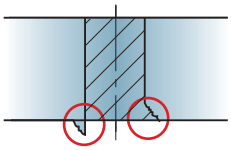
①Spot face with an end mill prior to drilling.

Stepped Holes



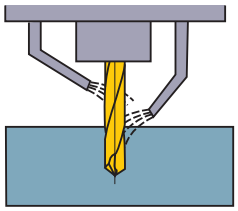
①Divide the two processes.
②Drill the larger hole first.
*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



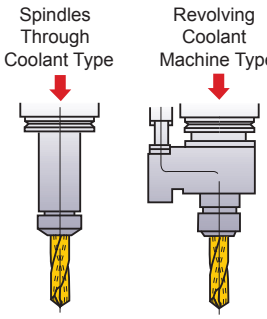
①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

Coolant Method (MVE)



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

Through Coolant Type (MVS)



Coolant pressure is approx. 0.5—1MPa (<ϕ5:2—3MPa).
Coolant volume is 1.5—4.0l/min.

Coolant Handling

<MVS Type>

1) Small particles of swarf will jam in the oil 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. Regular coolant exchange is recommended.

DRILLING(SOLID CARBIDE)

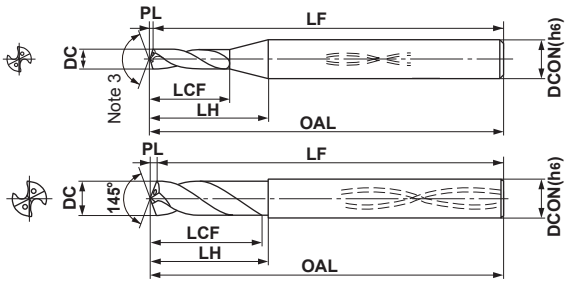
MWS
WSTAR DRILLS

●For high accuracy and efficient drilling of carbon steels through to difficult-to-cut materials.

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

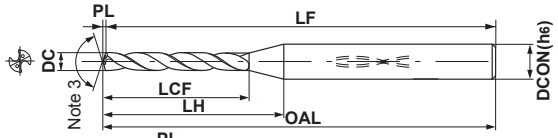
	0.5≤DC<1	1≤DC<2.95
	+0.009 0	+0.014 0
h6	0 −0.006	0 −0.006

SB Type
(For pilot holes)

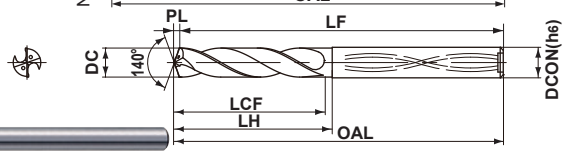


LB/XB Type (ϕ0.50−ϕ2.95)

	0.5≤DC<1	1≤DC<2.95
	0 −0.009	0 −0.014
h6	0 −0.006	0 −0.006



DB Type (ϕ0.50−ϕ2.95)

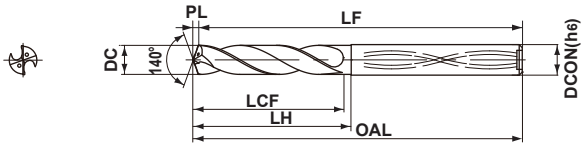


(Note) MWS drills are suitable for use with shrink fit holders.

MB/LB/X8DB Type (ϕ3−ϕ25)

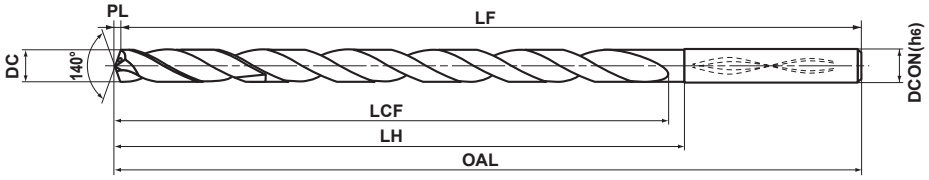
	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤25
	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

ϕ3.0−ϕ6.0



X10DB/X15DB/X20DB/X25DB/X30DB Type (ϕ3−ϕ14, l/d≥10)

	DC=3	3<DC≤6	6<DC≤10	10<DC≤14
	−0.017 −0.031	−0.025 −0.043	−0.033 −0.055	−0.041 −0.068
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011



(Note 1) MWS type bigger than ϕ5.0 have a recess in the end face.
(Note 2) MWS drills are suitable for use with shrink fit holders.
(Note 3) Point Angle l: 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.

★ To order non-stocked size of the DB Type (ϕ3-ϕ14, l/d>10), please provide the following.
①Drill name
②Workpiece material, drilling depth and required accuracy.
③Drilling mode (through hole, blind hole, cross hole...)
④Drill dimensions (dimensions specified in the drawing above).
Please contact us for inquiries.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.50	1	●	MWS0050SB	2.59	7.29	47.09	47	0.09	3	1
	5	●	MWS0050LB	8.09	13.09	47.09	47	0.10	3	3
	12	●	MWS0050XB	16.09	21.09	47.09	47	0.10	3	3
0.51	1	●	MWS0051SB	2.69	7.29	47.09	47	0.09	3	1
	5	●	MWS0051LB	8.09	13.09	47.09	47	0.11	3	3
	12	●	MWS0051XB	16.09	21.09	47.09	47	0.11	3	3
0.52	1	●	MWS0052SB	2.69	7.29	47.09	47	0.09	3	1
	5	●	MWS0052LB	8.09	13.09	47.09	47	0.11	3	3
	12	●	MWS0052XB	16.09	21.09	47.09	47	0.11	3	3
0.53	1	●	MWS0053SB	2.70	7.30	47.10	47	0.10	3	1
	5	●	MWS0053LB	8.10	13.10	47.10	47	0.11	3	3
	12	●	MWS0053XB	16.10	21.10	47.10	47	0.11	3	3
0.54	1	●	MWS0054SB	2.70	7.30	47.10	47	0.10	3	1
	5	●	MWS0054LB	8.10	13.10	47.10	47	0.11	3	3
	12	●	MWS0054XB	16.10	21.10	47.10	47	0.11	3	3
0.55	1	●	MWS0055SB	2.70	7.30	47.10	47	0.10	3	1
	5	●	MWS0055LB	8.10	13.10	47.10	47	0.11	3	3
	12	●	MWS0055XB	16.10	21.10	47.10	47	0.11	3	3
0.56	1	●	MWS0056SB	3.00	7.60	47.10	47	0.10	3	1
	5	●	MWS0056LB	8.10	13.10	47.10	47	0.12	3	3
	12	●	MWS0056XB	16.10	21.10	47.10	47	0.12	3	3
0.57	1	●	MWS0057SB	3.00	7.50	47.10	47	0.10	3	1
	5	●	MWS0057LB	8.10	13.10	47.10	47	0.12	3	3
	12	●	MWS0057XB	16.10	21.10	47.10	47	0.12	3	3
0.58	1	●	MWS0058SB	3.01	7.51	47.11	47	0.11	3	1
	5	●	MWS0058LB	8.11	13.11	47.11	47	0.12	3	3
	12	●	MWS0058XB	16.11	21.11	47.11	47	0.12	3	3
0.59	1	●	MWS0059SB	3.01	7.51	47.11	47	0.11	3	1
	5	●	MWS0059LB	8.11	12.11	47.11	47	0.12	3	3
	12	●	MWS0059XB	16.11	20.11	47.11	47	0.12	3	3
0.60	1	●	MWS0060SB	3.01	7.51	47.11	47	0.11	3	1
	5	●	MWS0060LB	8.11	12.11	47.11	47	0.12	3	3
	12	●	MWS0060XB	16.11	20.11	47.11	47	0.12	3	3
0.61	1	●	MWS0061SB	3.21	7.71	47.11	47	0.11	3	1
	5	●	MWS0061LB	8.11	12.11	47.11	47	0.13	3	3
	12	●	MWS0061XB	16.11	20.11	47.11	47	0.13	3	3
0.62	1	●	MWS0062SB	3.21	7.61	47.11	47	0.11	3	1
	5	●	MWS0062LB	8.11	12.11	47.11	47	0.13	3	3
	12	●	MWS0062XB	16.11	20.11	47.11	47	0.13	3	3
0.63	1	●	MWS0063SB	3.21	7.61	47.11	47	0.11	3	1
	5	●	MWS0063LB	8.11	12.11	47.11	47	0.13	3	3
	12	●	MWS0063XB	16.11	20.11	47.11	47	0.13	3	3
0.64	1	●	MWS0064SB	3.22	7.62	47.12	47	0.12	3	1
	5	●	MWS0064LB	8.12	12.12	47.12	47	0.13	3	3
	12	●	MWS0064XB	16.12	20.12	47.12	47	0.13	3	3
0.65	1	●	MWS0065SB	3.22	7.62	47.12	47	0.12	3	1
	5	●	MWS0065LB	8.12	12.12	47.12	47	0.13	3	3
	12	●	MWS0065XB	16.12	20.12	47.12	47	0.13	3	3
0.66	1	●	MWS0066SB	3.52	7.92	47.12	47	0.12	3	1
	5	●	MWS0066LB	8.12	12.12	47.12	47	0.14	3	3
	12	●	MWS0066XB	16.12	20.12	47.12	47	0.14	3	3

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.67	1	●	MWS0067SB	3.52	7.82	47.12	47	0.12	3	1
	5	●	MWS0067LB	8.12	12.12	47.12	47	0.14	3	3
	12	●	MWS0067XB	16.12	20.12	47.12	47	0.14	3	3
0.68	1	●	MWS0068SB	3.52	7.82	47.12	47	0.12	3	1
	5	●	MWS0068LB	8.12	12.12	47.12	47	0.14	3	3
	12	●	MWS0068XB	16.12	20.12	47.12	47	0.14	3	3
0.69	1	●	MWS0069SB	3.53	7.83	47.13	47	0.13	3	1
	5	●	MWS0069LB	8.13	12.13	47.13	47	0.14	3	3
	12	●	MWS0069XB	16.13	20.13	47.13	47	0.14	3	3
0.70	1	●	MWS0070SB	3.53	7.83	47.13	47	0.13	3	1
	5	●	MWS0070LB	8.13	12.13	47.13	47	0.14	3	3
	12	●	MWS0070XB	16.13	20.13	47.13	47	0.14	3	3
0.71	1	●	MWS0071SB	3.73	8.03	50.13	50	0.13	3	1
	5	●	MWS0071LB	10.13	14.13	50.13	50	0.15	3	3
	12	●	MWS0071XB	20.13	24.13	50.13	50	0.15	3	3
0.72	1	●	MWS0072SB	3.73	8.03	50.13	50	0.13	3	1
	5	●	MWS0072LB	10.13	14.13	50.13	50	0.15	3	3
	12	●	MWS0072XB	20.13	24.13	50.13	50	0.15	3	3
0.73	1	●	MWS0073SB	3.73	7.93	50.13	50	0.13	3	1
	5	●	MWS0073LB	10.13	14.13	50.13	50	0.15	3	3
	12	●	MWS0073XB	20.13	24.13	50.13	50	0.15	3	3
0.74	1	●	MWS0074SB	3.73	7.93	50.13	50	0.13	3	1
	5	●	MWS0074LB	10.13	14.13	50.13	50	0.15	3	3
	12	●	MWS0074XB	20.13	24.13	50.13	50	0.15	3	3
0.75	1	●	MWS0075SB	3.74	7.94	50.14	50	0.14	3	1
	5	●	MWS0075LB	10.14	14.14	50.14	50	0.16	3	3
	12	●	MWS0075XB	20.14	24.14	50.14	50	0.16	3	3
0.76	1	●	MWS0076SB	4.04	8.24	50.14	50	0.14	3	1
	5	●	MWS0076LB	10.14	14.14	50.14	50	0.16	3	3
	12	●	MWS0076XB	20.14	24.14	50.14	50	0.16	3	3
0.77	1	●	MWS0077SB	4.04	8.24	50.14	50	0.14	3	1
	5	●	MWS0077LB	10.14	14.14	50.14	50	0.16	3	3
	12	●	MWS0077XB	20.14	24.14	50.14	50	0.16	3	3
0.78	1	●	MWS0078SB	4.04	8.14	50.14	50	0.14	3	1
	5	●	MWS0078LB	10.14	14.14	50.14	50	0.16	3	3
	12	●	MWS0078XB	20.14	24.14	50.14	50	0.16	3	3
0.79	1	●	MWS0079SB	4.04	8.14	50.14	50	0.14	3	1
	5	●	MWS0079LB	10.14	14.14	50.14	50	0.16	3	3
	12	●	MWS0079XB	20.14	24.14	50.14	50	0.16	3	3
0.80	1	●	MWS0080SB	4.05	8.15	50.15	50	0.15	3	1
	5	●	MWS0080LB	10.15	14.15	50.15	50	0.17	3	3
	12	●	MWS0080XB	20.15	24.15	50.15	50	0.17	3	3
0.81	1	●	MWS0081SB	4.25	8.35	50.15	50	0.15	3	1
	5	●	MWS0081LB	10.15	14.15	50.15	50	0.17	3	3
	12	●	MWS0081XB	20.15	24.15	50.15	50	0.17	3	3
0.82	1	●	MWS0082SB	4.25	8.35	50.15	50	0.15	3	1
	5	●	MWS0082LB	10.15	14.15	50.15	50	0.17	3	3
	12	●	MWS0082XB	20.15	24.15	50.15	50	0.17	3	3
0.83	1	●	MWS0083SB	4.25	8.25	50.15	50	0.15	3	1
	5	●	MWS0083LB	10.15	14.15	50.15	50	0.17	3	3
	12	●	MWS0083XB	20.15	24.15	50.15	50	0.17	3	3

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

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.84	1	●	MWS0084SB	4.25	8.25	50.15	50	0.15	3	1
	5	●	MWS0084LB	10.15	14.15	50.15	50	0.17	3	3
	12	●	MWS0084XB	20.15	24.15	50.15	50	0.17	3	3
0.85	1	●	MWS0085SB	4.25	8.25	50.15	50	0.15	3	1
	5	●	MWS0085LB	10.15	14.15	50.15	50	0.18	3	3
	12	●	MWS0085XB	20.15	24.15	50.15	50	0.18	3	3
0.86	1	●	MWS0086SB	4.56	8.56	50.16	50	0.16	3	1
	5	●	MWS0086LB	10.16	14.16	50.16	50	0.18	3	3
	12	●	MWS0086XB	20.16	24.16	50.16	50	0.18	3	3
0.87	1	●	MWS0087SB	4.56	8.56	50.16	50	0.16	3	1
	5	●	MWS0087LB	10.16	14.16	50.16	50	0.18	3	3
	12	●	MWS0087XB	20.16	24.16	50.16	50	0.18	3	3
0.88	1	●	MWS0088SB	4.56	8.56	50.16	50	0.16	3	1
	5	●	MWS0088LB	10.16	14.16	50.16	50	0.18	3	3
	12	●	MWS0088XB	20.16	24.16	50.16	50	0.18	3	3
0.89	1	●	MWS0089SB	4.56	8.46	50.16	50	0.16	3	1
	5	●	MWS0089LB	10.16	14.16	50.16	50	0.18	3	3
	12	●	MWS0089XB	20.16	24.16	50.16	50	0.18	3	3
0.90	1	●	MWS0090SB	4.56	8.46	50.16	50	0.16	3	1
	5	●	MWS0090LB	10.16	14.16	50.16	50	0.19	3	3
	12	●	MWS0090XB	20.16	24.16	50.16	50	0.19	3	3
0.91	1	●	MWS0091SB	4.77	8.67	50.17	50	0.17	3	1
	5	●	MWS0091LB	10.17	14.17	50.17	50	0.19	3	3
	12	●	MWS0091XB	20.17	24.17	50.17	50	0.19	3	3
0.92	1	●	MWS0092SB	4.77	8.67	50.17	50	0.17	3	1
	5	●	MWS0092LB	10.17	14.17	50.17	50	0.19	3	3
	12	●	MWS0092XB	20.17	24.17	50.17	50	0.19	3	3
0.93	1	●	MWS0093SB	4.77	8.67	50.17	50	0.17	3	1
	5	●	MWS0093LB	10.17	14.17	50.17	50	0.19	3	3
	12	●	MWS0093XB	20.17	24.17	50.17	50	0.19	3	3
0.94	1	●	MWS0094SB	4.77	8.57	50.17	50	0.17	3	1
	5	●	MWS0094LB	10.17	14.17	50.17	50	0.19	3	3
	12	●	MWS0094XB	20.17	24.17	50.17	50	0.19	3	3
0.95	1	●	MWS0095SB	4.77	8.57	50.17	50	0.17	3	1
	5	●	MWS0095LB	10.17	14.17	50.17	50	0.20	3	3
	12	●	MWS0095XB	20.17	24.17	50.17	50	0.20	3	3
0.96	1	●	MWS0096SB	5.07	8.87	50.17	50	0.17	3	1
	5	●	MWS0096LB	10.17	14.17	50.17	50	0.20	3	3
	12	●	MWS0096XB	20.17	24.17	50.17	50	0.20	3	3
0.97	1	●	MWS0097SB	5.08	8.88	50.18	50	0.18	3	1
	5	●	MWS0097LB	10.18	14.18	50.18	50	0.20	3	3
	12	●	MWS0097XB	20.18	24.18	50.18	50	0.20	3	3
0.98	1	●	MWS0098SB	5.08	8.88	50.18	50	0.18	3	1
	5	●	MWS0098LB	10.18	14.18	50.18	50	0.20	3	3
	12	●	MWS0098XB	20.18	24.18	50.18	50	0.20	3	3
0.99	1	●	MWS0099SB	5.08	8.88	50.18	50	0.18	3	1
	5	●	MWS0099LB	10.18	14.18	50.18	50	0.21	3	3
	12	●	MWS0099XB	20.18	24.18	50.18	50	0.21	3	3

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.00	1	●	MWS0100SB	5.2	8.9	55.2	55	0.2	3	1
	5	●	MWS0100LB	11.2	15.2	55.2	55	0.2	3	3
	12	●	MWS0100XB	23.2	27.2	55.2	55	0.2	3	3
	20	●	MWS0100X20DB	24.2	28.2	60.2	60	0.2	3	3
	25	●	MWS0100X25DB	28.2	32.2	66.2	66	0.2	3	3
	30	●	MWS0100X30DB	33.2	37.2	72.2	72	0.2	3	3
1.05	1	□	MWS0105SB	5.4	9.0	55.2	55	0.2	3	1
	20	□	MWS0105X20DB	24.2	28.2	60.2	60	0.2	3	3
	25	□	MWS0105X25DB	29.2	33.2	66.2	66	0.2	3	3
	30	□	MWS0105X30DB	35.2	38.2	72.2	72	0.2	3	3
1.10	1	●	MWS0110SB	5.6	9.1	55.2	55	0.2	3	1
	5	●	MWS0110LB	17.2	21.2	55.2	55	0.2	3	3
	12	●	MWS0110XB	23.2	27.2	55.2	55	0.2	3	3
	20	●	MWS0110X20DB	25.2	29.2	60.2	60	0.2	3	3
	25	●	MWS0110X25DB	31.2	34.2	66.2	66	0.2	3	3
	30	●	MWS0110X30DB	36.2	40.2	72.2	72	0.2	3	3
1.15	1	□	MWS0115SB	5.8	9.3	55.2	55	0.2	3	1
	20	□	MWS0115X20DB	26.2	30.2	60.2	60	0.2	3	3
	25	□	MWS0115X25DB	32.2	36.2	66.2	66	0.2	3	3
	30	□	MWS0115X30DB	38.2	41.2	72.2	72	0.2	3	3
1.20	1	●	MWS0120SB	6.2	9.6	55.2	55	0.2	3	1
	5	●	MWS0120LB	17.2	20.2	55.2	55	0.3	3	3
	12	●	MWS0120XB	23.2	26.2	55.2	55	0.3	3	3
	20	●	MWS0120X20DB	28.2	31.2	60.2	60	0.3	3	3
	25	●	MWS0120X25DB	34.2	37.2	66.2	66	0.3	3	3
	30	●	MWS0120X30DB	40.2	43.2	72.2	72	0.3	3	3
1.25	1	□	MWS0125SB	6.4	9.7	55.2	55	0.2	3	1
	20	□	MWS0125X20DB	29.2	32.2	68.2	68	0.3	3	3
	25	□	MWS0125X25DB	35.2	38.2	74.2	74	0.3	3	3
	30	□	MWS0125X30DB	41.2	45.2	82.2	82	0.3	3	3
1.30	1	●	MWS0130SB	6.6	9.8	55.2	55	0.2	3	1
	5	●	MWS0130LB	17.2	20.2	55.2	55	0.3	3	3
	12	●	MWS0130XB	23.2	26.2	55.2	55	0.3	3	3
	20	●	MWS0130X20DB	30.2	33.2	68.2	68	0.3	3	3
	25	●	MWS0130X25DB	36.2	40.2	74.2	74	0.3	3	3
	30	●	MWS0130X30DB	43.2	46.2	82.2	82	0.3	3	3
1.35	1	□	MWS0135SB	6.8	9.9	55.2	55	0.3	3	1
	20	□	MWS0135X20DB	31.2	34.2	68.2	68	0.3	3	3
	25	□	MWS0135X25DB	38.2	41.2	74.2	74	0.3	3	3
	30	□	MWS0135X30DB	45.2	48.2	82.2	82	0.3	3	3
1.40	1	●	MWS0140SB	7.3	10.3	55.3	55	0.3	3	1
	5	●	MWS0140LB	17.3	20.3	55.3	55	0.3	3	3
	12	●	MWS0140XB	23.3	26.3	55.3	55	0.3	3	3
	20	●	MWS0140X20DB	32.3	35.3	68.3	68	0.3	3	3
	25	●	MWS0140X25DB	39.3	42.3	74.3	74	0.3	3	3
	30	●	MWS0140X30DB	46.3	49.3	82.3	82	0.3	3	3
1.45	1	□	MWS0145SB	7.5	10.4	55.3	55	0.3	3	1
	20	□	MWS0145X20DB	33.3	36.3	68.3	68	0.3	3	3
	25	□	MWS0145X25DB	41.3	43.3	74.3	74	0.3	3	3
	30	□	MWS0145X30DB	48.3	51.3	82.3	82	0.3	3	3

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.50	1	●	MWS0150SB	7.7	10.5	55.3	55	0.3	3	1
	5	●	MWS0150LB	17.3	20.3	55.3	55	0.3	3	3
	12	●	MWS0150XB	23.3	26.3	55.3	55	0.3	3	3
	20	●	MWS0150X20DB	35.3	37.3	68.3	68	0.3	3	3
	25	●	MWS0150X25DB	42.3	45.3	74.3	74	0.3	3	3
	30	●	MWS0150X30DB	50.3	52.3	82.3	82	0.3	3	3
1.55	1	□	MWS0155SB	7.9	10.6	68.3	68	0.3	3	1
	20	□	MWS0155X20DB	36.3	38.3	78.3	78	0.3	3	3
	25	□	MWS0155X25DB	43.3	46.3	86.3	86	0.3	3	3
	30	□	MWS0155X30DB	51.3	54.3	95.3	95	0.3	3	3
1.60	1	●	MWS0160SB	8.3	10.9	68.3	68	0.3	3	1
	5	●	MWS0160LB	22.3	25.3	68.3	68	0.3	3	3
	12	●	MWS0160XB	30.3	33.3	68.3	68	0.3	3	3
	20	●	MWS0160X20DB	37.3	39.3	78.3	78	0.3	3	3
	25	●	MWS0160X25DB	45.3	47.3	86.3	86	0.3	3	3
	30	●	MWS0160X30DB	53.3	55.3	95.3	95	0.3	3	3
1.65	1	□	MWS0165SB	8.5	11.0	68.3	68	0.3	3	1
	20	□	MWS0165X20DB	38.3	40.3	78.3	78	0.3	3	3
	25	□	MWS0165X25DB	46.3	49.3	86.3	86	0.3	3	3
	30	□	MWS0165X30DB	54.3	57.3	95.3	95	0.3	3	3
1.70	1	●	MWS0170SB	8.7	11.1	68.3	68	0.3	3	1
	5	●	MWS0170LB	22.3	24.3	68.3	68	0.4	3	3
	12	●	MWS0170XB	30.3	32.3	68.3	68	0.4	3	3
	20	●	MWS0170X20DB	39.3	42.3	78.3	78	0.4	3	3
	25	●	MWS0170X25DB	48.3	50.3	86.3	86	0.4	3	3
	30	●	MWS0170X30DB	56.3	59.3	95.3	95	0.4	3	3
1.75	1	□	MWS0175SB	8.9	11.2	68.3	68	0.3	3	1
	20	□	MWS0175X20DB	40.3	43.3	84.3	84	0.4	3	3
	25	□	MWS0175X25DB	49.3	51.3	94.3	94	0.4	3	3
	30	□	MWS0175X30DB	58.3	60.3	102.3	102	0.4	3	3
1.80	1	●	MWS0180SB	9.3	11.5	68.3	68	0.3	3	1
	5	●	MWS0180LB	22.3	24.3	68.3	68	0.4	3	3
	12	●	MWS0180XB	30.3	32.3	68.3	68	0.4	3	3
	20	●	MWS0180X20DB	41.3	44.3	84.3	84	0.4	3	3
	25	●	MWS0180X25DB	50.3	53.3	94.3	94	0.4	3	3
	30	●	MWS0180X30DB	59.3	62.3	102.3	102	0.4	3	3
1.85	1	□	MWS0185SB	9.5	11.6	68.3	68	0.3	3	1
	20	□	MWS0185X20DB	43.3	45.3	84.3	84	0.4	3	3
	25	□	MWS0185X25DB	52.3	54.3	94.3	94	0.4	3	3
	30	□	MWS0185X30DB	61.3	63.3	102.3	102	0.4	3	3
1.90	1	●	MWS0190SB	9.7	11.8	68.3	68	0.4	3	1
	5	●	MWS0190LB	22.3	24.3	68.3	68	0.4	3	3
	12	●	MWS0190XB	30.3	32.3	68.3	68	0.4	3	3
	20	●	MWS0190X20DB	44.3	46.3	84.3	84	0.4	3	3
	25	●	MWS0190X25DB	53.3	55.3	94.3	94	0.4	3	3
	30	●	MWS0190X30DB	63.3	65.3	102.3	102	0.4	3	3
1.95	1	□	MWS0195SB	10.0	12.0	68.4	68	0.4	3	1
	20	□	MWS0195X20DB	45.4	47.4	84.4	84	0.4	3	3
	25	□	MWS0195X25DB	55.4	57.4	94.4	94	0.4	3	3
	30	□	MWS0195X30DB	64.4	66.4	102.4	102	0.4	3	3

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.00	1	●	MWS0200SB	10.4	12.3	68.4	68	0.4	3	1
	5	●	MWS0200LB	22.4	24.4	68.4	68	0.4	3	3
	12	●	MWS0200XB	30.4	32.4	68.4	68	0.4	3	3
	20	●	MWS0200X20DB	46.4	48.4	84.4	84	0.4	3	3
	25	●	MWS0200X25DB	56.4	58.4	94.4	94	0.4	3	3
	30	●	MWS0200X30DB	66.4	68.4	102.4	102	0.4	3	3
2.05	1	□	MWS0205SB	10.6	12.4	74.4	74	0.3	3	1
	20	□	MWS0205X20DB	47.4	49.4	94.4	94	0.4	3	3
	25	□	MWS0205X25DB	57.4	59.4	107.4	107	0.4	3	3
	30	□	MWS0205X30DB	68.4	69.4	118.4	118	0.4	3	3
2.10	1	●	MWS0210SB	10.8	12.5	74.4	74	0.3	3	1
	5	●	MWS0210LB	28.4	30.4	74.4	74	0.4	3	3
	12	●	MWS0210XB	38.4	40.4	74.4	74	0.4	3	3
	20	●	MWS0210X20DB	48.4	50.4	94.4	94	0.4	3	3
	25	●	MWS0210X25DB	59.4	60.4	107.4	107	0.4	3	3
	30	●	MWS0210X30DB	69.4	71.4	118.4	118	0.4	3	3
2.15	1	□	MWS0215SB	11.0	12.6	74.4	74	0.3	3	1
	20	□	MWS0215X20DB	49.4	51.4	94.4	94	0.4	3	3
	25	□	MWS0215X25DB	60.4	62.4	107.4	107	0.4	3	3
	30	□	MWS0215X30DB	71.4	73.4	118.4	118	0.4	3	3
2.20	1	●	MWS0220SB	11.4	12.9	74.4	74	0.4	3	1
	5	●	MWS0220LB	28.4	29.4	74.4	74	0.4	3	3
	12	●	MWS0220XB	38.4	39.4	74.4	74	0.4	3	3
	20	●	MWS0220X20DB	51.4	52.4	94.4	94	0.4	3	3
	25	●	MWS0220X25DB	62.4	63.4	107.4	107	0.4	3	3
	30	●	MWS0220X30DB	73.4	74.4	118.4	118	0.4	3	3
2.25	1	□	MWS0225SB	11.6	13.0	74.4	74	0.4	3	1
	20	□	MWS0225X20DB	52.4	53.4	94.4	94	0.4	3	3
	25	□	MWS0225X25DB	63.4	64.4	107.4	107	0.4	3	3
	30	□	MWS0225X30DB	74.4	76.4	118.4	118	0.4	3	3
2.30	1	●	MWS0230SB	11.8	13.1	74.4	74	0.4	3	1
	5	●	MWS0230LB	28.4	29.4	74.4	74	0.4	3	3
	12	●	MWS0230XB	38.4	39.4	74.4	74	0.4	3	3
	20	●	MWS0230X20DB	53.4	54.4	94.4	94	0.4	3	3
	25	●	MWS0230X25DB	64.4	66.4	107.4	107	0.4	3	3
	30	●	MWS0230X30DB	76.4	77.4	118.4	118	0.4	3	3
2.35	1	□	MWS0235SB	12.0	13.2	74.4	74	0.4	3	1
	20	□	MWS0235X20DB	54.4	55.4	94.4	94	0.4	3	3
	25	□	MWS0235X25DB	66.4	67.4	107.4	107	0.4	3	3
	30	□	MWS0235X30DB	78.4	79.4	118.4	118	0.4	3	3
2.40	1	●	MWS0240SB	12.4	13.5	74.4	74	0.4	3	1
	5	●	MWS0240LB	28.4	29.4	74.4	74	0.4	3	3
	12	●	MWS0240XB	38.4	39.4	74.4	74	0.4	3	3
	20	●	MWS0240X20DB	55.4	56.4	94.4	94	0.4	3	3
	25	●	MWS0240X25DB	67.4	68.4	107.4	107	0.4	3	3
	30	●	MWS0240X30DB	79.4	80.4	118.4	118	0.4	3	3
2.45	1	□	MWS0245SB	12.6	13.6	74.4	74	0.4	3	1
	20	□	MWS0245X20DB	56.4	57.4	94.4	94	0.5	3	3
	25	□	MWS0245X25DB	69.4	70.4	107.4	107	0.5	3	3
	30	□	MWS0245X30DB	81.4	82.4	118.4	118	0.5	3	3

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.50	1	●	MWS0250SB	12.9	13.8	74.5	74	0.4	3	1
	5	●	MWS0250LB	28.5	29.5	74.5	74	0.5	3	3
	12	●	MWS0250XB	38.5	39.5	74.5	74	0.5	3	3
	20	●	MWS0250X20DB	58.5	59.5	94.5	94	0.5	3	3
	25	●	MWS0250X25DB	70.5	71.5	107.5	107	0.5	3	3
	30	●	MWS0250X30DB	83.5	84.5	118.5	118	0.5	3	3
2.55	1	□	MWS0255SB	13.1	13.1	81.5	81	0.5	3	2
	20	□	MWS0255X20DB	59.5	59.5	103.5	103	0.5	3	4
	25	□	MWS0255X25DB	71.5	71.5	117.5	117	0.5	3	4
	30	□	MWS0255X30DB	84.5	84.5	132.5	132	0.5	3	4
2.60	1	●	MWS0260SB	13.5	13.5	81.5	81	0.5	3	2
	5	●	MWS0260LB	33.5	33.5	81.5	81	0.5	3	4
	12	●	MWS0260XB	45.5	45.5	81.5	81	0.5	3	4
	20	●	MWS0260X20DB	60.5	60.5	103.5	103	0.5	3	4
	25	●	MWS0260X25DB	73.5	73.5	117.5	117	0.5	3	4
	30	●	MWS0260X30DB	86.5	86.5	132.5	132	0.5	3	4
2.65	1	□	MWS0265SB	13.7	13.7	81.5	81	0.5	3	2
	20	□	MWS0265X20DB	61.5	61.5	103.5	103	0.5	3	4
	25	□	MWS0265X25DB	74.5	74.5	117.5	117	0.5	3	4
	30	□	MWS0265X30DB	87.5	87.5	132.5	132	0.5	3	4
2.70	1	●	MWS0270SB	13.9	13.9	81.5	81	0.5	3	2
	5	●	MWS0270LB	33.5	33.5	81.5	81	0.5	3	4
	12	●	MWS0270XB	45.5	45.5	81.5	81	0.5	3	4
	20	●	MWS0270X20DB	62.5	62.5	103.5	103	0.5	3	4
	25	●	MWS0270X25DB	76.5	76.5	117.5	117	0.5	3	4
	30	●	MWS0270X30DB	89.5	89.5	132.5	132	0.5	3	4
2.75	1	□	MWS0275SB	14.1	14.1	81.5	81	0.5	3	2
	20	□	MWS0275X20DB	63.5	63.5	103.5	103	0.5	3	4
	25	□	MWS0275X25DB	77.5	77.5	117.5	117	0.5	3	4
	30	□	MWS0275X30DB	91.5	91.5	132.5	132	0.5	3	4
2.80	1	●	MWS0280SB	14.5	14.5	81.5	81	0.5	3	2
	5	●	MWS0280LB	33.5	33.5	81.5	81	0.5	3	4
	12	●	MWS0280XB	45.5	45.5	81.5	81	0.5	3	4
	20	●	MWS0280X20DB	64.5	64.5	103.5	103	0.5	3	4
	25	●	MWS0280X25DB	78.5	78.5	117.5	117	0.5	3	4
	30	●	MWS0280X30DB	92.5	92.5	132.5	132	0.5	3	4
2.85	1	□	MWS0285SB	14.7	14.7	81.5	81	0.5	3	2
	20	□	MWS0285X20DB	66.5	66.5	103.5	103	0.5	3	4
	25	□	MWS0285X25DB	80.5	80.5	117.5	117	0.5	3	4
	30	□	MWS0285X30DB	94.5	94.5	132.5	132	0.5	3	4
2.90	1	●	MWS0290SB	14.9	14.9	81.5	81	0.5	3	2
	5	●	MWS0290LB	33.5	33.5	81.5	81	0.5	3	4
	12	●	MWS0290XB	45.5	45.5	81.5	81	0.5	3	4
	20	●	MWS0290X20DB	67.5	67.5	103.5	103	0.5	3	4
	25	●	MWS0290X25DB	81.5	81.5	117.5	117	0.5	3	4
	30	●	MWS0290X30DB	96.5	96.5	132.5	132	0.5	3	4
2.95	1	□	MWS0295SB	15.1	15.1	81.5	81	0.5	3	2
	20	□	MWS0295X20DB	68.5	68.5	103.5	103	0.5	3	4
	25	□	MWS0295X25DB	83.5	83.5	117.5	117	0.5	3	4
	30	□	MWS0295X30DB	97.5	97.5	132.5	132	0.5	3	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.00	3	●	MWS0300MB	24.5	24.5	72.5	72	0.5	3	5
	5	●	MWS0300LB	33.5	33.5	81.5	81	0.5	3	5
	8	●	MWS0300X8DB	35.5	35.5	81.5	81	0.5	3	5
	10	●	MWS0300X10DB	39.5	42.5	90.5	90	0.5	3	6
	15	●	MWS0300X15DB	54.5	57.5	105.5	105	0.5	3	6
	20	●	MWS0300X20DB	69.5	72.5	120.5	120	0.5	3	6
	25	●	MWS0300X25DB	84.5	87.5	135.5	135	0.5	3	6
	30	●	MWS0300X30DB	99.5	102.5	150.5	150	0.5	3	6
3.10	3	●	MWS0310MB	28.6	28.6	76.6	76	0.6	4	5
	5	●	MWS0310LB	39.6	39.6	87.6	87	0.6	4	5
	8	●	MWS0310X8DB	41.6	41.6	87.6	87	0.6	4	5
	10	●	MWS0310X10DB	46.6	49.6	97.6	97	0.6	4	6
	15	●	MWS0310X15DB	63.6	66.6	114.6	114	0.6	4	6
	20	●	MWS0310X20DB	81.6	84.6	132.6	132	0.6	4	6
	25	●	MWS0310X25DB	98.6	101.6	149.6	149	0.6	4	6
	30	●	MWS0310X30DB	116.6	119.6	167.6	167	0.6	4	6
3.20	3	●	MWS0320MB	28.6	28.6	76.6	76	0.6	4	5
	5	●	MWS0320LB	39.6	39.6	87.6	87	0.6	4	5
	8	●	MWS0320X8DB	41.6	41.6	87.6	87	0.6	4	5
	10	●	MWS0320X10DB	46.6	49.6	97.6	97	0.6	4	6
	15	●	MWS0320X15DB	63.6	66.6	114.6	114	0.6	4	6
	20	●	MWS0320X20DB	81.6	84.6	132.6	132	0.6	4	6
	25	●	MWS0320X25DB	98.6	101.6	149.6	149	0.6	4	6
	30	●	MWS0320X30DB	116.6	119.6	167.6	167	0.6	4	6
3.30	3	●	MWS0330MB	28.6	28.6	76.6	76	0.6	4	5
	5	●	MWS0330LB	39.6	39.6	87.6	87	0.6	4	5
	8	●	MWS0330X8DB	41.6	41.6	87.6	87	0.6	4	5
	10	●	MWS0330X10DB	46.6	49.6	97.6	97	0.6	4	6
	15	●	MWS0330X15DB	63.6	66.6	114.6	114	0.6	4	6
	20	●	MWS0330X20DB	81.6	84.6	132.6	132	0.6	4	6
	25	●	MWS0330X25DB	98.6	101.6	149.6	149	0.6	4	6
	30	●	MWS0330X30DB	116.6	119.6	167.6	167	0.6	4	6
3.40	3	●	MWS0340MB	28.6	28.6	76.6	76	0.6	4	5
	5	●	MWS0340LB	39.6	39.6	87.6	87	0.6	4	5
	8	●	MWS0340X8DB	41.6	41.6	87.6	87	0.6	4	5
	10	●	MWS0340X10DB	46.6	49.6	97.6	97	0.6	4	6
	15	●	MWS0340X15DB	63.6	66.6	114.6	114	0.6	4	6
	20	●	MWS0340X20DB	81.6	84.6	132.6	132	0.6	4	6
	25	●	MWS0340X25DB	98.6	101.6	149.6	149	0.6	4	6
	30	●	MWS0340X30DB	116.6	119.6	167.6	167	0.6	4	6
3.50	3	●	MWS0350MB	28.6	28.6	76.6	76	0.6	4	5
	5	●	MWS0350LB	39.6	39.6	87.6	87	0.6	4	5
	8	●	MWS0350X8DB	41.6	41.6	87.6	87	0.6	4	5
	10	●	MWS0350X10DB	46.6	49.6	97.6	97	0.6	4	6
	15	●	MWS0350X15DB	63.6	66.6	114.6	114	0.6	4	6
	20	●	MWS0350X20DB	81.6	84.6	132.6	132	0.6	4	6
	25	●	MWS0350X25DB	98.6	101.6	149.6	149	0.6	4	6
	30	●	MWS0350X30DB	116.6	119.6	167.6	167	0.6	4	6

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.6	3	●	MWS0360MB	32.7	32.7	80.7	80	0.7	4	5
	5	●	MWS0360LB	44.7	44.7	92.7	92	0.7	4	5
	8	●	MWS0360X8DB	46.7	46.7	92.7	92	0.7	4	5
	10	●	MWS0360X10DB	52.7	55.7	103.7	103	0.7	4	6
	15	●	MWS0360X15DB	72.7	75.7	123.7	123	0.7	4	6
	20	●	MWS0360X20DB	92.7	95.7	143.7	143	0.7	4	6
	25	●	MWS0360X25DB	112.7	115.7	163.7	163	0.7	4	6
	30	●	MWS0360X30DB	132.7	135.7	183.7	183	0.7	4	6
3.7	3	●	MWS0370MB	32.7	32.7	80.7	80	0.7	4	5
	5	●	MWS0370LB	44.7	44.7	92.7	92	0.7	4	5
	8	●	MWS0370X8DB	46.7	46.7	92.7	92	0.7	4	5
	10	●	MWS0370X10DB	52.7	55.7	103.7	103	0.7	4	6
	15	●	MWS0370X15DB	72.7	75.7	123.7	123	0.7	4	6
	20	●	MWS0370X20DB	92.7	95.7	143.7	143	0.7	4	6
	25	●	MWS0370X25DB	112.7	115.7	163.7	163	0.7	4	6
	30	●	MWS0370X30DB	132.7	135.7	183.7	183	0.7	4	6
3.8	3	●	MWS0380MB	32.7	32.7	80.7	80	0.7	4	5
	5	●	MWS0380LB	44.7	44.7	92.7	92	0.7	4	5
	8	●	MWS0380X8DB	46.7	46.7	92.7	92	0.7	4	5
	10	●	MWS0380X10DB	52.7	55.7	103.7	103	0.7	4	6
	15	●	MWS0380X15DB	72.7	75.7	123.7	123	0.7	4	6
	20	●	MWS0380X20DB	92.7	95.7	143.7	143	0.7	4	6
	25	●	MWS0380X25DB	112.7	115.7	163.7	163	0.7	4	6
	30	●	MWS0380X30DB	132.7	135.7	183.7	183	0.7	4	6
3.9	3	●	MWS0390MB	32.7	32.7	80.7	80	0.7	4	5
	5	●	MWS0390LB	44.7	44.7	92.7	92	0.7	4	5
	8	●	MWS0390X8DB	46.7	46.7	92.7	92	0.7	4	5
	10	●	MWS0390X10DB	52.7	55.7	103.7	103	0.7	4	6
	15	●	MWS0390X15DB	72.7	75.7	123.7	123	0.7	4	6
	20	●	MWS0390X20DB	92.7	95.7	143.7	143	0.7	4	6
	25	●	MWS0390X25DB	112.7	115.7	163.7	163	0.7	4	6
	30	●	MWS0390X30DB	132.7	135.7	183.7	183	0.7	4	6
4.0	3	●	MWS0400MB	32.7	32.7	80.7	80	0.7	4	5
	5	●	MWS0400LB	44.7	44.7	92.7	92	0.7	4	5
	8	●	MWS0400X8DB	46.7	46.7	92.7	92	0.7	4	5
	10	●	MWS0400X10DB	52.7	55.7	103.7	103	0.7	4	6
	15	●	MWS0400X15DB	72.7	75.7	123.7	123	0.7	4	6
	20	●	MWS0400X20DB	92.7	95.7	143.7	143	0.7	4	6
	25	●	MWS0400X25DB	112.7	115.7	163.7	163	0.7	4	6
	30	●	MWS0400X30DB	132.7	135.7	183.7	183	0.7	4	6
4.1	3	●	MWS0410MB	36.7	36.7	86.7	86	0.7	5	5
	5	●	MWS0410LB	50.7	50.7	100.7	100	0.7	5	5
	8	●	MWS0410X8DB	52.7	52.7	100.7	100	0.7	5	5
	10	●	MWS0410X10DB	59.7	62.7	112.7	112	0.7	5	6
	15	●	MWS0410X15DB	81.7	84.7	134.7	134	0.7	5	6
	20	●	MWS0410X20DB	104.7	107.7	157.7	157	0.7	5	6
	25	●	MWS0410X25DB	126.7	129.7	179.7	179	0.7	5	6
	30	●	MWS0410X30DB	149.7	152.7	202.7	202	0.7	5	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.2	3	●	MWS0420MB	36.8	36.8	86.8	86	0.8	5	5
	5	●	MWS0420LB	50.8	50.8	100.8	100	0.8	5	5
	8	●	MWS0420X8DB	52.8	52.8	100.8	100	0.8	5	5
	10	●	MWS0420X10DB	59.8	62.8	112.8	112	0.8	5	6
	15	●	MWS0420X15DB	81.8	84.8	134.8	134	0.8	5	6
	20	●	MWS0420X20DB	104.8	107.8	157.8	157	0.8	5	6
	25	●	MWS0420X25DB	126.8	129.8	179.8	179	0.8	5	6
	30	●	MWS0420X30DB	149.8	152.8	202.8	202	0.8	5	6
4.3	3	●	MWS0430MB	36.8	36.8	86.8	86	0.8	5	5
	5	●	MWS0430LB	50.8	50.8	100.8	100	0.8	5	5
	8	●	MWS0430X8DB	52.8	52.8	100.8	100	0.8	5	5
	10	●	MWS0430X10DB	59.8	62.8	112.8	112	0.8	5	6
	15	●	MWS0430X15DB	81.8	84.8	134.8	134	0.8	5	6
	20	●	MWS0430X20DB	104.8	107.8	157.8	157	0.8	5	6
	25	●	MWS0430X25DB	126.8	129.8	179.8	179	0.8	5	6
	30	●	MWS0430X30DB	149.8	152.8	202.8	202	0.8	5	6
4.4	3	●	MWS0440MB	36.8	36.8	86.8	86	0.8	5	5
	5	●	MWS0440LB	50.8	50.8	100.8	100	0.8	5	5
	8	●	MWS0440X8DB	52.8	52.8	100.8	100	0.8	5	5
	10	●	MWS0440X10DB	59.8	62.8	112.8	112	0.8	5	6
	15	●	MWS0440X15DB	81.8	84.8	134.8	134	0.8	5	6
	20	●	MWS0440X20DB	104.8	107.8	157.8	157	0.8	5	6
	25	●	MWS0440X25DB	126.8	129.8	179.8	179	0.8	5	6
	30	●	MWS0440X30DB	149.8	152.8	202.8	202	0.8	5	6
4.5	3	●	MWS0450MB	36.8	36.8	86.8	86	0.8	5	5
	5	●	MWS0450LB	50.8	50.8	100.8	100	0.8	5	5
	8	●	MWS0450X8DB	52.8	52.8	100.8	100	0.8	5	5
	10	●	MWS0450X10DB	59.8	62.8	112.8	112	0.8	5	6
	15	●	MWS0450X15DB	81.8	84.8	134.8	134	0.8	5	6
	20	●	MWS0450X20DB	104.8	107.8	157.8	157	0.8	5	6
	25	●	MWS0450X25DB	126.8	129.8	179.8	179	0.8	5	6
	30	●	MWS0450X30DB	149.8	152.8	202.8	202	0.8	5	6
4.6	3	●	MWS0460MB	40.8	40.8	90.8	90	0.8	5	5
	5	●	MWS0460LB	55.8	55.8	105.8	105	0.8	5	5
	8	●	MWS0460X8DB	57.8	57.8	105.8	105	0.8	5	5
	10	●	MWS0460X10DB	65.8	68.8	118.8	118	0.8	5	6
	15	●	MWS0460X15DB	90.8	93.8	143.8	143	0.8	5	6
	20	●	MWS0460X20DB	115.8	118.8	168.8	168	0.8	5	6
	25	●	MWS0460X25DB	140.8	143.8	193.8	193	0.8	5	6
	30	●	MWS0460X30DB	165.8	168.8	218.8	218	0.8	5	6
4.7	3	●	MWS0470MB	40.9	40.9	90.9	90	0.9	5	5
	5	●	MWS0470LB	55.9	55.9	105.9	105	0.9	5	5
	8	●	MWS0470X8DB	57.9	57.9	105.9	105	0.9	5	5
	10	●	MWS0470X10DB	65.9	68.9	118.9	118	0.9	5	6
	15	●	MWS0470X15DB	90.9	93.9	143.9	143	0.9	5	6
	20	●	MWS0470X20DB	115.9	118.9	168.9	168	0.9	5	6
	25	●	MWS0470X25DB	140.9	143.9	193.9	193	0.9	5	6
	30	●	MWS0470X30DB	165.9	168.9	218.9	218	0.9	5	6

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.8	3	●	MWS0480MB	40.9	40.9	90.9	90	0.9	5	5
	5	●	MWS0480LB	55.9	55.9	105.9	105	0.9	5	5
	8	●	MWS0480X8DB	57.9	57.9	105.9	105	0.9	5	5
	10	●	MWS0480X10DB	65.9	68.9	118.9	118	0.9	5	6
	15	●	MWS0480X15DB	90.9	93.9	143.9	143	0.9	5	6
	20	●	MWS0480X20DB	115.9	118.9	168.9	168	0.9	5	6
	25	●	MWS0480X25DB	140.9	143.9	193.9	193	0.9	5	6
	30	●	MWS0480X30DB	165.9	168.9	218.9	218	0.9	5	6
4.9	3	●	MWS0490MB	40.9	40.9	90.9	90	0.9	5	5
	5	●	MWS0490LB	55.9	55.9	105.9	105	0.9	5	5
	8	●	MWS0490X8DB	57.9	57.9	105.9	105	0.9	5	5
	10	●	MWS0490X10DB	65.9	68.9	118.9	118	0.9	5	6
	15	●	MWS0490X15DB	90.9	93.9	143.9	143	0.9	5	6
	20	●	MWS0490X20DB	115.9	118.9	168.9	168	0.9	5	6
	25	●	MWS0490X25DB	140.9	143.9	193.9	193	0.9	5	6
	30	●	MWS0490X30DB	165.9	168.9	218.9	218	0.9	5	6
5.0	3	●	MWS0500MB	28.4	30.9	82.9	82	0.9	6	5
	5	●	MWS0500LB	44.9	48.9	100.9	100	0.9	6	5
	8	●	MWS0500X8DB	57.9	57.9	105.9	105	0.9	5	5
	10	●	MWS0500X10DB	65.9	68.9	118.9	118	0.9	5	6
	15	●	MWS0500X15DB	90.9	93.9	143.9	143	0.9	5	6
	20	●	MWS0500X20DB	115.9	118.9	168.9	168	0.9	5	6
	25	●	MWS0500X25DB	140.9	143.9	193.9	193	0.9	5	6
	30	●	MWS0500X30DB	165.9	168.9	218.9	218	0.9	5	6
5.1	3	●	MWS0510MB	28.4	30.9	82.9	82	0.9	6	5
	5	●	MWS0510LB	44.9	48.9	100.9	100	0.9	6	5
	8	●	MWS0510X8DB	61.9	66.9	118.9	118	0.9	6	5
	10	●	MWS0510X10DB	72.9	75.9	127.9	127	0.9	6	6
	15	●	MWS0510X15DB	99.9	102.9	154.9	154	0.9	6	6
	20	●	MWS0510X20DB	127.9	130.9	182.9	182	0.9	6	6
	25	●	MWS0510X25DB	154.9	157.9	209.9	209	0.9	6	6
	30	●	MWS0510X30DB	182.9	185.9	237.9	237	0.9	6	6
5.2	3	●	MWS0520MB	28.4	30.9	82.9	82	0.9	6	5
	5	●	MWS0520LB	44.9	48.9	100.9	100	0.9	6	5
	8	●	MWS0520X8DB	61.9	66.9	118.9	118	0.9	6	5
	10	●	MWS0520X10DB	72.9	75.9	127.9	127	0.9	6	6
	15	●	MWS0520X15DB	99.9	102.9	154.9	154	0.9	6	6
	20	●	MWS0520X20DB	127.9	130.9	182.9	182	0.9	6	6
	25	●	MWS0520X25DB	154.9	157.9	209.9	209	0.9	6	6
	30	●	MWS0520X30DB	182.9	185.9	237.9	237	0.9	6	6
5.3	3	●	MWS0530MB	28.5	31.0	83.0	82	1.0	6	5
	5	●	MWS0530LB	45.0	49.0	101.0	100	1.0	6	5
	8	●	MWS0530X8DB	62.0	67.0	119.0	118	1.0	6	5
	10	●	MWS0530X10DB	73.0	76.0	128.0	127	1.0	6	6
	15	●	MWS0530X15DB	100.0	103.0	155.0	154	1.0	6	6
	20	●	MWS0530X20DB	128.0	131.0	183.0	182	1.0	6	6
	25	●	MWS0530X25DB	155.0	158.0	210.0	209	1.0	6	6
	30	●	MWS0530X30DB	183.0	186.0	238.0	237	1.0	6	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
5.4	3	●	MWS0540MB	28.5	31.0	83.0	82	1.0	6	5
	5	●	MWS0540LB	45.0	49.0	101.0	100	1.0	6	5
	8	●	MWS0540X8DB	62.0	67.0	119.0	118	1.0	6	5
	10	●	MWS0540X10DB	73.0	76.0	128.0	127	1.0	6	6
	15	●	MWS0540X15DB	100.0	103.0	155.0	154	1.0	6	6
	20	●	MWS0540X20DB	128.0	131.0	183.0	182	1.0	6	6
	25	●	MWS0540X25DB	155.0	158.0	210.0	209	1.0	6	6
	30	●	MWS0540X30DB	183.0	186.0	238.0	237	1.0	6	6
5.5	3	●	MWS0550MB	28.5	31.0	83.0	82	1.0	6	5
	5	●	MWS0550LB	45.0	49.0	101.0	100	1.0	6	5
	8	●	MWS0550X8DB	62.0	67.0	119.0	118	1.0	6	5
	10	●	MWS0550X10DB	73.0	76.0	128.0	127	1.0	6	6
	15	●	MWS0550X15DB	100.0	103.0	155.0	154	1.0	6	6
	20	●	MWS0550X20DB	128.0	131.0	183.0	182	1.0	6	6
	25	●	MWS0550X25DB	155.0	158.0	210.0	209	1.0	6	6
	30	●	MWS0550X30DB	183.0	186.0	238.0	237	1.0	6	6
5.6	3	●	MWS0560MB	31.0	31.0	83.0	82	1.0	6	5
	5	●	MWS0560LB	49.0	49.0	101.0	100	1.0	6	5
	8	●	MWS0560X8DB	67.0	67.0	119.0	118	1.0	6	5
	10	●	MWS0560X10DB	79.0	82.0	134.0	133	1.0	6	6
	15	●	MWS0560X15DB	109.0	112.0	164.0	163	1.0	6	6
	20	●	MWS0560X20DB	139.0	142.0	194.0	193	1.0	6	6
	25	●	MWS0560X25DB	169.0	172.0	224.0	223	1.0	6	6
	30	●	MWS0560X30DB	199.0	202.0	254.0	253	1.0	6	6
5.7	3	●	MWS0570MB	31.0	31.0	83.0	82	1.0	6	5
	5	●	MWS0570LB	49.0	49.0	101.0	100	1.0	6	5
	8	●	MWS0570X8DB	67.0	67.0	119.0	118	1.0	6	5
	10	●	MWS0570X10DB	79.0	82.0	134.0	133	1.0	6	6
	15	●	MWS0570X15DB	109.0	112.0	164.0	163	1.0	6	6
	20	●	MWS0570X20DB	139.0	142.0	194.0	193	1.0	6	6
	25	●	MWS0570X25DB	169.0	172.0	224.0	223	1.0	6	6
	30	●	MWS0570X30DB	199.0	202.0	254.0	253	1.0	6	6
5.8	3	●	MWS0580MB	31.1	31.1	83.1	82	1.1	6	5
	5	●	MWS0580LB	49.1	49.1	101.1	100	1.1	6	5
	8	●	MWS0580X8DB	67.1	67.1	119.1	118	1.1	6	5
	10	●	MWS0580X10DB	79.1	82.1	134.1	133	1.1	6	6
	15	●	MWS0580X15DB	109.1	112.1	164.1	163	1.1	6	6
	20	●	MWS0580X20DB	139.1	142.1	194.1	193	1.1	6	6
	25	●	MWS0580X25DB	169.1	172.1	224.1	223	1.1	6	6
	30	●	MWS0580X30DB	199.1	202.1	254.1	253	1.1	6	6
5.9	3	●	MWS0590MB	31.1	31.1	83.1	82	1.1	6	5
	5	●	MWS0590LB	49.1	49.1	101.1	100	1.1	6	5
	8	●	MWS0590X8DB	67.1	67.1	119.1	118	1.1	6	5
	10	●	MWS0590X10DB	79.1	82.1	134.1	133	1.1	6	6
	15	●	MWS0590X15DB	109.1	112.1	164.1	163	1.1	6	6
	20	●	MWS0590X20DB	139.1	142.1	194.1	193	1.1	6	6
	25	●	MWS0590X25DB	169.1	172.1	224.1	223	1.1	6	6
	30	●	MWS0590X30DB	199.1	202.1	254.1	253	1.1	6	6

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

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.0	3	●	MWS0600MB	31.1	31.1	83.1	82	1.1	6	5
	5	●	MWS0600LB	49.1	49.1	101.1	100	1.1	6	5
	8	●	MWS0600X8DB	67.1	67.1	119.1	118	1.1	6	5
	10	●	MWS0600X10DB	79.1	82.1	134.1	133	1.1	6	6
	15	●	MWS0600X15DB	109.1	112.1	164.1	163	1.1	6	6
	20	●	MWS0600X20DB	139.1	142.1	194.1	193	1.1	6	6
	25	●	MWS0600X25DB	169.1	172.1	224.1	223	1.1	6	6
	30	●	MWS0600X30DB	199.1	202.1	254.1	253	1.1	6	6
6.1	3	●	MWS0610MB	33.6	36.1	89.1	88	1.1	7	5
	5	●	MWS0610LB	53.1	57.1	110.1	109	1.1	7	5
	8	●	MWS0610X8DB	73.1	78.1	131.1	130	1.1	7	5
	10	●	MWS0610X10DB	86.1	89.1	142.1	141	1.1	7	6
	15	●	MWS0610X15DB	118.1	121.1	174.1	173	1.1	7	6
	20	●	MWS0610X20DB	151.1	154.1	207.1	206	1.1	7	6
	25	●	MWS0610X25DB	183.1	186.1	239.1	238	1.1	7	6
	30	●	MWS0610X30DB	216.1	219.1	272.1	271	1.1	7	6
6.2	3	●	MWS0620MB	33.6	36.1	89.1	88	1.1	7	5
	5	●	MWS0620LB	53.1	57.1	110.1	109	1.1	7	5
	8	●	MWS0620X8DB	73.1	78.1	131.1	130	1.1	7	5
	10	●	MWS0620X10DB	86.1	89.1	142.1	141	1.1	7	6
	15	●	MWS0620X15DB	118.1	121.1	174.1	173	1.1	7	6
	20	●	MWS0620X20DB	151.1	154.1	207.1	206	1.1	7	6
	25	●	MWS0620X25DB	183.1	186.1	239.1	238	1.1	7	6
	30	●	MWS0620X30DB	216.1	219.1	272.1	271	1.1	7	6
6.3	3	●	MWS0630MB	33.6	36.1	89.1	88	1.1	7	5
	5	●	MWS0630LB	53.1	57.1	110.1	109	1.1	7	5
	8	●	MWS0630X8DB	73.1	78.1	131.1	130	1.1	7	5
	10	●	MWS0630X10DB	86.1	89.1	142.1	141	1.1	7	6
	15	●	MWS0630X15DB	118.1	121.1	174.1	173	1.1	7	6
	20	●	MWS0630X20DB	151.1	154.1	207.1	206	1.1	7	6
	25	●	MWS0630X25DB	183.1	186.1	239.1	238	1.1	7	6
	30	●	MWS0630X30DB	216.1	219.1	272.1	271	1.1	7	6
6.4	3	●	MWS0640MB	33.7	36.2	89.2	88	1.2	7	5
	5	●	MWS0640LB	53.2	57.2	110.2	109	1.2	7	5
	8	●	MWS0640X8DB	73.2	78.2	131.2	130	1.2	7	5
	10	●	MWS0640X10DB	86.2	89.2	142.2	141	1.2	7	6
	15	●	MWS0640X15DB	118.2	121.2	174.2	173	1.2	7	6
	20	●	MWS0640X20DB	151.2	154.2	207.2	206	1.2	7	6
	25	●	MWS0640X25DB	183.2	186.2	239.2	238	1.2	7	6
	30	●	MWS0640X30DB	216.2	219.2	272.2	271	1.2	7	6
6.5	3	●	MWS0650MB	33.7	36.2	89.2	88	1.2	7	5
	5	●	MWS0650LB	53.2	57.2	110.2	109	1.2	7	5
	8	●	MWS0650X8DB	73.2	78.2	131.2	130	1.2	7	5
	10	●	MWS0650X10DB	86.2	89.2	142.2	141	1.2	7	6
	15	●	MWS0650X15DB	118.2	121.2	174.2	173	1.2	7	6
	20	●	MWS0650X20DB	151.2	154.2	207.2	206	1.2	7	6
	25	●	MWS0650X25DB	183.2	186.2	239.2	238	1.2	7	6
	30	●	MWS0650X30DB	216.2	219.2	272.2	271	1.2	7	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.6	3	●	MWS0660MB	36.2	36.2	89.2	88	1.2	7	5
	5	●	MWS0660LB	57.2	57.2	110.2	109	1.2	7	5
	8	●	MWS0660X8DB	78.2	78.2	131.2	130	1.2	7	5
	10	●	MWS0660X10DB	92.2	95.2	148.2	147	1.2	7	6
	15	●	MWS0660X15DB	127.2	130.2	183.2	182	1.2	7	6
	20	●	MWS0660X20DB	162.2	165.2	218.2	217	1.2	7	6
	25	●	MWS0660X25DB	197.2	200.2	253.2	252	1.2	7	6
	30	●	MWS0660X30DB	232.2	235.2	288.2	287	1.2	7	6
6.7	3	●	MWS0670MB	36.2	36.2	89.2	88	1.2	7	5
	5	●	MWS0670LB	57.2	57.2	110.2	109	1.2	7	5
	8	●	MWS0670X8DB	78.2	78.2	131.2	130	1.2	7	5
	10	●	MWS0670X10DB	92.2	95.2	148.2	147	1.2	7	6
	15	●	MWS0670X15DB	127.2	130.2	183.2	182	1.2	7	6
	20	●	MWS0670X20DB	162.2	165.2	218.2	217	1.2	7	6
	25	●	MWS0670X25DB	197.2	200.2	253.2	252	1.2	7	6
	30	●	MWS0670X30DB	232.2	235.2	288.2	287	1.2	7	6
6.8	3	●	MWS0680MB	36.2	36.2	89.2	88	1.2	7	5
	5	●	MWS0680LB	57.2	57.2	110.2	109	1.2	7	5
	8	●	MWS0680X8DB	78.2	78.2	131.2	130	1.2	7	5
	10	●	MWS0680X10DB	92.2	95.2	148.2	147	1.2	7	6
	15	●	MWS0680X15DB	127.2	130.2	183.2	182	1.2	7	6
	20	●	MWS0680X20DB	162.2	165.2	218.2	217	1.2	7	6
	25	●	MWS0680X25DB	197.2	200.2	253.2	252	1.2	7	6
	30	●	MWS0680X30DB	232.2	235.2	288.2	287	1.2	7	6
6.9	3	●	MWS0690MB	36.3	36.3	89.3	88	1.3	7	5
	5	●	MWS0690LB	57.3	57.3	110.3	109	1.3	7	5
	8	●	MWS0690X8DB	78.3	78.3	131.3	130	1.3	7	5
	10	●	MWS0690X10DB	92.3	95.3	148.3	147	1.3	7	6
	15	●	MWS0690X15DB	127.3	130.3	183.3	182	1.3	7	6
	20	●	MWS0690X20DB	162.3	165.3	218.3	217	1.3	7	6
	25	●	MWS0690X25DB	197.3	200.3	253.3	252	1.3	7	6
	30	●	MWS0690X30DB	232.3	235.3	288.3	287	1.3	7	6
7.0	3	●	MWS0700MB	36.3	36.3	89.3	88	1.3	7	5
	5	●	MWS0700LB	57.3	57.3	110.3	109	1.3	7	5
	8	●	MWS0700X8DB	78.3	78.3	131.3	130	1.3	7	5
	10	●	MWS0700X10DB	92.3	95.3	148.3	147	1.3	7	6
	15	●	MWS0700X15DB	127.3	130.3	183.3	182	1.3	7	6
	20	●	MWS0700X20DB	162.3	165.3	218.3	217	1.3	7	6
	25	●	MWS0700X25DB	197.3	200.3	253.3	252	1.3	7	6
	30	●	MWS0700X30DB	232.3	235.3	288.3	287	1.3	7	6
7.1	3	●	MWS0710MB	38.8	41.3	95.3	94	1.3	8	5
	5	●	MWS0710LB	61.3	65.3	119.3	118	1.3	8	5
	8	●	MWS0710X8DB	84.3	89.3	143.3	142	1.3	8	5
	10	●	MWS0710X10DB	99.3	102.3	156.3	155	1.3	8	6
	15	●	MWS0710X15DB	136.3	139.3	193.3	192	1.3	8	6
	20	●	MWS0710X20DB	174.3	177.3	231.3	230	1.3	8	6
	25	●	MWS0710X25DB	211.3	214.3	268.3	267	1.3	8	6
	30	●	MWS0710X30DB	249.3	252.3	306.3	305	1.3	8	6

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.2	3	●	MWS0720MB	38.8	41.3	95.3	94	1.3	8	5
	5	●	MWS0720LB	61.3	65.3	119.3	118	1.3	8	5
	8	●	MWS0720X8DB	84.3	89.3	143.3	142	1.3	8	5
	10	●	MWS0720X10DB	99.3	102.3	156.3	155	1.3	8	6
	15	●	MWS0720X15DB	136.3	139.3	193.3	192	1.3	8	6
	20	●	MWS0720X20DB	174.3	177.3	231.3	230	1.3	8	6
	25	●	MWS0720X25DB	211.3	214.3	268.3	267	1.3	8	6
	30	●	MWS0720X30DB	249.3	252.3	306.3	305	1.3	8	6
7.3	3	●	MWS0730MB	38.8	41.3	95.3	94	1.3	8	5
	5	●	MWS0730LB	61.3	65.3	119.3	118	1.3	8	5
	8	●	MWS0730X8DB	84.3	89.3	143.3	142	1.3	8	5
	10	●	MWS0730X10DB	99.3	102.3	156.3	155	1.3	8	6
	15	●	MWS0730X15DB	136.3	139.3	193.3	192	1.3	8	6
	20	●	MWS0730X20DB	174.3	177.3	231.3	230	1.3	8	6
	25	●	MWS0730X25DB	211.3	214.3	268.3	267	1.3	8	6
	30	●	MWS0730X30DB	249.3	252.3	306.3	305	1.3	8	6
7.4	3	●	MWS0740MB	38.8	41.3	95.3	94	1.3	8	5
	5	●	MWS0740LB	61.3	65.3	119.3	118	1.3	8	5
	8	●	MWS0740X8DB	84.3	89.3	143.3	142	1.3	8	5
	10	●	MWS0740X10DB	99.3	102.3	156.3	155	1.3	8	6
	15	●	MWS0740X15DB	136.3	139.3	193.3	192	1.3	8	6
	20	●	MWS0740X20DB	174.3	177.3	231.3	230	1.3	8	6
	25	●	MWS0740X25DB	211.3	214.3	268.3	267	1.3	8	6
	30	●	MWS0740X30DB	249.3	252.3	306.3	305	1.3	8	6
7.5	3	●	MWS0750MB	38.9	41.4	95.4	94	1.4	8	5
	5	●	MWS0750LB	61.4	65.4	119.4	118	1.4	8	5
	8	●	MWS0750X8DB	84.4	89.4	143.4	142	1.4	8	5
	10	●	MWS0750X10DB	99.4	102.4	156.4	155	1.4	8	6
	15	●	MWS0750X15DB	136.4	139.4	193.4	192	1.4	8	6
	20	●	MWS0750X20DB	174.4	177.4	231.4	230	1.4	8	6
	25	●	MWS0750X25DB	211.4	214.4	268.4	267	1.4	8	6
	30	●	MWS0750X30DB	249.4	252.4	306.4	305	1.4	8	6
7.6	3	●	MWS0760MB	41.4	41.4	95.4	94	1.4	8	5
	5	●	MWS0760LB	65.4	65.4	119.4	118	1.4	8	5
	8	●	MWS0760X8DB	89.4	89.4	143.4	142	1.4	8	5
	10	●	MWS0760X10DB	105.4	108.4	162.4	161	1.4	8	6
	15	●	MWS0760X15DB	145.4	148.4	202.4	201	1.4	8	6
	20	●	MWS0760X20DB	185.4	188.4	242.4	241	1.4	8	6
	25	●	MWS0760X25DB	225.4	228.4	282.4	281	1.4	8	6
	30	●	MWS0760X30DB	265.4	268.4	322.4	321	1.4	8	6
7.7	3	●	MWS0770MB	41.4	41.4	95.4	94	1.4	8	5
	5	●	MWS0770LB	65.4	65.4	119.4	118	1.4	8	5
	8	●	MWS0770X8DB	89.4	89.4	143.4	142	1.4	8	5
	10	●	MWS0770X10DB	105.4	108.4	162.4	161	1.4	8	6
	15	●	MWS0770X15DB	145.4	148.4	202.4	201	1.4	8	6
	20	●	MWS0770X20DB	185.4	188.4	242.4	241	1.4	8	6
	25	●	MWS0770X25DB	225.4	228.4	282.4	281	1.4	8	6
	30	●	MWS0770X30DB	265.4	268.4	322.4	321	1.4	8	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.8	3	●	MWS0780MB	41.4	41.4	95.4	94	1.4	8	5
	5	●	MWS0780LB	65.4	65.4	119.4	118	1.4	8	5
	8	●	MWS0780X8DB	89.4	89.4	143.4	142	1.4	8	5
	10	●	MWS0780X10DB	105.4	108.4	162.4	161	1.4	8	6
	15	●	MWS0780X15DB	145.4	148.4	202.4	201	1.4	8	6
	20	●	MWS0780X20DB	185.4	188.4	242.4	241	1.4	8	6
	25	●	MWS0780X25DB	225.4	228.4	282.4	281	1.4	8	6
	30	●	MWS0780X30DB	265.4	268.4	322.4	321	1.4	8	6
7.9	3	●	MWS0790MB	41.4	41.4	95.4	94	1.4	8	5
	5	●	MWS0790LB	65.4	65.4	119.4	118	1.4	8	5
	8	●	MWS0790X8DB	89.4	89.4	143.4	142	1.4	8	5
	10	●	MWS0790X10DB	105.4	108.4	162.4	161	1.4	8	6
	15	●	MWS0790X15DB	145.4	148.4	202.4	201	1.4	8	6
	20	●	MWS0790X20DB	185.4	188.4	242.4	241	1.4	8	6
	25	●	MWS0790X25DB	225.4	228.4	282.4	281	1.4	8	6
	30	●	MWS0790X30DB	265.4	268.4	322.4	321	1.4	8	6
8.0	3	●	MWS0800MB	41.5	41.5	95.5	94	1.5	8	5
	5	●	MWS0800LB	65.5	65.5	119.5	118	1.5	8	5
	8	●	MWS0800X8DB	89.5	89.5	143.5	142	1.5	8	5
	10	●	MWS0800X10DB	105.5	108.5	162.5	161	1.5	8	6
	15	●	MWS0800X15DB	145.5	148.5	202.5	201	1.5	8	6
	20	●	MWS0800X20DB	185.5	188.5	242.5	241	1.5	8	6
	25	●	MWS0800X25DB	225.5	228.5	282.5	281	1.5	8	6
	30	●	MWS0800X30DB	265.5	268.5	322.5	321	1.5	8	6
8.1	3	●	MWS0810MB	44.0	46.5	101.5	100	1.5	9	5
	5	●	MWS0810LB	69.5	73.5	128.5	127	1.5	9	5
	8	●	MWS0810X8DB	95.5	100.5	155.5	154	1.5	9	5
	10	●	MWS0810X10DB	112.5	115.5	170.5	169	1.5	9	6
	15	●	MWS0810X15DB	154.5	157.5	212.5	211	1.5	9	6
	20	●	MWS0810X20DB	197.5	200.5	255.5	254	1.5	9	6
	25	●	MWS0810X25DB	239.5	242.5	297.5	296	1.5	9	6
	30	●	MWS0810X30DB	282.5	285.5	340.5	339	1.5	9	6
8.2	3	●	MWS0820MB	44.0	46.5	101.5	100	1.5	9	5
	5	●	MWS0820LB	69.5	73.5	128.5	127	1.5	9	5
	8	●	MWS0820X8DB	95.5	100.5	155.5	154	1.5	9	5
	10	●	MWS0820X10DB	112.5	115.5	170.5	169	1.5	9	6
	15	●	MWS0820X15DB	154.5	157.5	212.5	211	1.5	9	6
	20	●	MWS0820X20DB	197.5	200.5	255.5	254	1.5	9	6
	25	●	MWS0820X25DB	239.5	242.5	297.5	296	1.5	9	6
	30	●	MWS0820X30DB	282.5	285.5	340.5	339	1.5	9	6
8.3	3	●	MWS0830MB	44.0	46.5	101.5	100	1.5	9	5
	5	●	MWS0830LB	69.5	73.5	128.5	127	1.5	9	5
	8	●	MWS0830X8DB	95.5	100.5	155.5	154	1.5	9	5
	10	●	MWS0830X10DB	112.5	115.5	170.5	169	1.5	9	6
	15	●	MWS0830X15DB	154.5	157.5	212.5	211	1.5	9	6
	20	●	MWS0830X20DB	197.5	200.5	255.5	254	1.5	9	6
	25	●	MWS0830X25DB	239.5	242.5	297.5	296	1.5	9	6
	30	●	MWS0830X30DB	282.5	285.5	340.5	339	1.5	9	6

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

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.4	3	●	MWS0840MB	44.0	46.5	101.5	100	1.5	9	5
	5	●	MWS0840LB	69.5	73.5	128.5	127	1.5	9	5
	8	●	MWS0840X8DB	95.5	100.5	155.5	154	1.5	9	5
	10	●	MWS0840X10DB	112.5	115.5	170.5	169	1.5	9	6
	15	●	MWS0840X15DB	154.5	157.5	212.5	211	1.5	9	6
	20	●	MWS0840X20DB	197.5	200.5	255.5	254	1.5	9	6
	25	●	MWS0840X25DB	239.5	242.5	297.5	296	1.5	9	6
	30	●	MWS0840X30DB	282.5	285.5	340.5	339	1.5	9	6
8.5	3	●	MWS0850MB	44.0	46.5	101.5	100	1.5	9	5
	5	●	MWS0850LB	69.5	73.5	128.5	127	1.5	9	5
	8	●	MWS0850X8DB	95.5	100.5	155.5	154	1.5	9	5
	10	●	MWS0850X10DB	112.5	115.5	170.5	169	1.5	9	6
	15	●	MWS0850X15DB	154.5	157.5	212.5	211	1.5	9	6
	20	●	MWS0850X20DB	197.5	200.5	255.5	254	1.5	9	6
	25	●	MWS0850X25DB	239.5	242.5	297.5	296	1.5	9	6
	30	●	MWS0850X30DB	282.5	285.5	340.5	339	1.5	9	6
8.6	3	●	MWS0860MB	46.6	46.6	101.6	100	1.6	9	5
	5	●	MWS0860LB	73.6	73.6	128.6	127	1.6	9	5
	8	●	MWS0860X8DB	100.6	100.6	155.6	154	1.6	9	5
	10	●	MWS0860X10DB	118.6	121.6	176.6	175	1.6	9	6
	15	●	MWS0860X15DB	163.6	166.6	221.6	220	1.6	9	6
	20	●	MWS0860X20DB	208.6	211.6	266.6	265	1.6	9	6
	25	●	MWS0860X25DB	253.6	256.6	311.6	310	1.6	9	6
	30	●	MWS0860X30DB	298.6	301.6	356.6	355	1.6	9	6
8.7	3	●	MWS0870MB	46.6	46.6	101.6	100	1.6	9	5
	5	●	MWS0870LB	73.6	73.6	128.6	127	1.6	9	5
	8	●	MWS0870X8DB	100.6	100.6	155.6	154	1.6	9	5
	10	●	MWS0870X10DB	118.6	121.6	176.6	175	1.6	9	6
	15	●	MWS0870X15DB	163.6	166.6	221.6	220	1.6	9	6
	20	●	MWS0870X20DB	208.6	211.6	266.6	265	1.6	9	6
	25	●	MWS0870X25DB	253.6	256.6	311.6	310	1.6	9	6
	30	●	MWS0870X30DB	298.6	301.6	356.6	355	1.6	9	6
8.8	3	●	MWS0880MB	46.6	46.6	101.6	100	1.6	9	5
	5	●	MWS0880LB	73.6	73.6	128.6	127	1.6	9	5
	8	●	MWS0880X8DB	100.6	100.6	155.6	154	1.6	9	5
	10	●	MWS0880X10DB	118.6	121.6	176.6	175	1.6	9	6
	15	●	MWS0880X15DB	163.6	166.6	221.6	220	1.6	9	6
	20	●	MWS0880X20DB	208.6	211.6	266.6	265	1.6	9	6
	25	●	MWS0880X25DB	253.6	256.6	311.6	310	1.6	9	6
	30	●	MWS0880X30DB	298.6	301.6	356.6	355	1.6	9	6
8.9	3	●	MWS0890MB	46.6	46.6	101.6	100	1.6	9	5
	5	●	MWS0890LB	73.6	73.6	128.6	127	1.6	9	5
	8	●	MWS0890X8DB	100.6	100.6	155.6	154	1.6	9	5
	10	●	MWS0890X10DB	118.6	121.6	176.6	175	1.6	9	6
	15	●	MWS0890X15DB	163.6	166.6	221.6	220	1.6	9	6
	20	●	MWS0890X20DB	208.6	211.6	266.6	265	1.6	9	6
	25	●	MWS0890X25DB	253.6	256.6	311.6	310	1.6	9	6
	30	●	MWS0890X30DB	298.6	301.6	356.6	355	1.6	9	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
9.0	3	●	MWS0900MB	46.6	46.6	101.6	100	1.6	9	5
	5	●	MWS0900LB	73.6	73.6	128.6	127	1.6	9	5
	8	●	MWS0900X8DB	100.6	100.6	155.6	154	1.6	9	5
	10	●	MWS0900X10DB	118.6	121.6	176.6	175	1.6	9	6
	15	●	MWS0900X15DB	163.6	166.6	221.6	220	1.6	9	6
	20	●	MWS0900X20DB	208.6	211.6	266.6	265	1.6	9	6
	25	●	MWS0900X25DB	253.6	256.6	311.6	310	1.6	9	6
	30	●	MWS0900X30DB	298.6	301.6	356.6	355	1.6	9	6
9.1	3	●	MWS0910MB	49.2	51.7	107.7	106	1.7	10	5
	5	●	MWS0910LB	77.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0910X8DB	106.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0910X10DB	125.7	128.7	183.7	182	1.7	10	6
	15	●	MWS0910X15DB	172.7	175.7	230.7	229	1.7	10	6
	20	●	MWS0910X20DB	220.7	223.7	278.7	277	1.7	10	6
	25	●	MWS0910X25DB	267.7	270.7	325.7	324	1.7	10	6
	30	●	MWS0910X30DB	315.7	318.7	373.7	372	1.7	10	6
9.2	3	●	MWS0920MB	49.2	51.7	107.7	106	1.7	10	5
	5	●	MWS0920LB	77.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0920X8DB	106.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0920X10DB	125.7	128.7	183.7	182	1.7	10	6
	15	●	MWS0920X15DB	172.7	175.7	230.7	229	1.7	10	6
	20	●	MWS0920X20DB	220.7	223.7	278.7	277	1.7	10	6
	25	●	MWS0920X25DB	267.7	270.7	325.7	324	1.7	10	6
	30	●	MWS0920X30DB	315.7	318.7	373.7	372	1.7	10	6
9.3	3	●	MWS0930MB	49.2	51.7	107.7	106	1.7	10	5
	5	●	MWS0930LB	77.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0930X8DB	106.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0930X10DB	125.7	128.7	183.7	182	1.7	10	6
	15	●	MWS0930X15DB	172.7	175.7	230.7	229	1.7	10	6
	20	●	MWS0930X20DB	220.7	223.7	278.7	277	1.7	10	6
	25	●	MWS0930X25DB	267.7	270.7	325.7	324	1.7	10	6
	30	●	MWS0930X30DB	315.7	318.7	373.7	372	1.7	10	6
9.4	3	●	MWS0940MB	49.2	51.7	107.7	106	1.7	10	5
	5	●	MWS0940LB	77.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0940X8DB	106.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0940X10DB	125.7	128.7	183.7	182	1.7	10	6
	15	●	MWS0940X15DB	172.7	175.7	230.7	229	1.7	10	6
	20	●	MWS0940X20DB	220.7	223.7	278.7	277	1.7	10	6
	25	●	MWS0940X25DB	267.7	270.7	325.7	324	1.7	10	6
	30	●	MWS0940X30DB	315.7	318.7	373.7	372	1.7	10	6
9.5	3	●	MWS0950MB	49.2	51.7	107.7	106	1.7	10	5
	5	●	MWS0950LB	77.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0950X8DB	106.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0950X10DB	125.7	128.7	183.7	182	1.7	10	6
	15	●	MWS0950X15DB	172.7	175.7	230.7	229	1.7	10	6
	20	●	MWS0950X20DB	220.7	223.7	278.7	277	1.7	10	6
	25	●	MWS0950X25DB	267.7	270.7	325.7	324	1.7	10	6
	30	●	MWS0950X30DB	315.7	318.7	373.7	372	1.7	10	6

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
9.6	3	●	MWS0960MB	51.7	51.7	107.7	106	1.7	10	5
	5	●	MWS0960LB	81.7	81.7	137.7	136	1.7	10	5
	8	●	MWS0960X8DB	111.7	111.7	167.7	166	1.7	10	5
	10	●	MWS0960X10DB	131.7	134.7	189.7	188	1.7	10	6
	15	●	MWS0960X15DB	181.7	184.7	239.7	238	1.7	10	6
	20	●	MWS0960X20DB	231.7	234.7	289.7	288	1.7	10	6
	25	●	MWS0960X25DB	281.7	284.7	339.7	338	1.7	10	6
	30	●	MWS0960X30DB	331.7	334.7	389.7	388	1.7	10	6
9.7	3	●	MWS0970MB	51.8	51.8	107.8	106	1.8	10	5
	5	●	MWS0970LB	81.8	81.8	137.8	136	1.8	10	5
	8	●	MWS0970X8DB	111.8	111.8	167.8	166	1.8	10	5
	10	●	MWS0970X10DB	131.8	134.8	189.8	188	1.8	10	6
	15	●	MWS0970X15DB	181.8	184.8	239.8	238	1.8	10	6
	20	●	MWS0970X20DB	231.8	234.8	289.8	288	1.8	10	6
	25	●	MWS0970X25DB	281.8	284.8	339.8	338	1.8	10	6
	30	●	MWS0970X30DB	331.8	334.8	389.8	388	1.8	10	6
9.8	3	●	MWS0980MB	51.8	51.8	107.8	106	1.8	10	5
	5	●	MWS0980LB	81.8	81.8	137.8	136	1.8	10	5
	8	●	MWS0980X8DB	111.8	111.8	167.8	166	1.8	10	5
	10	●	MWS0980X10DB	131.8	134.8	189.8	188	1.8	10	6
	15	●	MWS0980X15DB	181.8	184.8	239.8	238	1.8	10	6
	20	●	MWS0980X20DB	231.8	234.8	289.8	288	1.8	10	6
	25	●	MWS0980X25DB	281.8	284.8	339.8	338	1.8	10	6
	30	●	MWS0980X30DB	331.8	334.8	389.8	388	1.8	10	6
9.9	3	●	MWS0990MB	51.8	51.8	107.8	106	1.8	10	5
	5	●	MWS0990LB	81.8	81.8	137.8	136	1.8	10	5
	8	●	MWS0990X8DB	111.8	111.8	167.8	166	1.8	10	5
	10	●	MWS0990X10DB	131.8	134.8	189.8	188	1.8	10	6
	15	●	MWS0990X15DB	181.8	184.8	239.8	238	1.8	10	6
	20	●	MWS0990X20DB	231.8	234.8	289.8	288	1.8	10	6
	25	●	MWS0990X25DB	281.8	284.8	339.8	338	1.8	10	6
	30	●	MWS0990X30DB	331.8	334.8	389.8	388	1.8	10	6
10.0	3	●	MWS1000MB	51.8	51.8	107.8	106	1.8	10	5
	5	●	MWS1000LB	81.8	81.8	137.8	136	1.8	10	5
	8	●	MWS1000X8DB	111.8	111.8	167.8	166	1.8	10	5
	10	●	MWS1000X10DB	131.8	134.8	189.8	188	1.8	10	6
	15	●	MWS1000X15DB	181.8	184.8	239.8	238	1.8	10	6
	20	●	MWS1000X20DB	231.8	234.8	289.8	288	1.8	10	6
	25	●	MWS1000X25DB	281.8	284.8	339.8	338	1.8	10	6
	30	●	MWS1000X30DB	331.8	334.8	389.8	388	1.8	10	6
10.1	3	●	MWS1010MB	54.3	56.8	117.8	116	1.8	11	5
	5	●	MWS1010LB	85.8	89.8	150.8	149	1.8	11	5
	8	●	MWS1010X8DB	117.8	122.8	183.8	182	1.8	11	5
	10	●	MWS1010X10DB	138.8	141.8	202.8	201	1.8	11	6
	15	●	MWS1010X15DB	190.8	193.8	254.8	253	1.8	11	6
	20	●	MWS1010X20DB	243.8	246.8	307.8	306	1.8	11	6
	25	●	MWS1010X25DB	295.8	298.8	359.8	358	1.8	11	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.2	3	●	MWS1020MB	54.4	56.9	117.9	116	1.9	11	5
	5	●	MWS1020LB	85.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1020X8DB	117.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1020X10DB	138.9	141.9	202.9	201	1.9	11	6
	15	●	MWS1020X15DB	190.9	193.9	254.9	253	1.9	11	6
	20	●	MWS1020X20DB	243.9	246.9	307.9	306	1.9	11	6
	25	●	MWS1020X25DB	295.9	298.9	359.9	358	1.9	11	6
10.3	3	●	MWS1030MB	54.4	56.9	117.9	116	1.9	11	5
	5	●	MWS1030LB	85.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1030X8DB	117.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1030X10DB	138.9	141.9	202.9	201	1.9	11	6
	15	●	MWS1030X15DB	190.9	193.9	254.9	253	1.9	11	6
	20	●	MWS1030X20DB	243.9	246.9	307.9	306	1.9	11	6
	25	●	MWS1030X25DB	295.9	298.9	359.9	358	1.9	11	6
10.4	3	●	MWS1040MB	54.4	56.9	117.9	116	1.9	11	5
	5	●	MWS1040LB	85.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1040X8DB	117.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1040X10DB	138.9	141.9	202.9	201	1.9	11	6
	15	●	MWS1040X15DB	190.9	193.9	254.9	253	1.9	11	6
	20	●	MWS1040X20DB	243.9	246.9	307.9	306	1.9	11	6
	25	●	MWS1040X25DB	295.9	298.9	359.9	358	1.9	11	6
10.5	3	●	MWS1050MB	54.4	56.9	117.9	116	1.9	11	5
	5	●	MWS1050LB	85.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1050X8DB	117.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1050X10DB	138.9	141.9	202.9	201	1.9	11	6
	15	●	MWS1050X15DB	190.9	193.9	254.9	253	1.9	11	6
	20	●	MWS1050X20DB	243.9	246.9	307.9	306	1.9	11	6
	25	●	MWS1050X25DB	295.9	298.9	359.9	358	1.9	11	6
10.6	3	●	MWS1060MB	56.9	56.9	117.9	116	1.9	11	5
	5	●	MWS1060LB	89.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1060X8DB	122.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1060X10DB	144.9	147.9	208.9	207	1.9	11	6
	15	●	MWS1060X15DB	199.9	202.9	263.9	262	1.9	11	6
	20	●	MWS1060X20DB	254.9	257.9	318.9	317	1.9	11	6
	25	●	MWS1060X25DB	309.9	312.9	373.9	372	1.9	11	6
10.7	3	●	MWS1070MB	56.9	56.9	117.9	116	1.9	11	5
	5	●	MWS1070LB	89.9	89.9	150.9	149	1.9	11	5
	8	●	MWS1070X8DB	122.9	122.9	183.9	182	1.9	11	5
	10	●	MWS1070X10DB	144.9	147.9	208.9	207	1.9	11	6
	15	●	MWS1070X15DB	199.9	202.9	263.9	262	1.9	11	6
	20	●	MWS1070X20DB	254.9	257.9	318.9	317	1.9	11	6
	25	●	MWS1070X25DB	309.9	312.9	373.9	372	1.9	11	6
10.8	3	●	MWS1080MB	57.0	57.0	118.0	116	2.0	11	5
	5	●	MWS1080LB	90.0	90.0	151.0	149	2.0	11	5
	8	●	MWS1080X8DB	123.0	123.0	184.0	182	2.0	11	5
	10	●	MWS1080X10DB	145.0	148.0	209.0	207	2.0	11	6
	15	●	MWS1080X15DB	200.0	203.0	264.0	262	2.0	11	6
	20	●	MWS1080X20DB	255.0	258.0	319.0	317	2.0	11	6
	25	●	MWS1080X25DB	310.0	313.0	374.0	372	2.0	11	6

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.9	3	●	MWS1090MB	57.0	57.0	118.0	116	2.0	11	5
	5	●	MWS1090LB	90.0	90.0	151.0	149	2.0	11	5
	8	●	MWS1090X8DB	123.0	123.0	184.0	182	2.0	11	5
	10	●	MWS1090X10DB	145.0	148.0	209.0	207	2.0	11	6
	15	●	MWS1090X15DB	200.0	203.0	264.0	262	2.0	11	6
	20	●	MWS1090X20DB	255.0	258.0	319.0	317	2.0	11	6
	25	●	MWS1090X25DB	310.0	313.0	374.0	372	2.0	11	6
11.0	3	●	MWS1100MB	57.0	57.0	118.0	116	2.0	11	5
	5	●	MWS1100LB	90.0	90.0	151.0	149	2.0	11	5
	8	●	MWS1100X8DB	123.0	123.0	184.0	182	2.0	11	5
	10	●	MWS1100X10DB	145.0	148.0	209.0	207	2.0	11	6
	15	●	MWS1100X15DB	200.0	203.0	264.0	262	2.0	11	6
	20	●	MWS1100X20DB	255.0	258.0	319.0	317	2.0	11	6
	25	●	MWS1100X25DB	310.0	313.0	374.0	372	2.0	11	6
11.1	3	●	MWS1110MB	59.5	62.0	124.0	122	2.0	12	5
	5	●	MWS1110LB	94.0	98.0	160.0	158	2.0	12	5
	8	●	MWS1110X8DB	129.0	134.0	196.0	194	2.0	12	5
	10	●	MWS1110X10DB	152.0	155.0	217.0	215	2.0	12	6
	15	●	MWS1110X15DB	209.0	212.0	274.0	272	2.0	12	6
	20	●	MWS1110X20DB	267.0	270.0	332.0	330	2.0	12	6
	25	●	MWS1110X25DB	324.0	327.0	389.0	387	2.0	12	6
11.2	3	●	MWS1120MB	59.5	62.0	124.0	122	2.0	12	5
	5	●	MWS1120LB	94.0	98.0	160.0	158	2.0	12	5
	8	●	MWS1120X8DB	129.0	134.0	196.0	194	2.0	12	5
	10	●	MWS1120X10DB	152.0	155.0	217.0	215	2.0	12	6
	15	●	MWS1120X15DB	209.0	212.0	274.0	272	2.0	12	6
	20	●	MWS1120X20DB	267.0	270.0	332.0	330	2.0	12	6
	25	●	MWS1120X25DB	324.0	327.0	389.0	387	2.0	12	6
11.3	3	●	MWS1130MB	59.6	62.1	124.1	122	2.1	12	5
	5	●	MWS1130LB	94.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1130X8DB	129.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1130X10DB	152.1	155.1	217.1	215	2.1	12	6
	15	●	MWS1130X15DB	209.1	212.1	274.1	272	2.1	12	6
	20	●	MWS1130X20DB	267.1	270.1	332.1	330	2.1	12	6
	25	●	MWS1130X25DB	324.1	327.1	389.1	387	2.1	12	6
11.4	3	●	MWS1140MB	59.6	62.1	124.1	122	2.1	12	5
	5	●	MWS1140LB	94.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1140X8DB	129.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1140X10DB	152.1	155.1	217.1	215	2.1	12	6
	15	●	MWS1140X15DB	209.1	212.1	274.1	272	2.1	12	6
	20	●	MWS1140X20DB	267.1	270.1	332.1	330	2.1	12	6
	25	●	MWS1140X25DB	324.1	327.1	389.1	387	2.1	12	6
11.5	3	●	MWS1150MB	59.6	62.1	124.1	122	2.1	12	5
	5	●	MWS1150LB	94.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1150X8DB	129.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1150X10DB	152.1	155.1	217.1	215	2.1	12	6
	15	●	MWS1150X15DB	209.1	212.1	274.1	272	2.1	12	6
	20	●	MWS1150X20DB	267.1	270.1	332.1	330	2.1	12	6
	25	●	MWS1150X25DB	324.1	327.1	389.1	387	2.1	12	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
11.6	3	●	MWS1160MB	62.1	62.1	124.1	122	2.1	12	5
	5	●	MWS1160LB	98.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1160X8DB	134.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1160X10DB	158.1	161.1	223.1	221	2.1	12	6
	15	●	MWS1160X15DB	218.1	221.1	283.1	281	2.1	12	6
	20	●	MWS1160X20DB	278.1	281.1	343.1	341	2.1	12	6
	25	●	MWS1160X25DB	338.1	341.1	403.1	401	2.1	12	6
11.7	3	●	MWS1170MB	62.1	62.1	124.1	122	2.1	12	5
	5	●	MWS1170LB	98.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1170X8DB	134.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1170X10DB	158.1	161.1	223.1	221	2.1	12	6
	15	●	MWS1170X15DB	218.1	221.1	283.1	281	2.1	12	6
	20	●	MWS1170X20DB	278.1	281.1	343.1	341	2.1	12	6
	25	●	MWS1170X25DB	338.1	341.1	403.1	401	2.1	12	6
11.8	3	●	MWS1180MB	62.1	62.1	124.1	122	2.1	12	5
	5	●	MWS1180LB	98.1	98.1	160.1	158	2.1	12	5
	8	●	MWS1180X8DB	134.1	134.1	196.1	194	2.1	12	5
	10	●	MWS1180X10DB	158.1	161.1	223.1	221	2.1	12	6
	15	●	MWS1180X15DB	218.1	221.1	283.1	281	2.1	12	6
	20	●	MWS1180X20DB	278.1	281.1	343.1	341	2.1	12	6
	25	●	MWS1180X25DB	338.1	341.1	403.1	401	2.1	12	6
11.9	3	●	MWS1190MB	62.2	62.2	124.2	122	2.2	12	5
	5	●	MWS1190LB	98.2	98.2	160.2	158	2.2	12	5
	8	●	MWS1190X8DB	134.2	134.2	196.2	194	2.2	12	5
	10	●	MWS1190X10DB	158.2	161.2	223.2	221	2.2	12	6
	15	●	MWS1190X15DB	218.2	221.2	283.2	281	2.2	12	6
	20	●	MWS1190X20DB	278.2	281.2	343.2	341	2.2	12	6
	25	●	MWS1190X25DB	338.2	341.2	403.2	401	2.2	12	6
12.0	3	●	MWS1200MB	62.2	62.2	124.2	122	2.2	12	5
	5	●	MWS1200LB	98.2	98.2	160.2	158	2.2	12	5
	8	●	MWS1200X8DB	134.2	134.2	196.2	194	2.2	12	5
	10	●	MWS1200X10DB	158.2	161.2	223.2	221	2.2	12	6
	15	●	MWS1200X15DB	218.2	221.2	283.2	281	2.2	12	6
	20	●	MWS1200X20DB	278.2	281.2	343.2	341	2.2	12	6
	25	●	MWS1200X25DB	338.2	341.2	403.2	401	2.2	12	6
12.1	3	●	MWS1210MB	64.7	67.2	130.2	128	2.2	13	5
	5	●	MWS1210LB	102.2	106.2	169.2	167	2.2	13	5
	8	□	MWS1210X8DB	140.2	145.2	208.2	206	2.2	13	5
	10	□	MWS1210X10DB	165.2	168.2	231.2	229	2.2	13	6
	15	□	MWS1210X15DB	227.2	230.2	293.2	291	2.2	13	6
	20	□	MWS1210X20DB	290.2	293.2	356.2	354	2.2	13	6
12.2	3	●	MWS1220MB	64.7	67.2	130.2	128	2.2	13	5
	5	●	MWS1220LB	102.2	106.2	169.2	167	2.2	13	5
	8	□	MWS1220X8DB	140.2	145.2	208.2	206	2.2	13	5
	10	□	MWS1220X10DB	165.2	168.2	231.2	229	2.2	13	6
	15	□	MWS1220X15DB	227.2	230.2	293.2	291	2.2	13	6
	20	□	MWS1220X20DB	290.2	293.2	356.2	354	2.2	13	6

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
12.3	3	●	MWS1230MB	64.7	67.2	130.2	128	2.2	13	5
	5	●	MWS1230LB	102.2	106.2	169.2	167	2.2	13	5
	8	□	MWS1230X8DB	140.2	145.2	208.2	206	2.2	13	5
	10	□	MWS1230X10DB	165.2	168.2	231.2	229	2.2	13	6
	15	□	MWS1230X15DB	227.2	230.2	293.2	291	2.2	13	6
	20	□	MWS1230X20DB	290.2	293.2	356.2	354	2.2	13	6
12.4	3	●	MWS1240MB	64.8	67.3	130.3	128	2.3	13	5
	5	●	MWS1240LB	102.3	106.3	169.3	167	2.3	13	5
	8	□	MWS1240X8DB	140.3	145.3	208.3	206	2.3	13	5
	10	□	MWS1240X10DB	165.3	168.3	231.3	229	2.3	13	6
	15	□	MWS1240X15DB	227.3	230.3	293.3	291	2.3	13	6
	20	□	MWS1240X20DB	290.3	293.3	356.3	354	2.3	13	6
12.5	3	●	MWS1250MB	64.8	67.3	130.3	128	2.3	13	5
	5	●	MWS1250LB	102.3	106.3	169.3	167	2.3	13	5
	8	●	MWS1250X8DB	140.3	145.3	208.3	206	2.3	13	5
	10	●	MWS1250X10DB	165.3	168.3	231.3	229	2.3	13	6
	15	●	MWS1250X15DB	227.3	230.3	293.3	291	2.3	13	6
	20	●	MWS1250X20DB	290.3	293.3	356.3	354	2.3	13	6
12.6	3	●	MWS1260MB	67.3	67.3	130.3	128	2.3	13	5
	5	●	MWS1260LB	106.3	106.3	169.3	167	2.3	13	5
	8	□	MWS1260X8DB	145.3	145.3	208.3	206	2.3	13	5
	10	□	MWS1260X10DB	171.3	174.3	237.3	235	2.3	13	6
	15	□	MWS1260X15DB	236.3	239.3	302.3	300	2.3	13	6
	20	□	MWS1260X20DB	301.3	304.3	367.3	365	2.3	13	6
12.7	3	●	MWS1270MB	67.3	67.3	130.3	128	2.3	13	5
	5	●	MWS1270LB	106.3	106.3	169.3	167	2.3	13	5
	8	□	MWS1270X8DB	145.3	145.3	208.3	206	2.3	13	5
	10	□	MWS1270X10DB	171.3	174.3	237.3	235	2.3	13	6
	15	□	MWS1270X15DB	236.3	239.3	302.3	300	2.3	13	6
	20	□	MWS1270X20DB	301.3	304.3	367.3	365	2.3	13	6
12.8	3	●	MWS1280MB	67.3	67.3	130.3	128	2.3	13	5
	5	●	MWS1280LB	106.3	106.3	169.3	167	2.3	13	5
	8	□	MWS1280X8DB	145.3	145.3	208.3	206	2.3	13	5
	10	□	MWS1280X10DB	171.3	174.3	237.3	235	2.3	13	6
	15	□	MWS1280X15DB	236.3	239.3	302.3	300	2.3	13	6
	20	□	MWS1280X20DB	301.3	304.3	367.3	365	2.3	13	6
12.9	3	●	MWS1290MB	67.3	67.3	130.3	128	2.3	13	5
	5	●	MWS1290LB	106.3	106.3	169.3	167	2.3	13	5
	8	□	MWS1290X8DB	145.3	145.3	208.3	206	2.3	13	5
	10	□	MWS1290X10DB	171.3	174.3	237.3	235	2.3	13	6
	15	□	MWS1290X15DB	236.3	239.3	302.3	300	2.3	13	6
	20	□	MWS1290X20DB	301.3	304.3	367.3	365	2.3	13	6
13.0	3	●	MWS1300MB	67.4	67.4	130.4	128	2.4	13	5
	5	●	MWS1300LB	106.4	106.4	169.4	167	2.4	13	5
	8	●	MWS1300X8DB	145.4	145.4	208.4	206	2.4	13	5
	10	●	MWS1300X10DB	171.4	174.4	237.4	235	2.4	13	6
	15	●	MWS1300X15DB	236.4	239.4	302.4	300	2.4	13	6
	20	●	MWS1300X20DB	301.4	304.4	367.4	365	2.4	13	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.1	3	●	MWS1310MB	89.9	72.4	136.4	134	2.4	14	5
	5	●	MWS1310LB	110.4	114.4	178.4	176	2.4	14	5
	8	□	MWS1310X8DB	151.4	156.4	220.4	218	2.4	14	5
	10	□	MWS1310X10DB	178.4	181.4	245.4	243	2.4	14	6
	15	□	MWS1310X15DB	245.4	248.4	312.4	310	2.4	14	6
	20	□	MWS1310X20DB	313.4	316.4	380.4	378	2.4	14	6
13.2	3	●	MWS1320MB	69.9	72.4	136.4	134	2.4	14	5
	5	●	MWS1320LB	110.4	114.4	178.4	176	2.4	14	5
	8	□	MWS1320X8DB	151.4	156.4	220.4	218	2.4	14	5
	10	□	MWS1320X10DB	178.4	181.4	245.4	243	2.4	14	6
	15	□	MWS1320X15DB	245.4	248.4	312.4	310	2.4	14	6
	20	□	MWS1320X20DB	313.4	316.4	380.4	378	2.4	14	6
13.3	3	●	MWS1330MB	69.9	72.4	136.4	134	2.4	14	5
	5	●	MWS1330LB	110.4	114.4	178.4	176	2.4	14	5
	8	□	MWS1330X8DB	151.4	156.4	220.4	218	2.4	14	5
	10	□	MWS1330X10DB	178.4	181.4	245.4	243	2.4	14	6
	15	□	MWS1330X15DB	245.4	248.4	312.4	310	2.4	14	6
	20	□	MWS1330X20DB	313.4	316.4	380.4	378	2.4	14	6
13.4	3	●	MWS1340MB	69.9	72.4	136.4	134	2.4	14	5
	5	●	MWS1340LB	110.4	114.4	178.4	176	2.4	14	5
	8	□	MWS1340X8DB	151.4	156.4	220.4	218	2.4	14	5
	10	□	MWS1340X10DB	178.4	181.4	245.4	243	2.4	14	6
	15	□	MWS1340X15DB	245.4	248.4	312.4	310	2.4	14	6
	20	□	MWS1340X20DB	313.4	316.4	380.4	378	2.4	14	6
13.5	3	●	MWS1350MB	70.0	72.5	136.5	134	2.5	14	5
	5	●	MWS1350LB	110.5	114.5	178.5	176	2.5	14	5
	8	●	MWS1350X8DB	151.5	156.5	220.5	218	2.5	14	5
	10	●	MWS1350X10DB	178.5	181.5	245.5	243	2.5	14	6
	15	●	MWS1350X15DB	245.5	248.5	312.5	310	2.5	14	6
	20	●	MWS1350X20DB	313.5	316.5	380.5	378	2.5	14	6
13.6	3	●	MWS1360MB	72.5	72.5	136.5	134	2.5	14	5
	5	●	MWS1360LB	114.5	114.5	178.5	176	2.5	14	5
	8	□	MWS1360X8DB	156.5	156.5	220.5	218	2.5	14	5
	10	□	MWS1360X10DB	184.5	187.5	251.5	249	2.5	14	6
	15	□	MWS1360X15DB	254.5	257.5	321.5	319	2.5	14	6
	20	□	MWS1360X20DB	324.5	327.5	391.5	389	2.5	14	6
13.7	3	●	MWS1370MB	72.5	72.5	136.5	134	2.5	14	5
	5	●	MWS1370LB	114.5	114.5	178.5	176	2.5	14	5
	8	□	MWS1370X8DB	156.5	156.5	220.5	218	2.5	14	5
	10	□	MWS1370X10DB	184.5	187.5	251.5	249	2.5	14	6
	15	□	MWS1370X15DB	254.5	257.5	321.5	319	2.5	14	6
	20	□	MWS1370X20DB	324.5	327.5	391.5	389	2.5	14	6
13.8	3	●	MWS1380MB	72.5	72.5	136.5	134	2.5	14	5
	5	●	MWS1380LB	114.5	114.5	178.5	176	2.5	14	5
	8	□	MWS1380X8DB	156.5	156.5	220.5	218	2.5	14	5
	10	□	MWS1380X10DB	184.5	187.5	251.5	249	2.5	14	6
	15	□	MWS1380X15DB	254.5	257.5	321.5	319	2.5	14	6
	20	□	MWS1380X20DB	324.5	327.5	391.5	389	2.5	14	6

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.9	3	●	MWS1390MB	72.5	72.5	136.5	134	2.5	14	5
	5	●	MWS1390LB	114.5	114.5	178.5	176	2.5	14	5
	8	□	MWS1390X8DB	156.5	156.5	220.5	218	2.5	14	5
	10	□	MWS1390X10DB	184.5	187.5	251.5	249	2.5	14	6
	15	□	MWS1390X15DB	254.5	257.5	321.5	319	2.5	14	6
	20	□	MWS1390X20DB	324.5	327.5	391.5	389	2.5	14	6
14.0	3	●	MWS1400MB	72.5	72.5	136.5	134	2.5	14	5
	5	●	MWS1400LB	114.5	114.5	178.5	176	2.5	14	5
	8	●	MWS1400X8DB	156.5	156.5	220.5	218	2.5	14	5
	10	●	MWS1400X10DB	184.5	187.5	251.5	249	2.5	14	6
	15	●	MWS1400X15DB	254.5	257.5	321.5	319	2.5	14	6
	20	●	MWS1400X20DB	324.5	327.5	391.5	389	2.5	14	6
14.1	3	●	MWS1410MB	75.1	77.6	142.6	140	2.6	15	5
	5	●	MWS1410LB	118.6	122.6	187.6	185	2.6	15	5
	8	□	MWS1410X8DB	162.6	167.6	227.6	225	2.6	15	5
14.2	3	●	MWS1420MB	75.1	77.6	142.6	140	2.6	15	5
	5	●	MWS1420LB	118.6	122.6	187.6	185	2.6	15	5
	8	●	MWS1420X8DB	162.6	167.6	227.6	225	2.6	15	5
14.3	3	●	MWS1430MB	75.1	77.6	142.6	140	2.6	15	5
	5	●	MWS1430LB	118.6	122.6	187.6	185	2.6	15	5
	8	□	MWS1430X8DB	162.6	167.6	227.6	225	2.6	15	5
14.4	3	●	MWS1440MB	75.1	77.6	142.6	140	2.6	15	5
	5	●	MWS1440LB	118.6	122.6	187.6	185	2.6	15	5
	8	□	MWS1440X8DB	162.6	167.6	227.6	225	2.6	15	5
14.5	3	●	MWS1450MB	75.1	77.6	142.6	140	2.6	15	5
	5	●	MWS1450LB	118.6	122.6	187.6	185	2.6	15	5
	8	●	MWS1450X8DB	162.6	167.6	227.6	225	2.6	15	5
14.6	3	●	MWS1460MB	77.7	77.7	142.7	140	2.7	15	5
	5	●	MWS1460LB	122.7	122.7	187.7	185	2.7	15	5
	8	□	MWS1460X8DB	167.7	167.7	227.7	225	2.7	15	5
14.7	3	●	MWS1470MB	77.7	77.7	142.7	140	2.7	15	5
	5	●	MWS1470LB	122.7	122.7	187.7	185	2.7	15	5
	8	□	MWS1470X8DB	167.7	167.7	227.7	225	2.7	15	5
14.8	3	●	MWS1480MB	77.7	77.7	142.7	140	2.7	15	5
	5	●	MWS1480LB	122.7	122.7	187.7	185	2.7	15	5
	8	□	MWS1480X8DB	167.7	167.7	227.7	225	2.7	15	5
14.9	3	●	MWS1490MB	77.7	77.7	142.7	140	2.7	15	5
	5	●	MWS1490LB	122.7	122.7	187.7	185	2.7	15	5
	8	□	MWS1490X8DB	167.7	167.7	227.7	225	2.7	15	5
15.0	3	●	MWS1500MB	77.7	77.7	142.7	140	2.7	15	5
	5	●	MWS1500LB	122.7	122.7	187.7	185	2.7	15	5
	8	●	MWS1500X8DB	167.7	167.7	227.7	225	2.7	15	5
15.1	3	●	MWS1510MB	80.2	82.7	147.7	145	2.7	16	5
	5	●	MWS1510LB	126.7	130.7	195.7	193	2.7	16	5
	8	□	MWS1510X8DB	173.7	183.7	243.7	241	2.7	16	5
15.2	3	●	MWS1520MB	80.3	82.8	147.8	145	2.8	16	5
	5	●	MWS1520LB	126.8	130.8	195.8	193	2.8	16	5
	8	□	MWS1520X8DB	173.8	183.8	243.8	241	2.8	16	5
15.3	3	●	MWS1530MB	80.3	82.8	147.8	145	2.8	16	5
	5	●	MWS1530LB	126.8	130.8	195.8	193	2.8	16	5
	8	□	MWS1530X8DB	173.8	183.8	243.8	241	2.8	16	5

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
15.4	3	●	MWS1540MB	80.3	82.8	147.8	145	2.8	16	5
	5	●	MWS1540LB	126.8	130.8	195.8	193	2.8	16	5
	8	□	MWS1540X8DB	173.8	183.8	243.8	241	2.8	16	5
15.5	3	●	MWS1550MB	80.3	82.8	147.8	145	2.8	16	5
	5	●	MWS1550LB	126.8	130.8	195.8	193	2.8	16	5
	8	●	MWS1550X8DB	173.8	183.8	243.8	241	2.8	16	5
15.6	3	●	MWS1560MB	82.8	82.8	147.8	145	2.8	16	5
	5	●	MWS1560LB	130.8	130.8	195.8	193	2.8	16	5
	8	□	MWS1560X8DB	178.8	183.8	243.8	241	2.8	16	5
15.7	3	●	MWS1570MB	82.9	82.9	147.9	145	2.9	16	5
	5	●	MWS1570LB	130.9	130.9	195.9	193	2.9	16	5
	8	□	MWS1570X8DB	178.9	183.9	243.9	241	2.9	16	5
15.8	3	●	MWS1580MB	82.9	82.9	147.9	145	2.9	16	5
	5	●	MWS1580LB	130.9	130.9	195.9	193	2.9	16	5
	8	□	MWS1580X8DB	178.9	183.9	243.9	241	2.9	16	5
15.9	3	●	MWS1590MB	82.9	82.9	147.9	145	2.9	16	5
	5	●	MWS1590LB	130.9	130.9	195.9	193	2.9	16	5
	8	□	MWS1590X8DB	178.9	183.9	243.9	241	2.9	16	5
16.0	3	●	MWS1600MB	82.9	82.9	147.9	145	2.9	16	5
	5	●	MWS1600LB	130.9	130.9	195.9	193	2.9	16	5
	8	●	MWS1600X8DB	178.9	183.9	243.9	241	2.9	16	5
16.1	3	□	MWS1610MB	85.4	87.9	152.9	150	2.9	17	5
	5	□	MWS1610LB	134.9	138.9	203.9	201	2.9	17	5
16.2	3	□	MWS1620MB	85.4	87.9	152.9	150	2.9	17	5
	5	□	MWS1620LB	134.9	138.9	203.9	201	2.9	17	5
16.3	3	□	MWS1630MB	85.5	88.0	153.0	150	3.0	17	5
	5	□	MWS1630LB	135.0	139.0	204.0	201	3.0	17	5
16.4	3	□	MWS1640MB	85.5	88.0	153.0	150	3.0	17	5
	5	□	MWS1640LB	135.0	139.0	204.0	201	3.0	17	5
16.5	3	●	MWS1650MB	85.5	88.0	153.0	150	3.0	17	5
	5	●	MWS1650LB	135.0	139.0	204.0	201	3.0	17	5
16.6	3	□	MWS1660MB	88.0	88.0	153.0	150	3.0	17	5
	5	□	MWS1660LB	139.0	139.0	204.0	201	3.0	17	5
16.7	3	□	MWS1670MB	88.0	88.0	153.0	150	3.0	17	5
	5	□	MWS1670LB	139.0	139.0	204.0	201	3.0	17	5
16.8	3	□	MWS1680MB	88.1	88.1	153.1	150	3.1	17	5
	5	□	MWS1680LB	139.1	139.1	204.1	201	3.1	17	5
16.9	3	□	MWS1690MB	88.1	88.1	153.1	150	3.1	17	5
	5	□	MWS1690LB	139.1	139.1	204.1	201	3.1	17	5
17.0	3	●	MWS1700MB	88.1	88.1	153.1	150	3.1	17	5
	5	●	MWS1700LB	139.1	139.1	204.1	201	3.1	17	5
17.1	3	□	MWS1710MB	90.6	93.1	158.1	155	3.1	18	5
	5	□	MWS1710LB	143.1	147.1	212.1	209	3.1	18	5
17.2	3	□	MWS1720MB	90.6	93.1	158.1	155	3.1	18	5
	5	□	MWS1720LB	143.1	147.1	212.1	209	3.1	18	5
17.3	3	□	MWS1730MB	90.6	93.1	158.1	155	3.1	18	5
	5	□	MWS1730LB	143.1	147.1	212.1	209	3.1	18	5
17.4	3	□	MWS1740MB	90.7	93.2	158.2	155	3.2	18	5
	5	□	MWS1740LB	143.2	147.2	212.2	209	3.2	18	5
17.5	3	●	MWS1750MB	90.7	93.2	158.2	155	3.2	18	5
	5	●	MWS1750LB	143.2	147.2	212.2	209	3.2	18	5

CUTTING CONDITIONS ➤ N047
OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.6	3	□	MWS1760MB	93.2	93.2	158.2	155	3.2	18	5
	5	□	MWS1760LB	147.2	147.2	212.2	209	3.2	18	5
17.7	3	□	MWS1770MB	93.2	93.2	158.2	155	3.2	18	5
	5	□	MWS1770LB	147.2	147.2	212.2	209	3.2	18	5
17.8	3	□	MWS1780MB	93.2	93.2	158.2	155	3.2	18	5
	5	□	MWS1780LB	147.2	147.2	212.2	209	3.2	18	5
17.9	3	□	MWS1790MB	93.3	93.3	158.3	155	3.3	18	5
	5	□	MWS1790LB	147.3	147.3	212.3	209	3.3	18	5
18.0	3	●	MWS1800MB	93.3	93.3	158.3	155	3.3	18	5
	5	●	MWS1800LB	147.3	147.3	212.3	209	3.3	18	5
18.1	3	□	MWS1810MB	95.8	98.3	163.3	160	3.3	19	5
	5	□	MWS1810LB	151.3	155.3	220.3	217	3.3	19	5
18.2	3	□	MWS1820MB	95.8	98.3	163.3	160	3.3	19	5
	5	□	MWS1820LB	151.3	155.3	220.3	217	3.3	19	5
18.3	3	□	MWS1830MB	95.8	98.3	163.3	160	3.3	19	5
	5	□	MWS1830LB	151.3	155.3	220.3	217	3.3	19	5
18.4	3	□	MWS1840MB	95.8	98.3	163.3	160	3.3	19	5
	5	□	MWS1840LB	151.3	155.3	220.3	217	3.3	19	5
18.5	3	●	MWS1850MB	95.9	98.4	163.4	160	3.4	19	5
	5	●	MWS1850LB	151.4	155.4	220.4	217	3.4	19	5
18.6	3	□	MWS1860MB	98.4	98.4	163.4	160	3.4	19	5
	5	□	MWS1860LB	155.4	155.4	220.4	217	3.4	19	5
18.7	3	□	MWS1870MB	98.4	98.4	163.4	160	3.4	19	5
	5	□	MWS1870LB	155.4	155.4	220.4	217	3.4	19	5
18.8	3	□	MWS1880MB	98.4	98.4	163.4	160	3.4	19	5
	5	□	MWS1880LB	155.4	155.4	220.4	217	3.4	19	5
18.9	3	□	MWS1890MB	98.4	98.4	163.4	160	3.4	19	5
	5	□	MWS1890LB	155.4	155.4	220.4	217	3.4	19	5
19.0	3	●	MWS1900MB	98.5	98.5	163.5	160	3.5	19	5
	5	●	MWS1900LB	155.5	155.5	220.5	217	3.5	19	5
19.1	3	□	MWS1910MB	101.0	103.5	168.5	165	3.5	20	5
	5	□	MWS1910LB	159.5	163.5	228.5	225	3.5	20	5
19.2	3	□	MWS1920MB	101.0	103.5	168.5	165	3.5	20	5
	5	□	MWS1920LB	159.5	163.5	228.5	225	3.5	20	5
19.3	3	□	MWS1930MB	101.0	103.5	168.5	165	3.5	20	5
	5	□	MWS1930LB	159.5	163.5	228.5	225	3.5	20	5
19.4	3	□	MWS1940MB	101.0	103.5	168.5	165	3.5	20	5
	5	□	MWS1940LB	159.5	163.5	228.5	225	3.5	20	5
19.5	3	●	MWS1950MB	101.0	103.5	168.5	165	3.5	20	5
	5	●	MWS1950LB	159.5	163.5	228.5	225	3.5	20	5
19.6	3	□	MWS1960MB	103.6	103.6	168.6	165	3.6	20	5
	5	□	MWS1960LB	163.6	163.6	228.6	225	3.6	20	5
19.7	3	□	MWS1970MB	103.6	103.6	168.6	165	3.6	20	5
	5	□	MWS1970LB	163.6	163.6	228.6	225	3.6	20	5
19.8	3	□	MWS1980MB	103.6	103.6	168.6	165	3.6	20	5
	5	□	MWS1980LB	163.6	163.6	228.6	225	3.6	20	5
19.9	3	□	MWS1990MB	103.6	103.6	168.6	165	3.6	20	5
	5	□	MWS1990LB	163.6	163.6	228.6	225	3.6	20	5
20.0	3	●	MWS2000MB	103.6	103.6	168.6	165	3.6	20	5
	5	●	MWS2000LB	163.6	163.6	228.6	225	3.6	20	5

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
20.5	3	●	MWS2050MB	106.7	108.7	179.7	176	3.7	21	5
	5	●	MWS2050LB	169.7	171.7	242.7	239	3.7	21	5
21.0	3	●	MWS2100MB	108.8	108.8	179.8	176	3.8	21	5
	5	●	MWS2100LB	171.8	171.8	242.8	239	3.8	21	5
21.5	3	●	MWS2150MB	111.9	113.9	185.9	182	3.9	22	5
	5	●	MWS2150LB	177.9	179.9	251.9	248	3.9	22	5
22.0	3	●	MWS2200MB	114.0	114.0	186.0	182	4.0	22	5
	5	●	MWS2200LB	180.0	180.0	252.0	248	4.0	22	5
22.5	3	●	MWS2250MB	117.1	119.1	192.1	188	4.1	23	5
	5	●	MWS2250LB	186.1	188.1	261.1	257	4.1	23	5
23.0	3	●	MWS2300MB	119.2	119.2	192.2	188	4.2	23	5
	5	●	MWS2300LB	188.2	188.2	261.2	257	4.2	23	5
23.5	3	●	MWS2350MB	122.3	124.3	198.3	194	4.3	24	5
	5	●	MWS2350LB	194.3	196.3	270.3	266	4.3	24	5
24.0	3	●	MWS2400MB	124.4	124.4	198.4	194	4.4	24	5
	5	●	MWS2400LB	196.4	196.4	270.4	266	4.4	24	5
24.5	3	●	MWS2450MB	127.5	129.5	204.5	200	4.5	25	5
	5	●	MWS2450LB	202.5	204.5	274.5	270	4.5	25	5
25.0	3	●	MWS2500MB	129.5	129.5	204.5	200	4.5	25	5
	5	●	MWS2500LB	204.5	204.5	274.5	270	4.5	25	5

(Note) 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.**

RECOMMENDED CUTTING CONDITIONS

SB/MB/LB/XB/DB Type Drill(l/d<10)

Work 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
3.2	90	8900	0.1	(0.06—0.13)	890	80	7900	0.1	(0.06—0.13)	790
4.0	100	7900	0.12	(0.08—0.16)	945	90	7100	0.12	(0.08—0.16)	850
5.0	100	6300	0.15	(0.10—0.20)	945	90	5700	0.15	(0.10—0.20)	855
6.3	110	5500	0.2	(0.13—0.26)	1100	100	5000	0.2	(0.13—0.26)	1000
8.0	120	4700	0.23	(0.18—0.28)	1080	110	4300	0.23	(0.18—0.28)	985
10.0	130	4100	0.27	(0.22—0.32)	1105	120	3800	0.27	(0.22—0.32)	1025
12.0	140	3700	0.3	(0.26—0.34)	1110	130	3400	0.3	(0.26—0.34)	1020
16.0	160	3100	0.33	(0.27—0.38)	1020	140	2700	0.33	(0.27—0.38)	890
20.0	160	2500	0.35	(0.30—0.40)	875	140	2200	0.35	(0.30—0.40)	770
25.0	160	2000	0.35	(0.30—0.40)	700	140	1700	0.35	(0.30—0.40)	595

Work 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
3.2	70	6900	0.1	(0.06—0.13)	690	40	3900	0.08	(0.06—0.10)	310
4.0	80	6300	0.11	(0.07—0.14)	690	40	3100	0.09	(0.06—0.11)	275
5.0	80	5000	0.14	(0.09—0.18)	700	40	2500	0.11	(0.08—0.14)	275
6.3	90	4500	0.18	(0.11—0.24)	810	50	2500	0.14	(0.09—0.18)	350
8.0	100	3900	0.21	(0.16—0.25)	815	50	1900	0.15	(0.10—0.19)	285
10.0	110	3500	0.23	(0.19—0.27)	805	50	1500	0.16	(0.12—0.20)	240
12.0	120	3100	0.26	(0.22—0.29)	805	60	1500	0.18	(0.15—0.21)	270
16.0	130	2500	0.28	(0.23—0.33)	700	60	1100	0.19	(0.14—0.24)	205
20.0	130	2000	0.3	(0.26—0.34)	600	60	900	0.21	(0.15—0.26)	185
25.0	130	1600	0.32	(0.28—0.35)	510	60	700	0.21	(0.17—0.25)	145

OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

WSTAR DRILLS

Work 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
3.2	90	8900	0.1 (0.06—0.13)	890	65	6400	0.1 (0.06—0.13)	640
4.0	100	7900	0.12 (0.08—0.16)	945	65	5100	0.12 (0.08—0.16)	610
5.0	100	6300	0.15 (0.10—0.20)	945	65	4100	0.15 (0.10—0.20)	615
6.3	110	5500	0.2 (0.13—0.26)	1100	70	3500	0.2 (0.13—0.26)	700
8.0	120	4700	0.25 (0.18—0.31)	1175	70	2700	0.23 (0.18—0.28)	620
10.0	130	4100	0.29 (0.22—0.35)	1185	70	2200	0.27 (0.22—0.32)	590
12.0	140	3700	0.32 (0.26—0.37)	1180	90	2300	0.3 (0.26—0.34)	690
16.0	160	3100	0.35 (0.28—0.42)	1085	90	1700	0.33 (0.28—0.38)	560
20.0	160	2500	0.37 (0.30—0.44)	925	100	1500	0.35 (0.30—0.40)	525
25.0	160	2000	0.37 (0.30—0.44)	740	100	1200	0.35 (0.30—0.40)	420

Work Material	Aluminium Alloy (Si<5%) ASTM A6061, ASTM A7075 etc				Heat Resistant Alloy 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
3.2	120	11900	0.23 (0.10—0.35)	2735	20	1900	0.07 (0.05—0.09)	130
4.0	120	9500	0.24 (0.12—0.35)	2280	20	1500	0.09 (0.06—0.11)	135
5.0	120	7600	0.25 (0.15—0.35)	1900	20	1200	0.11 (0.08—0.14)	130
6.3	150	7500	0.35 (0.20—0.50)	2625	25	1200	0.13 (0.09—0.16)	155
8.0	150	5900	0.35 (0.20—0.50)	2065	25	900	0.14 (0.11—0.17)	125
10.0	150	4700	0.5 (0.20—0.80)	2350	25	700	0.15 (0.12—0.17)	105
12.0	160	4200	0.5 (0.20—0.80)	2100	25	600	0.16 (0.13—0.18)	95
16.0	160	3100	0.6 (0.20—1.00)	1860	25	400	0.18 (0.14—0.21)	70
20.0	170	2700	0.6 (0.20—1.00)	1620	30	400	0.19 (0.15—0.22)	75
25.0	170	2100	0.6 (0.20—1.00)	1260	30	300	0.19 (0.15—0.22)	55

RECOMMENDED CUTTING CONDITIONS

DB Type Drill(l/d≥10)

Work 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
3.2	90	8900	0.1	(0.06—0.13)	890	80	7900	0.1	(0.06—0.13)	790
4.0	90	7100	0.12	(0.08—0.16)	850	80	6300	0.12	(0.08—0.16)	755
5.0	90	5700	0.15	(0.10—0.20)	855	80	5000	0.15	(0.10—0.20)	750
6.3	110	5500	0.2	(0.13—0.26)	1100	90	4500	0.2	(0.13—0.26)	900
8.0	110	4300	0.23	(0.18—0.28)	990	90	3500	0.23	(0.18—0.28)	805
10.0	110	3500	0.26	(0.20—0.32)	910	90	2800	0.26	(0.20—0.32)	730
12.0	130	3400	0.3	(0.25—0.34)	1020	110	2900	0.3	(0.25—0.34)	870
16.0	130	2500	0.31	(0.24—0.38)	775	110	2100	0.31	(0.24—0.38)	650

Work 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
3.2	70	6900	0.09	(0.05—0.12)	620	40	3900	0.07	(0.05—0.09)	270
4.0	70	5500	0.11	(0.07—0.15)	605	40	3100	0.08	(0.06—0.10)	245
5.0	70	4400	0.14	(0.09—0.19)	615	40	2500	0.1	(0.07—0.12)	250
6.3	80	4000	0.18	(0.11—0.25)	720	50	2500	0.12	(0.08—0.16)	300
8.0	80	3100	0.21	(0.15—0.26)	650	50	1900	0.14	(0.10—0.17)	265
10.0	80	2500	0.23	(0.15—0.30)	575	50	1500	0.15	(0.12—0.18)	225
12.0	90	2300	0.25	(0.19—0.31)	575	60	1500	0.17	(0.14—0.19)	255
16.0	90	1700	0.28	(0.19—0.36)	475	60	1100	0.18	(0.13—0.22)	195

OPERATION GUIDANCE ➤ N051,N052
TECHNICAL DATA ➤ Q001

MWS

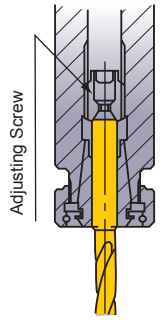
WSTAR DRILLS

Work 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
3.2	90	8900	0.1 (0.06—0.13)	890	50	4900	0.09 (0.05—0.12)	440
4.0	90	7100	0.12 (0.08—0.16)	850	50	3900	0.11 (0.07—0.15)	430
5.0	90	5700	0.15 (0.10—0.20)	855	50	3100	0.14 (0.09—0.19)	435
6.3	110	5500	0.2 (0.13—0.26)	1100	60	3000	0.18 (0.11—0.25)	540
8.0	110	4300	0.23 (0.18—0.28)	990	60	2300	0.21 (0.15—0.26)	480
10.0	110	3500	0.26 (0.20—0.32)	910	60	1900	0.23 (0.15—0.30)	435
12.0	130	3400	0.3 (0.25—0.34)	1020	80	2100	0.25 (0.19—0.31)	525
16.0	130	2500	0.31 (0.24—0.38)	775	80	1500	0.28 (0.19—0.36)	420

Work Material	Aluminium Alloy (Si<5%) ASTM A6061, ASTM A7075 etc				Heat Resistant Alloy 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
3.2	100	9900	0.23 (0.10—0.35)	2275	20	1900	0.07 (0.05—0.09)	130
4.0	100	7900	0.24 (0.12—0.35)	1895	20	1500	0.09 (0.06—0.11)	135
5.0	100	6300	0.25 (0.15—0.35)	1575	20	1200	0.11 (0.08—0.14)	130
6.3	130	6500	0.35 (0.20—0.50)	2275	20	1000	0.13 (0.09—0.16)	130
8.0	130	5100	0.35 (0.20—0.50)	1785	20	700	0.14 (0.11—0.16)	100
10.0	130	4100	0.5 (0.20—0.80)	2050	20	600	0.15 (0.12—0.17)	90
12.0	140	3700	0.5 (0.20—0.80)	1850	20	500	0.16 (0.13—0.18)	80
16.0	140	2700	0.5 (0.20—0.80)	1350	20	300	0.17 (0.14—0.19)	50

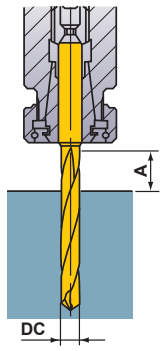
SB/MB/LB/XB Type Drill OPERATIONAL GUIDANCE

Drill Holding



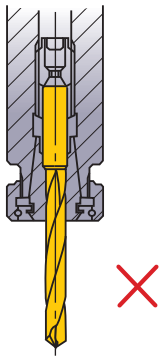
Thrust bearing type collet chuck holds the drill securely.

Drill Length



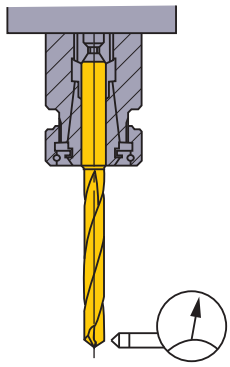
A ≥ DC x 1.5(DC×over 2.0 for DC<3)

Drill Installation



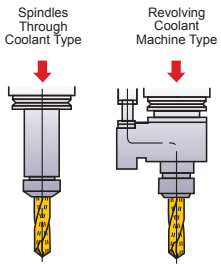
Do not clamp on the flutes.

Installation Tolerance(DC≥3)



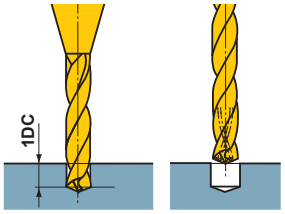
Run-out ≤ 0.03mm

Through Coolant Type(DC≥3)



Coolant pressure is approx. 0.5—1MPa (2-3MPa for DC≤5, 1.5MPa at minimum for DC<3
Recommended coolant pressure:>3Mpa).
Coolant volume is 1.5—4.0l/min. (For DC≥3)

Drill Installation



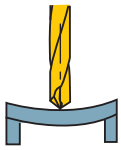
①When machining a prepared hole with the MWE-SB please set the depth to 1DC (DC=drill diameter). For pilot hole drilling when DC is up to 3, use the SB type drill.
②Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Coolant Handling

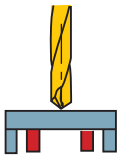
1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece

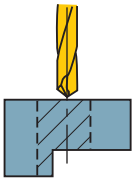


If Bending Occurs



Support the Workpiece

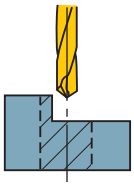
Interrupted Cutting(DC≥3)



One Process

○

①Lower the feed when drilling the interrupted part.

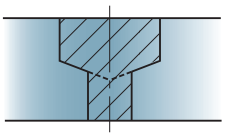


Requires Prior Machining

△

①Spot face with an end mill prior to drilling.

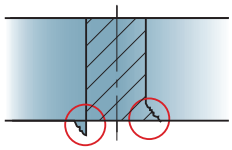
Stepped Holes(DC≥3)



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(DC≥3)



①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

NOTES ON USE (For DC<3)

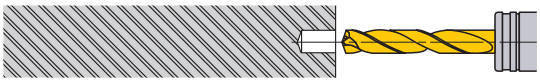
●Please use a fine mesh filter (mesh≤3μm) for coolant to prevent jamming in the oil hole.
●For deep drilling with the long type drill, machining a pilot hole is recommended.
(Otherwise, centrifugal forces may cause drill breakage.)

MWS
WSTAR DRILLS

DB Type Drill(L/D≥10, DC<3) OPERATIONAL GUIDANCE

FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



①Use the SB type drill.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

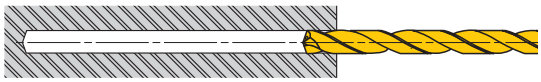
2. Initial cutting with the long type drill

①Penetrate the guide hole at low revolution. (Revolution 1000min^{-1}, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 0.5—1.0mm short of the guide hole bottom.

3. Drill the deep hole

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

4. Drill retraction



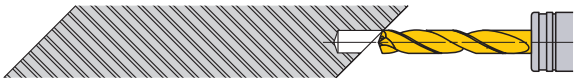
①After drilling, lower the cutting revolution about 0.5—1.0mm short of the hole end. (Revolution of around 1000min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
③Finally, clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.

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

1. Spot facing

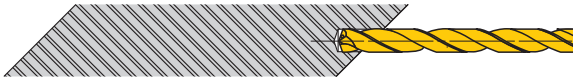
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



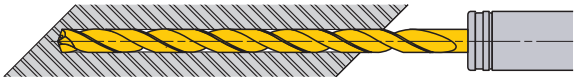
①Use a drill with a larger (flatter) point angle than the long type. TheMWS-SB type is recommended.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



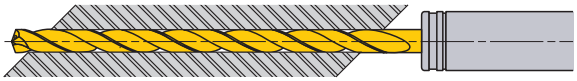
①Penetrate the guide hole at a low revolution. (Revolution 1000min-1, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 0.5—1.0mm short of the guide hole bottom.

4. Drill the deep hole



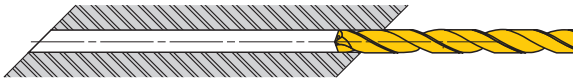
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Feed rate should be half the normal feed.

6. Drill retraction

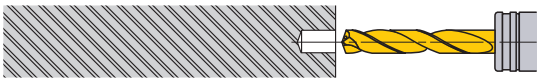


①Finally clear the hole at a revolution speed of 1000min-1 and feed rate of 0.2—0.3mm/rev.
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

OPERATIONAL GUIDANCE FOR THE LONG TYPE DRILL (L/D≥3)

FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MZE, MZS, MWE or MWS is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC or deeper.
④Ensure a high precision hole is drilled for the guide.

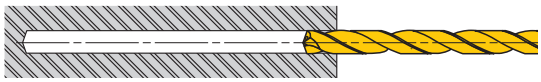
2. Initial cutting with the long type drill

①Penetrate the guide hole at low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the guide hole bottom.

3. Drill the deep hole

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

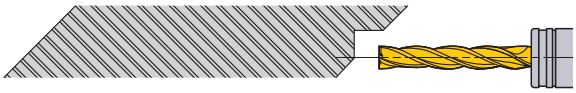
4. Drill retraction



①After drilling, lower the cutting revolution about 1—2mm short of the hole end. (Cutting speed of around 20—30m/min)
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
③Finally, clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.

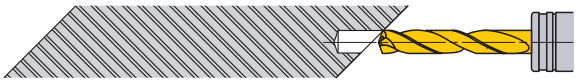
INTERRUPED DRILLING ●Drilling and breaking through on irregular faces or angles

1. Spot facing



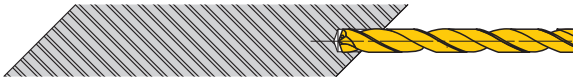
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



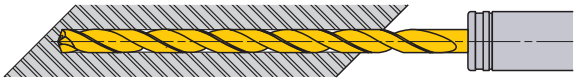
①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MZE, MZS, MWE or MWS is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC or deeper.
④Ensure a high precision hole is drilled for the guide.

3. Initial cutting with the long type drill



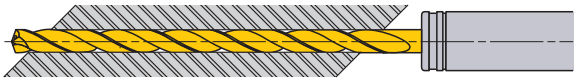
①Penetrate the guide hole at a low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the guide hole bottom.

4. Drill the deep hole



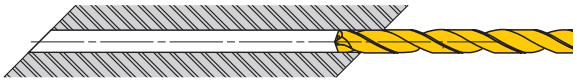
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②A feed rate of 0.05—0.1mm/rev is recommended.

6. Drill retraction



①Finally clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

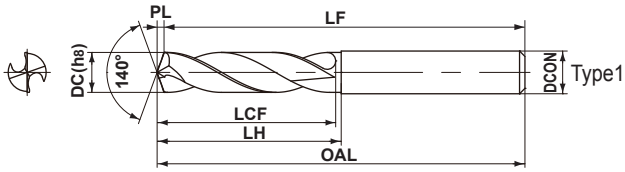
DRILLING(SOLID CARBIDE)

MWE
WSTAR DRILLS

- For high accuracy and efficient drilling of steels, carbon steels and difficult-to-cut materials.
- Also suitable for lower speed applications.

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

	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤25
	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
h8 MWE-5A/MA	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
h6 MWE-5B/MB	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013



(Note 2) MWE-SB/MB drills are suitable for use with shrink fit holders.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.0	2	●	MWE0300SA	16.5	16.5	55.5	55	0.5	3.0	1
	2	●	MWE0300SB	16.5	16.5	55.5	55	0.5	3.0	1
	3	●	MWE0300MA	21.5	21.5	60.5	60	0.5	3.0	1
	3	●	MWE0300MB	21.5	21.5	60.5	60	0.5	3.0	1
3.1	2	●	MWE0310SA	18.6	18.6	55.6	55	0.6	3.1	1
	2	□	MWE0310SB	18.6	20.6	55.6	55	0.6	4.0	1
	3	●	MWE0310MA	24.6	24.6	60.6	60	0.6	3.1	1
	3	□	MWE0310MB	24.6	26.6	60.6	60	0.6	4.0	1
3.2	2	●	MWE0320SA	18.6	18.6	55.6	55	0.6	3.2	1
	2	□	MWE0320SB	18.6	20.6	55.6	55	0.6	4.0	1
	3	●	MWE0320MA	24.6	24.6	60.6	60	0.6	3.2	1
	3	□	MWE0320MB	24.6	26.6	60.6	60	0.6	4.0	1
3.3	2	●	MWE0330SA	18.6	18.6	55.6	55	0.6	3.3	1
	2	●	MWE0330SB	18.6	20.6	55.6	55	0.6	4.0	1
	3	●	MWE0330MA	24.6	24.6	60.6	60	0.6	3.3	1
	3	●	MWE0330MB	24.6	26.6	60.6	60	0.6	4.0	1
3.4	2	●	MWE0340SA	20.6	20.6	55.6	55	0.6	3.4	1
	2	●	MWE0340SB	18.6	20.6	55.6	55	0.6	4.0	1
	3	●	MWE0340MA	24.6	24.6	60.6	60	0.6	3.4	1
	3	●	MWE0340MB	24.6	26.6	60.6	60	0.6	4.0	1
3.5	2	●	MWE0350SA	20.6	20.6	55.6	55	0.6	3.5	1
	2	●	MWE0350SB	18.6	20.6	55.6	55	0.6	4.0	1
	3	●	MWE0350MA	24.6	24.6	60.6	60	0.6	3.5	1
	3	●	MWE0350MB	24.6	26.6	60.6	60	0.6	4.0	1
3.6	2	●	MWE0360SA	20.7	20.7	55.7	55	0.7	3.6	1
	2	□	MWE0360SB	20.7	20.7	55.7	55	0.7	4.0	1
	3	●	MWE0360MA	27.7	27.7	60.7	60	0.7	3.6	1
	3	□	MWE0360MB	27.7	27.7	60.7	60	0.7	4.0	1
3.7	2	●	MWE0370SA	20.7	20.7	55.7	55	0.7	3.7	1
	2	●	MWE0370SB	20.7	20.7	55.7	55	0.7	4.0	1
	3	●	MWE0370MA	27.7	27.7	60.7	60	0.7	3.7	1
	3	●	MWE0370MB	27.7	27.7	60.7	60	0.7	4.0	1
3.8	2	●	MWE0380SA	22.7	22.7	55.7	55	0.7	3.8	1
	2	●	MWE0380SB	20.7	20.7	55.7	55	0.7	4.0	1
	3	●	MWE0380MA	27.7	27.7	60.7	60	0.7	3.8	1
	3	●	MWE0380MB	27.7	27.7	60.7	60	0.7	4.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.9	2	●	MWE0390SA	22.7	22.7	55.7	55	0.7	3.9	1
	2	●	MWE0390SB	20.7	20.7	55.7	55	0.7	4.0	1
	3	●	MWE0390MA	27.7	27.7	60.7	60	0.7	3.9	1
	3	●	MWE0390MB	27.7	27.7	60.7	60	0.7	4.0	1
4.0	2	●	MWE0400SA	22.7	22.7	55.7	55	0.7	4.0	1
	2	●	MWE0400SB	20.7	20.7	55.7	55	0.7	4.0	1
	3	●	MWE0400MA	27.7	27.7	60.7	60	0.7	4.0	1
	3	●	MWE0400MB	27.7	27.7	60.7	60	0.7	4.0	1
4.1	2	●	MWE0410SA	22.7	22.7	55.7	55	0.7	4.1	1
	2	□	MWE0410SB	22.7	24.7	62.7	62	0.7	5.0	1
	3	●	MWE0410MA	29.7	29.7	63.7	63	0.7	4.1	1
	3	□	MWE0410MB	29.7	31.7	68.7	68	0.7	5.0	1
4.2	2	●	MWE0420SA	22.8	22.8	55.8	55	0.8	4.2	1
	2	●	MWE0420SB	22.8	24.8	62.8	62	0.8	5.0	1
	3	●	MWE0420MA	29.8	29.8	63.8	63	0.8	4.2	1
	3	●	MWE0420MB	29.8	31.8	68.8	68	0.8	5.0	1
4.3	2	●	MWE0430SA	24.8	24.8	58.8	58	0.8	4.3	1
	2	●	MWE0430SB	22.8	24.8	62.8	62	0.8	5.0	1
	3	●	MWE0430MA	29.8	29.8	63.8	63	0.8	4.3	1
	3	●	MWE0430MB	29.8	31.8	68.8	68	0.8	5.0	1
4.4	2	●	MWE0440SA	24.8	24.8	58.8	58	0.8	4.4	1
	2	●	MWE0440SB	22.8	24.8	62.8	62	0.8	5.0	1
	3	●	MWE0440MA	29.8	29.8	63.8	63	0.8	4.4	1
	3	●	MWE0440MB	29.8	31.8	68.8	68	0.8	5.0	1
4.5	2	●	MWE0450SA	24.8	24.8	58.8	58	0.8	4.5	1
	2	●	MWE0450SB	22.8	24.8	62.8	62	0.8	5.0	1
	3	●	MWE0450MA	29.8	29.8	63.8	63	0.8	4.5	1
	3	●	MWE0450MB	29.8	31.8	68.8	68	0.8	5.0	1
4.6	2	●	MWE0460SA	24.8	24.8	58.8	58	0.8	4.6	1
	2	□	MWE0460SB	24.8	24.8	62.8	62	0.8	5.0	1
	3	●	MWE0460MA	32.8	32.8	68.8	68	0.8	4.6	1
	3	□	MWE0460MB	32.8	32.8	68.8	68	0.8	5.0	1
4.7	2	●	MWE0470SA	24.9	24.9	58.9	58	0.9	4.7	1
	2	□	MWE0470SB	24.9	24.9	62.9	62	0.9	5.0	1
	3	●	MWE0470MA	32.9	32.9	68.9	68	0.9	4.7	1
	3	□	MWE0470MB	32.9	32.9	68.9	68	0.9	5.0	1

(Note) 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.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.8	2	●	MWE0480SA	26.9	26.9	62.9	62	0.9	4.8	1
	2	□	MWE0480SB	24.9	24.9	62.9	62	0.9	5.0	1
	3	●	MWE0480MA	32.9	32.9	68.9	68	0.9	4.8	1
	3	□	MWE0480MB	32.9	32.9	68.9	68	0.9	5.0	1
4.9	2	●	MWE0490SA	26.9	26.9	62.9	62	0.9	4.9	1
	2	□	MWE0490SB	24.9	24.9	62.9	62	0.9	5.0	1
	3	●	MWE0490MA	32.9	32.9	68.9	68	0.9	4.9	1
	3	□	MWE0490MB	32.9	32.9	68.9	68	0.9	5.0	1
5.0	2	●	MWE0500SA	26.9	26.9	62.9	62	0.9	5.0	1
	2	●	MWE0500SB	24.9	24.9	62.9	62	0.9	5.0	1
	3	●	MWE0500MA	32.9	32.9	68.9	68	0.9	5.0	1
	3	●	MWE0500MB	32.9	32.9	68.9	68	0.9	5.0	1
5.1	2	●	MWE0510SA	26.9	26.9	62.9	62	0.9	5.1	1
	2	●	MWE0510SB	26.9	28.9	66.9	66	0.9	6.0	1
	3	●	MWE0510MA	34.9	34.9	72.9	72	0.9	5.1	1
	3	●	MWE0510MB	34.9	36.9	74.9	74	0.9	6.0	1
5.2	2	●	MWE0520SA	26.9	26.9	62.9	62	0.9	5.2	1
	2	●	MWE0520SB	26.9	28.9	66.9	66	0.9	6.0	1
	3	●	MWE0520MA	34.9	34.9	72.9	72	0.9	5.2	1
	3	●	MWE0520MB	34.9	36.9	74.9	74	0.9	6.0	1
5.3	2	●	MWE0530SA	27.0	27.0	63.0	62	1.0	5.3	1
	2	□	MWE0530SB	27.0	29.0	67.0	66	1.0	6.0	1
	3	●	MWE0530MA	35.0	35.0	73.0	72	1.0	5.3	1
	3	□	MWE0530MB	35.0	37.0	75.0	74	1.0	6.0	1
5.4	2	●	MWE0540SA	29.0	29.0	67.0	66	1.0	5.4	1
	2	□	MWE0540SB	27.0	29.0	67.0	66	1.0	6.0	1
	3	●	MWE0540MA	35.0	35.0	73.0	72	1.0	5.4	1
	3	□	MWE0540MB	35.0	37.0	75.0	74	1.0	6.0	1
5.5	2	●	MWE0550SA	29.0	29.0	67.0	66	1.0	5.5	1
	2	●	MWE0550SB	27.0	29.0	67.0	66	1.0	6.0	1
	3	●	MWE0550MA	35.0	35.0	73.0	72	1.0	5.5	1
	3	●	MWE0550MB	35.0	37.0	75.0	74	1.0	6.0	1
5.6	2	●	MWE0560SA	29.0	29.0	67.0	66	1.0	5.6	1
	2	□	MWE0560SB	29.0	29.0	67.0	66	1.0	6.0	1
	3	●	MWE0560MA	37.0	37.0	75.0	74	1.0	5.6	1
	3	□	MWE0560MB	37.0	37.0	75.0	74	1.0	6.0	1
5.7	2	●	MWE0570SA	29.0	29.0	67.0	66	1.0	5.7	1
	2	□	MWE0570SB	29.0	29.0	67.0	66	1.0	6.0	1
	3	●	MWE0570MA	37.0	37.0	75.0	74	1.0	5.7	1
	3	□	MWE0570MB	37.0	37.0	75.0	74	1.0	6.0	1
5.8	2	●	MWE0580SA	29.1	29.1	67.1	66	1.1	5.8	1
	2	□	MWE0580SB	29.1	29.1	67.1	66	1.1	6.0	1
	3	●	MWE0580MA	37.1	37.1	75.1	74	1.1	5.8	1
	3	□	MWE0580MB	37.1	37.1	75.1	74	1.1	6.0	1
5.9	2	●	MWE0590SA	29.1	29.1	67.1	66	1.1	5.9	1
	2	□	MWE0590SB	29.1	29.1	67.1	66	1.1	6.0	1
	3	●	MWE0590MA	37.1	37.1	75.1	74	1.1	5.9	1
	3	□	MWE0590MB	37.1	37.1	75.1	74	1.1	6.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.0	2	●	MWE0600SA	29.1	29.1	67.1	66	1.1	6.0	1
	2	●	MWE0600SB	29.1	29.1	67.1	66	1.1	6.0	1
	3	●	MWE0600MA	42.1	42.1	82.1	81	1.1	6.0	1
	3	●	MWE0600MB	37.1	37.1	75.1	74	1.1	6.0	1
6.1	2	●	MWE0610SA	32.1	32.1	71.1	70	1.1	6.1	1
	2	●	MWE0610SB	32.1	35.1	75.1	74	1.1	7.0	1
	3	●	MWE0610MA	42.1	42.1	82.1	81	1.1	6.1	1
	3	●	MWE0610MB	42.1	45.1	84.1	83	1.1	7.0	1
6.2	2	●	MWE0620SA	32.1	32.1	71.1	70	1.1	6.2	1
	2	●	MWE0620SB	32.1	35.1	75.1	74	1.1	7.0	1
	3	●	MWE0620MA	42.1	42.1	82.1	81	1.1	6.2	1
	3	●	MWE0620MB	42.1	45.1	84.1	83	1.1	7.0	1
6.3	2	●	MWE0630SA	32.1	32.1	71.1	70	1.1	6.3	1
	2	□	MWE0630SB	32.1	35.1	75.1	74	1.1	7.0	1
	3	●	MWE0630MA	42.1	42.1	72.1	81	1.1	6.3	1
	3	□	MWE0630MB	42.1	45.1	84.1	83	1.1	7.0	1
6.4	2	●	MWE0640SA	32.2	32.2	71.2	70	1.2	6.4	1
	2	□	MWE0640SB	32.2	35.2	75.2	74	1.2	7.0	1
	3	●	MWE0640MA	42.2	42.2	82.2	81	1.2	6.4	1
	3	□	MWE0640MB	42.2	45.2	84.2	83	1.2	7.0	1
6.5	2	●	MWE0650SA	32.2	32.2	71.2	70	1.2	6.5	1
	2	●	MWE0650SB	32.2	35.2	75.2	74	1.2	7.0	1
	3	●	MWE0650MA	42.2	42.2	82.2	81	1.2	6.5	1
	3	●	MWE0650MB	42.2	45.2	84.2	83	1.2	7.0	1
6.6	2	●	MWE0660SA	32.2	32.2	71.2	70	1.2	6.6	1
	2	□	MWE0660SB	35.2	35.2	75.2	74	1.2	7.0	1
	3	●	MWE0660MA	44.2	44.2	84.2	83	1.2	6.6	1
	3	□	MWE0660MB	44.2	44.2	84.2	83	1.2	7.0	1
6.7	2	●	MWE0670SA	32.2	32.2	71.2	70	1.2	6.7	1
	2	●	MWE0670SB	35.2	35.2	75.2	74	1.2	7.0	1
	3	●	MWE0670MA	44.2	44.2	84.2	83	1.2	6.7	1
	3	●	MWE0670MB	44.2	44.2	84.2	83	1.2	7.0	1
6.8	2	●	MWE0680SA	35.2	35.2	75.2	74	1.2	6.8	1
	2	●	MWE0680SB	35.2	35.2	75.2	74	1.2	7.0	1
	3	●	MWE0680MA	44.2	44.2	84.2	83	1.2	6.8	1
	3	●	MWE0680MB	44.2	44.2	84.2	83	1.2	7.0	1
6.9	2	●	MWE0690SA	35.3	35.3	75.3	74	1.3	6.9	1
	2	●	MWE0690SB	35.3	35.3	75.3	74	1.3	7.0	1
	3	●	MWE0690MA	44.3	44.3	84.3	83	1.3	6.9	1
	3	●	MWE0690MB	44.3	44.3	84.3	83	1.3	7.0	1
7.0	2	●	MWE0700SA	35.3	35.3	75.3	74	1.3	7.0	1
	2	●	MWE0700SB	35.3	35.3	75.3	74	1.3	7.0	1
	3	●	MWE0700MA	44.3	44.3	84.3	83	1.3	7.0	1
	3	●	MWE0700MB	44.3	44.3	84.3	83	1.3	7.0	1
7.1	2	●	MWE0710SA	35.3	35.3	75.3	74	1.3	7.1	1
	2	□	MWE0710SB	35.3	38.3	80.3	79	1.3	8.0	1
	3	●	MWE0710MA	46.3	46.3	88.3	87	1.3	7.1	1
	3	□	MWE0710MB	46.3	49.3	91.3	90	1.3	8.0	1

CUTTING CONDITIONS ➤ N061
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MWE

WSTAR DRILLS

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.2	2	●	MWE0720SA	35.3	35.3	75.3	74	1.3	7.2	1
	2	□	MWE0720SB	35.3	38.3	80.3	79	1.3	8.0	1
	3	●	MWE0720MA	46.3	46.3	88.3	87	1.3	7.2	1
	3	□	MWE0720MB	46.3	49.3	91.3	90	1.3	8.0	1
7.3	2	●	MWE0730SA	35.3	35.3	75.3	74	1.3	7.3	1
	2	□	MWE0730SB	35.3	38.3	80.3	79	1.3	8.0	1
	3	●	MWE0730MA	46.3	46.3	88.3	87	1.3	7.3	1
	3	□	MWE0730MB	46.3	49.3	91.3	90	1.3	8.0	1
7.4	2	●	MWE0740SA	35.3	35.3	75.3	74	1.3	7.4	1
	2	□	MWE0740SB	35.3	38.3	80.3	79	1.3	8.0	1
	3	●	MWE0740MA	46.3	46.3	88.3	87	1.3	7.4	1
	3	□	MWE0740MB	46.3	49.3	91.3	90	1.3	8.0	1
7.5	2	●	MWE0750SA	35.4	35.4	75.4	74	1.4	7.5	1
	2	●	MWE0750SB	35.4	38.4	80.4	79	1.4	8.0	1
	3	●	MWE0750MA	46.4	46.4	88.4	87	1.4	7.5	1
	3	●	MWE0750MB	46.4	49.4	91.4	90	1.4	8.0	1
7.6	2	●	MWE0760SA	38.4	38.4	80.4	79	1.4	7.6	1
	2	□	MWE0760SB	38.4	38.4	80.4	79	1.4	8.0	1
	3	●	MWE0760MA	49.4	49.4	91.4	90	1.4	7.6	1
	3	□	MWE0760MB	49.4	49.4	91.4	90	1.4	8.0	1
7.7	2	●	MWE0770SA	38.4	38.4	80.4	79	1.4	7.7	1
	2	●	MWE0770SB	38.4	38.4	80.4	79	1.4	8.0	1
	3	●	MWE0770MA	49.4	49.4	91.4	90	1.4	7.7	1
	3	●	MWE0770MB	49.4	49.4	91.4	90	1.4	8.0	1
7.8	2	●	MWE0780SA	38.4	38.4	80.4	79	1.4	7.8	1
	2	●	MWE0780SB	38.4	38.4	80.4	79	1.4	8.0	1
	3	●	MWE0780MA	49.4	49.4	91.4	90	1.4	7.8	1
	3	●	MWE0780MB	49.4	49.4	91.4	90	1.4	8.0	1
7.9	2	●	MWE0790SA	38.4	38.4	80.4	79	1.4	7.9	1
	2	●	MWE0790SB	38.4	38.4	80.4	79	1.4	8.0	1
	3	●	MWE0790MA	49.4	49.4	91.4	90	1.4	7.9	1
	3	●	MWE0790MB	49.4	49.4	91.4	90	1.4	8.0	1
8.0	2	●	MWE0800SA	38.5	38.5	80.5	79	1.5	8.0	1
	2	●	MWE0800SB	38.5	38.5	80.5	79	1.5	8.0	1
	3	●	MWE0800MA	49.5	49.5	91.5	90	1.5	8.0	1
	3	●	MWE0800MB	49.5	49.5	91.5	90	1.5	8.0	1
8.1	2	●	MWE0810SA	38.5	38.5	80.5	79	1.5	8.1	1
	2	□	MWE0810SB	38.5	41.5	85.5	84	1.5	9.0	1
	3	●	MWE0810MA	54.5	54.5	97.5	96	1.5	8.1	1
	3	□	MWE0810MB	54.5	57.5	99.5	98	1.5	9.0	1
8.2	2	●	MWE0820SA	38.5	38.5	80.5	79	1.5	8.2	1
	2	□	MWE0820SB	38.5	41.5	85.5	84	1.5	9.0	1
	3	●	MWE0820MA	54.5	54.5	97.5	96	1.5	8.2	1
	3	□	MWE0820MB	54.5	57.5	99.5	98	1.5	9.0	1
8.3	2	●	MWE0830SA	38.5	38.5	80.5	79	1.5	8.3	1
	2	□	MWE0830SB	38.5	41.5	85.5	84	1.5	9.0	1
	3	●	MWE0830MA	54.5	54.5	97.5	96	1.5	8.3	1
	3	□	MWE0830MB	54.5	57.5	99.5	98	1.5	9.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.4	2	●	MWE0840SA	38.5	38.5	80.5	79	1.5	8.4	1
	2	●	MWE0840SB	38.5	41.5	85.5	84	1.5	9.0	1
	3	●	MWE0840MA	54.5	54.5	97.5	96	1.5	8.4	1
	3	●	MWE0840MB	54.5	57.5	99.5	98	1.5	9.0	1
8.5	2	●	MWE0850SA	38.5	38.5	80.5	79	1.5	8.5	1
	2	●	MWE0850SB	38.5	41.5	85.5	84	1.5	9.0	1
	3	●	MWE0850MA	54.5	54.5	97.5	96	1.5	8.5	1
	3	●	MWE0850MB	54.5	57.5	99.5	98	1.5	9.0	1
8.6	2	●	MWE0860SA	41.6	41.6	85.6	84	1.6	8.6	1
	2	●	MWE0860SB	41.6	41.6	85.6	84	1.6	9.0	1
	3	●	MWE0860MA	56.6	56.6	99.6	98	1.6	8.6	1
	3	●	MWE0860MB	56.6	56.6	99.6	98	1.6	9.0	1
8.7	2	●	MWE0870SA	41.6	41.6	85.6	84	1.6	8.7	1
	2	□	MWE0870SB	41.6	41.6	85.6	84	1.6	9.0	1
	3	●	MWE0870MA	56.6	56.6	99.6	98	1.6	8.7	1
	3	□	MWE0870MB	56.6	56.6	99.6	98	1.6	9.0	1
8.8	2	●	MWE0880SA	41.6	41.6	85.6	84	1.6	8.8	1
	2	□	MWE0880SB	41.6	41.6	85.6	84	1.6	9.0	1
	3	●	MWE0880MA	56.6	56.6	99.6	98	1.6	8.8	1
	3	□	MWE0880MB	56.6	56.6	99.6	98	1.6	9.0	1
8.9	2	●	MWE0890SA	41.6	41.6	85.6	84	1.6	8.9	1
	2	□	MWE0890SB	41.6	41.6	85.6	84	1.6	9.0	1
	3	●	MWE0890MA	56.6	56.6	99.6	98	1.6	8.9	1
	3	□	MWE0890MB	56.6	56.6	99.6	98	1.6	9.0	1
9.0	2	●	MWE0900SA	41.6	41.6	85.6	84	1.6	9.0	1
	2	●	MWE0900SB	41.6	41.6	85.6	84	1.6	9.0	1
	3	●	MWE0900MA	56.6	56.6	99.6	98	1.6	9.0	1
	3	●	MWE0900MB	56.6	56.6	99.6	98	1.6	9.0	1
9.1	2	●	MWE0910SA	41.7	41.7	85.7	84	1.7	9.1	1
	2	□	MWE0910SB	41.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0910MA	59.7	59.7	103.7	102	1.7	9.1	1
	3	□	MWE0910MB	59.7	62.7	106.7	105	1.7	10.0	1
9.2	2	●	MWE0920SA	41.7	41.7	85.7	84	1.7	9.2	1
	2	□	MWE0920SB	41.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0920MA	59.7	59.7	103.7	102	1.7	9.2	1
	3	□	MWE0920MB	59.7	62.7	106.7	105	1.7	10.0	1
9.3	2	●	MWE0930SA	41.7	41.7	82.7	84	1.7	9.3	1
	2	□	MWE0930SB	41.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0930MA	59.7	59.7	103.7	102	1.7	9.3	1
	3	□	MWE0930MB	59.7	62.7	106.7	105	1.7	10.0	1
9.4	2	●	MWE0940SA	41.7	41.7	85.7	84	1.7	9.4	1
	2	●	MWE0940SB	41.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0940MA	59.7	59.7	103.7	102	1.7	9.4	1
	3	●	MWE0940MB	59.7	62.7	106.7	105	1.7	10.0	1
9.5	2	●	MWE0950SA	41.7	41.7	85.7	84	1.7	9.5	1
	2	●	MWE0950SB	41.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0950MA	59.7	59.7	103.7	102	1.7	9.5	1
	3	●	MWE0950MB	59.7	62.7	106.7	105	1.7	10.0	1

(Note) 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.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
9.6	2	●	MWE0960SA	44.7	44.7	90.7	89	1.7	9.6	1
	2	●	MWE0960SB	44.7	44.7	90.7	89	1.7	10.0	1
	3	●	MWE0960MA	61.7	61.7	106.7	105	1.7	9.6	1
	3	●	MWE0960MB	61.7	61.7	106.7	105	1.7	10.0	1
9.7	2	●	MWE0970SA	44.8	44.8	90.8	89	1.8	9.7	1
	2	□	MWE0970SB	44.8	44.8	90.8	89	1.8	10.0	1
	3	●	MWE0970MA	61.8	61.8	106.8	105	1.8	9.7	1
	3	□	MWE0970MB	61.8	61.8	106.8	105	1.8	10.0	1
9.8	2	●	MWE0980SA	44.8	44.8	90.8	89	1.8	9.8	1
	2	□	MWE0980SB	44.8	44.8	90.8	89	1.8	10.0	1
	3	●	MWE0980MA	61.8	61.8	106.8	105	1.8	9.8	1
	3	□	MWE0980MB	61.8	61.8	106.8	105	1.8	10.0	1
9.9	2	●	MWE0990SA	44.8	44.8	90.8	89	1.8	9.9	1
	2	□	MWE0990SB	44.8	44.8	90.8	89	1.8	10.0	1
	3	●	MWE0990MA	61.8	61.8	106.8	105	1.8	9.9	1
	3	□	MWE0990MB	61.8	61.8	106.8	105	1.8	10.0	1
10.0	2	●	MWE1000SA	44.8	44.8	90.8	89	1.8	10.0	1
	2	●	MWE1000SB	44.8	44.8	90.8	89	1.8	10.0	1
	3	●	MWE1000MA	61.8	61.8	106.8	105	1.8	10.0	1
	3	●	MWE1000MB	61.8	61.8	106.8	105	1.8	10.0	1
10.1	2	●	MWE1010SA	44.8	44.8	90.8	89	1.8	10.1	1
	2	□	MWE1010SB	44.8	47.8	96.8	95	1.8	11.0	1
	3	●	MWE1010MA	67.8	67.8	113.8	112	1.8	10.1	1
	3	□	MWE1010MB	67.8	70.8	115.8	114	1.8	11.0	1
10.2	2	●	MWE1020SA	44.9	44.9	90.9	89	1.9	10.2	1
	2	●	MWE1020SB	44.9	47.9	96.9	95	1.9	11.0	1
	3	●	MWE1020MA	67.9	67.9	113.9	112	1.9	10.2	1
	3	●	MWE1020MB	67.9	70.9	115.9	114	1.9	11.0	1
10.3	2	●	MWE1030SA	44.9	44.9	90.9	89	1.9	10.3	1
	2	●	MWE1030SB	44.9	47.9	96.9	95	1.9	11.0	1
	3	●	MWE1030MA	67.9	67.9	113.9	112	1.9	10.3	1
	3	●	MWE1030MB	67.9	70.9	115.9	114	1.9	11.0	1
10.4	2	●	MWE1040SA	44.9	44.9	90.9	89	1.9	10.4	1
	2	●	MWE1040SB	44.9	47.9	96.9	95	1.9	11.0	1
	3	●	MWE1040MA	67.9	67.9	113.9	112	1.9	10.4	1
	3	●	MWE1040MB	67.9	70.9	115.9	114	1.9	11.0	1
10.5	2	●	MWE1050SA	44.9	44.9	90.9	89	1.9	10.5	1
	2	●	MWE1050SB	44.9	47.9	96.9	95	1.9	11.0	1
	3	●	MWE1050MA	67.9	67.9	113.9	112	1.9	10.5	1
	3	●	MWE1050MB	67.9	70.9	115.9	114	1.9	11.0	1
10.6	2	●	MWE1060SA	44.9	44.9	90.9	89	1.9	10.6	1
	2	□	MWE1060SB	48.9	48.9	96.9	95	1.9	11.0	1
	3	●	MWE1060MA	69.9	69.9	115.9	114	1.9	10.6	1
	3	□	MWE1060MB	69.9	69.9	115.9	114	1.9	11.0	1
10.7	2	●	MWE1070SA	48.9	48.9	96.9	95	1.9	10.7	1
	2	□	MWE1070SB	48.9	48.9	96.9	95	1.9	11.0	1
	3	●	MWE1070MA	69.9	69.9	115.9	114	1.9	10.7	1
	3	□	MWE1070MB	69.9	69.9	115.9	114	1.9	11.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.8	2	●	MWE1080SA	49.0	49.0	97.0	95	2.0	10.8	1
	2	□	MWE1080SB	49.0	49.0	97.0	95	2.0	11.0	1
	3	●	MWE1080MA	70.0	70.0	116.0	114	2.0	10.8	1
	3	□	MWE1080MB	70.0	70.0	116.0	114	2.0	11.0	1
10.9	2	●	MWE1090SA	49.0	49.0	97.0	95	2.0	10.9	1
	2	□	MWE1090SB	49.0	49.0	97.0	95	2.0	11.0	1
	3	●	MWE1090MA	70.0	70.0	116.0	114	2.0	10.9	1
	3	□	MWE1090MB	70.0	70.0	116.0	114	2.0	11.0	1
11.0	2	●	MWE1100SA	49.0	49.0	97.0	95	2.0	11.0	1
	2	●	MWE1100SB	49.0	49.0	97.0	95	2.0	11.0	1
	3	●	MWE1100MA	70.0	70.0	116.0	114	2.0	11.0	1
	3	●	MWE1100MB	70.0	70.0	116.0	114	2.0	11.0	1
11.1	2	●	MWE1110SA	49.0	49.0	97.0	95	2.0	11.1	1
	2	□	MWE1110SB	49.0	52.0	97.0	95	2.0	12.0	1
	3	●	MWE1110MA	73.0	73.0	120.0	118	2.0	11.1	1
	3	□	MWE1110MB	73.0	76.0	123.0	121	2.0	12.0	1
11.2	2	●	MWE1120SA	49.0	49.0	97.0	95	2.0	11.2	1
	2	□	MWE1120SB	49.0	52.0	97.0	95	2.0	12.0	1
	3	●	MWE1120MA	73.0	73.0	120.0	118	2.0	11.2	1
	3	□	MWE1120MB	73.0	76.0	123.0	121	2.0	12.0	1
11.3	2	●	MWE1130SA	49.1	49.1	97.1	95	2.1	11.3	1
	2	□	MWE1130SB	49.1	52.1	97.1	95	2.1	12.0	1
	3	●	MWE1130MA	73.1	73.1	120.1	118	2.1	11.3	1
	3	□	MWE1130MB	73.1	76.1	123.1	121	2.1	12.0	1
11.4	2	●	MWE1140SA	49.1	49.1	97.1	95	2.1	11.4	1
	2	□	MWE1140SB	49.1	52.1	97.1	95	2.1	12.0	1
	3	●	MWE1140MA	73.1	73.1	120.1	118	2.1	11.4	1
	3	□	MWE1140MB	73.1	76.1	123.1	121	2.1	12.0	1
11.5	2	●	MWE1150SA	49.1	49.1	97.1	95	2.1	11.5	1
	2	●	MWE1150SB	49.1	52.1	97.1	95	2.1	12.0	1
	3	●	MWE1150MA	73.1	73.1	120.1	118	2.1	11.5	1
	3	●	MWE1150MB	73.1	76.1	123.1	121	2.1	12.0	1
11.6	2	●	MWE1160SA	49.1	49.1	97.1	95	2.1	11.6	1
	2	□	MWE1160SB	49.1	49.1	97.1	95	2.1	12.0	1
	3	●	MWE1160MA	75.1	75.1	123.1	121	2.1	11.6	1
	3	□	MWE1160MB	75.1	75.1	123.1	121	2.1	12.0	1
11.7	2	●	MWE1170SA	49.1	49.1	97.1	95	2.1	11.7	1
	2	□	MWE1170SB	49.1	49.1	97.1	95	2.1	12.0	1
	3	●	MWE1170MA	75.1	75.1	123.1	121	2.1	11.7	1
	3	□	MWE1170MB	75.1	75.1	123.1	121	2.1	12.0	1
11.8	2	●	MWE1180SA	49.1	49.1	97.1	95	2.1	11.8	1
	2	□	MWE1180SB	49.1	49.1	97.1	95	2.1	12.0	1
	3	●	MWE1180MA	75.1	75.1	123.1	121	2.1	11.8	1
	3	□	MWE1180MB	75.1	75.1	123.1	121	2.1	12.0	1
11.9	2	●	MWE1190SA	53.2	53.2	104.2	102	2.2	11.9	1
	2	●	MWE1190SB	49.2	49.2	97.2	95	2.2	12.0	1
	3	●	MWE1190MA	75.2	75.2	123.2	121	2.2	11.9	1
	3	●	MWE1190MB	75.2	75.2	123.2	121	2.2	12.0	1

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OPERATION GUIDANCE ➤ N062
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External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
12.0	2	●	MWE1200SA	53.2	53.2	104.2	102	2.2	12.0	1
	2	●	MWE1200SB	49.2	49.2	97.2	95	2.2	12.0	1
	3	●	MWE1200MA	75.2	75.2	123.2	121	2.2	12.0	1
	3	●	MWE1200MB	75.2	75.2	123.2	121	2.2	12.0	1
12.1	2	●	MWE1210SA	53.2	53.2	104.2	102	2.2	12.1	1
	2	●	MWE1210SB	53.2	56.2	104.2	102	2.2	13.0	1
	3	●	MWE1210MA	78.2	78.2	137.2	135	2.2	12.1	1
	3	●	MWE1210MB	78.2	81.2	139.2	137	2.2	13.0	1
12.2	2	●	MWE1220SA	53.2	53.2	104.2	102	2.2	12.2	1
	2	□	MWE1220SB	53.2	56.2	104.2	102	2.2	13.0	1
	3	●	MWE1220MA	78.2	78.2	137.2	135	2.2	12.2	1
	3	□	MWE1220MB	78.2	81.2	139.2	137	2.2	13.0	1
12.3	2	●	MWE1230SA	53.2	53.2	104.2	102	2.2	12.3	1
	2	□	MWE1230SB	53.2	56.2	104.2	102	2.2	13.0	1
	3	●	MWE1230MA	78.2	78.2	137.2	135	2.2	12.3	1
	3	□	MWE1230MB	78.2	81.2	139.2	137	2.2	13.0	1
12.4	2	●	MWE1240SA	53.3	53.3	104.3	102	2.3	12.4	1
	2	□	MWE1240SB	53.3	56.3	104.3	102	2.3	13.0	1
	3	●	MWE1240MA	78.3	78.3	137.3	135	2.3	12.4	1
	3	□	MWE1240MB	78.3	81.3	139.3	137	2.3	13.0	1
12.5	2	●	MWE1250SA	53.3	53.3	104.3	102	2.3	12.5	1
	2	●	MWE1250SB	53.3	56.3	104.3	102	2.3	13.0	1
	3	●	MWE1250MA	78.3	78.3	137.3	135	2.3	12.5	1
	3	●	MWE1250MB	78.3	81.3	139.3	137	2.3	13.0	1
12.6	2	●	MWE1260SA	53.3	53.3	104.3	102	2.3	12.6	1
	2	□	MWE1260SB	53.3	53.3	104.3	102	2.3	13.0	1
	3	●	MWE1260MA	80.3	80.3	139.3	137	2.3	12.6	1
	3	□	MWE1260MB	80.3	80.3	139.3	137	2.3	13.0	1
12.7	2	●	MWE1270SA	53.3	53.3	104.3	102	2.3	12.7	1
	2	□	MWE1270SB	53.3	53.3	104.3	102	2.3	13.0	1
	3	●	MWE1270MA	80.3	80.3	139.3	137	2.3	12.7	1
	3	□	MWE1270MB	80.3	80.3	139.3	137	2.3	13.0	1
12.8	2	●	MWE1280SA	53.3	53.3	104.3	102	2.3	12.8	1
	2	□	MWE1280SB	53.3	53.3	104.3	102	2.3	13.0	1
	3	●	MWE1280MA	80.3	80.3	139.3	137	2.3	12.8	1
	3	□	MWE1280MB	80.3	80.3	139.3	137	2.3	13.0	1
12.9	2	●	MWE1290SA	53.3	53.3	104.3	102	2.3	12.9	1
	2	□	MWE1290SB	53.3	53.3	104.3	102	2.3	13.0	1
	3	●	MWE1290MA	80.3	80.3	139.3	137	2.3	12.9	1
	3	□	MWE1290MB	80.3	80.3	139.3	137	2.3	13.0	1
13.0	2	●	MWE1300SA	53.4	53.4	104.4	102	2.4	13.0	1
	2	●	MWE1300SB	53.4	53.4	104.4	102	2.4	13.0	1
	3	●	MWE1300MA	80.4	80.4	139.4	137	2.4	13.0	1
	3	●	MWE1300MB	80.4	80.4	139.4	137	2.4	13.0	1
13.1	2	●	MWE1310SA	53.4	53.4	104.4	102	2.4	13.1	1
	2	□	MWE1310SB	56.4	59.4	109.4	107	2.4	14.0	1
	3	●	MWE1310MA	86.4	86.4	146.4	144	2.4	13.1	1
	3	□	MWE1310MB	86.4	89.4	149.4	147	2.4	14.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.2	2	●	MWE1320SA	53.4	53.4	104.4	102	2.4	13.2	1
	2	□	MWE1320SB	56.4	59.4	109.4	107	2.4	14.0	1
	3	●	MWE1320MA	86.4	86.4	146.4	144	2.4	13.2	1
	3	□	MWE1320MB	86.4	89.4	149.4	147	2.4	14.0	1
13.3	2	●	MWE1330SA	56.4	56.4	109.4	107	2.4	13.3	1
	2	□	MWE1330SB	56.4	59.4	109.4	107	2.4	14.0	1
	3	●	MWE1330MA	86.4	86.4	146.4	144	2.4	13.3	1
	3	□	MWE1330MB	86.4	89.4	149.4	147	2.4	14.0	1
13.4	2	●	MWE1340SA	56.4	56.4	109.4	107	2.4	13.4	1
	2	□	MWE1340SB	56.4	59.4	109.4	107	2.4	14.0	1
	3	●	MWE1340MA	86.4	86.4	146.4	144	2.4	13.4	1
	3	□	MWE1340MB	86.4	89.4	149.4	147	2.4	14.0	1
13.5	2	●	MWE1350SA	56.5	56.5	109.5	107	2.5	13.5	1
	2	●	MWE1350SB	56.5	59.5	109.5	107	2.5	14.0	1
	3	●	MWE1350MA	86.5	86.5	146.5	144	2.5	13.5	1
	3	●	MWE1350MB	86.5	89.5	149.5	147	2.5	14.0	1
13.6	2	●	MWE1360SA	56.5	56.5	109.5	107	2.5	13.6	1
	2	□	MWE1360SB	56.5	56.5	109.5	107	2.5	14.0	1
	3	●	MWE1360MA	88.5	88.5	149.5	147	2.5	13.6	1
	3	□	MWE1360MB	88.5	88.5	149.5	147	2.5	14.0	1
13.7	2	●	MWE1370SA	56.5	56.5	109.5	107	2.5	13.7	1
	2	□	MWE1370SB	56.5	56.5	109.5	107	2.5	14.0	1
	3	●	MWE1370MA	88.5	88.5	149.5	147	2.5	13.7	1
	3	□	MWE1370MB	88.5	88.5	149.5	147	2.5	14.0	1
13.8	2	●	MWE1380SA	56.5	56.5	109.5	107	2.5	13.8	1
	2	□	MWE1380SB	56.5	56.5	109.5	107	2.5	14.0	1
	3	●	MWE1380MA	88.5	88.5	149.5	147	2.5	13.8	1
	3	□	MWE1380MB	88.5	88.5	149.5	147	2.5	14.0	1
13.9	2	●	MWE1390SA	56.5	56.5	109.5	107	2.5	13.9	1
	2	●	MWE1390SB	56.5	56.5	109.5	107	2.5	14.0	1
	3	●	MWE1390MA	88.5	88.5	149.5	147	2.5	13.9	1
	3	●	MWE1390MB	88.5	88.5	149.5	147	2.5	14.0	1
14.0	2	●	MWE1400SA	56.5	56.5	109.5	107	2.5	14.0	1
	2	●	MWE1400SB	56.5	56.5	109.5	107	2.5	14.0	1
	3	●	MWE1400MA	88.5	88.5	149.5	147	2.5	14.0	1
	3	●	MWE1400MB	88.5	88.5	149.5	147	2.5	14.0	1
14.1	2	●	MWE1410SA	58.6	58.6	113.6	111	2.6	14.1	1
	2	●	MWE1410SB	58.6	61.6	113.6	111	2.6	15.0	1
	3	●	MWE1410MA	91.6	91.6	153.6	151	2.6	14.1	1
	3	●	MWE1410MB	91.6	94.6	155.6	153	2.6	15.0	1
14.2	2	●	MWE1420SA	58.6	58.6	113.6	111	2.6	14.2	1
	2	□	MWE1420SB	58.6	61.6	113.6	111	2.6	15.0	1
	3	●	MWE1420MA	91.6	91.6	153.6	151	2.6	14.2	1
	3	□	MWE1420MB	91.6	94.6	155.6	153	2.6	15.0	1
14.3	2	□	MWE1430SA	58.6	58.6	113.6	111	2.6	14.3	1
	2	□	MWE1430SB	58.6	61.6	113.6	111	2.6	15.0	1
	3	●	MWE1430MA	91.6	91.6	153.6	151	2.6	14.3	1
	3	□	MWE1430MB	91.6	94.6	155.6	153	2.6	15.0	1

(Note) 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.

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
14.4	2	□	MWE1440SA	58.6	58.6	113.6	111	2.6	14.4	1
	2	□	MWE1440SB	58.6	61.6	113.6	111	2.6	15.0	1
	3	●	MWE1440MA	91.6	91.6	153.6	151	2.6	14.4	1
	3	□	MWE1440MB	91.6	94.6	155.6	153	2.6	15.0	1
14.5	2	●	MWE1450SA	58.6	58.6	113.6	111	2.6	14.5	1
	2	●	MWE1450SB	58.6	61.6	113.6	111	2.6	15.0	1
	3	●	MWE1450MA	91.6	91.6	153.6	151	2.6	14.5	1
	3	●	MWE1450MB	91.6	94.6	155.6	153	2.6	15.0	1
14.6	2	□	MWE1460SA	58.7	58.7	113.7	111	2.7	14.6	1
	2	□	MWE1460SB	58.7	58.7	113.7	111	2.7	15.0	1
	3	●	MWE1460MA	93.7	93.7	155.7	153	2.7	14.6	1
	3	□	MWE1460MB	93.7	93.7	155.7	153	2.7	15.0	1
14.7	2	□	MWE1470SA	58.7	58.7	113.7	111	2.7	14.7	1
	2	□	MWE1470SB	58.7	58.7	113.7	111	2.7	15.0	1
	3	●	MWE1470MA	93.7	93.7	155.7	153	2.7	14.7	1
	3	□	MWE1470MB	93.7	93.7	155.7	153	2.7	15.0	1
14.8	2	□	MWE1480SA	58.7	58.7	113.7	111	2.7	14.8	1
	2	□	MWE1480SB	58.7	58.7	113.7	111	2.7	15.0	1
	3	●	MWE1480MA	93.7	93.7	155.7	153	2.7	14.8	1
	3	□	MWE1480MB	93.7	93.7	155.7	153	2.7	15.0	1
14.9	2	□	MWE1490SA	58.7	58.7	113.7	111	2.7	14.9	1
	2	□	MWE1490SB	58.7	58.7	113.7	111	2.7	15.0	1
	3	●	MWE1490MA	93.7	93.7	155.7	153	2.7	14.9	1
	3	□	MWE1490MB	93.7	93.7	155.7	153	2.7	15.0	1
15.0	2	●	MWE1500SA	58.7	58.7	113.7	111	2.7	15.0	1
	2	●	MWE1500SB	58.7	58.7	113.7	111	2.7	15.0	1
	3	●	MWE1500MA	93.7	93.7	155.7	153	2.7	15.0	1
	3	●	MWE1500MB	93.7	93.7	155.7	153	2.7	15.0	1
15.1	2	□	MWE1510SA	60.7	60.7	117.7	115	2.7	15.1	1
	2	□	MWE1510SB	60.7	63.7	117.7	115	2.7	16.0	1
	3	●	MWE1510MA	96.7	96.7	159.7	157	2.7	15.1	1
	3	□	MWE1510MB	96.7	99.7	162.7	160	2.7	16.0	1
15.2	2	●	MWE1520SA	60.8	60.8	117.8	115	2.8	15.2	1
	2	□	MWE1520SB	60.8	63.8	117.8	115	2.8	16.0	1
	3	●	MWE1520MA	96.8	96.8	159.8	157	2.8	15.2	1
	3	□	MWE1520MB	96.8	99.8	162.8	160	2.8	16.0	1
15.3	2	□	MWE1530SA	60.8	60.8	117.8	115	2.8	15.3	1
	2	□	MWE1530SB	60.8	63.8	117.8	115	2.8	16.0	1
	3	●	MWE1530MA	96.8	96.8	159.8	157	2.8	15.3	1
	3	□	MWE1530MB	96.8	99.8	162.8	160	2.8	16.0	1
15.4	2	□	MWE1540SA	60.8	60.8	117.8	115	2.8	15.4	1
	2	●	MWE1540SB	60.8	63.8	117.8	115	2.8	16.0	1
	3	●	MWE1540MA	96.8	96.8	159.8	157	2.8	15.4	1
	3	●	MWE1540MB	96.8	99.8	162.8	160	2.8	16.0	1
15.5	2	●	MWE1550SA	60.8	60.8	117.8	115	2.8	15.5	1
	2	●	MWE1550SB	60.8	63.8	117.8	115	2.8	16.0	1
	3	●	MWE1550MA	96.8	96.8	159.8	157	2.8	15.5	1
	3	●	MWE1550MB	96.8	99.8	162.8	160	2.8	16.0	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
15.6	2	□	MWE1560SA	60.8	60.8	117.8	115	2.8	15.6	1
	2	●	MWE1560SB	60.8	60.8	117.8	115	2.8	16.0	1
	3	●	MWE1560MA	98.8	98.8	162.8	160	2.8	15.6	1
	3	●	MWE1560MB	98.8	98.8	162.8	160	2.8	16.0	1
15.7	2	□	MWE1570SA	60.9	60.9	117.9	115	2.9	15.7	1
	2	□	MWE1570SB	60.9	60.9	117.9	115	2.9	16.0	1
	3	●	MWE1570MA	98.9	98.9	162.9	160	2.9	15.7	1
	3	□	MWE1570MB	98.9	98.9	162.9	160	2.9	16.0	1
15.8	2	□	MWE1580SA	60.9	60.9	117.9	115	2.9	15.8	1
	2	□	MWE1580SB	60.9	60.9	117.9	115	2.9	16.0	1
	3	●	MWE1580MA	98.9	98.9	162.9	160	2.9	15.8	1
	3	□	MWE1580MB	98.9	98.9	162.9	160	2.9	16.0	1
15.9	2	□	MWE1590SA	60.9	60.9	117.9	115	2.9	15.9	1
	2	□	MWE1590SB	60.9	60.9	117.9	115	2.9	16.0	1
	3	●	MWE1590MA	98.9	98.9	162.9	160	2.9	15.9	1
	3	□	MWE1590MB	98.9	98.9	162.9	160	2.9	16.0	1
16.0	2	●	MWE1600SA	60.9	60.9	117.9	115	2.9	16.0	1
	2	●	MWE1600SB	60.9	60.9	117.9	115	2.9	16.0	1
	3	●	MWE1600MA	98.9	98.9	162.9	160	2.9	16.0	1
	3	●	MWE1600MB	98.9	98.9	162.9	160	2.9	16.0	1
16.1	2	□	MWE1610SA	62.9	62.9	121.9	119	2.9	16.1	1
	3	□	MWE1610MA	104.9	104.9	169.9	167	2.9	16.1	1
16.2	2	●	MWE1620SA	62.9	62.9	121.9	119	2.9	16.2	1
	3	□	MWE1620MA	104.9	104.9	169.9	167	2.9	16.2	1
16.3	2	●	MWE1630SA	63.0	63.0	122.0	119	3.0	16.3	1
	3	□	MWE1630MA	105.0	105.0	170.0	167	3.0	16.3	1
16.4	2	□	MWE1640SA	63.0	63.0	122.0	119	3.0	16.4	1
	3	□	MWE1640MA	105.0	105.0	170.0	167	3.0	16.4	1
16.5	2	●	MWE1650SA	63.0	63.0	122.0	119	3.0	16.5	1
	3	●	MWE1650MA	105.0	105.0	170.0	167	3.0	16.5	1
16.6	2	□	MWE1660SA	63.0	63.0	122.0	119	3.0	16.6	1
	3	□	MWE1660MA	105.0	105.0	170.0	167	3.0	16.6	1
16.7	2	□	MWE1670SA	63.0	63.0	122.0	119	3.0	16.7	1
	3	□	MWE1670MA	105.0	105.0	170.0	167	3.0	16.7	1
16.8	2	□	MWE1680SA	63.1	63.1	122.1	119	3.1	16.8	1
	3	□	MWE1680MA	105.1	105.1	170.1	167	3.1	16.8	1
16.9	2	□	MWE1690SA	63.1	63.1	122.1	119	3.1	16.9	1
	3	□	MWE1690MA	105.1	105.1	170.1	167	3.1	16.9	1
17.0	2	●	MWE1700SA	63.1	63.1	122.1	119	3.1	17.0	1
	3	●	MWE1700MA	105.1	105.1	170.1	167	3.1	17.0	1
17.1	2	□	MWE1710SA	65.1	65.1	126.1	123	3.1	17.1	1
	3	□	MWE1710MA	105.1	105.1	170.1	167	3.1	17.1	1
17.2	2	□	MWE1720SA	65.1	65.1	126.1	123	3.1	17.2	1
	3	□	MWE1720MA	105.1	105.1	170.1	167	3.1	17.2	1
17.3	2	□	MWE1730SA	65.1	65.1	126.1	123	3.1	17.3	1
	3	□	MWE1730MA	105.1	105.1	170.1	167	3.1	17.3	1
17.4	2	□	MWE1740SA	65.2	65.2	126.2	123	3.2	17.4	1
	3	□	MWE1740MA	105.2	105.2	170.2	167	3.2	17.4	1

CUTTING CONDITIONS ➤ N061
OPERATION GUIDANCE ➤ N062
TECHNICAL DATA ➤ Q001

MWE

WSTAR DRILLS

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.5	2	●	MWE1750SA	65.2	65.2	126.2	123	3.2	17.5	1
	3	●	MWE1750MA	105.2	105.2	170.2	167	3.2	17.5	1
17.6	2	□	MWE1760SA	65.2	65.2	126.2	123	3.2	17.6	1
	3	□	MWE1760MA	105.2	105.2	170.2	167	3.2	17.6	1
17.7	2	□	MWE1770SA	65.2	65.2	126.2	123	3.2	17.7	1
	3	□	MWE1770MA	105.2	105.2	170.2	167	3.2	17.7	1
17.8	2	●	MWE1780SA	65.2	65.2	126.2	123	3.2	17.8	1
	3	□	MWE1780MA	105.2	105.2	170.2	167	3.2	17.8	1
17.9	2	□	MWE1790SA	65.3	65.3	126.3	123	3.3	17.9	1
	3	□	MWE1790MA	105.3	105.3	170.3	167	3.3	17.9	1
18.0	2	●	MWE1800SA	65.3	65.3	126.3	123	3.3	18.0	1
	3	●	MWE1800MA	105.3	105.3	170.3	167	3.3	18.0	1
18.1	2	□	MWE1810SA	67.3	67.3	130.3	127	3.3	18.1	1
	3	□	MWE1810MA	117.3	117.3	182.3	179	3.3	18.1	1
18.2	2	□	MWE1820SA	67.3	67.3	130.3	127	3.3	18.2	1
	3	□	MWE1820MA	117.3	117.3	182.3	179	3.3	18.2	1
18.3	2	□	MWE1830SA	67.3	67.3	130.3	127	3.3	18.3	1
	3	□	MWE1830MA	117.3	117.3	182.3	179	3.3	18.3	1
18.4	2	□	MWE1840SA	67.3	67.3	130.3	127	3.3	18.4	1
	3	□	MWE1840MA	117.3	117.3	182.3	179	3.3	18.4	1
18.5	2	●	MWE1850SA	67.4	67.4	130.4	127	3.4	18.5	1
	3	●	MWE1850MA	117.4	117.4	182.4	179	3.4	18.5	1
18.6	2	□	MWE1860SA	67.4	67.4	130.4	127	3.4	18.6	1
	3	□	MWE1860MA	117.4	117.4	182.4	179	3.4	18.6	1
18.7	2	□	MWE1870SA	67.4	67.4	130.4	127	3.4	18.7	1
	3	□	MWE1870MA	117.4	117.4	182.4	179	3.4	18.7	1
18.8	2	□	MWE1880SA	67.4	67.4	130.4	127	3.4	18.8	1
	3	□	MWE1880MA	117.4	117.4	182.4	179	3.4	18.8	1
18.9	2	□	MWE1890SA	67.4	67.4	130.4	127	3.4	18.9	1
	3	□	MWE1890MA	117.4	117.4	182.4	179	3.4	18.9	1
19.0	2	●	MWE1900SA	67.5	67.5	130.5	127	3.5	19.0	1
	3	●	MWE1900MA	117.5	117.5	182.5	179	3.5	19.0	1
19.1	2	□	MWE1910SA	69.5	69.5	134.5	131	3.5	19.1	1
	3	□	MWE1910MA	117.5	117.5	182.5	179	3.5	19.1	1
19.2	2	□	MWE1920SA	69.5	69.5	134.5	131	3.5	19.2	1
	3	□	MWE1920MA	117.5	117.5	182.5	179	3.5	19.2	1
19.3	2	□	MWE1930SA	69.5	69.5	134.5	131	3.5	19.3	1
	3	□	MWE1930MA	117.5	117.5	182.5	179	3.5	19.3	1
19.4	2	□	MWE1940SA	69.5	69.5	134.5	131	3.5	19.4	1
	3	□	MWE1940MA	117.5	117.5	182.5	179	3.5	19.4	1
19.5	2	●	MWE1950SA	69.5	69.5	134.5	131	3.5	19.5	1
	3	●	MWE1950MA	117.5	117.5	182.5	179	3.5	19.5	1
19.6	2	□	MWE1960SA	69.6	69.6	134.6	131	3.6	19.6	1
	3	□	MWE1960MA	117.6	117.6	182.6	179	3.6	19.6	1
19.7	2	□	MWE1970SA	69.6	69.6	134.6	131	3.6	19.7	1
	3	□	MWE1970MA	117.6	117.6	182.6	179	3.6	19.7	1
19.8	2	□	MWE1980SA	69.6	69.6	134.6	131	3.6	19.8	1
	3	□	MWE1980MA	117.6	117.6	182.6	179	3.6	19.8	1

External Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
19.9	2	□	MWE1990SA	69.6	69.6	134.6	131	3.6	19.9	1
	3	□	MWE1990MA	117.6	117.6	182.6	179	3.6	19.9	1
20.0	2	●	MWE2000SA	69.6	69.6	134.6	131	3.6	20.0	1
	3	●	MWE2000MA	117.6	117.6	182.6	179	3.6	20.0	1

(Note) 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.

RECOMMENDED CUTTING CONDITIONS

Work 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		
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	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)

Work 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		
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	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)

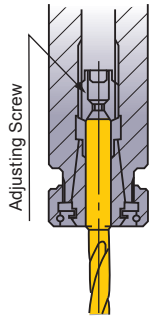
Work Material	Aluminium Alloy (Si<5%)			Heat Resistant Alloy Inconel718 etc			Hardened Steel (40—55HRC) AISI H13, L6 etc		
Drill Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	
3.0	7900	0.1	(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)

MWE

WSTAR DRILLS

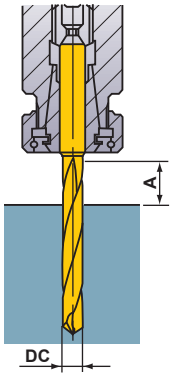
OPERATIONAL GUIDANCE

Drill Holding



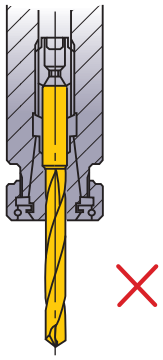
Thrust bearing type collet chuck holds the drill securely.

Drill Length



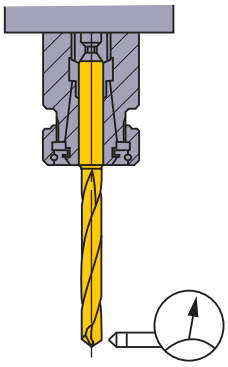
A ≥ DC x 1.5

Drill Installation



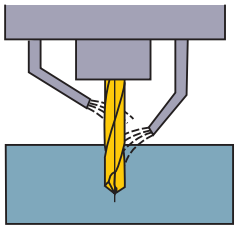
Do not clamp on the flutes.

Installation Tolerance



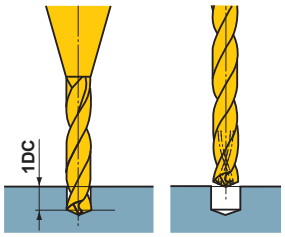
Run-out ≤ 0.03mm

Coolant Method



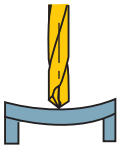
Two coolant positions, at the end and at the center are ideal.

Drill Installation

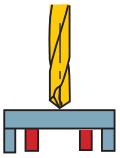


①When machining a prepared hole with the MZE-SB please set the depth to 1DC (DC=drill diameter).
②Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Thin Workpiece

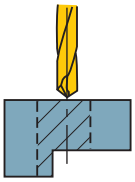


If Bending Occurs



Support the Workpiece

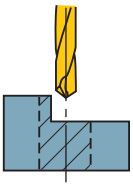
Interrupted Cutting



One Process

○

①Lower the feed when drilling the interrupted part.

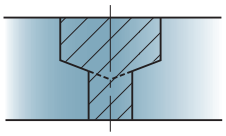


Requires Prior Machining

△

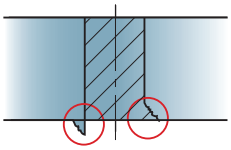
①Spot face with an end mill prior to drilling.

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



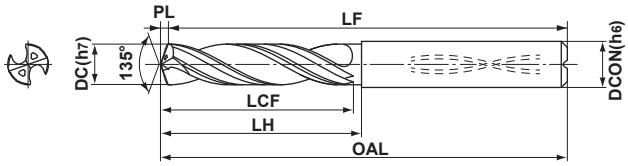
①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

MQS
WSTAR DRILLS

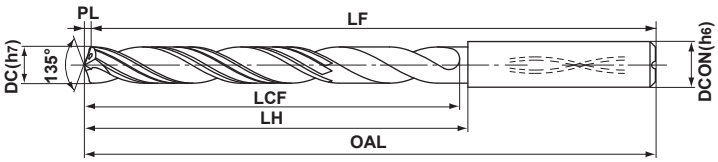
- New grade DP3020, unique coolant system, triple margin.
- High efficiency and high accuracy machining of steel and cast iron is possible.

P	M	K	N	S	H
Steel		Cast Iron			

	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
	0 −0.012	0 −0.012	0 −0.015	0 −0.018	0 −0.021
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013



Type1



Type2

(Note) MQS drills are suitable for use with shrink fit holders.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.0	3	●	MQS0300X3DB	21.6	23.6	70.6	70	0.6	3	1
	5	●	MQS0300X5DB	28.6	31.6	78.6	78	0.6	3	1
NEW	8	●	MQS0300X8DB	35.6	35.6	81.6	81	0.6	3	1
3.1	3	●	MQS0310X3DB	21.6	23.6	70.6	70	0.6	4	1
	5	●	MQS0310X5DB	28.6	31.6	78.6	78	0.6	4	1
3.2	3	●	MQS0320X3DB	21.7	23.7	70.7	70	0.7	4	1
	5	●	MQS0320X5DB	28.7	31.7	78.7	78	0.7	4	1
3.3	3	●	MQS0330X3DB	21.7	23.7	70.7	70	0.7	4	1
	5	●	MQS0330X5DB	28.7	31.7	78.7	78	0.7	4	1
3.4	3	●	MQS0340X3DB	21.7	23.7	70.7	70	0.7	4	1
	5	●	MQS0340X5DB	28.7	31.7	78.7	78	0.7	4	1
3.5	3	●	MQS0350X3DB	21.7	23.7	70.7	70	0.7	4	1
	5	●	MQS0350X5DB	28.7	31.7	78.7	78	0.7	4	1
NEW	8	●	MQS0350X8DB	41.7	41.7	87.7	87	0.7	4	1
3.6	3	●	MQS0360X3DB	22.7	23.7	70.7	70	0.7	4	1
	5	●	MQS0360X5DB	30.7	31.7	78.7	78	0.7	4	1
3.7	3	●	MQS0370X3DB	22.8	23.8	70.8	70	0.8	4	1
	5	●	MQS0370X5DB	30.8	31.8	78.8	78	0.8	4	1
3.8	3	●	MQS0380X3DB	22.8	23.8	70.8	70	0.8	4	1
	5	●	MQS0380X5DB	30.8	31.8	78.8	78	0.8	4	1
3.9	3	●	MQS0390X3DB	22.8	23.8	70.8	70	0.8	4	1
	5	●	MQS0390X5DB	30.8	31.8	78.8	78	0.8	4	1
4.0	3	●	MQS0400X3DB	22.8	23.8	70.8	70	0.8	4	1
	5	●	MQS0400X5DB	30.8	31.8	78.8	78	0.8	4	1
NEW	8	●	MQS0400X8DB	46.8	46.8	92.8	92	0.8	4	1
4.1	3	●	MQS0410X3DB	24.8	26.8	73.8	73	0.8	5	1
	5	●	MQS0410X5DB	33.8	35.8	82.8	82	0.8	5	1
4.2	3	●	MQS0420X3DB	24.9	26.9	73.9	73	0.9	5	1
	5	●	MQS0420X5DB	33.9	35.9	82.9	82	0.9	5	1
4.3	3	●	MQS0430X3DB	24.9	26.9	73.9	73	0.9	5	1
	5	●	MQS0430X5DB	33.9	35.9	82.9	82	0.9	5	1
4.4	3	●	MQS0440X3DB	24.9	26.9	73.9	73	0.9	5	1
	5	●	MQS0440X5DB	33.9	35.9	82.9	82	0.9	5	1
4.5	3	●	MQS0450X3DB	24.9	26.9	73.9	73	0.9	5	1
	5	●	MQS0450X5DB	33.9	35.9	82.9	82	0.9	5	1
NEW	8	●	MQS0450X8DB	52.9	52.9	100.9	100	0.9	5	1

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.6	3	●	MQS0460X3DB	26.0	29.0	76.0	75	1.0	5	1
	5	●	MQS0460X5DB	36.0	39.0	86.0	85	1.0	5	1
4.7	3	●	MQS0470X3DB	26.0	29.0	76.0	75	1.0	5	1
	5	●	MQS0470X5DB	36.0	39.0	86.0	85	1.0	5	1
4.8	3	●	MQS0480X3DB	26.0	29.0	76.0	75	1.0	5	1
	5	●	MQS0480X5DB	36.0	39.0	86.0	85	1.0	5	1
4.9	3	●	MQS0490X3DB	26.0	29.0	76.0	75	1.0	5	1
	5	●	MQS0490X5DB	36.0	39.0	86.0	85	1.0	5	1
5.0	3	●	MQS0500X3DB	26.0	29.0	76.0	75	1.0	5	1
	5	●	MQS0500X5DB	36.0	39.0	86.0	85	1.0	5	1
NEW	8	●	MQS0500X8DB	58.0	58.0	106.0	105	1.0	5	1
5.1	3	●	MQS0510X3DB	29.1	31.1	82.1	81	1.1	6	1
	5	●	MQS0510X5DB	40.1	43.1	90.1	89	1.1	6	1
5.2	3	●	MQS0520X3DB	29.1	31.1	82.1	81	1.1	6	1
	5	●	MQS0520X5DB	40.1	43.1	90.1	89	1.1	6	1
5.3	3	●	MQS0530X3DB	29.1	31.1	82.1	81	1.1	6	1
	5	●	MQS0530X5DB	40.1	43.1	90.1	89	1.1	6	1
5.4	3	●	MQS0540X3DB	29.1	31.1	82.1	81	1.1	6	1
	5	●	MQS0540X5DB	40.1	43.1	90.1	89	1.1	6	1
5.5	3	●	MQS0550X3DB	29.1	31.1	82.1	81	1.1	6	1
	5	●	MQS0550X5DB	40.1	43.1	90.1	89	1.1	6	1
NEW	8	●	MQS0550X8DB	62.1	67.1	119.1	118	1.1	6	1
5.6	3	●	MQS0560X3DB	31.2	31.2	82.2	81	1.2	6	1
	5	●	MQS0560X5DB	43.2	43.2	90.2	89	1.2	6	1
5.7	3	●	MQS0570X3DB	31.2	31.2	82.2	81	1.2	6	1
	5	●	MQS0570X5DB	43.2	43.2	90.2	89	1.2	6	1
5.8	3	●	MQS0580X3DB	31.2	31.2	82.2	81	1.2	6	1
	5	●	MQS0580X5DB	43.2	43.2	90.2	89	1.2	6	1
5.9	3	●	MQS0590X3DB	31.2	31.2	82.2	81	1.2	6	1
	5	●	MQS0590X5DB	43.2	43.2	90.2	89	1.2	6	1
6.0	3	●	MQS0600X3DB	31.2	31.2	82.2	81	1.2	6	1
	5	●	MQS0600X5DB	43.2	43.2	90.2	89	1.2	6	1
NEW	8	●	MQS0600X8DB	67.2	67.2	119.2	118	1.2	6	1
6.1	3	●	MQS0610X3DB	34.3	36.3	87.3	86	1.3	7	1
	5	●	MQS0610X5DB	47.3	49.3	96.3	95	1.3	7	1

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

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N067
OPERATION GUIDANCE ➤ N069
TECHNICAL DATA ➤ Q001

MQS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.2	3	●	MQS0620X3DB	34.3	36.3	87.3	86	1.3	7	1
	5	●	MQS0620X5DB	47.3	49.3	96.3	95	1.3	7	1
6.3	3	●	MQS0630X3DB	34.3	36.3	87.3	86	1.3	7	1
	5	●	MQS0630X5DB	47.3	49.3	96.3	95	1.3	7	1
6.4	3	●	MQS0640X3DB	34.3	36.3	87.3	86	1.3	7	1
	5	●	MQS0640X5DB	47.3	49.3	96.3	95	1.3	7	1
6.5	3	●	MQS0650X3DB	34.3	36.3	87.3	86	1.3	7	1
	5	●	MQS0650X5DB	47.3	49.3	96.3	95	1.3	7	1
NEW	8	●	MQS0650X8DB	73.3	78.3	131.3	130	1.3	7	1
6.6	3	●	MQS0660X3DB	36.4	38.4	91.4	90	1.4	7	1
	5	●	MQS0660X5DB	50.4	52.4	99.4	98	1.4	7	1
6.7	3	●	MQS0670X3DB	36.4	38.4	91.4	90	1.4	7	1
	5	●	MQS0670X5DB	50.4	52.4	99.4	98	1.4	7	1
6.8	3	●	MQS0680X3DB	36.4	38.4	91.4	90	1.4	7	1
	5	●	MQS0680X5DB	50.4	52.4	99.4	98	1.4	7	1
6.9	3	●	MQS0690X3DB	36.4	38.4	91.4	90	1.4	7	1
	5	●	MQS0690X5DB	50.4	52.4	99.4	98	1.4	7	1
7.0	3	●	MQS0700X3DB	36.4	38.4	91.4	90	1.4	7	1
	5	●	MQS0700X5DB	50.4	52.4	99.4	98	1.4	7	1
NEW	8	●	MQS0700X8DB	78.4	78.4	131.4	130	1.4	7	1
7.1	3	●	MQS0710X3DB	39.5	40.5	91.5	90	1.5	8	1
	5	●	MQS0710X5DB	54.5	57.5	104.5	103	1.5	8	1
7.2	3	●	MQS0720X3DB	39.5	40.5	91.5	90	1.5	8	1
	5	●	MQS0720X5DB	54.5	57.5	104.5	103	1.5	8	1
7.3	3	●	MQS0730X3DB	39.5	40.5	91.5	90	1.5	8	1
	5	●	MQS0730X5DB	54.5	57.5	104.5	103	1.5	8	1
7.4	3	●	MQS0740X3DB	39.5	40.5	91.5	90	1.5	8	1
	5	●	MQS0740X5DB	54.5	57.5	104.5	103	1.5	8	1
7.5	3	●	MQS0750X3DB	39.6	40.6	91.6	90	1.6	8	1
	5	●	MQS0750X5DB	54.6	57.6	104.6	103	1.6	8	1
NEW	8	●	MQS0750X8DB	84.6	89.6	143.6	142	1.6	8	2
7.6	3	●	MQS0760X3DB	41.6	41.6	91.6	90	1.6	8	1
	5	●	MQS0760X5DB	57.6	57.6	104.6	103	1.6	8	1
7.7	3	●	MQS0770X3DB	41.6	41.6	91.6	90	1.6	8	1
	5	●	MQS0770X5DB	57.6	57.6	104.6	103	1.6	8	1
7.8	3	●	MQS0780X3DB	41.6	41.6	91.6	90	1.6	8	1
	5	●	MQS0780X5DB	57.6	57.6	104.6	103	1.6	8	1
7.9	3	●	MQS0790X3DB	41.6	41.6	91.6	90	1.6	8	1
	5	●	MQS0790X5DB	57.6	57.6	104.6	103	1.6	8	1
8.0	3	●	MQS0800X3DB	41.7	41.7	91.7	90	1.7	8	1
	5	●	MQS0800X5DB	57.7	57.7	104.7	103	1.7	8	1
NEW	8	●	MQS0800X8DB	89.7	89.7	143.7	142	1.7	8	2
8.1	3	●	MQS0810X3DB	44.7	46.7	97.7	96	1.7	9	1
	5	●	MQS0810X5DB	61.7	63.7	114.7	113	1.7	9	1
8.2	3	●	MQS0820X3DB	44.7	46.7	97.7	96	1.7	9	1
	5	●	MQS0820X5DB	61.7	63.7	114.7	113	1.7	9	1
8.3	3	●	MQS0830X3DB	44.7	46.7	97.7	96	1.7	9	1
	5	●	MQS0830X5DB	61.7	63.7	114.7	113	1.7	9	1
8.4	3	●	MQS0840X3DB	44.7	46.7	97.7	96	1.7	9	1
	5	●	MQS0840X5DB	61.7	63.7	114.7	113	1.7	9	1

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.5	3	●	MQS0850X3DB	44.8	46.8	97.8	96	1.8	9	1
	5	●	MQS0850X5DB	61.8	63.8	114.8	113	1.8	9	1
NEW	8	●	MQS0850X8DB	95.8	100.8	155.8	154	1.8	9	2
8.6	3	●	MQS0860X3DB	46.8	48.8	102.8	101	1.8	9	1
	5	●	MQS0860X5DB	64.8	66.8	117.8	116	1.8	9	1
8.7	3	●	MQS0870X3DB	46.8	48.8	102.8	101	1.8	9	1
	5	●	MQS0870X5DB	64.8	66.8	117.8	116	1.8	9	1
8.8	3	●	MQS0880X3DB	46.8	48.8	102.8	101	1.8	9	1
	5	●	MQS0880X5DB	64.8	66.8	117.8	116	1.8	9	1
8.9	3	●	MQS0890X3DB	46.8	48.8	102.8	101	1.8	9	1
	5	●	MQS0890X5DB	64.8	66.8	117.8	116	1.8	9	1
9.0	3	●	MQS0900X3DB	46.9	48.9	102.9	101	1.9	9	1
	5	●	MQS0900X5DB	64.9	66.9	117.9	116	1.9	9	1
NEW	8	●	MQS0900X8DB	100.9	100.9	155.9	154	1.9	9	2
9.1	3	●	MQS0910X3DB	49.9	51.9	102.9	101	1.9	10	1
	5	●	MQS0910X5DB	68.9	71.9	122.9	121	1.9	10	1
9.2	3	●	MQS0920X3DB	49.9	51.9	102.9	101	1.9	10	1
	5	●	MQS0920X5DB	68.9	71.9	122.9	121	1.9	10	1
9.3	3	●	MQS0930X3DB	49.9	51.9	102.9	101	1.9	10	1
	5	●	MQS0930X5DB	68.9	71.9	122.9	121	1.9	10	1
9.4	3	●	MQS0940X3DB	49.9	51.9	102.9	101	1.9	10	1
	5	●	MQS0940X5DB	68.9	71.9	122.9	121	1.9	10	1
9.5	3	●	MQS0950X3DB	50.0	52.0	103.0	101	2.0	10	1
	5	●	MQS0950X5DB	69.0	72.0	123.0	121	2.0	10	1
NEW	8	●	MQS0950X8DB	107.0	112.0	168.0	166	2.0	10	2
9.6	3	●	MQS0960X3DB	52.0	52.0	103.0	101	2.0	10	1
	5	●	MQS0960X5DB	72.0	72.0	123.0	121	2.0	10	1
9.7	3	●	MQS0970X3DB	52.0	52.0	103.0	101	2.0	10	1
	5	●	MQS0970X5DB	72.0	72.0	123.0	121	2.0	10	1
9.8	3	●	MQS0980X3DB	52.0	52.0	103.0	101	2.0	10	1
	5	●	MQS0980X5DB	72.0	72.0	123.0	121	2.0	10	1
9.9	3	●	MQS0990X3DB	52.1	52.1	103.1	101	2.1	10	1
	5	●	MQS0990X5DB	72.1	72.1	123.1	121	2.1	10	1
10.0	3	●	MQS1000X3DB	52.1	52.1	103.1	101	2.1	10	1
	5	●	MQS1000X5DB	72.1	72.1	123.1	121	2.1	10	1
NEW	8	●	MQS1000X8DB	112.1	112.1	168.1	166	2.1	10	2
10.1	3	●	MQS1010X3DB	55.1	57.1	113.1	111	2.1	11	1
	5	●	MQS1010X5DB	76.1	80.1	136.1	134	2.1	11	1
10.2	3	●	MQS1020X3DB	55.1	57.1	113.1	111	2.1	11	1
	5	●	MQS1020X5DB	76.1	80.1	136.1	134	2.1	11	1
10.3	3	●	MQS1030X3DB	55.1	57.1	113.1	111	2.1	11	1
	5	●	MQS1030X5DB	76.1	80.1	136.1	134	2.1	11	1
10.4	3	●	MQS1040X3DB	55.2	57.2	113.2	111	2.2	11	1
	5	●	MQS1040X5DB	76.2	80.2	136.2	134	2.2	11	1
10.5	3	●	MQS1050X3DB	55.2	57.2	113.2	111	2.2	11	1
	5	●	MQS1050X5DB	76.2	80.2	136.2	134	2.2	11	1
NEW	8	●	MQS1050X8DB	118.2	123.2	184.2	182	2.2	11	2
10.6	3	●	MQS1060X3DB	57.2	58.2	118.2	116	2.2	11	1
	5	●	MQS1060X5DB	79.2	80.2	136.2	134	2.2	11	1

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

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Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.7	3	●	MQS1070X3DB	57.2	58.2	118.2	116	2.2	11	1
	5	●	MQS1070X5DB	79.2	80.2	136.2	134	2.2	11	1
10.8	3	●	MQS1080X3DB	57.2	58.2	118.2	116	2.2	11	1
	5	●	MQS1080X5DB	79.2	80.2	136.2	134	2.2	11	1
10.9	3	●	MQS1090X3DB	57.3	58.3	118.3	116	2.3	11	1
	5	●	MQS1090X5DB	79.3	80.3	136.3	134	2.3	11	1
11.0	3	●	MQS1100X3DB	57.3	58.3	118.3	116	2.3	11	1
	5	●	MQS1100X5DB	79.3	80.3	136.3	134	2.3	11	1
NEW	8	●	MQS1100X8DB	123.3	123.3	184.3	182	2.3	11	2
11.1	3	●	MQS1110X3DB	60.3	62.3	118.3	116	2.3	12	1
	5	●	MQS1110X5DB	83.3	86.3	142.3	140	2.3	12	1
11.2	3	●	MQS1120X3DB	60.3	62.3	118.3	116	2.3	12	1
	5	●	MQS1120X5DB	83.3	86.3	142.3	140	2.3	12	1
11.3	3	●	MQS1130X3DB	60.3	62.3	118.3	116	2.3	12	1
	5	●	MQS1130X5DB	83.3	86.3	142.3	140	2.3	12	1
11.4	3	●	MQS1140X3DB	60.4	62.4	118.4	116	2.4	12	1
	5	●	MQS1140X5DB	83.4	86.4	142.4	140	2.4	12	1
11.5	3	●	MQS1150X3DB	60.4	62.4	118.4	116	2.4	12	1
	5	●	MQS1150X5DB	83.4	86.4	142.4	140	2.4	12	1
NEW	8	●	MQS1150X8DB	129.4	134.4	196.4	194	2.4	12	2
11.6	3	●	MQS1160X3DB	62.4	62.4	118.4	116	2.4	12	1
	5	●	MQS1160X5DB	86.4	86.4	142.4	140	2.4	12	1
11.7	3	●	MQS1170X3DB	62.4	62.4	118.4	116	2.4	12	1
	5	●	MQS1170X5DB	86.4	86.4	142.4	140	2.4	12	1
11.8	3	●	MQS1180X3DB	62.4	62.4	118.4	116	2.4	12	1
	5	●	MQS1180X5DB	86.4	86.4	142.4	140	2.4	12	1
11.9	3	●	MQS1190X3DB	62.5	62.5	118.5	116	2.5	12	1
	5	●	MQS1190X5DB	86.5	86.5	142.5	140	2.5	12	1
12.0	3	●	MQS1200X3DB	62.5	62.5	118.5	116	2.5	12	1
	5	●	MQS1200X5DB	86.5	86.5	142.5	140	2.5	12	1
NEW	8	●	MQS1200X8DB	134.5	134.5	196.5	194	2.5	12	2
12.1	3	●	MQS1210X3DB	65.5	68.5	124.5	122	2.5	13	1
	5	●	MQS1210X5DB	90.5	94.5	150.5	148	2.5	13	1
12.2	3	●	MQS1220X3DB	65.5	68.5	124.5	122	2.5	13	1
	5	●	MQS1220X5DB	90.5	94.5	150.5	148	2.5	13	1
12.3	3	●	MQS1230X3DB	65.5	68.5	124.5	122	2.5	13	1
	5	●	MQS1230X5DB	90.5	94.5	150.5	148	2.5	13	1
12.4	3	●	MQS1240X3DB	65.6	68.6	124.6	122	2.6	13	1
	5	●	MQS1240X5DB	90.6	94.6	150.6	148	2.6	13	1
12.5	3	●	MQS1250X3DB	65.6	68.6	124.6	122	2.6	13	1
	5	●	MQS1250X5DB	90.6	94.6	150.6	148	2.6	13	1
NEW	8	●	MQS1250X8DB	140.6	145.6	208.6	206	2.6	13	2
12.6	3	●	MQS1260X3DB	67.6	68.6	124.6	122	2.6	13	1
	5	●	MQS1260X5DB	93.6	94.6	150.6	148	2.6	13	1
12.7	3	●	MQS1270X3DB	67.6	68.6	124.6	122	2.6	13	1
	5	●	MQS1270X5DB	93.6	94.6	150.6	148	2.6	13	1
12.8	3	●	MQS1280X3DB	67.7	68.7	124.7	122	2.7	13	1
	5	●	MQS1280X5DB	93.7	94.7	150.7	148	2.7	13	1
12.9	3	●	MQS1290X3DB	67.7	68.7	124.7	122	2.7	13	1
	5	●	MQS1290X5DB	93.7	94.7	150.7	148	2.7	13	1

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.0	3	●	MQS1300X3DB	67.7	68.7	124.7	122	2.7	13	1
	5	●	MQS1300X5DB	93.7	94.7	150.7	148	2.7	13	1
NEW	8	●	MQS1300X8DB	145.7	145.7	208.7	206	2.7	13	2
13.1	3	●	MQS1310X3DB	70.7	72.7	128.7	126	2.7	14	1
	5	●	MQS1310X5DB	97.7	100.7	156.7	154	2.7	14	1
13.2	3	●	MQS1320X3DB	70.7	72.7	128.7	126	2.7	14	1
	5	●	MQS1320X5DB	97.7	100.7	156.7	154	2.7	14	1
13.3	3	●	MQS1330X3DB	70.8	72.8	128.8	126	2.8	14	1
	5	●	MQS1330X5DB	97.8	100.8	156.8	154	2.8	14	1
13.4	3	●	MQS1340X3DB	70.8	72.8	128.8	126	2.8	14	1
	5	●	MQS1340X5DB	97.8	100.8	156.8	154	2.8	14	1
13.5	3	●	MQS1350X3DB	70.8	72.8	128.8	126	2.8	14	1
	5	●	MQS1350X5DB	97.8	100.8	156.8	154	2.8	14	1
NEW	8	●	MQS1350X8DB	151.8	156.8	220.8	218	2.8	14	2
13.6	3	●	MQS1360X3DB	72.8	72.8	128.8	126	2.8	14	1
	5	●	MQS1360X5DB	100.8	100.8	156.8	154	2.8	14	1
13.7	3	●	MQS1370X3DB	72.8	72.8	128.8	126	2.8	14	1
	5	●	MQS1370X5DB	100.8	100.8	156.8	154	2.8	14	1
13.8	3	●	MQS1380X3DB	72.9	72.9	128.9	126	2.9	14	1
	5	●	MQS1380X5DB	100.9	100.9	156.9	154	2.9	14	1
13.9	3	●	MQS1390X3DB	72.9	72.9	128.9	126	2.9	14	1
	5	●	MQS1390X5DB	100.9	100.9	156.9	154	2.9	14	1
14.0	3	●	MQS1400X3DB	72.9	72.9	128.9	126	2.9	14	1
	5	●	MQS1400X5DB	100.9	100.9	156.9	154	2.9	14	1
NEW	8	●	MQS1400X8DB	156.9	156.9	220.9	218	2.9	14	2
14.1	3	●	MQS1410X3DB	75.9	78.9	137.9	135	2.9	15	1
	5	●	MQS1410X5DB	104.9	108.9	167.9	165	2.9	15	1
14.2	3	●	MQS1420X3DB	75.9	78.9	137.9	135	2.9	15	1
	5	●	MQS1420X5DB	104.9	108.9	167.9	165	2.9	15	1
14.3	3	●	MQS1430X3DB	76.0	79.0	138.0	135	3.0	15	1
	5	●	MQS1430X5DB	105.0	109.0	168.0	165	3.0	15	1
14.4	3	●	MQS1440X3DB	76.0	79.0	138.0	135	3.0	15	1
	5	●	MQS1440X5DB	105.0	109.0	168.0	165	3.0	15	1
14.5	3	●	MQS1450X3DB	76.0	79.0	138.0	135	3.0	15	1
	5	●	MQS1450X5DB	105.0	109.0	168.0	165	3.0	15	1
NEW	8	●	MQS1450X8DB	163.0	168.0	228.0	225	3.0	15	2
14.6	3	●	MQS1460X3DB	78.0	79.0	138.0	135	3.0	15	1
	5	●	MQS1460X5DB	108.0	109.0	168.0	165	3.0	15	1
14.7	3	●	MQS1470X3DB	78.0	79.0	138.0	135	3.0	15	1
	5	●	MQS1470X5DB	108.0	109.0	168.0	165	3.0	15	1
14.8	3	●	MQS1480X3DB	78.1	79.1	138.1	135	3.1	15	1
	5	●	MQS1480X5DB	108.1	109.1	168.1	165	3.1	15	1
14.9	3	●	MQS1490X3DB	78.1	79.1	138.1	135	3.1	15	1
	5	●	MQS1490X5DB	108.1	109.1	168.1	165	3.1	15	1
15.0	3	●	MQS1500X3DB	78.1	79.1	138.1	135	3.1	15	1
	5	●	MQS1500X5DB	108.1	109.1	168.1	165	3.1	15	1
NEW	8	●	MQS1500X8DB	168.1	168.1	228.1	225	3.1	15	2
15.1	3	●	MQS1510X3DB	81.1	83.1	142.1	139	3.1	16	1
	5	●	MQS1510X5DB	112.1	115.1	174.1	171	3.1	16	1

CUTTING CONDITIONS ➤ N067
OPERATION GUIDANCE ➤ N069
TECHNICAL DATA ➤ Q001

MQS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
15.2	3	●	MQS1520X3DB	81.1	83.1	142.1	139	3.1	16	1
	5	●	MQS1520X5DB	112.1	115.1	174.1	171	3.1	16	1
15.3	3	●	MQS1530X3DB	81.2	83.2	142.2	139	3.2	16	1
	5	●	MQS1530X5DB	112.2	115.2	174.2	171	3.2	16	1
15.4	3	●	MQS1540X3DB	81.2	83.2	142.2	139	3.2	16	1
	5	●	MQS1540X5DB	112.2	115.2	174.2	171	3.2	16	1
15.5	3	●	MQS1550X3DB	81.2	83.2	142.2	139	3.2	16	1
	5	●	MQS1550X5DB	112.2	115.2	174.2	171	3.2	16	1
NEW	8	●	MQS1550X8DB	174.2	184.2	244.2	241	3.2	16	2
15.6	3	●	MQS1560X3DB	83.2	83.2	142.2	139	3.2	16	1
	5	●	MQS1560X5DB	115.2	115.2	174.2	171	3.2	16	1
15.7	3	●	MQS1570X3DB	83.3	83.3	142.3	139	3.3	16	1
	5	●	MQS1570X5DB	115.3	115.3	174.3	171	3.3	16	1
15.8	3	●	MQS1580X3DB	83.3	83.3	142.3	139	3.3	16	1
	5	●	MQS1580X5DB	115.3	115.3	174.3	171	3.3	16	1
15.9	3	●	MQS1590X3DB	83.3	83.3	142.3	139	3.3	16	1
	5	●	MQS1590X5DB	115.3	115.3	174.3	171	3.3	16	1
16.0	3	●	MQS1600X3DB	83.3	83.3	142.3	139	3.3	16	1
	5	●	MQS1600X5DB	115.3	115.3	174.3	171	3.3	16	1
NEW	8	●	MQS1600X8DB	179.3	184.3	244.3	241	3.3	16	2
16.1	3	□	MQS1610X3DB	86.3	89.3	148.3	145	3.3	17	1
	5	□	MQS1610X5DB	119.3	123.3	182.3	179	3.3	17	1
16.2	3	□	MQS1620X3DB	86.4	89.4	148.4	145	3.4	17	1
	5	□	MQS1620X5DB	119.4	123.4	182.4	179	3.4	17	1
16.3	3	□	MQS1630X3DB	86.4	89.4	148.4	145	3.4	17	1
	5	□	MQS1630X5DB	119.4	123.4	182.4	179	3.4	17	1
16.4	3	□	MQS1640X3DB	86.4	89.4	148.4	145	3.4	17	1
	5	□	MQS1640X5DB	119.4	123.4	182.4	179	3.4	17	1
16.5	3	●	MQS1650X3DB	86.4	89.4	148.4	145	3.4	17	1
	5	●	MQS1650X5DB	119.4	123.4	182.4	179	3.4	17	1
16.6	3	□	MQS1660X3DB	88.4	89.4	148.4	145	3.4	17	1
	5	□	MQS1660X5DB	122.4	123.4	182.4	179	3.4	17	1
16.7	3	□	MQS1670X3DB	88.5	89.5	148.5	145	3.5	17	1
	5	□	MQS1670X5DB	122.5	123.5	182.5	179	3.5	17	1
16.8	3	□	MQS1680X3DB	88.5	89.5	148.5	145	3.5	17	1
	5	□	MQS1680X5DB	122.5	123.5	182.5	179	3.5	17	1
16.9	3	□	MQS1690X3DB	88.5	89.5	148.5	145	3.5	17	1
	5	□	MQS1690X5DB	122.5	123.5	182.5	179	3.5	17	1
17.0	3	●	MQS1700X3DB	88.5	89.5	148.5	145	3.5	17	1
	5	●	MQS1700X5DB	122.5	123.5	182.5	179	3.5	17	1
17.1	3	□	MQS1710X3DB	91.5	93.5	152.5	149	3.5	18	1
	5	□	MQS1710X5DB	126.5	129.5	188.5	185	3.5	18	1
17.2	3	□	MQS1720X3DB	91.6	93.6	152.6	149	3.6	18	1
	5	□	MQS1720X5DB	126.6	129.6	188.6	185	3.6	18	1
17.3	3	□	MQS1730X3DB	91.6	93.6	152.6	149	3.6	18	1
	5	□	MQS1730X5DB	126.6	129.6	188.6	185	3.6	18	1
17.4	3	□	MQS1740X3DB	91.6	93.6	152.6	149	3.6	18	1
	5	□	MQS1740X5DB	126.6	129.6	188.6	185	3.6	18	1
17.5	3	●	MQS1750X3DB	91.6	93.6	152.6	149	3.6	18	1
	5	●	MQS1750X5DB	126.6	129.6	188.6	185	3.6	18	1

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP3020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.6	3	□	MQS1760X3DB	93.6	93.6	152.6	149	3.6	18	1
	5	□	MQS1760X5DB	129.6	129.6	188.6	185	3.6	18	1
17.7	3	□	MQS1770X3DB	93.7	93.7	152.7	149	3.7	18	1
	5	□	MQS1770X5DB	129.7	129.7	188.7	185	3.7	18	1
17.8	3	□	MQS1780X3DB	93.7	93.7	152.7	149	3.7	18	1
	5	□	MQS1780X5DB	129.7	129.7	188.7	185	3.7	18	1
17.9	3	□	MQS1790X3DB	93.7	93.7	152.7	149	3.7	18	1
	5	□	MQS1790X5DB	129.7	129.7	188.7	185	3.7	18	1
18.0	3	●	MQS1800X3DB	93.7	93.7	152.7	149	3.7	18	1
	5	●	MQS1800X5DB	129.7	129.7	188.7	185	3.7	18	1
18.1	3	□	MQS1810X3DB	96.7	99.7	160.7	157	3.7	19	1
	5	□	MQS1810X5DB	133.7	137.7	198.7	195	3.7	19	1
18.2	3	□	MQS1820X3DB	96.8	99.8	160.8	157	3.8	19	1
	5	□	MQS1820X5DB	133.8	137.8	198.8	195	3.8	19	1
18.3	3	□	MQS1830X3DB	96.8	99.8	160.8	157	3.8	19	1
	5	□	MQS1830X5DB	133.8	137.8	198.8	195	3.8	19	1
18.4	3	□	MQS1840X3DB	96.8	99.8	160.8	157	3.8	19	1
	5	□	MQS1840X5DB	133.8	137.8	198.8	195	3.8	19	1
18.5	3	●	MQS1850X3DB	96.8	99.8	160.8	157	3.8	19	1
	5	●	MQS1850X5DB	133.8	137.8	198.8	195	3.8	19	1
18.6	3	□	MQS1860X3DB	98.9	99.9	160.9	157	3.9	19	1
	5	□	MQS1860X5DB	136.9	137.9	198.9	195	3.9	19	1
18.7	3	□	MQS1870X3DB	98.9	99.9	160.9	157	3.9	19	1
	5	□	MQS1870X5DB	136.9	137.9	198.9	195	3.9	19	1
18.8	3	□	MQS1880X3DB	98.9	99.9	160.9	157	3.9	19	1
	5	□	MQS1880X5DB	136.9	137.9	198.9	195	3.9	19	1
18.9	3	□	MQS1890X3DB	98.9	99.9	160.9	157	3.9	19	1
	5	□	MQS1890X5DB	136.9	137.9	198.9	195	3.9	19	1
19.0	3	●	MQS1900X3DB	98.9	99.9	160.9	157	3.9	19	1
	5	●	MQS1900X5DB	136.9	137.9	198.9	195	3.9	19	1
19.1	3	□	MQS1910X3DB	102.0	104.0	165.0	161	4.0	20	1
	5	□	MQS1910X5DB	141.0	144.0	205.0	201	4.0	20	1
19.2	3	□	MQS1920X3DB	102.0	104.0	165.0	161	4.0	20	1
	5	□	MQS1920X5DB	141.0	144.0	205.0	201	4.0	20	1
19.3	3	□	MQS1930X3DB	102.0	104.0	165.0	161	4.0	20	1
	5	□	MQS1930X5DB	141.0	144.0	205.0	201	4.0	20	1
19.4	3	□	MQS1940X3DB	102.0	104.0	165.0	161	4.0	20	1
	5	□	MQS1940X5DB	141.0	144.0	205.0	201	4.0	20	1
19.5	3	●	MQS1950X3DB	102.0	104.0	165.0	161	4.0	20	1
	5	●	MQS1950X5DB	141.0	144.0	205.0	201	4.0	20	1
19.6	3	□	MQS1960X3DB	104.1	104.1	165.1	161	4.1	20	1
	5	□	MQS1960X5DB	144.1	144.1	205.1	201	4.1	20	1
19.7	3	□	MQS1970X3DB	104.1	104.1	165.1	161	4.1	20	1
	5	□	MQS1970X5DB	144.1	144.1	205.1	201	4.1	20	1
19.8	3	□	MQS1980X3DB	104.1	104.1	165.1	161	4.1	20	1
	5	□	MQS1980X5DB	144.1	144.1	205.1	201	4.1	20	1
19.9	3	□	MQS1990X3DB	104.1	104.1	165.1	161	4.1	20	1
	5	□	MQS1990X5DB	144.1	144.1	205.1	201	4.1	20	1
20.0	3	●	MQS2000X3DB	104.1	104.1	165.1	161	4.1	20	1
	5	●	MQS2000X5DB	144.1	144.1	205.1	201	4.1	20	1

(Note) 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.

RECOMMENDED CUTTING CONDITIONS

Internal Coolant

Work 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)
3.2	130	12900	0.15	(0.10−0.20)	1935	100	9900	0.15	(0.10−0.20)	1485
4.0	130	10300	0.2	(0.15−0.25)	2060	100	7900	0.2	(0.15−0.25)	1580
5.0	130	8200	0.2	(0.15−0.25)	1640	100	6300	0.2	(0.15−0.25)	1260
6.3	140	7000	0.25	(0.20−0.30)	1750	130	6500	0.25	(0.20−0.30)	1625
8.0	140	5500	0.25	(0.20−0.30)	1375	130	5100	0.25	(0.20−0.30)	1275
10.0	140	4400	0.27	(0.22−0.32)	1185	130	4100	0.27	(0.22−0.32)	1105
12.0	160	4200	0.3	(0.26−0.35)	1260	140	3700	0.3	(0.26−0.35)	1110
16.0	180	3500	0.33	(0.27−0.38)	1155	150	2900	0.33	(0.27−0.38)	955
20.0	180	2800	0.35	(0.30−0.40)	980	150	2300	0.35	(0.30−0.40)	805

Work Material	Carbon steel, Alloy steel (280−350HB) AISI 4340 etc					Gray Cast Iron (≤350MPa) No 45 B 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)
3.2	70	6900	0.1	(0.06−0.15)	690	110	10900	0.28	(0.15−0.35)	3050
4.0	80	6300	0.11	(0.07−0.15)	690	110	8700	0.28	(0.15−0.35)	2435
5.0	80	5000	0.14	(0.09−0.18)	700	110	7000	0.3	(0.15−0.40)	2100
6.3	90	4500	0.18	(0.11−0.24)	810	120	6000	0.33	(0.20−0.45)	1980
8.0	100	3900	0.21	(0.16−0.25)	815	120	4700	0.35	(0.20−0.45)	1645
10.0	110	3500	0.23	(0.19−0.27)	805	130	4100	0.4	(0.22−0.45)	1640
12.0	120	3100	0.26	(0.22−0.30)	805	150	3900	0.45	(0.26−0.50)	1755
16.0	130	2500	0.28	(0.23−0.33)	700	160	3100	0.5	(0.28−0.60)	1550
20.0	130	2000	0.3	(0.26−0.35)	600	160	2500	0.5	(0.30−0.60)	1250

Work Material	Ductile Cast Iron (≤450MPa) 60-40-8 etc					Ductile Cast Iron (≤800MPa) 100-70-03 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)
3.2	90	8900	0.25	(0.15−0.32)	2225	75	7400	0.1	(0.06−0.15)	740
4.0	90	7100	0.25	(0.15−0.32)	1775	75	5900	0.1	(0.06−0.15)	590
5.0	90	5700	0.25	(0.15−0.32)	1425	75	4700	0.1	(0.06−0.15)	470
6.3	100	5000	0.3	(0.20−0.38)	1500	85	4200	0.15	(0.10−0.20)	630
8.0	100	3900	0.3	(0.20−0.38)	1170	85	3300	0.2	(0.10−0.25)	660
10.0	100	3100	0.3	(0.22−0.38)	930	85	2700	0.2	(0.10−0.25)	540
12.0	110	2900	0.35	(0.26−0.40)	1015	95	2500	0.25	(0.20−0.30)	625
16.0	120	2300	0.35	(0.28−0.40)	805	110	2100	0.25	(0.20−0.30)	525
20.0	120	1900	0.35	(0.30−0.40)	665	110	1700	0.3	(0.20−0.35)	510

(Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.
(Note 2) Emulsion type of water coolant is recommended.

MQS
WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

M.Q.L.

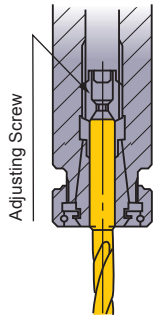
Work Material	Mild Steel (≤180HB) AISI 1010 etc					Carbon steel, Alloy steel (180−280HB) AISI 1045, AISI 4140 etc				
Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)		Table Feed (mm/min)
3.2	100	9900	0.15	(0.10−0.20)	1485	80	7900	0.15	(0.10−0.20)	1185
4.0	100	7900	0.2	(0.15−0.25)	1580	80	6300	0.2	(0.15−0.25)	1260
5.0	100	6300	0.2	(0.15−0.25)	1260	80	5000	0.2	(0.15−0.25)	1000
6.3	110	5500	0.25	(0.20−0.30)	1375	100	5000	0.25	(0.20−0.30)	1250
8.0	110	4300	0.25	(0.20−0.30)	1075	100	3900	0.25	(0.20−0.30)	975
10.0	110	3500	0.27	(0.22−0.32)	945	100	3100	0.27	(0.22−0.32)	835
12.0	130	3400	0.3	(0.26−0.35)	1020	110	2900	0.3	(0.26−0.35)	870
16.0	140	2700	0.33	(0.27−0.38)	890	120	2300	0.33	(0.27−0.38)	755
20.0	140	2200	0.35	(0.30−0.40)	770	120	1900	0.35	(0.30−0.40)	665

Work Material	Carbon steel, Alloy steel (280−350HB) AISI 4340 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)		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	(0.06−0.15)	590	90	8900	0.28	(0.15−0.35)	2490
4.0	60	4700	0.11	(0.07−0.15)	515	90	7100	0.28	(0.15−0.35)	1985
5.0	60	3800	0.14	(0.09−0.18)	530	90	5700	0.3	(0.15−0.40)	1710
6.3	60	3000	0.18	(0.11−0.24)	540	100	5000	0.33	(0.20−0.45)	1650
8.0	60	2300	0.21	(0.16−0.25)	480	100	3900	0.35	(0.20−0.45)	1365
10.0	60	1900	0.23	(0.19−0.27)	435	100	3100	0.4	(0.22−0.45)	1240
12.0	80	2100	0.26	(0.22−0.30)	545	120	3100	0.45	(0.26−0.50)	1395
16.0	80	1500	0.28	(0.23−0.33)	420	130	2500	0.5	(0.28−0.60)	1250
20.0	80	1200	0.3	(0.26−0.35)	360	130	2000	0.5	(0.30−0.60)	1000

Work Material	Ductile Cast Iron (≤450MPa) 60-40-8 etc					Ductile Cast Iron (≤800MPa) 100-70-03 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	70	6900	0.25	(0.15−0.32)	1725	60	5900	0.1	(0.06−0.15)	590
4.0	70	5500	0.25	(0.15−0.32)	1375	60	4700	0.1	(0.06−0.15)	470
5.0	70	4400	0.25	(0.15−0.32)	1100	60	3800	0.1	(0.06−0.15)	380
6.3	80	4000	0.3	(0.20−0.38)	1200	70	3500	0.15	(0.10−0.20)	525
8.0	80	3100	0.3	(0.20−0.38)	930	70	2700	0.2	(0.10−0.25)	540
10.0	80	2500	0.3	(0.22−0.38)	750	70	2200	0.2	(0.10−0.25)	440
12.0	90	2300	0.35	(0.26−0.40)	805	80	2100	0.25	(0.20−0.30)	525
16.0	100	1900	0.35	(0.28−0.40)	665	90	1700	0.25	(0.20−0.30)	425
20.0	100	1500	0.35	(0.30−0.40)	525	90	1400	0.3	(0.20−0.35)	420

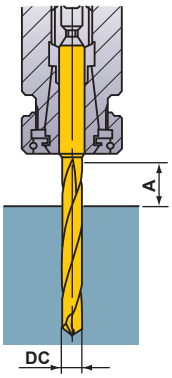
Operation Guidance for....X3DB....X5DB and....X8DB

Drill Holding



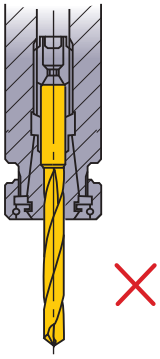
Thrust bearing type collet chuck holds the drill securely.

Drill Length



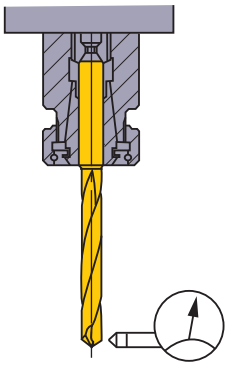
A ≥ DC x 1.5

Drill Installation



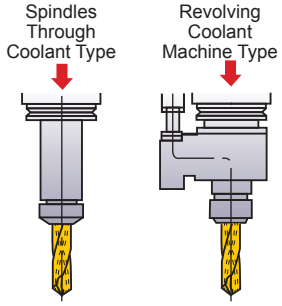
Do not clamp on the flutes.

Installation Tolerance



Run-out ≤ 0.03mm

Through Coolant Type (MQS)



Coolant pressure is approx. 0.5MPa–7MPa

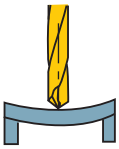
Coolant Handling

<MQS Type>

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

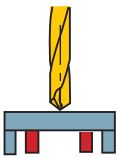
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



×

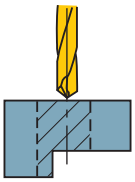
If Bending Occurs



○

Support the Workpiece

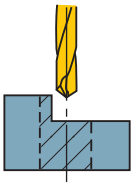
Interrupted Cutting



One Process

○

①Lower the feed when drilling the interrupted part.

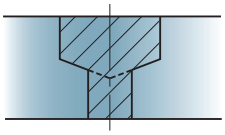


Requires Prior Machining

△

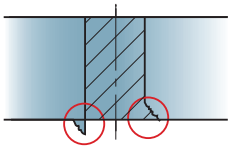
①Spot face with an end mill prior to drilling.

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



①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

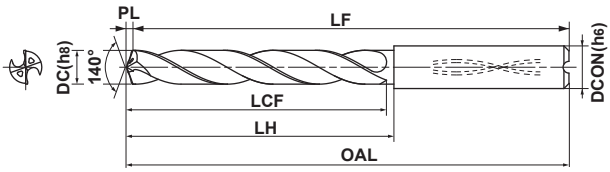
MMS

WSTAR DRILLS

- New grade DP7020, unique coolant system, special fine margin.
- Long tool life and high efficiency drilling for stainless steel.

P	**M**	K	N	S	H
	Stainless Steel				

	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
h6		0 −0.008	0 −0.009	0 −0.011	0 −0.013



*When looking at the coating the color can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

(Note) MMS drills are suitable for use with shrink fit holders.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
3.0	3	●	MMS0300X3DB	21.5	23.5	70.5	70	0.5	6
	5	●	MMS0300X5DB	28.5	31.5	78.5	78	0.5	6
3.1	3	●	MMS0310X3DB	21.6	23.6	70.6	70	0.6	6
	5	●	MMS0310X5DB	28.6	31.6	78.6	78	0.6	6
3.2	3	●	MMS0320X3DB	21.6	23.6	70.6	70	0.6	6
	5	●	MMS0320X5DB	28.6	31.6	78.6	78	0.6	6
3.3	3	●	MMS0330X3DB	21.6	23.6	70.6	70	0.6	6
	5	●	MMS0330X5DB	28.6	31.6	78.6	78	0.6	6
3.4	3	●	MMS0340X3DB	21.6	23.6	70.6	70	0.6	6
	5	●	MMS0340X5DB	28.6	31.6	78.6	78	0.6	6
3.5	3	●	MMS0350X3DB	21.6	23.6	70.6	70	0.6	6
	5	●	MMS0350X5DB	28.6	31.6	78.6	78	0.6	6
3.6	3	●	MMS0360X3DB	22.7	23.7	70.7	70	0.7	6
	5	●	MMS0360X5DB	30.7	31.7	78.7	78	0.7	6
3.7	3	●	MMS0370X3DB	22.7	23.7	70.7	70	0.7	6
	5	●	MMS0370X5DB	30.7	31.7	78.7	78	0.7	6
3.8	3	●	MMS0380X3DB	22.7	23.7	70.7	70	0.7	6
	5	●	MMS0380X5DB	30.7	31.7	78.7	78	0.7	6
3.9	3	●	MMS0390X3DB	22.7	23.7	70.7	70	0.7	6
	5	●	MMS0390X5DB	30.7	31.7	78.7	78	0.7	6
4.0	3	●	MMS0400X3DB	22.7	23.7	70.7	70	0.7	6
	5	●	MMS0400X5DB	30.7	31.7	78.7	78	0.7	6
4.1	3	●	MMS0410X3DB	24.7	26.7	73.7	73	0.7	6
	5	●	MMS0410X5DB	33.7	35.7	82.7	82	0.7	6
4.2	3	●	MMS0420X3DB	24.8	26.8	73.8	73	0.8	6
	5	●	MMS0420X5DB	33.8	35.8	82.8	82	0.8	6
4.3	3	●	MMS0430X3DB	24.8	26.8	73.8	73	0.8	6
	5	●	MMS0430X5DB	33.8	35.8	82.8	82	0.8	6
4.4	3	●	MMS0440X3DB	24.8	26.8	73.8	73	0.8	6
	5	●	MMS0440X5DB	33.8	35.8	82.8	82	0.8	6
4.5	3	●	MMS0450X3DB	24.8	26.8	73.8	73	0.8	6
	5	●	MMS0450X5DB	33.8	35.8	82.8	82	0.8	6
4.6	3	●	MMS0460X3DB	25.8	28.8	75.8	75	0.8	6
	5	●	MMS0460X5DB	35.8	38.8	85.8	85	0.8	6
4.7	3	●	MMS0470X3DB	25.9	28.9	75.9	75	0.9	6
	5	●	MMS0470X5DB	35.9	38.9	85.9	85	0.9	6
4.8	3	●	MMS0480X3DB	25.9	28.9	75.9	75	0.9	6
	5	●	MMS0480X5DB	35.9	38.9	85.9	85	0.9	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
4.9	3	●	MMS0490X3DB	25.9	28.9	75.9	75	0.9	6
	5	●	MMS0490X5DB	35.9	38.9	85.9	85	0.9	6
5.0	3	●	MMS0500X3DB	25.9	28.9	75.9	75	0.9	6
	5	●	MMS0500X5DB	35.9	38.9	85.9	85	0.9	6
5.1	3	●	MMS0510X3DB	28.9	30.9	81.9	81	0.9	6
	5	●	MMS0510X5DB	39.9	42.9	89.9	89	0.9	6
5.2	3	●	MMS0520X3DB	28.9	30.9	81.9	81	0.9	6
	5	●	MMS0520X5DB	39.9	42.9	89.9	89	0.9	6
5.3	3	●	MMS0530X3DB	29.0	31.0	82.0	81	1.0	6
	5	●	MMS0530X5DB	40.0	43.0	90.0	89	1.0	6
5.4	3	●	MMS0540X3DB	29.0	31.0	82.0	81	1.0	6
	5	●	MMS0540X5DB	40.0	43.0	90.0	89	1.0	6
5.5	3	●	MMS0550X3DB	29.0	31.0	82.0	81	1.0	6
	5	●	MMS0550X5DB	40.0	43.0	90.0	89	1.0	6
5.6	3	●	MMS0560X3DB	31.0	31.0	82.0	81	1.0	6
	5	●	MMS0560X5DB	43.0	43.0	90.0	89	1.0	6
5.7	3	●	MMS0570X3DB	31.0	31.0	82.0	81	1.0	6
	5	●	MMS0570X5DB	43.0	43.0	90.0	89	1.0	6
5.8	3	●	MMS0580X3DB	31.1	31.1	82.1	81	1.1	6
	5	●	MMS0580X5DB	43.1	43.1	90.1	89	1.1	6
5.9	3	●	MMS0590X3DB	31.1	31.1	82.1	81	1.1	6
	5	●	MMS0590X5DB	43.1	43.1	90.1	89	1.1	6
6.0	3	●	MMS0600X3DB	31.1	31.1	82.1	81	1.1	6
	5	●	MMS0600X5DB	43.1	43.1	90.1	89	1.1	6
6.1	3	●	MMS0610X3DB	34.1	36.1	87.1	86	1.1	8
	5	●	MMS0610X5DB	47.1	49.1	96.1	95	1.1	8
6.2	3	●	MMS0620X3DB	34.1	36.1	87.1	86	1.1	8
	5	●	MMS0620X5DB	47.1	49.1	96.1	95	1.1	8
6.3	3	●	MMS0630X3DB	34.1	36.1	87.1	86	1.1	8
	5	●	MMS0630X5DB	47.1	49.1	96.1	95	1.1	8
6.4	3	●	MMS0640X3DB	34.2	36.2	87.2	86	1.2	8
	5	●	MMS0640X5DB	47.2	49.2	96.2	95	1.2	8
6.5	3	●	MMS0650X3DB	34.2	36.2	87.2	86	1.2	8
	5	●	MMS0650X5DB	47.2	49.2	96.2	95	1.2	8
6.6	3	●	MMS0660X3DB	36.2	38.2	91.2	90	1.2	8
	5	●	MMS0660X5DB	50.2	52.2	99.2	98	1.2	8
6.7	3	●	MMS0670X3DB	36.2	38.2	91.2	90	1.2	8
	5	●	MMS0670X5DB	50.2	52.2	99.2	98	1.2	8

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

● : Inventory maintained in Japan.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
6.8	3	●	MMS0680X3DB	36.2	38.2	91.2	90	1.2	8
	5	●	MMS0680X5DB	50.2	52.2	99.2	98	1.2	8
6.9	3	●	MMS0690X3DB	36.3	38.3	91.3	90	1.3	8
	5	●	MMS0690X5DB	50.3	52.3	99.3	98	1.3	8
7.0	3	●	MMS0700X3DB	36.3	38.3	91.3	90	1.3	8
	5	●	MMS0700X5DB	50.3	52.3	99.3	98	1.3	8
7.1	3	●	MMS0710X3DB	39.3	40.3	91.3	90	1.3	8
	5	●	MMS0710X5DB	54.3	57.3	104.3	103	1.3	8
7.2	3	●	MMS0720X3DB	39.3	40.3	91.3	90	1.3	8
	5	●	MMS0720X5DB	54.3	57.3	104.3	103	1.3	8
7.3	3	●	MMS0730X3DB	39.3	40.3	91.3	90	1.3	8
	5	●	MMS0730X5DB	54.3	57.3	104.3	103	1.3	8
7.4	3	●	MMS0740X3DB	39.3	40.3	91.3	90	1.3	8
	5	●	MMS0740X5DB	54.3	57.3	104.3	103	1.3	8
7.5	3	●	MMS0750X3DB	39.4	40.4	91.4	90	1.4	8
	5	●	MMS0750X5DB	54.4	57.4	104.4	103	1.4	8
7.6	3	●	MMS0760X3DB	41.4	41.4	91.4	90	1.4	8
	5	●	MMS0760X5DB	57.4	57.4	104.4	103	1.4	8
7.7	3	●	MMS0770X3DB	41.4	41.4	91.4	90	1.4	8
	5	●	MMS0770X5DB	57.4	57.4	104.4	103	1.4	8
7.8	3	●	MMS0780X3DB	41.4	41.4	91.4	90	1.4	8
	5	●	MMS0780X5DB	57.4	57.4	104.4	103	1.4	8
7.9	3	●	MMS0790X3DB	41.4	41.4	91.4	90	1.4	8
	5	●	MMS0790X5DB	57.4	57.4	104.4	103	1.4	8
8.0	3	●	MMS0800X3DB	41.5	41.5	91.5	90	1.5	8
	5	●	MMS0800X5DB	57.5	57.5	104.5	103	1.5	8
8.1	3	●	MMS0810X3DB	44.5	46.5	97.5	96	1.5	10
	5	●	MMS0810X5DB	61.5	63.5	114.5	113	1.5	10
8.2	3	●	MMS0820X3DB	44.5	46.5	97.5	96	1.5	10
	5	●	MMS0820X5DB	61.5	63.5	114.5	113	1.5	10
8.3	3	●	MMS0830X3DB	44.5	46.5	97.5	96	1.5	10
	5	●	MMS0830X5DB	61.5	63.5	114.5	113	1.5	10
8.4	3	●	MMS0840X3DB	44.5	46.5	97.5	96	1.5	10
	5	●	MMS0840X5DB	61.5	63.5	114.5	113	1.5	10
8.5	3	●	MMS0850X3DB	44.5	46.5	97.5	96	1.5	10
	5	●	MMS0850X5DB	61.5	63.5	114.5	113	1.5	10
8.6	3	●	MMS0860X3DB	46.6	48.6	102.6	101	1.6	10
	5	●	MMS0860X5DB	64.6	66.6	117.6	116	1.6	10
8.7	3	●	MMS0870X3DB	46.6	48.6	102.6	101	1.6	10
	5	●	MMS0870X5DB	64.6	66.6	117.6	116	1.6	10
8.8	3	●	MMS0880X3DB	46.6	48.6	102.6	101	1.6	10
	5	●	MMS0880X5DB	64.6	66.6	117.6	116	1.6	10
8.9	3	●	MMS0890X3DB	46.6	48.6	102.6	101	1.6	10
	5	●	MMS0890X5DB	64.6	66.6	117.6	116	1.6	10
9.0	3	●	MMS0900X3DB	46.6	48.6	102.6	101	1.6	10
	5	●	MMS0900X5DB	64.6	66.6	117.6	116	1.6	10
9.1	3	●	MMS0910X3DB	49.7	51.7	102.7	101	1.7	10
	5	●	MMS0910X5DB	68.7	71.7	122.7	121	1.7	10
9.2	3	●	MMS0920X3DB	49.7	51.7	102.7	101	1.7	10
	5	●	MMS0920X5DB	68.7	71.7	122.7	121	1.7	10

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
9.3	3	●	MMS0930X3DB	49.7	51.7	102.7	101	1.7	10
	5	●	MMS0930X5DB	68.7	71.7	122.7	121	1.7	10
9.4	3	●	MMS0940X3DB	49.7	51.7	102.7	101	1.7	10
	5	●	MMS0940X5DB	68.7	71.7	122.7	121	1.7	10
9.5	3	●	MMS0950X3DB	49.7	51.7	102.7	101	1.7	10
	5	●	MMS0950X5DB	68.7	71.7	122.7	121	1.7	10
9.6	3	●	MMS0960X3DB	51.7	51.7	102.7	101	1.7	10
	5	●	MMS0960X5DB	71.7	71.7	122.7	121	1.7	10
9.7	3	●	MMS0970X3DB	51.8	51.8	102.8	101	1.8	10
	5	●	MMS0970X5DB	71.8	71.8	122.8	121	1.8	10
9.8	3	●	MMS0980X3DB	51.8	51.8	102.8	101	1.8	10
	5	●	MMS0980X5DB	71.8	71.8	122.8	121	1.8	10
9.9	3	●	MMS0990X3DB	51.8	51.8	102.8	101	1.8	10
	5	●	MMS0990X5DB	71.8	71.8	122.8	121	1.8	10
10.0	3	●	MMS1000X3DB	51.8	51.8	102.8	101	1.8	10
	5	●	MMS1000X5DB	71.8	71.8	122.8	121	1.8	10
10.1	3	●	MMS1010X3DB	54.8	56.8	112.8	111	1.8	12
	5	●	MMS1010X5DB	75.8	79.8	135.8	134	1.8	12
10.2	3	●	MMS1020X3DB	54.9	56.9	112.9	111	1.9	12
	5	●	MMS1020X5DB	75.9	79.9	135.9	134	1.9	12
10.3	3	●	MMS1030X3DB	54.9	56.9	112.9	111	1.9	12
	5	●	MMS1030X5DB	75.9	79.9	135.9	134	1.9	12
10.4	3	●	MMS1040X3DB	54.9	56.9	112.9	111	1.9	12
	5	●	MMS1040X5DB	75.9	79.9	135.9	134	1.9	12
10.5	3	●	MMS1050X3DB	54.9	56.9	112.9	111	1.9	12
	5	●	MMS1050X5DB	75.9	79.9	135.9	134	1.9	12
10.6	3	●	MMS1060X3DB	56.9	57.9	117.9	116	1.9	12
	5	●	MMS1060X5DB	78.9	79.9	135.9	134	1.9	12
10.7	3	●	MMS1070X3DB	56.9	57.9	117.9	116	1.9	12
	5	●	MMS1070X5DB	78.9	79.9	135.9	134	1.9	12
10.8	3	●	MMS1080X3DB	57.0	58.0	118.0	116	2.0	12
	5	●	MMS1080X5DB	79.0	80.0	136.0	134	2.0	12
10.9	3	●	MMS1090X3DB	57.0	58.0	118.0	116	2.0	12
	5	●	MMS1090X5DB	79.0	80.0	136.0	134	2.0	12
11.0	3	●	MMS1100X3DB	57.0	58.0	118.0	116	2.0	12
	5	●	MMS1100X5DB	79.0	80.0	136.0	134	2.0	12
11.1	3	●	MMS1110X3DB	60.0	62.0	118.0	116	2.0	12
	5	●	MMS1110X5DB	83.0	86.0	142.0	140	2.0	12
11.2	3	●	MMS1120X3DB	60.0	62.0	118.0	116	2.0	12
	5	●	MMS1120X5DB	83.0	86.0	142.0	140	2.0	12
11.3	3	●	MMS1130X3DB	60.1	62.1	118.1	116	2.1	12
	5	●	MMS1130X5DB	83.1	86.1	142.1	140	2.1	12
11.4	3	●	MMS1140X3DB	60.1	62.1	118.1	116	2.1	12
	5	●	MMS1140X5DB	83.1	86.1	142.1	140	2.1	12
11.5	3	●	MMS1150X3DB	60.1	62.1	118.1	116	2.1	12
	5	●	MMS1150X5DB	83.1	86.1	142.1	140	2.1	12
11.6	3	●	MMS1160X3DB	62.1	62.1	118.1	116	2.1	12
	5	●	MMS1160X5DB	86.1	86.1	142.1	140	2.1	12
11.7	3	●	MMS1170X3DB	62.1	62.1	118.1	116	2.1	12
	5	●	MMS1170X5DB	86.1	86.1	142.1	140	2.1	12

CUTTING CONDITIONS ➤ N074
OPERATION GUIDANCE ➤ N076
TECHNICAL DATA ➤ Q001

MMS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
11.8	3	●	MMS1180X3DB	62.1	62.1	118.1	116	2.1	12
	5	●	MMS1180X5DB	86.1	86.1	142.1	140	2.1	12
11.9	3	●	MMS1190X3DB	62.2	62.2	118.2	116	2.2	12
	5	●	MMS1190X5DB	86.2	86.2	142.2	140	2.2	12
12.0	3	●	MMS1200X3DB	62.2	62.2	118.2	116	2.2	12
	5	●	MMS1200X5DB	86.2	86.2	142.2	140	2.2	12
12.1	3	●	MMS1210X3DB	65.2	68.2	124.2	122	2.2	14
	5	●	MMS1210X5DB	90.2	94.2	150.2	148	2.2	14
12.2	3	●	MMS1220X3DB	65.2	68.2	124.2	122	2.2	14
	5	●	MMS1220X5DB	90.2	94.2	150.2	148	2.2	14
12.3	3	●	MMS1230X3DB	65.2	68.2	124.2	122	2.2	14
	5	●	MMS1230X5DB	90.2	94.2	150.2	148	2.2	14
12.4	3	●	MMS1240X3DB	65.3	68.3	124.3	122	2.3	14
	5	●	MMS1240X5DB	90.3	94.3	150.3	148	2.3	14
12.5	3	●	MMS1250X3DB	65.3	68.3	124.3	122	2.3	14
	5	●	MMS1250X5DB	90.3	94.3	150.3	148	2.3	14
12.6	3	●	MMS1260X3DB	67.3	68.3	124.3	122	2.3	14
	5	●	MMS1260X5DB	93.3	94.3	150.3	148	2.3	14
12.7	3	●	MMS1270X3DB	67.3	68.3	124.3	122	2.3	14
	5	●	MMS1270X5DB	93.3	94.3	150.3	148	2.3	14
12.8	3	●	MMS1280X3DB	67.3	68.3	124.3	122	2.3	14
	5	●	MMS1280X5DB	93.3	94.3	150.3	148	2.3	14
12.9	3	●	MMS1290X3DB	67.3	68.3	124.3	122	2.3	14
	5	●	MMS1290X5DB	93.3	94.3	150.3	148	2.3	14
13.0	3	●	MMS1300X3DB	67.4	68.4	124.4	122	2.4	14
	5	●	MMS1300X5DB	93.4	94.4	150.4	148	2.4	14
13.1	3	●	MMS1310X3DB	70.4	72.4	128.4	126	2.4	14
	5	●	MMS1310X5DB	97.4	100.4	156.4	154	2.4	14
13.2	3	●	MMS1320X3DB	70.4	72.4	128.4	126	2.4	14
	5	●	MMS1320X5DB	97.4	100.4	156.4	154	2.4	14
13.3	3	●	MMS1330X3DB	70.4	72.4	128.4	126	2.4	14
	5	●	MMS1330X5DB	97.4	100.4	156.4	154	2.4	14
13.4	3	●	MMS1340X3DB	70.4	72.4	128.4	126	2.4	14
	5	●	MMS1340X5DB	97.4	100.4	156.4	154	2.4	14
13.5	3	●	MMS1350X3DB	70.5	72.5	128.5	126	2.5	14
	5	●	MMS1350X5DB	97.5	100.5	156.5	154	2.5	14
13.6	3	●	MMS1360X3DB	72.5	72.5	128.5	126	2.5	14
	5	●	MMS1360X5DB	100.5	100.5	156.5	154	2.5	14
13.7	3	●	MMS1370X3DB	72.5	72.5	128.5	126	2.5	14
	5	●	MMS1370X5DB	100.5	100.5	156.5	154	2.5	14
13.8	3	●	MMS1380X3DB	72.5	72.5	128.5	126	2.5	14
	5	●	MMS1380X5DB	100.5	100.5	156.5	154	2.5	14
13.9	3	●	MMS1390X3DB	72.5	72.5	128.5	126	2.5	14
	5	●	MMS1390X5DB	100.5	100.5	156.5	154	2.5	14
14.0	3	●	MMS1400X3DB	72.5	72.5	128.5	126	2.5	14
	5	●	MMS1400X5DB	100.5	100.5	156.5	154	2.5	14
14.1	3	●	MMS1410X3DB	75.6	78.6	137.6	135	2.6	16
	5	●	MMS1410X5DB	104.6	108.6	167.6	165	2.6	16
14.2	3	●	MMS1420X3DB	75.6	78.6	137.6	135	2.6	16
	5	●	MMS1420X5DB	104.6	108.6	167.6	165	2.6	16

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
14.3	3	●	MMS1430X3DB	75.6	78.6	137.6	135	2.6	16
	5	●	MMS1430X5DB	104.6	108.6	167.6	165	2.6	16
14.4	3	●	MMS1440X3DB	75.6	78.6	137.6	135	2.6	16
	5	●	MMS1440X5DB	104.6	108.6	167.6	165	2.6	16
14.5	3	●	MMS1450X3DB	75.6	78.6	137.6	135	2.6	16
	5	●	MMS1450X5DB	104.6	108.6	167.6	165	2.6	16
14.6	3	●	MMS1460X3DB	77.7	78.7	137.7	135	2.7	16
	5	●	MMS1460X5DB	107.7	108.7	167.7	165	2.7	16
14.7	3	●	MMS1470X3DB	77.7	78.7	137.7	135	2.7	16
	5	●	MMS1470X5DB	107.7	108.7	167.7	165	2.7	16
14.8	3	●	MMS1480X3DB	77.7	78.7	137.7	135	2.7	16
	5	●	MMS1480X5DB	107.7	108.7	167.7	165	2.7	16
14.9	3	●	MMS1490X3DB	77.7	78.7	137.7	135	2.7	16
	5	●	MMS1490X5DB	107.7	108.7	167.7	165	2.7	16
15.0	3	●	MMS1500X3DB	77.7	78.7	137.7	135	2.7	16
	5	●	MMS1500X5DB	107.7	108.7	167.7	165	2.7	16
15.1	3	●	MMS1510X3DB	80.7	82.7	141.7	139	2.7	16
	5	●	MMS1510X5DB	111.7	114.7	173.7	171	2.7	16
15.2	3	●	MMS1520X3DB	80.8	82.8	141.8	139	2.8	16
	5	●	MMS1520X5DB	111.8	114.8	173.8	171	2.8	16
15.3	3	●	MMS1530X3DB	80.8	82.8	141.8	139	2.8	16
	5	●	MMS1530X5DB	111.8	114.8	173.8	171	2.8	16
15.4	3	●	MMS1540X3DB	80.8	82.8	141.8	139	2.8	16
	5	●	MMS1540X5DB	111.8	114.8	173.8	171	2.8	16
15.5	3	●	MMS1550X3DB	80.8	82.8	141.8	139	2.8	16
	5	●	MMS1550X5DB	111.8	114.8	173.8	171	2.8	16
15.6	3	●	MMS1560X3DB	82.8	82.8	141.8	139	2.8	16
	5	●	MMS1560X5DB	114.8	114.8	173.8	171	2.8	16
15.7	3	●	MMS1570X3DB	82.9	82.9	141.9	139	2.9	16
	5	●	MMS1570X5DB	114.9	114.9	173.9	171	2.9	16
15.8	3	●	MMS1580X3DB	82.9	82.9	141.9	139	2.9	16
	5	●	MMS1580X5DB	114.9	114.9	173.9	171	2.9	16
15.9	3	●	MMS1590X3DB	82.9	82.9	141.9	139	2.9	16
	5	●	MMS1590X5DB	114.9	114.9	173.9	171	2.9	16
16.0	3	●	MMS1600X3DB	82.9	82.9	141.9	139	2.9	16
	5	●	MMS1600X5DB	114.9	114.9	173.9	171	2.9	16
16.1	3	□	MMS1610X3DB	85.9	88.9	147.9	145	2.9	18
	5	□	MMS1610X5DB	118.9	122.9	181.9	179	2.9	18
16.2	3	□	MMS1620X3DB	85.9	88.9	147.9	145	2.9	18
	5	□	MMS1620X5DB	118.9	122.9	181.9	179	2.9	18
16.3	3	□	MMS1630X3DB	86.0	89.0	148.0	145	3.0	18
	5	□	MMS1630X5DB	119.0	123.0	182.0	179	3.0	18
16.4	3	□	MMS1640X3DB	86.0	89.0	148.0	145	3.0	18
	5	□	MMS1640X5DB	119.0	123.0	182.0	179	3.0	18
16.5	3	●	MMS1650X3DB	86.0	89.0	148.0	145	3.0	18
	5	●	MMS1650X5DB	119.0	123.0	182.0	179	3.0	18
16.6	3	□	MMS1660X3DB	88.0	89.0	148.0	145	3.0	18
	5	□	MMS1660X5DB	122.0	123.0	182.0	179	3.0	18
16.7	3	□	MMS1670X3DB	88.0	89.0	148.0	145	3.0	18
	5	□	MMS1670X5DB	122.0	123.0	182.0	179	3.0	18

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
16.8	3	□	MMS1680X3DB	88.1	89.1	148.1	145	3.1	18
	5	□	MMS1680X5DB	122.1	123.1	182.1	179	3.1	18
16.9	3	□	MMS1690X3DB	88.1	89.1	148.1	145	3.1	18
	5	□	MMS1690X5DB	122.1	123.1	182.1	179	3.1	18
17.0	3	●	MMS1700X3DB	88.1	89.1	148.1	145	3.1	18
	5	●	MMS1700X5DB	122.1	123.1	182.1	179	3.1	18
17.1	3	□	MMS1710X3DB	91.1	93.1	152.1	149	3.1	18
	5	□	MMS1710X5DB	126.1	129.1	188.1	185	3.1	18
17.2	3	□	MMS1720X3DB	91.1	93.1	152.1	149	3.1	18
	5	□	MMS1720X5DB	126.1	129.1	188.1	185	3.1	18
17.3	3	□	MMS1730X3DB	91.1	93.1	152.1	149	3.1	18
	5	□	MMS1730X5DB	126.1	129.1	188.1	185	3.1	18
17.4	3	□	MMS1740X3DB	91.2	93.2	152.2	149	3.2	18
	5	□	MMS1740X5DB	126.2	129.2	188.2	185	3.2	18
17.5	3	●	MMS1750X3DB	91.2	93.2	152.2	149	3.2	18
	5	●	MMS1750X5DB	126.2	129.2	188.2	185	3.2	18
17.6	3	□	MMS1760X3DB	93.2	93.2	152.2	149	3.2	18
	5	□	MMS1760X5DB	129.2	129.2	188.2	185	3.2	18
17.7	3	□	MMS1770X3DB	93.2	93.2	152.2	149	3.2	18
	5	□	MMS1770X5DB	129.2	129.2	188.2	185	3.2	18
17.8	3	□	MMS1780X3DB	93.2	93.2	152.2	149	3.2	18
	5	□	MMS1780X5DB	129.2	129.2	188.2	185	3.2	18
17.9	3	□	MMS1790X3DB	93.3	93.3	152.3	149	3.3	18
	5	□	MMS1790X5DB	129.3	129.3	188.3	185	3.3	18
18.0	3	●	MMS1800X3DB	93.3	93.3	152.3	149	3.3	18
	5	●	MMS1800X5DB	129.3	129.3	188.3	185	3.3	18
18.1	3	□	MMS1810X3DB	96.3	99.3	160.3	157	3.3	20
	5	□	MMS1810X5DB	133.3	137.3	198.3	195	3.3	20
18.2	3	□	MMS1820X3DB	96.3	99.3	160.3	157	3.3	20
	5	□	MMS1820X5DB	133.3	137.3	198.3	195	3.3	20
18.3	3	□	MMS1830X3DB	96.3	99.3	160.3	157	3.3	20
	5	□	MMS1830X5DB	133.3	137.3	198.3	195	3.3	20
18.4	3	□	MMS1840X3DB	96.3	99.3	160.3	157	3.3	20
	5	□	MMS1840X5DB	133.3	137.3	198.3	195	3.3	20
18.5	3	●	MMS1850X3DB	96.4	99.4	160.4	157	3.4	20
	5	●	MMS1850X5DB	133.4	137.4	198.4	195	3.4	20
18.6	3	□	MMS1860X3DB	98.4	99.4	160.4	157	3.4	20
	5	□	MMS1860X5DB	136.4	137.4	198.4	195	3.4	20
18.7	3	□	MMS1870X3DB	98.4	99.4	160.4	157	3.4	20
	5	□	MMS1870X5DB	136.4	137.4	198.4	195	3.4	20
18.8	3	□	MMS1880X3DB	98.4	99.4	160.4	157	3.4	20
	5	□	MMS1880X5DB	136.4	137.4	198.4	195	3.4	20
18.9	3	□	MMS1890X3DB	98.4	99.4	160.4	157	3.4	20
	5	□	MMS1890X5DB	136.4	137.4	198.4	195	3.4	20
19.0	3	●	MMS1900X3DB	98.5	99.5	160.5	157	3.5	20
	5	●	MMS1900X5DB	136.5	137.5	198.5	195	3.5	20
19.1	3	□	MMS1910X3DB	101.5	103.5	164.5	161	3.5	20
	5	□	MMS1910X5DB	140.5	143.5	204.5	201	3.5	20
19.2	3	□	MMS1920X3DB	101.5	103.5	164.5	161	3.5	20
	5	□	MMS1920X5DB	140.5	143.5	204.5	201	3.5	20

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock DP7020	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
19.3	3	□	MMS1930X3DB	101.5	103.5	164.5	161	3.5	20
	5	□	MMS1930X5DB	140.5	143.5	204.5	201	3.5	20
19.4	3	□	MMS1940X3DB	101.5	103.5	164.5	161	3.5	20
	5	□	MMS1940X5DB	140.5	143.5	204.5	201	3.5	20
19.5	3	●	MMS1950X3DB	101.5	103.5	164.5	161	3.5	20
	5	●	MMS1950X5DB	140.5	143.5	204.5	201	3.5	20
19.6	3	□	MMS1960X3DB	103.6	103.6	164.6	161	3.6	20
	5	□	MMS1960X5DB	143.6	143.6	204.6	201	3.6	20
19.7	3	□	MMS1970X3DB	103.6	103.6	164.6	161	3.6	20
	5	□	MMS1970X5DB	143.6	143.6	204.6	201	3.6	20
19.8	3	□	MMS1980X3DB	103.6	103.6	164.6	161	3.6	20
	5	□	MMS1980X5DB	143.6	143.6	204.6	201	3.6	20
19.9	3	□	MMS1990X3DB	103.6	103.6	164.6	161	3.6	20
	5	□	MMS1990X5DB	143.6	143.6	204.6	201	3.6	20
20.0	3	●	MMS2000X3DB	103.6	103.6	164.6	161	3.6	20
	5	●	MMS2000X5DB	143.6	143.6	204.6	201	3.6	20

CUTTING CONDITIONS ➢ N074
OPERATION GUIDANCE ➢ N076
TECHNICAL DATA ➢ Q001

MMS

WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

Work 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

Work Material	Duplex Steel (≤280HB) AISI 329 etc					Ferritic, Precipitation hardening 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

Work Material	Ferritic, Precipitation hardening 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, and coolant property or discharge amount .

Stainless Steel Cross Reference List

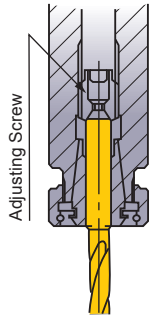
Material		Japan	Germany		USA
		JIS	W-no.	DIN	AISI/SAE
Ferritic, Precipitation hardening stainless steel	≤200HB	SUS416	1.4005	X12CrS3	416
		SUS410	1.4006	X10Cr13	410
		SUS430	1.4016	X6Cr17	430
		SUS434	1.4113	X6CrMo17	434
		SUS430LX	1.4510	X6CrTi17	430Ti
		—	1.4512	X6CrTi12	409
	>200HB	SUS420J1	1.4021	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 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

OPERATION GUIDANCE ➢ N076
TECHNICAL DATA ➢ Q001

MMS
WSTAR DRILLS

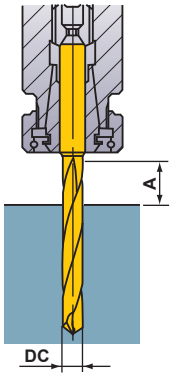
Operation Guidance for....X3DB and....X5DB

Drill Holding



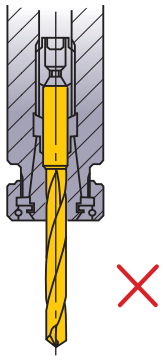
Thrust bearing type collet chuck holds the drill securely.

Drill Length



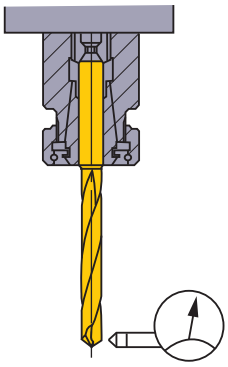
A ≥ DC x 1.5

Drill Installation



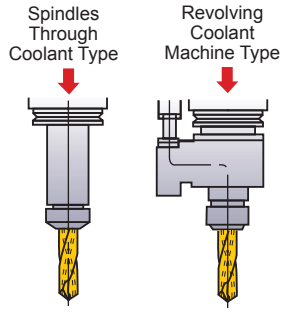
Do not clamp on the flutes.

Installation Tolerance



Run-out ≤ 0.03mm

Through Coolant Type (MQS)



Coolant pressure is approx. 0.5MPa—7MPa

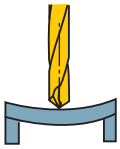
Coolant Handling

<MMS Type>

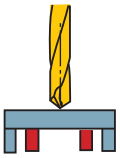
(1)Small particles of swarf will jam in the oil hole. Use a filter as a preventative measure. When using small diameter drills, use a fine mesh filter.

(2)Dirt and dust particles in old coolant can clog the oil hole and prevent effective flow. Regular coolant exchange is recommended.

Thin Workpiece

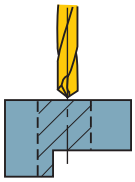


If Bending Occurs ×



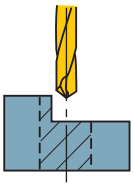
Support the Workpiece ○

Interrupted Cutting



One Process ○

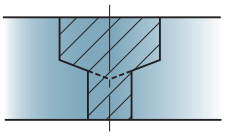
①Lower the feed when drilling the interrupted part.



Requires Prior Machining △

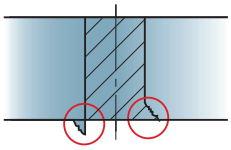
①Spot face with an end mill prior to drilling.

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



①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

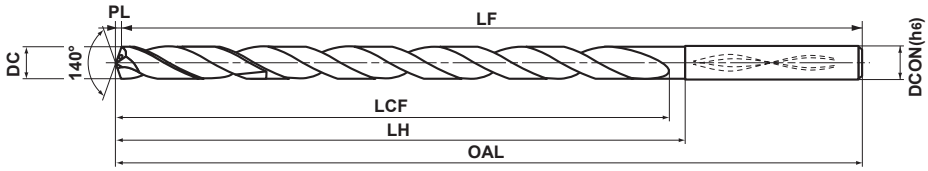
SOLID CARBIDE DRILLS FOR MACHINING OF ALUMINIUM ALLOYS

MNS
WSTAR DRILLS

- 4 holes special coolant system, good for resistance to adhesion.
- High efficiency drilling for aluminium alloy.

P	M	K	N	S	H
			Non-ferrous Metal		

	DC=3	3<DC≤6	6<DC≤10	10<DC≤14
	0 / −0.014	0 / −0.018	0 / −0.022	0 / −0.027
h6	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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
3.0	5	●	MNS0300LB	33.5	33.5	81.5	81	0.5	3
	10	●	MNS0300X10DB	39.5	42.5	90.5	90	0.5	3
	20	●	MNS0300X20DB	69.5	72.5	120.5	120	0.5	3
	30	●	MNS0300X30DB	99.5	102.5	150.5	150	0.5	3
3.1	5	●	MNS0310LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0310X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0310X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0310X30DB	116.6	119.6	167.6	167	0.6	4
3.2	5	●	MNS0320LB	39.6	39.6	87.6	87	0.6	4
	10	●	MNS0320X10DB	46.6	49.6	97.6	97	0.6	4
	20	●	MNS0320X20DB	81.6	84.6	132.6	132	0.6	4
	30	●	MNS0320X30DB	116.6	119.6	167.6	167	0.6	4
3.3	5	●	MNS0330LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0330X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0330X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0330X30DB	116.6	119.6	167.6	167	0.6	4
3.4	5	●	MNS0340LB	39.6	39.6	87.6	87	0.6	4
	10	●	MNS0340X10DB	46.6	49.6	97.6	97	0.6	4
	20	●	MNS0340X20DB	81.6	84.6	132.6	132	0.6	4
	30	●	MNS0340X30DB	116.6	119.6	167.6	167	0.6	4
3.5	5	●	MNS0350LB	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0350X10DB	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0350X20DB	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0350X30DB	116.6	119.6	167.6	167	0.6	4
3.6	5	●	MNS0360LB	44.7	44.7	92.7	92	0.7	4
	10	●	MNS0360X10DB	52.7	55.7	103.7	103	0.7	4
	20	●	MNS0360X20DB	92.7	95.7	143.7	143	0.7	4
	30	●	MNS0360X30DB	132.7	135.7	183.7	183	0.7	4
3.7	5	●	MNS0370LB	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0370X10DB	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0370X20DB	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0370X30DB	132.7	135.7	183.7	183	0.7	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
3.8	5	●	MNS0380LB	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0380X10DB	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0380X20DB	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0380X30DB	132.7	135.7	183.7	183	0.7	4
3.9	5	●	MNS0390LB	44.7	44.7	92.7	92	0.7	4
	10	●	MNS0390X10DB	52.7	55.7	103.7	103	0.7	4
	20	●	MNS0390X20DB	92.7	95.7	143.7	143	0.7	4
	30	●	MNS0390X30DB	132.7	135.7	183.7	183	0.7	4
4.0	5	●	MNS0400LB	44.7	44.7	92.7	92	0.7	4
	10	●	MNS0400X10DB	52.7	55.7	103.7	103	0.7	4
	20	●	MNS0400X20DB	92.7	95.7	143.7	143	0.7	4
	30	●	MNS0400X30DB	132.7	135.7	183.7	183	0.7	4
4.1	5	●	MNS0410LB	50.7	50.7	100.7	100	0.7	5
	10	□	MNS0410X10DB	59.7	62.7	112.7	112	0.7	5
	20	□	MNS0410X20DB	104.7	107.7	157.7	157	0.7	5
	30	□	MNS0410X30DB	149.7	152.7	202.7	202	0.7	5
4.2	5	●	MNS0420LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0420X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0420X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0420X30DB	149.8	152.8	202.8	202	0.8	5
4.3	5	●	MNS0430LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0430X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0430X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0430X30DB	149.8	152.8	202.8	202	0.8	5
4.4	5	●	MNS0440LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0440X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0440X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0440X30DB	149.8	152.8	202.8	202	0.8	5
4.5	5	●	MNS0450LB	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0450X10DB	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0450X20DB	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0450X30DB	149.8	152.8	202.8	202	0.8	5

(Note) 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.

CUTTING CONDITIONS ➤ N082
OPERATION GUIDANCE ➤ N083
TECHNICAL DATA ➤ Q001

MNS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
4.6	5	●	MNS0460LB	55.8	55.8	105.8	105	0.8	5
	10	□	MNS0460X10DB	65.8	68.8	118.8	118	0.8	5
	20	□	MNS0460X20DB	115.8	118.8	168.8	168	0.8	5
	30	□	MNS0460X30DB	165.8	168.8	218.8	218	0.8	5
4.7	5	●	MNS0470LB	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0470X10DB	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0470X20DB	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0470X30DB	165.9	168.9	218.9	218	0.9	5
4.8	5	●	MNS0480LB	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0480X10DB	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0480X20DB	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0480X30DB	165.9	168.9	218.9	218	0.9	5
4.9	5	●	MNS0490LB	55.9	55.9	105.9	105	0.9	5
	10	●	MNS0490X10DB	65.9	68.9	118.9	118	0.9	5
	20	●	MNS0490X20DB	115.9	118.9	168.9	168	0.9	5
	30	●	MNS0490X30DB	165.9	168.9	218.9	218	0.9	5
5.0	5	●	MNS0500LB	44.9	44.9	100.9	100	0.9	6
	10	●	MNS0500X10DB	65.9	68.9	118.9	118	0.9	5
	20	●	MNS0500X20DB	115.9	118.9	168.9	168	0.9	5
	30	●	MNS0500X30DB	165.9	168.9	218.9	218	0.9	5
5.1	5	●	MNS0510LB	44.9	44.9	100.9	100	0.9	6
	10	●	MNS0510X10DB	72.9	75.9	127.9	127	0.9	6
	20	●	MNS0510X20DB	127.9	130.9	182.9	182	0.9	6
	30	●	MNS0510X30DB	182.9	185.9	237.9	237	0.9	6
5.2	5	●	MNS0520LB	44.9	44.9	100.9	100	0.9	6
	10	□	MNS0520X10DB	72.9	75.9	127.9	127	0.9	6
	20	□	MNS0520X20DB	127.9	130.9	182.9	182	0.9	6
	30	□	MNS0520X30DB	182.9	185.9	237.9	237	0.9	6
5.3	5	●	MNS0530LB	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0530X10DB	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0530X20DB	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0530X30DB	183.0	186.0	238.0	237	1.0	6
5.4	5	●	MNS0540LB	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0540X10DB	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0540X20DB	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0540X30DB	183.0	186.0	238.0	237	1.0	6
5.5	5	●	MNS0550LB	45.0	45.0	101.0	100	1.0	6
	10	●	MNS0550X10DB	73.0	76.0	128.0	127	1.0	6
	20	●	MNS0550X20DB	128.0	131.0	183.0	182	1.0	6
	30	●	MNS0550X30DB	183.0	186.0	238.0	237	1.0	6
5.6	5	●	MNS0560LB	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0560X10DB	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0560X20DB	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0560X30DB	199.0	202.0	254.0	253	1.0	6
5.7	5	●	MNS0570LB	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0570X10DB	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0570X20DB	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0570X30DB	199.0	202.0	254.0	253	1.0	6

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
5.8	5	●	MNS0580LB	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0580X10DB	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0580X20DB	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0580X30DB	199.1	202.1	254.1	253	1.1	6
5.9	5	●	MNS0590LB	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0590X10DB	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0590X20DB	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0590X30DB	199.1	202.1	254.1	253	1.1	6
6.0	5	●	MNS0600LB	49.1	49.1	101.1	100	1.1	6
	10	●	MNS0600X10DB	79.1	82.1	134.1	133	1.1	6
	20	●	MNS0600X20DB	139.1	142.1	194.1	193	1.1	6
	30	●	MNS0600X30DB	199.1	202.1	254.1	253	1.1	6
6.1	5	●	MNS0610LB	53.1	53.1	110.1	109	1.1	7
	10	●	MNS0610X10DB	86.1	89.1	142.1	141	1.1	7
	20	●	MNS0610X20DB	151.1	154.1	207.1	206	1.1	7
	30	●	MNS0610X30DB	216.1	219.1	272.1	271	1.1	7
6.2	5	●	MNS0620LB	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0620X10DB	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0620X20DB	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0620X30DB	216.1	219.1	272.1	271	1.1	7
6.3	5	●	MNS0630LB	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0630X10DB	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0630X20DB	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0630X30DB	216.1	219.1	272.1	271	1.1	7
6.4	5	●	MNS0640LB	53.2	53.2	110.2	109	1.2	7
	10	□	MNS0640X10DB	86.2	89.2	142.2	141	1.2	7
	20	□	MNS0640X20DB	151.2	154.2	207.2	206	1.2	7
	30	□	MNS0640X30DB	216.2	219.2	272.2	271	1.2	7
6.5	5	●	MNS0650LB	53.2	53.2	110.2	109	1.2	7
	10	●	MNS0650X10DB	86.2	89.2	142.2	141	1.2	7
	20	●	MNS0650X20DB	151.2	154.2	207.2	206	1.2	7
	30	●	MNS0650X30DB	216.2	219.2	272.2	271	1.2	7
6.6	5	●	MNS0660LB	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0660X10DB	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0660X20DB	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0660X30DB	232.2	235.2	288.2	287	1.2	7
6.7	5	●	MNS0670LB	57.2	57.2	110.2	109	1.2	7
	10	●	MNS0670X10DB	92.2	95.2	148.2	147	1.2	7
	20	●	MNS0670X20DB	162.2	165.2	218.2	217	1.2	7
	30	●	MNS0670X30DB	232.2	235.2	288.2	287	1.2	7
6.8	5	●	MNS0680LB	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0680X10DB	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0680X20DB	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0680X30DB	232.2	235.2	288.2	287	1.2	7
6.9	5	●	MNS0690LB	57.3	57.3	110.3	109	1.3	7
	10	□	MNS0690X10DB	92.3	95.3	148.3	147	1.3	7
	20	□	MNS0690X20DB	162.3	165.3	218.3	217	1.3	7
	30	□	MNS0690X30DB	232.3	235.3	288.3	287	1.3	7

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
7.0	5	●	MNS0700LB	57.3	57.3	110.3	109	1.3	7
	10	●	MNS0700X10DB	92.3	95.3	148.3	147	1.3	7
	20	●	MNS0700X20DB	162.3	165.3	218.3	217	1.3	7
	30	●	MNS0700X30DB	232.3	235.3	288.3	287	1.3	7
7.1	5	●	MNS0710LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0710X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0710X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0710X30DB	249.3	252.3	306.3	305	1.3	8
7.2	5	●	MNS0720LB	61.3	65.3	119.3	118	1.3	8
	10	●	MNS0720X10DB	99.3	102.3	156.3	155	1.3	8
	20	●	MNS0720X20DB	174.3	177.3	231.3	230	1.3	8
	30	●	MNS0720X30DB	249.3	252.3	306.3	305	1.3	8
7.3	5	●	MNS0730LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0730X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0730X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0730X30DB	249.3	252.3	306.3	305	1.3	8
7.4	5	●	MNS0740LB	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0740X10DB	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0740X20DB	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0740X30DB	249.3	252.3	306.3	305	1.3	8
7.5	5	●	MNS0750LB	61.4	65.4	119.4	118	1.4	8
	10	□	MNS0750X10DB	99.4	102.4	156.4	155	1.4	8
	20	□	MNS0750X20DB	174.4	177.4	231.4	230	1.4	8
	30	□	MNS0750X30DB	249.4	252.4	306.4	305	1.4	8
7.6	5	●	MNS0760LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0760X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0760X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0760X30DB	265.4	268.4	322.4	321	1.4	8
7.7	5	●	MNS0770LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0770X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0770X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0770X30DB	265.4	268.4	322.4	321	1.4	8
7.8	5	●	MNS0780LB	65.4	65.4	119.4	118	1.4	8
	10	●	MNS0780X10DB	105.4	108.4	162.4	161	1.4	8
	20	●	MNS0780X20DB	185.4	188.4	242.4	241	1.4	8
	30	●	MNS0780X30DB	265.4	268.4	322.4	321	1.4	8
7.9	5	●	MNS0790LB	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0790X10DB	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0790X20DB	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0790X30DB	265.4	268.4	322.4	321	1.4	8
8.0	5	●	MNS0800LB	65.5	65.5	119.5	118	1.5	8
	10	●	MNS0800X10DB	105.5	108.5	162.5	161	1.5	8
	20	●	MNS0800X20DB	185.5	188.5	242.5	241	1.5	8
	30	●	MNS0800X30DB	265.5	268.5	322.5	321	1.5	8
8.1	5	●	MNS0810LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0810X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0810X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0810X30DB	282.5	285.5	340.5	339	1.5	9

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
8.2	5	●	MNS0820LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0820X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0820X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0820X30DB	282.5	285.5	340.5	339	1.5	9
8.3	5	●	MNS0830LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0830X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0830X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0830X30DB	282.5	285.5	340.5	339	1.5	9
8.4	5	●	MNS0840LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0840X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0840X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0840X30DB	282.5	285.5	340.5	339	1.5	9
8.5	5	●	MNS0850LB	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0850X10DB	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0850X20DB	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0850X30DB	282.5	285.5	340.5	339	1.5	9
8.6	5	●	MNS0860LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0860X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0860X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0860X30DB	298.6	301.6	356.6	355	1.6	9
8.7	5	●	MNS0870LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0870X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0870X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0870X30DB	298.6	301.6	356.6	355	1.6	9
8.8	5	●	MNS0880LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0880X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0880X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0880X30DB	298.6	301.6	356.6	355	1.6	9
8.9	5	●	MNS0890LB	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0890X10DB	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0890X20DB	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0890X30DB	298.6	301.6	356.6	355	1.6	9
9.0	5	●	MNS0900LB	73.6	73.6	128.6	127	1.6	9
	10	●	MNS0900X10DB	118.6	121.6	176.6	175	1.6	9
	20	●	MNS0900X20DB	208.6	211.6	266.6	265	1.6	9
	30	●	MNS0900X30DB	298.6	301.6	356.6	355	1.6	9
9.1	5	●	MNS0910LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0910X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0910X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0910X30DB	315.7	318.7	373.7	372	1.7	10
9.2	5	●	MNS0920LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0920X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0920X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0920X30DB	315.7	318.7	373.7	372	1.7	10
9.3	5	●	MNS0930LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0930X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0930X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0930X30DB	315.7	318.7	373.7	372	1.7	10

CUTTING CONDITIONS ➤ N082
OPERATION GUIDANCE ➤ N083
TECHNICAL DATA ➤ Q001

MNS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
9.4	5	●	MNS0940LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0940X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0940X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0940X30DB	315.7	318.7	373.7	372	1.7	10
9.5	5	●	MNS0950LB	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0950X10DB	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0950X20DB	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0950X30DB	315.7	318.7	373.7	372	1.7	10
9.6	5	●	MNS0960LB	81.7	81.7	137.7	136	1.7	10
	10	□	MNS0960X10DB	131.7	134.7	189.7	188	1.7	10
	20	□	MNS0960X20DB	231.7	234.7	289.7	288	1.7	10
	30	□	MNS0960X30DB	331.7	334.7	389.7	388	1.7	10
9.7	5	●	MNS0970LB	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0970X10DB	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0970X20DB	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0970X30DB	331.8	334.8	389.8	388	1.8	10
9.8	5	●	MNS0980LB	81.8	81.8	137.8	136	1.8	10
	10	●	MNS0980X10DB	131.8	134.8	189.8	188	1.8	10
	20	●	MNS0980X20DB	231.8	234.8	289.8	288	1.8	10
	30	●	MNS0980X30DB	331.8	334.8	389.8	388	1.8	10
9.9	5	●	MNS0990LB	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0990X10DB	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0990X20DB	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0990X30DB	331.8	334.8	389.8	388	1.8	10
10.0	5	●	MNS1000LB	81.8	81.8	137.8	136	1.8	10
	10	●	MNS1000X10DB	131.8	134.8	189.8	188	1.8	10
	20	●	MNS1000X20DB	231.8	234.8	289.8	288	1.8	10
	30	●	MNS1000X30DB	331.8	334.8	389.8	388	1.8	10
10.1	5	●	MNS1010LB	85.8	89.8	150.8	149	1.8	11
	10	□	MNS1010X10DB	138.8	141.8	202.8	201	1.8	11
	20	□	MNS1010X20DB	243.8	246.8	307.8	306	1.8	11
10.2	5	●	MNS1020LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1020X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1020X20DB	243.9	246.9	307.9	306	1.9	11
10.3	5	●	MNS1030LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1030X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1030X20DB	243.9	246.9	307.9	306	1.9	11
10.4	5	●	MNS1040LB	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1040X10DB	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1040X20DB	243.9	246.9	307.9	306	1.9	11
10.5	5	●	MNS1050LB	85.9	89.9	150.9	149	1.9	11
	10	●	MNS1050X10DB	138.9	141.9	202.9	201	1.9	11
	20	●	MNS1050X20DB	243.9	246.9	307.9	306	1.9	11
10.6	5	●	MNS1060LB	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1060X10DB	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1060X20DB	254.9	257.9	318.9	317	1.9	11
10.7	5	●	MNS1070LB	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1070X10DB	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1070X20DB	254.9	257.9	318.9	317	1.9	11

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
10.8	5	●	MNS1080LB	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1080X10DB	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1080X20DB	255.0	258.0	319.0	317	2.0	11
10.9	5	●	MNS1090LB	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1090X10DB	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1090X20DB	255.0	258.0	319.0	317	2.0	11
11.0	5	●	MNS1100LB	90.0	90.0	151.0	149	2.0	11
	10	●	MNS1100X10DB	145.0	148.0	209.0	207	2.0	11
	20	●	MNS1100X20DB	255.0	258.0	319.0	317	2.0	11
11.1	5	●	MNS1110LB	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1110X10DB	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1110X20DB	267.0	270.0	332.0	330	2.0	12
11.2	5	●	MNS1120LB	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1120X10DB	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1120X20DB	267.0	270.0	332.0	330	2.0	12
11.3	5	●	MNS1130LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1130X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1130X20DB	267.1	270.1	332.1	330	2.1	12
11.4	5	●	MNS1140LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1140X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1140X20DB	267.1	270.1	332.1	330	2.1	12
11.5	5	●	MNS1150LB	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1150X10DB	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1150X20DB	267.1	270.1	332.1	330	2.1	12
11.6	5	●	MNS1160LB	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1160X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1160X20DB	278.1	281.1	343.1	341	2.1	12
11.7	5	●	MNS1170LB	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1170X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1170X20DB	278.1	281.1	343.1	341	2.1	12
11.8	5	●	MNS1180LB	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1180X10DB	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1180X20DB	278.1	281.1	343.1	341	2.1	12
11.9	5	●	MNS1190LB	98.2	98.2	160.2	158	2.2	12
	10	□	MNS1190X10DB	158.2	161.2	223.2	221	2.2	12
	20	□	MNS1190X20DB	278.2	281.2	343.2	341	2.2	12
12.0	5	●	MNS1200LB	98.2	98.2	160.2	158	2.2	12
	10	●	MNS1200X10DB	158.2	161.2	223.2	221	2.2	12
	20	●	MNS1200X20DB	278.2	281.2	343.2	341	2.2	12
12.1	5	●	MNS1210LB	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1210X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1210X20DB	290.2	293.2	356.2	354	2.2	13
12.2	5	●	MNS1220LB	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1220X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1220X20DB	290.2	293.2	356.2	354	2.2	13
12.3	5	●	MNS1230LB	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1230X10DB	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1230X20DB	290.2	293.2	356.2	354	2.2	13

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock TF15	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
12.4	5	●	MNS1240LB	102.3	106.3	169.3	167	2.3	13
	10	□	MNS1240X10DB	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1240X20DB	290.3	293.3	356.3	354	2.3	13
12.5	5	●	MNS1250LB	102.3	106.3	169.3	167	2.3	13
	10	□	MNS1250X10DB	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1250X20DB	290.3	293.3	356.3	354	2.3	13
12.6	5	●	MNS1260LB	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1260X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1260X20DB	301.3	304.3	367.3	365	2.3	13
12.7	5	●	MNS1270LB	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1270X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1270X20DB	301.3	304.3	367.3	365	2.3	13
12.8	5	●	MNS1280LB	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1280X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1280X20DB	301.3	304.3	367.3	365	2.3	13
12.9	5	●	MNS1290LB	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1290X10DB	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1290X20DB	301.3	304.3	367.3	365	2.3	13
13.0	5	●	MNS1300LB	106.4	106.4	169.4	167	2.4	13
	10	●	MNS1300X10DB	171.4	174.4	237.4	235	2.4	13
	20	●	MNS1300X20DB	301.4	304.4	367.4	365	2.4	13
13.1	5	●	MNS1310LB	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1310X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1310X20DB	313.4	316.4	380.4	378	2.4	14
13.2	5	●	MNS1320LB	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1320X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1320X20DB	313.4	316.4	380.4	378	2.4	14
13.3	5	●	MNS1330LB	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1330X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1330X20DB	313.4	316.4	380.4	378	2.4	14
13.4	5	●	MNS1340LB	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1340X10DB	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1340X20DB	313.4	316.4	380.4	378	2.4	14
13.5	5	●	MNS1350LB	110.5	114.5	178.5	176	2.5	14
	10	□	MNS1350X10DB	178.5	181.5	245.5	243	2.5	14
	20	□	MNS1350X20DB	313.5	316.5	380.5	378	2.5	14
13.6	5	●	MNS1360LB	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1360X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1360X20DB	324.5	327.5	391.5	389	2.5	14
13.7	5	●	MNS1370LB	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1370X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1370X20DB	324.5	327.5	391.5	389	2.5	14
13.8	5	●	MNS1380LB	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1380X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1380X20DB	324.5	327.5	391.5	389	2.5	14
13.9	5	●	MNS1390LB	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1390X10DB	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1390X20DB	324.5	327.5	391.5	389	2.5	14
14.0	5	●	MNS1400LB	114.5	114.5	178.5	176	2.5	14
	10	●	MNS1400X10DB	184.5	187.5	251.5	249	2.5	14
	20	●	MNS1400X20DB	324.5	327.5	391.5	389	2.5	14

CUTTING CONDITIONS ➢ N082
OPERATION GUIDANCE ➢ N083
TECHNICAL DATA ➢ Q001

MNS
WSTAR DRILLS

RECOMMENDED CUTTING CONDITIONS

LB Type Drill

Work material	Aluminium Alloy (Si<5%) ASTM A6061, ASTM A7075 etc			Aluminium Alloy (5%≦Si≦10%) ASTM 333.0 etc			Aluminium Alloy (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 the drill with a length over l/d 10, it is necessary to use a prep holes as a guide. (If no prep-hole is used then drill breakage can occur)
(Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.

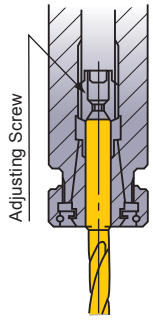
DB Type Drill

Work material	Aluminium Alloy (Si<5%) ASTM A6061, ASTM A7075 etc			Aluminium Alloy (5%≦Si≦10%) ASTM 333.0 etc			Aluminium Alloy (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 the drill with a length over l/d 10, it is necessary to use a prep holes as a guide. (If no prep-hole is used then drill breakage can occur)
(Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.

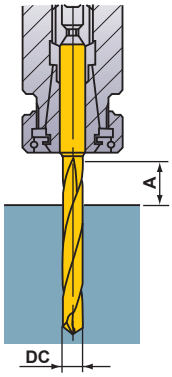
OPERATIONAL GUIDANCE

Drill Holding



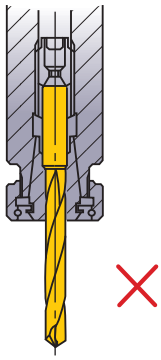
Thrust bearing type collet chuck holds the drill securely.

Drill Length



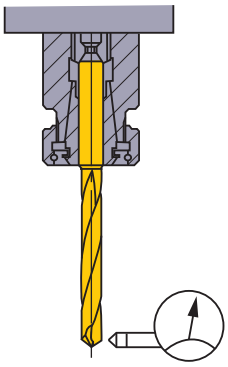
A ≥ DC x 1.5

Drill Installation



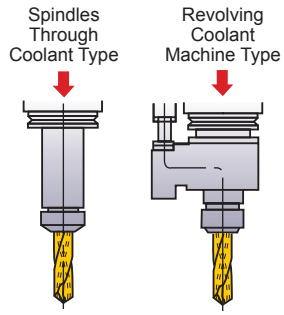
Do not clamp on the flutes.

Installation Tolerance



Run-out ≤ 0.03mm

Through Coolant Type



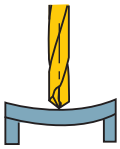
Coolant pressure is approx. 0.5MPa–7MPa

Coolant Handling

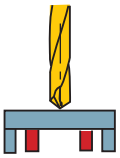
1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece

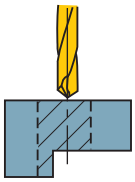


If Bending Occurs ×



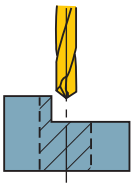
Support the Workpiece ○

Interrupted Cutting



One Process ○

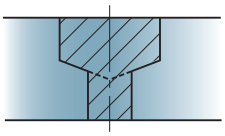
①Lower the feed when drilling the interrupted part.



Requires Prior Machining △

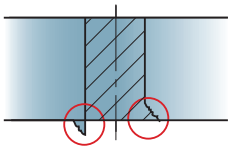
①Spot face with an end mill prior to drilling.

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



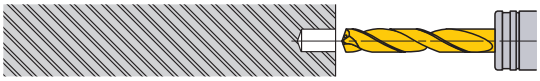
①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

MNS
WSTAR DRILLS

OPERATIONAL GUIDANCE FOR MNS...DB DRILLS

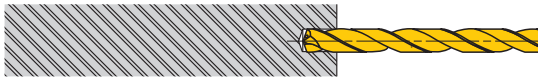
FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



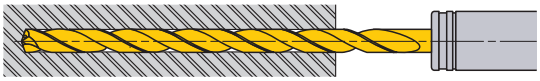
①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



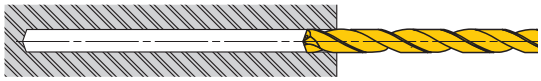
①Penetrate the guide hole at low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the guide hole bottom.

3. Drill the deep hole



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

4. Drill retraction



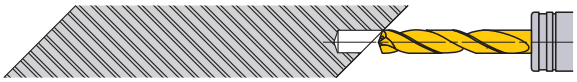
①After drilling, lower the cutting revolution about 1—2mm short of the hole end. (Cutting speed of around 20—30m/min)
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
③Finally, clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.

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

1. Spot facing

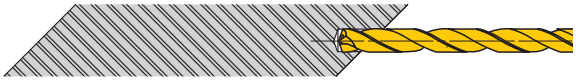
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



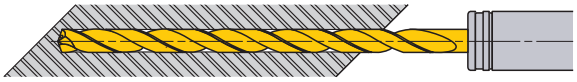
①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



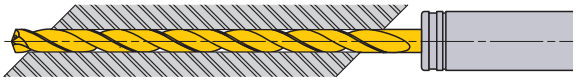
①Penetrate the guide hole at a low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the guide hole bottom.

4. Drill the deep hole



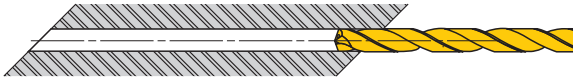
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②A feed rate of 0.05—0.1mm/rev is recommended.

6. Drill retraction



①Finally clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

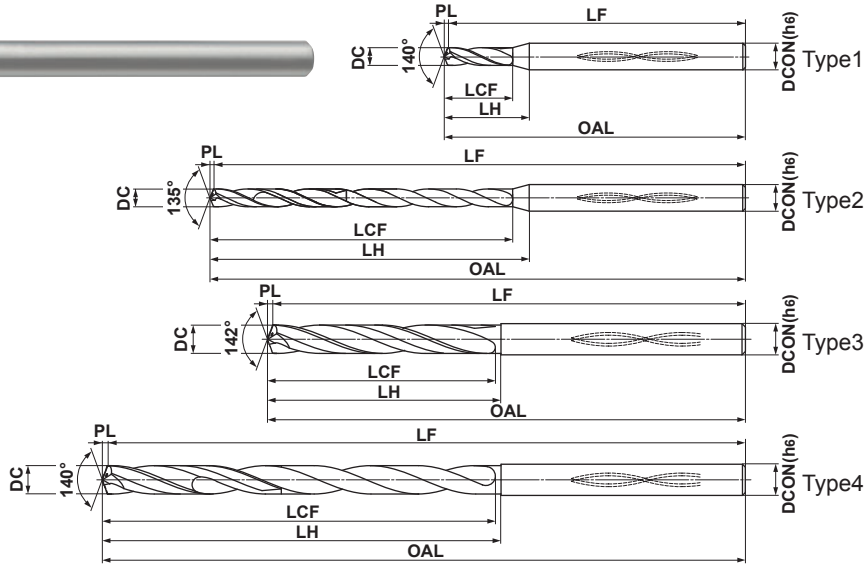
SOLID CARBIDE DRILLS FOR DIE & MOULD MACHINING

MHS
WSTAR DRILLS

- High backling strength and unique double margin.
- Non-step drilling with long tool life for high hardness steel,35HRC-55HRC

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

	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
h6	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 shortest type in the respective diameter as a pilot drill.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.95	3	●	MHS0095L006B	6.17	9.97	60.17	60	0.17	3	1
	6	●	MHS0095L009B	9.17	12.97	60.17	60	0.17	3	2
	13	●	MHS0095L015B	15.17	18.97	60.17	60	0.17	3	2
	23	●	MHS0095L025B	25.17	28.97	60.17	60	0.17	3	2
	30	●	MHS0095L035B	35.17	38.97	80.17	80	0.17	3	2
1.00	3	●	MHS0100L006B	6.2	9.9	60.2	60	0.2	3	1
	6	●	MHS0100L009B	9.2	12.9	60.2	60	0.2	3	2
	12	●	MHS0100L015B	15.2	18.9	60.2	60	0.2	3	2
	22	●	MHS0100L025B	25.2	28.9	60.2	60	0.2	3	2
	30	●	MHS0100L035B	35.2	38.9	80.2	80	0.2	3	2
1.10	2	●	MHS0110L006B	6.2	9.7	60.2	60	0.2	3	1
	5	●	MHS0110L009B	9.2	12.7	60.2	60	0.2	3	2
	11	●	MHS0110L015B	15.2	18.7	60.2	60	0.2	3	2
	20	●	MHS0110L025B	25.2	28.7	60.2	60	0.2	3	2
	29	●	MHS0110L035B	35.2	38.7	80.2	80	0.2	3	2
1.20	2	●	MHS0120L006B	6.2	9.6	60.2	60	0.2	3	1
	5	●	MHS0120L009B	9.2	12.6	60.2	60	0.2	3	2
	10	●	MHS0120L015B	15.2	18.6	60.2	60	0.2	3	2
	18	●	MHS0120L025B	25.2	28.6	60.2	60	0.2	3	2
	26	●	MHS0120L035B	35.2	38.6	80.2	80	0.2	3	2
1.30	2	●	MHS0130L007B	7.2	10.4	60.2	60	0.2	3	1
	5	●	MHS0130L011B	11.3	14.5	60.3	60	0.3	3	2
	12	●	MHS0130L020B	20.3	23.5	60.3	60	0.3	3	2
	20	●	MHS0130L030B	30.3	33.5	80.3	80	0.3	3	2
	30	●	MHS0130L045B	45.3	48.5	80.3	80	0.3	3	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.40	2	●	MHS0140L007B	7.3	10.3	60.3	60	0.3	3	1
	5	●	MHS0140L011B	11.3	14.3	60.3	60	0.3	3	2
	11	●	MHS0140L020B	20.3	23.3	60.3	60	0.3	3	2
	18	●	MHS0140L030B	30.3	33.3	80.3	80	0.3	3	2
	29	●	MHS0140L045B	45.3	48.3	80.3	80	0.3	3	2
1.45	3	●	MHS0145L008B	8.3	11.2	60.3	60	0.3	3	1
	6	●	MHS0145L013B	13.3	16.2	60.3	60	0.3	3	2
	11	●	MHS0145L020B	20.3	23.2	60.3	60	0.3	3	2
	21	●	MHS0145L035B	35.3	38.2	80.3	80	0.3	3	2
	30	●	MHS0145L055B	55.3	58.2	100.3	100	0.3	3	2
1.50	2	●	MHS0150L008B	8.3	11.1	60.3	60	0.3	3	1
	6	●	MHS0150L013B	13.3	16.1	60.3	60	0.3	3	2
	10	●	MHS0150L020B	20.3	23.1	60.3	60	0.3	3	2
	20	●	MHS0150L035B	35.3	38.1	80.3	80	0.3	3	2
	30	●	MHS0150L055B	55.3	58.1	100.3	100	0.3	3	2
1.60	2	●	MHS0160L008B	8.3	10.9	60.3	60	0.3	3	1
	5	●	MHS0160L013B	13.3	15.9	60.3	60	0.3	3	2
	10	●	MHS0160L020B	20.3	22.9	60.3	60	0.3	3	2
	19	●	MHS0160L035B	35.3	37.9	80.3	80	0.3	3	2
	30	●	MHS0160L055B	55.3	57.9	100.3	100	0.3	3	2
1.70	2	●	MHS0170L008B	8.3	10.7	60.3	60	0.3	3	1
	5	●	MHS0170L013B	13.4	15.8	60.4	60	0.4	3	2
	9	●	MHS0170L020B	20.4	22.8	60.4	60	0.4	3	2
	18	●	MHS0170L035B	35.4	37.8	80.4	80	0.4	3	2
	29	●	MHS0170L055B	55.4	57.8	100.4	100	0.4	3	2

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

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N093
OPERATION GUIDANCE ➤ N094
TECHNICAL DATA ➤ Q001

MHS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.80	3	●	MHS0180L010B	10.3	12.5	60.3	60	0.3	3	1
	5	●	MHS0180L015B	15.4	17.6	60.4	60	0.4	3	2
	11	●	MHS0180L025B	25.4	27.6	60.4	60	0.4	3	2
	22	●	MHS0180L045B	45.4	47.6	80.4	80	0.4	3	2
	30	●	MHS0180L065B	65.4	67.6	100.4	100	0.4	3	2
1.90	2	●	MHS0190L010B	10.3	12.4	60.3	60	0.3	3	1
	5	●	MHS0190L015B	15.4	17.5	60.4	60	0.4	3	2
	10	●	MHS0190L025B	25.4	27.5	60.4	60	0.4	3	2
	21	●	MHS0190L045B	45.4	47.5	80.4	80	0.4	3	2
	30	●	MHS0190L065B	65.4	67.5	100.4	100	0.4	3	2
1.95	2	●	MHS0195L010B	10.4	12.4	60.4	60	0.4	3	1
	5	●	MHS0195L015B	15.4	17.4	60.4	60	0.4	3	2
	10	●	MHS0195L025B	25.4	27.4	60.4	60	0.4	3	2
	20	●	MHS0195L045B	45.4	47.4	80.4	80	0.4	3	2
	30	●	MHS0195L065B	65.4	67.4	100.4	100	0.4	3	2
2.00	2	●	MHS0200L010B	10.4	12.3	60.4	60	0.4	3	1
	5	●	MHS0200L015B	15.4	17.3	60.4	60	0.4	3	2
	9	●	MHS0200L025B	25.4	27.3	60.4	60	0.4	3	2
	20	●	MHS0200L045B	45.4	47.3	80.4	80	0.4	3	2
	30	●	MHS0200L065B	65.4	67.3	100.4	100	0.4	3	2
2.10	3	●	MHS0210L012B	12.4	14.1	60.4	60	0.4	3	1
	7	●	MHS0210L020B	20.4	22.1	60.4	60	0.4	3	2
	11	●	MHS0210L030B	30.4	32.1	80.4	80	0.4	3	2
	23	●	MHS0210L055B	55.4	57.1	100.4	100	0.4	3	2
	30	●	MHS0210L075B	75.4	77.1	120.4	120	0.4	3	2
2.20	2	●	MHS0220L012B	12.4	13.9	60.4	60	0.4	3	1
	6	●	MHS0220L020B	20.5	22.0	60.5	60	0.5	3	2
	11	●	MHS0220L030B	30.5	32.0	80.5	80	0.5	3	2
	22	●	MHS0220L055B	55.5	57.0	100.5	100	0.5	3	2
	30	●	MHS0220L075B	75.5	77.0	120.5	120	0.5	3	2
2.30	2	●	MHS0230L012B	12.4	13.7	60.4	60	0.4	3	1
	6	●	MHS0230L020B	20.5	21.8	60.5	60	0.5	3	2
	10	●	MHS0230L030B	30.5	31.8	80.5	80	0.5	3	2
	21	●	MHS0230L055B	55.5	56.8	100.5	100	0.5	3	2
	30	●	MHS0230L075B	75.5	76.8	120.5	120	0.5	3	2
2.40	2	●	MHS0240L012B	12.4	13.5	60.4	60	0.4	3	1
	5	●	MHS0240L020B	20.5	21.6	60.5	60	0.5	3	2
	9	●	MHS0240L030B	30.5	31.6	80.5	80	0.5	3	2
	20	●	MHS0240L055B	55.5	56.6	100.5	100	0.5	3	2
	28	●	MHS0240L075B	75.5	76.6	120.5	120	0.5	3	2
2.45	2	●	MHS0245L013B	13.4	14.4	70.4	70	0.4	4	1
	5	●	MHS0245L020B	20.5	21.5	70.5	70	0.5	4	2
	11	●	MHS0245L035B	35.5	36.5	90.5	90	0.5	4	2
	24	●	MHS0245L065B	65.5	66.5	110.5	110	0.5	4	2
	30	●	MHS0245L090B	90.5	91.5	140.5	140	0.5	4	2
2.50	2	●	MHS0250L013B	13.5	16.3	70.5	70	0.5	4	1
	5	●	MHS0250L020B	20.5	23.3	70.5	70	0.5	4	2
	11	●	MHS0250L035B	35.5	38.3	90.5	90	0.5	4	2
	23	●	MHS0250L065B	65.5	68.3	110.5	110	0.5	4	2
	30	●	MHS0250L090B	90.5	93.3	140.5	140	0.5	4	2

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.60	2	●	MHS0260L013B	13.5	16.1	70.5	70	0.5	4	1
	5	●	MHS0260L020B	20.5	23.1	70.5	70	0.5	4	2
	10	●	MHS0260L035B	35.5	38.1	90.5	90	0.5	4	2
	22	●	MHS0260L065B	65.5	68.1	110.5	110	0.5	4	2
	30	●	MHS0260L090B	90.5	93.1	140.5	140	0.5	4	2
2.70	2	●	MHS0270L013B	13.5	15.9	70.5	70	0.5	4	1
	4	●	MHS0270L020B	20.6	23.0	70.6	70	0.6	4	2
	10	●	MHS0270L035B	35.6	38.0	90.6	90	0.6	4	2
	21	●	MHS0270L065B	65.6	68.0	110.6	110	0.6	4	2
	30	●	MHS0270L090B	90.6	93.0	140.6	140	0.6	4	2
2.80	2	●	MHS0280L014B	14.5	16.7	70.5	70	0.5	4	1
	4	●	MHS0280L020B	20.6	22.8	70.6	70	0.6	4	2
	9	●	MHS0280L035B	35.6	37.8	90.6	90	0.6	4	2
	20	●	MHS0280L065B	65.6	67.8	110.6	110	0.6	4	2
	29	●	MHS0280L090B	90.6	92.8	140.6	140	0.6	4	2
2.90	2	●	MHS0290L014B	14.5	16.6	70.5	70	0.5	4	1
	4	●	MHS0290L020B	20.6	22.7	70.6	70	0.6	4	2
	9	●	MHS0290L035B	35.6	37.7	90.6	90	0.6	4	2
	19	●	MHS0290L065B	65.6	67.7	110.6	110	0.6	4	2
	28	●	MHS0290L090B	90.6	92.7	140.6	140	0.6	4	2
2.95	2	●	MHS0295L014B	14.5	16.5	70.5	70	0.5	4	1
	4	●	MHS0295L020B	20.6	22.6	70.6	70	0.6	4	2
	9	●	MHS0295L035B	35.6	37.6	90.6	90	0.6	4	2
	19	●	MHS0295L065B	65.6	67.6	110.6	110	0.6	4	2
	28	●	MHS0295L090B	90.6	92.6	140.6	140	0.6	4	2
3.0	4	●	MHS0300L020B	19.5	20.5	70.5	70	0.5	4	3
	10	●	MHS0300L040B	39.5	40.5	90.5	90	0.5	4	4
	17	●	MHS0300L060B	59.5	60.5	110.5	110	0.5	4	4
	27	●	MHS0300L090B	89.5	90.5	140.5	140	0.5	4	4
3.1	4	□	MHS0310L020B	20.0	20.5	70.5	70	0.5	4	3
	10	□	MHS0310L040B	40.1	40.6	90.6	90	0.6	4	4
	17	□	MHS0310L060B	60.1	60.6	110.6	110	0.6	4	4
	26	□	MHS0310L090B	90.1	90.6	140.6	140	0.6	4	4
3.2	4	□	MHS0320L020B	20.1	20.6	70.6	70	0.6	4	3
	10	□	MHS0320L040B	40.1	40.6	90.6	90	0.6	4	4
	16	□	MHS0320L060B	60.1	60.6	110.6	110	0.6	4	4
	25	□	MHS0320L090B	90.1	90.6	140.6	140	0.6	4	4
3.3	3	□	MHS0330L020B	20.1	20.6	70.6	70	0.6	4	3
	9	□	MHS0330L040B	40.1	40.6	90.6	90	0.6	4	4
	16	□	MHS0330L060B	60.1	60.6	110.6	110	0.6	4	4
	25	□	MHS0330L090B	90.1	90.6	140.6	140	0.6	4	4
3.4	3	□	MHS0340L020B	20.1	20.6	70.6	70	0.6	4	3
	9	□	MHS0340L040B	40.1	40.6	90.6	90	0.6	4	4
	15	□	MHS0340L060B	60.1	60.6	110.6	110	0.6	4	4
	24	□	MHS0340L090B	90.1	90.6	140.6	140	0.6	4	4
3.5	3	●	MHS0350L020B	20.1	20.6	70.6	70	0.6	4	3
	9	●	MHS0350L040B	40.1	40.6	90.6	90	0.6	4	4
	14	●	MHS0350L060B	60.1	60.6	110.6	110	0.6	4	4
	23	●	MHS0350L090B	90.1	90.6	140.6	140	0.6	4	4

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
3.6	3	□	MHS0360L020B	20.6	20.6	70.6	70	0.6	4	3
	9	□	MHS0360L040B	40.7	40.7	90.7	90	0.7	4	4
	14	□	MHS0360L060B	60.7	60.7	110.7	110	0.7	4	4
	22	□	MHS0360L090B	90.7	90.7	140.7	140	0.7	4	4
	30	□	MHS0360L120B	120.7	120.7	170.7	170	0.7	4	4
3.7	3	□	MHS0370L020B	20.6	20.6	70.6	70	0.6	4	3
	8	□	MHS0370L040B	40.7	40.7	90.7	90	0.7	4	4
	14	□	MHS0370L060B	60.7	60.7	110.7	110	0.7	4	4
	22	□	MHS0370L090B	90.7	90.7	140.7	140	0.7	4	4
	30	□	MHS0370L120B	120.7	120.7	170.7	170	0.7	4	4
3.8	3	●	MHS0380L020B	20.7	20.7	70.7	70	0.7	4	3
	8	●	MHS0380L040B	40.7	40.7	90.7	90	0.7	4	4
	13	●	MHS0380L060B	60.7	60.7	110.7	110	0.7	4	4
	21	●	MHS0380L090B	90.7	90.7	140.7	140	0.7	4	4
	29	●	MHS0380L120B	120.7	120.7	170.7	170	0.7	4	4
3.9	3	□	MHS0390L020B	20.7	20.7	70.7	70	0.7	4	3
	8	□	MHS0390L040B	40.7	40.7	90.7	90	0.7	4	4
	13	□	MHS0390L060B	60.7	60.7	110.7	110	0.7	4	4
	21	□	MHS0390L090B	90.7	90.7	140.7	140	0.7	4	4
	28	□	MHS0390L120B	120.7	120.7	170.7	170	0.7	4	4
4.0	2	●	MHS0400L020B	20.7	20.7	70.7	70	0.7	4	3
	7	●	MHS0400L040B	40.7	40.7	90.7	90	0.7	4	4
	12	●	MHS0400L060B	60.7	60.7	110.7	110	0.7	4	4
	20	●	MHS0400L090B	90.7	90.7	140.7	140	0.7	4	4
	27	●	MHS0400L120B	120.7	120.7	170.7	170	0.7	4	4
4.1	2	□	MHS0410L020B	19.2	20.7	70.7	70	0.7	6	3
	7	□	MHS0410L040B	39.2	40.7	90.7	90	0.7	6	4
	12	□	MHS0410L060B	59.2	60.7	110.7	110	0.7	6	4
	19	□	MHS0410L090B	89.2	90.7	140.7	140	0.7	6	4
	26	□	MHS0410L120B	119.2	120.7	170.7	170	0.7	6	4
4.2	2	□	MHS0420L020B	19.2	20.7	70.7	70	0.7	6	3
	7	□	MHS0420L040B	39.3	40.8	90.8	90	0.8	6	4
	11	□	MHS0420L060B	59.3	60.8	110.8	110	0.8	6	4
	19	□	MHS0420L090B	89.3	90.8	140.8	140	0.8	6	4
	26	□	MHS0420L120B	119.3	120.8	170.8	170	0.8	6	4
4.3	2	□	MHS0430L020B	19.2	20.7	70.7	70	0.7	6	3
	6	□	MHS0430L040B	39.3	40.8	90.8	90	0.8	6	4
	11	□	MHS0430L060B	59.3	60.8	110.8	110	0.8	6	4
	18	□	MHS0430L090B	89.3	90.8	140.8	140	0.8	6	4
	25	□	MHS0430L120B	119.3	120.8	170.8	170	0.8	6	4
4.4	2	□	MHS0440L020B	19.3	20.8	70.8	70	0.8	6	3
	6	□	MHS0440L040B	39.3	40.8	90.8	90	0.8	6	4
	11	□	MHS0440L060B	59.3	60.8	110.8	110	0.8	6	4
	18	□	MHS0440L090B	89.3	90.8	140.8	140	0.8	6	4
	24	□	MHS0440L120B	119.3	120.8	170.8	170	0.8	6	4
4.5	2	●	MHS0450L020B	19.3	20.8	70.8	70	0.8	6	3
	6	●	MHS0450L040B	39.3	40.8	90.8	90	0.8	6	4
	10	●	MHS0450L060B	59.3	60.8	110.8	110	0.8	6	4
	17	●	MHS0450L090B	89.3	90.8	140.8	140	0.8	6	4
	24	●	MHS0450L120B	119.3	120.8	170.8	170	0.8	6	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.6	2	□	MHS0460L020B	19.8	20.8	70.8	70	0.8	6	3
	6	□	MHS0460L040B	39.8	40.8	90.8	90	0.8	6	4
	10	□	MHS0460L060B	59.8	60.8	110.8	110	0.8	6	4
	17	□	MHS0460L090B	89.8	90.8	140.8	140	0.8	6	4
	23	□	MHS0460L120B	119.8	120.8	170.8	170	0.8	6	4
	30	□	MHS0460L150B	149.8	150.8	200.8	200	0.8	6	4
4.7	2	□	MHS0470L020B	19.8	20.8	70.8	70	0.8	6	3
	6	□	MHS0470L040B	39.9	40.9	90.9	90	0.9	6	4
	10	□	MHS0470L060B	59.9	60.9	110.9	110	0.9	6	4
	16	□	MHS0470L090B	89.9	90.9	140.9	140	0.9	6	4
	23	□	MHS0470L120B	119.9	120.9	170.9	170	0.9	6	4
	29	□	MHS0470L150B	149.9	150.9	200.9	200	0.9	6	4
4.8	1	●	MHS0480L020B	19.8	20.8	70.8	70	0.8	6	3
	6	●	MHS0480L040B	39.9	40.9	90.9	90	0.9	6	4
	10	●	MHS0480L060B	59.9	60.9	110.9	110	0.9	6	4
	16	●	MHS0480L090B	89.9	90.9	140.9	140	0.9	6	4
	22	●	MHS0480L120B	119.9	120.9	170.9	170	0.9	6	4
	29	●	MHS0480L150B	149.9	150.9	200.9	200	0.9	6	4
4.9	1	□	MHS0490L020B	19.8	20.8	70.8	70	0.8	6	3
	5	□	MHS0490L040B	39.9	40.9	90.9	90	0.9	6	4
	10	□	MHS0490L060B	59.9	60.9	110.9	110	0.9	6	4
	16	□	MHS0490L090B	89.9	90.9	140.9	140	0.9	6	4
	22	□	MHS0490L120B	119.9	120.9	170.9	170	0.9	6	4
	28	□	MHS0490L150B	149.9	150.9	200.9	200	0.9	6	4
5.0	1	●	MHS0500L020B	19.9	20.9	70.9	70	0.9	6	3
	5	●	MHS0500L040B	39.9	40.9	90.9	90	0.9	6	4
	9	●	MHS0500L060B	59.9	60.9	110.9	110	0.9	6	4
	15	●	MHS0500L090B	89.9	90.9	140.9	140	0.9	6	4
	21	●	MHS0500L120B	119.9	120.9	170.9	170	0.9	6	4
	27	●	MHS0500L150B	149.9	150.9	200.9	200	0.9	6	4
5.1	3	□	MHS0510L030B	30.4	30.9	80.9	80	0.9	6	3
	9	□	MHS0510L060B	60.4	60.9	110.9	110	0.9	6	4
	15	□	MHS0510L090B	90.4	90.9	140.9	140	0.9	6	4
	21	□	MHS0510L120B	120.4	120.9	170.9	170	0.9	6	4
	27	□	MHS0510L150B	150.4	150.9	200.9	200	0.9	6	4
5.2	3	□	MHS0520L030B	30.4	30.9	80.9	80	0.9	6	3
	9	□	MHS0520L060B	60.4	60.9	110.9	110	0.9	6	4
	15	□	MHS0520L090B	90.4	90.9	140.9	140	0.9	6	4
	20	□	MHS0520L120B	120.4	120.9	170.9	170	0.9	6	4
	26	□	MHS0520L150B	150.4	150.9	200.9	200	0.9	6	4
5.3	3	□	MHS0530L030B	30.4	30.9	80.9	80	0.9	6	3
	9	□	MHS0530L060B	60.5	61.0	111.0	110	1.0	6	4
	14	□	MHS0530L090B	90.5	91.0	141.0	140	1.0	6	4
	20	□	MHS0530L120B	120.5	121.0	171.0	170	1.0	6	4
	26	□	MHS0530L150B	150.5	151.0	201.0	200	1.0	6	4
5.4	3	□	MHS0540L030B	30.4	30.9	80.9	80	0.9	6	3
	9	□	MHS0540L060B	60.5	61.0	111.0	110	1.0	6	4
	14	□	MHS0540L090B	90.5	91.0	141.0	140	1.0	6	4
	20	□	MHS0540L120B	120.5	121.0	171.0	170	1.0	6	4
	25	□	MHS0540L150B	150.5	151.0	201.0	200	1.0	6	4

CUTTING CONDITIONS ➤ N093
OPERATION GUIDANCE ➤ N094
TECHNICAL DATA ➤ Q001

MHS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
5.5	3	●	MHS0550L030B	30.4	30.9	80.9	80	0.9	6	3
	8	●	MHS0550L060B	60.5	61.0	111.0	110	1.0	6	4
	14	●	MHS0550L090B	90.5	91.0	141.0	140	1.0	6	4
	19	●	MHS0550L120B	120.5	121.0	171.0	170	1.0	6	4
	25	●	MHS0550L150B	150.5	151.0	201.0	200	1.0	6	4
5.6	3	□	MHS0560L030B	31.0	31.0	81.0	80	1.0	6	3
	8	□	MHS0560L060B	61.0	61.0	111.0	110	1.0	6	4
	14	□	MHS0560L090B	91.0	91.0	141.0	140	1.0	6	4
	19	□	MHS0560L120B	121.0	121.0	171.0	170	1.0	6	4
	24	□	MHS0560L150B	151.0	151.0	201.0	200	1.0	6	4
5.7	3	□	MHS0570L030B	31.0	31.0	81.0	80	1.0	6	3
	8	□	MHS0570L060B	61.0	61.0	111.0	110	1.0	6	4
	13	□	MHS0570L090B	91.0	91.0	141.0	140	1.0	6	4
	19	□	MHS0570L120B	121.0	121.0	171.0	170	1.0	6	4
	24	□	MHS0570L150B	151.0	151.0	201.0	200	1.0	6	4
5.8	3	●	MHS0580L030B	31.0	31.0	81.0	80	1.0	6	3
	8	●	MHS0580L060B	61.1	61.1	111.1	110	1.1	6	4
	13	●	MHS0580L090B	91.1	91.1	141.1	140	1.1	6	4
	18	●	MHS0580L120B	121.1	121.1	171.1	170	1.1	6	4
	23	●	MHS0580L150B	151.1	151.1	201.1	200	1.1	6	4
5.9	3	□	MHS0590L030B	31.0	31.0	81.0	80	1.0	6	3
	8	□	MHS0590L060B	61.1	61.1	111.1	110	1.1	6	4
	13	□	MHS0590L090B	91.1	91.1	141.1	140	1.1	6	4
	18	□	MHS0590L120B	121.1	121.1	171.1	170	1.1	6	4
	23	□	MHS0590L150B	151.1	151.1	201.1	200	1.1	6	4
6.0	2	●	MHS0600L030B	31.0	31.0	81.0	80	1.0	6	3
	7	●	MHS0600L060B	61.1	61.1	111.1	110	1.1	6	4
	12	●	MHS0600L090B	91.1	91.1	141.1	140	1.1	6	4
	17	●	MHS0600L120B	121.1	121.1	171.1	170	1.1	6	4
	22	●	MHS0600L150B	151.1	151.1	201.1	200	1.1	6	4
6.1	2	□	MHS0610L030B	29.6	31.1	81.1	80	1.1	8	3
	7	□	MHS0610L060B	59.6	61.1	111.1	110	1.1	8	4
	12	□	MHS0610L090B	89.6	91.1	141.1	140	1.1	8	4
	17	□	MHS0610L120B	119.6	121.1	171.1	170	1.1	8	4
	22	□	MHS0610L150B	149.6	151.1	201.1	200	1.1	8	4
6.2	2	□	MHS0620L030B	29.6	31.1	81.1	80	1.1	8	3
	7	□	MHS0620L060B	59.6	61.1	111.1	110	1.1	8	4
	12	□	MHS0620L090B	89.6	91.1	141.1	140	1.1	8	4
	17	□	MHS0620L120B	119.6	121.1	171.1	170	1.1	8	4
	21	□	MHS0620L150B	149.6	151.1	201.1	200	1.1	8	4
6.3	2	□	MHS0630L030B	29.6	31.1	81.1	80	1.1	8	3
	7	□	MHS0630L060B	59.6	61.1	111.1	110	1.1	8	4
	12	□	MHS0630L090B	89.6	91.1	141.1	140	1.1	8	4
	16	□	MHS0630L120B	119.6	121.1	171.1	170	1.1	8	4
	21	□	MHS0630L150B	149.6	151.1	201.1	200	1.1	8	4
6.4	2	□	MHS0640L030B	29.6	31.1	81.1	80	1.1	8	3
	7	□	MHS0640L060B	59.7	61.2	111.2	110	1.2	8	4
	11	□	MHS0640L090B	89.7	91.2	141.2	140	1.2	8	4
	16	□	MHS0640L120B	119.7	121.2	171.2	170	1.2	8	4
	21	□	MHS0640L150B	149.7	151.2	201.2	200	1.2	8	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.5	2	●	MHS0650L030B	29.6	31.1	81.1	80	1.1	8	3
	6	●	MHS0650L060B	59.7	61.2	111.2	110	1.2	8	4
	11	●	MHS0650L090B	89.7	91.2	141.2	140	1.2	8	4
	16	●	MHS0650L120B	119.7	121.2	171.2	170	1.2	8	4
	20	●	MHS0650L150B	149.7	151.2	201.2	200	1.2	8	4
6.6	2	□	MHS0660L030B	30.1	31.1	81.1	80	1.1	8	3
	6	□	MHS0660L060B	60.2	61.2	111.2	110	1.2	8	4
	11	□	MHS0660L090B	90.2	91.2	141.2	140	1.2	8	4
	16	□	MHS0660L120B	120.2	121.2	171.2	170	1.2	8	4
	20	□	MHS0660L150B	150.2	151.2	201.2	200	1.2	8	4
	28	□	MHS0660L200B	200.2	201.2	251.2	250	1.2	8	4
6.7	2	□	MHS0670L030B	30.2	31.2	81.2	80	1.2	8	3
	6	□	MHS0670L060B	60.2	61.2	111.2	110	1.2	8	4
	11	□	MHS0670L090B	90.2	91.2	141.2	140	1.2	8	4
	15	□	MHS0670L120B	120.2	121.2	171.2	170	1.2	8	4
	20	□	MHS0670L150B	150.2	151.2	201.2	200	1.2	8	4
	27	□	MHS0670L200B	200.2	201.2	251.2	250	1.2	8	4
6.8	2	●	MHS0680L030B	30.2	31.2	81.2	80	1.2	8	3
	6	●	MHS0680L060B	60.2	61.2	111.2	110	1.2	8	4
	11	●	MHS0680L090B	90.2	91.2	141.2	140	1.2	8	4
	15	●	MHS0680L120B	120.2	121.2	171.2	170	1.2	8	4
	19	●	MHS0680L150B	150.2	151.2	201.2	200	1.2	8	4
	27	●	MHS0680L200B	200.2	201.2	251.2	250	1.2	8	4
6.9	2	□	MHS0690L030B	30.2	31.2	81.2	80	1.2	8	3
	6	□	MHS0690L060B	60.3	61.3	111.3	110	1.3	8	4
	10	□	MHS0690L090B	90.3	91.3	141.3	140	1.3	8	4
	15	□	MHS0690L120B	120.3	121.3	171.3	170	1.3	8	4
	19	□	MHS0690L150B	150.3	151.3	201.3	200	1.3	8	4
	26	□	MHS0690L200B	200.3	201.3	251.3	250	1.3	8	4
7.0	2	●	MHS0700L030B	30.2	31.2	81.2	80	1.2	8	3
	6	●	MHS0700L060B	60.3	61.3	111.3	110	1.3	8	4
	10	●	MHS0700L090B	90.3	91.3	141.3	140	1.3	8	4
	14	●	MHS0700L120B	120.3	121.3	171.3	170	1.3	8	4
	19	●	MHS0700L150B	150.3	151.3	201.3	200	1.3	8	4
	26	●	MHS0700L200B	200.3	201.3	251.3	250	1.3	8	4
7.1	2	□	MHS0710L030B	30.7	31.2	81.2	80	1.2	8	3
	6	□	MHS0710L060B	60.8	61.3	111.3	110	1.3	8	4
	10	□	MHS0710L090B	90.8	91.3	141.3	140	1.3	8	4
	14	□	MHS0710L120B	120.8	121.3	171.3	170	1.3	8	4
	19	□	MHS0710L150B	150.8	151.3	201.3	200	1.3	8	4
	26	□	MHS0710L200B	200.8	201.3	251.3	250	1.3	8	4
7.2	2	□	MHS0720L030B	30.7	31.2	81.2	80	1.2	8	3
	6	□	MHS0720L060B	60.8	61.3	111.3	110	1.3	8	4
	10	□	MHS0720L090B	90.8	91.3	141.3	140	1.3	8	4
	14	□	MHS0720L120B	120.8	121.3	171.3	170	1.3	8	4
	18	□	MHS0720L150B	150.8	151.3	201.3	200	1.3	8	4
	25	□	MHS0720L200B	200.8	201.3	251.3	250	1.3	8	4

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.3	2	□	MHS0730L030B	30.8	31.3	81.3	80	1.3	8	3
	6	□	MHS0730L060B	60.8	61.3	111.3	110	1.3	8	4
	10	□	MHS0730L090B	90.8	91.3	141.3	140	1.3	8	4
	14	□	MHS0730L120B	120.8	121.3	171.3	170	1.3	8	4
	18	□	MHS0730L150B	150.8	151.3	201.3	200	1.3	8	4
	25	□	MHS0730L200B	200.8	201.3	251.3	250	1.3	8	4
7.4	1	□	MHS0740L030B	30.8	31.3	81.3	80	1.3	8	3
	6	□	MHS0740L060B	60.8	61.3	111.3	110	1.3	8	4
	10	□	MHS0740L090B	90.8	91.3	141.3	140	1.3	8	4
	14	□	MHS0740L120B	120.8	121.3	171.3	170	1.3	8	4
	18	□	MHS0740L150B	150.8	151.3	201.3	200	1.3	8	4
	24	□	MHS0740L200B	200.8	201.3	251.3	250	1.3	8	4
7.5	1	●	MHS0750L030B	30.8	31.3	81.3	80	1.3	8	3
	5	●	MHS0750L060B	60.9	61.4	111.4	110	1.4	8	4
	9	●	MHS0750L090B	90.9	91.4	141.4	140	1.4	8	4
	13	●	MHS0750L120B	120.9	121.4	171.4	170	1.4	8	4
	17	●	MHS0750L150B	150.9	151.4	201.4	200	1.4	8	4
	24	●	MHS0750L200B	200.9	201.4	251.4	250	1.4	8	4
7.6	1	□	MHS0760L030B	31.3	31.3	81.3	80	1.3	8	3
	5	□	MHS0760L060B	61.4	61.4	111.4	110	1.4	8	4
	9	□	MHS0760L090B	91.4	91.4	141.4	140	1.4	8	4
	13	□	MHS0760L120B	121.4	121.4	171.4	170	1.4	8	4
	17	□	MHS0760L150B	151.4	151.4	201.4	200	1.4	8	4
	24	□	MHS0760L200B	201.4	201.4	251.4	250	1.4	8	4
	30	□	MHS0760L250B	251.4	251.4	301.4	300	1.4	8	4
7.7	1	□	MHS0770L030B	31.3	31.3	81.3	80	1.3	8	3
	5	□	MHS0770L060B	61.4	61.4	111.4	110	1.4	8	4
	9	□	MHS0770L090B	91.4	91.4	141.4	140	1.4	8	4
	13	□	MHS0770L120B	121.4	121.4	171.4	170	1.4	8	4
	17	□	MHS0770L150B	151.4	151.4	201.4	200	1.4	8	4
	23	□	MHS0770L200B	201.4	201.4	251.4	250	1.4	8	4
	30	□	MHS0770L250B	251.4	251.4	301.4	300	1.4	8	4
7.8	1	●	MHS0780L030B	31.3	31.3	81.3	80	1.3	8	3
	5	●	MHS0780L060B	61.4	61.4	111.4	110	1.4	8	4
	9	●	MHS0780L090B	91.4	91.4	141.4	140	1.4	8	4
	13	●	MHS0780L120B	121.4	121.4	171.4	170	1.4	8	4
	17	●	MHS0780L150B	151.4	151.4	201.4	200	1.4	8	4
	23	●	MHS0780L200B	201.4	201.4	251.4	250	1.4	8	4
	30	●	MHS0780L250B	251.4	251.4	301.4	300	1.4	8	4
7.9	1	□	MHS0790L030B	31.4	31.4	81.4	80	1.4	8	3
	5	□	MHS0790L060B	61.4	61.4	111.4	110	1.4	8	4
	9	□	MHS0790L090B	91.4	91.4	141.4	140	1.4	8	4
	13	□	MHS0790L120B	121.4	121.4	171.4	170	1.4	8	4
	16	□	MHS0790L150B	151.4	151.4	201.4	200	1.4	8	4
	23	□	MHS0790L200B	201.4	201.4	251.4	250	1.4	8	4
	29	□	MHS0790L250B	251.4	251.4	301.4	300	1.4	8	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.0	1	●	MHS0800L030B	31.4	31.4	81.4	80	1.4	8	3
	5	●	MHS0800L060B	61.5	61.5	111.5	110	1.5	8	4
	9	●	MHS0800L090B	91.5	91.5	141.5	140	1.5	8	4
	12	●	MHS0800L120B	121.5	121.5	171.5	170	1.5	8	4
	16	●	MHS0800L150B	151.5	151.5	201.5	200	1.5	8	4
	22	●	MHS0800L200B	201.5	201.5	251.5	250	1.5	8	4
	29	●	MHS0800L250B	251.5	251.5	301.5	300	1.5	8	4
8.1	2	□	MHS0810L040B	39.9	41.4	101.4	100	1.4	10	3
	8	□	MHS0810L090B	90.0	91.5	151.5	150	1.5	10	4
	12	□	MHS0810L120B	120.0	121.5	181.5	180	1.5	10	4
	16	□	MHS0810L150B	150.0	151.5	211.5	210	1.5	10	4
	22	□	MHS0810L200B	200.0	201.5	261.5	260	1.5	10	4
	28	□	MHS0810L250B	250.0	251.5	311.5	310	1.5	10	4
8.2	2	□	MHS0820L040B	39.9	41.4	101.4	100	1.4	10	3
	8	□	MHS0820L090B	90.0	91.5	151.5	150	1.5	10	4
	12	□	MHS0820L120B	120.0	121.5	181.5	180	1.5	10	4
	16	□	MHS0820L150B	150.0	151.5	211.5	210	1.5	10	4
	22	□	MHS0820L200B	200.0	201.5	261.5	260	1.5	10	4
	28	□	MHS0820L250B	250.0	251.5	311.5	310	1.5	10	4
8.3	2	□	MHS0830L040B	39.9	41.4	101.4	100	1.4	10	3
	8	□	MHS0830L090B	90.0	91.5	151.5	150	1.5	10	4
	12	□	MHS0830L120B	120.0	121.5	181.5	180	1.5	10	4
	15	□	MHS0830L150B	150.0	151.5	211.5	210	1.5	10	4
	21	□	MHS0830L200B	200.0	201.5	261.5	260	1.5	10	4
	27	□	MHS0830L250B	250.0	251.5	311.5	310	1.5	10	4
8.4	2	□	MHS0840L040B	39.9	41.4	101.4	100	1.4	10	3
	8	□	MHS0840L090B	90.0	91.5	151.5	150	1.5	10	4
	12	□	MHS0840L120B	120.0	121.5	181.5	180	1.5	10	4
	15	□	MHS0840L150B	150.0	151.5	211.5	210	1.5	10	4
	21	□	MHS0840L200B	200.0	201.5	261.5	260	1.5	10	4
	27	□	MHS0840L250B	250.0	251.5	311.5	310	1.5	10	4
8.5	2	●	MHS0850L040B	40.0	41.5	101.5	100	1.5	10	3
	8	●	MHS0850L090B	90.0	91.5	151.5	150	1.5	10	4
	11	●	MHS0850L120B	120.0	121.5	181.5	180	1.5	10	4
	15	●	MHS0850L150B	150.0	151.5	211.5	210	1.5	10	4
	21	●	MHS0850L200B	200.0	201.5	261.5	260	1.5	10	4
	27	●	MHS0850L250B	250.0	251.5	311.5	310	1.5	10	4
8.6	2	□	MHS0860L040B	40.5	41.5	101.5	100	1.5	10	3
	8	□	MHS0860L090B	90.6	91.6	151.6	150	1.6	10	4
	11	□	MHS0860L120B	120.6	121.6	181.6	180	1.6	10	4
	15	□	MHS0860L150B	150.6	151.6	211.6	210	1.6	10	4
	21	□	MHS0860L200B	200.6	201.6	261.6	260	1.6	10	4
	26	□	MHS0860L250B	250.6	251.6	311.6	310	1.6	10	4
8.7	2	□	MHS0870L040B	40.5	41.5	101.5	100	1.5	10	3
	8	□	MHS0870L090B	90.6	91.6	151.6	150	1.6	10	4
	11	□	MHS0870L120B	120.6	121.6	181.6	180	1.6	10	4
	15	□	MHS0870L150B	150.6	151.6	211.6	210	1.6	10	4
	20	□	MHS0870L200B	200.6	201.6	261.6	260	1.6	10	4
	26	□	MHS0870L250B	250.6	251.6	311.6	310	1.6	10	4

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OPERATION GUIDANCE ➤ N094
TECHNICAL DATA ➤ Q001

MHS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.8	2	●	MHS0880L040B	40.5	41.5	101.5	100	1.5	10	3
	8	●	MHS0880L090B	90.6	91.6	151.6	150	1.6	10	4
	11	●	MHS0880L120B	120.6	121.6	181.6	180	1.6	10	4
	14	●	MHS0880L150B	150.6	151.6	211.6	210	1.6	10	4
	20	●	MHS0880L200B	200.6	201.6	261.6	260	1.6	10	4
	26	●	MHS0880L250B	250.6	251.6	311.6	310	1.6	10	4
8.9	2	□	MHS0890L040B	40.5	41.5	101.5	100	1.5	10	3
	7	□	MHS0890L090B	90.6	91.6	151.6	150	1.6	10	4
	11	□	MHS0890L120B	120.6	121.6	181.6	180	1.6	10	4
	14	□	MHS0890L150B	150.6	151.6	211.6	210	1.6	10	4
	20	□	MHS0890L200B	200.6	201.6	261.6	260	1.6	10	4
	25	□	MHS0890L250B	250.6	251.6	311.6	310	1.6	10	4
9.0	2	●	MHS0900L040B	40.5	41.5	101.5	100	1.5	10	3
	7	●	MHS0900L090B	90.6	91.6	151.6	150	1.6	10	4
	11	●	MHS0900L120B	120.6	121.6	181.6	180	1.6	10	4
	14	●	MHS0900L150B	150.6	151.6	211.6	210	1.6	10	4
	20	●	MHS0900L200B	200.6	201.6	261.6	260	1.6	10	4
	25	●	MHS0900L250B	250.6	251.6	311.6	310	1.6	10	4
9.1	2	□	MHS0910L040B	41.1	41.6	101.6	100	1.6	10	3
	7	□	MHS0910L090B	91.2	91.7	151.7	150	1.7	10	4
	11	□	MHS0910L120B	121.2	121.7	181.7	180	1.7	10	4
	14	□	MHS0910L150B	151.2	151.7	211.7	210	1.7	10	4
	19	□	MHS0910L200B	201.2	201.7	261.7	260	1.7	10	4
	25	□	MHS0910L250B	251.2	251.7	311.7	310	1.7	10	4
	30	□	MHS0910L300B	301.2	301.7	361.7	360	1.7	10	4
9.2	2	□	MHS0920L040B	41.1	41.6	101.6	100	1.6	10	3
	7	□	MHS0920L090B	91.2	91.7	151.7	150	1.7	10	4
	10	□	MHS0920L120B	121.2	121.7	181.7	180	1.7	10	4
	14	□	MHS0920L150B	151.2	151.7	211.7	210	1.7	10	4
	19	□	MHS0920L200B	201.2	201.7	261.7	260	1.7	10	4
	25	□	MHS0920L250B	251.2	251.7	311.7	310	1.7	10	4
	30	□	MHS0920L300B	301.2	301.7	361.7	360	1.7	10	4
9.3	2	□	MHS0930L040B	41.1	41.6	101.6	100	1.6	10	3
	7	□	MHS0930L090B	91.2	91.7	151.7	150	1.7	10	4
	10	□	MHS0930L120B	121.2	121.7	181.7	180	1.7	10	4
	14	□	MHS0930L150B	151.2	151.7	211.7	210	1.7	10	4
	19	□	MHS0930L200B	201.2	201.7	261.7	260	1.7	10	4
	24	□	MHS0930L250B	251.2	251.7	311.7	310	1.7	10	4
	30	□	MHS0930L300B	301.2	301.7	361.7	360	1.7	10	4
9.4	2	□	MHS0940L040B	41.1	41.6	101.6	100	1.6	10	3
	7	□	MHS0940L090B	91.2	91.7	151.7	150	1.7	10	4
	10	□	MHS0940L120B	121.2	121.7	181.7	180	1.7	10	4
	13	□	MHS0940L150B	151.2	151.7	211.7	210	1.7	10	4
	19	□	MHS0940L200B	201.2	201.7	261.7	260	1.7	10	4
	24	□	MHS0940L250B	251.2	251.7	311.7	310	1.7	10	4
	29	□	MHS0940L300B	301.2	301.7	361.7	360	1.7	10	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
9.5	2	●	MHS0950L040B	41.1	41.6	101.6	100	1.6	10	3
	7	●	MHS0950L090B	91.2	91.7	151.7	150	1.7	10	4
	10	●	MHS0950L120B	121.2	121.7	181.7	180	1.7	10	4
	13	●	MHS0950L150B	151.2	151.7	211.7	210	1.7	10	4
	18	●	MHS0950L200B	201.2	201.7	261.7	260	1.7	10	4
	24	●	MHS0950L250B	251.2	251.7	311.7	310	1.7	10	4
	29	●	MHS0950L300B	301.2	301.7	361.7	360	1.7	10	4
9.6	2	□	MHS0960L040B	41.7	41.7	101.7	100	1.7	10	3
	7	□	MHS0960L090B	91.7	91.7	151.7	150	1.7	10	4
	10	□	MHS0960L120B	121.7	121.7	181.7	180	1.7	10	4
	13	□	MHS0960L150B	151.7	151.7	211.7	210	1.7	10	4
	18	□	MHS0960L200B	201.7	201.7	261.7	260	1.7	10	4
	24	□	MHS0960L250B	251.7	251.7	311.7	310	1.7	10	4
	29	□	MHS0960L300B	301.7	301.7	361.7	360	1.7	10	4
9.7	2	□	MHS0970L040B	41.7	41.7	101.7	100	1.7	10	3
	7	□	MHS0970L090B	91.8	91.8	151.8	150	1.8	10	4
	10	□	MHS0970L120B	121.8	121.8	181.8	180	1.8	10	4
	13	□	MHS0970L150B	151.8	151.8	211.8	210	1.8	10	4
	18	□	MHS0970L200B	201.8	201.8	261.8	260	1.8	10	4
	23	□	MHS0970L250B	251.8	251.8	311.8	310	1.8	10	4
	28	□	MHS0970L300B	301.8	301.8	361.8	360	1.8	10	4
9.8	2	●	MHS0980L040B	41.7	41.7	101.7	100	1.7	10	3
	7	●	MHS0980L090B	91.8	91.8	151.8	150	1.8	10	4
	10	●	MHS0980L120B	121.8	121.8	181.8	180	1.8	10	4
	13	●	MHS0980L150B	151.8	151.8	211.8	210	1.8	10	4
	18	●	MHS0980L200B	201.8	201.8	261.8	260	1.8	10	4
	23	●	MHS0980L250B	251.8	251.8	311.8	310	1.8	10	4
	28	●	MHS0980L300B	301.8	301.8	361.8	360	1.8	10	4
9.9	2	□	MHS0990L040B	41.7	41.7	101.7	100	1.7	10	3
	7	□	MHS0990L090B	91.8	91.8	151.8	150	1.8	10	4
	10	□	MHS0990L120B	121.8	121.8	181.8	180	1.8	10	4
	13	□	MHS0990L150B	151.8	151.8	211.8	210	1.8	10	4
	18	□	MHS0990L200B	201.8	201.8	261.8	260	1.8	10	4
	23	□	MHS0990L250B	251.8	251.8	311.8	310	1.8	10	4
	28	□	MHS0990L300B	301.8	301.8	361.8	360	1.8	10	4
10.0	1	●	MHS1000L040B	41.7	41.7	101.7	100	1.7	10	3
	6	●	MHS1000L090B	91.8	91.8	151.8	150	1.8	10	4
	9	●	MHS1000L120B	121.8	121.8	181.8	180	1.8	10	4
	12	●	MHS1000L150B	151.8	151.8	211.8	210	1.8	10	4
	17	●	MHS1000L200B	201.8	201.8	261.8	260	1.8	10	4
	22	●	MHS1000L250B	251.8	251.8	311.8	310	1.8	10	4
	27	●	MHS1000L300B	301.8	301.8	361.8	360	1.8	10	4
10.1	1	□	MHS1010L040B	40.2	41.7	101.7	100	1.7	12	3
	6	□	MHS1010L090B	90.3	91.8	151.8	150	1.8	12	4
	9	□	MHS1010L120B	120.3	121.8	181.8	180	1.8	12	4
	12	□	MHS1010L150B	150.3	151.8	211.8	210	1.8	12	4
	17	□	MHS1010L200B	200.3	201.8	261.8	260	1.8	12	4
	22	□	MHS1010L250B	250.3	251.8	311.8	310	1.8	12	4
	27	□	MHS1010L300B	300.3	301.8	361.8	360	1.8	12	4

(Note) 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.

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.2	1	□	MHS1020L040B	40.3	41.8	101.8	100	1.8	12	3
	6	□	MHS1020L090B	90.4	91.9	151.9	150	1.9	12	4
	9	□	MHS1020L120B	120.4	121.9	181.9	180	1.9	12	4
	12	□	MHS1020L150B	150.4	151.9	211.9	210	1.9	12	4
	17	□	MHS1020L200B	200.4	201.9	261.9	260	1.9	12	4
	22	□	MHS1020L250B	250.4	251.9	311.9	310	1.9	12	4
	27	□	MHS1020L300B	300.4	301.9	361.9	360	1.9	12	4
10.3	1	□	MHS1030L040B	40.3	41.8	101.8	100	1.8	12	3
	6	□	MHS1030L090B	90.4	91.9	151.9	150	1.9	12	4
	9	□	MHS1030L120B	120.4	121.9	181.9	180	1.9	12	4
	12	□	MHS1030L150B	150.4	151.9	211.9	210	1.9	12	4
	17	□	MHS1030L200B	200.4	201.9	261.9	260	1.9	12	4
	22	□	MHS1030L250B	250.4	251.9	311.9	310	1.9	12	4
	26	□	MHS1030L300B	300.4	301.9	361.9	360	1.9	12	4
10.4	1	□	MHS1040L040B	40.3	41.8	101.8	100	1.8	12	3
	6	□	MHS1040L090B	90.4	91.9	151.9	150	1.9	12	4
	9	□	MHS1040L120B	120.4	121.9	181.9	180	1.9	12	4
	12	□	MHS1040L150B	150.4	151.9	211.9	210	1.9	12	4
	17	□	MHS1040L200B	200.4	201.9	261.9	260	1.9	12	4
	21	□	MHS1040L250B	250.4	251.9	311.9	310	1.9	12	4
	26	□	MHS1040L300B	300.4	301.9	361.9	360	1.9	12	4
10.5	1	●	MHS1050L040B	40.3	41.8	101.8	100	1.8	12	3
	6	●	MHS1050L090B	90.4	91.9	151.9	150	1.9	12	4
	9	●	MHS1050L120B	120.4	121.9	181.9	180	1.9	12	4
	12	●	MHS1050L150B	150.4	151.9	211.9	210	1.9	12	4
	16	●	MHS1050L200B	200.4	201.9	261.9	260	1.9	12	4
	21	●	MHS1050L250B	250.4	251.9	311.9	310	1.9	12	4
	26	●	MHS1050L300B	300.4	301.9	361.9	360	1.9	12	4
10.6	1	□	MHS1060L040B	40.8	41.8	101.8	100	1.8	12	3
	6	□	MHS1060L090B	90.9	91.9	151.9	150	1.9	12	4
	9	□	MHS1060L120B	120.9	121.9	181.9	180	1.9	12	4
	12	□	MHS1060L150B	150.9	151.9	211.9	210	1.9	12	4
	16	□	MHS1060L200B	200.9	201.9	261.9	260	1.9	12	4
	21	□	MHS1060L250B	250.9	251.9	311.9	310	1.9	12	4
	26	□	MHS1060L300B	300.9	301.9	361.9	360	1.9	12	4
10.7	1	□	MHS1070L040B	40.8	41.8	101.8	100	1.8	12	3
	6	□	MHS1070L090B	90.9	91.9	151.9	150	1.9	12	4
	9	□	MHS1070L120B	120.9	121.9	181.9	180	1.9	12	4
	11	□	MHS1070L150B	150.9	151.9	211.9	210	1.9	12	4
	16	□	MHS1070L200B	200.9	201.9	261.9	260	1.9	12	4
	21	□	MHS1070L250B	250.9	251.9	311.9	310	1.9	12	4
	25	□	MHS1070L300B	300.9	301.9	361.9	360	1.9	12	4
10.8	1	●	MHS1080L040B	40.9	41.9	101.9	100	1.9	12	3
	6	●	MHS1080L090B	91.0	92.0	152.0	150	2.0	12	4
	9	●	MHS1080L120B	121.0	122.0	182.0	180	2.0	12	4
	11	●	MHS1080L150B	151.0	152.0	212.0	210	2.0	12	4
	16	●	MHS1080L200B	201.0	202.0	262.0	260	2.0	12	4
	21	●	MHS1080L250B	251.0	252.0	312.0	310	2.0	12	4
	25	●	MHS1080L300B	301.0	302.0	362.0	360	2.0	12	4

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.9	1	□	MHS1090L040B	40.9	41.9	101.9	100	1.9	12	3
	6	□	MHS1090L090B	91.0	92.0	152.0	150	2.0	12	4
	8	□	MHS1090L120B	121.0	122.0	182.0	180	2.0	12	4
	11	□	MHS1090L150B	151.0	152.0	212.0	210	2.0	12	4
	16	□	MHS1090L200B	201.0	202.0	262.0	260	2.0	12	4
	20	□	MHS1090L250B	251.0	252.0	312.0	310	2.0	12	4
	25	□	MHS1090L300B	301.0	302.0	362.0	360	2.0	12	4
11.0	1	●	MHS1100L040B	40.9	41.9	101.9	100	1.9	12	3
	6	●	MHS1100L090B	91.0	92.0	152.0	150	2.0	12	4
	8	●	MHS1100L120B	121.0	122.0	182.0	180	2.0	12	4
	11	●	MHS1100L150B	151.0	152.0	212.0	210	2.0	12	4
	16	●	MHS1100L200B	201.0	202.0	262.0	260	2.0	12	4
	20	●	MHS1100L250B	251.0	252.0	312.0	310	2.0	12	4
	25	●	MHS1100L300B	301.0	302.0	362.0	360	2.0	12	4
11.1	1	□	MHS1110L040B	41.4	41.9	101.9	100	1.9	12	3
	6	□	MHS1110L090B	91.5	92.0	152.0	150	2.0	12	4
	8	□	MHS1110L120B	121.5	122.0	182.0	180	2.0	12	4
	11	□	MHS1110L150B	151.5	152.0	212.0	210	2.0	12	4
	15	□	MHS1110L200B	201.5	202.0	262.0	260	2.0	12	4
	20	□	MHS1110L250B	251.5	252.0	312.0	310	2.0	12	4
	24	□	MHS1110L300B	301.5	302.0	362.0	360	2.0	12	4
11.2	1	□	MHS1120L040B	41.4	41.9	101.9	100	1.9	12	3
	5	□	MHS1120L090B	91.5	92.0	152.0	150	2.0	12	4
	8	□	MHS1120L120B	121.5	122.0	182.0	180	2.0	12	4
	11	□	MHS1120L150B	151.5	152.0	212.0	210	2.0	12	4
	15	□	MHS1120L200B	201.5	202.0	262.0	260	2.0	12	4
	20	□	MHS1120L250B	251.5	252.0	312.0	310	2.0	12	4
	24	□	MHS1120L300B	301.5	302.0	362.0	360	2.0	12	4
11.3	1	□	MHS1130L040B	41.4	41.9	101.9	100	1.9	12	3
	5	□	MHS1130L090B	91.6	92.1	152.1	150	2.1	12	4
	8	□	MHS1130L120B	121.6	122.1	182.1	180	2.1	12	4
	11	□	MHS1130L150B	151.6	152.1	212.1	210	2.1	12	4
	15	□	MHS1130L200B	201.6	202.1	262.1	260	2.1	12	4
	20	□	MHS1130L250B	251.6	252.1	312.1	310	2.1	12	4
	24	□	MHS1130L300B	301.6	302.1	362.1	360	2.1	12	4
11.4	1	□	MHS1140L040B	41.5	42.0	102.0	100	2.0	12	3
	5	□	MHS1140L090B	91.6	92.1	152.1	150	2.1	12	4
	8	□	MHS1140L120B	121.6	122.1	182.1	180	2.1	12	4
	11	□	MHS1140L150B	151.6	152.1	212.1	210	2.1	12	4
	15	□	MHS1140L200B	201.6	202.1	262.1	260	2.1	12	4
	19	□	MHS1140L250B	251.6	252.1	312.1	310	2.1	12	4
	24	□	MHS1140L300B	301.6	302.1	362.1	360	2.1	12	4
11.5	1	●	MHS1150L040B	41.5	42.0	102.0	100	2.0	12	3
	5	●	MHS1150L090B	91.6	92.1	152.1	150	2.1	12	4
	8	●	MHS1150L120B	121.6	122.1	182.1	180	2.1	12	4
	10	●	MHS1150L150B	151.6	152.1	212.1	210	2.1	12	4
	15	●	MHS1150L200B	201.6	202.1	262.1	260	2.1	12	4
	19	●	MHS1150L250B	251.6	252.1	312.1	310	2.1	12	4
	24	●	MHS1150L300B	301.6	302.1	362.1	360	2.1	12	4

CUTTING CONDITIONS ➤ N093
OPERATION GUIDANCE ➤ N094
TECHNICAL DATA ➤ Q001

MHS

WSTAR DRILLS

Internal Coolant

DC (mm)	Hole Depth (l/d)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
11.6	1	□	MHS1160L040B	42.0	42.0	102.0	100	2.0	12	3
	5	□	MHS1160L090B	92.1	92.1	152.1	150	2.1	12	4
	8	□	MHS1160L120B	122.1	122.1	182.1	180	2.1	12	4
	10	□	MHS1160L150B	152.1	152.1	212.1	210	2.1	12	4
	15	□	MHS1160L200B	202.1	202.1	262.1	260	2.1	12	4
	19	□	MHS1160L250B	252.1	252.1	312.1	310	2.1	12	4
	23	□	MHS1160L300B	302.1	302.1	362.1	360	2.1	12	4
11.7	1	□	MHS1170L040B	42.0	42.0	102.0	100	2.0	12	3
	5	□	MHS1170L090B	92.1	92.1	152.1	150	2.1	12	4
	8	□	MHS1170L120B	122.1	122.1	182.1	180	2.1	12	4
	10	□	MHS1170L150B	152.1	152.1	212.1	210	2.1	12	4
	15	□	MHS1170L200B	202.1	202.1	262.1	260	2.1	12	4
	19	□	MHS1170L250B	252.1	252.1	312.1	310	2.1	12	4
	23	□	MHS1170L300B	302.1	302.1	362.1	360	2.1	12	4
11.8	1	●	MHS1180L040B	42.0	42.0	102.0	100	2.0	12	3
	5	●	MHS1180L090B	92.1	92.1	152.1	150	2.1	12	4
	8	●	MHS1180L120B	122.1	122.1	182.1	180	2.1	12	4
	10	●	MHS1180L150B	152.1	152.1	212.1	210	2.1	12	4
	14	●	MHS1180L200B	202.1	202.1	262.1	260	2.1	12	4
	19	●	MHS1180L250B	252.1	252.1	312.1	310	2.1	12	4
	23	●	MHS1180L300B	302.1	302.1	362.1	360	2.1	12	4
11.9	1	□	MHS1190L040B	42.0	42.0	102.0	100	2.0	12	3
	5	□	MHS1190L090B	92.2	92.2	152.2	150	2.2	12	4
	8	□	MHS1190L120B	122.2	122.2	182.2	180	2.2	12	4
	10	□	MHS1190L150B	152.2	152.2	212.2	210	2.2	12	4
	14	□	MHS1190L200B	202.2	202.2	262.2	260	2.2	12	4
	19	□	MHS1190L250B	252.2	252.2	312.2	310	2.2	12	4
	23	□	MHS1190L300B	302.2	302.2	362.2	360	2.2	12	4
12.0	1	●	MHS1200L040B	42.1	42.1	102.1	100	2.1	12	3
	5	●	MHS1200L090B	92.2	92.2	152.2	150	2.2	12	4
	7	●	MHS1200L120B	122.2	122.2	182.2	180	2.2	12	4
	10	●	MHS1200L150B	152.2	152.2	212.2	210	2.2	12	4
	14	●	MHS1200L200B	202.2	202.2	262.2	260	2.2	12	4
	18	●	MHS1200L250B	252.2	252.2	312.2	310	2.2	12	4
	22	●	MHS1200L300B	302.2	302.2	362.2	360	2.2	12	4

(Note) 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.

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel (≤180HB), Carbon steel, Alloy steel (180—280HB) AISI 1010, AISI 1045, AISI 4140 etc				Ferritic, Precipitation hardening 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

Work Material	Pre-hardened steel (35—45HRC), Alloy tool steel (≤350) AISI P21, AISI P20, ASTM H13, AISI L6 etc				Hardened Steel (40—55HRC), Precipitation hardening stainless steel (<450HB) AISI 431, AISI 420, 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

Work 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 the drill with a length over l/d 10, it is necessary to use a prep holes as a guide. (If no prep-hole is used then drill breakage can occur)

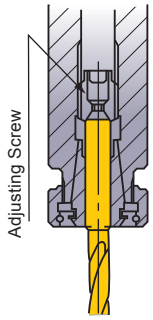
(Note 2) Setting of the diameter tolerance differs from general-purpose drills. MHS shortest flute drills are recommended for prep hole machining.

OPERATION GUIDANCE ➤ N094
TECHNICAL DATA ➤ Q001

MHS
WSTAR DRILLS

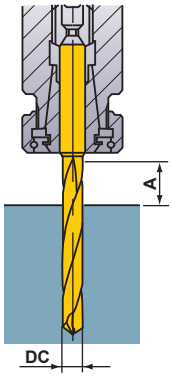
OPERATIONAL GUIDANCE

Drill Holding



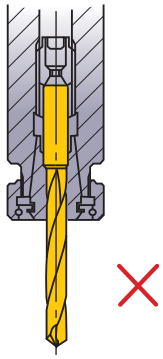
Thrust bearing type collet chuck holds the drill securely.

Drill Length



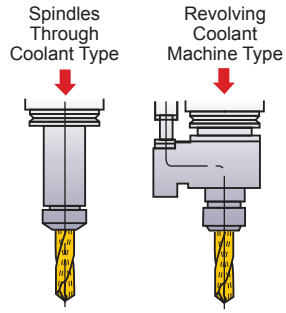
A ≥ DC x 2

Drill Installation



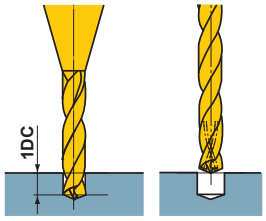
Do not clamp on the flutes.

Coolant Method



Coolant pressure is approx. 1.5MPa–7MPa
Recommended coolant pressure: ≥3Mpa

Drill Installation



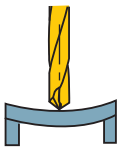
1) Make approx. 1DC(DC=drill diameter) pilot hole by using the MHS with the shortest flutes.
2) Use the pilot hole as a guide and machine by the drill with coolant hole. Depending on the application, carry out pecking.

Coolant Handling

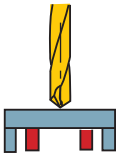
1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece

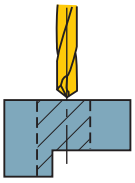


If Bending Occurs



Support the Workpiece

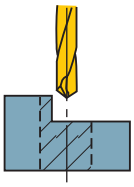
Interrupted Cutting



One Process

○

①Lower the feed when drilling the interrupted part.

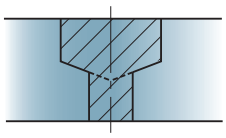


Requires Prior Machining

△

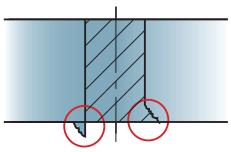
①Spot face with an end mill prior to drilling.

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

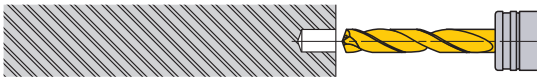


①Lower the feed rate by 50% at the end of through cutting.
②Change the point angle.

OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D≥10)

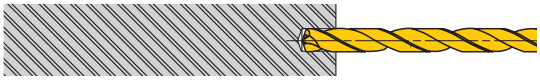
FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



①Penetrate the guide hole at low revolution. (Revolution 1000min^{-1}, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the guide hole bottom.

3. Drill the deep hole

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

4. Drill retraction

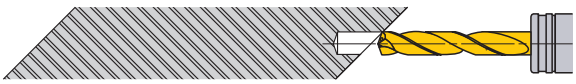
①After drilling, lower the cutting revolution about 0.5—1mm short of the hole end. (Revolution of around 1000min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
③Finally, clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.

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

1. Spot facing

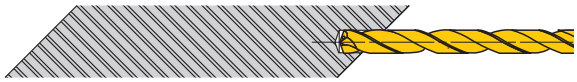
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



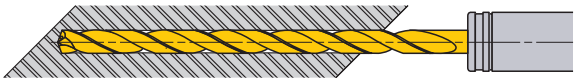
①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



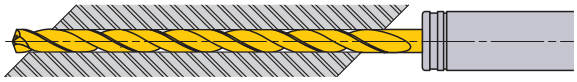
①Penetrate the guide hole at a low revolution. (Revolution 1000min^{-1}, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 0.5—1mm short of the guide hole bottom.

4. Drill the deep hole



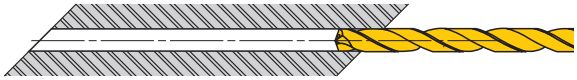
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Lower the feed rate when penetrating.

6. Drill retraction



①Finally clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.
②Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

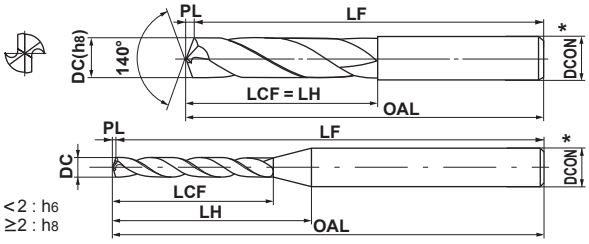
MZE/MZS

●Helical coolant hole enables high speed machining (MZS type).

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel (MZE only)

		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
h6,h8	MZE		0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
h6	MZS		0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

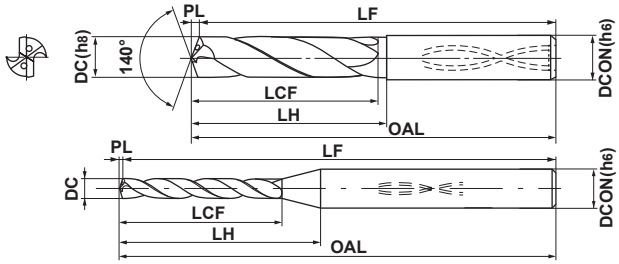
MZE (External coolant)



Type1

* DCON < 2 : h6
DCON ≥2 : h8

MZS (Internal coolant)



Type2

(Note) MZS drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
1.0	2	Ext.	●	MZE0100SB	6.2	8.2	55.2	55	0.2	2.0	1
	5	Int.	●	MZS0100LB	11.2	15.2	55.2	55	0.2	3.0	2
	12	Int.	□	MZS0100XB	23.2	27.2	55.2	55	0.2	3.0	2
1.1	2	Ext.	●	MZE0110SB	7.2	9.2	55.2	55	0.2	2.0	1
	5	Int.	●	MZS0110LB	17.2	21.2	55.2	55	0.2	3.0	2
	12	Int.	□	MZS0110XB	23.2	27.2	55.2	55	0.2	3.0	2
1.2	2	Ext.	●	MZE0120SB	8.2	9.2	55.2	55	0.2	2.0	1
	5	Int.	●	MZS0120LB	17.2	20.2	55.2	55	0.2	3.0	2
	12	Int.	□	MZS0120XB	23.2	26.2	55.2	55	0.2	3.0	2
1.3	2	Ext.	●	MZE0130SB	8.2	9.2	55.2	55	0.2	2.0	1
	5	Int.	●	MZS0130LB	17.2	20.2	55.2	55	0.2	3.0	2
	12	Int.	□	MZS0130XB	23.2	26.2	55.2	55	0.2	3.0	2
1.4	2	Ext.	●	MZE0140SB	9.3	10.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0140LB	17.3	20.3	55.3	55	0.3	3.0	2
	12	Int.	□	MZS0140XB	23.3	26.3	55.3	55	0.3	3.0	2
1.5	2	Ext.	●	MZE0150SB	9.3	10.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0150LB	17.3	20.3	55.3	55	0.3	3.0	2
	12	Int.	□	MZS0150XB	23.3	26.3	55.3	55	0.3	3.0	2
1.6	2	Ext.	●	MZE0160SB	10.3	10.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0160LB	22.3	25.3	68.3	68	0.3	3.0	2
	12	Int.	□	MZS0160XB	30.3	33.3	68.3	68	0.3	3.0	2
1.7	2	Ext.	●	MZE0170SB	10.3	10.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0170LB	22.3	24.3	68.3	68	0.3	3.0	2
	12	Int.	□	MZS0170XB	30.3	32.3	68.3	68	0.3	3.0	2
1.8	2	Ext.	●	MZE0180SB	11.3	11.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0180LB	22.3	24.3	68.3	68	0.3	3.0	2
	12	Int.	□	MZS0180XB	30.3	32.3	68.3	68	0.3	3.0	2
1.9	2	Ext.	●	MZE0190SB	11.3	11.3	55.3	55	0.3	2.0	1
	5	Int.	●	MZS0190LB	22.3	24.3	68.3	68	0.3	3.0	2
	12	Int.	□	MZS0190XB	30.3	32.3	68.3	68	0.3	3.0	2

(Note) 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.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.0	2	Ext.	●	**MZE0200SA**	12.4	12.4	55.4	55	0.4	2.0	1
	3	Ext.	●	**MZE0200MA**	16.4	16.4	55.4	55	0.4	2.0	1
	3	Int.	●	**MZS0200MB**	16.4	18.4	62.4	62	0.4	3.0	2
	5	Int.	●	**MZS0200LB**	22.4	24.4	68.4	68	0.4	3.0	2
	12	Int.	□	**MZS0200XB**	30.4	32.4	68.4	68	0.4	3.0	2
2.1	2	Ext.	●	**MZE0210SA**	12.4	12.4	55.4	55	0.4	2.1	1
	3	Ext.	●	**MZE0210MA**	16.4	16.4	55.4	55	0.4	2.1	1
	3	Int.	●	**MZS0210MB**	20.4	22.4	66.4	66	0.4	3.0	2
	5	Int.	●	**MZS0210LB**	28.4	30.4	74.4	74	0.4	3.0	2
	12	Int.	□	**MZS0210XB**	38.4	40.4	74.4	74	0.4	3.0	2
2.2	2	Ext.	●	**MZE0220SA**	13.4	13.4	55.4	55	0.4	2.2	1
	3	Ext.	●	**MZE0220MA**	18.4	18.4	55.4	55	0.4	2.2	1
	3	Int.	●	**MZS0220MB**	20.4	21.4	66.4	66	0.4	3.0	2
	5	Int.	●	**MZS0220LB**	28.4	29.4	74.4	74	0.4	3.0	2
	12	Int.	□	**MZS0220XB**	38.4	39.4	74.4	74	0.4	3.0	2
2.3	2	Ext.	●	**MZE0230SA**	13.4	13.4	55.4	55	0.4	2.3	1
	3	Ext.	●	**MZE0230MA**	18.4	18.4	55.4	55	0.4	2.3	1
	3	Int.	●	**MZS0230MB**	20.4	21.4	66.4	66	0.4	3.0	2
	5	Int.	●	**MZS0230LB**	28.4	29.4	74.4	74	0.4	3.0	2
	12	Int.	□	**MZS0230XB**	38.4	39.4	74.4	74	0.4	3.0	2
2.4	2	Ext.	●	**MZE0240SA**	16.4	16.4	55.4	55	0.4	2.4	1
	3	Ext.	●	**MZE0240MA**	20.4	20.4	55.4	55	0.4	2.4	1
	3	Int.	●	**MZS0240MB**	20.4	21.4	66.4	66	0.4	3.0	2
	5	Int.	●	**MZS0240LB**	28.4	29.4	74.4	74	0.4	3.0	2
	12	Int.	□	**MZS0240XB**	38.4	39.4	74.4	74	0.4	3.0	2
2.5	2	Ext.	●	**MZE0250SA**	16.5	16.5	55.5	55	0.5	2.5	1
	3	Ext.	●	**MZE0250MA**	20.5	20.5	55.5	55	0.5	2.5	1
	3	Int.	●	**MZS0250MB**	20.5	21.5	66.5	66	0.5	3.0	2
	5	Int.	●	**MZS0250LB**	28.5	29.5	74.5	74	0.5	3.0	2
	12	Int.	□	**MZS0250XB**	38.5	39.5	74.5	74	0.5	3.0	2
2.6	2	Ext.	●	**MZE0260SA**	16.5	16.5	55.5	55	0.5	2.6	1
	3	Ext.	●	**MZE0260MA**	20.5	20.5	55.5	55	0.5	2.6	1
	3	Int.	●	**MZS0260MB**	24.5	24.5	72.5	72	0.5	3.0	2
	5	Int.	●	**MZS0260LB**	33.5	33.5	81.5	81	0.5	3.0	2
	12	Int.	□	**MZS0260XB**	45.5	45.5	81.5	81	0.5	3.0	2
2.7	2	Ext.	●	**MZE0270SA**	16.5	16.5	55.5	55	0.5	2.7	1
	3	Ext.	●	**MZE0270MA**	20.5	20.5	55.5	55	0.5	2.7	1
	3	Int.	●	**MZS0270MB**	24.5	24.5	72.5	72	0.5	3.0	2
	5	Int.	●	**MZS0270LB**	33.5	33.5	81.5	81	0.5	3.0	2
	12	Int.	□	**MZS0270XB**	45.5	45.5	81.5	81	0.5	3.0	2
2.8	2	Ext.	●	**MZE0280SA**	16.5	16.5	55.5	55	0.5	2.8	1
	3	Ext.	●	**MZE0280MA**	21.5	21.5	60.5	60	0.5	2.8	1
	3	Int.	●	**MZS0280MB**	24.5	24.5	72.5	72	0.5	3.0	2
	5	Int.	●	**MZS0280LB**	33.5	33.5	81.5	81	0.5	3.0	2
	12	Int.	□	**MZS0280XB**	45.5	45.5	81.5	81	0.5	3.0	2

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DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
2.9	2	Ext.	●	**MZE0290SA**	16.5	16.5	55.5	55	0.5	2.9	1
	3	Ext.	●	**MZE0290MA**	21.5	21.5	60.5	60	0.5	2.9	1
	3	Int.	●	**MZS0290MB**	24.5	24.5	72.5	72	0.5	3.0	2
	5	Int.	●	**MZS0290LB**	33.5	33.5	81.5	81	0.5	3.0	2
	12	Int.	□	**MZS0290XB**	45.5	45.5	81.5	81	0.5	3.0	2
3.0	2	Ext.	●	**MZE0300SA**	16.5	16.5	55.5	55	0.5	3.0	1
	3	Ext.	●	**MZE0300MA**	21.5	21.5	60.5	60	0.5	3.0	1
	3	Int.	●	**MZS0300MB**	24.5	24.5	72.5	72	0.5	3.0	2
	5	Int.	●	**MZS0300LB**	33.5	33.5	81.5	81	0.5	3.0	2
3.1	2	Ext.	●	**MZE0310SA**	18.6	18.6	55.6	55	0.6	3.1	1
	3	Ext.	●	**MZE0310MA**	24.6	24.6	60.6	60	0.6	3.1	1
	3	Int.	●	**MZS0310MB**	28.6	28.6	76.6	76	0.6	4.0	2
	5	Int.	●	**MZS0310LB**	39.6	39.6	87.6	87	0.6	4.0	2
3.2	2	Ext.	●	**MZE0320SA**	18.6	18.6	55.6	55	0.6	3.2	1
	3	Ext.	●	**MZE0320MA**	24.6	24.6	60.6	60	0.6	3.2	1
	3	Int.	●	**MZS0320MB**	28.6	28.6	76.6	76	0.6	4.0	2
	5	Int.	●	**MZS0320LB**	39.6	39.6	87.6	87	0.6	4.0	2
3.3	2	Ext.	●	**MZE0330SA**	18.6	18.6	55.6	55	0.6	3.3	1
	3	Ext.	●	**MZE0330MA**	24.6	24.6	60.6	60	0.6	3.3	1
	3	Int.	●	**MZS0330MB**	28.6	28.6	76.6	76	0.6	4.0	2
	5	Int.	●	**MZS0330LB**	39.6	39.6	87.6	87	0.6	4.0	2
3.4	2	Ext.	●	**MZE0340SA**	20.6	20.6	55.6	55	0.6	3.4	1
	3	Ext.	●	**MZE0340MA**	24.6	24.6	60.6	60	0.6	3.4	1
	3	Int.	●	**MZS0340MB**	28.6	28.6	76.6	76	0.6	4.0	2
	5	Int.	●	**MZS0340LB**	39.6	39.6	87.6	87	0.6	4.0	2
3.5	2	Ext.	●	**MZE0350SA**	20.6	20.6	55.6	55	0.6	3.5	1
	3	Ext.	●	**MZE0350MA**	24.6	24.6	60.6	60	0.6	3.5	1
	3	Int.	●	**MZS0350MB**	28.6	28.6	76.6	76	0.6	4.0	2
	5	Int.	●	**MZS0350LB**	39.6	39.6	87.6	87	0.6	4.0	2
3.6	2	Ext.	●	**MZE0360SA**	20.7	20.7	55.7	55	0.7	3.6	1
	3	Ext.	●	**MZE0360MA**	27.7	27.7	60.7	60	0.7	3.6	1
	3	Int.	●	**MZS0360MB**	32.7	32.7	80.7	80	0.7	4.0	2
	5	Int.	●	**MZS0360LB**	44.7	44.7	92.7	92	0.7	4.0	2
3.7	2	Ext.	●	**MZE0370SA**	20.7	20.7	55.7	55	0.7	3.7	1
	3	Ext.	●	**MZE0370MA**	27.7	27.7	60.7	60	0.7	3.7	1
	3	Int.	●	**MZS0370MB**	32.7	32.7	80.7	80	0.7	4.0	2
	5	Int.	●	**MZS0370LB**	44.7	44.7	92.7	92	0.7	4.0	2
3.8	2	Ext.	●	**MZE0380SA**	22.7	22.7	55.7	55	0.7	3.8	1
	3	Ext.	●	**MZE0380MA**	27.7	27.7	60.7	60	0.7	3.8	1
	3	Int.	●	**MZS0380MB**	32.7	32.7	80.7	80	0.7	4.0	2
	5	Int.	●	**MZS0380LB**	44.7	44.7	92.7	92	0.7	4.0	2
3.9	2	Ext.	●	**MZE0390SA**	22.7	22.7	55.7	55	0.7	3.9	1
	3	Ext.	●	**MZE0390MA**	27.7	27.7	60.7	60	0.7	3.9	1
	3	Int.	●	**MZS0390MB**	32.7	32.7	80.7	80	0.7	4.0	2
	5	Int.	●	**MZS0390LB**	44.7	44.7	92.7	92	0.7	4.0	2
4.0	2	Ext.	●	**MZE0400SA**	22.7	22.7	55.7	55	0.7	4.0	1
	3	Ext.	●	**MZE0400MA**	27.7	27.7	60.7	60	0.7	4.0	1
	3	Int.	●	**MZS0400MB**	32.7	32.7	80.7	80	0.7	4.0	2
	5	Int.	●	**MZS0400LB**	44.7	44.7	92.7	92	0.7	4.0	2

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

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DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
4.1	2	Ext.	●	**MZE0410SA**	22.7	22.7	55.7	55	0.7	4.1	1
	3	Ext.	●	**MZE0410MA**	29.7	29.7	63.7	63	0.7	4.1	1
	3	Int.	●	**MZS0410MB**	36.7	36.7	86.7	86	0.7	5.0	2
	5	Int.	●	**MZS0410LB**	50.7	50.7	100.7	100	0.7	5.0	2
4.2	2	Ext.	●	**MZE0420SA**	22.8	22.8	55.8	55	0.8	4.2	1
	3	Ext.	●	**MZE0420MA**	29.8	29.8	63.8	63	0.8	4.2	1
	3	Int.	●	**MZS0420MB**	36.8	36.8	86.8	86	0.8	5.0	2
	5	Int.	●	**MZS0420LB**	50.8	50.8	100.8	100	0.8	5.0	2
4.3	2	Ext.	●	**MZE0430SA**	24.8	24.8	58.8	58	0.8	4.3	1
	3	Ext.	●	**MZE0430MA**	29.8	29.8	63.8	63	0.8	4.3	1
	3	Int.	●	**MZS0430MB**	36.8	36.8	86.8	86	0.8	5.0	2
	5	Int.	●	**MZS0430LB**	50.8	50.8	100.8	100	0.8	5.0	2
4.4	2	Ext.	●	**MZE0440SA**	24.8	24.8	58.8	58	0.8	4.4	1
	3	Ext.	●	**MZE0440MA**	29.8	29.8	63.8	63	0.8	4.4	1
	3	Int.	●	**MZS0440MB**	36.8	36.8	86.8	86	0.8	5.0	2
	5	Int.	●	**MZS0440LB**	50.8	50.8	100.8	100	0.8	5.0	2
4.5	2	Ext.	●	**MZE0450SA**	24.8	24.8	58.8	58	0.8	4.5	1
	3	Ext.	●	**MZE0450MA**	29.8	29.8	63.8	63	0.8	4.5	1
	3	Int.	●	**MZS0450MB**	36.8	36.8	86.8	86	0.8	5.0	2
	5	Int.	●	**MZS0450LB**	50.8	50.8	100.8	100	0.8	5.0	2
4.6	2	Ext.	●	**MZE0460SA**	24.8	24.8	58.8	58	0.8	4.6	1
	3	Ext.	●	**MZE0460MA**	32.8	32.8	68.8	68	0.8	4.6	1
	3	Int.	●	**MZS0460MB**	40.8	40.8	90.8	90	0.8	5.0	2
	5	Int.	●	**MZS0460LB**	55.8	55.8	105.8	105	0.8	5.0	2
4.7	2	Ext.	●	**MZE0470SA**	24.9	24.9	58.9	58	0.9	4.7	1
	3	Ext.	●	**MZE0470MA**	32.9	32.9	68.9	68	0.9	4.7	1
	3	Int.	●	**MZS0470MB**	40.9	40.9	90.9	90	0.9	5.0	2
	5	Int.	●	**MZS0470LB**	55.9	55.9	105.9	105	0.9	5.0	2
4.8	2	Ext.	●	**MZE0480SA**	26.9	26.9	62.9	62	0.9	4.8	1
	3	Ext.	●	**MZE0480MA**	32.9	32.9	68.9	68	0.9	4.8	1
	3	Int.	●	**MZS0480MB**	40.9	40.9	90.9	90	0.9	5.0	2
	5	Int.	●	**MZS0480LB**	55.9	55.9	105.9	105	0.9	5.0	2
4.9	2	Ext.	●	**MZE0490SA**	26.9	26.9	62.9	62	0.9	4.9	1
	3	Ext.	●	**MZE0490MA**	32.9	32.9	68.9	68	0.9	4.9	1
	3	Int.	●	**MZS0490MB**	40.9	40.9	90.9	90	0.9	5.0	2
	5	Int.	●	**MZS0490LB**	55.9	55.9	105.9	105	0.9	5.0	2
5.0	2	Ext.	●	**MZE0500SA**	26.9	26.9	62.9	62	0.9	5.0	1
	3	Ext.	●	**MZE0500MA**	32.9	32.9	68.9	68	0.9	5.0	1
	3	Int.	●	**MZS0500MB**	28.4	30.9	82.9	82	0.9	6.0	2
	5	Int.	●	**MZS0500LB**	44.9	48.9	100.9	100	0.9	6.0	2
5.1	2	Ext.	●	**MZE0510SA**	26.9	26.9	62.9	62	0.9	5.1	1
	3	Ext.	●	**MZE0510MA**	34.9	34.9	72.9	72	0.9	5.1	1
	3	Int.	●	**MZS0510MB**	28.4	30.9	82.9	82	0.9	6.0	2
	5	Int.	●	**MZS0510LB**	44.9	48.9	100.9	100	0.9	6.0	2
5.2	2	Ext.	●	**MZE0520SA**	26.9	26.9	62.9	62	0.9	5.2	1
	3	Ext.	●	**MZE0520MA**	34.9	34.9	72.9	72	0.9	5.2	1
	3	Int.	●	**MZS0520MB**	28.4	30.9	82.9	82	0.9	6.0	2
	5	Int.	●	**MZS0520LB**	44.9	48.9	100.9	100	0.9	6.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
5.3	2	Ext.	●	**MZE0530SA**	27.0	27.0	63.0	62	1.0	5.3	1
	3	Ext.	●	**MZE0530MA**	35.0	35.0	73.0	72	1.0	5.3	1
	3	Int.	●	**MZS0530MB**	28.5	31.0	83.0	82	1.0	6.0	2
	5	Int.	●	**MZS0530LB**	45.0	49.0	101.0	100	1.0	6.0	2
5.4	2	Ext.	●	**MZE0540SA**	29.0	29.0	67.0	66	1.0	5.4	1
	3	Ext.	●	**MZE0540MA**	35.0	35.0	73.0	72	1.0	5.4	1
	3	Int.	●	**MZS0540MB**	28.5	31.0	83.0	82	1.0	6.0	2
	5	Int.	●	**MZS0540LB**	45.0	49.0	101.0	100	1.0	6.0	2
5.5	2	Ext.	●	**MZE0550SA**	29.0	29.0	67.0	66	1.0	5.5	1
	3	Ext.	●	**MZE0550MA**	35.0	35.0	73.0	72	1.0	5.5	1
	3	Int.	●	**MZS0550MB**	28.5	31.0	83.0	82	1.0	6.0	2
	5	Int.	●	**MZS0550LB**	45.0	49.0	101.0	100	1.0	6.0	2
5.6	2	Ext.	●	**MZE0560SA**	29.0	29.0	67.0	66	1.0	5.6	1
	3	Ext.	●	**MZE0560MA**	37.0	37.0	75.0	74	1.0	5.6	1
	3	Int.	●	**MZS0560MB**	31.0	31.0	83.0	82	1.0	6.0	2
	5	Int.	●	**MZS0560LB**	49.0	49.0	101.0	100	1.0	6.0	2
5.7	2	Ext.	●	**MZE0570SA**	29.0	29.0	67.0	66	1.0	5.7	1
	3	Ext.	●	**MZE0570MA**	37.0	37.0	75.0	74	1.0	5.7	1
	3	Int.	●	**MZS0570MB**	31.0	31.0	83.0	82	1.0	6.0	2
	5	Int.	●	**MZS0570LB**	49.0	49.0	101.0	100	1.0	6.0	2
5.8	2	Ext.	●	**MZE0580SA**	29.1	29.1	67.1	66	1.1	5.8	1
	3	Ext.	●	**MZE0580MA**	37.1	37.1	75.1	74	1.1	5.8	1
	3	Int.	●	**MZS0580MB**	31.1	31.1	83.1	82	1.1	6.0	2
	5	Int.	●	**MZS0580LB**	49.1	49.1	101.1	100	1.1	6.0	2
5.9	2	Ext.	●	**MZE0590SA**	29.1	29.1	67.1	66	1.1	5.9	1
	3	Ext.	●	**MZE0590MA**	37.1	37.1	75.1	74	1.1	5.9	1
	3	Int.	●	**MZS0590MB**	31.1	31.1	83.1	82	1.1	6.0	2
	5	Int.	●	**MZS0590LB**	49.1	49.1	101.1	100	1.1	6.0	2
6.0	2	Ext.	●	**MZE0600SA**	29.1	29.1	67.1	66	1.1	6.0	1
	3	Ext.	●	**MZE0600MA**	42.1	42.1	82.1	81	1.1	6.0	1
	3	Int.	●	**MZS0600MB**	31.1	31.1	83.1	82	1.1	6.0	2
	5	Int.	●	**MZS0600LB**	49.1	49.1	101.1	100	1.1	6.0	2
6.1	2	Ext.	●	**MZE0610SA**	32.1	32.1	71.1	70	1.1	6.1	1
	3	Ext.	●	**MZE0610MA**	42.1	42.1	82.1	81	1.1	6.1	1
	3	Int.	●	**MZS0610MB**	33.6	36.1	89.1	88	1.1	7.0	2
	5	Int.	●	**MZS0610LB**	53.1	57.1	110.1	109	1.1	7.0	2
6.2	2	Ext.	●	**MZE0620SA**	32.1	32.1	71.1	70	1.1	6.2	1
	3	Ext.	●	**MZE0620MA**	42.1	42.1	82.1	81	1.1	6.2	1
	3	Int.	●	**MZS0620MB**	33.6	36.1	89.1	88	1.1	7.0	2
	5	Int.	●	**MZS0620LB**	53.1	57.1	110.1	109	1.1	7.0	2
6.3	2	Ext.	●	**MZE0630SA**	32.1	32.1	71.1	70	1.1	6.3	1
	3	Ext.	●	**MZE0630MA**	42.1	42.1	82.1	81	1.1	6.3	1
	3	Int.	●	**MZS0630MB**	33.6	36.1	89.1	88	1.1	7.0	2
	5	Int.	●	**MZS0630LB**	53.1	57.1	110.1	109	1.1	7.0	2
6.4	2	Ext.	●	**MZE0640SA**	32.2	32.2	71.2	70	1.2	6.4	1
	3	Ext.	●	**MZE0640MA**	42.2	42.2	82.2	81	1.2	6.4	1
	3	Int.	●	**MZS0640MB**	33.7	36.2	89.2	88	1.2	7.0	2
	5	Int.	●	**MZS0640LB**	53.2	57.2	110.2	109	1.2	7.0	2

(Note) 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)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
6.5	2	Ext.	●	**MZE0650SA**	32.2	32.2	71.2	70	1.2	6.5	1
	3	Ext.	●	**MZE0650MA**	42.2	42.2	82.2	81	1.2	6.5	1
	3	Int.	●	**MZS0650MB**	33.7	36.2	89.2	88	1.2	7.0	2
	5	Int.	●	**MZS0650LB**	53.2	57.2	110.2	109	1.2	7.0	2
6.6	2	Ext.	●	**MZE0660SA**	32.2	32.2	71.2	70	1.2	6.6	1
	3	Ext.	●	**MZE0660MA**	44.2	44.2	84.2	83	1.2	6.6	1
	3	Int.	●	**MZS0660MB**	36.2	36.2	89.2	88	1.2	7.0	2
	5	Int.	●	**MZS0660LB**	57.2	57.2	110.2	109	1.2	7.0	2
6.7	2	Ext.	●	**MZE0670SA**	32.2	32.2	71.2	70	1.2	6.7	1
	3	Ext.	●	**MZE0670MA**	44.2	44.2	84.2	83	1.2	6.7	1
	3	Int.	●	**MZS0670MB**	36.2	36.2	89.2	88	1.2	7.0	2
	5	Int.	●	**MZS0670LB**	57.2	57.2	110.2	109	1.2	7.0	2
6.8	2	Ext.	●	**MZE0680SA**	35.2	35.2	75.2	74	1.2	6.8	1
	3	Ext.	●	**MZE0680MA**	44.2	44.2	84.2	83	1.2	6.8	1
	3	Int.	●	**MZS0680MB**	36.2	36.2	89.2	88	1.2	7.0	2
	5	Int.	●	**MZS0680LB**	57.2	57.2	110.2	109	1.2	7.0	2
6.9	2	Ext.	●	**MZE0690SA**	35.3	35.3	75.3	74	1.3	6.9	1
	3	Ext.	●	**MZE0690MA**	44.3	44.3	84.3	83	1.3	6.9	1
	3	Int.	●	**MZS0690MB**	36.3	36.3	89.3	88	1.3	7.0	2
	5	Int.	●	**MZS0690LB**	57.3	57.3	110.3	109	1.3	7.0	2
7.0	2	Ext.	●	**MZE0700SA**	35.3	35.3	75.3	74	1.3	7.0	1
	3	Ext.	●	**MZE0700MA**	44.3	44.3	84.3	83	1.3	7.0	1
	3	Int.	●	**MZS0700MB**	36.3	36.3	89.3	88	1.3	7.0	2
	5	Int.	●	**MZS0700LB**	57.3	57.3	110.3	109	1.3	7.0	2
7.1	2	Ext.	●	**MZE0710SA**	35.3	35.3	75.3	74	1.3	7.1	1
	3	Ext.	●	**MZE0710MA**	46.3	46.3	88.3	87	1.3	7.1	1
	3	Int.	●	**MZS0710MB**	38.8	41.3	95.3	94	1.3	8.0	2
	5	Int.	●	**MZS0710LB**	61.3	65.3	119.3	118	1.3	8.0	2
7.2	2	Ext.	●	**MZE0720SA**	35.3	35.3	75.3	74	1.3	7.2	1
	3	Ext.	●	**MZE0720MA**	46.3	46.3	88.3	87	1.3	7.2	1
	3	Int.	●	**MZS0720MB**	38.8	41.3	95.3	94	1.3	8.0	2
	5	Int.	●	**MZS0720LB**	61.3	65.3	119.3	118	1.3	8.0	2
7.3	2	Ext.	●	**MZE0730SA**	35.3	35.3	75.3	74	1.3	7.3	1
	3	Ext.	●	**MZE0730MA**	46.3	46.3	88.3	87	1.3	7.3	1
	3	Int.	●	**MZS0730MB**	38.8	41.3	95.3	94	1.3	8.0	2
	5	Int.	●	**MZS0730LB**	61.3	65.3	119.3	118	1.3	8.0	2
7.4	2	Ext.	●	**MZE0740SA**	35.3	35.3	75.3	74	1.3	7.4	1
	3	Ext.	●	**MZE0740MA**	46.3	46.3	88.3	87	1.3	7.4	1
	3	Int.	●	**MZS0740MB**	38.8	41.3	95.3	94	1.3	8.0	2
	5	Int.	●	**MZS0740LB**	61.3	65.3	119.3	118	1.3	8.0	2
7.5	2	Ext.	●	**MZE0750SA**	35.4	35.4	75.4	74	1.4	7.5	1
	3	Ext.	●	**MZE0750MA**	46.4	46.4	88.4	87	1.4	7.5	1
	3	Int.	●	**MZS0750MB**	38.9	41.4	95.4	94	1.4	8.0	2
	5	Int.	●	**MZS0750LB**	61.4	65.4	119.4	118	1.4	8.0	2
7.6	2	Ext.	●	**MZE0760SA**	38.4	38.4	80.4	79	1.4	7.6	1
	3	Ext.	●	**MZE0760MA**	49.4	49.4	91.4	90	1.4	7.6	1
	3	Int.	●	**MZS0760MB**	41.4	41.4	95.4	94	1.4	8.0	2
	5	Int.	●	**MZS0760LB**	65.4	65.4	119.4	118	1.4	8.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
7.7	2	Ext.	●	**MZE0770SA**	38.4	38.4	80.4	79	1.4	7.7	1
	3	Ext.	●	**MZE0770MA**	49.4	49.4	91.4	90	1.4	7.7	1
	3	Int.	●	**MZS0770MB**	41.4	41.4	95.4	94	1.4	8.0	2
	5	Int.	●	**MZS0770LB**	65.4	65.4	119.4	118	1.4	8.0	2
7.8	2	Ext.	●	**MZE0780SA**	38.4	38.4	80.4	79	1.4	7.8	1
	3	Ext.	●	**MZE0780MA**	49.4	49.4	91.4	90	1.4	7.8	1
	3	Int.	●	**MZS0780MB**	41.4	41.4	95.4	94	1.4	8.0	2
	5	Int.	●	**MZS0780LB**	65.4	65.4	119.4	118	1.4	8.0	2
7.9	2	Ext.	●	**MZE0790SA**	38.4	38.4	80.4	79	1.4	7.9	1
	3	Ext.	●	**MZE0790MA**	49.4	49.4	91.4	90	1.4	7.9	1
	3	Int.	●	**MZS0790MB**	41.4	41.4	95.4	94	1.4	8.0	2
	5	Int.	●	**MZS0790LB**	65.4	65.4	119.4	118	1.4	8.0	2
8.0	2	Ext.	●	**MZE0800SA**	38.5	38.5	80.5	79	1.5	8.0	1
	3	Ext.	●	**MZE0800MA**	49.5	49.5	91.5	90	1.5	8.0	1
	3	Int.	●	**MZS0800MB**	41.5	41.5	95.5	94	1.5	8.0	2
	5	Int.	●	**MZS0800LB**	65.5	65.5	119.5	118	1.5	8.0	2
8.1	2	Ext.	●	**MZE0810SA**	38.5	38.5	80.5	79	1.5	8.1	1
	3	Ext.	●	**MZE0810MA**	54.5	54.5	97.5	96	1.5	8.1	1
	3	Int.	●	**MZS0810MB**	44.0	46.5	101.5	100	1.5	9.0	2
	5	Int.	●	**MZS0810LB**	69.5	73.5	128.5	127	1.5	9.0	2
8.2	2	Ext.	●	**MZE0820SA**	38.5	38.5	80.5	79	1.5	8.2	1
	3	Ext.	●	**MZE0820MA**	54.5	54.5	97.5	96	1.5	8.2	1
	3	Int.	●	**MZS0820MB**	44.0	46.5	101.5	100	1.5	9.0	2
	5	Int.	●	**MZS0820LB**	69.5	73.5	128.5	127	1.5	9.0	2
8.3	2	Ext.	●	**MZE0830SA**	38.5	38.5	80.5	79	1.5	8.3	1
	3	Ext.	●	**MZE0830MA**	54.5	54.5	97.5	96	1.5	8.3	1
	3	Int.	●	**MZS0830MB**	44.0	46.5	101.5	100	1.5	9.0	2
	5	Int.	●	**MZS0830LB**	69.5	73.5	128.5	127	1.5	9.0	2
8.4	2	Ext.	●	**MZE0840SA**	38.5	38.5	80.5	79	1.5	8.4	1
	3	Ext.	●	**MZE0840MA**	54.5	54.5	97.5	96	1.5	8.4	1
	3	Int.	●	**MZS0840MB**	44.0	46.5	101.5	100	1.5	9.0	2
	5	Int.	●	**MZS0840LB**	69.5	73.5	128.5	127	1.5	9.0	2
8.5	2	Ext.	●	**MZE0850SA**	38.5	38.5	80.5	79	1.5	8.5	1
	3	Ext.	●	**MZE0850MA**	54.5	54.5	97.5	96	1.5	8.5	1
	3	Int.	●	**MZS0850MB**	44.0	46.5	101.5	100	1.5	9.0	2
	5	Int.	●	**MZS0850LB**	69.5	73.5	128.5	127	1.5	9.0	2
8.6	2	Ext.	●	**MZE0860SA**	41.6	41.6	85.6	84	1.6	8.6	1
	3	Ext.	●	**MZE0860MA**	56.6	56.6	99.6	98	1.6	8.6	1
	3	Int.	●	**MZS0860MB**	46.6	46.6	101.6	100	1.6	9.0	2
	5	Int.	●	**MZS0860LB**	73.6	73.6	128.6	127	1.6	9.0	2
8.7	2	Ext.	●	**MZE0870SA**	41.6	41.6	85.6	84	1.6	8.7	1
	3	Ext.	●	**MZE0870MA**	56.6	56.6	99.6	98	1.6	8.7	1
	3	Int.	●	**MZS0870MB**	46.6	46.6	101.6	100	1.6	9.0	2
	5	Int.	●	**MZS0870LB**	73.6	73.6	128.6	127	1.6	9.0	2
8.8	2	Ext.	●	**MZE0880SA**	41.6	41.6	85.6	84	1.6	8.8	1
	3	Ext.	●	**MZE0880MA**	56.6	56.6	99.6	98	1.6	8.8	1
	3	Int.	●	**MZS0880MB**	46.6	46.6	101.6	100	1.6	9.0	2
	5	Int.	●	**MZS0880LB**	73.6	73.6	128.6	127	1.6	9.0	2

(Note) 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)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
8.9	2	Ext.	●	**MZE0890SA**	41.6	41.6	85.6	84	1.6	8.9	1
	3	Ext.	●	**MZE0890MA**	56.6	56.6	99.6	98	1.6	8.9	1
	3	Int.	●	**MZS0890MB**	46.6	46.6	101.6	100	1.6	9.0	2
	5	Int.	●	**MZS0890LB**	73.6	73.6	128.6	127	1.6	9.0	2
9.0	2	Ext.	●	**MZE0900SA**	41.6	41.6	85.6	84	1.6	9.0	1
	3	Ext.	●	**MZE0900MA**	56.6	56.6	99.6	98	1.6	9.0	1
	3	Int.	●	**MZS0900MB**	46.6	46.6	101.6	100	1.6	9.0	2
	5	Int.	●	**MZS0900LB**	73.6	73.6	128.6	127	1.6	9.0	2
9.1	2	Ext.	●	**MZE0910SA**	41.7	41.7	85.7	84	1.7	9.1	1
	3	Ext.	●	**MZE0910MA**	59.7	59.7	103.7	102	1.7	9.1	1
	3	Int.	●	**MZS0910MB**	49.2	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0910LB**	77.7	81.7	137.7	136	1.7	10.0	2
9.2	2	Ext.	●	**MZE0920SA**	41.7	41.7	85.7	84	1.7	9.2	1
	3	Ext.	●	**MZE0920MA**	59.7	59.7	103.7	102	1.7	9.2	1
	3	Int.	●	**MZS0920MB**	49.2	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0920LB**	77.7	81.7	137.7	136	1.7	10.0	2
9.3	2	Ext.	●	**MZE0930SA**	41.7	41.7	85.7	84	1.7	9.3	1
	3	Ext.	●	**MZE0930MA**	59.7	59.7	103.7	102	1.7	9.3	1
	3	Int.	●	**MZS0930MB**	49.2	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0930LB**	77.7	81.7	137.7	136	1.7	10.0	2
9.4	2	Ext.	●	**MZE0940SA**	41.7	41.7	85.7	84	1.7	9.4	1
	3	Ext.	●	**MZE0940MA**	59.7	59.7	103.7	102	1.7	9.4	1
	3	Int.	●	**MZS0940MB**	49.2	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0940LB**	77.7	81.7	137.7	136	1.7	10.0	2
9.5	2	Ext.	●	**MZE0950SA**	41.7	41.7	85.7	84	1.7	9.5	1
	3	Ext.	●	**MZE0950MA**	59.7	59.7	103.7	102	1.7	9.5	1
	3	Int.	●	**MZS0950MB**	49.2	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0950LB**	77.7	81.7	137.7	136	1.7	10.0	2
9.6	2	Ext.	●	**MZE0960SA**	44.7	44.7	90.7	89	1.7	9.6	1
	3	Ext.	●	**MZE0960MA**	61.7	61.7	106.7	105	1.7	9.6	1
	3	Int.	●	**MZS0960MB**	51.7	51.7	107.7	106	1.7	10.0	2
	5	Int.	●	**MZS0960LB**	81.7	81.7	137.7	136	1.7	10.0	2
9.7	2	Ext.	●	**MZE0970SA**	44.8	44.8	90.8	89	1.8	9.7	1
	3	Ext.	●	**MZE0970MA**	61.8	61.8	106.8	105	1.8	9.7	1
	3	Int.	●	**MZS0970MB**	51.8	51.8	107.8	106	1.8	10.0	2
	5	Int.	●	**MZS0970LB**	81.8	81.8	137.8	136	1.8	10.0	2
9.8	2	Ext.	●	**MZE0980SA**	44.8	44.8	90.8	89	1.8	9.8	1
	3	Ext.	●	**MZE0980MA**	61.8	61.8	106.8	105	1.8	9.8	1
	3	Int.	●	**MZS0980MB**	51.8	51.8	107.8	106	1.8	10.0	2
	5	Int.	●	**MZS0980LB**	81.8	81.8	137.8	136	1.8	10.0	2
9.9	2	Ext.	●	**MZE0990SA**	44.8	44.8	90.8	89	1.8	9.9	1
	3	Ext.	●	**MZE0990MA**	61.8	61.8	106.8	105	1.8	9.9	1
	3	Int.	●	**MZS0990MB**	51.8	51.8	107.8	106	1.8	10.0	2
	5	Int.	●	**MZS0990LB**	81.8	81.8	137.8	136	1.8	10.0	2
10.0	2	Ext.	●	**MZE1000SA**	44.8	44.8	90.8	89	1.8	10.0	1
	3	Ext.	●	**MZE1000MA**	61.8	61.8	106.8	105	1.8	10.0	1
	3	Int.	●	**MZS1000MB**	51.8	51.8	107.8	106	1.8	10.0	2
	5	Int.	●	**MZS1000LB**	81.8	81.8	137.8	136	1.8	10.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
10.1	2	Ext.	●	**MZE1010SA**	44.8	44.8	90.8	89	1.8	10.1	1
	3	Ext.	●	**MZE1010MA**	67.8	67.8	113.8	112	1.8	10.1	1
	3	Int.	●	**MZS1010MB**	54.3	56.8	117.8	116	1.8	11.0	2
	5	Int.	●	**MZS1010LB**	85.8	89.8	150.8	149	1.8	11.0	2
10.2	2	Ext.	●	**MZE1020SA**	44.9	44.9	90.9	89	1.9	10.2	1
	3	Ext.	●	**MZE1020MA**	67.9	67.9	113.9	112	1.9	10.2	1
	3	Int.	●	**MZS1020MB**	54.4	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1020LB**	85.9	89.9	150.9	149	1.9	11.0	2
10.3	2	Ext.	●	**MZE1030SA**	44.9	44.9	90.9	89	1.9	10.3	1
	3	Ext.	●	**MZE1030MA**	67.9	67.9	113.9	112	1.9	10.3	1
	3	Int.	●	**MZS1030MB**	54.4	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1030LB**	85.9	89.9	150.9	149	1.9	11.0	2
10.4	2	Ext.	●	**MZE1040SA**	44.9	44.9	90.9	89	1.9	10.4	1
	3	Ext.	●	**MZE1040MA**	67.9	67.9	113.9	112	1.9	10.4	1
	3	Int.	●	**MZS1040MB**	54.4	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1040LB**	85.9	89.9	150.9	149	1.9	11.0	2
10.5	2	Ext.	●	**MZE1050SA**	44.9	44.9	90.9	89	1.9	10.5	1
	3	Ext.	●	**MZE1050MA**	67.9	67.9	113.9	112	1.9	10.5	1
	3	Int.	●	**MZS1050MB**	54.4	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1050LB**	85.9	89.9	150.9	149	1.9	11.0	2
10.6	2	Ext.	●	**MZE1060SA**	44.9	44.9	90.9	89	1.9	10.6	1
	3	Ext.	●	**MZE1060MA**	69.9	69.9	115.9	114	1.9	10.6	1
	3	Int.	●	**MZS1060MB**	56.9	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1060LB**	89.9	89.9	150.9	149	1.9	11.0	2
10.7	2	Ext.	●	**MZE1070SA**	48.9	48.9	96.9	95	1.9	10.7	1
	3	Ext.	●	**MZE1070MA**	69.9	69.9	115.9	114	1.9	10.7	1
	3	Int.	●	**MZS1070MB**	56.9	56.9	117.9	116	1.9	11.0	2
	5	Int.	●	**MZS1070LB**	89.9	89.9	150.9	149	1.9	11.0	2
10.8	2	Ext.	●	**MZE1080SA**	49.0	49.0	97.0	95	2.0	10.8	1
	3	Ext.	●	**MZE1080MA**	70.0	70.0	116.0	114	2.0	10.8	1
	3	Int.	●	**MZS1080MB**	57.0	57.0	118.0	116	2.0	11.0	2
	5	Int.	●	**MZS1080LB**	90.0	90.0	151.0	149	2.0	11.0	2
10.9	2	Ext.	●	**MZE1090SA**	49.0	49.0	97.0	95	2.0	10.9	1
	3	Ext.	●	**MZE1090MA**	70.0	70.0	116.0	114	2.0	10.9	1
	3	Int.	●	**MZS1090MB**	57.0	57.0	118.0	116	2.0	11.0	2
	5	Int.	●	**MZS1090LB**	90.0	90.0	151.0	149	2.0	11.0	2
11.0	2	Ext.	●	**MZE1100SA**	49.0	49.0	97.0	95	2.0	11.0	1
	3	Ext.	●	**MZE1100MA**	70.0	70.0	116.0	114	2.0	11.0	1
	3	Int.	●	**MZS1100MB**	57.0	57.0	118.0	116	2.0	11.0	2
	5	Int.	●	**MZS1100LB**	90.0	90.0	151.0	149	2.0	11.0	2
11.1	2	Ext.	●	**MZE1110SA**	49.0	49.0	97.0	95	2.0	11.1	1
	3	Ext.	●	**MZE1110MA**	73.0	73.0	120.0	118	2.0	11.1	1
	3	Int.	●	**MZS1110MB**	59.5	62.0	124.0	122	2.0	12.0	2
	5	Int.	●	**MZS1110LB**	94.0	98.0	160.0	158	2.0	12.0	2
11.2	2	Ext.	●	**MZE1120SA**	49.0	49.0	97.0	95	2.0	11.2	1
	3	Ext.	●	**MZE1120MA**	73.0	73.0	120.0	118	2.0	11.2	1
	3	Int.	●	**MZS1120MB**	59.5	62.0	124.0	122	2.0	12.0	2
	5	Int.	●	**MZS1120LB**	94.0	98.0	160.0	158	2.0	12.0	2

(Note) 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)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
11.3	2	Ext.	●	**MZE1130SA**	49.1	49.1	97.1	95	2.1	11.3	1
	3	Ext.	●	**MZE1130MA**	73.1	73.1	120.1	118	2.1	11.3	1
	3	Int.	●	**MZS1130MB**	59.6	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1130LB**	94.1	98.1	160.1	158	2.1	12.0	2
11.4	2	Ext.	●	**MZE1140SA**	49.1	49.1	97.1	95	2.1	11.4	1
	3	Ext.	●	**MZE1140MA**	73.1	73.1	120.1	118	2.1	11.4	1
	3	Int.	●	**MZS1140MB**	59.6	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1140LB**	94.1	98.1	160.1	158	2.1	12.0	2
11.5	2	Ext.	●	**MZE1150SA**	49.1	49.1	97.1	95	2.1	11.5	1
	3	Ext.	●	**MZE1150MA**	73.1	73.1	120.1	118	2.1	11.5	1
	3	Int.	●	**MZS1150MB**	59.6	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1150LB**	94.1	98.1	160.1	158	2.1	12.0	2
11.6	2	Ext.	●	**MZE1160SA**	49.1	49.1	97.1	95	2.1	11.6	1
	3	Ext.	●	**MZE1160MA**	75.1	75.1	123.1	121	2.1	11.6	1
	3	Int.	●	**MZS1160MB**	62.1	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1160LB**	98.1	98.1	160.1	158	2.1	12.0	2
11.7	2	Ext.	●	**MZE1170SA**	49.1	49.1	97.1	95	2.1	11.7	1
	3	Ext.	●	**MZE1170MA**	75.1	75.1	123.1	121	2.1	11.7	1
	3	Int.	●	**MZS1170MB**	62.1	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1170LB**	98.1	98.1	160.1	158	2.1	12.0	2
11.8	2	Ext.	●	**MZE1180SA**	49.1	49.1	97.1	95	2.1	11.8	1
	3	Ext.	●	**MZE1180MA**	75.1	75.1	123.1	121	2.1	11.8	1
	3	Int.	●	**MZS1180MB**	62.1	62.1	124.1	122	2.1	12.0	2
	5	Int.	●	**MZS1180LB**	98.1	98.1	160.1	158	2.1	12.0	2
11.9	2	Ext.	●	**MZE1190SA**	53.2	53.2	104.2	102	2.2	11.9	1
	3	Ext.	●	**MZE1190MA**	75.2	75.2	123.2	121	2.2	11.9	1
	3	Int.	●	**MZS1190MB**	62.2	62.2	124.2	122	2.2	12.0	2
	5	Int.	●	**MZS1190LB**	98.2	98.2	160.2	158	2.2	12.0	2
12.0	2	Ext.	●	**MZE1200SA**	53.2	53.2	104.2	102	2.2	12.0	1
	3	Ext.	●	**MZE1200MA**	75.2	75.2	123.2	121	2.2	12.0	1
	3	Int.	●	**MZS1200MB**	62.2	62.2	124.2	122	2.2	12.0	2
	5	Int.	●	**MZS1200LB**	98.2	98.2	160.2	158	2.2	12.0	2
12.1	2	Ext.	●	**MZE1210SA**	53.2	53.2	104.2	102	2.2	12.1	1
	3	Ext.	●	**MZE1210MA**	78.2	78.2	137.2	135	2.2	12.1	1
	3	Int.	●	**MZS1210MB**	64.7	67.2	130.2	128	2.2	13.0	2
	5	Int.	●	**MZS1210LB**	102.2	106.2	169.2	167	2.2	13.0	2
12.2	2	Ext.	●	**MZE1220SA**	53.2	53.2	104.2	102	2.2	12.2	1
	3	Ext.	●	**MZE1220MA**	78.2	78.2	137.2	135	2.2	12.2	1
	3	Int.	●	**MZS1220MB**	64.7	67.2	130.2	128	2.2	13.0	2
	5	Int.	●	**MZS1220LB**	102.2	106.2	169.2	167	2.2	13.0	2
12.3	2	Ext.	●	**MZE1230SA**	53.2	53.2	104.2	102	2.2	12.3	1
	3	Ext.	●	**MZE1230MA**	78.2	78.2	137.2	135	2.2	12.3	1
	3	Int.	●	**MZS1230MB**	64.7	67.2	130.2	128	2.2	13.0	2
	5	Int.	●	**MZS1230LB**	102.2	106.2	169.2	167	2.2	13.0	2
12.4	2	Ext.	●	**MZE1240SA**	53.3	53.3	104.3	102	2.3	12.4	1
	3	Ext.	●	**MZE1240MA**	78.3	78.3	137.3	135	2.3	12.4	1
	3	Int.	●	**MZS1240MB**	64.8	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1240LB**	102.3	106.3	169.3	167	2.3	13.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
12.5	2	Ext.	●	**MZE1250SA**	53.3	53.3	104.3	102	2.3	12.5	1
	3	Ext.	●	**MZE1250MA**	78.3	78.3	137.3	135	2.3	12.5	1
	3	Int.	●	**MZS1250MB**	64.8	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1250LB**	102.3	106.3	169.3	167	2.3	13.0	2
12.6	2	Ext.	●	**MZE1260SA**	53.3	53.3	104.3	102	2.3	12.6	1
	3	Ext.	●	**MZE1260MA**	80.3	80.3	139.3	137	2.3	12.6	1
	3	Int.	●	**MZS1260MB**	67.3	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1260LB**	106.3	106.3	169.3	167	2.3	13.0	2
12.7	2	Ext.	●	**MZE1270SA**	53.3	53.3	104.3	102	2.3	12.7	1
	3	Ext.	●	**MZE1270MA**	80.3	80.3	139.3	137	2.3	12.7	1
	3	Int.	●	**MZS1270MB**	67.3	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1270LB**	106.3	106.3	169.3	167	2.3	13.0	2
12.8	2	Ext.	●	**MZE1280SA**	53.3	53.3	104.3	102	2.3	12.8	1
	3	Ext.	●	**MZE1280MA**	80.3	80.3	139.3	137	2.3	12.8	1
	3	Int.	●	**MZS1280MB**	67.3	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1280LB**	106.3	106.3	169.3	167	2.3	13.0	2
12.9	2	Ext.	●	**MZE1290SA**	53.3	53.3	104.3	102	2.3	12.9	1
	3	Ext.	●	**MZE1290MA**	80.3	80.3	139.3	137	2.3	12.9	1
	3	Int.	●	**MZS1290MB**	67.3	67.3	130.3	128	2.3	13.0	2
	5	Int.	●	**MZS1290LB**	106.3	106.3	169.3	167	2.3	13.0	2
13.0	2	Ext.	●	**MZE1300SA**	53.4	53.4	104.4	102	2.4	13.0	1
	3	Ext.	●	**MZE1300MA**	80.4	80.4	139.4	137	2.4	13.0	1
	3	Int.	●	**MZS1300MB**	67.4	67.4	130.4	128	2.4	13.0	2
	5	Int.	●	**MZS1300LB**	106.4	106.4	169.4	167	2.4	13.0	2
13.1	2	Ext.	●	**MZE1310SA**	53.4	53.4	104.4	102	2.4	13.1	1
	3	Ext.	●	**MZE1310MA**	86.4	86.4	146.4	144	2.4	13.1	1
	3	Int.	●	**MZS1310MB**	69.9	72.4	136.4	134	2.4	14.0	2
	5	Int.	●	**MZS1310LB**	110.4	114.4	178.4	176	2.4	14.0	2
13.2	2	Ext.	●	**MZE1320SA**	53.4	53.4	104.4	102	2.4	13.2	1
	3	Ext.	●	**MZE1320MA**	86.4	86.4	146.4	144	2.4	13.2	1
	3	Int.	●	**MZS1320MB**	69.9	72.4	136.4	134	2.4	14.0	2
	5	Int.	●	**MZS1320LB**	110.4	114.4	178.4	176	2.4	14.0	2
13.3	2	Ext.	●	**MZE1330SA**	56.4	56.4	109.4	107	2.4	13.3	1
	3	Ext.	●	**MZE1330MA**	86.4	86.4	146.4	144	2.4	13.3	1
	3	Int.	●	**MZS1330MB**	69.9	72.4	136.4	134	2.4	14.0	2
	5	Int.	●	**MZS1330LB**	110.4	114.4	178.4	176	2.4	14.0	2
13.4	2	Ext.	●	**MZE1340SA**	56.4	56.4	109.4	107	2.4	13.4	1
	3	Ext.	●	**MZE1340MA**	86.4	86.4	146.4	144	2.4	13.4	1
	3	Int.	●	**MZS1340MB**	69.9	72.4	136.4	134	2.4	14.0	2
	5	Int.	●	**MZS1340LB**	110.4	114.4	178.4	176	2.4	14.0	2
13.5	2	Ext.	●	**MZE1350SA**	56.5	56.5	109.5	107	2.5	13.5	1
	3	Ext.	●	**MZE1350MA**	86.5	86.5	146.5	144	2.5	13.5	1
	3	Int.	●	**MZS1350MB**	70.0	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1350LB**	110.5	114.5	178.5	176	2.5	14.0	2
13.6	2	Ext.	●	**MZE1360SA**	56.5	56.5	109.5	107	2.5	13.6	1
	3	Ext.	●	**MZE1360MA**	88.5	88.5	149.5	147	2.5	13.6	1
	3	Int.	●	**MZS1360MB**	72.5	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1360LB**	114.5	114.5	178.5	176	2.5	14.0	2

(Note) 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.**

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
13.7	2	Ext.	●	**MZE1370SA**	56.5	56.5	109.5	107	2.5	13.7	1
	3	Ext.	●	**MZE1370MA**	88.5	88.5	149.5	147	2.5	13.7	1
	3	Int.	●	**MZS1370MB**	72.5	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1370LB**	114.5	114.5	178.5	176	2.5	14.0	2
13.8	2	Ext.	●	**MZE1380SA**	56.5	56.5	109.5	107	2.5	13.8	1
	3	Ext.	●	**MZE1380MA**	88.5	88.5	149.5	147	2.5	13.8	1
	3	Int.	●	**MZS1380MB**	72.5	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1380LB**	114.5	114.5	178.5	176	2.5	14.0	2
13.9	2	Ext.	●	**MZE1390SA**	56.5	56.5	109.5	107	2.5	13.9	1
	3	Ext.	●	**MZE1390MA**	88.5	88.5	149.5	147	2.5	13.9	1
	3	Int.	●	**MZS1390MB**	72.5	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1390LB**	114.5	114.5	178.5	176	2.5	14.0	2
14.0	2	Ext.	●	**MZE1400SA**	56.5	56.5	109.5	107	2.5	14.0	1
	3	Ext.	●	**MZE1400MA**	88.5	88.5	149.5	147	2.5	14.0	1
	3	Int.	●	**MZS1400MB**	72.5	72.5	136.5	134	2.5	14.0	2
	5	Int.	●	**MZS1400LB**	114.5	114.5	178.5	176	2.5	14.0	2
14.1	2	Ext.	●	**MZE1410SA**	58.6	58.6	113.6	111	2.6	14.1	1
	3	Ext.	●	**MZE1410MA**	91.6	91.6	153.6	151	2.6	14.1	1
	3	Int.	●	**MZS1410MB**	75.1	77.6	142.6	140	2.6	15.0	2
	5	Int.	●	**MZS1410LB**	118.6	122.6	187.6	185	2.6	15.0	2
14.2	2	Ext.	●	**MZE1420SA**	58.6	58.6	113.6	111	2.6	14.2	1
	3	Ext.	●	**MZE1420MA**	91.6	91.6	153.6	151	2.6	14.2	1
	3	Int.	●	**MZS1420MB**	75.1	77.6	142.6	140	2.6	15.0	2
	5	Int.	●	**MZS1420LB**	118.6	122.6	187.6	185	2.6	15.0	2
14.3	2	Ext.	□	**MZE1430SA**	58.6	58.6	113.6	111	2.6	14.3	1
	3	Ext.	●	**MZE1430MA**	91.6	91.6	153.6	151	2.6	14.3	1
	3	Int.	●	**MZS1430MB**	75.1	77.6	142.6	140	2.6	15.0	2
	5	Int.	●	**MZS1430LB**	118.6	122.6	187.6	185	2.6	15.0	2
14.4	2	Ext.	□	**MZE1440SA**	58.6	58.6	113.6	111	2.6	14.4	1
	3	Ext.	●	**MZE1440MA**	91.6	91.6	153.6	151	2.6	14.4	1
	3	Int.	●	**MZS1440MB**	75.1	77.6	142.6	140	2.6	15.0	2
	5	Int.	●	**MZS1440LB**	118.6	122.6	187.6	185	2.6	15.0	2
14.5	2	Ext.	●	**MZE1450SA**	58.6	58.6	113.6	111	2.6	14.5	1
	3	Ext.	●	**MZE1450MA**	91.6	91.6	153.6	151	2.6	14.5	1
	3	Int.	●	**MZS1450MB**	75.1	77.6	142.6	140	2.6	15.0	2
	5	Int.	●	**MZS1450LB**	118.6	122.6	187.6	185	2.6	15.0	2
14.6	2	Ext.	□	**MZE1460SA**	58.7	58.7	113.7	111	2.7	14.6	1
	3	Ext.	●	**MZE1460MA**	93.7	93.7	155.7	153	2.7	14.6	1
	3	Int.	●	**MZS1460MB**	77.7	77.7	142.7	140	2.7	15.0	2
	5	Int.	●	**MZS1460LB**	122.7	122.7	187.7	185	2.7	15.0	2
14.7	2	Ext.	□	**MZE1470SA**	58.7	58.7	113.7	111	2.7	14.7	1
	3	Ext.	●	**MZE1470MA**	93.7	93.7	155.7	153	2.7	14.7	1
	3	Int.	●	**MZS1470MB**	77.7	77.7	142.7	140	2.7	15.0	2
	5	Int.	●	**MZS1470LB**	122.7	122.7	187.7	185	2.7	15.0	2
14.8	2	Ext.	□	**MZE1480SA**	58.7	58.7	113.7	111	2.7	14.8	1
	3	Ext.	●	**MZE1480MA**	93.7	93.7	155.7	153	2.7	14.8	1
	3	Int.	●	**MZS1480MB**	77.7	77.7	142.7	140	2.7	15.0	2
	5	Int.	●	**MZS1480LB**	122.7	122.7	187.7	185	2.7	15.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
14.9	2	Ext.	□	**MZE1490SA**	58.7	58.7	113.7	111	2.7	14.9	1
	3	Ext.	●	**MZE1490MA**	93.7	93.7	155.7	153	2.7	14.9	1
	3	Int.	●	**MZS1490MB**	77.7	77.7	142.7	140	2.7	15.0	2
	5	Int.	●	**MZS1490LB**	122.7	122.7	187.7	185	2.7	15.0	2
15.0	2	Ext.	●	**MZE1500SA**	58.7	58.7	113.7	111	2.7	15.0	1
	3	Ext.	●	**MZE1500MA**	93.7	93.7	155.7	153	2.7	15.0	1
	3	Int.	●	**MZS1500MB**	77.7	77.7	142.7	140	2.7	15.0	2
	5	Int.	●	**MZS1500LB**	122.7	122.7	187.7	185	2.7	15.0	2
15.1	2	Ext.	□	**MZE1510SA**	60.7	60.7	117.7	115	2.7	15.1	1
	3	Ext.	●	**MZE1510MA**	96.7	96.7	159.7	157	2.7	15.1	1
	3	Int.	●	**MZS1510MB**	80.2	82.7	147.7	145	2.7	16.0	2
	5	Int.	●	**MZS1510LB**	126.7	130.7	195.7	193	2.7	16.0	2
15.2	2	Ext.	●	**MZE1520SA**	60.8	60.8	117.8	115	2.8	15.2	1
	3	Ext.	●	**MZE1520MA**	96.8	96.8	159.8	157	2.8	15.2	1
	3	Int.	●	**MZS1520MB**	80.3	82.8	147.8	145	2.8	16.0	2
	5	Int.	●	**MZS1520LB**	126.8	130.8	195.8	193	2.8	16.0	2
15.3	2	Ext.	□	**MZE1530SA**	60.8	60.8	117.8	115	2.8	15.3	1
	3	Ext.	●	**MZE1530MA**	96.8	96.8	159.8	157	2.8	15.3	1
	3	Int.	●	**MZS1530MB**	80.3	82.8	147.8	145	2.8	16.0	2
	5	Int.	●	**MZS1530LB**	126.8	130.8	195.8	193	2.8	16.0	2
15.4	2	Ext.	□	**MZE1540SA**	60.8	60.8	117.8	115	2.8	15.4	1
	3	Ext.	●	**MZE1540MA**	96.8	96.8	159.8	157	2.8	15.4	1
	3	Int.	●	**MZS1540MB**	80.3	82.8	147.8	145	2.8	16.0	2
	5	Int.	●	**MZS1540LB**	126.8	130.8	195.8	193	2.8	16.0	2
15.5	2	Ext.	●	**MZE1550SA**	60.8	60.8	117.8	115	2.8	15.5	1
	3	Ext.	●	**MZE1550MA**	96.8	96.8	159.8	157	2.8	15.5	1
	3	Int.	●	**MZS1550MB**	80.3	82.8	147.8	145	2.8	16.0	2
	5	Int.	●	**MZS1550LB**	126.8	130.8	195.8	193	2.8	16.0	2
15.6	2	Ext.	□	**MZE1560SA**	60.8	60.8	117.8	115	2.8	15.6	1
	3	Ext.	●	**MZE1560MA**	98.8	98.8	162.8	160	2.8	15.6	1
	3	Int.	●	**MZS1560MB**	82.8	82.8	147.8	145	2.8	16.0	2
	5	Int.	●	**MZS1560LB**	130.8	130.8	195.8	193	2.8	16.0	2
15.7	2	Ext.	□	**MZE1570SA**	60.9	60.9	117.9	115	2.9	15.7	1
	3	Ext.	●	**MZE1570MA**	98.9	98.9	162.9	160	2.9	15.7	1
	3	Int.	●	**MZS1570MB**	82.9	82.9	147.9	145	2.9	16.0	2
	5	Int.	●	**MZS1570LB**	130.9	130.9	195.9	193	2.9	16.0	2
15.8	2	Ext.	□	**MZE1580SA**	60.9	60.9	117.9	115	2.9	15.8	1
	3	Ext.	●	**MZE1580MA**	98.9	98.9	162.9	160	2.9	15.8	1
	3	Int.	●	**MZS1580MB**	82.9	82.9	147.9	145	2.9	16.0	2
	5	Int.	●	**MZS1580LB**	130.9	130.9	195.9	193	2.9	16.0	2
15.9	2	Ext.	□	**MZE1590SA**	60.9	60.9	117.9	115	2.9	15.9	1
	3	Ext.	●	**MZE1590MA**	98.9	98.9	162.9	160	2.9	15.9	1
	3	Int.	●	**MZS1590MB**	82.9	82.9	147.9	145	2.9	16.0	2
	5	Int.	●	**MZS1590LB**	130.9	130.9	195.9	193	2.9	16.0	2
16.0	2	Ext.	●	**MZE1600SA**	60.9	60.9	117.9	115	2.9	16.0	1
	3	Ext.	●	**MZE1600MA**	98.9	98.9	162.9	160	2.9	16.0	1
	3	Int.	●	**MZS1600MB**	82.9	82.9	147.9	145	2.9	16.0	2
	5	Int.	●	**MZS1600LB**	130.9	130.9	195.9	193	2.9	16.0	2

(Note) 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.**

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
16.1	2	Ext.	□	**MZE1610SA**	62.9	62.9	121.9	119	2.9	16.1	1
	3	Ext.	□	**MZE1610MA**	104.9	104.9	169.9	167	2.9	16.1	1
	3	Int.	□	**MZS1610MB**	85.4	87.9	152.9	150	2.9	17.0	2
	5	Int.	□	**MZS1610LB**	134.9	138.9	203.9	201	2.9	17.0	2
16.2	2	Ext.	●	**MZE1620SA**	62.9	62.9	121.9	119	2.9	16.2	1
	3	Ext.	□	**MZE1620MA**	104.9	104.9	169.9	167	2.9	16.2	1
	3	Int.	□	**MZS1620MB**	85.4	87.9	152.9	150	2.9	17.0	2
	5	Int.	□	**MZS1620LB**	134.9	138.9	203.9	201	2.9	17.0	2
16.3	2	Ext.	●	**MZE1630SA**	63.0	63.0	122.0	119	3.0	16.3	1
	3	Ext.	□	**MZE1630MA**	105.0	105.0	170.0	167	3.0	16.3	1
	3	Int.	□	**MZS1630MB**	85.5	88.0	153.0	150	3.0	17.0	2
	5	Int.	□	**MZS1630LB**	135.0	139.0	204.0	201	3.0	17.0	2
16.4	2	Ext.	□	**MZE1640SA**	63.0	63.0	122.0	119	3.0	16.4	1
	3	Ext.	□	**MZE1640MA**	105.0	105.0	170.0	167	3.0	16.4	1
	3	Int.	□	**MZS1640MB**	85.5	88.0	153.0	150	3.0	17.0	2
	5	Int.	□	**MZS1640LB**	135.0	139.0	204.0	201	3.0	17.0	2
16.5	2	Ext.	●	**MZE1650SA**	63.0	63.0	122.0	119	3.0	16.5	1
	3	Ext.	●	**MZE1650MA**	105.0	105.0	170.0	167	3.0	16.5	1
	3	Int.	●	**MZS1650MB**	85.5	88.0	153.0	150	3.0	17.0	2
	5	Int.	●	**MZS1650LB**	135.0	139.0	204.0	201	3.0	17.0	2
16.6	2	Ext.	□	**MZE1660SA**	63.0	63.0	122.0	119	3.0	16.6	1
	3	Ext.	□	**MZE1660MA**	105.0	105.0	170.0	167	3.0	16.6	1
	3	Int.	□	**MZS1660MB**	88.0	88.0	153.0	150	3.0	17.0	2
	5	Int.	□	**MZS1660LB**	139.0	139.0	204.0	201	3.0	17.0	2
16.7	2	Ext.	□	**MZE1670SA**	63.0	63.0	122.0	119	3.0	16.7	1
	3	Ext.	□	**MZE1670MA**	105.0	105.0	170.0	167	3.0	16.7	1
	3	Int.	□	**MZS1670MB**	88.0	88.0	153.0	150	3.0	17.0	2
	5	Int.	□	**MZS1670LB**	139.0	139.0	204.0	201	3.0	17.0	2
16.8	2	Ext.	□	**MZE1680SA**	63.1	63.1	122.1	119	3.1	16.8	1
	3	Ext.	□	**MZE1680MA**	105.1	105.1	170.1	167	3.1	16.8	1
	3	Int.	□	**MZS1680MB**	88.1	88.1	153.1	150	3.1	17.0	2
	5	Int.	□	**MZS1680LB**	139.1	139.1	204.1	201	3.1	17.0	2
16.9	2	Ext.	□	**MZE1690SA**	63.1	63.1	122.1	119	3.1	16.9	1
	3	Ext.	□	**MZE1690MA**	105.1	105.1	170.1	167	3.1	16.9	1
	3	Int.	□	**MZS1690MB**	88.1	88.1	153.1	150	3.1	17.0	2
	5	Int.	□	**MZS1690LB**	139.1	139.1	204.1	201	3.1	17.0	2
17.0	2	Ext.	●	**MZE1700SA**	63.1	63.1	122.1	119	3.1	17.0	1
	3	Ext.	●	**MZE1700MA**	105.1	105.1	170.1	167	3.1	17.0	1
	3	Int.	●	**MZS1700MB**	88.1	88.1	153.1	150	3.1	17.0	2
	5	Int.	●	**MZS1700LB**	139.1	139.1	204.1	201	3.1	17.0	2
17.1	2	Ext.	□	**MZE1710SA**	65.1	65.1	126.1	123	3.1	17.1	1
	3	Ext.	□	**MZE1710MA**	105.1	105.1	170.1	167	3.1	17.1	1
	3	Int.	□	**MZS1710MB**	90.6	93.1	158.1	155	3.1	18.0	2
	5	Int.	□	**MZS1710LB**	143.1	147.1	212.1	209	3.1	18.0	2
17.2	2	Ext.	□	**MZE1720SA**	65.1	65.1	126.1	123	3.1	17.2	1
	3	Ext.	□	**MZE1720MA**	105.1	105.1	170.1	167	3.1	17.2	1
	3	Int.	□	**MZS1720MB**	90.6	93.1	158.1	155	3.1	18.0	2
	5	Int.	□	**MZS1720LB**	143.1	147.1	212.1	209	3.1	18.0	2

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OPERATION GUIDANCE ➤ N119
TECHNICAL DATA ➤ Q001

MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
17.3	2	Ext.	□	**MZE1730SA**	65.1	65.1	126.1	123	3.1	17.3	1
	3	Ext.	□	**MZE1730MA**	105.1	105.1	170.1	167	3.1	17.3	1
	3	Int.	□	**MZS1730MB**	90.6	93.1	158.1	155	3.1	18.0	2
	5	Int.	□	**MZS1730LB**	143.1	147.1	212.1	209	3.1	18.0	2
17.4	2	Ext.	□	**MZE1740SA**	65.2	65.2	126.2	123	3.2	17.4	1
	3	Ext.	□	**MZE1740MA**	105.2	105.2	170.2	167	3.2	17.4	1
	3	Int.	□	**MZS1740MB**	90.7	93.2	158.2	155	3.2	18.0	2
	5	Int.	□	**MZS1740LB**	143.2	147.2	212.2	209	3.2	18.0	2
17.5	2	Ext.	●	**MZE1750SA**	65.2	65.2	126.2	123	3.2	17.5	1
	3	Ext.	●	**MZE1750MA**	105.2	105.2	170.2	167	3.2	17.5	1
	3	Int.	●	**MZS1750MB**	90.7	93.2	158.2	155	3.2	18.0	2
	5	Int.	●	**MZS1750LB**	143.2	147.2	212.2	209	3.2	18.0	2
17.6	2	Ext.	□	**MZE1760SA**	65.2	65.2	126.2	123	3.2	17.6	1
	3	Ext.	□	**MZE1760MA**	105.2	105.2	170.2	167	3.2	17.6	1
	3	Int.	□	**MZS1760MB**	93.2	93.2	158.2	155	3.2	18.0	2
	5	Int.	□	**MZS1760LB**	147.2	147.2	212.2	209	3.2	18.0	2
17.7	2	Ext.	□	**MZE1770SA**	65.2	65.2	126.2	123	3.2	17.7	1
	3	Ext.	□	**MZE1770MA**	105.2	105.2	170.2	167	3.2	17.7	1
	3	Int.	□	**MZS1770MB**	93.2	93.2	158.2	155	3.2	18.0	2
	5	Int.	□	**MZS1770LB**	147.2	147.2	212.2	209	3.2	18.0	2
17.8	2	Ext.	●	**MZE1780SA**	65.2	65.2	126.2	123	3.2	17.8	1
	3	Ext.	□	**MZE1780MA**	105.2	105.2	170.2	167	3.2	17.8	1
	3	Int.	□	**MZS1780MB**	93.2	93.2	158.2	155	3.2	18.0	2
	5	Int.	□	**MZS1780LB**	147.2	147.2	212.2	209	3.2	18.0	2
17.9	2	Ext.	□	**MZE1790SA**	65.3	65.3	126.3	123	3.3	17.9	1
	3	Ext.	□	**MZE1790MA**	105.3	105.3	170.3	167	3.3	17.9	1
	3	Int.	□	**MZS1790MB**	93.3	93.3	158.3	155	3.3	18.0	2
	5	Int.	□	**MZS1790LB**	147.3	147.3	212.3	209	3.3	18.0	2
18.0	2	Ext.	●	**MZE1800SA**	65.3	65.3	126.3	123	3.3	18.0	1
	3	Ext.	●	**MZE1800MA**	105.3	105.3	170.3	167	3.3	18.0	1
	3	Int.	●	**MZS1800MB**	93.3	93.3	158.3	155	3.3	18.0	2
	5	Int.	●	**MZS1800LB**	147.3	147.3	212.3	209	3.3	18.0	2
18.1	2	Ext.	□	**MZE1810SA**	67.3	67.3	130.3	127	3.3	18.1	1
	3	Ext.	□	**MZE1810MA**	117.3	117.3	182.3	179	3.3	18.1	1
	3	Int.	□	**MZS1810MB**	95.8	98.3	163.3	160	3.3	19.0	2
	5	Int.	□	**MZS1810LB**	151.3	155.3	220.3	217	3.3	19.0	2
18.2	2	Ext.	□	**MZE1820SA**	67.3	67.3	130.3	127	3.3	18.2	1
	3	Ext.	□	**MZE1820MA**	117.3	117.3	182.3	179	3.3	18.2	1
	3	Int.	□	**MZS1820MB**	95.8	98.3	163.3	160	3.3	19.0	2
	5	Int.	□	**MZS1820LB**	151.3	155.3	220.3	217	3.3	19.0	2
18.3	2	Ext.	□	**MZE1830SA**	67.3	67.3	130.3	127	3.3	18.3	1
	3	Ext.	□	**MZE1830MA**	117.3	117.3	182.3	179	3.3	18.3	1
	3	Int.	□	**MZS1830MB**	95.8	98.3	163.3	160	3.3	19.0	2
	5	Int.	□	**MZS1830LB**	151.3	155.3	220.3	217	3.3	19.0	2
18.4	2	Ext.	□	**MZE1840SA**	67.3	67.3	130.3	127	3.3	18.4	1
	3	Ext.	□	**MZE1840MA**	117.3	117.3	182.3	179	3.3	18.4	1
	3	Int.	□	**MZS1840MB**	95.8	98.3	163.3	160	3.3	19.0	2
	5	Int.	□	**MZS1840LB**	151.3	155.3	220.3	217	3.3	19.0	2

(Note) 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.**

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
18.5	2	Ext.	●	**MZE1850SA**	67.4	67.4	130.4	127	3.4	18.5	1
	3	Ext.	●	**MZE1850MA**	117.4	117.4	182.4	179	3.4	18.5	1
	3	Int.	●	**MZS1850MB**	95.9	98.4	163.4	160	3.4	19.0	2
	5	Int.	●	**MZS1850LB**	151.4	155.4	220.4	217	3.4	19.0	2
18.6	2	Ext.	□	**MZE1860SA**	67.4	67.4	130.4	127	3.4	18.6	1
	3	Ext.	□	**MZE1860MA**	117.4	117.4	182.4	179	3.4	18.6	1
	3	Int.	□	**MZS1860MB**	98.4	98.4	163.4	160	3.4	19.0	2
	5	Int.	□	**MZS1860LB**	155.4	155.4	220.4	217	3.4	19.0	2
18.7	2	Ext.	□	**MZE1870SA**	67.4	67.4	130.4	127	3.4	18.7	1
	3	Ext.	□	**MZE1870MA**	117.4	117.4	182.4	179	3.4	18.7	1
	3	Int.	□	**MZS1870MB**	98.4	98.4	163.4	160	3.4	19.0	2
	5	Int.	□	**MZS1870LB**	155.4	155.4	220.4	217	3.4	19.0	2
18.8	2	Ext.	□	**MZE1880SA**	67.4	67.4	130.4	127	3.4	18.8	1
	3	Ext.	□	**MZE1880MA**	117.4	117.4	182.4	179	3.4	18.8	1
	3	Int.	□	**MZS1880MB**	98.4	98.4	163.4	160	3.4	19.0	2
	5	Int.	□	**MZS1880LB**	155.4	155.4	220.4	217	3.4	19.0	2
18.9	2	Ext.	□	**MZE1890SA**	67.4	67.4	130.4	127	3.4	18.9	1
	3	Ext.	□	**MZE1890MA**	117.4	117.4	182.4	179	3.4	18.9	1
	3	Int.	□	**MZS1890MB**	98.4	98.4	163.4	160	3.4	19.0	2
	5	Int.	□	**MZS1890LB**	155.4	155.4	220.4	217	3.4	19.0	2
19.0	2	Ext.	●	**MZE1900SA**	67.5	67.5	130.5	127	3.5	19.0	1
	3	Ext.	●	**MZE1900MA**	117.5	117.5	182.5	179	3.5	19.0	1
	3	Int.	●	**MZS1900MB**	98.5	98.5	163.5	160	3.5	19.0	2
	5	Int.	●	**MZS1900LB**	155.5	155.5	220.5	217	3.5	19.0	2
19.1	2	Ext.	□	**MZE1910SA**	69.5	69.5	134.5	131	3.5	19.1	1
	3	Ext.	□	**MZE1910MA**	117.5	117.5	182.5	179	3.5	19.1	1
	3	Int.	□	**MZS1910MB**	101.0	103.5	168.5	165	3.5	20.0	2
	5	Int.	□	**MZS1910LB**	159.5	163.5	228.5	225	3.5	20.0	2
19.2	2	Ext.	□	**MZE1920SA**	69.5	69.5	134.5	131	3.5	19.2	1
	3	Ext.	□	**MZE1920MA**	117.5	117.5	182.5	179	3.5	19.2	1
	3	Int.	□	**MZS1920MB**	101.0	103.5	168.5	165	3.5	20.0	2
	5	Int.	□	**MZS1920LB**	159.5	163.5	228.5	225	3.5	20.0	2
19.3	2	Ext.	□	**MZE1930SA**	69.5	69.5	134.5	131	3.5	19.3	1
	3	Ext.	□	**MZE1930MA**	117.5	117.5	182.5	179	3.5	19.3	1
	3	Int.	□	**MZS1930MB**	101.0	103.5	168.5	165	3.5	20.0	2
	5	Int.	□	**MZS1930LB**	159.5	163.5	228.5	225	3.5	20.0	2
19.4	2	Ext.	□	**MZE1940SA**	69.5	69.5	134.5	131	3.5	19.4	1
	3	Ext.	□	**MZE1940MA**	117.5	117.5	182.5	179	3.5	19.4	1
	3	Int.	□	**MZS1940MB**	101.0	103.5	168.5	165	3.5	20.0	2
	5	Int.	□	**MZS1940LB**	159.5	163.5	228.5	225	3.5	20.0	2
19.5	2	Ext.	●	**MZE1950SA**	69.5	69.5	134.5	131	3.5	19.5	1
	3	Ext.	●	**MZE1950MA**	117.5	117.5	182.5	179	3.5	19.5	1
	3	Int.	●	**MZS1950MB**	101.0	103.5	168.5	165	3.5	20.0	2
	5	Int.	●	**MZS1950LB**	159.5	163.5	228.5	225	3.5	20.0	2
19.6	2	Ext.	□	**MZE1960SA**	69.6	69.6	134.6	131	3.6	19.6	1
	3	Ext.	□	**MZE1960MA**	117.6	117.6	182.6	179	3.6	19.6	1
	3	Int.	□	**MZS1960MB**	103.6	103.6	168.6	165	3.6	20.0	2
	5	Int.	□	**MZS1960LB**	163.6	163.6	228.6	225	3.6	20.0	2

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MZE/MZS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
19.7	2	Ext.	□	**MZE1970SA**	69.6	69.6	134.6	131	3.6	19.7	1
	3	Ext.	□	**MZE1970MA**	117.6	117.6	182.6	179	3.6	19.7	1
	3	Int.	□	**MZS1970MB**	103.6	103.6	168.6	165	3.6	20.0	2
	5	Int.	□	**MZS1970LB**	163.6	163.6	228.6	225	3.6	20.0	2
19.8	2	Ext.	□	**MZE1980SA**	69.6	69.6	134.6	131	3.6	19.8	1
	3	Ext.	□	**MZE1980MA**	117.6	117.6	182.6	179	3.6	19.8	1
	3	Int.	□	**MZS1980MB**	103.6	103.6	168.6	165	3.6	20.0	2
	5	Int.	□	**MZS1980LB**	163.6	163.6	228.6	225	3.6	20.0	2
19.9	2	Ext.	□	**MZE1990SA**	69.6	69.6	134.6	131	3.6	19.9	1
	3	Ext.	□	**MZE1990MA**	117.6	117.6	182.6	179	3.6	19.9	1
	3	Int.	□	**MZS1990MB**	103.6	103.6	168.6	165	3.6	20.0	2
	5	Int.	□	**MZS1990LB**	163.6	163.6	228.6	225	3.6	20.0	2
20.0	2	Ext.	●	**MZE2000SA**	69.6	69.6	134.6	131	3.6	20.0	1
	3	Ext.	●	**MZE2000MA**	117.6	117.6	182.6	179	3.6	20.0	1
	3	Int.	●	**MZS2000MB**	103.6	103.6	168.6	165	3.6	20.0	2
	5	Int.	●	**MZS2000LB**	163.6	163.6	228.6	225	3.6	20.0	2

(Note) 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.**

MZE/MZS

STEP DRILLS

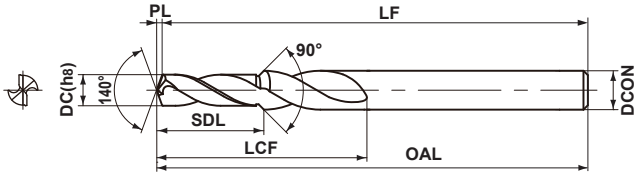
- Pre-hole drilling for metric screw thread.
- Helical coolant hole enables high speed machining (MZS type).

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel (MZE only)

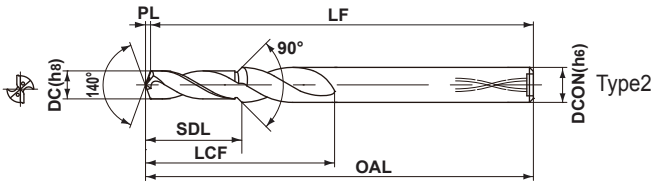
h6

	3<DC≤6	6<DC≤10	10<DC≤18
	0 / −0.018	0 / −0.022	0 / −0.027
MZE	0 / −0.018	0 / −0.022	0 / −0.027
MZS	0 / −0.008	0 / −0.009	0 / −0.011

MZE (External coolant)



MZS (Internal coolant)



(Note 1) MZS type bigger than ϕ5.0 have a recess in the end face.
(Note 2) Spot face drilling is not possible (chamfering only).
(Note 3) For metric coarse thread.
(Note 4) MZS type also available for shrink fit holder.

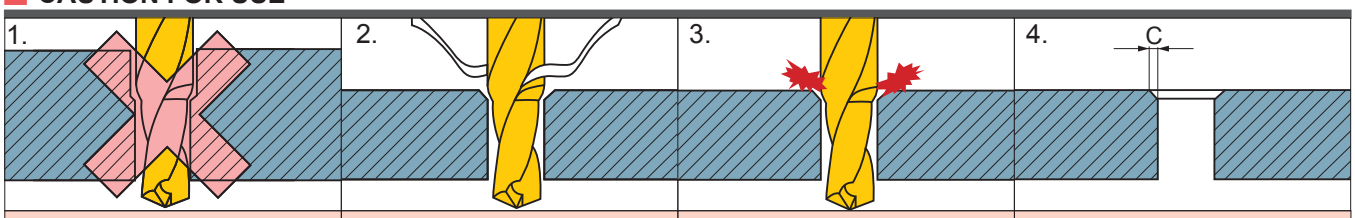
DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Order Number	Thread Size	Stock VP15TF	Dimensions (mm) SDL	LCF	OAL	LF	PL	DCON	Type
3.4	2	Ext.	MZE0340SM04	M4	●	8.6	21.6	73.6	73	0.6	6.0	1
	2	Int.	MZS0340SM04	M4	●	8.6	21.6	73.6	73	0.6	6.0	2
	3	Ext.	MZE0340MM04	M4	●	12.6	25.6	77.6	77	0.6	6.0	1
	3	Int.	MZS0340MM04	M4	●	12.6	25.6	77.6	77	0.6	6.0	2
4.3	2	Ext.	MZE0430SM05	M5	●	10.8	26.8	79.8	79	0.8	7.0	1
	2	Int.	MZS0430SM05	M5	●	10.8	26.8	79.8	79	0.8	7.0	2
	3	Ext.	MZE0430MM05	M5	●	15.8	31.8	84.8	84	0.8	7.0	1
	3	Int.	MZS0430MM05	M5	●	15.8	31.8	84.8	84	0.8	7.0	2
5.1	2	Ext.	MZE0510SM06	M6	●	12.9	30.9	84.9	84	0.9	8.0	1
	2	Int.	MZS0510SM06	M6	●	12.9	30.9	84.9	84	0.9	8.0	2
	3	Ext.	MZE0510MM06	M6	●	18.9	36.9	90.9	90	0.9	8.0	1
	3	Int.	MZS0510MM06	M6	●	18.9	36.9	90.9	90	0.9	8.0	2
6.8	2	Ext.	MZE0680SM08	M8	●	17.2	41.2	97.2	96	1.2	10.0	1
	2	Int.	MZS0680SM08	M8	●	17.2	41.2	97.2	96	1.2	10.0	2
	3	Ext.	MZE0680MM08	M8	●	25.2	49.2	105.2	104	1.2	10.0	1
	3	Int.	MZS0680MM08	M8	●	25.2	49.2	105.2	104	1.2	10.0	2
8.5	2	Ext.	MZE0850SM10	M10	●	21.5	51.5	113.5	112	1.5	12.0	1
	2	Int.	MZS0850SM10	M10	●	21.5	51.5	113.5	112	1.5	12.0	2
	3	Ext.	MZE0850MM10	M10	●	31.5	61.5	123.5	122	1.5	12.0	1
	3	Int.	MZS0850MM10	M10	●	31.5	61.5	123.5	122	1.5	12.0	2
10.3	2	Ext.	MZE1030SM12	M12	●	25.9	61.9	125.9	124	1.9	14.0	1
	2	Int.	MZS1030SM12	M12	●	25.9	61.9	125.9	124	1.9	14.0	2
	3	Ext.	MZE1030MM12	M12	●	37.9	73.9	137.9	136	1.9	14.0	1
	3	Int.	MZS1030MM12	M12	●	37.9	73.9	137.9	136	1.9	14.0	2

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

MZE/MZS

STEP DRILLS

CAUTION FOR USE



1.	2.	3.	4.
Spot facing as shown above is not possible due to the large diameter not having a back taper. Please contact us if spot face drills are required.	Chips from the chamfer machining tend to be elongated and may cause jamming. It is recommended to pick feed to reduce the length of chips.	Cutting resistance increases on initial contact with the chamfer. Reduce feed at this point.	The width of the chamfer is C1.0 for M4–M6, and C1.5 for M8–M12. For widths other than those stated above please contact us.

DRILL SIZE AND HOLE DIAMETERS FOR TAPPING

For Metric Coarse Screw Thread				
Thread Size	Initial Thread Diameter Tolerance		MZE/MZS Drill Application **DC**	Reference HSS Drill
	max.	min.		
M2.5x0.45	2.138	2.013	2.1	2.1
M3x0.5	2.599	2.459	2.5	2.5
M3.5x0.6	3.010	2.850	2.9	2.9
M4x0.7	3.422	3.242	3.4	3.3
M4.5x0.75	3.878	3.688	3.8	3.8
M5x0.8	4.334	4.134	4.3	4.2
M6x1	5.153	4.917	5.1	5.0
M7x1.25	6.153	5.917	6.1	6.0
M8x1.25	6.912	6.647	6.8	6.8

For Metric Coarse Screw Thread				
Thread Size	Initial Thread Diameter Tolerance		MZE/MZS Drill Application **DC**	Reference HSS Drill
	max.	min.		
M9x1.25	7.912	7.647	7.8	7.8
M10x1.5	8.676	8.376	8.5	8.5
M11x1.5	9.676	9.376	9.5	9.5
M12x1.75	10.441	10.106	10.3	10.3
M14x2	12.210	11.835	12.0	12.0
M16x2	14.210	13.835	14.0	14.0
M18x2.5	15.744	15.294	15.5	15.5
M20x2.5	17.744	17.294	17.5	17.5
M22x2.5	19.744	19.294	19.5	19.5

(Note) Holes drilled with an MZE type drill should be +0.01—+0.03mm oversize.
For thread tapping and replacement of HSS drills, a drill approximately 0.1mm bigger is recommended.

RECOMMENDED CUTTING CONDITIONS OF MZE/MZS DRILLS

MZE (External coolant)

Work 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)

Work 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)

MZE/MZS

STEP DRILLS

MZE (External coolant)

Work Material	Aluminium Alloy (Si<5%)			Heat Resistant Alloy 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)

MZS (Internal coolant)

Work 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)	9500	0.035 (0.020−0.050)	9500	0.035 (0.020−0.050)
1.2	10600	0.045 (0.030−0.060)	7900	0.045 (0.030−0.060)	7900	0.045 (0.030−0.060)
1.6	8900	0.055 (0.035−0.080)	6900	0.055 (0.035−0.080)	6900	0.055 (0.035−0.080)
2.0	7900	0.07 (0.040−0.100)	6300	0.07 (0.040−0.100)	6300	0.07 (0.040−0.100)
2.5	6300	0.085 (0.050−0.125)	5700	0.085 (0.050−0.125)	5000	0.085 (0.050−0.125)
3.2	7900	0.1 (0.06−0.13)	6900	0.1 (0.06−0.13)	5900	0.1 (0.06−0.13)
4.0	6300	0.12 (0.08−0.16)	6300	0.12 (0.08−0.16)	5100	0.11 (0.07−0.14)
5.0	5700	0.15 (0.10−0.20)	5700	0.15 (0.10−0.20)	4400	0.14 (0.09−0.18)
6.3	5000	0.2 (0.13−0.26)	4500	0.2 (0.13−0.26)	3500	0.18 (0.11−0.24)
8.0	4300	0.23 (0.18−0.28)	3900	0.23 (0.18−0.28)	3100	0.21 (0.16−0.25)
10.0	3800	0.27 (0.22−0.32)	3500	0.27 (0.22−0.32)	2500	0.23 (0.19−0.27)
12.0	3400	0.3 (0.26−0.34)	3100	0.3 (0.28−0.34)	2300	0.26 (0.22−0.29)
16.0	2700	0.33 (0.27−0.38)	2500	0.33 (0.28−0.38)	1700	0.28 (0.23−0.33)
20.0	2300	0.35 (0.30−0.40)	2200	0.35 (0.30−0.40)	1500	0.3 (0.26−0.34)

Work 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	6300	0.03 (0.020−0.044)	12700	0.035 (0.020−0.050)	9500	0.035 (0.020−0.050)
1.2	5300	0.04 (0.030−0.053)	10600	0.045 (0.030−0.060)	7900	0.045 (0.030−0.060)
1.6	4900	0.05 (0.035−0.070)	8900	0.055 (0.035−0.080)	6900	0.055 (0.035−0.080)
2.0	4700	0.06 (0.040−0.080)	7900	0.07 (0.040−0.100)	6300	0.07 (0.040−0.100)
2.5	3800	0.075 (0.050−0.100)	6300	0.085 (0.050−0.125)	5000	0.085 (0.050−0.125)
3.2	2900	0.08 (0.06−0.10)	7900	0.1 (0.06−0.13)	5900	0.1 (0.06−0.13)
4.0	3100	0.09 (0.06−0.11)	6300	0.12 (0.08−0.16)	5100	0.12 (0.08−0.16)
5.0	2500	0.11 (0.08−0.14)	5700	0.15 (0.10−0.20)	4400	0.15 (0.10−0.20)
6.3	2200	0.14 (0.09−0.18)	5000	0.2 (0.13−0.26)	3500	0.2 (0.13−0.26)
8.0	1900	0.15 (0.10−0.19)	4300	0.25 (0.18−0.31)	3100	0.23 (0.18−0.28)
10.0	1500	0.16 (0.12−0.20)	3800	0.29 (0.22−0.35)	2500	0.27 (0.22−0.32)
12.0	1500	0.18 (0.15−0.21)	3400	0.32 (0.26−0.37)	2300	0.3 (0.26−0.34)
16.0	1200	0.19 (0.14−0.24)	2700	0.35 (0.27−0.42)	1700	0.33 (0.28−0.38)
20.0	1100	0.21 (0.15−0.26)	2300	0.37 (0.30−0.44)	1500	0.35 (0.30−0.40)

MZE/MZS

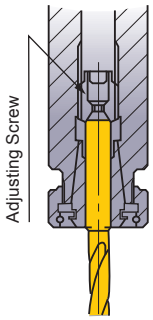
STEP DRILLS

MZS (Internal coolant)

Work Material	Aluminium Alloy (Si<5%)			Heat Resistant Alloy Inconel718 etc		
Dia. **DC** (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)		Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	
1.0	19000	0.05	(0.030—0.075)	3100	0.02	(0.016—0.027)
1.2	15900	0.065	(0.045—0.090)	2600	0.025	(0.022—0.032)
1.6	13900	0.085	(0.053—0.120)	1900	0.03	(0.025—0.040)
2.0	11100	0.105	(0.060—0.150)	1500	0.04	(0.032—0.050)
2.5	10100	0.135	(0.075—0.200)	1200	0.05	(0.040—0.060)
3.2	9900	0.23	(0.10—0.35)	1400	0.07	(0.05—0.09)
4.0	7900	0.24	(0.12—0.35)	1100	0.09	(0.06—0.11)
5.0	7000	0.25	(0.15—0.35)	1200	0.11	(0.08—0.14)
6.3	6000	0.35	(0.20—0.50)	1200	0.13	(0.09—0.16)
8.0	4700	0.35	(0.20—0.50)	900	0.14	(0.11—0.17)
10.0	4100	0.5	(0.20—0.80)	700	0.15	(0.12—0.17)
12.0	3900	0.5	(0.20—0.80)	600	0.16	(0.13—0.18)
16.0	3300	0.6	(0.20—1.00)	500	0.18	(0.14—0.21)
20.0	2700	0.6	(0.20—1.00)	400	0.19	(0.15—0.22)

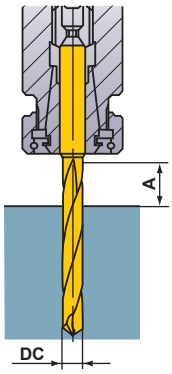
OPERATIONAL GUIDANCE

Drill Holding



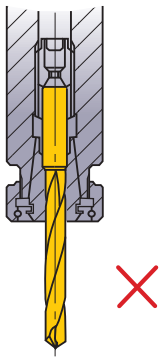
Thrust bearing type collet chuck holds the drill securely.

Drill Length



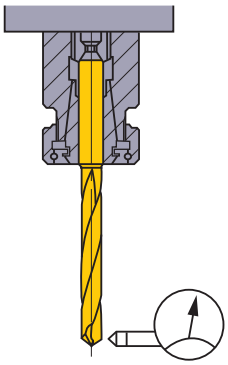
A ≥ DC x 1.5

Drill Installation



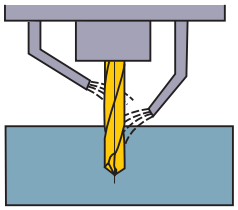
Do not clamp on the flutes.

Installation Tolerance



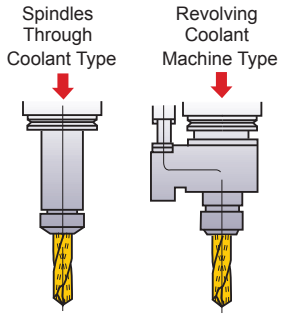
Run-out ≤ 0.03mm

Coolant Method (MZE)



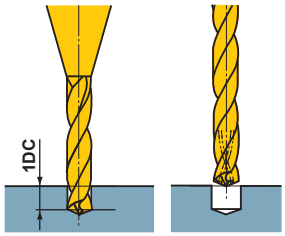
Two coolant positions, at the end and at the center are ideal.

Through Coolant Type (MZS)



Coolant pressure is approx. 0.5—1MPa (<ϕ5:2—3MPa). Coolant volume is 1.5—4.0l/min.

Drill Installation



①When machining a prepared hole with the MZE-SA please set the depth to 1DC (DC=drill diameter).
②Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

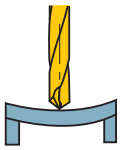
Coolant Handling

<MZS Type>

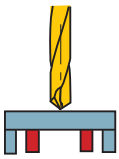
1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece

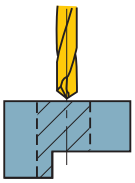


If Bending Occurs ×



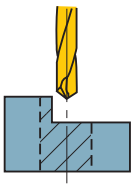
Support the Workpiece ○

Interrupted Cutting



One Process ○

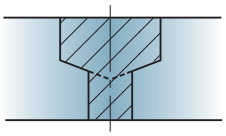
①Lower the feed when drilling the interrupted part.



Requires Prior Machining △

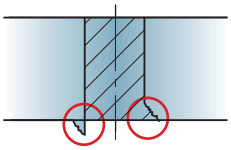
①Spot face with an end mill prior to drilling.

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



①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

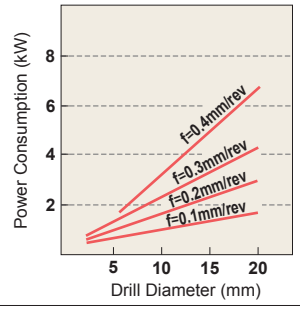
CAUTION TO USE MZS TYPE (Drill Diameter ≤ ϕ3)

- Please use a fine mesh filter (mesh≤3μm) for coolant to prevent jamming in the oil hole.
- For deep drilling (l/d>3), machining guiding hole is recommended. (Use MZE□□□□SA type for guiding hole.)
- Pick drilling is also effective.

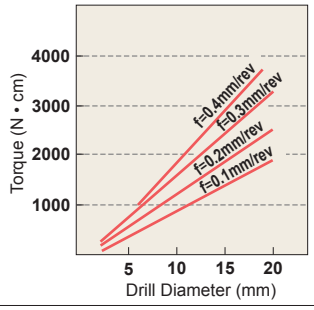
CUTTING RESISTANCE

Workpiece : JIS SCM440(300HB) Cutting Speed : 50m/min

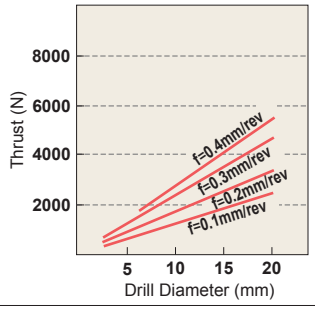
Power Consumption



Torque



Thrust



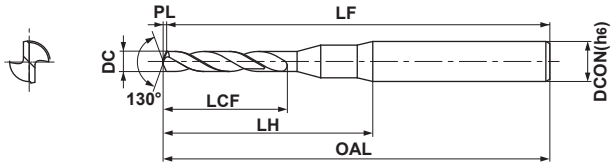
MSE

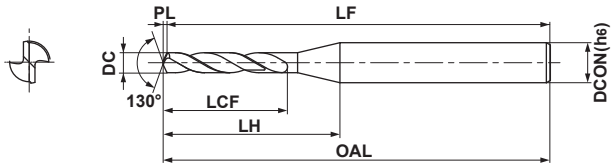
MIRACLE MINI STAR DRILL

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

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

	0.10≤DC≤0.99
	0 / −0.009
h6	0 / −0.006





(Note) MSE drills are suitable for use with shrink fit holders.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.10	●		MSE0010SB	1.22	9.72	38.02	38	0.02	3	1
0.11	●		MSE0011SB	1.23	9.73	38.03	38	0.03	3	1
0.12	●		MSE0012SB	1.43	9.73	38.03	38	0.03	3	1
0.13	●		MSE0013SB	1.43	9.73	38.03	38	0.03	3	1
0.14	●		MSE0014SB	2.03	9.73	38.03	38	0.03	3	1
0.15	●		MSE0015SB	2.03	9.73	38.03	38	0.03	3	1
0.16	●		MSE0016SB	2.04	9.74	38.04	38	0.04	3	1
0.17	●		MSE0017SB	2.04	9.74	38.04	38	0.04	3	1
0.18	●		MSE0018SB	2.04	9.74	38.04	38	0.04	3	1
0.19	●		MSE0019SB	2.04	9.74	38.04	38	0.04	3	1
0.20	●		MSE0020SB	2.55	9.75	38.05	38	0.05	3	1
0.21	●		MSE0021SB	2.55	9.75	38.05	38	0.05	3	1
0.22	●		MSE0022SB	2.55	9.75	38.05	38	0.05	3	1
0.23	●		MSE0023SB	2.55	9.75	38.05	38	0.05	3	1
0.24	●		MSE0024SB	3.06	9.76	38.06	38	0.06	3	1
0.25	●		MSE0025SB	3.06	9.76	38.06	38	0.06	3	1
0.26	●		MSE0026SB	3.06	9.76	38.06	38	0.06	3	1
0.27	●		MSE0027SB	3.06	9.76	38.06	38	0.06	3	1
0.28	●		MSE0028SB	3.07	9.77	38.07	38	0.07	3	1
0.29	●		MSE0029SB	3.07	9.77	38.07	38	0.07	3	1
0.30		●	MSE0030SB	5.07	10.27	38.07	38	0.07	3	2
0.31		●	MSE0031SB	5.07	10.27	38.07	38	0.07	3	2
0.32		●	MSE0032SB	5.07	10.27	38.07	38	0.07	3	2
0.33		●	MSE0033SB	5.08	10.28	38.08	38	0.08	3	2
0.34		●	MSE0034SB	6.08	11.28	38.08	38	0.08	3	2
0.35		●	MSE0035SB	6.08	11.18	38.08	38	0.08	3	2
0.36		●	MSE0036SB	6.08	11.18	38.08	38	0.08	3	2
0.37		●	MSE0037SB	6.09	11.19	38.09	38	0.09	3	2
0.38		●	MSE0038SB	6.09	11.19	38.09	38	0.09	3	2
0.39		●	MSE0039SB	6.09	11.19	38.09	38	0.09	3	2
0.40		●	MSE0040SB	7.09	12.19	38.09	38	0.09	3	2
0.41		●	MSE0041SB	7.10	12.10	38.10	38	0.10	3	2
0.42		●	MSE0042SB	7.10	12.10	38.10	38	0.10	3	2
0.43		●	MSE0043SB	7.10	12.10	38.10	38	0.10	3	2

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.44		●	MSE0044SB	7.10	12.10	38.10	38	0.10	3	2
0.45		●	MSE0045SB	7.10	12.10	38.10	38	0.10	3	2
0.46		●	MSE0046SB	7.11	12.01	38.11	38	0.11	3	2
0.47		●	MSE0047SB	7.11	12.01	38.11	38	0.11	3	2
0.48		●	MSE0048SB	7.11	12.01	38.11	38	0.11	3	2
0.49		●	MSE0049SB	7.11	12.01	38.11	38	0.11	3	2
0.50		●	MSE0050SB	7.12	12.02	38.12	38	0.12	3	2
0.51		●	MSE0051SB	7.12	11.92	38.12	38	0.12	3	2
0.52		●	MSE0052SB	7.12	11.92	38.12	38	0.12	3	2
0.53		●	MSE0053SB	7.12	11.92	38.12	38	0.12	3	2
0.54		●	MSE0054SB	7.13	11.93	38.13	38	0.13	3	2
0.55		●	MSE0055SB	7.13	11.93	38.13	38	0.13	3	2
0.56		●	MSE0056SB	7.13	11.93	38.13	38	0.13	3	2
0.57		●	MSE0057SB	7.13	11.83	38.13	38	0.13	3	2
0.58		●	MSE0058SB	7.14	11.84	38.14	38	0.14	3	2
0.59		●	MSE0059SB	7.14	11.84	38.14	38	0.14	3	2
0.60		●	MSE0060SB	7.14	11.84	38.14	38	0.14	3	2
0.61		●	MSE0061SB	7.14	11.84	38.14	38	0.14	3	2
0.62		●	MSE0062SB	7.14	11.74	38.14	38	0.14	3	2
0.63		●	MSE0063SB	7.15	11.75	38.15	38	0.15	3	2
0.64		●	MSE0064SB	7.15	11.75	38.15	38	0.15	3	2
0.65		●	MSE0065SB	7.15	11.75	38.15	38	0.15	3	2
0.66		●	MSE0066SB	7.15	11.75	38.15	38	0.15	3	2
0.67		●	MSE0067SB	7.16	11.66	38.16	38	0.16	3	2
0.68		●	MSE0068SB	7.16	11.66	38.16	38	0.16	3	2
0.69		●	MSE0069SB	7.16	11.66	38.16	38	0.16	3	2
0.70		●	MSE0070SB	8.16	12.66	38.16	38	0.16	3	2
0.71		●	MSE0071SB	8.17	12.67	38.17	38	0.17	3	2
0.72		●	MSE0072SB	8.17	12.67	38.17	38	0.17	3	2
0.73		●	MSE0073SB	8.17	12.57	38.17	38	0.17	3	2
0.74		●	MSE0074SB	8.17	12.57	38.17	38	0.17	3	2
0.75		●	MSE0075SB	8.17	12.57	38.17	38	0.17	3	2
0.76		●	MSE0076SB	8.18	12.58	38.18	38	0.18	3	2
0.77		●	MSE0077SB	8.18	12.58	38.18	38	0.18	3	2

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

● : Inventory maintained in Japan.

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.78		●	MSE0078SB	8.18	12.48	38.18	38	0.18	3	2
0.79		●	MSE0079SB	8.18	12.48	38.18	38	0.18	3	2
0.80		●	MSE0080SB	10.19	14.49	38.19	38	0.19	3	2
0.81		●	MSE0081SB	10.19	14.49	38.19	38	0.19	3	2
0.82		●	MSE0082SB	10.19	14.49	38.19	38	0.19	3	2
0.83		●	MSE0083SB	10.19	14.49	38.19	38	0.19	3	2
0.84		●	MSE0084SB	10.20	14.40	38.20	38	0.20	3	2
0.85		●	MSE0085SB	10.20	14.40	38.20	38	0.20	3	2
0.86		●	MSE0086SB	10.20	14.40	38.20	38	0.20	3	2
0.87		●	MSE0087SB	10.20	14.40	38.20	38	0.20	3	2
0.88		●	MSE0088SB	10.21	14.41	38.21	38	0.21	3	2

External Coolant

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.89		●	MSE0089SB	10.21	14.31	38.21	38	0.21	3	2
0.90		●	MSE0090SB	10.21	14.31	38.21	38	0.21	3	2
0.91		●	MSE0091SB	10.21	14.31	38.21	38	0.21	3	2
0.92		●	MSE0092SB	10.21	14.31	38.21	38	0.21	3	2
0.93		●	MSE0093SB	10.22	14.32	38.22	38	0.22	3	2
0.94		●	MSE0094SB	10.22	14.22	38.22	38	0.22	3	2
0.95		●	MSE0095SB	10.22	14.22	38.22	38	0.22	3	2
0.96		●	MSE0096SB	10.22	14.22	38.22	38	0.22	3	2
0.97		●	MSE0097SB	10.23	14.23	38.23	38	0.23	3	2
0.98		●	MSE0098SB	10.23	14.23	38.23	38	0.23	3	2
0.99		●	MSE0099SB	10.23	14.23	38.23	38	0.23	3	2

RECOMMENDED CUTTING CONDITIONS

Work 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

Work 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

1) When drilling holes up to ϕ0.3mm, the use of a spot drill is recommended.
(Order number : MSP0300SB, Cutting conditions : See below.)
2) Change cutting conditions depending on your machine and workpiece rigidity.
3) When machining holes over 5D, reduce the step stated above.
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.

MSE

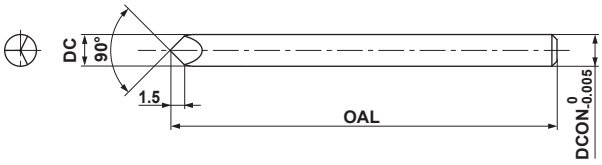
MIRACLE MINI STAR DRILL

Work 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

Work Material	Aluminium Alloy (Si<5%)					Heat Resistant Alloy 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

1) When drilling holes up to Φ0.3mm, the use of a spot drill is recommended.
(Order number : MSP0300SB, Cutting conditions : See below.)
2) Change cutting conditions depending on your machine and workpiece rigidity.
3) When machining holes over 5D, reduce the step stated above.
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.

MSP
SPOT DRILL



Order Number	Grade	Stock	Dimensions (mm)			Diameter Range (mm)
			DC	OAL	DCON	
MSP0300SB	**VP15TF**	●	3	38	3	**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

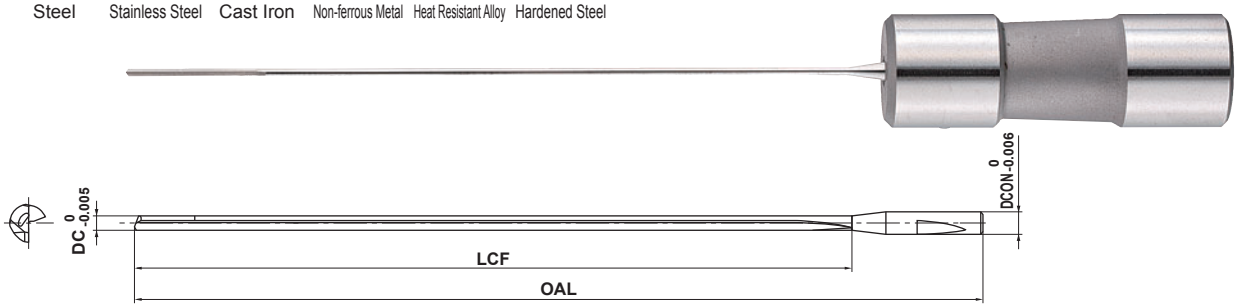
● : Inventory maintained in Japan.

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	Heat Resistant Alloy	Hardened Steel



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

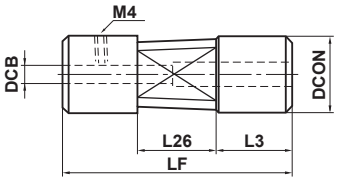
DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	DCON
0.7	50	Int.	●	MGS0070L040B	40	80	3
	80	Int.	●	MGS0070L060B	60	100	3
0.8	45	Int.	●	MGS0080L040B	40	80	3
	70	Int.	●	MGS0080L060B	60	100	3
0.9	40	Int.	●	MGS0090L040B	40	80	3
	60	Int.	●	MGS0090L060B	60	100	3
1.0	35	Int.	●	MGS0100L040B	40	80	3
	55	Int.	●	MGS0100L060B	60	100	3
	75	Int.	●	MGS0100L080B	80	120	3
1.1	30	Int.	●	MGS0110L040B	40	80	3
	50	Int.	●	MGS0110L060B	60	100	3
	65	Int.	●	MGS0110L080B	80	120	3
1.2	30	Int.	●	MGS0120L040B	40	80	3
	45	Int.	●	MGS0120L060B	60	100	3
	60	Int.	●	MGS0120L080B	80	120	3
1.3	40	Int.	●	MGS0130L060B	60	100	3
	55	Int.	●	MGS0130L080B	80	120	3
	70	Int.	●	MGS0130L100B	100	140	3
1.4	35	Int.	●	MGS0140L060B	60	100	3
	50	Int.	●	MGS0140L080B	80	120	3
	65	Int.	●	MGS0140L100B	100	140	3
1.5	35	Int.	●	MGS0150L060B	60	100	3
	50	Int.	●	MGS0150L080B	80	120	3
	60	Int.	●	MGS0150L100B	100	140	3
1.6	30	Int.	●	MGS0160L060B	60	100	3
	45	Int.	●	MGS0160L080B	80	120	3
	55	Int.	●	MGS0160L100B	100	140	3
1.7	30	Int.	●	MGS0170L060B	60	100	3
	40	Int.	●	MGS0170L080B	80	120	3
	55	Int.	●	MGS0170L100B	100	140	3

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	DCON
1.8	30	Int.	●	MGS0180L060B	60	100	3
	40	Int.	●	MGS0180L080B	80	120	3
	50	Int.	●	MGS0180L100B	100	140	3
1.9	25	Int.	●	MGS0190L060B	60	100	3
	35	Int.	●	MGS0190L080B	80	120	3
	45	Int.	●	MGS0190L100B	100	140	3
2.0	25	Int.	●	MGS0200L060B	60	100	3
	35	Int.	●	MGS0200L080B	80	120	3
	45	Int.	●	MGS0200L100B	100	140	3
2.1	35	Int.	●	MGS0210L080B	80	120	3
	40	Int.	●	MGS0210L100B	100	140	3
2.2	30	Int.	●	MGS0220L080B	80	120	3
	40	Int.	●	MGS0220L100B	100	140	3
2.3	30	Int.	●	MGS0230L080B	80	120	3
	40	Int.	●	MGS0230L100B	100	140	3
2.4	30	Int.	●	MGS0240L080B	80	120	3
	35	Int.	●	MGS0240L100B	100	140	3
2.5	25	Int.	●	MGS0250L080B	80	120	3
	35	Int.	●	MGS0250L100B	100	140	3
2.6	25	Int.	●	MGS0260L080B	80	120	3
	35	Int.	●	MGS0260L100B	100	140	3
2.7	25	Int.	●	MGS0270L080B	80	120	3
	30	Int.	●	MGS0270L100B	100	140	3
2.8	25	Int.	●	MGS0280L080B	80	120	3
	30	Int.	●	MGS0280L100B	100	140	3
2.9	20	Int.	●	MGS0290L080B	80	120	3
	30	Int.	●	MGS0290L100B	100	140	3
3.0	20	Int.	●	MGS0300L080B	80	120	3
	30	Int.	●	MGS0300L100B	100	140	3

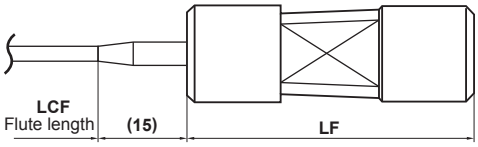
(Note) Please consult us regarding coated type drills (***VP***, ***GP*** and ***UP*** coated carbide).

● : Inventory maintained in Japan.

DRIVER



WHEN CONNECTED WITH A DRIVER



Order Number	Stock	Dimensions (mm)						
		DCON	DCB	LF	L3	L26	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

RECOMMENDED CUTTING CONDITIONS

Work 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

Work 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

Work 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

1) For safety and success, high pressure coolant is required. (Minimum coolant pressure=1,000PSI)
2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
3) A pilot hole or guide bushing is required.

MGS

SOLID GUN DRILL

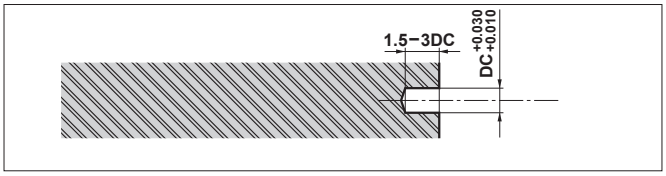
Work Material	Aluminium Alloy (Si<5%)				Copper, Copper alloy			
Recommended grinding fluid	Water insoluble Water soluble				Water insoluble Water soluble			
Dia. **DC** (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (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

1) For safety and success, high pressure coolant is required. (Minimum coolant pressure=1,000PSI)
2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
3) A pilot hole or guide bushing is required.

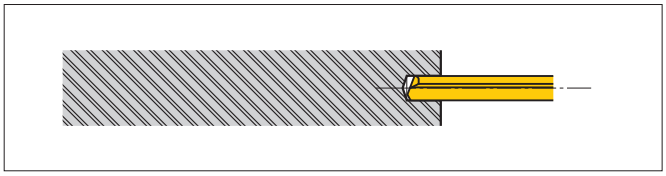
SPECIAL APPLICATION NOTES

- For safety and success, high pressure coolant is required.
  (Minimum coolant pressure=1,000PSI)
- Coolant filter must be less than 5 microns.
  Fine filtration is necessary to prevent blockage of the coolant holes.
- A pilot hole or guide bushing is required.

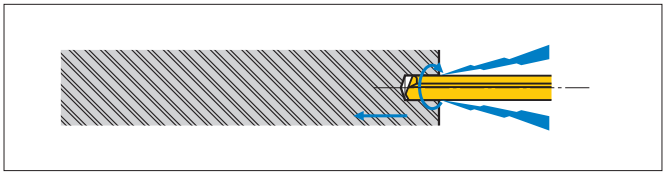
HOW TO USE



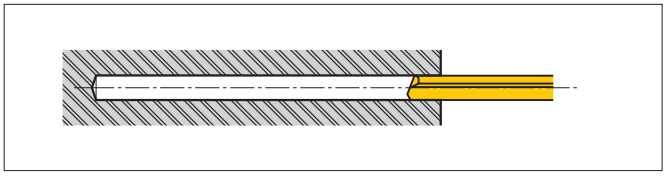
1. Pilot hole drilling.
   (Mitsubishi's MZE, MZS, MWE or MWS is recommended.)



2. Drill is inserted into the pilot hole with the MSG drill rotation stopped or rotating CCW at 300rpm or less.
   ● UP to 1-2mm before hole bottom.



3. Coolant is turned ON, raise cutting speed and feed to the recommended cutting condition.



4. Return to "Pos 2" after drilling end, coolant turned OFF and drill rotation is stopped.

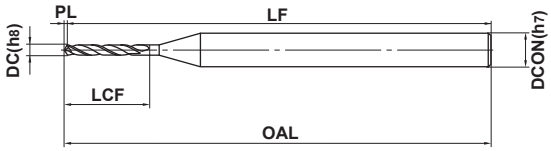
VCSSS

Short, For steel (3mm shank series)

UWC VC 130° DC≤0.6 120° DC≥0.7 X Thinning

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

h7 DC≤2.4 0 −0.014 / 0 −0.010



● First recommendation for pilot hole drilling of hardened material.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VCSSSD0030	0.3	3.07	38.07	38	0.07	3	●
VCSSSD0040	0.4	4.09	38.09	38	0.09	3	●
VCSSSD0050	0.5	4.12	38.12	38	0.12	3	●
VCSSSD0060	0.6	5.14	38.14	38	0.14	3	●
VCSSSD0070	0.7	5.20	38.20	38	0.20	3	●
VCSSSD0080	0.8	6.23	38.23	38	0.23	3	●
VCSSSD0090	0.9	6.26	38.26	38	0.26	3	●
VCSSSD0100	1.0	8.3	38.3	38	0.3	3	●
VCSSSD0110	1.1	8.3	38.3	38	0.3	3	●
VCSSSD0120	1.2	8.4	38.4	38	0.4	3	●
VCSSSD0130	1.3	8.4	38.4	38	0.4	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VCSSSD0140	1.4	8.4	38.4	38	0.4	3	●
VCSSSD0150	1.5	10.4	45.4	45	0.4	3	●
VCSSSD0160	1.6	10.5	45.5	45	0.5	3	●
VCSSSD0170	1.7	10.5	45.5	45	0.5	3	●
VCSSSD0180	1.8	10.5	45.5	45	0.5	3	●
VCSSSD0190	1.9	10.6	45.6	45	0.6	3	●
VCSSSD0200	2.0	12.6	45.6	45	0.6	3	●
VCSSSD0210	2.1	12.6	45.6	45	0.6	3	●
VCSSSD0220	2.2	12.6	45.6	45	0.6	3	●
VCSSSD0230	2.3	12.7	45.7	45	0.7	3	●
VCSSSD0240	2.4	12.7	45.7	45	0.7	3	●

RECOMMENDED CUTTING CONDITIONS

Work Material	Heat-treated steel AISI H13, AISI 4140 etc. (40–50HRC)			Hardened steel AISI H13, AISI 420 etc. (50–55HRC)			Hardened steel AISI D2, Powder high-speed steel etc. (55–60HRC)		
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Step feed (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Step feed (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Step feed (mm)
0.3	21000	0.005	0.03	16000	0.005	0.03	11000	0.005	0.03
0.5	13000	0.005	0.05	9600	0.005	0.05	6400	0.005	0.05
0.8	8000	0.008	0.08	6000	0.008	0.08	4000	0.008	0.08
1.0	6400	0.01	0.10	4800	0.01	0.10	3200	0.01	0.10
1.2	5300	0.01	0.15	4000	0.01	0.15	2700	0.01	0.10
1.5	4200	0.02	0.20	3200	0.01	0.20	2100	0.01	0.20
1.8	3500	0.03	0.25	2700	0.01	0.25	1800	0.01	0.20
2.0	3200	0.04	0.30	2400	0.02	0.30	1600	0.02	0.30
2.2	2900	0.04	0.40	2200	0.02	0.40	1400	0.02	0.30
2.4	2700	0.05	0.50	2000	0.02	0.50	1300	0.02	0.30

1) Please use a machine with a high accuracy spindle.
2) A collet chuck is recommended to maintain shank condition.
3) Use emulsion as a cutting fluid.

● : Inventory maintained in Japan.

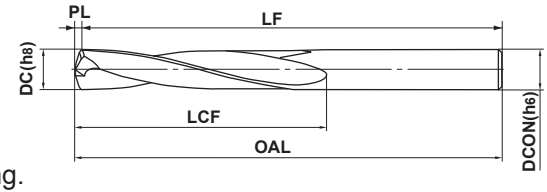
VCHSM

Medium, For hardened material

UWC | VC | 130° DC<6 | 120° 140° DC≥6 | X Thinning

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

	DC≦3	3<DC≦6	6<DC≦10	10<DC≦16
	0 −0.014	0 −0.018	0 −0.022	0 −0.027
h6	0 −0.009	0 −0.012	0 −0.015	0 −0.018



● A suitable geometry for high hardness (60 HRC) material drilling.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VCHSMD0250	2.5	20.6	55.6	55	0.6	2.5	●
VCHSMD0260	2.6	20.6	55.6	55	0.6	2.6	●
VCHSMD0270	2.7	20.6	55.6	55	0.6	2.7	●
VCHSMD0280	2.8	21.7	60.7	60	0.7	2.8	●
VCHSMD0290	2.9	21.7	60.7	60	0.7	2.9	●
VCHSMD0300	3.0	21.7	60.7	60	0.7	3.0	●
VCHSMD0310	3.1	24.7	60.7	60	0.7	3.1	●
VCHSMD0320	3.2	24.7	60.7	60	0.7	3.2	●
VCHSMD0330	3.3	24.8	60.8	60	0.8	3.3	●
VCHSMD0340	3.4	24.8	60.8	60	0.8	3.4	●
VCHSMD0350	3.5	24.8	60.8	60	0.8	3.5	●
VCHSMD0360	3.6	27.8	60.8	60	0.8	3.6	●
VCHSMD0370	3.7	27.9	60.9	60	0.9	3.7	●
VCHSMD0380	3.8	27.9	60.9	60	0.9	3.8	●
VCHSMD0390	3.9	27.9	60.9	60	0.9	3.9	●
VCHSMD0400	4.0	27.9	60.9	60	0.9	4.0	●
VCHSMD0410	4.1	30.0	64.0	63	1.0	4.1	●
VCHSMD0420	4.2	30.0	64.0	63	1.0	4.2	●
VCHSMD0430	4.3	30.0	64.0	63	1.0	4.3	●
VCHSMD0440	4.4	30.0	64.0	63	1.0	4.4	●
VCHSMD0450	4.5	30.0	64.0	63	1.0	4.5	●
VCHSMD0460	4.6	33.1	69.1	68	1.1	4.6	●
VCHSMD0470	4.7	33.1	69.1	68	1.1	4.7	●
VCHSMD0480	4.8	33.1	69.1	68	1.1	4.8	●
VCHSMD0490	4.9	33.1	69.1	68	1.1	4.9	●
VCHSMD0500	5.0	33.2	69.2	68	1.2	5.0	●
VCHSMD0510	5.1	35.2	73.2	72	1.2	5.1	●
VCHSMD0520	5.2	35.2	73.2	72	1.2	5.2	●
VCHSMD0530	5.3	35.2	73.2	72	1.2	5.3	●
VCHSMD0540	5.4	35.3	73.3	72	1.3	5.4	●
VCHSMD0550	5.5	35.3	73.3	72	1.3	5.5	●
VCHSMD0560	5.6	37.3	75.3	74	1.3	5.6	●
VCHSMD0570	5.7	37.3	75.3	74	1.3	5.7	●
VCHSMD0580	5.8	37.4	75.4	74	1.4	5.8	●
VCHSMD0590	5.9	37.4	75.4	74	1.4	5.9	●
VCHSMD0600	6.0	42.2	82.2	81	1.2	6.0	●
VCHSMD0650	6.5	42.3	82.3	81	1.3	6.5	●
VCHSMD0690	6.9	44.4	84.4	83	1.4	6.9	●
VCHSMD0700	7.0	44.4	84.4	83	1.4	7.0	●
VCHSMD0750	7.5	46.5	88.5	87	1.5	7.5	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VCHSMD0800	8.0	49.6	91.6	90	1.6	8.0	●
VCHSMD0850	8.5	54.7	97.7	96	1.7	8.5	●
VCHSMD0860	8.6	56.7	99.7	98	1.7	8.6	●
VCHSMD0900	9.0	56.8	99.8	98	1.8	9.0	●
VCHSMD0950	9.5	59.9	103.9	102	1.9	9.5	●
VCHSMD1000	10.0	62.0	107.0	105	2.0	10.0	●
VCHSMD1040	10.4	68.1	114.1	112	2.1	10.4	●
VCHSMD1050	10.5	68.1	114.1	112	2.1	10.5	●
VCHSMD1100	11.0	70.2	116.2	114	2.2	11.0	●
VCHSMD1150	11.5	73.3	120.3	118	2.3	11.5	●
VCHSMD1200	12.0	75.4	123.4	121	2.4	12.0	●
VCHSMD1250	12.5	78.5	137.5	135	2.5	12.5	●
VCHSMD1300	13.0	80.6	139.6	137	2.6	13.0	●
VCHSMD1350	13.5	86.7	146.7	144	2.7	13.5	●
VCHSMD1400	14.0	88.8	149.8	147	2.8	14.0	●
VCHSMD1450	14.5	91.9	153.9	151	2.9	14.5	●
VCHSMD1500	15.0	94.0	156.0	153	3.0	15.0	●
VCHSMD1550	15.5	97.2	160.2	157	3.2	15.5	●
VCHSMD1600	16.0	99.3	163.3	160	3.3	16.0	●

RECOMMENDED CUTTING CONDITIONS

Work Material	Hardened steel AISI H13, AISI 420 etc. (50—55HRC)		Hardened steel AISI D2, Powder high-speed steel etc. (55—60HRC)	
Dia. DC (mm)	Revolution (min^{-1})	Feed rate (mm/rev)	Revolution (min^{-1})	Feed rate (mm/rev)
2.5	1900	0.06	1300	0.04
3.0	1600	0.06	1100	0.04
4.0	1200	0.06	800	0.04
5.0	1000	0.06	600	0.04
6.0	800	0.06	530	0.04
8.0	600	0.07	400	0.05
10.0	480	0.07	320	0.05
12.0	400	0.07	270	0.05
14.0	340	0.07	230	0.05
16.0	300	0.07	200	0.05

1) Use rigid machines.
2) Collet chuck is recommended to maintain shank condition.
3) Use emulsion as cutting fluid.
4) Recommended depth of drilling is 3DC (DC:drill diameter) under these cutting conditions.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

MAE/MAS

- Specially for aluminium and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for roll taps.
- Helical through coolant hole enables high speed machining (MAS type).

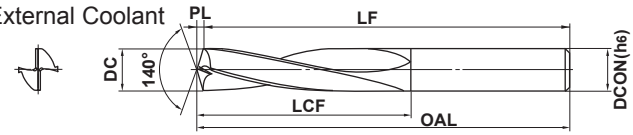
P	M	K	N	S	H
		Cast Iron	Non-ferrous Metal		

	DC=3	3<DC≤6	6<DC≤10	10<DC≤16
	+0.005 0	+0.005 0	+0.005 0	+0.005 0
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011

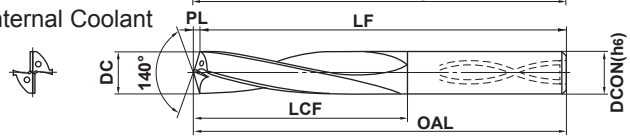
MAE (External coolant)

MAS (Internal coolant)

External Coolant



Internal Coolant



(Note 1) MAS type bigger than ϕ5.0 have a recess in the end face.
(Note 2) MAE/MAS drills are suitable for use with shrink fit holders.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
3.0	3	Ext.	●	MAE0300MB	21.5	61.5	61	0.5	3
	3	Int.	□	MAS0300MB	21.5	61.5	61	0.5	3
	6	Int.	●	MAS0300LB	30.5	70.5	70	0.5	3
3.1	3	Ext.	●	MAE0310MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0310MB	24.6	64.6	64	0.6	4
	6	Int.	●	MAS0310LB	34.6	74.6	74	0.6	4
3.2	3	Ext.	●	MAE0320MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0320MB	24.6	64.6	64	0.6	4
	6	Int.	●	MAS0320LB	34.6	74.6	74	0.6	4
3.3	3	Ext.	●	MAE0330MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0330MB	24.6	64.6	64	0.6	4
	6	Int.	●	MAS0330LB	34.6	74.6	74	0.6	4
3.4	3	Ext.	●	MAE0340MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0340MB	24.6	64.6	64	0.6	4
	6	Int.	●	MAS0340LB	34.6	74.6	74	0.6	4
3.5	3	Ext.	●	MAE0350MB	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0350MB	24.6	64.6	64	0.6	4
	6	Int.	●	MAS0350LB	34.6	74.6	74	0.6	4
3.6	3	Ext.	●	MAE0360MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0360MB	28.7	68.7	68	0.7	4
	6	Int.	●	MAS0360LB	40.7	80.7	80	0.7	4
3.65	3	Ext.	●	*MAE0365MB	28.7	68.7	68	0.7	4
	3	Int.	□	*MAS0365MB	28.7	68.7	68	0.7	4
	6	Int.	●	*MAS0365LB	40.7	80.7	80	0.7	4
3.7	3	Ext.	●	MAE0370MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0370MB	28.7	68.7	68	0.7	4
	6	Int.	●	MAS0370LB	40.7	80.7	80	0.7	4
3.8	3	Ext.	●	MAE0380MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0380MB	28.7	68.7	68	0.7	4
	6	Int.	●	MAS0380LB	40.7	80.7	80	0.7	4
3.9	3	Ext.	●	MAE0390MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0390MB	28.7	68.7	68	0.7	4
	6	Int.	●	MAS0390LB	40.7	80.7	80	0.7	4
4.0	3	Ext.	●	MAE0400MB	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0400MB	28.7	68.7	68	0.7	4
	6	Int.	●	MAS0400LB	40.7	80.7	80	0.7	4
4.1	3	Ext.	●	MAE0410MB	31.7	71.7	71	0.7	5
	3	Int.	□	MAS0410MB	31.7	71.7	71	0.7	5
	6	Int.	●	MAS0410LB	44.7	84.7	84	0.7	5

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
4.2	3	Ext.	●	MAE0420MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0420MB	31.8	71.8	71	0.8	5
	6	Int.	●	MAS0420LB	44.8	84.8	84	0.8	5
4.3	3	Ext.	●	MAE0430MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0430MB	31.8	71.8	71	0.8	5
	6	Int.	●	MAS0430LB	44.8	84.8	84	0.8	5
4.4	3	Ext.	●	MAE0440MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0440MB	31.8	71.8	71	0.8	5
	6	Int.	●	MAS0440LB	44.8	84.8	84	0.8	5
4.5	3	Ext.	●	MAE0450MB	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0450MB	31.8	71.8	71	0.8	5
	6	Int.	●	MAS0450LB	44.8	84.8	84	0.8	5
4.6	3	Ext.	●	*MAE0460MB	33.8	73.8	73	0.8	5
	3	Int.	□	*MAS0460MB	33.8	73.8	73	0.8	5
	6	Int.	●	*MAS0460LB	48.8	88.8	88	0.8	5
4.7	3	Ext.	●	MAE0470MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0470MB	33.9	73.9	73	0.9	5
	6	Int.	●	MAS0470LB	48.9	88.9	88	0.9	5
4.8	3	Ext.	●	MAE0480MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0480MB	33.9	73.9	73	0.9	5
	6	Int.	●	MAS0480LB	48.9	88.9	88	0.9	5
4.9	3	Ext.	●	MAE0490MB	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0490MB	33.9	73.9	73	0.9	5
	6	Int.	●	MAS0490LB	48.9	88.9	88	0.9	5
5.0	3	Ext.	●	MAE0500MB	33.9	73.9	73	0.9	5
	3	Int.	●	MAS0500MB	33.9	73.9	73	0.9	5
	6	Int.	●	MAS0500LB	48.9	88.9	88	0.9	5
5.1	3	Ext.	●	MAE0510MB	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0510MB	36.9	76.9	76	0.9	6
	6	Int.	●	MAS0510LB	52.9	92.9	92	0.9	6
5.2	3	Ext.	●	MAE0520MB	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0520MB	36.9	76.9	76	0.9	6
	6	Int.	●	MAS0520LB	52.9	92.9	92	0.9	6
5.3	3	Ext.	●	MAE0530MB	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0530MB	37.0	77.0	76	1.0	6
	6	Int.	●	MAS0530LB	53.0	93.0	92	1.0	6
5.4	3	Ext.	●	MAE0540MB	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0540MB	37.0	77.0	76	1.0	6
	6	Int.	●	MAS0540LB	53.0	93.0	92	1.0	6

* Standard hole size for rolled thread taps.

CUTTING CONDITIONS ➤ N134
TECHNICAL DATA ➤ Q001

MAE/MAS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
5.5	3	Ext.	●	*MAE0550MB	37.0	77.0	76	1.0	6
	3	Int.	●	*MAS0550MB	37.0	77.0	76	1.0	6
	6	Int.	●	*MAS0550LB	53.0	93.0	92	1.0	6
5.6	3	Ext.	●	MAE0560MB	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0560MB	40.0	80.0	79	1.0	6
	6	Int.	●	MAS0560LB	58.0	98.0	97	1.0	6
5.7	3	Ext.	●	MAE0570MB	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0570MB	40.0	80.0	79	1.0	6
	6	Int.	●	MAS0570LB	58.0	98.0	97	1.0	6
5.8	3	Ext.	●	MAE0580MB	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0580MB	40.1	80.1	79	1.1	6
	6	Int.	●	MAS0580LB	58.1	98.1	97	1.1	6
5.9	3	Ext.	●	MAE0590MB	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0590MB	40.1	80.1	79	1.1	6
	6	Int.	●	MAS0590LB	58.1	98.1	97	1.1	6
6.0	3	Ext.	●	MAE0600MB	40.1	80.1	79	1.1	6
	3	Int.	●	MAS0600MB	40.1	80.1	79	1.1	6
	6	Int.	●	MAS0600LB	58.1	98.1	97	1.1	6
6.1	3	Ext.	●	MAE0610MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0610MB	43.1	85.1	84	1.1	7
	6	Int.	●	MAS0610LB	63.1	105.1	104	1.1	7
6.2	3	Ext.	●	MAE0620MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0620MB	43.1	85.1	84	1.1	7
	6	Int.	●	MAS0620LB	63.1	105.1	104	1.1	7
6.3	3	Ext.	●	MAE0630MB	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0630MB	43.1	85.1	84	1.1	7
	6	Int.	●	MAS0630LB	63.1	105.1	104	1.1	7
6.4	3	Ext.	●	MAE0640MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0640MB	43.2	85.2	84	1.2	7
	6	Int.	●	MAS0640LB	63.2	105.2	104	1.2	7
6.5	3	Ext.	●	MAE0650MB	43.2	85.2	84	1.2	7
	3	Int.	●	MAS0650MB	43.2	85.2	84	1.2	7
	6	Int.	●	MAS0650LB	63.2	105.2	104	1.2	7
6.6	3	Ext.	●	MAE0660MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0660MB	43.2	85.2	84	1.2	7
	6	Int.	●	MAS0660LB	66.2	108.2	107	1.2	7
6.7	3	Ext.	●	MAE0670MB	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0670MB	43.2	85.2	84	1.2	7
	6	Int.	●	MAS0670LB	66.2	108.2	107	1.2	7
6.8	3	Ext.	●	MAE0680MB	43.2	85.2	84	1.2	7
	3	Int.	●	MAS0680MB	43.2	85.2	84	1.2	7
	6	Int.	●	MAS0680LB	66.2	108.2	107	1.2	7
6.9	3	Ext.	●	MAE0690MB	43.3	85.3	84	1.3	7
	3	Int.	□	MAS0690MB	43.3	85.3	84	1.3	7
	6	Int.	●	MAS0690LB	66.3	108.3	107	1.3	7
7.0	3	Ext.	●	MAE0700MB	43.3	85.3	84	1.3	7
	3	Int.	●	MAS0700MB	43.3	85.3	84	1.3	7
	6	Int.	●	MAS0700LB	66.3	108.3	107	1.3	7

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
7.1	3	Ext.	●	MAE0710MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0710MB	49.3	91.3	90	1.3	8
	6	Int.	●	MAS0710LB	69.3	111.3	110	1.3	8
7.2	3	Ext.	●	MAE0720MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0720MB	49.3	91.3	90	1.3	8
	6	Int.	●	MAS0720LB	69.3	111.3	110	1.3	8
7.3	3	Ext.	●	MAE0730MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0730MB	49.3	91.3	90	1.3	8
	6	Int.	●	MAS0730LB	69.3	111.3	110	1.3	8
7.35	3	Ext.	●	*MAE0735MB	49.3	91.3	90	1.3	8
	3	Int.	●	*MAS0735MB	49.3	91.3	90	1.3	8
	6	Int.	●	*MAS0735LB	69.3	111.3	110	1.3	8
7.4	3	Ext.	●	MAE0740MB	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0740MB	49.3	91.3	90	1.3	8
	6	Int.	●	MAS0740LB	69.3	111.3	110	1.3	8
7.5	3	Ext.	●	MAE0750MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0750MB	49.4	91.4	90	1.4	8
	6	Int.	●	MAS0750LB	69.4	111.4	110	1.4	8
7.6	3	Ext.	●	MAE0760MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0760MB	49.4	91.4	90	1.4	8
	6	Int.	●	MAS0760LB	73.4	115.4	114	1.4	8
7.7	3	Ext.	●	MAE0770MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0770MB	49.4	91.4	90	1.4	8
	6	Int.	●	MAS0770LB	73.4	115.4	114	1.4	8
7.8	3	Ext.	●	MAE0780MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0780MB	49.4	91.4	90	1.4	8
	6	Int.	●	MAS0780LB	73.4	115.4	114	1.4	8
7.9	3	Ext.	●	MAE0790MB	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0790MB	49.4	91.4	90	1.4	8
	6	Int.	●	MAS0790LB	73.4	115.4	114	1.4	8
8.0	3	Ext.	●	MAE0800MB	49.5	91.5	90	1.5	8
	3	Int.	●	MAS0800MB	49.5	91.5	90	1.5	8
	6	Int.	●	MAS0800LB	73.5	115.5	114	1.5	8
8.1	3	Ext.	●	MAE0810MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0810MB	51.5	95.5	94	1.5	9
	6	Int.	●	MAS0810LB	76.5	120.5	119	1.5	9
8.2	3	Ext.	●	MAE0820MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0820MB	51.5	95.5	94	1.5	9
	6	Int.	●	MAS0820LB	76.5	120.5	119	1.5	9
8.3	3	Ext.	●	MAE0830MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0830MB	51.5	95.5	94	1.5	9
	6	Int.	●	MAS0830LB	76.5	120.5	119	1.5	9
8.4	3	Ext.	●	MAE0840MB	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0840MB	51.5	95.5	94	1.5	9
	6	Int.	●	MAS0840LB	76.5	120.5	119	1.5	9
8.5	3	Ext.	●	MAE0850MB	51.5	95.5	94	1.5	9
	3	Int.	●	MAS0850MB	51.5	95.5	94	1.5	9
	6	Int.	●	MAS0850LB	76.5	120.5	119	1.5	9

* Standard hole size for rolled thread taps.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
8.6	3	Ext.	●	MAE0860MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0860MB	51.6	95.6	94	1.6	9
	6	Int.	●	MAS0860LB	78.6	122.6	121	1.6	9
8.7	3	Ext.	●	MAE0870MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0870MB	51.6	95.6	94	1.6	9
	6	Int.	●	MAS0870LB	78.6	122.6	121	1.6	9
8.8	3	Ext.	●	MAE0880MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0880MB	51.6	95.6	94	1.6	9
	6	Int.	●	MAS0880LB	78.6	122.6	121	1.6	9
8.9	3	Ext.	●	MAE0890MB	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0890MB	51.6	95.6	94	1.6	9
	6	Int.	●	MAS0890LB	78.6	122.6	121	1.6	9
9.0	3	Ext.	●	MAE0900MB	51.6	95.6	94	1.6	9
	3	Int.	●	MAS0900MB	51.6	95.6	94	1.6	9
	6	Int.	●	MAS0900LB	78.6	122.6	121	1.6	9
9.1	3	Ext.	●	MAE0910MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0910MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0910LB	82.7	126.7	125	1.7	10
9.2	3	Ext.	●	MAE0920MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0920MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0920LB	82.7	126.7	125	1.7	10
9.21	3	Ext.	●	*MAE0921MB	54.7	98.7	97	1.7	10
	3	Int.	●	*MAS0921MB	54.7	98.7	97	1.7	10
	6	Int.	●	*MAS0921LB	82.7	126.7	125	1.7	10
9.3	3	Ext.	●	MAE0930MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0930MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0930LB	82.7	126.7	125	1.7	10
9.4	3	Ext.	●	MAE0940MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0940MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0940LB	82.7	126.7	125	1.7	10
9.5	3	Ext.	●	MAE0950MB	54.7	98.7	97	1.7	10
	3	Int.	●	MAS0950MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0950LB	82.7	126.7	125	1.7	10
9.6	3	Ext.	●	MAE0960MB	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0960MB	54.7	98.7	97	1.7	10
	6	Int.	●	MAS0960LB	82.7	126.7	125	1.7	10
9.7	3	Ext.	●	MAE0970MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0970MB	54.8	98.8	97	1.8	10
	6	Int.	●	MAS0970LB	82.8	126.8	125	1.8	10
9.8	3	Ext.	●	MAE0980MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0980MB	54.8	98.8	97	1.8	10
	6	Int.	●	MAS0980LB	82.8	126.8	125	1.8	10
9.9	3	Ext.	●	MAE0990MB	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0990MB	54.8	98.8	97	1.8	10
	6	Int.	●	MAS0990LB	82.8	126.8	125	1.8	10
10.0	3	Ext.	●	MAE1000MB	54.8	98.8	97	1.8	10
	3	Int.	●	MAS1000MB	54.8	98.8	97	1.8	10
	6	Int.	●	MAS1000LB	82.8	126.8	125	1.8	10

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
10.1	3	Ext.	□	MAE1010MB	56.8	102.8	101	1.8	11
	3	Int.	□	MAS1010MB	56.8	102.8	101	1.8	11
	6	Int.	□	MAS1010LB	90.8	136.8	135	1.8	11
10.2	3	Ext.	□	MAE1020MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1020MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1020LB	90.9	136.9	135	1.9	11
10.3	3	Ext.	●	MAE1030MB	56.9	102.9	101	1.9	11
	3	Int.	●	MAS1030MB	56.9	102.9	101	1.9	11
	6	Int.	●	MAS1030LB	90.9	136.9	135	1.9	11
10.4	3	Ext.	□	MAE1040MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1040MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1040LB	90.9	136.9	135	1.9	11
10.5	3	Ext.	●	MAE1050MB	56.9	102.9	101	1.9	11
	3	Int.	●	MAS1050MB	56.9	102.9	101	1.9	11
	6	Int.	●	MAS1050LB	90.9	136.9	135	1.9	11
10.6	3	Ext.	□	MAE1060MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1060MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1060LB	90.9	136.9	135	1.9	11
10.7	3	Ext.	□	MAE1070MB	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1070MB	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1070LB	90.9	136.9	135	1.9	11
10.8	3	Ext.	□	MAE1080MB	57.0	103.0	101	2.0	11
	3	Int.	□	MAS1080MB	57.0	103.0	101	2.0	11
	6	Int.	□	MAS1080LB	91.0	137.0	135	2.0	11
10.9	3	Ext.	□	MAE1090MB	57.0	103.0	101	2.0	11
	3	Int.	□	MAS1090MB	57.0	103.0	101	2.0	11
	6	Int.	□	MAS1090LB	91.0	137.0	135	2.0	11
11.0	3	Ext.	●	MAE1100MB	57.0	103.0	101	2.0	11
	3	Int.	●	MAS1100MB	57.0	103.0	101	2.0	11
	6	Int.	●	MAS1100LB	91.0	137.0	135	2.0	11
11.08	3	Ext.	●	*MAE1108MB	62.0	108.0	106	2.0	12
	3	Int.	●	*MAS1108MB	62.0	108.0	106	2.0	12
	6	Int.	●	*MAS1108LB	96.0	142.0	140	2.0	12
11.1	3	Ext.	□	MAE1110MB	62.0	108.0	106	2.0	12
	3	Int.	□	MAS1110MB	62.0	108.0	106	2.0	12
	6	Int.	□	MAS1110LB	96.0	142.0	140	2.0	12
11.2	3	Ext.	□	MAE1120MB	62.0	108.0	106	2.0	12
	3	Int.	□	MAS1120MB	62.0	108.0	106	2.0	12
	6	Int.	□	MAS1120LB	96.0	142.0	140	2.0	12
11.3	3	Ext.	□	MAE1130MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1130MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1130LB	96.1	142.1	140	2.1	12
11.4	3	Ext.	□	MAE1140MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1140MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1140LB	96.1	142.1	140	2.1	12
11.5	3	Ext.	□	MAE1150MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1150MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1150LB	96.1	142.1	140	2.1	12

* Standard hole size for rolled thread taps.

CUTTING CONDITIONS ➤ N134
TECHNICAL DATA ➤ Q001

MAE/MAS

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
11.6	3	Ext.	□	MAE1160MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1160MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1160LB	96.1	142.1	140	2.1	12
11.7	3	Ext.	□	MAE1170MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1170MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1170LB	96.1	142.1	140	2.1	12
11.8	3	Ext.	□	MAE1180MB	62.1	108.1	106	2.1	12
	3	Int.	□	MAS1180MB	62.1	108.1	106	2.1	12
	6	Int.	□	MAS1180LB	96.1	142.1	140	2.1	12
11.9	3	Ext.	□	MAE1190MB	62.2	108.2	106	2.2	12
	3	Int.	□	MAS1190MB	62.2	108.2	106	2.2	12
	6	Int.	□	MAS1190LB	96.2	142.2	140	2.2	12
12.0	3	Ext.	●	MAE1200MB	62.2	108.2	106	2.2	12
	3	Int.	●	MAS1200MB	62.2	108.2	106	2.2	12
	6	Int.	●	MAS1200LB	96.2	142.2	140	2.2	12
12.1	3	Ext.	□	MAE1210MB	67.2	117.2	115	2.2	13
	3	Int.	□	MAS1210MB	67.2	117.2	115	2.2	13
	6	Int.	□	MAS1210LB	102.2	152.2	150	2.2	13
12.2	3	Ext.	□	MAE1220MB	67.2	117.2	115	2.2	13
	3	Int.	□	MAS1220MB	67.2	117.2	115	2.2	13
	6	Int.	□	MAS1220LB	102.2	152.2	150	2.2	13
12.3	3	Ext.	□	MAE1230MB	67.2	117.2	115	2.2	13
	3	Int.	□	MAS1230MB	67.2	117.2	115	2.2	13
	6	Int.	□	MAS1230LB	102.2	152.2	150	2.2	13
12.4	3	Ext.	□	MAE1240MB	67.3	117.3	115	2.3	13
	3	Int.	□	MAS1240MB	67.3	117.3	115	2.3	13
	6	Int.	□	MAS1240LB	102.3	152.3	150	2.3	13
12.5	3	Ext.	●	MAE1250MB	67.3	117.3	115	2.3	13
	3	Int.	●	MAS1250MB	67.3	117.3	115	2.3	13
	6	Int.	●	MAS1250LB	102.3	152.3	150	2.3	13
12.6	3	Ext.	□	MAE1260MB	67.3	117.3	115	2.3	13
	3	Int.	□	MAS1260MB	67.3	117.3	115	2.3	13
	6	Int.	□	MAS1260LB	102.3	152.3	150	2.3	13
12.7	3	Ext.	□	MAE1270MB	67.3	117.3	115	2.3	13
	3	Int.	□	MAS1270MB	67.3	117.3	115	2.3	13
	6	Int.	□	MAS1270LB	102.3	152.3	150	2.3	13
12.8	3	Ext.	□	MAE1280MB	67.3	117.3	115	2.3	13
	3	Int.	□	MAS1280MB	67.3	117.3	115	2.3	13
	6	Int.	□	MAS1280LB	102.3	152.3	150	2.3	13
12.9	3	Ext.	□	MAE1290MB	67.3	117.3	115	2.3	13
	3	Int.	□	MAS1290MB	67.3	117.3	115	2.3	13
	6	Int.	□	MAS1290LB	102.3	152.3	150	2.3	13
12.96	3	Ext.	●	*MAE1296MB	67.4	117.4	115	2.4	13
	3	Int.	●	*MAS1296MB	67.4	117.4	115	2.4	13
	6	Int.	●	*MAS1296LB	102.4	152.4	150	2.4	13
13.0	3	Ext.	●	MAE1300MB	67.4	117.4	115	2.4	13
	3	Int.	●	MAS1300MB	67.4	117.4	115	2.4	13
	6	Int.	●	MAS1300LB	102.4	152.4	150	2.4	13

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
13.1	3	Ext.	□	MAE1310MB	72.4	122.4	120	2.4	14
	3	Int.	□	MAS1310MB	72.4	122.4	120	2.4	14
	6	Int.	□	MAS1310LB	112.4	162.4	160	2.4	14
13.2	3	Ext.	□	MAE1320MB	72.4	122.4	120	2.4	14
	3	Int.	□	MAS1320MB	72.4	122.4	120	2.4	14
	6	Int.	□	MAS1320LB	112.4	162.4	160	2.4	14
13.3	3	Ext.	□	MAE1330MB	72.4	122.4	120	2.4	14
	3	Int.	□	MAS1330MB	72.4	122.4	120	2.4	14
	6	Int.	□	MAS1330LB	112.4	162.4	160	2.4	14
13.4	3	Ext.	□	MAE1340MB	72.4	122.4	120	2.4	14
	3	Int.	□	MAS1340MB	72.4	122.4	120	2.4	14
	6	Int.	□	MAS1340LB	112.4	162.4	160	2.4	14
13.5	3	Ext.	●	MAE1350MB	72.5	122.5	120	2.5	14
	3	Int.	●	MAS1350MB	72.5	122.5	120	2.5	14
	6	Int.	●	MAS1350LB	112.5	162.5	160	2.5	14
13.6	3	Ext.	□	MAE1360MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1360MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1360LB	112.5	162.5	160	2.5	14
13.7	3	Ext.	□	MAE1370MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1370MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1370LB	112.5	162.5	160	2.5	14
13.8	3	Ext.	□	MAE1380MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1380MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1380LB	112.5	162.5	160	2.5	14
13.9	3	Ext.	□	MAE1390MB	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1390MB	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1390LB	112.5	162.5	160	2.5	14
14.0	3	Ext.	●	MAE1400MB	72.5	122.5	120	2.5	14
	3	Int.	●	MAS1400MB	72.5	122.5	120	2.5	14
	6	Int.	●	MAS1400LB	112.5	162.5	160	2.5	14
14.1	3	Ext.	□	MAE1410MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1410MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1410LB	117.6	175.6	173	2.6	15
14.2	3	Ext.	□	MAE1420MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1420MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1420LB	117.6	175.6	173	2.6	15
14.3	3	Ext.	□	MAE1430MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1430MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1430LB	117.6	175.6	173	2.6	15
14.4	3	Ext.	□	MAE1440MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1440MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1440LB	117.6	175.6	173	2.6	15
14.5	3	Ext.	□	MAE1450MB	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1450MB	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1450LB	117.6	175.6	173	2.6	15
14.6	3	Ext.	□	MAE1460MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1460MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1460LB	117.7	175.7	173	2.7	15

* Standard hole size for rolled thread taps.

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LCF	OAL	LF	PL	DCON
14.7	3	Ext.	□	MAE1470MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1470MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1470LB	117.7	175.7	173	2.7	15
14.8	3	Ext.	□	MAE1480MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1480MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1480LB	117.7	175.7	173	2.7	15
14.9	3	Ext.	□	MAE1490MB	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1490MB	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1490LB	117.7	175.7	173	2.7	15
14.96	3	Ext.	●	*MAE1496MB	74.7	132.7	130	2.7	15
	3	Int.	●	*MAS1496MB	74.7	132.7	130	2.7	15
	6	Int.	●	*MAS1496LB	117.7	175.7	173	2.7	15
15.0	3	Ext.	●	MAE1500MB	74.7	132.7	130	2.7	15
	3	Int.	●	MAS1500MB	74.7	132.7	130	2.7	15
	6	Int.	●	MAS1500LB	117.7	175.7	173	2.7	15
15.1	3	Ext.	□	MAE1510MB	78.7	136.7	134	2.7	16
	3	Int.	□	MAS1510MB	78.7	136.7	134	2.7	16
	6	Int.	□	MAS1510LB	122.7	180.7	178	2.7	16
15.2	3	Ext.	□	MAE1520MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1520MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1520LB	122.8	180.8	178	2.8	16
15.3	3	Ext.	□	MAE1530MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1530MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1530LB	122.8	180.8	178	2.8	16
15.4	3	Ext.	□	MAE1540MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1540MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1540LB	122.8	180.8	178	2.8	16
15.5	3	Ext.	□	MAE1550MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1550MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1550LB	122.8	180.8	178	2.8	16
15.6	3	Ext.	□	MAE1560MB	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1560MB	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1560LB	122.8	180.8	178	2.8	16
15.7	3	Ext.	□	MAE1570MB	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1570MB	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1570LB	122.9	180.9	178	2.9	16
15.8	3	Ext.	□	MAE1580MB	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1580MB	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1580LB	122.9	180.9	178	2.9	16
15.9	3	Ext.	□	MAE1590MB	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1590MB	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1590LB	122.9	180.9	178	2.9	16
16.0	3	Ext.	●	MAE1600MB	78.9	136.9	134	2.9	16
	3	Int.	●	MAS1600MB	78.9	136.9	134	2.9	16
	6	Int.	●	MAS1600LB	122.9	180.9	178	2.9	16

* Standard hole size for rolled thread taps.

CUTTING CONDITIONS ➢ N134
TECHNICAL DATA ➢ Q001

MAE/MAS

RECOMMENDED CUTTING CONDITIONS

Type		Work 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)

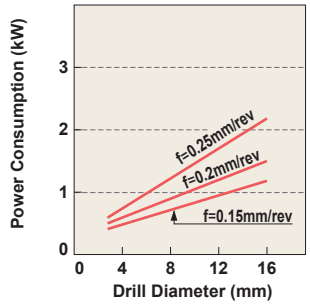
HOLE AND DRILL DIAMETERS FOR THREAD TAPPING

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

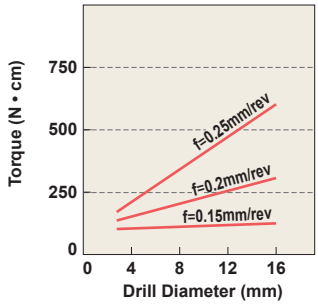
CUTTING RESISTANCE

Workpiece : JIS AC4B-T6 Drilled Depth : l/d=3(Through Hole) Cutting Speed : 100m/min WSO (10%)

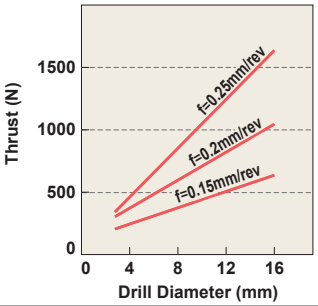
Power Consumption



Torque



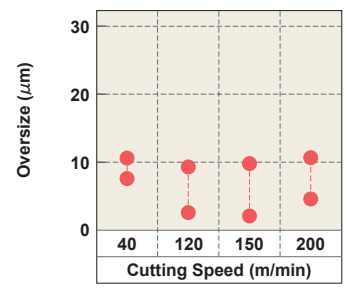
Thrust



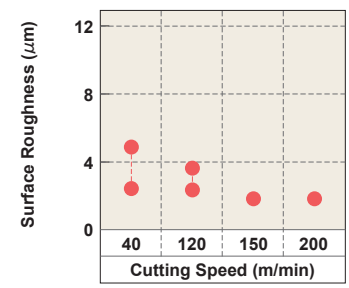
MACHINED HOLE ACCURACY

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

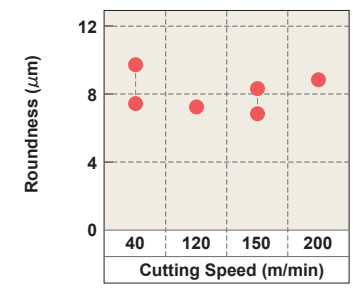
Oversize



Surface Roughness



Roundness



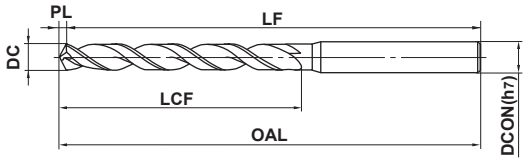
SEPDM NEW

SE High Precision Drill (M)

CO HSS D-STH | 118° DC<4 | 135° DC=4 | X Thinning

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
SEPDMD0050	0.50	6.15	50.15	50	0.15	3	●
SEPDMD0055	0.55	6.17	50.17	50	0.17	3	●
SEPDMD0060	0.60	8.18	50.18	50	0.18	3	●
SEPDMD0065	0.65	8.20	50.20	50	0.20	3	●
SEPDMD0070	0.70	10.21	50.21	50	0.21	3	●
SEPDMD0075	0.75	10.23	50.23	50	0.23	3	●
SEPDMD0080	0.80	10.24	50.24	50	0.24	3	●
SEPDMD0085	0.85	10.26	50.26	50	0.26	3	●
SEPDMD0090	0.90	12.27	50.27	50	0.27	3	●
SEPDMD0095	0.95	12.29	50.29	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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
SEPDMD0400	4.0	42.8	85.8	85	0.8	4	●

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N136
TECHNICAL DATA ➤ Q001

SEPDM NEW

SE High Precision Drill (M)

RECOMMENDED CUTTING CONDITIONS

Work material	Mild Steel (≤180HB), Aluminium Alloy (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			
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)
0.5	24	15000	0.02	300	18	11250	0.01	110
0.65	28	13700	0.03	410	22	10700	0.02	210
0.8	33	13100	0.04	520	27	10700	0.03	320
1.0	38	12000	0.05	600	31	10000	0.05	500
1.2	38	10000	0.06	600	31	8200	0.06	490
1.6	40	8000	0.08	640	33	6500	0.08	520
2.0	40	6400	0.09	575	35	5500	0.09	495
2.5	40	5100	0.11	560	35	4400	0.11	480
3.2	40	4000	0.13	520	34	3400	0.13	440
4.0	40	3200	0.15	480	35	2800	0.15	420

Work material	Alloy tool steel (≤250HB) Ferritic, Precipitation hardening stainless steel (≤200HB) AISI D2, AISI 410, AISI 430 etc				Austenitic Stainless Steel (≤200HB) AISI 304LN, AISI 316LN 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)
0.5	13	8000	0.01	80	10	6600	0.01	65
0.65	14	6800	0.02	135	11	5300	0.012	60
0.8	14	5500	0.03	165	11	4300	0.015	60
1.0	16	5000	0.05	250	12	3800	0.02	75
1.2	17	4500	0.05	225	12	3100	0.025	75
1.6	18	3500	0.06	210	14	2700	0.03	80
2.0	18	2900	0.06	170	15	2400	0.04	95
2.5	18	2300	0.08	180	15	1900	0.05	95
3.2	18	1800	0.09	160	15	1500	0.07	105
4.0	18	1400	0.10	140	15	1200	0.09	105

Work material	Alloy tool steel (≤30HRC) ASTM H13, AISI L6 etc			
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)
0.5	10	6600	0.01	65
0.65	11	5300	0.012	60
0.8	11	4300	0.015	60
1.0	12	3800	0.02	75
1.2	12	3100	0.023	70
1.6	14	2700	0.03	80
2.0	15	2400	0.04	95
2.5	15	1900	0.04	75
3.2	15	1500	0.05	75
4.0	15	1200	0.07	80

1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
2) Please use a collet type drill chuck or a milling chuck.
3) Use sufficient cutting fluid.
4) VAPDM is recommended when the work material hardness exceeds 30HRC.
5) WSTAR drill(MWE, MWS) are recommended for Precipitation hardening stainless steel (JIS-SUS630/ISO-L-No58X5CrNiCuNb16-4/ASTM-S17400, JIS-SUS631/DIN-X7CrNiAl177/ASTM-S17700)
6) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.
7) The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using water-insoluble cutting fluid.
8) 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 feedrate per revolution to a suitable value with the recommended feedrate of the closest drill diameter as the standard.

VAPDS

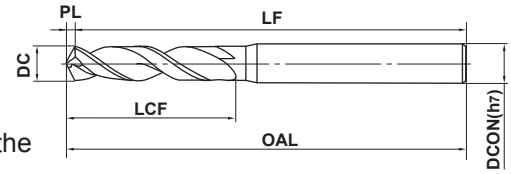
Short, High precision

HG HSS | V | 118° DC<2 | 135° DC≥2 | X Thinning

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	

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 newly developed Violet coating.
(Standard drill depth : less than 3 times the drill diameter)

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSD0050	0.50	3.15	50.15	50	0.15	3	●
VAPDSD0051	0.51	3.15	50.15	50	0.15	3	●
VAPDSD0052	0.52	3.16	50.16	50	0.16	3	●
VAPDSD0053	0.53	3.16	50.16	50	0.16	3	●
VAPDSD0054	0.54	3.16	50.16	50	0.16	3	●
VAPDSD0055	0.55	3.17	50.17	50	0.17	3	●
VAPDSD0056	0.56	4.17	50.17	50	0.17	3	●
VAPDSD0057	0.57	4.17	50.17	50	0.17	3	●
VAPDSD0058	0.58	4.17	50.17	50	0.17	3	●
VAPDSD0059	0.59	4.18	50.18	50	0.18	3	●
VAPDSD0060	0.60	5.18	50.18	50	0.18	3	●
VAPDSD0061	0.61	5.18	50.18	50	0.18	3	●
VAPDSD0062	0.62	5.19	50.19	50	0.19	3	●
VAPDSD0063	0.63	5.19	50.19	50	0.19	3	●
VAPDSD0064	0.64	5.19	50.19	50	0.19	3	●
VAPDSD0065	0.65	5.20	50.20	50	0.20	3	●
VAPDSD0066	0.66	5.20	50.20	50	0.20	3	●
VAPDSD0067	0.67	5.20	50.20	50	0.20	3	●
VAPDSD0068	0.68	5.20	50.20	50	0.20	3	●
VAPDSD0069	0.69	5.21	50.21	50	0.21	3	●
VAPDSD0070	0.70	5.21	50.21	50	0.21	3	●
VAPDSD0071	0.71	5.21	50.21	50	0.21	3	●
VAPDSD0072	0.72	5.22	50.22	50	0.22	3	●
VAPDSD0073	0.73	5.22	50.22	50	0.22	3	●
VAPDSD0074	0.74	5.22	50.22	50	0.22	3	●
VAPDSD0075	0.75	5.23	50.23	50	0.23	3	●
VAPDSD0076	0.76	5.23	50.23	50	0.23	3	●
VAPDSD0077	0.77	5.23	50.23	50	0.23	3	●
VAPDSD0078	0.78	5.23	50.23	50	0.23	3	●
VAPDSD0079	0.79	5.24	50.24	50	0.24	3	●
VAPDSD0080	0.80	5.24	50.24	50	0.24	3	●
VAPDSD0081	0.81	5.24	50.24	50	0.24	3	●
VAPDSD0082	0.82	5.25	50.25	50	0.25	3	●
VAPDSD0083	0.83	5.25	50.25	50	0.25	3	●
VAPDSD0084	0.84	5.25	50.25	50	0.25	3	●
VAPDSD0085	0.85	5.26	50.26	50	0.26	3	●
VAPDSD0086	0.86	6.26	50.26	50	0.26	3	●
VAPDSD0087	0.87	6.26	50.26	50	0.26	3	●
VAPDSD0088	0.88	6.26	50.26	50	0.26	3	●
VAPDSD0089	0.89	6.27	50.27	50	0.27	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSD0090	0.90	6.27	50.27	50	0.27	3	●
VAPDSD0091	0.91	6.27	50.27	50	0.27	3	●
VAPDSD0092	0.92	6.28	50.28	50	0.28	3	●
VAPDSD0093	0.93	6.28	50.28	50	0.28	3	●
VAPDSD0094	0.94	6.28	50.28	50	0.28	3	●
VAPDSD0095	0.95	6.29	50.29	50	0.29	3	●
VAPDSD0096	0.96	6.29	50.29	50	0.29	3	●
VAPDSD0097	0.97	6.29	50.29	50	0.29	3	●
VAPDSD0098	0.98	6.29	50.29	50	0.29	3	●
VAPDSD0099	0.99	6.30	50.30	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	●
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	●

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤N141

HSS

VAPDS

Short, High precision

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

HSS

VAPDS

Short, High precision

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
VAPDSD0905	9.05	39.9	94.9	93	1.9	10	●
VAPDSD0910	9.10	39.9	94.9	93	1.9	10	●
VAPDSD0915	9.15	39.9	94.9	93	1.9	10	●
VAPDSD0920	9.20	39.9	94.9	93	1.9	10	●
VAPDSD0925	9.25	39.9	94.9	93	1.9	10	●
VAPDSD0930	9.30	39.9	94.9	93	1.9	10	●
VAPDSD0935	9.35	39.9	94.9	93	1.9	10	●
VAPDSD0940	9.40	40.0	95.0	93	2.0	10	●
VAPDSD0945	9.45	40.0	95.0	93	2.0	10	●
VAPDSD0950	9.50	40.0	95.0	93	2.0	10	●
VAPDSD0955	9.55	43.0	98.0	96	2.0	10	●
VAPDSD0960	9.60	43.0	98.0	96	2.0	10	●
VAPDSD0965	9.65	43.0	98.0	96	2.0	10	●
VAPDSD0970	9.70	43.0	98.0	96	2.0	10	●
VAPDSD0975	9.75	43.0	98.0	96	2.0	10	●
VAPDSD0980	9.80	43.0	98.0	96	2.0	10	●
VAPDSD0985	9.85	43.0	98.0	96	2.0	10	●
VAPDSD0990	9.90	43.1	98.1	96	2.1	10	●
VAPDSD0995	9.95	43.1	98.1	96	2.1	10	●
VAPDSD1000	10.00	43.1	98.1	96	2.1	10	●
VAPDSD1005	10.05	43.1	103.1	101	2.1	12	●
VAPDSD1010	10.10	43.1	103.1	101	2.1	12	●
VAPDSD1015	10.15	43.1	103.1	101	2.1	12	●
VAPDSD1020	10.20	43.1	103.1	101	2.1	12	●
VAPDSD1025	10.25	43.1	103.1	101	2.1	12	●
VAPDSD1030	10.30	43.1	103.1	101	2.1	12	●
VAPDSD1035	10.35	43.1	103.1	101	2.1	12	●
VAPDSD1040	10.40	43.2	103.2	101	2.2	12	●
VAPDSD1045	10.45	43.2	103.2	101	2.2	12	●
VAPDSD1050	10.50	43.2	103.2	101	2.2	12	●
VAPDSD1055	10.55	43.2	103.2	101	2.2	12	●
VAPDSD1060	10.60	43.2	103.2	101	2.2	12	●
VAPDSD1065	10.65	47.2	107.2	105	2.2	12	●
VAPDSD1070	10.70	47.2	107.2	105	2.2	12	●
VAPDSD1075	10.75	47.2	107.2	105	2.2	12	●
VAPDSD1080	10.80	47.2	107.2	105	2.2	12	●
VAPDSD1085	10.85	47.3	107.3	105	2.3	12	●
VAPDSD1090	10.90	47.3	107.3	105	2.3	12	●
VAPDSD1095	10.95	47.3	107.3	105	2.3	12	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSD1100	11.00	47.3	107.3	105	2.3	12	●
VAPDSD1105	11.05	47.3	107.3	105	2.3	12	●
VAPDSD1110	11.10	47.3	107.3	105	2.3	12	●
VAPDSD1115	11.15	47.3	107.3	105	2.3	12	●
VAPDSD1120	11.20	47.3	107.3	105	2.3	12	●
VAPDSD1125	11.25	47.3	107.3	105	2.3	12	●
VAPDSD1130	11.30	47.3	107.3	105	2.3	12	●
VAPDSD1135	11.35	47.4	107.4	105	2.4	12	●
VAPDSD1140	11.40	47.4	107.4	105	2.4	12	●
VAPDSD1145	11.45	47.4	107.4	105	2.4	12	●
VAPDSD1150	11.50	47.4	107.4	105	2.4	12	●
VAPDSD1155	11.55	47.4	107.4	105	2.4	12	●
VAPDSD1160	11.60	47.4	107.4	105	2.4	12	●
VAPDSD1165	11.65	47.4	107.4	105	2.4	12	●
VAPDSD1170	11.70	47.4	107.4	105	2.4	12	●
VAPDSD1175	11.75	47.4	107.4	105	2.4	12	●
VAPDSD1180	11.80	47.4	107.4	105	2.4	12	●
VAPDSD1185	11.85	51.5	111.5	109	2.5	12	●
VAPDSD1190	11.90	51.5	111.5	109	2.5	12	●
VAPDSD1195	11.95	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	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS (Standard drilling depth : 3 times or below the drill diameter)

Work material	Structural steel		Carbon steel AISI 1049 Alloy steel SCM Cast iron FC		Alloy tool steel AISI D2 (Low-hardness materials) Ferritic stainless steel AISI 430, AISI 405 Martensitic stainless steel AISI 420, AISI 440		Alloy tool steel AISI H13 (−40HRC) Precipitation hardening stainless steel 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

1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
2) Please use a collet type drill chuck or a milling chuck.
3) Use sufficient cutting fluid.
4) VAPDSSUS are recommended for austenitic stainless steels (AISI 304).
5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.

The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

VIOLET DRILLS

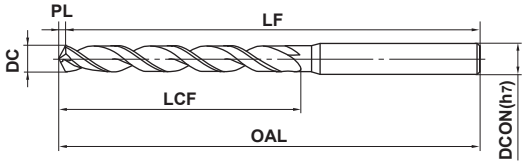
VAPDM

Medium, High precision

HG HSS | V | 118° DC<2 | 135° DC≥2 | X Thinning

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

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 newly developed Violet coating.
(Standard drill depth : less than 5 times the drill diameter)

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMD0050	0.50	6.15	50.15	50	0.15	3	●
VAPDMD0055	0.55	6.17	50.17	50	0.17	3	●
VAPDMD0060	0.60	8.18	50.18	50	0.18	3	●
VAPDMD0065	0.65	8.20	50.20	50	0.20	3	●
VAPDMD0070	0.70	10.21	50.21	50	0.21	3	●
VAPDMD0075	0.75	10.23	50.23	50	0.23	3	●
VAPDMD0080	0.80	10.24	50.24	50	0.24	3	●
VAPDMD0085	0.85	10.26	50.26	50	0.26	3	●
VAPDMD0090	0.90	12.27	50.27	50	0.27	3	●
VAPDMD0095	0.95	12.29	50.29	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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

CUTTING CONDITIONS ➤N145

HSS

VAPDM

Medium, High precision

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS (Standard drilling depth : 5 times or below the drill diameter)

Work material	Structural steel		Carbon steel AISI 1049 Alloy steel SCM Cast iron FC		Alloy tool steel AISI D2 (Low-hardness materials) Ferritic stainless steel AISI 430, AISI 405 Martensitic stainless steel AISI 420, AISI 440		Alloy tool steel AISI H13 (−40HRC) Precipitation hardening stainless steel 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

1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
2) Please use a collet type drill chuck or a milling chuck.
3) Use sufficient cutting fluid.
4) VAPDMSUS are recommended for austenitic stainless steels (AISI 304).
5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.

The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

HSS

VAPDSSUS

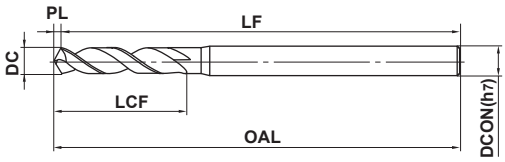
Short, High precision, For stainless steel

CO HSS | V | 135° | X Thinning DC≥1

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

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.



● New design and the Violet coating combination enable high efficiency drilling and long tool life for drilling of stainless steels.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0050	0.50	3.10	50.10	50	0.10	3	●
VAPDSSUSD0051	0.51	3.11	50.11	50	0.11	3	●
VAPDSSUSD0052	0.52	3.11	50.11	50	0.11	3	●
VAPDSSUSD0053	0.53	3.11	50.11	50	0.11	3	●
VAPDSSUSD0054	0.54	3.11	50.11	50	0.11	3	●
VAPDSSUSD0055	0.55	3.11	50.11	50	0.11	3	●
VAPDSSUSD0056	0.56	4.12	50.12	50	0.12	3	●
VAPDSSUSD0057	0.57	4.12	50.12	50	0.12	3	●
VAPDSSUSD0058	0.58	4.12	50.12	50	0.12	3	●
VAPDSSUSD0059	0.59	4.12	50.12	50	0.12	3	●
VAPDSSUSD0060	0.60	5.12	50.12	50	0.12	3	●
VAPDSSUSD0061	0.61	5.13	50.13	50	0.13	3	●
VAPDSSUSD0062	0.62	5.13	50.13	50	0.13	3	●
VAPDSSUSD0063	0.63	5.13	50.13	50	0.13	3	●
VAPDSSUSD0064	0.64	5.13	50.13	50	0.13	3	●
VAPDSSUSD0065	0.65	5.13	50.13	50	0.13	3	●
VAPDSSUSD0066	0.66	5.14	50.14	50	0.14	3	●
VAPDSSUSD0067	0.67	5.14	50.14	50	0.14	3	●
VAPDSSUSD0068	0.68	5.14	50.14	50	0.14	3	●
VAPDSSUSD0069	0.69	5.14	50.14	50	0.14	3	●
VAPDSSUSD0070	0.70	5.14	50.14	50	0.14	3	●
VAPDSSUSD0071	0.71	5.15	50.15	50	0.15	3	●
VAPDSSUSD0072	0.72	5.15	50.15	50	0.15	3	●
VAPDSSUSD0073	0.73	5.15	50.15	50	0.15	3	●
VAPDSSUSD0074	0.74	5.15	50.15	50	0.15	3	●
VAPDSSUSD0075	0.75	5.16	50.16	50	0.16	3	●
VAPDSSUSD0076	0.76	5.16	50.16	50	0.16	3	●
VAPDSSUSD0077	0.77	5.16	50.16	50	0.16	3	●
VAPDSSUSD0078	0.78	5.16	50.16	50	0.16	3	●
VAPDSSUSD0079	0.79	5.16	50.16	50	0.16	3	●
VAPDSSUSD0080	0.80	5.17	50.17	50	0.17	3	●
VAPDSSUSD0081	0.81	5.17	50.17	50	0.17	3	●
VAPDSSUSD0082	0.82	5.17	50.17	50	0.17	3	●
VAPDSSUSD0083	0.83	5.17	50.17	50	0.17	3	●
VAPDSSUSD0084	0.84	5.17	50.17	50	0.17	3	●
VAPDSSUSD0085	0.85	5.18	50.18	50	0.18	3	●
VAPDSSUSD0086	0.86	6.18	50.18	50	0.18	3	●
VAPDSSUSD0087	0.87	6.18	50.18	50	0.18	3	●
VAPDSSUSD0088	0.88	6.18	50.18	50	0.18	3	●
VAPDSSUSD0089	0.89	6.18	50.18	50	0.18	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0090	0.90	6.19	50.19	50	0.19	3	●
VAPDSSUSD0091	0.91	6.19	50.19	50	0.19	3	●
VAPDSSUSD0092	0.92	6.19	50.19	50	0.19	3	●
VAPDSSUSD0093	0.93	6.19	50.19	50	0.19	3	●
VAPDSSUSD0094	0.94	6.19	50.19	50	0.19	3	●
VAPDSSUSD0095	0.95	6.20	50.20	50	0.20	3	●
VAPDSSUSD0096	0.96	6.20	50.20	50	0.20	3	●
VAPDSSUSD0097	0.97	6.20	50.20	50	0.20	3	●
VAPDSSUSD0098	0.98	6.20	50.20	50	0.20	3	●
VAPDSSUSD0099	0.99	6.21	50.21	50	0.21	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	●
VAPDSSUSD0103	1.03	6.2	50.2	50	0.2	3	●
VAPDSSUSD0104	1.04	6.2	50.2	50	0.2	3	●
VAPDSSUSD0105	1.05	6.2	50.2	50	0.2	3	●
VAPDSSUSD0106	1.06	6.2	50.2	50	0.2	3	●
VAPDSSUSD0107	1.07	8.2	55.2	55	0.2	3	●
VAPDSSUSD0108	1.08	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	●
VAPDSSUSD0111	1.11	8.2	55.2	55	0.2	3	●
VAPDSSUSD0112	1.12	8.2	55.2	55	0.2	3	●
VAPDSSUSD0113	1.13	8.2	55.2	55	0.2	3	●
VAPDSSUSD0114	1.14	8.2	55.2	55	0.2	3	●
VAPDSSUSD0115	1.15	8.2	55.2	55	0.2	3	●
VAPDSSUSD0116	1.16	8.2	55.2	55	0.2	3	●
VAPDSSUSD0117	1.17	8.2	55.2	55	0.2	3	●
VAPDSSUSD0118	1.18	8.2	55.2	55	0.2	3	●
VAPDSSUSD0119	1.19	8.3	55.3	55	0.3	3	●
VAPDSSUSD0120	1.20	8.3	55.3	55	0.3	3	●
VAPDSSUSD0121	1.21	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	●
VAPDSSUSD0129	1.29	8.3	55.3	55	0.3	3	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0130	1.30	9.3	55.3	55	0.3	3	●
VAPDSSUSD0131	1.31	9.3	55.3	55	0.3	3	●
VAPDSSUSD0132	1.32	9.3	55.3	55	0.3	3	●
VAPDSSUSD0133	1.33	9.3	55.3	55	0.3	3	●
VAPDSSUSD0134	1.34	9.3	55.3	55	0.3	3	●
VAPDSSUSD0135	1.35	9.3	55.3	55	0.3	3	●
VAPDSSUSD0136	1.36	9.3	55.3	55	0.3	3	●
VAPDSSUSD0137	1.37	9.3	55.3	55	0.3	3	●
VAPDSSUSD0138	1.38	9.3	55.3	55	0.3	3	●
VAPDSSUSD0139	1.39	9.3	55.3	55	0.3	3	●
VAPDSSUSD0140	1.40	9.3	55.3	55	0.3	3	●
VAPDSSUSD0141	1.41	9.3	55.3	55	0.3	3	●
VAPDSSUSD0142	1.42	9.3	55.3	55	0.3	3	●
VAPDSSUSD0143	1.43	9.3	55.3	55	0.3	3	●
VAPDSSUSD0144	1.44	9.3	55.3	55	0.3	3	●
VAPDSSUSD0145	1.45	9.3	55.3	55	0.3	3	●
VAPDSSUSD0146	1.46	9.3	55.3	55	0.3	3	●
VAPDSSUSD0147	1.47	9.3	55.3	55	0.3	3	●
VAPDSSUSD0148	1.48	9.3	55.3	55	0.3	3	●
VAPDSSUSD0149	1.49	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	●
VAPDSSUSD0154	1.54	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	●
VAPDSSUSD0158	1.58	11.3	55.3	55	0.3	3	●
VAPDSSUSD0159	1.59	11.3	55.3	55	0.3	3	●
VAPDSSUSD0160	1.60	11.3	55.3	55	0.3	3	●
VAPDSSUSD0161	1.61	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	●
VAPDSSUSD0164	1.64	11.3	55.3	55	0.3	3	●
VAPDSSUSD0165	1.65	11.3	55.3	55	0.3	3	●
VAPDSSUSD0166	1.66	11.3	55.3	55	0.3	3	●
VAPDSSUSD0167	1.67	11.4	55.4	55	0.4	3	●
VAPDSSUSD0168	1.68	11.4	55.4	55	0.4	3	●
VAPDSSUSD0169	1.69	11.4	55.4	55	0.4	3	●
VAPDSSUSD0170	1.70	11.4	55.4	55	0.4	3	●
VAPDSSUSD0171	1.71	11.4	55.4	55	0.4	3	●
VAPDSSUSD0172	1.72	11.4	55.4	55	0.4	3	●
VAPDSSUSD0173	1.73	11.4	55.4	55	0.4	3	●
VAPDSSUSD0174	1.74	11.4	55.4	55	0.4	3	●
VAPDSSUSD0175	1.75	11.4	55.4	55	0.4	3	●
VAPDSSUSD0176	1.76	11.4	55.4	55	0.4	3	●
VAPDSSUSD0177	1.77	11.4	55.4	55	0.4	3	●
VAPDSSUSD0178	1.78	11.4	55.4	55	0.4	3	●
VAPDSSUSD0179	1.79	11.4	55.4	55	0.4	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
VAPDSSUSD0184	1.84	11.4	55.4	55	0.4	3	●
VAPDSSUSD0185	1.85	11.4	55.4	55	0.4	3	●
VAPDSSUSD0186	1.86	11.4	55.4	55	0.4	3	●
VAPDSSUSD0187	1.87	11.4	55.4	55	0.4	3	●
VAPDSSUSD0188	1.88	11.4	55.4	55	0.4	3	●
VAPDSSUSD0189	1.89	11.4	55.4	55	0.4	3	●
VAPDSSUSD0190	1.90	12.4	55.4	55	0.4	3	●
VAPDSSUSD0191	1.91	12.4	60.4	60	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	●
VAPDSSUSD0194	1.94	12.4	60.4	60	0.4	3	●
VAPDSSUSD0195	1.95	12.4	60.4	60	0.4	3	●
VAPDSSUSD0196	1.96	12.4	60.4	60	0.4	3	●
VAPDSSUSD0197	1.97	12.4	60.4	60	0.4	3	●
VAPDSSUSD0198	1.98	12.4	60.4	60	0.4	3	●
VAPDSSUSD0199	1.99	12.4	60.4	60	0.4	3	●
VAPDSSUSD0200	2.00	12.4	60.4	60	0.4	3	●
VAPDSSUSD0201	2.01	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	●
VAPDSSUSD0204	2.04	12.4	60.4	60	0.4	3	●
VAPDSSUSD0205	2.05	12.4	60.4	60	0.4	3	●
VAPDSSUSD0206	2.06	12.4	60.4	60	0.4	3	●
VAPDSSUSD0207	2.07	12.4	60.4	60	0.4	3	●
VAPDSSUSD0208	2.08	12.4	60.4	60	0.4	3	●
VAPDSSUSD0209	2.09	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	●
VAPDSSUSD0213	2.13	12.4	60.4	60	0.4	3	●
VAPDSSUSD0214	2.14	12.4	60.4	60	0.4	3	●
VAPDSSUSD0215	2.15	12.5	60.5	60	0.5	3	●
VAPDSSUSD0216	2.16	12.5	60.5	60	0.5	3	●
VAPDSSUSD0217	2.17	12.5	60.5	60	0.5	3	●
VAPDSSUSD0218	2.18	12.5	60.5	60	0.5	3	●
VAPDSSUSD0219	2.19	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	●
VAPDSSUSD0222	2.22	12.5	60.5	60	0.5	3	●
VAPDSSUSD0223	2.23	12.5	60.5	60	0.5	3	●
VAPDSSUSD0224	2.24	12.5	60.5	60	0.5	3	●
VAPDSSUSD0225	2.25	12.5	60.5	60	0.5	3	●
VAPDSSUSD0226	2.26	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	●
VAPDSSUSD0229	2.29	12.5	60.5	60	0.5	3	●

VAPDSSUS

Short, High precision, For stainless steel

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0230	2.30	13.5	60.5	60	0.5	3	●
VAPDSSUSD0231	2.31	13.5	60.5	60	0.5	3	●
VAPDSSUSD0232	2.32	13.5	60.5	60	0.5	3	●
VAPDSSUSD0233	2.33	13.5	60.5	60	0.5	3	●
VAPDSSUSD0234	2.34	13.5	60.5	60	0.5	3	●
VAPDSSUSD0235	2.35	13.5	60.5	60	0.5	3	●
VAPDSSUSD0236	2.36	13.5	60.5	60	0.5	3	●
VAPDSSUSD0237	2.37	13.5	60.5	60	0.5	3	●
VAPDSSUSD0238	2.38	13.5	60.5	60	0.5	3	●
VAPDSSUSD0239	2.39	13.5	60.5	60	0.5	3	●
VAPDSSUSD0240	2.40	13.5	60.5	60	0.5	3	●
VAPDSSUSD0241	2.41	13.5	60.5	60	0.5	3	●
VAPDSSUSD0242	2.42	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	●
VAPDSSUSD0246	2.46	13.5	60.5	60	0.5	3	●
VAPDSSUSD0247	2.47	13.5	60.5	60	0.5	3	●
VAPDSSUSD0248	2.48	13.5	60.5	60	0.5	3	●
VAPDSSUSD0249	2.49	13.5	60.5	60	0.5	3	●
VAPDSSUSD0250	2.50	13.5	60.5	60	0.5	3	●
VAPDSSUSD0251	2.51	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	●
VAPDSSUSD0254	2.54	13.5	60.5	60	0.5	3	●
VAPDSSUSD0255	2.55	13.5	60.5	60	0.5	3	●
VAPDSSUSD0256	2.56	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	●
VAPDSSUSD0259	2.59	13.5	60.5	60	0.5	3	●
VAPDSSUSD0260	2.60	15.5	60.5	60	0.5	3	●
VAPDSSUSD0261	2.61	15.5	60.5	60	0.5	3	●
VAPDSSUSD0262	2.62	15.5	60.5	60	0.5	3	●
VAPDSSUSD0263	2.63	15.5	60.5	60	0.5	3	●
VAPDSSUSD0264	2.64	15.6	60.6	60	0.6	3	●
VAPDSSUSD0265	2.65	15.6	60.6	60	0.6	3	●
VAPDSSUSD0266	2.66	15.6	60.6	60	0.6	3	●
VAPDSSUSD0267	2.67	15.6	60.6	60	0.6	3	●
VAPDSSUSD0268	2.68	15.6	60.6	60	0.6	3	●
VAPDSSUSD0269	2.69	15.6	60.6	60	0.6	3	●
VAPDSSUSD0270	2.70	15.6	60.6	60	0.6	3	●
VAPDSSUSD0271	2.71	15.6	60.6	60	0.6	3	●
VAPDSSUSD0272	2.72	15.6	60.6	60	0.6	3	●
VAPDSSUSD0273	2.73	15.6	60.6	60	0.6	3	●
VAPDSSUSD0274	2.74	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	●
VAPDSSUSD0279	2.79	15.6	60.6	60	0.6	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0280	2.80	15.6	60.6	60	0.6	3	●
VAPDSSUSD0281	2.81	15.6	60.6	60	0.6	3	●
VAPDSSUSD0282	2.82	15.6	60.6	60	0.6	3	●
VAPDSSUSD0283	2.83	15.6	60.6	60	0.6	3	●
VAPDSSUSD0284	2.84	15.6	60.6	60	0.6	3	●
VAPDSSUSD0285	2.85	15.6	60.6	60	0.6	3	●
VAPDSSUSD0286	2.86	15.6	60.6	60	0.6	3	●
VAPDSSUSD0287	2.87	15.6	60.6	60	0.6	3	●
VAPDSSUSD0288	2.88	15.6	60.6	60	0.6	3	●
VAPDSSUSD0289	2.89	15.6	60.6	60	0.6	3	●
VAPDSSUSD0290	2.90	15.6	60.6	60	0.6	3	●
VAPDSSUSD0291	2.91	15.6	60.6	60	0.6	3	●
VAPDSSUSD0292	2.92	15.6	60.6	60	0.6	3	●
VAPDSSUSD0293	2.93	15.6	60.6	60	0.6	3	●
VAPDSSUSD0294	2.94	15.6	60.6	60	0.6	3	●
VAPDSSUSD0295	2.95	15.6	60.6	60	0.6	3	●
VAPDSSUSD0296	2.96	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	●
VAPDSSUSD0306	3.06	17.6	70.6	70	0.6	4	●
VAPDSSUSD0307	3.07	17.6	70.6	70	0.6	4	●
VAPDSSUSD0308	3.08	17.6	70.6	70	0.6	4	●
VAPDSSUSD0309	3.09	17.6	70.6	70	0.6	4	●
VAPDSSUSD0310	3.10	17.6	70.6	70	0.6	4	●
VAPDSSUSD0311	3.11	17.6	70.6	70	0.6	4	●
VAPDSSUSD0312	3.12	17.7	70.7	70	0.7	4	●
VAPDSSUSD0313	3.13	17.7	70.7	70	0.7	4	●
VAPDSSUSD0314	3.14	17.7	70.7	70	0.7	4	●
VAPDSSUSD0315	3.15	17.7	70.7	70	0.7	4	●
VAPDSSUSD0316	3.16	17.7	70.7	70	0.7	4	●
VAPDSSUSD0317	3.17	17.7	70.7	70	0.7	4	●
VAPDSSUSD0318	3.18	17.7	70.7	70	0.7	4	●
VAPDSSUSD0319	3.19	17.7	70.7	70	0.7	4	●
VAPDSSUSD0320	3.20	17.7	70.7	70	0.7	4	●
VAPDSSUSD0321	3.21	17.7	70.7	70	0.7	4	●
VAPDSSUSD0322	3.22	17.7	70.7	70	0.7	4	●
VAPDSSUSD0323	3.23	17.7	70.7	70	0.7	4	●
VAPDSSUSD0324	3.24	17.7	70.7	70	0.7	4	●
VAPDSSUSD0325	3.25	17.7	70.7	70	0.7	4	●
VAPDSSUSD0326	3.26	17.7	70.7	70	0.7	4	●
VAPDSSUSD0327	3.27	17.7	70.7	70	0.7	4	●
VAPDSSUSD0328	3.28	17.7	70.7	70	0.7	4	●
VAPDSSUSD0329	3.29	17.7	70.7	70	0.7	4	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0330	3.30	19.7	70.7	70	0.7	4	●
VAPDSSUSD0331	3.31	19.7	70.7	70	0.7	4	●
VAPDSSUSD0332	3.32	19.7	70.7	70	0.7	4	●
VAPDSSUSD0333	3.33	19.7	70.7	70	0.7	4	●
VAPDSSUSD0334	3.34	19.7	70.7	70	0.7	4	●
VAPDSSUSD0335	3.35	19.7	70.7	70	0.7	4	●
VAPDSSUSD0336	3.36	19.7	70.7	70	0.7	4	●
VAPDSSUSD0337	3.37	19.7	70.7	70	0.7	4	●
VAPDSSUSD0338	3.38	19.7	70.7	70	0.7	4	●
VAPDSSUSD0339	3.39	19.7	70.7	70	0.7	4	●
VAPDSSUSD0340	3.40	19.7	70.7	70	0.7	4	●
VAPDSSUSD0341	3.41	19.7	70.7	70	0.7	4	●
VAPDSSUSD0342	3.42	19.7	70.7	70	0.7	4	●
VAPDSSUSD0343	3.43	19.7	70.7	70	0.7	4	●
VAPDSSUSD0344	3.44	19.7	70.7	70	0.7	4	●
VAPDSSUSD0345	3.45	19.7	70.7	70	0.7	4	●
VAPDSSUSD0346	3.46	19.7	70.7	70	0.7	4	●
VAPDSSUSD0347	3.47	19.7	70.7	70	0.7	4	●
VAPDSSUSD0348	3.48	19.7	70.7	70	0.7	4	●
VAPDSSUSD0349	3.49	19.7	70.7	70	0.7	4	●
VAPDSSUSD0350	3.50	19.7	70.7	70	0.7	4	●
VAPDSSUSD0351	3.51	19.7	70.7	70	0.7	4	●
VAPDSSUSD0352	3.52	19.7	70.7	70	0.7	4	●
VAPDSSUSD0353	3.53	19.7	70.7	70	0.7	4	●
VAPDSSUSD0354	3.54	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	●
VAPDSSUSD0357	3.57	19.7	70.7	70	0.7	4	●
VAPDSSUSD0358	3.58	19.7	70.7	70	0.7	4	●
VAPDSSUSD0359	3.59	19.7	70.7	70	0.7	4	●
VAPDSSUSD0360	3.60	21.8	70.8	70	0.8	4	●
VAPDSSUSD0361	3.61	21.8	70.8	70	0.8	4	●
VAPDSSUSD0362	3.62	21.8	70.8	70	0.8	4	●
VAPDSSUSD0363	3.63	21.8	70.8	70	0.8	4	●
VAPDSSUSD0364	3.64	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	●
VAPDSSUSD0372	3.72	21.8	70.8	70	0.8	4	●
VAPDSSUSD0373	3.73	21.8	70.8	70	0.8	4	●
VAPDSSUSD0374	3.74	21.8	70.8	70	0.8	4	●
VAPDSSUSD0375	3.75	21.8	70.8	70	0.8	4	●
VAPDSSUSD0376	3.76	21.8	70.8	70	0.8	4	●
VAPDSSUSD0377	3.77	21.8	70.8	70	0.8	4	●
VAPDSSUSD0378	3.78	21.8	70.8	70	0.8	4	●
VAPDSSUSD0379	3.79	21.8	70.8	70	0.8	4	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD0380	3.80	21.8	70.8	70	0.8	4	●
VAPDSSUSD0381	3.81	21.8	70.8	70	0.8	4	●
VAPDSSUSD0382	3.82	21.8	70.8	70	0.8	4	●
VAPDSSUSD0383	3.83	21.8	70.8	70	0.8	4	●
VAPDSSUSD0384	3.84	21.8	70.8	70	0.8	4	●
VAPDSSUSD0385	3.85	21.8	70.8	70	0.8	4	●
VAPDSSUSD0386	3.86	21.8	70.8	70	0.8	4	●
VAPDSSUSD0387	3.87	21.8	70.8	70	0.8	4	●
VAPDSSUSD0388	3.88	21.8	70.8	70	0.8	4	●
VAPDSSUSD0389	3.89	21.8	70.8	70	0.8	4	●
VAPDSSUSD0390	3.90	21.8	70.8	70	0.8	4	●
VAPDSSUSD0391	3.91	21.8	70.8	70	0.8	4	●
VAPDSSUSD0392	3.92	21.8	70.8	70	0.8	4	●
VAPDSSUSD0393	3.93	21.8	70.8	70	0.8	4	●
VAPDSSUSD0394	3.94	21.8	70.8	70	0.8	4	●
VAPDSSUSD0395	3.95	21.8	70.8	70	0.8	4	●
VAPDSSUSD0396	3.96	21.8	70.8	70	0.8	4	●
VAPDSSUSD0397	3.97	21.8	70.8	70	0.8	4	●
VAPDSSUSD0398	3.98	21.8	70.8	70	0.8	4	●
VAPDSSUSD0399	3.99	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	●
VAPDSSUSD0435	4.35	23.9	80.9	80	0.9	6	●
VAPDSSUSD0440	4.40	23.9	80.9	80	0.9	6	●
VAPDSSUSD0445	4.45	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	●
VAPDSSUSD0475	4.75	26.0	81.0	80	1.0	6	●
VAPDSSUSD0480	4.80	26.0	81.0	80	1.0	6	●
VAPDSSUSD0485	4.85	26.0	81.0	80	1.0	6	●
VAPDSSUSD0490	4.90	26.0	81.0	80	1.0	6	●
VAPDSSUSD0495	4.95	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	●
VAPDSSUSD0525	5.25	26.1	81.1	80	1.1	6	●
VAPDSSUSD0530	5.30	26.1	81.1	80	1.1	6	●
VAPDSSUSD0535	5.35	28.1	81.1	80	1.1	6	●
VAPDSSUSD0540	5.40	28.1	81.1	80	1.1	6	●
VAPDSSUSD0545	5.45	28.1	81.1	80	1.1	6	●

HSS

VAPDSSUS

Short, High precision, For stainless steel

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
VAPDSSUSD0575	5.75	28.2	81.2	80	1.2	6	●
VAPDSSUSD0580	5.80	28.2	81.2	80	1.2	6	●
VAPDSSUSD0585	5.85	28.2	81.2	80	1.2	6	●
VAPDSSUSD0590	5.90	28.2	81.2	80	1.2	6	●
VAPDSSUSD0595	5.95	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	●
VAPDSSUSD0635	6.35	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	●
VAPDSSUSD0655	6.55	31.4	81.4	80	1.4	8	●
VAPDSSUSD0660	6.60	31.4	81.4	80	1.4	8	●
VAPDSSUSD0665	6.65	31.4	81.4	80	1.4	8	●
VAPDSSUSD0670	6.70	31.4	81.4	80	1.4	8	●
VAPDSSUSD0675	6.75	33.4	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	●
VAPDSSUSD0695	6.95	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	●
VAPDSSUSD0715	7.15	33.5	81.5	80	1.5	8	●
VAPDSSUSD0720	7.20	33.5	81.5	80	1.5	8	●
VAPDSSUSD0725	7.25	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	●
VAPDSSUSD0745	7.45	33.5	81.5	80	1.5	8	●
VAPDSSUSD0750	7.50	33.6	81.6	80	1.6	8	●
VAPDSSUSD0755	7.55	36.6	86.6	85	1.6	8	●
VAPDSSUSD0760	7.60	36.6	86.6	85	1.6	8	●
VAPDSSUSD0765	7.65	36.6	86.6	85	1.6	8	●
VAPDSSUSD0770	7.70	36.6	86.6	85	1.6	8	●
VAPDSSUSD0775	7.75	36.6	86.6	85	1.6	8	●
VAPDSSUSD0780	7.80	36.6	86.6	85	1.6	8	●
VAPDSSUSD0785	7.85	36.6	86.6	85	1.6	8	●
VAPDSSUSD0790	7.90	36.6	86.6	85	1.6	8	●
VAPDSSUSD0795	7.95	36.7	86.7	85	1.7	8	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
VAPDSSUSD0825	8.25	36.7	91.7	90	1.7	10	●
VAPDSSUSD0830	8.30	36.7	91.7	90	1.7	10	●
VAPDSSUSD0835	8.35	36.7	91.7	90	1.7	10	●
VAPDSSUSD0840	8.40	36.7	91.7	90	1.7	10	●
VAPDSSUSD0845	8.45	36.8	91.8	90	1.8	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	●
VAPDSSUSD0865	8.65	39.8	94.8	93	1.8	10	●
VAPDSSUSD0870	8.70	39.8	94.8	93	1.8	10	●
VAPDSSUSD0875	8.75	39.8	94.8	93	1.8	10	●
VAPDSSUSD0880	8.80	39.8	94.8	93	1.8	10	●
VAPDSSUSD0885	8.85	39.8	94.8	93	1.8	10	●
VAPDSSUSD0890	8.90	39.8	94.8	93	1.8	10	●
VAPDSSUSD0895	8.95	39.9	94.9	93	1.9	10	●
VAPDSSUSD0900	9.00	39.9	94.9	93	1.9	10	●
VAPDSSUSD0910	9.10	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	●
VAPDSSUSD0940	9.40	40.0	95.0	93	2.0	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	●
VAPDSSUSD0980	9.80	43.0	98.0	96	2.0	10	●
VAPDSSUSD0990	9.90	43.1	98.1	96	2.1	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	●
VAPDSSUSD1070	10.7	47.2	107.2	105	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	●
VAPDSSUSD1110	11.1	47.3	107.3	105	2.3	12	●
VAPDSSUSD1120	11.2	47.3	107.3	105	2.3	12	●
VAPDSSUSD1130	11.3	47.3	107.3	105	2.3	12	●
VAPDSSUSD1140	11.4	47.4	107.4	105	2.4	12	●
VAPDSSUSD1150	11.5	47.4	107.4	105	2.4	12	●
VAPDSSUSD1160	11.6	47.4	107.4	105	2.4	12	●
VAPDSSUSD1170	11.7	47.4	107.4	105	2.4	12	●
VAPDSSUSD1180	11.8	47.4	107.4	105	2.4	12	●
VAPDSSUSD1190	11.9	51.5	111.5	109	2.5	12	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDSSUSD1200	12.0	51.5	111.5	109	2.5	12	●
VAPDSSUSD1210	12.1	51.5	111.5	109	2.5	12	●
VAPDSSUSD1220	12.2	51.5	111.5	109	2.5	12	●
VAPDSSUSD1230	12.3	51.6	111.6	109	2.6	12	●
VAPDSSUSD1240	12.4	51.6	111.6	109	2.6	12	●
VAPDSSUSD1250	12.5	51.6	111.6	109	2.6	12	●
VAPDSSUSD1260	12.6	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	●
VAPDSSUSD1290	12.9	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	●
VAPDSSUSD1560	15.6	58.2	118.2	115	3.2	16	●
VAPDSSUSD1570	15.7	58.3	118.3	115	3.3	16	●
VAPDSSUSD1600	16.0	58.3	118.3	115	3.3	16	●
VAPDSSUSD1650	16.5	60.4	125.4	122	3.4	20	●
VAPDSSUSD1700	17.0	60.5	125.5	122	3.5	20	●
VAPDSSUSD1750	17.5	61.6	126.6	123	3.6	20	●
VAPDSSUSD1760	17.6	61.7	126.7	123	3.7	20	●
VAPDSSUSD1770	17.7	61.7	126.7	123	3.7	20	●
VAPDSSUSD1800	18.0	61.7	126.7	123	3.7	20	●
VAPDSSUSD1850	18.5	63.8	128.8	125	3.8	20	●
VAPDSSUSD1900	19.0	63.9	128.9	125	3.9	20	●
VAPDSSUSD1950	19.5	66.0	131.0	127	4.0	20	●
VAPDSSUSD1960	19.6	66.1	131.1	127	4.1	20	●
VAPDSSUSD1970	19.7	66.1	131.1	127	4.1	20	●
VAPDSSUSD2000	20.0	66.1	131.1	127	4.1	20	●

HSS

VAPDMSUS

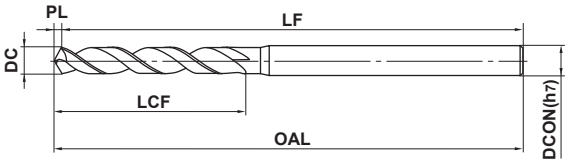
Medium, High precision, For stainless steel

CO HSS | V | 118° DC<4 | 135° DC≥4 | X Thinning DC≥1

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

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.



● New design and the Violet coating combination enable high efficiency drilling and long tool life for drilling of stainless steels.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0050	0.50	6.15	50.15	50	0.15	3	●
VAPDMSUSD0051	0.51	6.15	50.15	50	0.15	3	●
VAPDMSUSD0052	0.52	6.16	50.16	50	0.16	3	●
VAPDMSUSD0053	0.53	6.16	50.16	50	0.16	3	●
VAPDMSUSD0054	0.54	6.16	50.16	50	0.16	3	●
VAPDMSUSD0055	0.55	6.17	50.17	50	0.17	3	●
VAPDMSUSD0056	0.56	8.17	50.17	50	0.17	3	●
VAPDMSUSD0057	0.57	8.17	50.17	50	0.17	3	●
VAPDMSUSD0058	0.58	8.17	50.17	50	0.17	3	●
VAPDMSUSD0059	0.59	8.18	50.18	50	0.18	3	●
VAPDMSUSD0060	0.60	8.18	50.18	50	0.18	3	●
VAPDMSUSD0061	0.61	8.18	50.18	50	0.18	3	●
VAPDMSUSD0062	0.62	8.19	50.19	50	0.19	3	●
VAPDMSUSD0063	0.63	8.19	50.19	50	0.19	3	●
VAPDMSUSD0064	0.64	8.19	50.19	50	0.19	3	●
VAPDMSUSD0065	0.65	8.20	50.20	50	0.20	3	●
VAPDMSUSD0066	0.66	8.20	50.20	50	0.20	3	●
VAPDMSUSD0067	0.67	8.20	50.20	50	0.20	3	●
VAPDMSUSD0068	0.68	8.20	50.20	50	0.20	3	●
VAPDMSUSD0069	0.69	8.21	50.21	50	0.21	3	●
VAPDMSUSD0070	0.70	10.21	50.21	50	0.21	3	●
VAPDMSUSD0071	0.71	10.21	50.21	50	0.21	3	●
VAPDMSUSD0072	0.72	10.22	50.22	50	0.22	3	●
VAPDMSUSD0073	0.73	10.22	50.22	50	0.22	3	●
VAPDMSUSD0074	0.74	10.22	50.22	50	0.22	3	●
VAPDMSUSD0075	0.75	10.23	50.23	50	0.23	3	●
VAPDMSUSD0076	0.76	10.23	50.23	50	0.23	3	●
VAPDMSUSD0077	0.77	10.23	50.23	50	0.23	3	●
VAPDMSUSD0078	0.78	10.23	50.23	50	0.23	3	●
VAPDMSUSD0079	0.79	10.24	50.24	50	0.24	3	●
VAPDMSUSD0080	0.80	10.24	50.24	50	0.24	3	●
VAPDMSUSD0081	0.81	10.24	50.24	50	0.24	3	●
VAPDMSUSD0082	0.82	10.25	50.25	50	0.25	3	●
VAPDMSUSD0083	0.83	10.25	50.25	50	0.25	3	●
VAPDMSUSD0084	0.84	10.25	50.25	50	0.25	3	●
VAPDMSUSD0085	0.85	10.26	50.26	50	0.26	3	●
VAPDMSUSD0086	0.86	12.26	50.26	50	0.26	3	●
VAPDMSUSD0087	0.87	12.26	50.26	50	0.26	3	●
VAPDMSUSD0088	0.88	12.26	50.26	50	0.26	3	●
VAPDMSUSD0089	0.89	12.27	50.27	50	0.27	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0090	0.90	12.27	50.27	50	0.27	3	●
VAPDMSUSD0091	0.91	12.27	50.27	50	0.27	3	●
VAPDMSUSD0092	0.92	12.28	50.28	50	0.28	3	●
VAPDMSUSD0093	0.93	12.28	50.28	50	0.28	3	●
VAPDMSUSD0094	0.94	12.28	50.28	50	0.28	3	●
VAPDMSUSD0095	0.95	12.29	50.29	50	0.29	3	●
VAPDMSUSD0096	0.96	12.29	50.29	50	0.29	3	●
VAPDMSUSD0097	0.97	12.29	50.29	50	0.29	3	●
VAPDMSUSD0098	0.98	12.29	50.29	50	0.29	3	●
VAPDMSUSD0099	0.99	12.30	50.30	50	0.30	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	●
VAPDMSUSD0104	1.04	12.3	60.3	60	0.3	3	●
VAPDMSUSD0105	1.05	12.3	60.3	60	0.3	3	●
VAPDMSUSD0106	1.06	12.3	60.3	60	0.3	3	●
VAPDMSUSD0107	1.07	16.3	60.3	60	0.3	3	●
VAPDMSUSD0108	1.08	16.3	60.3	60	0.3	3	●
VAPDMSUSD0109	1.09	16.3	60.3	60	0.3	3	●
VAPDMSUSD0110	1.10	16.3	60.3	60	0.3	3	●
VAPDMSUSD0111	1.11	16.3	60.3	60	0.3	3	●
VAPDMSUSD0112	1.12	16.3	60.3	60	0.3	3	●
VAPDMSUSD0113	1.13	16.3	60.3	60	0.3	3	●
VAPDMSUSD0114	1.14	16.3	60.3	60	0.3	3	●
VAPDMSUSD0115	1.15	16.4	60.4	60	0.4	3	●
VAPDMSUSD0116	1.16	16.4	60.4	60	0.4	3	●
VAPDMSUSD0117	1.17	16.4	60.4	60	0.4	3	●
VAPDMSUSD0118	1.18	16.4	60.4	60	0.4	3	●
VAPDMSUSD0119	1.19	16.4	60.4	60	0.4	3	●
VAPDMSUSD0120	1.20	16.4	60.4	60	0.4	3	●
VAPDMSUSD0121	1.21	16.4	60.4	60	0.4	3	●
VAPDMSUSD0122	1.22	16.4	60.4	60	0.4	3	●
VAPDMSUSD0123	1.23	16.4	60.4	60	0.4	3	●
VAPDMSUSD0124	1.24	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	●
VAPDMSUSD0127	1.27	16.4	60.4	60	0.4	3	●
VAPDMSUSD0128	1.28	16.4	60.4	60	0.4	3	●
VAPDMSUSD0129	1.29	16.4	60.4	60	0.4	3	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0130	1.30	16.4	60.4	60	0.4	3	●
VAPDMSUSD0131	1.31	18.4	60.4	60	0.4	3	●
VAPDMSUSD0132	1.32	18.4	60.4	60	0.4	3	●
VAPDMSUSD0133	1.33	18.4	60.4	60	0.4	3	●
VAPDMSUSD0134	1.34	18.4	60.4	60	0.4	3	●
VAPDMSUSD0135	1.35	18.4	60.4	60	0.4	3	●
VAPDMSUSD0136	1.36	18.4	60.4	60	0.4	3	●
VAPDMSUSD0137	1.37	18.4	60.4	60	0.4	3	●
VAPDMSUSD0138	1.38	18.4	60.4	60	0.4	3	●
VAPDMSUSD0139	1.39	18.4	60.4	60	0.4	3	●
VAPDMSUSD0140	1.40	18.4	60.4	60	0.4	3	●
VAPDMSUSD0141	1.41	18.4	60.4	60	0.4	3	●
VAPDMSUSD0142	1.42	18.4	60.4	60	0.4	3	●
VAPDMSUSD0143	1.43	18.4	60.4	60	0.4	3	●
VAPDMSUSD0144	1.44	18.4	60.4	60	0.4	3	●
VAPDMSUSD0145	1.45	18.4	60.4	60	0.4	3	●
VAPDMSUSD0146	1.46	18.4	60.4	60	0.4	3	●
VAPDMSUSD0147	1.47	18.4	60.4	60	0.4	3	●
VAPDMSUSD0148	1.48	18.4	60.4	60	0.4	3	●
VAPDMSUSD0149	1.49	18.5	60.5	60	0.5	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	●
VAPDMSUSD0154	1.54	20.5	60.5	60	0.5	3	●
VAPDMSUSD0155	1.55	20.5	60.5	60	0.5	3	●
VAPDMSUSD0156	1.56	20.5	60.5	60	0.5	3	●
VAPDMSUSD0157	1.57	20.5	60.5	60	0.5	3	●
VAPDMSUSD0158	1.58	20.5	60.5	60	0.5	3	●
VAPDMSUSD0159	1.59	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	●
VAPDMSUSD0164	1.64	20.5	60.5	60	0.5	3	●
VAPDMSUSD0165	1.65	20.5	60.5	60	0.5	3	●
VAPDMSUSD0166	1.66	20.5	60.5	60	0.5	3	●
VAPDMSUSD0167	1.67	20.5	60.5	60	0.5	3	●
VAPDMSUSD0168	1.68	20.5	60.5	60	0.5	3	●
VAPDMSUSD0169	1.69	20.5	60.5	60	0.5	3	●
VAPDMSUSD0170	1.70	20.5	60.5	60	0.5	3	●
VAPDMSUSD0171	1.71	20.5	60.5	60	0.5	3	●
VAPDMSUSD0172	1.72	20.5	60.5	60	0.5	3	●
VAPDMSUSD0173	1.73	20.5	60.5	60	0.5	3	●
VAPDMSUSD0174	1.74	20.5	60.5	60	0.5	3	●
VAPDMSUSD0175	1.75	20.5	60.5	60	0.5	3	●
VAPDMSUSD0176	1.76	20.5	60.5	60	0.5	3	●
VAPDMSUSD0177	1.77	20.5	60.5	60	0.5	3	●
VAPDMSUSD0178	1.78	20.5	60.5	60	0.5	3	●
VAPDMSUSD0179	1.79	20.5	60.5	60	0.5	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0180	1.80	22.5	60.5	60	0.5	3	●
VAPDMSUSD0181	1.81	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	●
VAPDMSUSD0184	1.84	22.6	60.6	60	0.6	3	●
VAPDMSUSD0185	1.85	22.6	60.6	60	0.6	3	●
VAPDMSUSD0186	1.86	22.6	60.6	60	0.6	3	●
VAPDMSUSD0187	1.87	22.6	60.6	60	0.6	3	●
VAPDMSUSD0188	1.88	22.6	60.6	60	0.6	3	●
VAPDMSUSD0189	1.89	22.6	60.6	60	0.6	3	●
VAPDMSUSD0190	1.90	22.6	60.6	60	0.6	3	●
VAPDMSUSD0191	1.91	23.6	60.6	60	0.6	3	●
VAPDMSUSD0192	1.92	23.6	60.6	60	0.6	3	●
VAPDMSUSD0193	1.93	23.6	60.6	60	0.6	3	●
VAPDMSUSD0194	1.94	23.6	60.6	60	0.6	3	●
VAPDMSUSD0195	1.95	23.6	60.6	60	0.6	3	●
VAPDMSUSD0196	1.96	23.6	60.6	60	0.6	3	●
VAPDMSUSD0197	1.97	23.6	60.6	60	0.6	3	●
VAPDMSUSD0198	1.98	23.6	60.6	60	0.6	3	●
VAPDMSUSD0199	1.99	23.6	60.6	60	0.6	3	●
VAPDMSUSD0200	2.00	23.6	70.6	70	0.6	3	●
VAPDMSUSD0201	2.01	23.6	70.6	70	0.6	3	●
VAPDMSUSD0202	2.02	23.6	70.6	70	0.6	3	●
VAPDMSUSD0203	2.03	23.6	70.6	70	0.6	3	●
VAPDMSUSD0204	2.04	23.6	70.6	70	0.6	3	●
VAPDMSUSD0205	2.05	23.6	70.6	70	0.6	3	●
VAPDMSUSD0206	2.06	23.6	70.6	70	0.6	3	●
VAPDMSUSD0207	2.07	23.6	70.6	70	0.6	3	●
VAPDMSUSD0208	2.08	23.6	70.6	70	0.6	3	●
VAPDMSUSD0209	2.09	23.6	70.6	70	0.6	3	●
VAPDMSUSD0210	2.10	23.6	70.6	70	0.6	3	●
VAPDMSUSD0211	2.11	23.6	70.6	70	0.6	3	●
VAPDMSUSD0212	2.12	23.6	70.6	70	0.6	3	●
VAPDMSUSD0213	2.13	23.6	70.6	70	0.6	3	●
VAPDMSUSD0214	2.14	23.6	70.6	70	0.6	3	●
VAPDMSUSD0215	2.15	23.7	70.7	70	0.7	3	●
VAPDMSUSD0216	2.16	23.7	70.7	70	0.7	3	●
VAPDMSUSD0217	2.17	23.7	70.7	70	0.7	3	●
VAPDMSUSD0218	2.18	23.7	70.7	70	0.7	3	●
VAPDMSUSD0219	2.19	23.7	70.7	70	0.7	3	●
VAPDMSUSD0220	2.20	26.7	70.7	70	0.7	3	●
VAPDMSUSD0221	2.21	26.7	70.7	70	0.7	3	●
VAPDMSUSD0222	2.22	26.7	70.7	70	0.7	3	●
VAPDMSUSD0223	2.23	26.7	70.7	70	0.7	3	●
VAPDMSUSD0224	2.24	26.7	70.7	70	0.7	3	●
VAPDMSUSD0225	2.25	26.7	70.7	70	0.7	3	●
VAPDMSUSD0226	2.26	26.7	70.7	70	0.7	3	●
VAPDMSUSD0227	2.27	26.7	70.7	70	0.7	3	●
VAPDMSUSD0228	2.28	26.7	70.7	70	0.7	3	●
VAPDMSUSD0229	2.29	26.7	70.7	70	0.7	3	●

CUTTING CONDITIONS ➢ N158

VAPDMSUS

Medium, High precision, For stainless steel

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0230	2.30	26.7	70.7	70	0.7	3	●
VAPDMSUSD0231	2.31	26.7	70.7	70	0.7	3	●
VAPDMSUSD0232	2.32	26.7	70.7	70	0.7	3	●
VAPDMSUSD0233	2.33	26.7	70.7	70	0.7	3	●
VAPDMSUSD0234	2.34	26.7	70.7	70	0.7	3	●
VAPDMSUSD0235	2.35	26.7	70.7	70	0.7	3	●
VAPDMSUSD0236	2.36	26.7	70.7	70	0.7	3	●
VAPDMSUSD0237	2.37	26.7	70.7	70	0.7	3	●
VAPDMSUSD0238	2.38	26.7	70.7	70	0.7	3	●
VAPDMSUSD0239	2.39	26.7	70.7	70	0.7	3	●
VAPDMSUSD0240	2.40	29.7	70.7	70	0.7	3	●
VAPDMSUSD0241	2.41	29.7	70.7	70	0.7	3	●
VAPDMSUSD0242	2.42	29.7	70.7	70	0.7	3	●
VAPDMSUSD0243	2.43	29.7	70.7	70	0.7	3	●
VAPDMSUSD0244	2.44	29.7	70.7	70	0.7	3	●
VAPDMSUSD0245	2.45	29.7	70.7	70	0.7	3	●
VAPDMSUSD0246	2.46	29.7	70.7	70	0.7	3	●
VAPDMSUSD0247	2.47	29.7	70.7	70	0.7	3	●
VAPDMSUSD0248	2.48	29.8	70.8	70	0.8	3	●
VAPDMSUSD0249	2.49	29.8	70.8	70	0.8	3	●
VAPDMSUSD0250	2.50	29.8	70.8	70	0.8	3	●
VAPDMSUSD0251	2.51	29.8	70.8	70	0.8	3	●
VAPDMSUSD0252	2.52	29.8	70.8	70	0.8	3	●
VAPDMSUSD0253	2.53	29.8	70.8	70	0.8	3	●
VAPDMSUSD0254	2.54	29.8	70.8	70	0.8	3	●
VAPDMSUSD0255	2.55	29.8	70.8	70	0.8	3	●
VAPDMSUSD0256	2.56	29.8	70.8	70	0.8	3	●
VAPDMSUSD0257	2.57	29.8	70.8	70	0.8	3	●
VAPDMSUSD0258	2.58	29.8	70.8	70	0.8	3	●
VAPDMSUSD0259	2.59	29.8	70.8	70	0.8	3	●
VAPDMSUSD0260	2.60	29.8	70.8	70	0.8	3	●
VAPDMSUSD0261	2.61	29.8	70.8	70	0.8	3	●
VAPDMSUSD0262	2.62	29.8	70.8	70	0.8	3	●
VAPDMSUSD0263	2.63	29.8	70.8	70	0.8	3	●
VAPDMSUSD0264	2.64	29.8	70.8	70	0.8	3	●
VAPDMSUSD0265	2.65	29.8	70.8	70	0.8	3	●
VAPDMSUSD0266	2.66	29.8	70.8	70	0.8	3	●
VAPDMSUSD0267	2.67	29.8	70.8	70	0.8	3	●
VAPDMSUSD0268	2.68	29.8	70.8	70	0.8	3	●
VAPDMSUSD0269	2.69	29.8	70.8	70	0.8	3	●
VAPDMSUSD0270	2.70	32.8	70.8	70	0.8	3	●
VAPDMSUSD0271	2.71	32.8	70.8	70	0.8	3	●
VAPDMSUSD0272	2.72	32.8	70.8	70	0.8	3	●
VAPDMSUSD0273	2.73	32.8	70.8	70	0.8	3	●
VAPDMSUSD0274	2.74	32.8	70.8	70	0.8	3	●
VAPDMSUSD0275	2.75	32.8	70.8	70	0.8	3	●
VAPDMSUSD0276	2.76	32.8	70.8	70	0.8	3	●
VAPDMSUSD0277	2.77	32.8	70.8	70	0.8	3	●
VAPDMSUSD0278	2.78	32.8	70.8	70	0.8	3	●
VAPDMSUSD0279	2.79	32.8	70.8	70	0.8	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0280	2.80	32.8	70.8	70	0.8	3	●
VAPDMSUSD0281	2.81	32.8	70.8	70	0.8	3	●
VAPDMSUSD0282	2.82	32.9	70.9	70	0.9	3	●
VAPDMSUSD0283	2.83	32.9	70.9	70	0.9	3	●
VAPDMSUSD0284	2.84	32.9	70.9	70	0.9	3	●
VAPDMSUSD0285	2.85	32.9	70.9	70	0.9	3	●
VAPDMSUSD0286	2.86	32.9	70.9	70	0.9	3	●
VAPDMSUSD0287	2.87	32.9	70.9	70	0.9	3	●
VAPDMSUSD0288	2.88	32.9	70.9	70	0.9	3	●
VAPDMSUSD0289	2.89	32.9	70.9	70	0.9	3	●
VAPDMSUSD0290	2.90	32.9	70.9	70	0.9	3	●
VAPDMSUSD0291	2.91	32.9	70.9	70	0.9	3	●
VAPDMSUSD0292	2.92	32.9	70.9	70	0.9	3	●
VAPDMSUSD0293	2.93	32.9	70.9	70	0.9	3	●
VAPDMSUSD0294	2.94	32.9	70.9	70	0.9	3	●
VAPDMSUSD0295	2.95	32.9	70.9	70	0.9	3	●
VAPDMSUSD0296	2.96	32.9	70.9	70	0.9	3	●
VAPDMSUSD0297	2.97	32.9	70.9	70	0.9	3	●
VAPDMSUSD0298	2.98	32.9	70.9	70	0.9	3	●
VAPDMSUSD0299	2.99	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	●
VAPDMSUSD0304	3.04	35.9	85.9	85	0.9	4	●
VAPDMSUSD0305	3.05	35.9	85.9	85	0.9	4	●
VAPDMSUSD0306	3.06	35.9	85.9	85	0.9	4	●
VAPDMSUSD0307	3.07	35.9	85.9	85	0.9	4	●
VAPDMSUSD0308	3.08	35.9	85.9	85	0.9	4	●
VAPDMSUSD0309	3.09	35.9	85.9	85	0.9	4	●
VAPDMSUSD0310	3.10	35.9	85.9	85	0.9	4	●
VAPDMSUSD0311	3.11	35.9	85.9	85	0.9	4	●
VAPDMSUSD0312	3.12	35.9	85.9	85	0.9	4	●
VAPDMSUSD0313	3.13	35.9	85.9	85	0.9	4	●
VAPDMSUSD0314	3.14	35.9	85.9	85	0.9	4	●
VAPDMSUSD0315	3.15	36.0	86.0	85	1.0	4	●
VAPDMSUSD0316	3.16	36.0	86.0	85	1.0	4	●
VAPDMSUSD0317	3.17	36.0	86.0	85	1.0	4	●
VAPDMSUSD0318	3.18	36.0	86.0	85	1.0	4	●
VAPDMSUSD0319	3.19	36.0	86.0	85	1.0	4	●
VAPDMSUSD0320	3.20	36.0	86.0	85	1.0	4	●
VAPDMSUSD0321	3.21	36.0	86.0	85	1.0	4	●
VAPDMSUSD0322	3.22	36.0	86.0	85	1.0	4	●
VAPDMSUSD0323	3.23	36.0	86.0	85	1.0	4	●
VAPDMSUSD0324	3.24	36.0	86.0	85	1.0	4	●
VAPDMSUSD0325	3.25	36.0	86.0	85	1.0	4	●
VAPDMSUSD0326	3.26	36.0	86.0	85	1.0	4	●
VAPDMSUSD0327	3.27	36.0	86.0	85	1.0	4	●
VAPDMSUSD0328	3.28	36.0	86.0	85	1.0	4	●
VAPDMSUSD0329	3.29	36.0	86.0	85	1.0	4	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0330	3.30	36.0	86.0	85	1.0	4	●
VAPDMSUSD0331	3.31	39.0	86.0	85	1.0	4	●
VAPDMSUSD0332	3.32	39.0	86.0	85	1.0	4	●
VAPDMSUSD0333	3.33	39.0	86.0	85	1.0	4	●
VAPDMSUSD0334	3.34	39.0	86.0	85	1.0	4	●
VAPDMSUSD0335	3.35	39.0	86.0	85	1.0	4	●
VAPDMSUSD0336	3.36	39.0	86.0	85	1.0	4	●
VAPDMSUSD0337	3.37	39.0	86.0	85	1.0	4	●
VAPDMSUSD0338	3.38	39.0	86.0	85	1.0	4	●
VAPDMSUSD0339	3.39	39.0	86.0	85	1.0	4	●
VAPDMSUSD0340	3.40	39.0	86.0	85	1.0	4	●
VAPDMSUSD0341	3.41	39.0	86.0	85	1.0	4	●
VAPDMSUSD0342	3.42	39.0	86.0	85	1.0	4	●
VAPDMSUSD0343	3.43	39.0	86.0	85	1.0	4	●
VAPDMSUSD0344	3.44	39.0	86.0	85	1.0	4	●
VAPDMSUSD0345	3.45	39.0	86.0	85	1.0	4	●
VAPDMSUSD0346	3.46	39.0	86.0	85	1.0	4	●
VAPDMSUSD0347	3.47	39.0	86.0	85	1.0	4	●
VAPDMSUSD0348	3.48	39.1	86.1	85	1.1	4	●
VAPDMSUSD0349	3.49	39.1	86.1	85	1.1	4	●
VAPDMSUSD0350	3.50	39.1	86.1	85	1.1	4	●
VAPDMSUSD0351	3.51	39.1	86.1	85	1.1	4	●
VAPDMSUSD0352	3.52	39.1	86.1	85	1.1	4	●
VAPDMSUSD0353	3.53	39.1	86.1	85	1.1	4	●
VAPDMSUSD0354	3.54	39.1	86.1	85	1.1	4	●
VAPDMSUSD0355	3.55	39.1	86.1	85	1.1	4	●
VAPDMSUSD0356	3.56	39.1	86.1	85	1.1	4	●
VAPDMSUSD0357	3.57	39.1	86.1	85	1.1	4	●
VAPDMSUSD0358	3.58	39.1	86.1	85	1.1	4	●
VAPDMSUSD0359	3.59	39.1	86.1	85	1.1	4	●
VAPDMSUSD0360	3.60	39.1	86.1	85	1.1	4	●
VAPDMSUSD0361	3.61	39.1	86.1	85	1.1	4	●
VAPDMSUSD0362	3.62	39.1	86.1	85	1.1	4	●
VAPDMSUSD0363	3.63	39.1	86.1	85	1.1	4	●
VAPDMSUSD0364	3.64	39.1	86.1	85	1.1	4	●
VAPDMSUSD0365	3.65	39.1	86.1	85	1.1	4	●
VAPDMSUSD0366	3.66	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	●
VAPDMSUSD0369	3.69	39.1	86.1	85	1.1	4	●
VAPDMSUSD0370	3.70	39.1	86.1	85	1.1	4	●
VAPDMSUSD0371	3.71	43.1	86.1	85	1.1	4	●
VAPDMSUSD0372	3.72	43.1	86.1	85	1.1	4	●
VAPDMSUSD0373	3.73	43.1	86.1	85	1.1	4	●
VAPDMSUSD0374	3.74	43.1	86.1	85	1.1	4	●
VAPDMSUSD0375	3.75	43.1	86.1	85	1.1	4	●
VAPDMSUSD0376	3.76	43.1	86.1	85	1.1	4	●
VAPDMSUSD0377	3.77	43.1	86.1	85	1.1	4	●
VAPDMSUSD0378	3.78	43.1	86.1	85	1.1	4	●
VAPDMSUSD0379	3.79	43.1	86.1	85	1.1	4	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0380	3.80	43.1	86.1	85	1.1	4	●
VAPDMSUSD0381	3.81	43.1	86.1	85	1.1	4	●
VAPDMSUSD0382	3.82	43.2	86.2	85	1.2	4	●
VAPDMSUSD0383	3.83	43.2	86.2	85	1.2	4	●
VAPDMSUSD0384	3.84	43.2	86.2	85	1.2	4	●
VAPDMSUSD0385	3.85	43.2	86.2	85	1.2	4	●
VAPDMSUSD0386	3.86	43.2	86.2	85	1.2	4	●
VAPDMSUSD0387	3.87	43.2	86.2	85	1.2	4	●
VAPDMSUSD0388	3.88	43.2	86.2	85	1.2	4	●
VAPDMSUSD0389	3.89	43.2	86.2	85	1.2	4	●
VAPDMSUSD0390	3.90	43.2	86.2	85	1.2	4	●
VAPDMSUSD0391	3.91	43.2	86.2	85	1.2	4	●
VAPDMSUSD0392	3.92	43.2	86.2	85	1.2	4	●
VAPDMSUSD0393	3.93	43.2	86.2	85	1.2	4	●
VAPDMSUSD0394	3.94	43.2	86.2	85	1.2	4	●
VAPDMSUSD0395	3.95	43.2	86.2	85	1.2	4	●
VAPDMSUSD0396	3.96	43.2	86.2	85	1.2	4	●
VAPDMSUSD0397	3.97	43.2	86.2	85	1.2	4	●
VAPDMSUSD0398	3.98	43.2	86.2	85	1.2	4	●
VAPDMSUSD0399	3.99	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	●
VAPDMSUSD0415	4.15	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	●
VAPDMSUSD0435	4.35	46.9	100.9	100	0.9	6	●
VAPDMSUSD0440	4.40	46.9	100.9	100	0.9	6	●
VAPDMSUSD0445	4.45	46.9	100.9	100	0.9	6	●
VAPDMSUSD0450	4.50	46.9	100.9	100	0.9	6	●
VAPDMSUSD0455	4.55	46.9	100.9	100	0.9	6	●
VAPDMSUSD0460	4.60	47.0	101.0	100	1.0	6	●
VAPDMSUSD0465	4.65	47.0	101.0	100	1.0	6	●
VAPDMSUSD0470	4.70	47.0	101.0	100	1.0	6	●
VAPDMSUSD0475	4.75	47.0	101.0	100	1.0	6	●
VAPDMSUSD0480	4.80	52.0	101.0	100	1.0	6	●
VAPDMSUSD0485	4.85	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	●
VAPDMSUSD0505	5.05	52.1	101.1	100	1.1	6	●
VAPDMSUSD0510	5.10	52.1	101.1	100	1.1	6	●
VAPDMSUSD0515	5.15	52.1	101.1	100	1.1	6	●
VAPDMSUSD0520	5.20	52.1	101.1	100	1.1	6	●
VAPDMSUSD0525	5.25	52.1	101.1	100	1.1	6	●
VAPDMSUSD0530	5.30	52.1	101.1	100	1.1	6	●
VAPDMSUSD0535	5.35	57.1	107.1	106	1.1	6	●
VAPDMSUSD0540	5.40	57.1	107.1	106	1.1	6	●
VAPDMSUSD0545	5.45	57.1	107.1	106	1.1	6	●

VAPDMSUS

Medium, High precision, For stainless steel

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
VAPDMSUSD0565	5.65	57.2	107.2	106	1.2	6	●
VAPDMSUSD0570	5.70	57.2	107.2	106	1.2	6	●
VAPDMSUSD0575	5.75	57.2	107.2	106	1.2	6	●
VAPDMSUSD0580	5.80	57.2	107.2	106	1.2	6	●
VAPDMSUSD0585	5.85	57.2	107.2	106	1.2	6	●
VAPDMSUSD0590	5.90	57.2	107.2	106	1.2	6	●
VAPDMSUSD0595	5.95	57.2	107.2	106	1.2	6	●
VAPDMSUSD0600	6.00	57.2	107.2	106	1.2	6	●
VAPDMSUSD0605	6.05	63.3	113.3	112	1.3	8	●
VAPDMSUSD0610	6.10	63.3	113.3	112	1.3	8	●
VAPDMSUSD0615	6.15	63.3	113.3	112	1.3	8	●
VAPDMSUSD0620	6.20	63.3	113.3	112	1.3	8	●
VAPDMSUSD0625	6.25	63.3	113.3	112	1.3	8	●
VAPDMSUSD0630	6.30	63.3	113.3	112	1.3	8	●
VAPDMSUSD0635	6.35	63.3	113.3	112	1.3	8	●
VAPDMSUSD0640	6.40	63.3	113.3	112	1.3	8	●
VAPDMSUSD0645	6.45	63.3	113.3	112	1.3	8	●
VAPDMSUSD0650	6.50	63.4	113.4	112	1.4	8	●
VAPDMSUSD0655	6.55	63.4	113.4	112	1.4	8	●
VAPDMSUSD0660	6.60	63.4	113.4	112	1.4	8	●
VAPDMSUSD0665	6.65	63.4	113.4	112	1.4	8	●
VAPDMSUSD0670	6.70	63.4	113.4	112	1.4	8	●
VAPDMSUSD0675	6.75	68.4	118.4	117	1.4	8	●
VAPDMSUSD0680	6.80	68.4	118.4	117	1.4	8	●
VAPDMSUSD0685	6.85	68.4	118.4	117	1.4	8	●
VAPDMSUSD0690	6.90	68.4	118.4	117	1.4	8	●
VAPDMSUSD0695	6.95	68.4	118.4	117	1.4	8	●
VAPDMSUSD0700	7.00	68.5	118.5	117	1.5	8	●
VAPDMSUSD0705	7.05	68.5	118.5	117	1.5	8	●
VAPDMSUSD0710	7.10	68.5	118.5	117	1.5	8	●
VAPDMSUSD0715	7.15	68.5	118.5	117	1.5	8	●
VAPDMSUSD0720	7.20	68.5	118.5	117	1.5	8	●
VAPDMSUSD0725	7.25	68.5	118.5	117	1.5	8	●
VAPDMSUSD0730	7.30	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	●
VAPDMSUSD0745	7.45	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	●
VAPDMSUSD0765	7.65	74.6	124.6	123	1.6	8	●
VAPDMSUSD0770	7.70	74.6	124.6	123	1.6	8	●
VAPDMSUSD0775	7.75	74.6	124.6	123	1.6	8	●
VAPDMSUSD0780	7.80	74.6	124.6	123	1.6	8	●
VAPDMSUSD0785	7.85	74.6	124.6	123	1.6	8	●
VAPDMSUSD0790	7.90	74.6	124.6	123	1.6	8	●
VAPDMSUSD0795	7.95	74.7	124.7	123	1.7	8	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD0800	8.00	74.7	124.7	123	1.7	8	●
VAPDMSUSD0805	8.05	74.7	129.7	128	1.7	10	●
VAPDMSUSD0810	8.10	74.7	129.7	128	1.7	10	●
VAPDMSUSD0815	8.15	74.7	129.7	128	1.7	10	●
VAPDMSUSD0820	8.20	74.7	129.7	128	1.7	10	●
VAPDMSUSD0825	8.25	74.7	129.7	128	1.7	10	●
VAPDMSUSD0830	8.30	74.7	129.7	128	1.7	10	●
VAPDMSUSD0835	8.35	74.7	129.7	128	1.7	10	●
VAPDMSUSD0840	8.40	74.7	129.7	128	1.7	10	●
VAPDMSUSD0845	8.45	74.8	129.8	128	1.8	10	●
VAPDMSUSD0850	8.50	74.8	129.8	128	1.8	10	●
VAPDMSUSD0855	8.55	80.8	135.8	134	1.8	10	●
VAPDMSUSD0860	8.60	80.8	135.8	134	1.8	10	●
VAPDMSUSD0865	8.65	80.8	135.8	134	1.8	10	●
VAPDMSUSD0870	8.70	80.8	135.8	134	1.8	10	●
VAPDMSUSD0875	8.75	80.8	135.8	134	1.8	10	●
VAPDMSUSD0880	8.80	80.8	135.8	134	1.8	10	●
VAPDMSUSD0885	8.85	80.8	135.8	134	1.8	10	●
VAPDMSUSD0890	8.90	80.8	135.8	134	1.8	10	●
VAPDMSUSD0895	8.95	80.9	135.9	134	1.9	10	●
VAPDMSUSD0900	9.00	80.9	135.9	134	1.9	10	●
VAPDMSUSD0910	9.10	80.9	135.9	134	1.9	10	●
VAPDMSUSD0920	9.20	80.9	135.9	134	1.9	10	●
VAPDMSUSD0930	9.30	80.9	135.9	134	1.9	10	●
VAPDMSUSD0940	9.40	81.0	136.0	134	2.0	10	●
VAPDMSUSD0950	9.50	81.0	136.0	134	2.0	10	●
VAPDMSUSD0960	9.60	87.0	142.0	140	2.0	10	●
VAPDMSUSD0970	9.70	87.0	142.0	140	2.0	10	●
VAPDMSUSD0980	9.80	87.0	142.0	140	2.0	10	●
VAPDMSUSD0990	9.90	87.1	142.1	140	2.1	10	●
VAPDMSUSD1000	10.0	87.1	142.1	140	2.1	10	●
VAPDMSUSD1010	10.1	87.1	147.1	145	2.1	12	●
VAPDMSUSD1020	10.2	87.1	147.1	145	2.1	12	●
VAPDMSUSD1030	10.3	87.1	147.1	145	2.1	12	●
VAPDMSUSD1040	10.4	87.2	147.2	145	2.2	12	●
VAPDMSUSD1050	10.5	87.2	147.2	145	2.2	12	●
VAPDMSUSD1060	10.6	87.2	147.2	145	2.2	12	●
VAPDMSUSD1070	10.7	94.2	154.2	152	2.2	12	●
VAPDMSUSD1080	10.8	94.2	154.2	152	2.2	12	●
VAPDMSUSD1090	10.9	94.3	154.3	152	2.3	12	●
VAPDMSUSD1100	11.0	94.3	154.3	152	2.3	12	●
VAPDMSUSD1110	11.1	94.3	154.3	152	2.3	12	●
VAPDMSUSD1120	11.2	94.3	154.3	152	2.3	12	●
VAPDMSUSD1130	11.3	94.3	154.3	152	2.3	12	●
VAPDMSUSD1140	11.4	94.4	154.4	152	2.4	12	●
VAPDMSUSD1150	11.5	94.4	154.4	152	2.4	12	●
VAPDMSUSD1160	11.6	94.4	154.4	152	2.4	12	●
VAPDMSUSD1170	11.7	94.4	154.4	152	2.4	12	●
VAPDMSUSD1180	11.8	94.4	154.4	152	2.4	12	●
VAPDMSUSD1190	11.9	101.5	161.5	159	2.5	12	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDMSUSD1200	12.0	101.5	161.5	159	2.5	12	●
VAPDMSUSD1210	12.1	101.5	161.5	159	2.5	12	●
VAPDMSUSD1220	12.2	101.5	161.5	159	2.5	12	●
VAPDMSUSD1230	12.3	101.6	161.6	159	2.6	12	●
VAPDMSUSD1240	12.4	101.6	161.6	159	2.6	12	●
VAPDMSUSD1250	12.5	101.6	161.6	159	2.6	12	●
VAPDMSUSD1260	12.6	101.6	161.6	159	2.6	12	●
VAPDMSUSD1270	12.7	101.6	161.6	159	2.6	12	●
VAPDMSUSD1280	12.8	101.7	161.7	159	2.7	12	●
VAPDMSUSD1290	12.9	101.7	161.7	159	2.7	12	●
VAPDMSUSD1300	13.0	101.7	161.7	159	2.7	12	●

HSS

VAPDSSUS VAPDMSUS

VIOLET DRILLS, High precision, For stainless steel, Short/medium

RECOMMENDED CUTTING CONDITIONS

Work Material	Stainless steel				Carbon steel AISI 1049 Alloy steel SCM Cast iron FC Copper, Copper alloy		Structural steel Aluminium alloy	
	Austenitic AISI 304, AISI 316		Martensitic Ferritic AISI 430					
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

1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
2) Please use a collet type drill chuck or a milling chuck.
3) Use sufficient cutting fluid.
4) For precipitation-hardened stainless steels (JIS SUS630 and SUS631), MWE and MWS are recommended.
5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.

The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

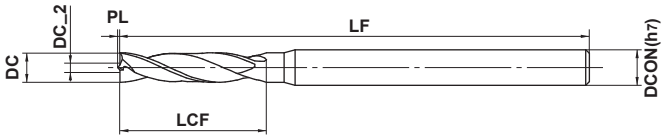
VAPDSCB

Short flute length, High precision, For counter boring

HG HSS | V | 180° 118° | X Thinning

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

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.

Unit : mm

Order Number	DC	DC_2	LCF	LF	PL	DCON	Stock
VAPDSCBD0200	2.0	0.7	12	60	0.2	3	●
VAPDSCBD0210	2.1	0.7	12	60	0.2	3	●
VAPDSCBD0220	2.2	0.7	12	60	0.2	3	●
VAPDSCBD0230	2.3	0.7	13	60	0.2	3	●
VAPDSCBD0240	2.4	0.7	13	60	0.2	3	●
VAPDSCBD0250	2.5	0.7	13	60	0.2	3	●
VAPDSCBD0260	2.6	0.8	15	60	0.2	3	●
VAPDSCBD0270	2.7	0.8	15	60	0.2	3	●
VAPDSCBD0280	2.8	0.8	15	60	0.2	3	●
VAPDSCBD0290	2.9	0.8	15	60	0.2	3	●
VAPDSCBD0300	3.0	0.8	15	60	0.2	3	●
VAPDSCBD0310	3.1	0.8	17	70	0.2	4	●
VAPDSCBD0320	3.2	0.8	17	70	0.2	4	●
VAPDSCBD0330	3.3	0.8	19	70	0.2	4	●
VAPDSCBD0340	3.4	0.8	19	70	0.2	4	●
VAPDSCBD0350	3.5	0.8	19	70	0.2	4	●
VAPDSCBD0360	3.6	1.0	21	70	0.2	4	●
VAPDSCBD0370	3.7	1.0	21	70	0.2	4	●
VAPDSCBD0380	3.8	1.0	21	70	0.2	4	●
VAPDSCBD0390	3.9	1.0	21	70	0.2	4	●
VAPDSCBD0400	4.0	1.0	21	70	0.3	4	●
VAPDSCBD0410	4.1	1.0	21	80	0.3	6	●
VAPDSCBD0420	4.2	1.0	21	80	0.3	6	●
VAPDSCBD0430	4.3	1.0	23	80	0.3	6	●
VAPDSCBD0440	4.4	1.0	23	80	0.3	6	●
VAPDSCBD0450	4.5	1.0	23	80	0.3	6	●
VAPDSCBD0460	4.6	1.4	25	80	0.3	6	●
VAPDSCBD0470	4.7	1.4	25	80	0.3	6	●
VAPDSCBD0480	4.8	1.4	25	80	0.3	6	●
VAPDSCBD0490	4.9	1.4	25	80	0.3	6	●
VAPDSCBD0500	5.0	1.4	25	80	0.4	6	●
VAPDSCBD0510	5.1	1.4	25	80	0.4	6	●
VAPDSCBD0520	5.2	1.4	25	80	0.4	6	●
VAPDSCBD0530	5.3	1.4	25	80	0.4	6	●
VAPDSCBD0540	5.4	1.4	27	80	0.4	6	●
VAPDSCBD0550	5.5	1.4	27	80	0.4	6	●
VAPDSCBD0560	5.6	1.4	27	80	0.4	6	●
VAPDSCBD0570	5.7	1.4	27	80	0.4	6	●
VAPDSCBD0580	5.8	1.4	27	80	0.4	6	●
VAPDSCBD0590	5.9	1.4	27	80	0.4	6	●

Order Number	DC	DC_2	LCF	LF	PL	DCON	Stock
VAPDSCBD0600	6.0	1.4	27	80	0.4	6	●
VAPDSCBD0610	6.1	1.4	30	80	0.4	8	●
VAPDSCBD0620	6.2	1.4	30	80	0.4	8	●
VAPDSCBD0630	6.3	1.4	30	80	0.4	8	●
VAPDSCBD0640	6.4	1.4	30	80	0.4	8	●
VAPDSCBD0650	6.5	1.4	30	80	0.4	8	●
VAPDSCBD0660	6.6	1.8	30	80	0.4	8	●
VAPDSCBD0670	6.7	1.8	30	80	0.4	8	●
VAPDSCBD0680	6.8	1.8	32	80	0.4	8	●
VAPDSCBD0690	6.9	1.8	32	80	0.4	8	●
VAPDSCBD0700	7.0	1.8	32	80	0.6	8	●
VAPDSCBD0710	7.1	1.8	32	80	0.6	8	●
VAPDSCBD0720	7.2	1.8	32	80	0.6	8	●
VAPDSCBD0730	7.3	1.8	32	80	0.6	8	●
VAPDSCBD0740	7.4	1.8	32	80	0.6	8	●
VAPDSCBD0750	7.5	1.8	32	80	0.6	8	●
VAPDSCBD0760	7.6	2.0	35	85	0.6	8	●
VAPDSCBD0770	7.7	2.0	35	85	0.6	8	●
VAPDSCBD0780	7.8	2.0	35	85	0.6	8	●
VAPDSCBD0790	7.9	2.0	35	85	0.6	8	●
VAPDSCBD0800	8.0	2.0	35	85	0.6	8	●
VAPDSCBD0810	8.1	2.0	35	90	0.6	10	●
VAPDSCBD0850	8.5	2.0	35	90	0.6	10	●
VAPDSCBD0860	8.6	2.8	38	93	0.6	10	●
VAPDSCBD0880	8.8	2.8	38	93	0.6	10	●
VAPDSCBD0900	9.0	2.8	38	93	0.8	10	●
VAPDSCBD0910	9.1	2.8	38	93	0.8	10	●
VAPDSCBD0950	9.5	2.8	38	93	0.8	10	●
VAPDSCBD0960	9.6	3.2	41	96	0.8	10	●
VAPDSCBD0980	9.8	3.2	41	96	0.8	10	●
VAPDSCBD1000	10.0	3.2	41	96	0.9	10	●
VAPDSCBD1010	10.1	3.2	41	101	0.9	12	●
VAPDSCBD1030	10.3	3.2	41	101	0.9	12	●
VAPDSCBD1050	10.5	3.2	41	101	0.9	12	●
VAPDSCBD1080	10.8	3.7	45	105	0.9	12	●
VAPDSCBD1100	11.0	3.7	45	105	0.9	12	●
VAPDSCBD1110	11.1	3.7	45	105	0.9	12	●
VAPDSCBD1150	11.5	3.7	45	105	0.9	12	●
VAPDSCBD1180	11.8	3.7	45	105	0.9	12	●
VAPDSCBD1200	12.0	3.7	49	109	0.9	12	●

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤N161

VAPDSCB

Short flute length, High precision, For counter boring

Unit : mm

Order Number	DC	DC_2	LCF	LF	PL	DCON	Stock
VAPDSCBD1250	12.5	3.7	49	109	0.9	12	●
VAPDSCBD1300	13.0	4.2	49	109	1.1	12	●
VAPDSCBD1350	13.5	4.2	51	121	1.1	16	●
VAPDSCBD1380	13.8	4.2	51	121	1.1	16	●
VAPDSCBD1400	14.0	4.2	51	121	1.1	16	●
VAPDSCBD1410	14.1	5.5	58	123	1.1	16	●
VAPDSCBD1420	14.2	5.5	58	123	1.1	16	●
VAPDSCBD1450	14.5	5.5	58	123	1.1	16	●
VAPDSCBD1480	14.8	5.5	58	123	1.1	16	●
VAPDSCBD1500	15.0	5.5	58	123	1.3	16	●
VAPDSCBD1550	15.5	5.5	60	125	1.3	16	●
VAPDSCBD1570	15.7	5.5	60	125	1.3	16	●
VAPDSCBD1580	15.8	5.5	60	125	1.3	16	●
VAPDSCBD1600	16.0	5.5	60	125	1.3	16	●
VAPDSCBD1700	17.0	5.5	62	132	1.3	20	●
VAPDSCBD1750	17.5	5.5	63	133	1.6	20	●
VAPDSCBD1760	17.6	6.5	63	133	1.6	20	●
VAPDSCBD1770	17.7	6.5	63	133	1.6	20	●
VAPDSCBD1780	17.8	6.5	63	133	1.6	20	●
VAPDSCBD1800	18.0	6.5	63	133	1.6	20	●
VAPDSCBD1810	18.1	6.5	65	135	1.6	20	●
VAPDSCBD1900	19.0	6.5	65	135	1.6	20	●
VAPDSCBD1980	19.8	7.5	67	137	1.6	20	●
VAPDSCBD2000	20.0	7.5	67	137	1.8	20	●
VAPDSCBD2010	20.1	7.5	67	137	1.8	20	●
VAPDSCBD2100	21.0	7.5	75	165	1.8	25	●
VAPDSCBD2200	22.0	7.5	75	165	1.8	25	●
VAPDSCBD2300	23.0	7.5	80	170	1.8	25	●
VAPDSCBD2400	24.0	8.5	80	170	2.2	25	●
VAPDSCBD2500	25.0	8.5	85	180	2.2	25	●
VAPDSCBD2600	26.0	9.0	85	180	2.2	32	●
VAPDSCBD2700	27.0	9.0	95	190	2.2	32	●
VAPDSCBD2800	28.0	10.0	95	190	2.6	32	●
VAPDSCBD2900	29.0	10.0	100	195	2.6	32	●
VAPDSCBD3000	30.0	11.0	100	195	2.6	32	●
VAPDSCBD3100	31.0	11.0	105	200	2.6	32	●
VAPDSCBD3200	32.0	13.0	105	200	2.6	32	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work material	Structural steel Aluminium alloy		Carbon steel AISI 1049 Alloy steel SCM Cast iron FCD		Alloy tool steel AISI D2 (Low-hardness materials) Ferritic stainless steel AISI 430, AISI 405 Martensitic stainless steel AISI 420, AISI 440		Alloy tool steel AISI H13 (−40HRC) Precipitation hardening stainless steel 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

1) The above cutting conditions are for drilling 3xDC hole depths without a pilot hole. When drilling holes smaller than 1xDC hole depths, it is possible to increase the revolution speed by 20%.
2) Drilling without a pilot hole is recommended. If there is a pilot hole, chips are not broken. Use a pick feed when chip breaking is necessary.
3) For counter boring of a sloped face, a carbide end mill is recommended.
4) When machining austenitic stainless steels (JIS SUS304, SUS316), set the revolution at 40%-70% and the feed rate 40%-60%.
5) Please use a collet type drill chuck or a milling chuck.
6) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
7) Use sufficient cutting fluid.

The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

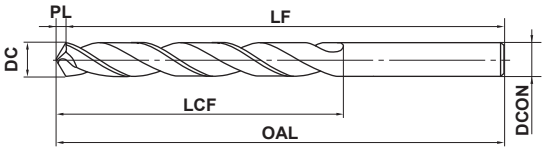
HSS

VSD
Straight shank

HSS | V | 110° DC<0.7 | 118° DC≥0.7 | X Thinning DC<2 | XR Thinning DC≥2

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

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



Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VSDD0050	0.5	6.18	27.18	27	0.18	0.5	●
VSDD0060	0.6	7.21	30.21	30	0.21	0.6	●
VSDD0070	0.7	9.21	32.21	32	0.21	0.7	●
VSDD0080	0.8	10.24	34.24	34	0.24	0.8	●
VSDD0090	0.9	11.27	36.27	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	●
VSDD0430	4.3	47.3	84.3	83	1.3	4.3	●
VSDD0440	4.4	47.3	87.3	86	1.3	4.4	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	DC	LCF	OAL	LF	PL	DCON	Stock
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

Work Material	Structural steel		Carbon steel AISI 1049		Stainless steel AISI 420		Stainless steel AISI 304 Tool steel AISI D2 (Low-hardness materials) Heat-treated steel AISI H13 (−40HRC)	
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

1) Please reduce the revolution depending on drilling situation when the application lacks rigidity.
2) Please use step drilling and reduce the cutting conditions in the case when the drilling depth exceeds 3DC (DC: drill diameter).
3) The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

HSS

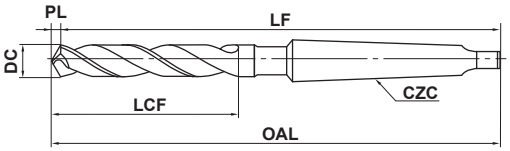
VTDS

Short, Taper shank

HSS V 118° XR Thinning

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

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



Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
VTDSD0600M1	6.0	45.8	127.8	126	1.8	MT.1	●
VTDSD0650M1	6.5	46.0	128.0	126	2.0	MT.1	●
VTDSD0660M1	6.6	46.0	128.0	126	2.0	MT.1	●
VTDSD0680M1	6.8	46.0	128.0	126	2.0	MT.1	●
VTDSD0700M1	7.0	46.1	128.1	126	2.1	MT.1	●
VTDSD0720M1	7.2	46.2	128.2	126	2.2	MT.1	●
VTDSD0750M1	7.5	46.3	128.3	126	2.3	MT.1	●
VTDSD0770M1	7.7	50.3	132.3	130	2.3	MT.1	●
VTDSD0780M1	7.8	50.3	132.3	130	2.3	MT.1	●
VTDSD0800M1	8.0	50.4	132.4	130	2.4	MT.1	●
VTDSD0820M1	8.2	50.5	132.5	130	2.5	MT.1	●
VTDSD0850M1	8.5	50.6	132.6	130	2.6	MT.1	●
VTDSD0880M1	8.8	54.6	135.6	133	2.6	MT.1	●
VTDSD0900M1	9.0	54.7	135.7	133	2.7	MT.1	●
VTDSD0950M1	9.5	54.9	135.9	133	2.9	MT.1	●
VTDSD0970M1	9.7	58.9	139.9	137	2.9	MT.1	●
VTDSD0980M1	9.8	58.9	139.9	137	2.9	MT.1	●
VTDSD1000M1	10.0	59.0	140.0	137	3.0	MT.1	●
VTDSD1030M1	10.3	59.1	140.1	137	3.1	MT.1	●
VTDSD1050M1	10.5	59.2	140.2	137	3.2	MT.1	●
VTDSD1080M1	10.8	64.2	145.2	142	3.2	MT.1	●
VTDSD1100M1	11.0	64.3	145.3	142	3.3	MT.1	●
VTDSD1150M1	11.5	64.5	145.5	142	3.5	MT.1	●
VTDSD1200M1	12.0	69.6	149.6	146	3.6	MT.1	●
VTDSD1250M2	12.5	69.8	166.8	163	3.8	MT.2	●
VTDSD1300M2	13.0	69.9	166.9	163	3.9	MT.2	●
VTDSD1350M2	13.5	74.1	172.1	168	4.1	MT.2	●
VTDSD1400M2	14.0	74.2	172.2	168	4.2	MT.2	●
VTDSD1450M2	14.5	77.4	175.4	171	4.4	MT.2	●
VTDSD1500M2	15.0	77.5	175.5	171	4.5	MT.2	●
VTDSD1550M2	15.5	81.7	179.7	175	4.7	MT.2	●
VTDSD1600M2	16.0	81.8	179.8	175	4.8	MT.2	●
VTDSD1650M2	16.5	85.0	183.0	178	5.0	MT.2	●
VTDSD1700M2	17.0	85.1	183.1	178	5.1	MT.2	●
VTDSD1750M2	17.5	89.3	187.3	182	5.3	MT.2	●
VTDSD1800M2	18.0	89.4	187.4	182	5.4	MT.2	●
VTDSD1850M2	18.5	91.6	189.6	184	5.6	MT.2	●
VTDSD1900M2	19.0	91.7	189.7	184	5.7	MT.2	●
VTDSD1950M2	19.5	95.9	193.9	188	5.9	MT.2	●
VTDSD2000M2	20.0	96.0	194.0	188	6.0	MT.2	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
VTDSD2050M2	20.5	99.2	197.2	191	6.2	MT.2	●
VTDSD2100M2	21.0	99.3	197.3	191	6.3	MT.2	●
VTDSD2150M2	21.5	102.5	200.5	194	6.5	MT.2	●
VTDSD2200M2	22.0	102.6	200.6	194	6.6	MT.2	●
VTDSD2250M2	22.5	106.8	204.8	198	6.8	MT.2	●
VTDSD2300M2	23.0	106.9	204.9	198	6.9	MT.2	●
VTDSD2350M3	23.5	109.1	231.1	224	7.1	MT.3	●
VTDSD2400M3	24.0	109.2	231.2	224	7.2	MT.3	●
VTDSD2450M3	24.5	109.4	231.4	224	7.4	MT.3	●
VTDSD2500M3	25.0	109.5	231.5	224	7.5	MT.3	●
VTDSD2550M3	25.5	112.7	233.7	226	7.7	MT.3	●
VTDSD2600M3	26.0	112.8	233.8	226	7.8	MT.3	●
VTDSD2650M3	26.5	113.0	234.0	226	8.0	MT.3	●
VTDSD2700M3	27.0	116.1	238.1	230	8.1	MT.3	●
VTDSD2750M3	27.5	116.3	238.3	230	8.3	MT.3	●
VTDSD2800M3	28.0	116.4	238.4	230	8.4	MT.3	●
VTDSD2850M3	28.5	119.6	240.6	232	8.6	MT.3	●
VTDSD2900M3	29.0	119.7	240.7	232	8.7	MT.3	●
VTDSD2950M3	29.5	119.9	240.9	232	8.9	MT.3	●
VTDSD3000M3	30.0	120.0	241.0	232	9.0	MT.3	●
VTDSD3050M3	30.5	123.2	244.2	235	9.2	MT.3	●
VTDSD3100M3	31.0	123.3	244.3	235	9.3	MT.3	●
VTDSD3150M3	31.5	123.5	244.5	235	9.5	MT.3	●
VTDSD3200M3	32.0	123.6	244.6	235	9.6	MT.3	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work Material	Structural steel		Carbon steel AISI 1049		Stainless steel AISI 420 Copper alloy, Brass		Stainless steel AISI 304 Tool steel AISI D2 (Low-hardness materials)		Heat-treated steel AISI H13 (35—40HRC)	
Cutting speed	33—38m/min		28—33m/min		20m/min		15m/min		18m/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)	Revolution (min^{-1})	Feed rate (mm/rev)
6.0	2000	0.18	1750	0.18	1060	0.15	800	0.12	950	0.12
8.0	1400	0.22	1270	0.22	800	0.20	600	0.15	720	0.15
10.0	1100	0.25	960	0.25	640	0.22	480	0.18	570	0.18
14.0	790	0.30	680	0.28	450	0.25	340	0.23	410	0.23
18.0	610	0.35	530	0.34	350	0.30	270	0.27	320	0.27
20.0	540	0.40	480	0.38	320	0.33	240	0.30	280	0.30
22.0	480	0.42	430	0.40	290	0.35	220	0.30	260	0.30
24.0	430	0.42	380	0.40	260	0.35	200	0.30	240	0.30
28.0	370	0.45	330	0.42	220	0.38	170	0.33	200	0.33
32.0	320	0.45	280	0.42	200	0.38	150	0.33	180	0.33

1) The above-mentioned cutting condition is standard when using water-soluble cutting fluid.
Please reduce the revolution when using non-water-soluble cutting fluid.

HSS

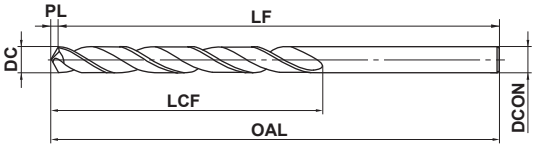
GSD

TiN, Straight shank

HSS | G | 110° DC<0.7 | 118° DC≥0.7 | X Thinning DC<2 | XR Thinning DC≥2

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

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



Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
GSDD0050	0.5	6.18	27.18	27	0.18	0.5	●
GSDD0060	0.6	7.21	30.21	30	0.21	0.6	●
GSDD0070	0.7	9.21	32.21	32	0.21	0.7	●
GSDD0080	0.8	10.24	34.24	34	0.24	0.8	●
GSDD0090	0.9	11.27	36.27	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	●
GSDD0430	4.3	47.3	84.3	83	1.3	4.3	●
GSDD0440	4.4	47.3	87.3	86	1.3	4.4	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

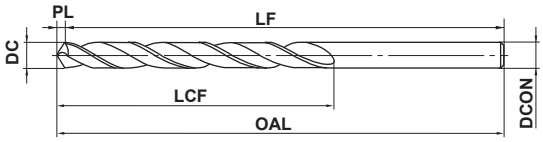
STRAIGHT SHANK DRILLS

SD
Straight shank

HSS 118°

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
SDD0020	0.2	2.56	19.06	19	0.06	0.2	●
SDD0030	0.3	3.09	19.09	19	0.09	0.3	●
SDD0040	0.4	5.12	20.12	20	0.12	0.4	●
SDD0050	0.5	6.15	22.15	22	0.15	0.5	●
SDD0060	0.6	7.18	24.18	24	0.18	0.6	●
SDD0070	0.7	10.21	32.21	32	0.21	0.7	●
SDD0080	0.8	11.24	34.24	34	0.24	0.8	●
SDD0090	0.9	13.27	36.27	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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●

HSS

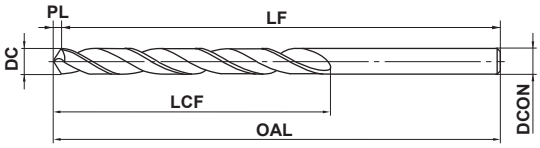
SD

Straight shank, 1/100mm

HSS 118°

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

0.25≤DC≤5.95
$^{0}_{-0.007}$



● The diameter tolerance is $^{0}_{-0.007}$ mm.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
SDD0025	0.25	3.08	19.08	19	0.08	0.25	●
SDD0035	0.35	4.11	19.11	19	0.11	0.35	●
SDD0045	0.45	5.14	20.14	20	0.14	0.45	●
SDD0055	0.55	7.17	24.17	24	0.17	0.55	●
SDD0065	0.65	8.20	26.20	26	0.20	0.65	●
SDD0075	0.75	11.23	34.23	34	0.23	0.75	●
SDD0085	0.85	13.26	36.26	36	0.26	0.85	●
SDD0095	0.95	18.29	40.29	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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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 ➤ N199

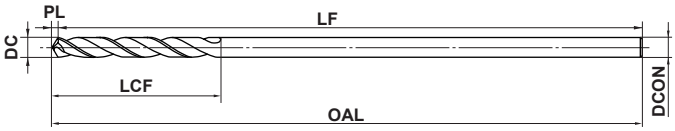
SDLS NEW

Long shank straight drill

HSS | 118° | X Thinning DC≥2

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

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 center and manually operated machines.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

CUTTING CONDITIONS ➢N173

HSS

SDLS NEW

Long shank straight drill

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●

DRILLING

● : Inventory maintained in Japan.

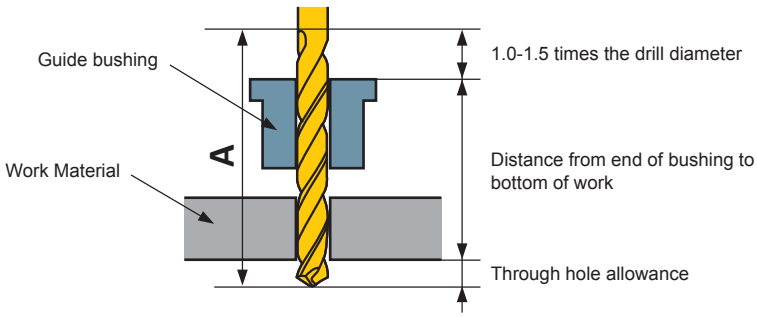
RECOMMENDED CUTTING CONDITIONS

Work 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

Work material	Ferritic, Precipitation hardening stainless steel (≤200HB) AISI 410, AISI 430 etc				Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc				Copper, Copper alloy				Aluminium Alloy (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) 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 feedrate per revolution to a suitable value with the recommended feedrate of the closest drill diameter as the standard.

1) Lower the revolution and feedrate accordingly, when the work material is not rigid or there are restrictions on the machine.
2) When drilling holes greater than 3 x drill diameter hole depths, please use a peck feed.
3) The cutting conditions mentioned above arevstandard with the tool protrusion length was made 2 times the flute length.
4) Use of water-soluble cutting fluid is recommended. Please reduce the revolution when using water-insoluble cutting fluid.
5) Use sufficient cutting fluid. Please reduce the revolution when insufficient cutting fluid.
6) 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.



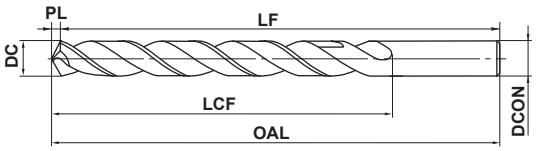
KSD

Cobalt HSS, For stainless steel

CO HSS | 125° DC<2 | 118° DC≥2 | XR Thinning DC≥2

P	M	K	N	S	H
Steel	Stainless Steel		Non-ferrous Metal		

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 steels up to 200HB.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

HSS

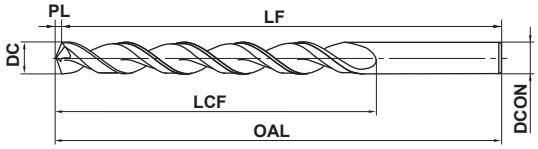
GWSS

TiN, For deep hole, Convolute flute

CO HSS | G | 118° | X Thinning

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

HSS

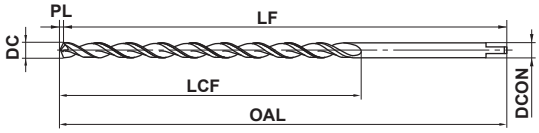
GWSL

TiN, Extra long

CO HSS | G | 118° | X Thinning

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●

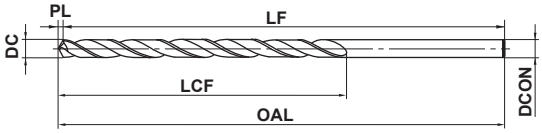
HSS

LSD
Extra long

HSS 118° X Thinning

P Steel | M | K Cast Iron | N Non-ferrous Metal | S | H

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
LSDD0280A100	2.8	50.8	100.8	100	0.8	2.8	●
LSDD0280A150	2.8	75.8	150.8	150	0.8	2.8	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
LSDD0480A250	4.8	131.4	251.4	250	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	●
LSDD0530A300	5.3	151.6	301.6	300	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	●
LSDD0540A300	5.4	151.6	301.6	300	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	●
LSDD0610A200	6.1	121.8	201.8	200	1.8	6.1	●
LSDD0610A250	6.1	131.8	251.8	250	1.8	6.1	●
LSDD0610A300	6.1	151.8	301.8	300	1.8	6.1	●
LSDD0620A200	6.2	121.9	201.9	200	1.9	6.2	●
LSDD0620A250	6.2	131.9	251.9	250	1.9	6.2	●
LSDD0620A300	6.2	151.9	301.9	300	1.9	6.2	●
LSDD0630A200	6.3	121.9	201.9	200	1.9	6.3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
LSDD0630A250	6.3	131.9	251.9	250	1.9	6.3	●
LSDD0630A300	6.3	151.9	301.9	300	1.9	6.3	●
LSDD0640A200	6.4	121.9	201.9	200	1.9	6.4	●
LSDD0640A250	6.4	131.9	251.9	250	1.9	6.4	●
LSDD0640A300	6.4	151.9	301.9	300	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	●
LSDD0660A200	6.6	122.0	202.0	200	2.0	6.6	●
LSDD0660A250	6.6	132.0	252.0	250	2.0	6.6	●
LSDD0670A200	6.7	122.0	202.0	200	2.0	6.7	●
LSDD0670A250	6.7	132.0	252.0	250	2.0	6.7	●
LSDD0680A200	6.8	122.0	202.0	200	2.0	6.8	●
LSDD0680A250	6.8	132.0	252.0	250	2.0	6.8	●
LSDD0690A200	6.9	122.1	202.1	200	2.1	6.9	●
LSDD0690A250	6.9	132.1	252.1	250	2.1	6.9	●
LSDD0690A300	6.9	152.1	302.1	300	2.1	6.9	●
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	●
LSDD0700A300	7.0	152.1	302.1	300	2.1	7.0	●
LSDD0710A200	7.1	122.1	202.1	200	2.1	7.1	●
LSDD0710A250	7.1	132.1	252.1	250	2.1	7.1	●
LSDD0710A300	7.1	152.1	302.1	300	2.1	7.1	●
LSDD0720A200	7.2	122.2	202.2	200	2.2	7.2	●
LSDD0720A250	7.2	132.2	252.2	250	2.2	7.2	●
LSDD0720A300	7.2	152.2	302.2	300	2.2	7.2	●
LSDD0730A200	7.3	122.2	202.2	200	2.2	7.3	●
LSDD0730A250	7.3	132.2	252.2	250	2.2	7.3	●
LSDD0730A300	7.3	152.2	302.2	300	2.2	7.3	●
LSDD0740A250	7.4	132.2	252.2	250	2.2	7.4	●
LSDD0740A300	7.4	152.2	302.2	300	2.2	7.4	●
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	●
LSDD0760A200	7.6	122.3	202.3	200	2.3	7.6	●
LSDD0760A250	7.6	132.3	252.3	250	2.3	7.6	●
LSDD0760A300	7.6	152.3	302.3	300	2.3	7.6	●
LSDD0770A200	7.7	122.3	202.3	200	2.3	7.7	●
LSDD0770A250	7.7	132.3	252.3	250	2.3	7.7	●
LSDD0770A300	7.7	152.3	302.3	300	2.3	7.7	●
LSDD0780A200	7.8	122.3	202.3	200	2.3	7.8	●
LSDD0780A250	7.8	132.3	252.3	250	2.3	7.8	●
LSDD0780A300	7.8	152.3	302.3	300	2.3	7.8	●
LSDD0790A200	7.9	122.4	202.4	200	2.4	7.9	●
LSDD0790A250	7.9	132.4	252.4	250	2.4	7.9	●
LSDD0800A150	8.0	92.4	152.4	150	2.4	8.0	●
LSDD0800A200	8.0	122.4	202.4	200	2.4	8.0	●

HSS

LSD

Extra long

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
LSDD0800A250	8.0	132.4	252.4	250	2.4	8.0	●
LSDD0800A300	8.0	152.4	302.4	300	2.4	8.0	●
LSDD0810A250	8.1	132.4	252.4	250	2.4	8.1	●
LSDD0810A300	8.1	182.4	302.4	300	2.4	8.1	●
LSDD0810A350	8.1	202.4	352.4	350	2.4	8.1	●
LSDD0820A250	8.2	132.5	252.5	250	2.5	8.2	●
LSDD0820A300	8.2	182.5	302.5	300	2.5	8.2	●
LSDD0830A250	8.3	132.5	252.5	250	2.5	8.3	●
LSDD0830A300	8.3	182.5	302.5	300	2.5	8.3	●
LSDD0840A200	8.4	122.5	202.5	200	2.5	8.4	●
LSDD0840A250	8.4	132.5	252.5	250	2.5	8.4	●
LSDD0840A300	8.4	182.5	302.5	300	2.5	8.4	●
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	●
LSDD0860A250	8.6	132.6	252.6	250	2.6	8.6	●
LSDD0870A250	8.7	132.6	252.6	250	2.6	8.7	●
LSDD0870A300	8.7	182.6	302.6	300	2.6	8.7	●
LSDD0880A200	8.8	122.6	202.6	200	2.6	8.8	●
LSDD0880A250	8.8	132.6	252.6	250	2.6	8.8	●
LSDD0880A300	8.8	182.6	302.6	300	2.6	8.8	●
LSDD0890A200	8.9	122.7	202.7	200	2.7	8.9	●
LSDD0890A250	8.9	132.7	252.7	250	2.7	8.9	●
LSDD0890A300	8.9	182.7	302.7	300	2.7	8.9	●
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	●
LSDD0910A250	9.1	132.7	252.7	250	2.7	9.1	●
LSDD0910A300	9.1	182.7	302.7	300	2.7	9.1	●
LSDD0920A250	9.2	132.8	252.8	250	2.8	9.2	●
LSDD0920A300	9.2	182.8	302.8	300	2.8	9.2	●
LSDD0930A250	9.3	132.8	252.8	250	2.8	9.3	●
LSDD0930A300	9.3	182.8	302.8	300	2.8	9.3	●
LSDD0940A250	9.4	132.8	252.8	250	2.8	9.4	●
LSDD0940A300	9.4	182.8	302.8	300	2.8	9.4	●
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	●
LSDD0960A250	9.6	132.9	252.9	250	2.9	9.6	●
LSDD0960A300	9.6	182.9	302.9	300	2.9	9.6	●
LSDD0970A250	9.7	132.9	252.9	250	2.9	9.7	●
LSDD0970A300	9.7	182.9	302.9	300	2.9	9.7	●
LSDD0980A250	9.8	132.9	252.9	250	2.9	9.8	●
LSDD0980A300	9.8	182.9	302.9	300	2.9	9.8	●
LSDD0990A250	9.9	133.0	253.0	250	3.0	9.9	●
LSDD0990A300	9.9	183.0	303.0	300	3.0	9.9	●
LSDD1000A200	10.0	123.0	203.0	200	3.0	10.0	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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	●
LSDD1010A250	10.1	133.0	253.0	250	3.0	10.1	●
LSDD1010A300	10.1	183.0	303.0	300	3.0	10.1	●
LSDD1020A250	10.2	133.1	253.1	250	3.1	10.2	●
LSDD1020A300	10.2	183.1	303.1	300	3.1	10.2	●
LSDD1030A250	10.3	133.1	253.1	250	3.1	10.3	●
LSDD1030A300	10.3	183.1	303.1	300	3.1	10.3	●
LSDD1040A250	10.4	133.1	253.1	250	3.1	10.4	●
LSDD1040A300	10.4	183.1	303.1	300	3.1	10.4	●
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	●
LSDD1060A300	10.6	183.2	303.2	300	3.2	10.6	●
LSDD1070A300	10.7	183.2	303.2	300	3.2	10.7	●
LSDD1080A300	10.8	183.2	303.2	300	3.2	10.8	●
LSDD1090A300	10.9	183.3	303.3	300	3.3	10.9	●
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	●
LSDD1110A250	11.1	133.3	253.3	250	3.3	11.1	●
LSDD1110A350	11.1	203.3	353.3	350	3.3	11.1	●
LSDD1120A250	11.2	133.4	253.4	250	3.4	11.2	●
LSDD1120A350	11.2	203.4	353.4	350	3.4	11.2	●
LSDD1130A250	11.3	133.4	253.4	250	3.4	11.3	●
LSDD1130A350	11.3	203.4	353.4	350	3.4	11.3	●
LSDD1140A250	11.4	133.4	253.4	250	3.4	11.4	●
LSDD1140A350	11.4	203.4	353.4	350	3.4	11.4	●
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.

CUTTING CONDITIONS ➤ N199

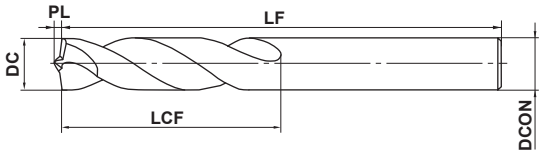
EPSS

Plate pal

HSS | 170° 110° | X Thinning

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

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.

Unit : mm

Order Number	DC	LCF	LF	PL	DCON	Stock
EPSSD0200	2.0	17	48	0.3	2.0	●
EPSSD0210	2.1	17	48	0.3	2.1	●
EPSSD0220	2.2	17	48	0.3	2.2	●
EPSSD0230	2.3	17	48	0.3	2.3	●
EPSSD0240	2.4	17	48	0.3	2.4	●
EPSSD0250	2.5	17	48	0.4	2.5	●
EPSSD0260	2.6	17	48	0.4	2.6	●
EPSSD0270	2.7	17	48	0.4	2.7	●
EPSSD0280	2.8	17	48	0.4	2.8	●
EPSSD0290	2.9	17	48	0.4	2.9	●
EPSSD0300	3.0	17	48	0.5	3.0	●
EPSSD0310	3.1	17	48	0.5	3.1	●
EPSSD0320	3.2	17	48	0.5	3.2	●
EPSSD0330	3.3	17	48	0.5	3.3	●
EPSSD0340	3.4	19	51	0.5	3.4	●
EPSSD0350	3.5	19	51	0.6	3.5	●
EPSSD0360	3.6	19	51	0.6	3.6	●
EPSSD0370	3.7	19	51	0.6	3.7	●
EPSSD0380	3.8	21	54	0.6	3.8	●
EPSSD0390	3.9	21	54	0.6	3.9	●
EPSSD0400	4.0	21	54	0.6	4.0	●
EPSSD0410	4.1	21	54	0.6	4.1	●
EPSSD0420	4.2	21	54	0.6	4.2	●
EPSSD0430	4.3	23	57	0.6	4.3	●
EPSSD0440	4.4	23	57	0.6	4.4	●
EPSSD0450	4.5	23	57	0.7	4.5	●
EPSSD0460	4.6	23	57	0.7	4.6	●
EPSSD0470	4.7	23	57	0.7	4.7	●
EPSSD0480	4.8	24	60	0.7	4.8	●
EPSSD0490	4.9	24	60	0.7	4.9	●
EPSSD0500	5.0	24	60	0.8	5.0	●
EPSSD0510	5.1	24	60	0.8	5.1	●
EPSSD0520	5.2	24	60	0.8	5.2	●
EPSSD0530	5.3	24	60	0.8	5.3	●
EPSSD0540	5.4	26	64	0.8	5.4	●
EPSSD0550	5.5	26	64	0.9	5.5	●
EPSSD0600	6.0	26	64	1.0	6.0	●
EPSSD0650	6.5	29	68	1.0	6.5	●
EPSSD0680	6.8	32	72	1.1	6.8	●
EPSSD0700	7.0	32	72	1.1	7.0	●

Order Number	DC	LCF	LF	PL	DCON	Stock
EPSSD0750	7.5	32	72	1.2	7.5	●
EPSSD0800	8.0	34	76	1.3	8.0	●
EPSSD0820	8.2	34	76	1.3	8.2	●
EPSSD0850	8.5	34	76	1.4	8.5	●
EPSSD0900	9.0	37	81	1.5	9.0	●
EPSSD0950	9.5	37	81	1.6	9.5	●
EPSSD1000	10.0	40	86	1.6	10.0	●
EPSSD1020	10.2	40	86	1.6	10.2	●
EPSSD1030	10.3	40	86	1.6	10.3	●
EPSSD1050	10.5	40	86	1.7	10.5	●
EPSSD1100	11.0	43	91	1.8	11.0	●
EPSSD1150	11.5	43	91	1.9	11.5	●
EPSSD1200	12.0	47	98	2.0	12.0	●
EPSSD1250	12.5	47	98	2.0	12.5	●
EPSSD1300	13.0	47	98	2.2	13.0	●

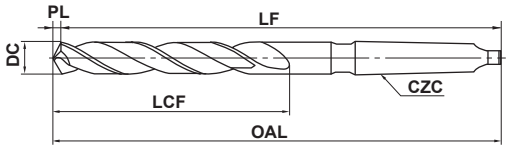
TAPER SHANK DRILLS

GTD
TiN

HSS G 118° XR Thinning

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
GTDD1950M2	19.5	138.9	255.9	250	5.9	MT.2	●
GTDD2000M2	20.0	139.0	256.0	250	6.0	MT.2	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N198

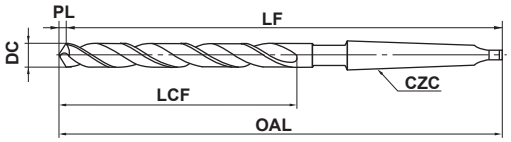
TD

Taper shank

HSS | 118° | S Thinning DC>40

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

TD

Taper shank

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
TDD2310M3	23.1	171.9	291.9	285	6.9	MT.3	●
TDD2320M3	23.2	172.0	292.0	285	7.0	MT.3	●
TDD2330M3	23.3	172.0	292.0	285	7.0	MT.3	●
TDD2340M3	23.4	172.0	292.0	285	7.0	MT.3	●
TDD2350M3	23.5	172.1	292.1	285	7.1	MT.3	●
TDD2360M3	23.6	172.1	292.1	285	7.1	MT.3	●
TDD2370M3	23.7	172.1	292.1	285	7.1	MT.3	●
TDD2380M3	23.8	172.2	292.2	285	7.2	MT.3	●
TDD2390M3	23.9	172.2	292.2	285	7.2	MT.3	●
TDD2400M3	24.0	172.2	292.2	285	7.2	MT.3	●
TDD2410M3	24.1	172.2	292.2	285	7.2	MT.3	●
TDD2420M3	24.2	172.3	292.3	285	7.3	MT.3	●
TDD2430M3	24.3	172.3	292.3	285	7.3	MT.3	●
TDD2440M3	24.4	172.3	292.3	285	7.3	MT.3	●
TDD2450M3	24.5	172.4	292.4	285	7.4	MT.3	●
TDD2460M3	24.6	172.4	292.4	285	7.4	MT.3	●
TDD2470M3	24.7	172.4	292.4	285	7.4	MT.3	●
TDD2480M3	24.8	172.5	292.5	285	7.5	MT.3	●
TDD2490M3	24.9	172.5	292.5	285	7.5	MT.3	●
TDD2500M3	25.0	172.5	292.5	285	7.5	MT.3	●
TDD2510M3	25.1	172.5	292.5	285	7.5	MT.3	●
TDD2520M3	25.2	172.6	292.6	285	7.6	MT.3	●
TDD2530M3	25.3	172.6	292.6	285	7.6	MT.3	●
TDD2540M3	25.4	172.6	292.6	285	7.6	MT.3	●
TDD2550M3	25.5	172.7	292.7	285	7.7	MT.3	●
TDD2560M3	25.6	172.7	292.7	285	7.7	MT.3	●
TDD2570M3	25.7	172.7	292.7	285	7.7	MT.3	●
TDD2580M3	25.8	172.8	292.8	285	7.8	MT.3	●
TDD2590M3	25.9	172.8	292.8	285	7.8	MT.3	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
TDD2600M3	26.0	172.8	292.8	285	7.8	MT.3	●
TDD2610M3	26.1	177.8	297.8	290	7.8	MT.3	●
TDD2620M3	26.2	177.9	297.9	290	7.9	MT.3	●
TDD2630M3	26.3	177.9	297.9	290	7.9	MT.3	●
TDD2640M3	26.4	177.9	297.9	290	7.9	MT.3	●
TDD2650M3	26.5	178.0	298.0	290	8.0	MT.3	●
TDD2660M3	26.6	178.0	298.0	290	8.0	MT.3	●
TDD2670M3	26.7	178.0	298.0	290	8.0	MT.3	●
TDD2680M3	26.8	178.1	298.1	290	8.1	MT.3	●
TDD2690M3	26.9	178.1	298.1	290	8.1	MT.3	●
TDD2700M3	27.0	178.1	298.1	290	8.1	MT.3	●
TDD2710M3	27.1	183.1	303.1	295	8.1	MT.3	●
TDD2720M3	27.2	183.2	303.2	295	8.2	MT.3	●
TDD2730M3	27.3	183.2	303.2	295	8.2	MT.3	●
TDD2740M3	27.4	183.2	303.2	295	8.2	MT.3	●
TDD2750M3	27.5	183.3	303.3	295	8.3	MT.3	●
TDD2760M3	27.6	183.3	303.3	295	8.3	MT.3	●
TDD2770M3	27.7	183.3	303.3	295	8.3	MT.3	●
TDD2780M3	27.8	183.4	303.4	295	8.4	MT.3	●
TDD2790M3	27.9	183.4	303.4	295	8.4	MT.3	●
TDD2800M3	28.0	183.4	303.4	295	8.4	MT.3	●
TDD2810M3	28.1	188.4	308.4	300	8.4	MT.3	●
TDD2820M3	28.2	188.5	308.5	300	8.5	MT.3	●
TDD2830M3	28.3	188.5	308.5	300	8.5	MT.3	●
TDD2840M3	28.4	188.5	308.5	300	8.5	MT.3	●
TDD2850M3	28.5	188.6	308.6	300	8.6	MT.3	●
TDD2860M3	28.6	188.6	308.6	300	8.6	MT.3	●
TDD2870M3	28.7	188.6	308.6	300	8.6	MT.3	●
TDD2880M3	28.8	188.7	308.7	300	8.7	MT.3	●
TDD2890M3	28.9	188.7	308.7	300	8.7	MT.3	●
TDD2900M3	29.0	188.7	308.7	300	8.7	MT.3	●
TDD2910M3	29.1	193.7	313.7	305	8.7	MT.3	●
TDD2920M3	29.2	193.8	313.8	305	8.8	MT.3	●
TDD2930M3	29.3	193.8	313.8	305	8.8	MT.3	●
TDD2940M3	29.4	193.8	313.8	305	8.8	MT.3	●
TDD2950M3	29.5	193.9	313.9	305	8.9	MT.3	●
TDD2960M3	29.6	193.9	313.9	305	8.9	MT.3	●
TDD2970M3	29.7	193.9	313.9	305	8.9	MT.3	●
TDD2980M3	29.8	194.0	314.0	305	9.0	MT.3	●
TDD2990M3	29.9	194.0	314.0	305	9.0	MT.3	●
TDD3000M3	30.0	194.0	314.0	305	9.0	MT.3	●
TDD3010M3	30.1	199.0	319.0	310	9.0	MT.3	●
TDD3020M3	30.2	199.1	319.1	310	9.1	MT.3	●
TDD3030M3	30.3	199.1	319.1	310	9.1	MT.3	●
TDD3040M3	30.4	199.1	319.1	310	9.1	MT.3	●
TDD3050M3	30.5	199.2	319.2	310	9.2	MT.3	●
TDD3060M3	30.6	199.2	319.2	310	9.2	MT.3	●
TDD3070M3	30.7	199.2	319.2	310	9.2	MT.3	●
TDD3080M3	30.8	199.3	319.3	310	9.3	MT.3	●
TDD3090M3	30.9	199.3	319.3	310	9.3	MT.3	●

HSS

TD

Taper shank

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
TDD3100M3	31.0	199.3	319.3	310	9.3	MT.3	●
TDD3110M3	31.1	204.3	324.3	315	9.3	MT.3	●
TDD3120M3	31.2	204.4	324.4	315	9.4	MT.3	●
TDD3130M3	31.3	204.4	324.4	315	9.4	MT.3	●
TDD3140M3	31.4	204.4	324.4	315	9.4	MT.3	●
TDD3150M3	31.5	204.5	324.5	315	9.5	MT.3	●
TDD3160M3	31.6	204.5	324.5	315	9.5	MT.3	●
TDD3170M3	31.7	204.5	324.5	315	9.5	MT.3	●
TDD3180M3	31.8	204.6	324.6	315	9.6	MT.3	●
TDD3190M3	31.9	204.6	324.6	315	9.6	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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●
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	●

● : Inventory maintained in Japan.

DRILLING

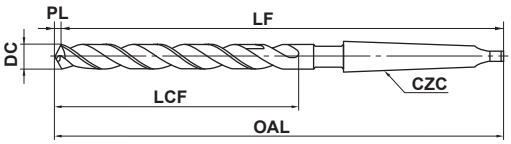
CUTTING CONDITIONS ➢ N199

KTD
Cobalt HSS

CO HSS | 118° DC<10,DC>35 | 128° 10≤DC≤35 | C Thinning 16<DC≤35 | S Thinning DC>35

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

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 of difficult-to-cut materials.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

CUTTING CONDITIONS ➤ N199

HSS

KTD

Cobalt HSS

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

DRILLING

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➢ N199

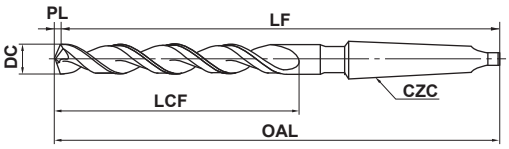
GWTS

TiN, For deep hole, Convolute flute

CO HSS | G | 118° | XR Thinning

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

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●

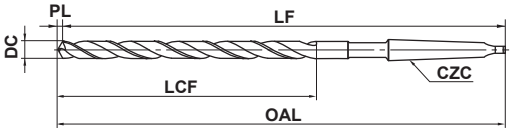
TAPER SHANK DRILLS

LTD
Extra long

HSS | 118° | S Thinning DC>6

P	M	K	N	S	H
Steel		Cast Iron	Non-ferrous Metal		

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.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
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	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
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	●
LTDD1850A300M2	18.5	180.6	305.6	300	5.6	MT.2	●
LTDD1850A350M2	18.5	230.6	355.6	350	5.6	MT.2	●
LTDD1850A400M2	18.5	255.6	405.6	400	5.6	MT.2	●
LTDD1850A450M2	18.5	305.6	455.6	450	5.6	MT.2	●
LTDD1850A500M2	18.5	355.6	505.6	500	5.6	MT.2	●
LTDD1850A600M2	18.5	405.6	605.6	600	5.6	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	●
LTDD1950A300M2	19.5	180.9	305.9	300	5.9	MT.2	●
LTDD1950A350M2	19.5	230.9	355.9	350	5.9	MT.2	●
LTDD1950A400M2	19.5	255.9	405.9	400	5.9	MT.2	●
LTDD1950A450M2	19.5	305.9	455.9	450	5.9	MT.2	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
LTDD1950A500M2	19.5	355.9	505.9	500	5.9	MT.2	●
LTDD1950A600M2	19.5	405.9	605.9	600	5.9	MT.2	●
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	●
LTDD2050A350M2	20.5	231.2	356.2	350	6.2	MT.2	●
LTDD2050A400M2	20.5	256.2	406.2	400	6.2	MT.2	●
LTDD2050A450M2	20.5	306.2	456.2	450	6.2	MT.2	●
LTDD2050A500M2	20.5	356.2	506.2	500	6.2	MT.2	●
LTDD2050A600M2	20.5	406.2	606.2	600	6.2	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	●
LTDD2150A350M2	21.5	231.5	356.5	350	6.5	MT.2	●
LTDD2150A400M2	21.5	256.5	406.5	400	6.5	MT.2	●
LTDD2150A450M2	21.5	306.5	456.5	450	6.5	MT.2	●
LTDD2150A500M2	21.5	356.5	506.5	500	6.5	MT.2	●
LTDD2150A600M2	21.5	406.5	606.5	600	6.5	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	●
LTDD2250A350M2	22.5	231.8	356.8	350	6.8	MT.2	●
LTDD2250A400M2	22.5	256.8	406.8	400	6.8	MT.2	●
LTDD2250A450M2	22.5	306.8	456.8	450	6.8	MT.2	●
LTDD2250A500M2	22.5	356.8	506.8	500	6.8	MT.2	●
LTDD2250A600M2	22.5	406.8	606.8	600	6.8	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	●
LTDD2350A350M3	23.5	207.1	357.1	350	7.1	MT.3	●
LTDD2350A400M3	23.5	257.1	407.1	400	7.1	MT.3	●
LTDD2350A450M3	23.5	307.1	457.1	450	7.1	MT.3	●
LTDD2350A500M3	23.5	357.1	507.1	500	7.1	MT.3	●
LTDD2350A600M3	23.5	407.1	607.1	600	7.1	MT.3	●
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	●
LTDD2450A350M3	24.5	207.4	357.4	350	7.4	MT.3	●
LTDD2450A400M3	24.5	257.4	407.4	400	7.4	MT.3	●

HSS

LTD
Extra long

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
LTDD2450A450M3	24.5	307.4	457.4	450	7.4	MT.3	●
LTDD2450A500M3	24.5	357.4	507.4	500	7.4	MT.3	●
LTDD2450A600M3	24.5	407.4	607.4	600	7.4	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	●
LTDD2550A400M3	25.5	257.7	407.7	400	7.7	MT.3	●
LTDD2550A450M3	25.5	307.7	457.7	450	7.7	MT.3	●
LTDD2550A500M3	25.5	357.7	507.7	500	7.7	MT.3	●
LTDD2550A600M3	25.5	407.7	607.7	600	7.7	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	●
LTDD2650A400M3	26.5	258.0	408.0	400	8.0	MT.3	●
LTDD2650A450M3	26.5	308.0	458.0	450	8.0	MT.3	●
LTDD2650A500M3	26.5	358.0	508.0	500	8.0	MT.3	●
LTDD2650A600M3	26.5	408.0	608.0	600	8.0	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	●
LTDD2750A400M3	27.5	258.3	408.3	400	8.3	MT.3	●
LTDD2750A450M3	27.5	308.3	458.3	450	8.3	MT.3	●
LTDD2750A500M3	27.5	358.3	508.3	500	8.3	MT.3	●
LTDD2750A600M3	27.5	408.3	608.3	600	8.3	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	●
LTDD2850A400M3	28.5	258.6	408.6	400	8.6	MT.3	●
LTDD2850A450M3	28.5	308.6	458.6	450	8.6	MT.3	●
LTDD2850A500M3	28.5	358.6	508.6	500	8.6	MT.3	●
LTDD2850A600M3	28.5	408.6	608.6	600	8.6	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	●
LTDD2950A400M3	29.5	258.9	408.9	400	8.9	MT.3	●
LTDD2950A450M3	29.5	308.9	458.9	450	8.9	MT.3	●
LTDD2950A500M3	29.5	358.9	508.9	500	8.9	MT.3	●
LTDD2950A600M3	29.5	408.9	608.9	600	8.9	MT.3	●
LTDD3000A400M3	30.0	259.0	409.0	400	9.0	MT.3	●
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	●
LTDD3050A450M3	30.5	309.2	459.2	450	9.2	MT.3	●
LTDD3050A500M3	30.5	359.2	509.2	500	9.2	MT.3	●

Order Number	DC	LCF	OAL	LF	PL	CZC	Stock
LTDD3050A600M3	30.5	409.2	609.2	600	9.2	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	●
LTDD3150A450M3	31.5	309.5	459.5	450	9.5	MT.3	●
LTDD3150A500M3	31.5	359.5	509.5	500	9.5	MT.3	●
LTDD3150A600M3	31.5	409.5	609.5	600	9.5	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	●
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.

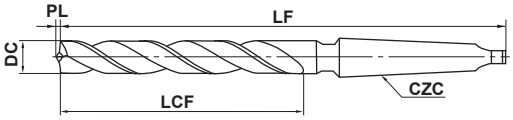
GTTD

TiN, For steel frame

HSS G 160° 100° N Thinning

P	M	K	N	S	H
Steel					

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.

Unit : mm

Order Number	DC	LCF	LF	PL	CZC	Stock
GTTDD1700M3	17.0	135	255	2.9	MT.3	●
GTTDD1750M3	17.5	140	260	3.0	MT.3	●
GTTDD1800M3	18.0	140	260	3.0	MT.3	●
GTTDD1900M3	19.0	145	265	3.2	MT.3	●
GTTDD2000M3	20.0	150	270	3.3	MT.3	●
GTTDD2150M3	21.5	160	280	3.6	MT.3	●
GTTDD2200M3	22.0	160	280	3.7	MT.3	●
GTTDD2250M3	22.5	165	285	3.8	MT.3	●
GTTDD2300M3	23.0	165	285	3.8	MT.3	●
GTTDD2350M3	23.5	165	285	4.0	MT.3	●
GTTDD2400M3	24.0	165	285	4.0	MT.3	●
GTTDD2450M3	24.5	165	285	4.1	MT.3	●
GTTDD2500M3	25.0	165	285	4.1	MT.3	●
GTTDD2600M3	26.0	165	285	4.3	MT.3	●
GTTDD2650M3	26.5	170	290	4.4	MT.3	●
GTTDD2800M4	28.0	175	320	4.5	MT.4	●
GTTDD3200M4	32.0	195	340	5.0	MT.4	●

CUTTING CONDITIONS ➢ N198

HSS

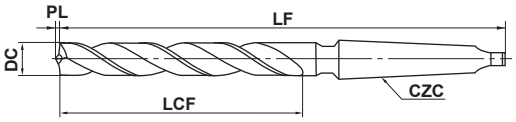
TTD

For steel frame

HSS 160° 100° N Thinning

P	M	K	N	S	H
Steel					

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.

Unit : mm

Order Number	DC	LCF	LF	PL	CZC	Stock
TTDD1700M3	17.0	135	255	2.9	MT.3	●
TTDD1750M3	17.5	140	260	3.0	MT.3	●
TTDD1800M3	18.0	140	260	3.0	MT.3	●
TTDD1900M3	19.0	145	265	3.2	MT.3	●
TTDD2000M3	20.0	150	270	3.3	MT.3	●
TTDD2150M3	21.5	160	280	3.6	MT.3	●
TTDD2200M3	22.0	160	280	3.7	MT.3	●
TTDD2250M3	22.5	165	285	3.8	MT.3	●
TTDD2300M3	23.0	165	285	3.8	MT.3	●
TTDD2350M3	23.5	165	285	4.0	MT.3	●
TTDD2400M3	24.0	165	285	4.0	MT.3	●
TTDD2450M3	24.5	165	285	4.1	MT.3	●
TTDD2500M3	25.0	165	285	4.1	MT.3	●
TTDD2600M3	26.0	165	285	4.3	MT.3	●
TTDD2650M3	26.5	170	290	4.4	MT.3	●
TTDD2800M4	28.0	175	320	4.5	MT.4	●
TTDD3200M4	32.0	195	340	5.0	MT.4	●

DRILLING

● : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ N199

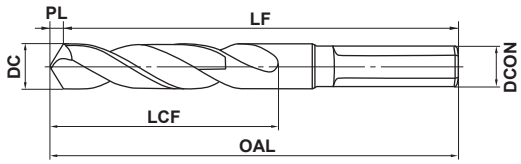
3KD

Triangular shank (Type 6.5)(Type 10)(Type 13)

HSS 118°

P	M	K	N	S	H
Steel		Cast Iron	Non-ferrous Metal		

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

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
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 GWSL GTD GWTS GTTD

TiN coated drills

RECOMMENDED CUTTING CONDITIONS

Work 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

Work material	Stainless steel				Copper alloy, Brass		Aluminium alloy	
	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

1) Please reduce the cutting conditions when drilling a deep hole.
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
4D	10%	10%
5D	10%	15%
6D	20%	20%
7D	20%	20%

Drilling depth	Reduction rate of cutting speed	Reduction rate of feed
8D	30%	20%
10D	30%	25%
15D	40%	30%
20D	40%	45%

D : Drill dia.

RECOMMENDED CUTTING CONDITIONS

Work 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

Work material	Stainless steel				Copper alloy, Brass		Aluminium alloy	
	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

1) Please reduce the cutting conditions when drilling a deep hole.
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
4D	10%	10%
5D	10%	15%
6D	20%	20%
7D	20%	20%

Drilling depth	Reduction rate of cutting speed	Reduction rate of feed
8D	30%	20%
10D	30%	25%
15D	40%	30%
20D	40%	45%

D : Drill dia.

DRILLING(BRAZED TYPE)

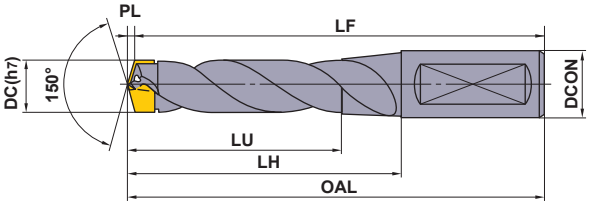
BRS

●Excellent cutting sharpness and chip discharge due to high rake type insert.
●High efficiency, high accuracy machining.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

14≤DC≤18	18<DC≤30
0 −0.018	0 −0.021

(l/d=3)



DC (mm)	Standard Diameter Order Number	Stock UP20M	Intermediate Diameters Range of Drill Diameters (DC)	Intermediate Diameters Order Number	LU	LH	OAL	LF	PL	DCON
14.0	BRS1400S16	●	14.0<DC≤14.5	BRS□□□□S16	53.9	67.9	115.9	114	1.9	16
14.5	BRS1450S16	●			53.9	67.9	115.9	114	1.9	16
15.0	BRS1500S20	●	14.5<DC≤15.5	BRS□□□□S20	63.0	78.0	128.0	126	2.0	20
15.5	BRS1550S20	●			63.1	78.1	128.1	126	2.1	20
16.0	BRS1600S20	●	15.5<DC≤16.5		67.1	83.1	133.1	131	2.1	20
16.5	BRS1650S20	●			67.2	83.2	133.2	131	2.2	20
17.0	BRS1700S20	●	16.5<DC≤17.5		71.3	88.3	138.3	136	2.3	20
17.5	BRS1750S20	●			71.3	88.3	138.3	136	2.3	20
18.0	BRS1800S20	●	17.5<DC≤18.5		75.4	93.4	143.4	141	2.4	20
18.5	BRS1850S20	●			75.5	93.5	143.5	141	2.5	20
19.0	BRS1900S25	●	18.5<DC≤19.5	BRS□□□□S25	79.5	103.5	159.5	157	2.5	25
19.5	BRS1950S25	●			79.6	103.6	159.6	157	2.6	25
20.0	BRS2000S25	●	19.5<DC≤20.5		83.7	103.7	159.7	157	2.7	25
20.5	BRS2050S25	●			83.7	103.7	159.7	157	2.7	25
21.0	BRS2100S25	●	20.5<DC≤21.5		82.8	103.8	159.8	157	2.8	25
21.5	BRS2150S25	●			82.9	103.9	159.9	157	2.9	25
22.0	BRS2200S25	●	21.5<DC≤22.5		86.9	108.9	164.9	162	2.9	25
22.5	BRS2250S25	●			87.0	109.0	165.0	162	3.0	25
23.0	BRS2300S25	●	22.5<DC≤23.5		86.1	109.1	165.1	162	3.1	25
23.5	BRS2350S25	●			86.1	109.1	165.1	162	3.1	25
24.0	BRS2400S32	●	23.5<DC≤24.5	BRS□□□□S32	90.2	114.2	174.2	171	3.2	32
24.5	BRS2450S32	●			90.3	114.3	174.3	171	3.3	32
25.0	BRS2500S32	●	24.5<DC≤25.5		89.3	114.3	174.3	171	3.3	32
25.5	BRS2550S32	●			89.4	114.4	174.4	171	3.4	32
26.0	BRS2600S32	●	25.5<DC≤26.5		93.5	119.5	179.5	176	3.5	32
26.5	BRS2650S32	●			93.6	119.6	179.6	176	3.6	32
27.0	BRS2700S32	●	26.5<DC≤27.5		92.6	119.6	179.6	176	3.6	32
27.5	BRS2750S32	●			92.7	119.7	179.7	176	3.7	32
28.0	BRS2800S32	●	27.5<DC≤28.5		96.8	124.8	184.8	181	3.8	32
28.5	BRS2850S32	●			96.8	124.8	184.8	181	3.8	32
29.0	BRS2900S32	●	28.5<DC≤29.5		100.9	129.9	189.9	186	3.9	32
29.5	BRS2950S32	●			101.0	130.0	190.0	186	4.0	32
30.0	BRS3000S32	●	29.5<DC≤30.5		100.0	130.0	190.0	186	4.0	32

For ordering an intermediate diameter, please enter the diameter (DC) into the 4-digit space□□□□in the nominal designation.
(Ex. UP20M BRS2530S32 for a diameter of ϕ25.30mm)

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

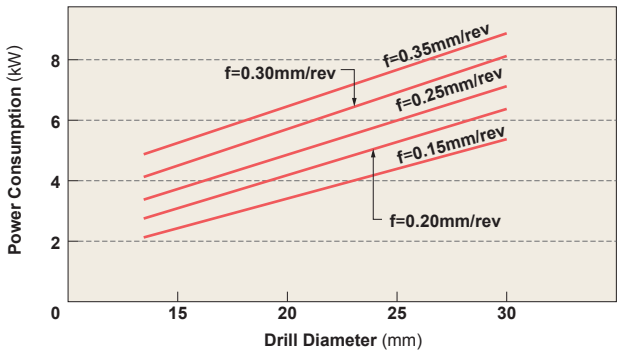
	Work Material		Hardness	Drill Dia. ϕ14.0−ϕ20.0		Drill Dia. ϕ20.0−ϕ30.0	
				Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel		≤180HB	65 (50−75)	0.3 (0.20−0.40)	70 (55−85)	0.35 (0.20−0.45)
P	Structural Steel	SS400 (JIS)	Tensile Strength 400−500MPa	80 (70−90)	0.30 (0.25−0.35)	80 (70−90)	0.35 (0.30−0.45)
P	Structural Steel	SM490 (JIS)	Tensile Strength 490−610MPa	70 (60−80)	0.25 (0.20−0.30)	70 (60−80)	0.30 (0.20−0.40)
P	Structural Steel	SM570 (JIS)	Tensile Strength 570−720MPa	60 (50−70)	0.25 (0.20−0.30)	60 (50−70)	0.30 (0.20−0.35)
P	Carbon Steel Alloy Steel		180−280HB	60 (45−70)	0.25 (0.1−0.35)	65 (45−80)	0.30 (0.15−0.35)
P	Carbon Steel Alloy Steel		280−350HB	55 (40−65)	0.20 (0.15−0.35)	60 (45−70)	0.25 (0.15−0.35)
M	Stainless Steel (Austenitic)		≤200HB	70 (50−90)	0.30 (0.20−0.40)	80 (60−100)	0.3 (0.20−0.40)
K	Gray Cast Iron		Tensile Strength≤350MPa	75 (60−110)	0.30 (0.20−0.40)	80 (60−100)	0.35 (0.25−0.50)
K	Ductile Cast Iron		Tensile Strength≤450MPa	75 (60−100)	0.30 (0.20−0.40)	80 (60−100)	0.35 (0.20−0.45)
K	Ductile Cast Iron		Tensile Strength 500−800MPa	70 (55−90)	0.25 (0.15−0.35)	75 (55−90)	0.30 (0.15−0.40)

(Note) The above conditions are for general cutting. The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

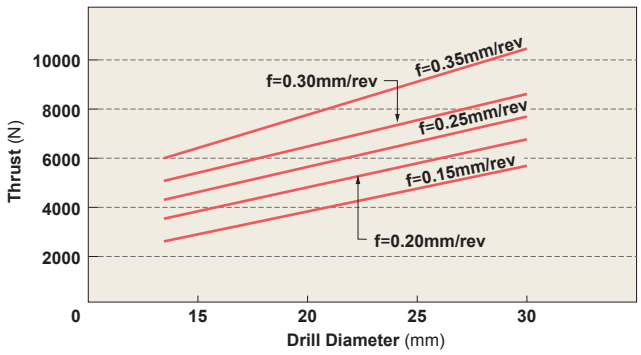
CUTTING RESISTANCE

Workpiece : JIS SUS304 Drilled Depth : l/d=3(Through Hole) Cutting Speed : 70m/min WSO (10%)

Power Consumption



Thrust



DRILLING(BRAZED TYPE)

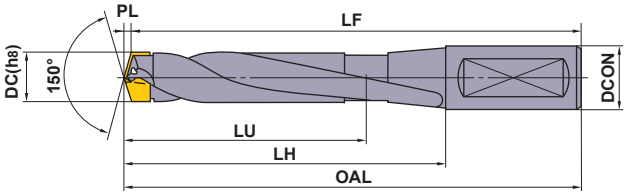
BRM

●Excellent cutting sharpness and chip discharge due to high rake type insert.
●High efficiency, high accuracy machining.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

14≤DC≤18	18<DC≤30
0 −0.027	0 −0.033

(l/d=5)



DC (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)					
	Order Number	Stock UP20M	Range of Drill Diameters (DC)	Order Number	LU	LH	OAL	LF	PL	DCON
14.0	BRM1400S16	●	14.0<DC≤14.5	BRM□□□□S16	79.9	93.9	141.9	140	1.9	16
14.5	BRM1450S16	●			79.9	93.9	141.9	140	1.9	16
15.0	BRM1500S20	●	14.5<DC≤15.5	BRM□□□□S20	87.0	102.0	152.0	150	2.0	20
15.5	BRM1550S20	●			87.1	102.1	152.1	150	2.1	20
16.0	BRM1600S20	●	15.5<DC≤16.5		91.1	107.1	157.1	155	2.1	20
16.5	BRM1650S20	●			91.2	107.2	157.2	155	2.2	20
17.0	BRM1700S20	●	16.5<DC≤17.5		100.3	117.3	167.3	165	2.3	20
17.5	BRM1750S20	●			100.3	117.3	167.3	165	2.3	20
18.0	BRM1800S20	●	17.5<DC≤18.5		104.4	122.4	172.4	170	2.4	20
18.5	BRM1850S20	●			104.5	122.5	172.5	170	2.5	20
19.0	BRM1900S25	●	18.5<DC≤19.5	BRM□□□□S25	107.5	126.5	182.5	180	2.5	25
19.5	BRM1950S25	●			107.6	126.6	182.6	180	2.6	25
20.0	BRM2000S25	●	19.5<DC≤20.5		116.7	136.7	192.7	190	2.7	25
20.5	BRM2050S25	●			116.7	136.7	192.7	190	2.7	25
21.0	BRM2100S25	●	20.5<DC≤21.5		120.8	141.8	197.8	195	2.8	25
21.5	BRM2150S25	●			120.9	141.9	197.9	195	2.9	25
22.0	BRM2200S25	●	21.5<DC≤22.5		124.9	146.9	202.9	200	2.9	25
22.5	BRM2250S25	●			125.0	147.0	203.0	200	3.0	25
23.0	BRM2300S25	●	22.5<DC≤23.5		129.1	152.1	208.1	205	3.1	25
23.5	BRM2350S25	●			129.1	152.1	208.1	205	3.1	25
24.0	BRM2400S32	●	23.5<DC≤24.5	BRM□□□□S32	139.2	163.2	223.2	220	3.2	32
24.5	BRM2450S32	●			139.3	163.3	223.3	220	3.3	32
25.0	BRM2500S32	●	24.5<DC≤25.5		143.3	168.3	228.3	225	3.3	32
25.5	BRM2550S32	●			143.4	168.4	228.4	225	3.4	32
26.0	BRM2600S32	●	25.5<DC≤26.5		147.5	173.5	233.5	230	3.5	32
26.5	BRM2650S32	●			147.6	173.6	233.6	230	3.6	32
27.0	BRM2700S32	●	26.5<DC≤27.5		151.6	178.6	238.6	235	3.6	32
27.5	BRM2750S32	●			151.7	178.7	238.7	235	3.7	32
28.0	BRM2800S32	●	27.5<DC≤28.5		160.8	188.8	248.8	245	3.8	32
28.5	BRM2850S32	●			160.8	188.8	248.8	245	3.8	32
29.0	BRM2900S32	●	28.5<DC≤29.5		164.9	193.9	253.9	250	3.9	32
29.5	BRM2950S32	●			165.0	194.0	254.0	250	4.0	32
30.0	BRM3000S32	●	29.5<DC≤30.0		169.0	199.0	259.0	255	4.0	32

For ordering an intermediate diameter, please enter the diameter (DC) into the 4-digit space□□□□in the nominal designation.
(Ex. UP20M BRM2530S32 for a diameter of ϕ25.30mm)

● : **Inventory maintained in Japan.**

RECOMMENDED CUTTING CONDITIONS

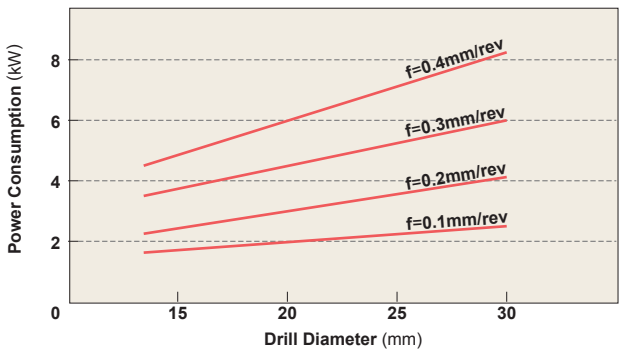
	Work Material		Hardness	Drill Dia. ϕ14.0−ϕ20.0		Drill Dia. ϕ20.0−ϕ30.0	
				Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel		≤180HB	65 (50−75)	0.30 (0.20−0.40)	70 (55−85)	0.35 (0.20−0.45)
	Structural Steel	**SS400 (JIS)**	Tensile Strength 400−500MPa	70 (60−80)	0.30 (0.25−0.35)	70 (60−80)	0.35 (0.30−0.45)
		SM490 (JIS)	Tensile Strength 490−610MPa	60 (50−70)	0.25 (0.20−0.30)	60 (50−70)	0.30 (0.20−0.40)
		SM570 (JIS)	Tensile Strength 570−720MPa	50 (40−60)	0.25 (0.20−0.30)	50 (40−60)	0.30 (0.20−0.35)
	Carbon Steel Alloy Steel		180−280HB	60 (45−70)	0.25 (0.15−0.35)	65 (45−80)	0.30 (0.15−0.40)
			280−350HB	55 (40−65)	0.20 (0.15−0.35)	60 (45−70)	0.25 (0.15−0.35)
M	Stainless Steel (Austenitic)		≤200HB	60 (50−80)	0.25 (0.15−0.35)	65 (50−80)	0.30 (0.20−0.40)
K	Gray Cast Iron		Tensile Strength≤350MPa	65 (50−100)	0.30 (0.20−0.40)	70 (50−100)	0.35 (0.25−0.50)
	Ductile Cast Iron		Tensile Strength≤450MPa	65 (50−90)	0.30 (0.2−0.40)	70 (50−90)	0.35 (0.20−0.45)
			Tensile Strength 500−800MPa	60 (45−80)	0.25 (0.15−0.35)	65 (45−80)	0.30 (0.15−0.40)

(Note) The above conditions are for general cutting. The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

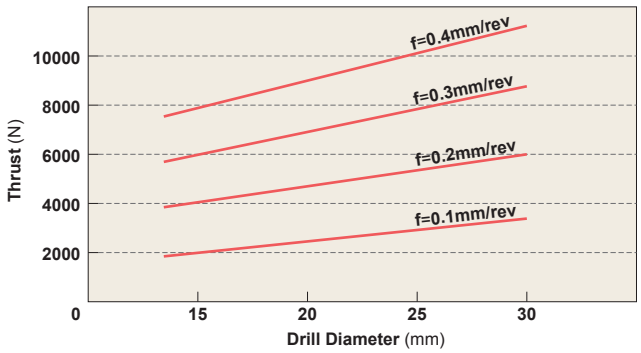
CUTTING RESISTANCE

Workpiece : JIS SUS304 Drilled Depth : l/d=5(Through Hole) Cutting Speed : 60m/min WSO (10%)

Power Consumption



Thrust



BRSB

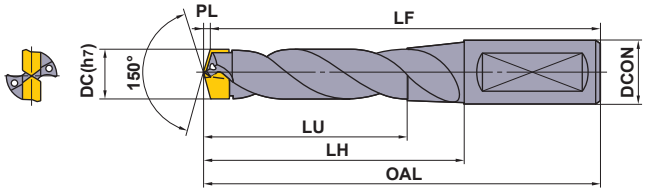
Key point drill for bridge construction

- Excellent cutting sharpness and chip discharge due to high rake type insert.
- Unique flute shape is used. (l/d=3)

P	M	K	N	S	H
Steel					

18<DC≤30
0
−0.021

Key point drill for bridge construction
(l/d=3)



DC (mm)	Order Number	Stock UP20M	Dimensions (mm) LU	LH	OAL	LF	PL	DCON
24.5	BRSB2450S32	●	90.3	114.3	174.3	171	3.3	32
24.6	BRSB2460S32	●	89.3	114.3	174.3	171	3.3	32
24.7	BRSB2470S32	●	89.3	114.3	174.3	171	3.3	32
26.5	BRSB2650S32	●	93.6	119.6	179.6	176	3.6	32
26.7	BRSB2670S32	●	92.6	119.6	179.6	176	3.6	32

BRMB

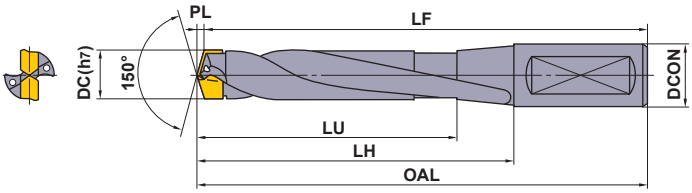
Key point drill for bridge construction

- Excellent cutting sharpness and chip discharge due to high rake type insert.
- Unique flute shape is used. (l/d=5)

P	M	K	N	S	H
Steel					

18<DC≤30
0
−0.021

Key point drill for bridge construction
(l/d=5)



DC (mm)	Order Number	Stock UP20M	Dimensions (mm) LU	LH	OAL	LF	PL	DCON
24.5	BRMB2450S32	●	139.3	163.3	223.3	220	3.3	32
24.6	BRMB2460S32	●	143.3	168.3	228.3	225	3.3	32
24.7	BRMB2470S32	●	143.3	168.3	228.3	225	3.3	32
26.5	BRMB2650S32	●	147.6	173.6	233.6	230	3.6	32
26.7	BRMB2670S32	●	151.6	178.6	238.6	235	3.6	32

● : Inventory maintained in Japan.

BRB

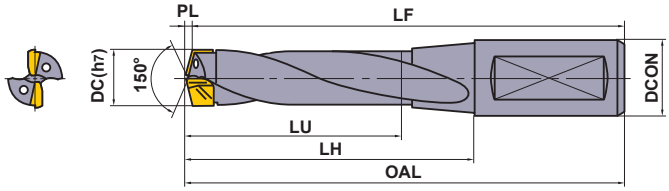
●Low thrust due to the absence of a chisel edge.
●Easy regrinding.

New point drill for bridge construction parts

P	M	K	N	S	H
Steel					

18<DC≤30
0
−0.021

●New point drill for bridge construction parts
(l/d=3)



DC (mm)	Order Number	Stock UTi20T	Dimensions (mm) LU	LH	OAL	LF	PL	DCON
24.5	BRB2450S32M	●	90.3	114.3	174.3	171	3.3	32
24.6	BRB2460S32M	●	89.3	114.3	174.3	171	3.3	32
24.7	BRB2470S32M	●	89.3	114.3	174.3	171	3.3	32
26.5	BRB2650S32M	●	93.6	119.6	179.6	176	3.6	32
26.7	BRB2670S32M	●	92.6	119.6	179.6	176	3.6	32

RECOMMENDED CUTTING CONDITIONS

Work Material			Hardness	BRB Cutting Speed (m/min)	BRB Feed (mm/rev)	BRSB Cutting Speed (m/min)	BRSB Feed (mm/rev)	BRMB Cutting Speed (m/min)	BRMB Feed (mm/rev)
P	Structural Steel	SS400 (JIS)	Tensile Strength 400−500MPa	65 (60−75)	0.35 (0.3−0.4)	80 (70−90)	0.35 (0.3−0.45)	70 (60−80)	0.35 (0.3−0.45)
		SM490 (JIS)	Tensile Strength 490−610MPa	60 (50−70)	0.3 (0.2−0.4)	70 (60−80)	0.3 (0.2−0.4)	60 (50−70)	0.3 (0.2−0.4)
		SM570 (JIS)	Tensile Strength 570−720MPa	55 (50−60)	0.3 (0.2−0.35)	60 (50−70)	0.3 (0.2−0.35)	50 (40−60)	0.3 (0.2−0.35)
	Mild Steel		≤180HB	40 (30−50)	0.35 (0.25−0.4)	70 (55−85)	0.35 (0.2−0.45)	70 (55−85)	0.35 (0.2−0.45)

DRILLING(BRAZED TYPE)

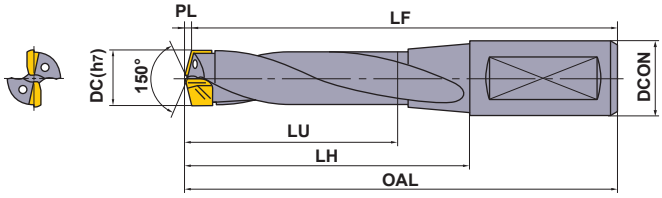
BRA

- Low thrust due to the absence of a chisel edge.
- Easy regrinding.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

8≤D≤10	10<DC≤18	18<DC≤30	30<DC≤40
0 −0.015	0 −0.018	0 −0.021	0 −0.025

General Use (Carbon Steel, Alloy Steel, Stainless Steel)
(l/d=3)



DC (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)					
	Order Number	Stock UP20M	Range of Drill Diameters (DC)	Order Number	LU	LH	OAL	LF	PL	DCON
8.0	BRA0800S16	●	8.0<DC≤8.5	BRA□□□□S16	24.1	36.1	84.1	83	1.1	16
8.5	BRA0850S16	●			24.1	36.1	84.1	83	1.1	16
9.0	BRA0900S16	●	8.5<DC≤9.5		29.2	41.2	89.2	88	1.2	16
9.5	BRA0950S16	●			29.3	41.3	89.3	88	1.3	16
10.0	BRA1000S16	●	9.5<DC≤10.5		36.3	46.3	94.3	93	1.3	16
10.5	BRA1050S16	●			36.4	46.4	94.4	93	1.4	16
11.0	BRA1100S16	●	10.5<DC≤11.5		41.5	52.5	100.5	99	1.5	16
11.5	BRA1150S16	●			41.5	52.5	100.5	99	1.5	16
12.0	BRA1200S16	●	11.5<DC≤12.5		45.6	57.6	105.6	104	1.6	16
12.5	BRA1250S16	●			45.7	57.7	105.7	104	1.7	16
13.0	BRA1300S16	●	12.5<DC≤13.5		49.7	62.7	110.7	109	1.7	16
13.5	BRA1350S16	●			49.8	62.8	110.8	109	1.8	16
14.0	BRA1400S16	●	13.5<DC≤14.5		53.9	67.9	115.9	114	1.9	16
14.5	BRA1450S16	●			53.9	67.9	115.9	114	1.9	16
15.0	BRA1500S20	●	14.5<DC≤15.5	BRA□□□□S20	63.0	78.0	128.0	126	2.0	20
15.5	BRA1550S20	●			63.1	78.1	128.1	126	2.1	20
16.0	BRA1600S20	●	15.5<DC≤16.5		67.1	83.1	133.1	131	2.1	20
16.5	BRA1650S20	●			67.2	83.2	133.2	131	2.2	20
17.0	BRA1700S20	●	16.5<DC≤17.5		71.3	88.3	138.3	136	2.3	20
17.5	BRA1750S20	●			71.3	88.3	138.3	136	2.3	20
18.0	BRA1800S20	●	17.5<DC≤18.5		75.4	93.4	143.4	141	2.4	20
18.5	BRA1850S20	●			75.5	93.5	143.5	141	2.5	20
19.0	BRA1900S25	●	18.5<DC≤19.5	BRA□□□□S25	79.5	103.5	159.5	157	2.5	25
19.5	BRA1950S25	●			79.6	103.6	159.6	157	2.6	25
20.0	BRA2000S25	●	19.5<DC≤20.5		83.7	103.7	159.7	157	2.7	25
20.5	BRA2050S25	●			83.7	103.7	159.7	157	2.7	25
21.0	BRA2100S25	●	20.5<DC≤21.5		82.8	103.8	159.8	157	2.8	25
21.5	BRA2150S25	●			82.9	103.9	159.9	157	2.9	25
22.0	BRA2200S25	●	21.5<DC≤22.5		86.9	108.9	164.9	162	2.9	25
22.5	BRA2250S25	●			87.0	109.0	165.0	162	3.0	25
23.0	BRA2300S25	●	22.5<DC≤23.5		86.1	109.1	165.1	162	3.1	25
23.5	BRA2350S25	●			86.1	109.1	165.1	162	3.1	25

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)					
	Order Number	Stock UP20M	Range of Drill Diameters (DC)	Order Number	LU	LH	OAL	LF	PL	DCON
24.0	BRA2400S32	●	23.5<DC≤24.5	BRA□□□□S32	90.2	114.2	174.2	171	3.2	32
24.5	BRA2450S32	●			90.3	114.3	174.3	171	3.3	32
25.0	BRA2500S32	●	24.5<DC≤25.5		89.3	114.3	174.3	171	3.3	32
25.5	BRA2550S32	●			89.4	114.4	174.4	171	3.4	32
26.0	BRA2600S32	●	25.5<DC≤26.5		93.5	119.5	179.5	176	3.5	32
26.5	BRA2650S32	●			93.6	119.6	179.6	176	3.6	32
27.0	BRA2700S32	●	26.5<DC≤27.5		92.6	119.6	179.6	176	3.6	32
27.5	BRA2750S32	●			92.7	119.7	179.7	176	3.7	32
28.0	BRA2800S32	●	27.5<DC≤28.5		96.8	124.8	184.8	181	3.8	32
28.5	BRA2850S32	●			96.8	124.8	184.8	181	3.8	32
29.0	BRA2900S32	●	28.5<DC≤29.5		100.9	129.9	189.9	186	3.9	32
29.5	BRA2950S32	●			101.0	130.0	190.0	186	4.0	32
30.0	BRA3000S32	●	29.5<DC≤30.5		100.0	130.0	190.0	186	4.0	32
30.5	BRA3050S32	●			100.1	130.1	190.1	186	4.1	32
31.0	BRA3100S40	□	30.5<DC≤31.5	BRA□□□□S40	100.2	131.2	201.2	197	4.2	40
31.5	BRA3150S40	□			100.2	131.2	201.2	197	4.2	40
32.0	BRA3200S40	□	31.5<DC≤32.5		104.3	136.3	206.3	202	4.3	40
32.5	BRA3250S40	□			104.4	136.4	206.4	202	4.4	40
33.0	BRA3300S40	□	32.5<DC≤33.5		108.4	141.4	211.4	207	4.4	40
33.5	BRA3350S40	□			108.5	141.5	211.5	207	4.5	40
34.0	BRA3400S40	□	33.5<DC≤34.5		107.6	141.6	211.6	207	4.6	40
34.5	BRA3450S40	□			107.6	141.6	211.6	207	4.6	40
35.0	BRA3500S40	□	34.5<DC≤35.5		111.7	146.7	216.7	212	4.7	40
35.5	BRA3550S40	□			111.8	146.8	216.8	212	4.8	40
36.0	BRA3600S40	□	35.5<DC≤36.5		115.8	151.8	221.8	217	4.8	40
36.5	BRA3650S40	□			115.9	151.9	221.9	217	4.9	40
37.0	BRA3700S40	□	36.5<DC≤37.5		120.0	157.0	227.0	222	5.0	40
37.5	BRA3750S40	□			120.0	157.0	227.0	222	5.0	40
38.0	BRA3800S40	□	37.5<DC≤38.5		124.1	162.1	232.1	227	5.1	40
38.5	BRA3850S40	□			124.2	162.2	232.2	227	5.2	40
39.0	BRA3900S40	□	38.5<DC≤39.5		123.2	162.2	232.2	227	5.2	40
39.5	BRA3950S40	□			123.3	162.3	232.3	227	5.3	40
40.0	BRA4000S40	□	39.5<DC≤40.0		127.4	167.4	237.4	232	5.4	40

(Note 1) Drills in the intermediate drill diameter range are produced to order only.
(Note 2) For ordering an intermediate diameter, please enter the diameter (DC) into the 4-digit space□□□□in the nominal designation.
(Ex. UP20M BRA2530S32 for a diameter of ϕ25.30mm)
(Note 3) Please contact us regarding special designs.
(Note 4) Please contact us for any geometry that is not in this catalogue (e.g. drills with chamfered cutting edges can be made to order).

CUTTING CONDITIONS ➢ N210
TECHNICAL DATA ➢ Q001

DRILLING(BRAZED TYPE)

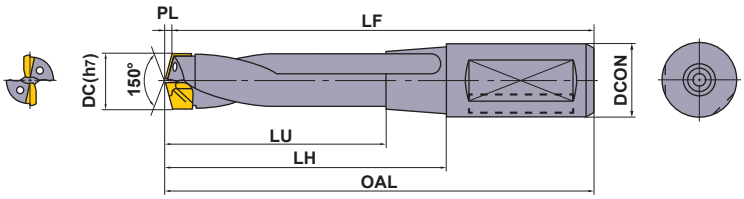
BRL

- Low thrust due to the absence of a chisel edge.
- Easy regrinding.
- Unique flute shape for lathes.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

8≤DC≤10	10<DC≤18	18<DC≤30	30<DC≤40
0 −0.015	0 −0.018	0 −0.021	0 −0.025

For turning
(l/d=3)



DC (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)					
	Order Number	Stock STi40T	Range of Drill Diameters (DC)	Order Number	LU	LH	OAL	LF	PL	DCON
8.0	BRL0800S16	●	8.0≤DC≤8.5	BRL□□□□S16	24.1	36.1	84.1	83	1.1	16
8.5	BRL0850S16	●			24.1	36.1	84.1	83	1.1	16
9.0	BRL0900S16	●	8.5<DC≤9.5		29.2	41.2	89.2	88	1.2	16
9.5	BRL0950S16	●			29.3	41.3	89.3	88	1.3	16
10.0	BRL1000S16	●	9.5<DC≤10.5		36.3	46.3	94.3	93	1.3	16
10.5	BRL1050S16	●			36.4	46.4	94.4	93	1.4	16
11.0	BRL1100S16	●	10.5<DC≤11.5		41.5	52.5	100.5	99	1.5	16
11.5	BRL1150S16	●			41.5	52.5	100.5	99	1.5	16
12.0	BRL1200S16	●	11.5<DC≤12.5		45.6	57.6	105.6	104	1.6	16
12.5	BRL1250S16	●			45.7	57.7	105.7	104	1.7	16
13.0	BRL1300S16	●	12.5<DC≤13.5		49.7	62.7	110.7	109	1.7	16
13.5	BRL1350S16	●			49.8	62.8	110.8	109	1.8	16
14.0	BRL1400S16	●	13.5<DC≤14.5		53.9	67.9	115.9	114	1.9	16
14.5	BRL1450S16	●			53.9	67.9	115.9	114	1.9	16
15.0	BRL1500S20	●	14.5<DC≤15.5	BRL□□□□S20	63.0	78.0	128.0	126	2.0	20
15.5	BRL1550S20	●			63.1	78.1	128.1	126	2.1	20
16.0	BRL1600S20	●	15.5<DC≤16.5		67.1	83.1	133.1	131	2.1	20
16.5	BRL1650S20	●			67.2	83.2	133.2	131	2.2	20
17.0	BRL1700S20	●	16.5<DC≤17.5		71.3	88.3	138.3	136	2.3	20
17.5	BRL1750S20	●			71.3	88.3	138.3	136	2.3	20
18.0	BRL1800S20	●	17.5<DC≤18.5		75.4	93.4	143.4	141	2.4	20
18.5	BRL1850S20	●			75.5	93.5	143.5	141	2.5	20
19.0	BRL1900S25	●	18.5<DC≤19.5	BRL□□□□S25	79.5	103.5	159.5	157	2.5	25
19.5	BRL1950S25	●			79.6	103.6	159.6	157	2.6	25
20.0	BRL2000S25	●	19.5<DC≤20.5		83.7	103.7	159.7	157	2.7	25
20.5	BRL2050S25	●			83.7	103.7	159.7	157	2.7	25
21.0	BRL2100S25	●	20.5<DC≤21.5		82.8	103.8	159.8	157	2.8	25
21.5	BRL2150S25	●			82.9	103.9	159.9	157	2.9	25
22.0	BRL2200S25	●	21.5<DC≤22.5		86.9	108.9	164.9	162	2.9	25
22.5	BRL2250S25	●			87.0	109.0	165.0	162	3.0	25
23.0	BRL2300S25	●	22.5<DC≤23.5		86.1	109.1	165.1	162	3.1	25
23.5	BRL2350S25	●			86.1	109.1	165.1	162	3.1	25

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

DC (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)					
	Order Number	Stock STi40T	Range of Drill Diameters (DC)	Order Number	LU	LH	OAL	LF	PL	DCON
24.0	BRL2400S32	●	23.5<DC≤24.5	BRL□□□□S32	90.2	114.2	174.2	171	3.2	32
24.5	BRL2450S32	●			90.3	114.3	174.3	171	3.3	32
25.0	BRL2500S32	●	24.5<DC≤25.5		89.3	114.3	174.3	171	3.3	32
25.5	BRL2550S32	●			89.4	114.4	174.4	171	3.4	32
26.0	BRL2600S32	●	25.5<DC≤26.5		93.5	119.5	179.5	176	3.5	32
26.5	BRL2650S32	●			93.6	119.6	179.6	176	3.6	32
27.0	BRL2700S32	●	26.5<DC≤27.5		92.6	119.6	179.6	176	3.6	32
27.5	BRL2750S32	●			92.7	119.7	179.7	176	3.7	32
28.0	BRL2800S32	●	27.5<DC≤28.5		96.8	124.8	184.8	181	3.8	32
28.5	BRL2850S32	●			96.8	124.8	184.8	181	3.8	32
29.0	BRL2900S32	●	28.5<DC≤29.5		100.9	129.9	189.9	186	3.9	32
29.5	BRL2950S32	●			101.0	130.0	190.0	186	4.0	32
30.0	BRL3000S32	●	29.5<DC≤30.5		100.0	130.0	190.0	186	4.0	32
30.5	BRL3050S32	●			100.1	130.1	190.1	186	4.1	32
31.0	BRL3100S40	□	30.5<DC≤31.5	BRL□□□□S40	100.2	131.2	201.2	197	4.2	40
31.5	BRL3150S40	□			100.2	131.2	201.2	197	4.2	40
32.0	BRL3200S40	□	31.5<DC≤32.5		104.3	136.3	206.3	202	4.3	40
32.5	BRL3250S40	□			104.4	136.4	206.4	202	4.4	40
33.0	BRL3300S40	□	32.5<DC≤33.5		108.4	141.4	211.4	207	4.4	40
33.5	BRL3350S40	□			108.5	141.5	211.5	207	4.5	40
34.0	BRL3400S40	□	33.5<DC≤34.5		107.6	141.6	211.6	207	4.6	40
34.5	BRL3450S40	□			107.6	141.6	211.6	207	4.6	40
35.0	BRL3500S40	□	34.5<DC≤35.5		111.7	146.7	216.7	212	4.7	40
35.5	BRL3550S40	□			111.8	146.8	216.8	212	4.8	40
36.0	BRL3600S40	□	35.5<DC≤36.5		115.8	151.8	221.8	217	4.8	40
36.5	BRL3650S40	□			115.9	151.9	221.9	217	4.9	40
37.0	BRL3700S40	□	36.5<DC≤37.5		120.0	157.0	227.0	222	5.0	40
37.5	BRL3750S40	□			120.0	157.0	227.0	222	5.0	40
38.0	BRL3800S40	□	37.5<DC≤38.5		124.1	162.1	232.1	227	5.1	40
38.5	BRL3850S40	□			124.2	162.2	232.2	227	5.2	40
39.0	BRL3900S40	□	38.5<DC≤39.5		123.2	162.2	232.2	227	5.2	40
39.5	BRL3950S40	□			123.3	162.3	232.3	227	5.3	40
40.0	BRL4000S40	□	39.5<DC≤40.0		127.4	167.4	237.4	232	5.4	40

(Note 1) Drills in the intermediate drill diameter range are produced to order only.
(Note 2) For ordering an intermediate diameter, please enter the diameter (DC) into the 4-digit space□□□□in the nominal designation.
(Ex. STi40T BRL2530S32 for a diameter of ϕ25.30mm)
(Note 3) Please contact us regarding special designs.
(Note 4) Please contact us for any geometry that is not in this catalogue (e.g. drills with chamfered cutting edges can be made to order).

CUTTING CONDITIONS ➤ N210
TECHNICAL DATA ➤ Q001

DRILLING(BRAZED TYPE)

BRA/BRL

RECOMMENDED CUTTING CONDITIONS

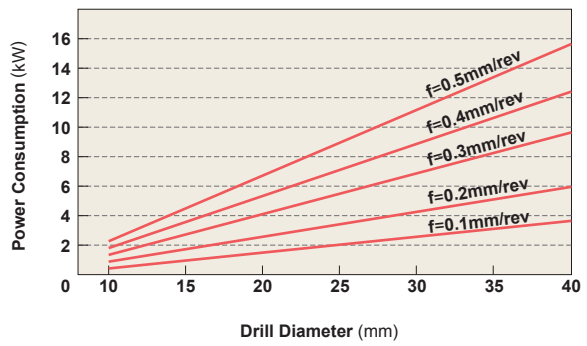
Type		Work Material	Hardness	Drill Diameter φ8.0—φ13.0		Drill Diameter φ13.0—φ18.0		Drill Diameter≥φ18.0	
				Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
BRA	P	Mild Steel	≤180HB	55 (40—65)	0.25 (0.20—0.30)	65 (50—75)	0.30 (0.25—0.35)	75 (60—85)	0.30 (0.25—0.35)
		Carbon Steel Alloy Steel	180—280HB	50 (35—60)	0.25 (0.20—0.30)	60 (45—70)	0.30 (0.25—0.35)	70 (55—80)	0.30 (0.25—0.35)
			280—350HB	40 (30—50)	0.25 (0.20—0.30)	50 (40—60)	0.25 (0.20—0.30)	55 (45—65)	0.27 (0.20—0.30)
	M	Stainless Steel	≤200HB	30 (20—40)	0.25 (0.20—0.27)	35 (25—45)	0.27 (0.20—0.30)	40 (30—50)	0.30 (0.25—0.35)
	K	Gray Cast Iron	Tensile Strength≤350MPa	60 (40—70)	0.30 (0.25—0.35)	70 (50—80)	0.35 (0.30—0.40)	80 (60—90)	0.40 (0.35—0.45)
		Ductile Cast Iron	Tensile Strength≤450MPa	55 (40—65)	0.27 (0.20—0.30)	60 (45—70)	0.30 (0.25—0.35)	70 (55—80)	0.30 (0.25—0.35)
	S	Heat Resistant Alloy	—	15 (10—20)	0.10 (0.05—0.12)	20 (15—25)	0.15 (0.10—0.20)	25 (20—30)	0.15 (0.10—0.20)
		Titanium Alloy	—	20 (10—25)	0.15 (0.10—0.17)	30 (20—35)	0.20 (0.15—0.25)	35 (30—40)	0.25 (0.20—0.30)
BRL	P	Mild Steel	≤180HB	50 (35—60)	0.25 (0.20—0.30)	60 (45—70)	0.30 (0.25—0.35)	65 (50—75)	0.30 (0.25—0.35)
		Carbon Steel Alloy Steel	180—280HB	45 (30—55)	0.25 (0.20—0.30)	55 (40—65)	0.30 (0.25—0.35)	60 (45—70)	0.30 (0.25—0.35)
			280—350HB	35 (25—45)	0.25 (0.20—0.30)	45 (35—55)	0.25 (0.20—0.30)	50 (40—60)	0.27 (0.20—0.30)
	M	Stainless Steel	≤200HB	30 (20—40)	0.25 (0.20—0.27)	30 (20—40)	0.27 (0.20—0.30)	35 (25—45)	0.30 (0.25—0.35)
	K	Gray Cast Iron	Tensile Strength≤350MPa	55 (40—70)	0.30 (0.25—0.35)	60 (45—75)	0.35 (0.3—0.40)	65 (50—80)	0.40 (0.35—0.45)
		Ductile Cast Iron	Tensile Strength≤450MPa	50 (35—60)	0.27 (0.20—0.30)	55 (40—65)	0.30 (0.25—0.35)	60 (45—70)	0.30 (0.25—0.35)
	S	Heat Resistant Alloy	—	15 (10—20)	0.10 (0.05—0.12)	15 (10—20)	0.15 (0.10—0.20)	20 (15—25)	0.15 (0.10—0.20)
		Titanium Alloy	—	20 (10—25)	0.15 (0.10—0.17)	25 (10—30)	0.20 (0.15—0.25)	30 (20—35)	0.25 (0.20—0.30)

(Note) The above conditions are for general cutting. The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

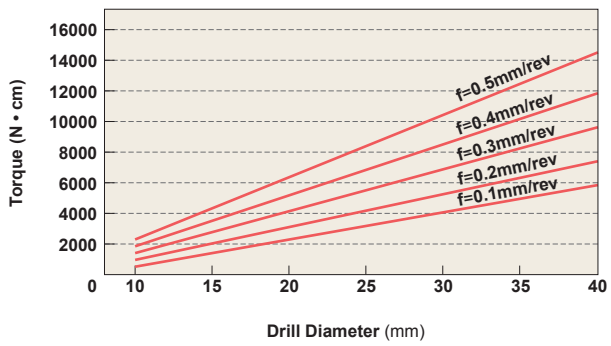
CUTTING RESISTANCE

Workpiece : JIS SCM440(200HB) Cutting Speed : 60m/min

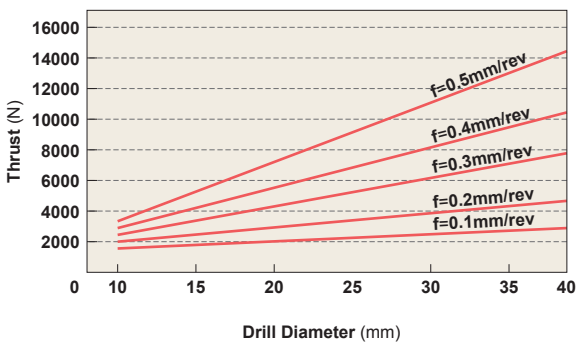
Power Consumption



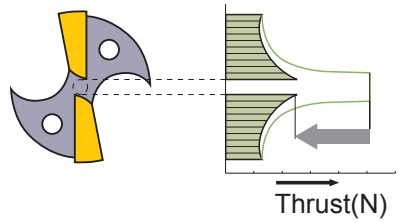
Torque

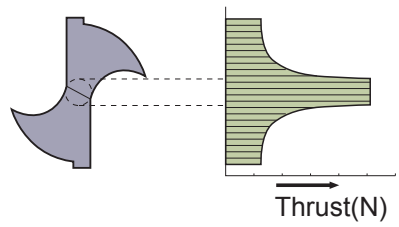


Thrust

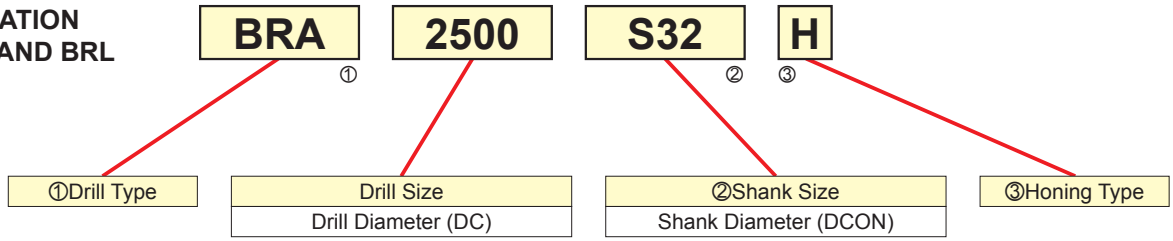


Reason for Low Thrust Load





IDENTIFICATION FOR BRA AND BRL



①Drill Type

Type	Description						Applications	Products Name
	Point Angle	Hole Depth	Helix Angle	Relief Angle	Back Taper	Body Dia.		
BRA	150°	l/d=3—4	20°	10°	0.3mm/100mm	DC-0.2mm	For General Use (Carbon / Alloy / Stainless Steel)	BRA○○○○S○○
BRL	150°	l/d=3—4	10°+ Straight	10°	1.0mm/100mm	DC-1.0mm	For Turning	BRL○○○○S○○L

②Shank Size

Type	Shank Diameter	Drill Diameter
S16	ø16 (h6)	ø8.0≤DC≤ø14.5
S20	ø20 (h6)	ø14.5 < DC≤ø18.5
S25	ø25 (h6)	ø18.5 < DC≤ø23.5
S32	ø32 (h6)	ø23.5 < DC≤ø30.5
S40	ø40 (h6)	ø30.5 < DC≤ø40.0

③Honing Type

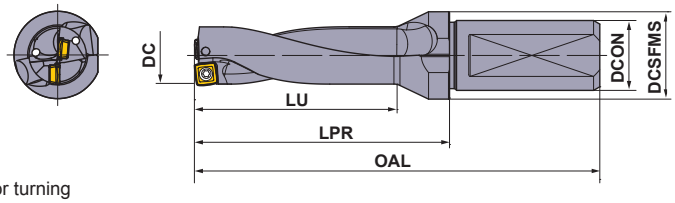
Type	Honing Width (mm)	Work Material	
		BRA	**BRL**
-(Standard)	0.15—0.2	Carbon Steel, Alloy Steel, Mild Steel	Carbon Steel (≥200HB), Alloy Steel, Stainless Steel
S	0.2—0.25	—	Carbon Steel (<200HB)
M	0.25—0.3	—	High Tension Steel, Rolled Steel for Welded Structures
L	0.3—0.4	—	Mild Steel
H	0.05—0.1	Stainless Steel, Heat Resistant Alloy, Titanium Alloy	—
G	0.025—0.08	Cast Iron, Aluminium Alloy, Non-Ferrous Metals	Cast Iron

MVX

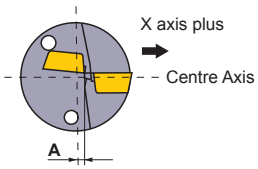
- Ideal combination of outer CVD insert and inner PVD insert.
- High rigidity body that enabled L/D=6 deep hole machining.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

L/D	Machining tolerance(guide)(mm) ø17–ø33	ø33.5–ø47	ø48–ø63
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	



Maximum offset for turning



Tighten the clamp screw according to the torque below.

Drill Diameter (mm)	Clamp Torque (N · m)
17—19.5	1.0
20—22.5	2.0
23—27.5	2.5
28—46	3.5
47—63	7.5

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
17.0	2	MVX1700X2F20	●	2	41	56	99	20	25	0.5	SOMX063005-○○	TPS25	TIP07F
	3	MVX1700X3F20	●	2	58	73	116	20	25	0.5	SOMX063005-○○	TPS25	TIP07F
	4	MVX1700X4F20	●	2	75	90	133	20	25	0.5	SOMX063005-○○	TPS25	TIP07F
	5	MVX1700X5F20	●	2	92	107	150	20	25	0.5	SOMX063005-○○	TPS25	TIP07F
	6	MVX1700X6F20	●	2	109	124	167	20	25	0.5	SOMX063005-○○	TPS25	TIP07F
17.5	2	MVX1750X2F25	●	2	42	62	112	25	32	0.45	SOMX063005-○○	TPS25	TIP07F
	3	MVX1750X3F25	●	2	59.5	79.5	129.5	25	32	0.45	SOMX063005-○○	TPS25	TIP07F
	4	MVX1750X4F25	●	2	77	97	147	25	32	0.45	SOMX063005-○○	TPS25	TIP07F
	5	MVX1750X5F25	●	2	94.5	114.5	164.5	25	32	0.45	SOMX063005-○○	TPS25	TIP07F
	6	MVX1750X6F25	●	2	112	132	182	25	32	0.45	SOMX063005-○○	TPS25	TIP07F
18.0	2	MVX1800X2F25	●	2	43	63	113	25	32	0.4	SOMX063005-○○	TPS25	TIP07F
	3	MVX1800X3F25	●	2	61	81	131	25	32	0.4	SOMX063005-○○	TPS25	TIP07F
	4	MVX1800X4F25	●	2	79	99	149	25	32	0.4	SOMX063005-○○	TPS25	TIP07F
	5	MVX1800X5F25	●	2	97	117	167	25	32	0.4	SOMX063005-○○	TPS25	TIP07F
	6	MVX1800X6F25	●	2	115	135	185	25	32	0.4	SOMX063005-○○	TPS25	TIP07F
18.5	2	MVX1850X2F25	●	2	44	64	114	25	32	0.35	SOMX063005-○○	TPS25	TIP07F
	3	MVX1850X3F25	●	2	62.5	82.5	132.5	25	32	0.35	SOMX063005-○○	TPS25	TIP07F
	4	MVX1850X4F25	●	2	81	101	151	25	32	0.35	SOMX063005-○○	TPS25	TIP07F
	5	MVX1850X5F25	●	2	99.5	119.5	169.5	25	32	0.35	SOMX063005-○○	TPS25	TIP07F
	6	MVX1850X6F25	●	2	118	138	188	25	32	0.35	SOMX063005-○○	TPS25	TIP07F
19.0	2	MVX1900X2F25	●	2	45	65	115	25	32	0.3	SOMX063005-○○	TPS25	TIP07F
	3	MVX1900X3F25	●	2	64	84	134	25	32	0.3	SOMX063005-○○	TPS25	TIP07F
	4	MVX1900X4F25	●	2	83	103	153	25	32	0.3	SOMX063005-○○	TPS25	TIP07F
	5	MVX1900X5F25	●	2	102	122	172	25	32	0.3	SOMX063005-○○	TPS25	TIP07F
	6	MVX1900X6F25	●	2	121	141	191	25	32	0.3	SOMX063005-○○	TPS25	TIP07F
19.5	2	MVX1950X2F25	●	2	46	66	116	25	32	0.25	SOMX063005-○○	TPS25	TIP07F
	3	MVX1950X3F25	●	2	65.5	85.5	135.5	25	32	0.25	SOMX063005-○○	TPS25	TIP07F
	4	MVX1950X4F25	●	2	85	105	155	25	32	0.25	SOMX063005-○○	TPS25	TIP07F
	5	MVX1950X5F25	●	2	104.5	124.5	174.5	25	32	0.25	SOMX063005-○○	TPS25	TIP07F
	6	MVX1950X6F25	●	2	124	144	194	25	32	0.25	SOMX063005-○○	TPS25	TIP07F

* Clamp Torque (N • m) : TPS25=1.0, TPS3=2.0

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
20.0	2	MVX2000X2F25	●	2	47	67	117	25	32	0.6	SOMX073505-○○	TPS3	TIP10W
	3	MVX2000X3F25	●	2	67	87	137	25	32	0.6	SOMX073505-○○	TPS3	TIP10W
	4	MVX2000X4F25	●	2	87	107	157	25	32	0.6	SOMX073505-○○	TPS3	TIP10W
	5	MVX2000X5F25	●	2	107	127	177	25	32	0.6	SOMX073505-○○	TPS3	TIP10W
	6	MVX2000X6F25	●	2	127	147	197	25	32	0.6	SOMX073505-○○	TPS3	TIP10W
20.5	2	MVX2050X2F25	●	2	48	68	118	25	32	0.55	SOMX073505-○○	TPS3	TIP10W
	3	MVX2050X3F25	●	2	68.5	88.5	138.5	25	32	0.55	SOMX073505-○○	TPS3	TIP10W
21.0	2	MVX2100X2F25	●	2	49	69	119	25	32	0.5	SOMX073505-○○	TPS3	TIP10W
	3	MVX2100X3F25	●	2	70	90	140	25	32	0.5	SOMX073505-○○	TPS3	TIP10W
	4	MVX2100X4F25	●	2	91	111	161	25	32	0.5	SOMX073505-○○	TPS3	TIP10W
	5	MVX2100X5F25	●	2	112	132	182	25	32	0.5	SOMX073505-○○	TPS3	TIP10W
	6	MVX2100X6F25	●	2	133	153	203	25	32	0.5	SOMX073505-○○	TPS3	TIP10W
21.5	2	MVX2150X2F25	●	2	50	70	120	25	32	0.45	SOMX073505-○○	TPS3	TIP10W
	3	MVX2150X3F25	●	2	71.5	91.5	141.5	25	32	0.45	SOMX073505-○○	TPS3	TIP10W
22.0	2	MVX2200X2F25	●	2	51	71	121	25	32	0.4	SOMX073505-○○	TPS3	TIP10W
	3	MVX2200X3F25	●	2	73	93	143	25	32	0.4	SOMX073505-○○	TPS3	TIP10W
	4	MVX2200X4F25	●	2	95	115	165	25	32	0.4	SOMX073505-○○	TPS3	TIP10W
	5	MVX2200X5F25	●	2	117	137	187	25	32	0.4	SOMX073505-○○	TPS3	TIP10W
	6	MVX2200X6F25	●	2	139	159	209	25	32	0.4	SOMX073505-○○	TPS3	TIP10W
22.5	2	MVX2250X2F25	●	2	52	72	122	25	32	0.35	SOMX073505-○○	TPS3	TIP10W
	3	MVX2250X3F25	●	2	74.5	94.5	144.5	25	32	0.35	SOMX073505-○○	TPS3	TIP10W
23.0	2	MVX2300X2F25	●	2	53	73	123	25	32	0.8	SOMX084005-○○	TPS351	TIP10W
	3	MVX2300X3F25	●	2	76	96	146	25	32	0.8	SOMX084005-○○	TPS351	TIP10W
	4	MVX2300X4F25	●	2	99	119	169	25	32	0.8	SOMX084005-○○	TPS351	TIP10W
	5	MVX2300X5F25	●	2	122	142	192	25	32	0.8	SOMX084005-○○	TPS351	TIP10W
	6	MVX2300X6F25	●	2	145	165	215	25	32	0.8	SOMX084005-○○	TPS351	TIP10W
23.5	2	MVX2350X2F25	●	2	54	74	124	25	32	0.75	SOMX084005-○○	TPS351	TIP10W
	3	MVX2350X3F25	●	2	77.5	97.5	147.5	25	32	0.75	SOMX084005-○○	TPS351	TIP10W
24.0	2	MVX2400X2F25	●	2	55	75	125	25	32	0.7	SOMX084005-○○	TPS351	TIP10W
	3	MVX2400X3F25	●	2	79	99	149	25	32	0.7	SOMX084005-○○	TPS351	TIP10W
	4	MVX2400X4F25	●	2	103	123	173	25	32	0.7	SOMX084005-○○	TPS351	TIP10W
	5	MVX2400X5F25	●	2	127	147	197	25	32	0.7	SOMX084005-○○	TPS351	TIP10W
	6	MVX2400X6F25	●	2	151	171	221	25	32	0.7	SOMX084005-○○	TPS351	TIP10W
24.5	2	MVX2450X2F25	●	2	56	76	126	25	32	0.65	SOMX084005-○○	TPS351	TIP10W
	3	MVX2450X3F25	●	2	80.5	100.5	150.5	25	32	0.65	SOMX084005-○○	TPS351	TIP10W
25.0	2	MVX2500X2F25	●	2	57	77	127	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
	3	MVX2500X3F25	●	2	82	102	152	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
	4	MVX2500X4F25	●	2	107	127	177	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
	5	MVX2500X5F25	●	2	132	152	202	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
	6	MVX2500X6F25	●	2	157	177	227	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
25.5	2	MVX2550X2F25	●	2	58	78	128	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
	3	MVX2550X3F25	●	2	83.5	103.5	153.5	25	32	0.6	SOMX084005-○○	TPS351	TIP10W
26.0	2	MVX2600X2F32	●	2	59	79	134	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
	3	MVX2600X3F32	●	2	85	105	160	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
	4	MVX2600X4F32	●	2	111	131	186	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
	5	MVX2600X5F32	●	2	137	157	212	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
	6	MVX2600X6F32	●	2	163	183	238	32	42	0.5	SOMX084005-○○	TPS351	TIP10W

* Clamp Torque (N • m) : TPS3=2.0, TPS351=2.0

INSERT DESCRIPTION ➤ N218
CUTTING CONDITIONS ➤ N218
USAGE NOTE ➤ N247
TECHNICAL DATA ➤ Q001

MVX

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
26.5	2	MVX2650X2F32	●	2	60	80	135	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
	3	MVX2650X3F32	●	2	86.5	106.5	161.5	32	42	0.5	SOMX084005-○○	TPS351	TIP10W
27.0	2	MVX2700X2F32	●	2	61	81	136	32	42	0.45	SOMX084005-○○	TPS351	TIP10W
	3	MVX2700X3F32	●	2	88	108	163	32	42	0.45	SOMX084005-○○	TPS351	TIP10W
	4	MVX2700X4F32	●	2	115	135	190	32	42	0.45	SOMX084005-○○	TPS351	TIP10W
	5	MVX2700X5F32	●	2	142	162	217	32	42	0.45	SOMX084005-○○	TPS351	TIP10W
	6	MVX2700X6F32	●	2	169	189	244	32	42	0.45	SOMX084005-○○	TPS351	TIP10W
27.5	2	MVX2750X2F32	●	2	62	82	137	32	42	0.4	SOMX084005-○○	TPS351	TIP10W
	3	MVX2750X3F32	●	2	89.5	109.5	164.5	32	42	0.4	SOMX084005-○○	TPS351	TIP10W
28.0	2	MVX2800X2F32	●	2	63	83	138	32	42	0.85	SOMX094506-○○	TPS4	TIP15W
	3	MVX2800X3F32	●	2	91	111	166	32	42	0.85	SOMX094506-○○	TPS4	TIP15W
	4	MVX2800X4F32	●	2	119	139	194	32	42	0.85	SOMX094506-○○	TPS4	TIP15W
	5	MVX2800X5F32	●	2	147	167	222	32	42	0.85	SOMX094506-○○	TPS4	TIP15W
	6	MVX2800X6F32	●	2	175	195	250	32	42	0.85	SOMX094506-○○	TPS4	TIP15W
28.5	2	MVX2850X2F32	●	2	64	84	139	32	42	0.8	SOMX094506-○○	TPS4	TIP15W
	3	MVX2850X3F32	●	2	92.5	112.5	167.5	32	42	0.8	SOMX094506-○○	TPS4	TIP15W
29.0	2	MVX2900X2F32	●	2	65	85	140	32	42	0.75	SOMX094506-○○	TPS4	TIP15W
	3	MVX2900X3F32	●	2	94	114	169	32	42	0.75	SOMX094506-○○	TPS4	TIP15W
	4	MVX2900X4F32	●	2	123	143	198	32	42	0.75	SOMX094506-○○	TPS4	TIP15W
	5	MVX2900X5F32	●	2	152	172	227	32	42	0.75	SOMX094506-○○	TPS4	TIP15W
	6	MVX2900X6F32	●	2	181	201	256	32	42	0.75	SOMX094506-○○	TPS4	TIP15W
29.5	2	MVX2950X2F32	●	2	66	86	141	32	42	0.7	SOMX094506-○○	TPS4	TIP15W
	3	MVX2950X3F32	●	2	95.5	115.5	170.5	32	42	0.7	SOMX094506-○○	TPS4	TIP15W
30.0	2	MVX3000X2F32	●	2	67	87	142	32	42	0.65	SOMX094506-○○	TPS4	TIP15W
	3	MVX3000X3F32	●	2	97	117	172	32	42	0.65	SOMX094506-○○	TPS4	TIP15W
	4	MVX3000X4F32	●	2	127	147	202	32	42	0.65	SOMX094506-○○	TPS4	TIP15W
	5	MVX3000X5F32	●	2	157	177	232	32	42	0.65	SOMX094506-○○	TPS4	TIP15W
	6	MVX3000X6F32	●	2	187	207	262	32	42	0.65	SOMX094506-○○	TPS4	TIP15W
30.5	3	MVX3050X3F32	●	2	98.5	118.5	173.5	32	42	0.6	SOMX094506-○○	TPS4	TIP15W
31.0	2	MVX3100X2F40	●	2	69	89	154	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
	3	MVX3100X3F40	●	2	100	120	185	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
	4	MVX3100X4F40	●	2	131	151	216	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
	5	MVX3100X5F40	●	2	162	182	247	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
	6	MVX3100X6F40	●	2	193	213	278	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
31.5	3	MVX3150X3F40	●	2	101.5	121.5	186.5	40	50	0.55	SOMX094506-○○	TPS4	TIP15W
32.0	2	MVX3200X2F40	●	2	71	91	156	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
	3	MVX3200X3F40	●	2	103	123	188	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
	4	MVX3200X4F40	●	2	135	155	220	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
	5	MVX3200X5F40	●	2	167	187	252	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
	6	MVX3200X6F40	●	2	199	219	284	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
32.5	3	MVX3250X3F40	●	2	104.5	124.5	189.5	40	50	0.45	SOMX094506-○○	TPS4	TIP15W
33.0	2	MVX3300X2F40	●	2	73	93	158	40	50	0.4	SOMX094506-○○	TPS4	TIP15W
	3	MVX3300X3F40	●	2	106	126	191	40	50	0.4	SOMX094506-○○	TPS4	TIP15W
	4	MVX3300X4F40	●	2	139	159	224	40	50	0.4	SOMX094506-○○	TPS4	TIP15W
	5	MVX3300X5F40	●	2	172	192	257	40	50	0.4	SOMX094506-○○	TPS4	TIP15W
	6	MVX3300X6F40	●	2	205	225	290	40	50	0.4	SOMX094506-○○	TPS4	TIP15W

* Clamp Torque (N • m) : TPS351=2.0, TPS4=3.5

● : Inventory maintained in Japan.

NEW

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
33.5	3	MVX3350X3F40	●	2	107.5	127.5	192.5	40	50	1.2	SOMX115506-○○	TPS43	TIP15W
34.0	2	MVX3400X2F40	●	2	75	105	170	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
	3	MVX3400X3F40	●	2	109	139	204	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
	4	MVX3400X4F40	●	2	143	173	238	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
	5	MVX3400X5F40	●	2	177	207	272	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
	6	MVX3400X6F40	●	2	211	241	306	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
34.5	3	MVX3450X3F40	●	2	110.5	140.5	205.5	40	50	1.1	SOMX115506-○○	TPS43	TIP15W
35.0	2	MVX3500X2F40	●	2	77	107	172	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	3	MVX3500X3F40	●	2	112	142	207	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	4	MVX3500X4F40	●	2	147	177	242	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	5	MVX3500X5F40	●	2	182	212	277	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	6	MVX3500X6F40	●	2	217	247	312	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
35.5	3	MVX3550X3F40	●	2	113.5	143.5	208.5	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
36.0	2	MVX3600X2F40	●	2	79	109	174	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	3	MVX3600X3F40	●	2	115	145	210	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	4	MVX3600X4F40	●	2	151	181	246	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	5	MVX3600X5F40	●	2	187	217	282	40	50	1.0	SOMX115506-○○	TPS43	TIP15W
	6	MVX3600X6F40	●	2	223	253	318	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
37.0	2	MVX3700X2F40	●	2	81	111	176	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
	3	MVX3700X3F40	●	2	118	148	213	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
	4	MVX3700X4F40	●	2	155	185	250	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
	5	MVX3700X5F40	●	2	192	222	287	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
	6	MVX3700X6F40	●	2	229	259	324	40	50	0.9	SOMX115506-○○	TPS43	TIP15W
38.0	2	MVX3800X2F40	●	2	83	113	178	40	50	0.8	SOMX115506-○○	TPS43	TIP15W
	3	MVX3800X3F40	●	2	121	151	216	40	50	0.8	SOMX115506-○○	TPS43	TIP15W
	4	MVX3800X4F40	●	2	159	189	254	40	50	0.8	SOMX115506-○○	TPS43	TIP15W
	5	MVX3800X5F40	●	2	197	227	292	40	50	0.8	SOMX115506-○○	TPS43	TIP15W
	6	MVX3800X6F40	●	2	235	265	330	40	50	0.8	SOMX115506-○○	TPS43	TIP15W
39.0	2	MVX3900X2F40	●	2	85	115	180	40	50	0.7	SOMX115506-○○	TPS43	TIP15W
	3	MVX3900X3F40	●	2	124	154	219	40	50	0.7	SOMX115506-○○	TPS43	TIP15W
	4	MVX3900X4F40	●	2	163	193	258	40	50	0.7	SOMX115506-○○	TPS43	TIP15W
	5	MVX3900X5F40	●	2	202	232	297	40	50	0.7	SOMX115506-○○	TPS43	TIP15W
	6	MVX3900X6F40	●	2	241	271	336	40	50	0.7	SOMX115506-○○	TPS43	TIP15W
40.0	2	MVX4000X2F40	●	2	87	117	182	40	50	1.5	SOMX136008-○○	TPS43	TIP15W
	3	MVX4000X3F40	●	2	127	157	222	40	50	1.5	SOMX136008-○○	TPS43	TIP15W
	4	MVX4000X4F40	●	2	167	197	262	40	50	1.5	SOMX136008-○○	TPS43	TIP15W
	5	MVX4000X5F40	●	2	207	237	302	40	50	1.5	SOMX136008-○○	TPS43	TIP15W
	6	MVX4000X6F40	●	2	247	277	342	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
41.0	2	MVX4100X2F40	●	2	89	119	184	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
	3	MVX4100X3F40	●	2	130	160	225	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
	4	MVX4100X4F40	●	2	171	201	266	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
	5	MVX4100X5F40	●	2	212	242	307	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
	6	MVX4100X6F40	●	2	253	283	348	40	50	1.4	SOMX136008-○○	TPS43	TIP15W
42.0	2	MVX4200X2F40	●	2	91	121	186	40	50	1.3	SOMX136008-○○	TPS43	TIP15W
	3	MVX4200X3F40	●	2	133	163	228	40	50	1.3	SOMX136008-○○	TPS43	TIP15W
	4	MVX4200X4F50	●	2	175	205	280	50	63	1.3	SOMX136008-○○	TPS43	TIP15W
	5	MVX4200X5F50	●	2	217	247	322	50	63	1.3	SOMX136008-○○	TPS43	TIP15W
	6	MVX4200X6F50	●	2	259	289	364	50	63	1.3	SOMX136008-○○	TPS43	TIP15W

* Clamp Torque (N • m) : TPS43=3.5

INSERT DESCRIPTION	➢ N218
CUTTING CONDITIONS	➢ N218
USAGE NOTE	➢ N247
TECHNICAL DATA	➢ Q001

MVX

NEW

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
43.0	2	MVX4300X2F40	●	2	93	123	188	40	50	1.2	SOMX136008-○○	TPS43	①TIP15W
	3	MVX4300X3F40	●	2	136	166	231	40	50	1.2	SOMX136008-○○	TPS43	①TIP15W
	4	MVX4300X4F50	●	2	179	209	284	50	63	1.2	SOMX136008-○○	TPS43	①TIP15W
	5	MVX4300X5F50	●	2	222	252	327	50	63	1.2	SOMX136008-○○	TPS43	①TIP15W
	6	MVX4300X6F50	●	2	265	295	370	50	63	1.2	SOMX136008-○○	TPS43	①TIP15W
44.0	2	MVX4400X2F40	●	2	95	125	190	40	50	1.1	SOMX136008-○○	TPS43	①TIP15W
	3	MVX4400X3F40	●	2	139	169	234	40	50	1.1	SOMX136008-○○	TPS43	①TIP15W
	4	MVX4400X4F50	●	2	183	213	288	50	63	1.1	SOMX136008-○○	TPS43	①TIP15W
	5	MVX4400X5F50	●	2	227	257	332	50	63	1.1	SOMX136008-○○	TPS43	①TIP15W
45.0	2	MVX4500X2F40	●	2	97	127	192	40	50	1.0	SOMX136008-○○	TPS43	①TIP15W
	3	MVX4500X3F40	●	2	142	172	237	40	50	1.0	SOMX136008-○○	TPS43	①TIP15W
	4	MVX4500X4F50	●	2	187	217	292	50	63	1.0	SOMX136008-○○	TPS43	①TIP15W
	5	MVX4500X5F50	●	2	232	262	337	50	63	1.0	SOMX136008-○○	TPS43	①TIP15W
46.0	2	MVX4600X2F40	●	2	99	129	194	40	50	0.9	SOMX136008-○○	TPS43	①TIP15W
	3	MVX4600X3F40	●	2	145	175	240	40	50	0.9	SOMX136008-○○	TPS43	①TIP15W
	4	MVX4600X4F50	●	2	191	221	296	50	63	0.9	SOMX136008-○○	TPS43	①TIP15W
	5	MVX4600X5F50	●	2	237	267	342	50	63	0.9	SOMX136008-○○	TPS43	①TIP15W
47.0	2	MVX4700X2F40	●	2	101	141	206	40	63	1.9	SOMX166508-○○	TPS54	②TIP25D
	3	MVX4700X3F40	●	2	148	188	253	40	63	1.9	SOMX166508-○○	TPS54	②TIP25D
	4	MVX4700X4F50	●	2	195	235	310	50	63	1.9	SOMX166508-○○	TPS54	②TIP25D
	5	MVX4700X5F50	●	2	242	282	357	50	63	1.9	SOMX166508-○○	TPS54	②TIP25D
48.0	2	MVX4800X2F40	●	2	103	143	208	40	63	1.8	SOMX166508-○○	TPS54	②TIP25D
	3	MVX4800X3F40	●	2	151	191	256	40	63	1.8	SOMX166508-○○	TPS54	②TIP25D
	4	MVX4800X4F50	●	2	199	239	314	50	63	1.8	SOMX166508-○○	TPS54	②TIP25D
	5	MVX4800X5F50	●	2	247	287	362	50	63	1.8	SOMX166508-○○	TPS54	②TIP25D
49.0	2	MVX4900X2F40	●	2	105	145	210	40	63	1.7	SOMX166508-○○	TPS54	②TIP25D
	3	MVX4900X3F40	●	2	154	194	259	40	63	1.7	SOMX166508-○○	TPS54	②TIP25D
	4	MVX4900X4F50	●	2	203	243	318	50	63	1.7	SOMX166508-○○	TPS54	②TIP25D
	5	MVX4900X5F50	●	2	252	292	367	50	63	1.7	SOMX166508-○○	TPS54	②TIP25D
50.0	2	MVX5000X2F40	●	2	107	147	212	40	63	1.6	SOMX166508-○○	TPS54	②TIP25D
	3	MVX5000X3F40	●	2	157	197	262	40	63	1.6	SOMX166508-○○	TPS54	②TIP25D
	4	MVX5000X4F50	●	2	207	247	322	50	63	1.6	SOMX166508-○○	TPS54	②TIP25D
	5	MVX5000X5F50	●	2	257	297	372	50	63	1.6	SOMX166508-○○	TPS54	②TIP25D
51.0	2	MVX5100X2F40	●	2	109	149	214	40	63	1.5	SOMX166508-○○	TPS54	②TIP25D
	3	MVX5100X3F40	●	2	160	200	265	40	63	1.5	SOMX166508-○○	TPS54	②TIP25D
	4	MVX5100X4F50	●	2	211	251	326	50	63	1.5	SOMX166508-○○	TPS54	②TIP25D
	5	MVX5100X5F50	●	2	262	302	377	50	63	1.5	SOMX166508-○○	TPS54	②TIP25D
52.0	2	MVX5200X2F40	●	2	111	151	216	40	63	1.4	SOMX166508-○○	TPS54	②TIP25D
	3	MVX5200X3F40	●	2	163	203	268	40	63	1.4	SOMX166508-○○	TPS54	②TIP25D
	4	MVX5200X4F50	●	2	215	255	330	50	63	1.4	SOMX166508-○○	TPS54	②TIP25D
	5	MVX5200X5F50	●	2	267	307	382	50	63	1.4	SOMX166508-○○	TPS54	②TIP25D
53.0	2	MVX5300X2F40	●	2	113	153	218	40	63	1.3	SOMX166508-○○	TPS54	②TIP25D
	3	MVX5300X3F40	●	2	166	206	271	40	63	1.3	SOMX166508-○○	TPS54	②TIP25D
	4	MVX5300X4F50	●	2	219	259	334	50	63	1.3	SOMX166508-○○	TPS54	②TIP25D
	5	MVX5300X5F50	●	2	272	312	387	50	63	1.3	SOMX166508-○○	TPS54	②TIP25D

* Clamp Torque (N • m) : TPS43=3.5, TPS54=4.5

● : Inventory maintained in Japan.

NEW

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	A (mm)	Insert Number	Clamp Screw	Wrench
54.0	2	MVX5400X2F40	●	2	115	155	220	40	63	1.2	SOMX166508-○○	TPS54	TIP25D
	3	MVX5400X3F40	●	2	169	209	274	40	63	1.2	SOMX166508-○○	TPS54	TIP25D
	4	MVX5400X4F50	●	2	223	263	338	50	63	1.2	SOMX166508-○○	TPS54	TIP25D
	5	MVX5400X5F50	●	2	277	317	392	50	63	1.2	SOMX166508-○○	TPS54	TIP25D
55.0	2	MVX5500X2F40	●	2	117	157	222	40	63	1.1	SOMX166508-○○	TPS54	TIP25D
	3	MVX5500X3F40	●	2	172	212	277	40	63	1.1	SOMX166508-○○	TPS54	TIP25D
	4	MVX5500X4F50	●	2	227	267	342	50	63	1.1	SOMX166508-○○	TPS54	TIP25D
	5	MVX5500X5F50	●	2	282	322	397	50	63	1.1	SOMX166508-○○	TPS54	TIP25D
56.0	2	MVX5600X2F40	●	2	119	159	224	40	63	1.0	SOMX166508-○○	TPS54	TIP25D
	3	MVX5600X3F40	●	2	175	215	280	40	63	1.0	SOMX166508-○○	TPS54	TIP25D
	4	MVX5600X4F50	●	2	231	271	346	50	63	1.0	SOMX166508-○○	TPS54	TIP25D
	5	MVX5600X5F50	●	2	287	327	402	50	63	1.0	SOMX166508-○○	TPS54	TIP25D
57.0	2	MVX5700X2F40	●	2	121	161	226	40	68	1.5	SOMX187008-○○	TPS54	TIP25D
	3	MVX5700X3F40	●	2	178	218	283	40	68	1.5	SOMX187008-○○	TPS54	TIP25D
	4	MVX5700X4F50	●	2	235	275	350	50	68	1.5	SOMX187008-○○	TPS54	TIP25D
	5	MVX5700X5F50	●	2	292	332	407	50	68	1.5	SOMX187008-○○	TPS54	TIP25D
58.0	2	MVX5800X2F40	●	2	123	163	228	40	68	1.4	SOMX187008-○○	TPS54	TIP25D
	3	MVX5800X3F40	●	2	181	221	286	40	68	1.4	SOMX187008-○○	TPS54	TIP25D
	4	MVX5800X4F50	●	2	239	279	354	50	68	1.4	SOMX187008-○○	TPS54	TIP25D
	5	MVX5800X5F50	●	2	297	337	412	50	68	1.4	SOMX187008-○○	TPS54	TIP25D
59.0	2	MVX5900X2F40	●	2	125	165	230	40	68	1.3	SOMX187008-○○	TPS54	TIP25D
	3	MVX5900X3F40	●	2	184	224	289	40	68	1.3	SOMX187008-○○	TPS54	TIP25D
	4	MVX5900X4F50	●	2	243	283	358	50	68	1.3	SOMX187008-○○	TPS54	TIP25D
	5	MVX5900X5F50	●	2	302	342	417	50	68	1.3	SOMX187008-○○	TPS54	TIP25D
60.0	2	MVX6000X2F40	●	2	127	167	232	40	68	1.2	SOMX187008-○○	TPS54	TIP25D
	3	MVX6000X3F40	●	2	187	227	292	40	68	1.2	SOMX187008-○○	TPS54	TIP25D
	4	MVX6000X4F50	●	2	247	287	362	50	68	1.2	SOMX187008-○○	TPS54	TIP25D
	5	MVX6000X5F50	●	2	307	347	422	50	68	1.2	SOMX187008-○○	TPS54	TIP25D
61.0	2	MVX6100X2F40	●	2	129	169	234	40	68	1.1	SOMX187008-○○	TPS54	TIP25D
	3	MVX6100X3F40	●	2	190	230	295	40	68	1.1	SOMX187008-○○	TPS54	TIP25D
	4	MVX6100X4F50	●	2	251	291	366	50	68	1.1	SOMX187008-○○	TPS54	TIP25D
	5	MVX6100X5F50	●	2	312	352	427	50	68	1.1	SOMX187008-○○	TPS54	TIP25D
62.0	2	MVX6200X2F40	●	2	131	171	236	40	68	1.0	SOMX187008-○○	TPS54	TIP25D
	3	MVX6200X3F40	●	2	193	233	298	40	68	1.0	SOMX187008-○○	TPS54	TIP25D
	4	MVX6200X4F50	●	2	255	295	370	50	68	1.0	SOMX187008-○○	TPS54	TIP25D
	5	MVX6200X5F50	●	2	317	357	432	50	68	1.0	SOMX187008-○○	TPS54	TIP25D
63.0	2	MVX6300X2F40	●	2	133	173	238	40	68	0.8	SOMX187008-○○	TPS54	TIP25D
	3	MVX6300X3F40	●	2	196	236	301	40	68	0.8	SOMX187008-○○	TPS54	TIP25D
	4	MVX6300X4F50	●	2	259	299	374	50	68	0.8	SOMX187008-○○	TPS54	TIP25D
	5	MVX6300X5F50	●	2	322	362	437	50	68	0.8	SOMX187008-○○	TPS54	TIP25D

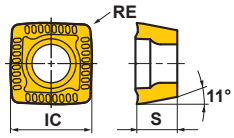
* Clamp Torque (N • m) : TPS54=4.5

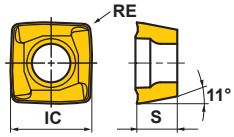
INSERT DESCRIPTION ➢ N218
CUTTING CONDITIONS ➢ N218
USAGE NOTE ➢ N247
TECHNICAL DATA ➢ Q001

MVX

INSERTS

Shape	Drill Dia.	Insert Number	Dimensions (mm) IC	S	RE	Stock VP15TF	MC1020	MC5020	Geometry
UM	ø17—ø19.5	SOMX063005-UM	6	3	0.5	●	●	●	
	ø20—ø22.5	SOMX073505-UM	7	3.5	0.5	●	●	●	
	ø23—ø27.5	SOMX084005-UM	8.3	4	0.5	●	●	●	
	ø28—ø33	SOMX094506-UM	9.7	4.5	0.6	●	●	●	
NEW	ø33.5—ø39	SOMX115506-UM	11.6	5.5	0.6	●	●	●	
NEW	ø40—ø46	SOMX136008-UM	13.8	6	0.8	●	●	●	
NEW	ø47—ø56	SOMX166508-UM	16.5	6.5	0.8	●	●	●	
General purpose NEW	ø57—ø63	SOMX187008-UM	18.2	7	0.8	●	●	●	
NEW US	ø17—ø19.5	SOMX063005-US	6	3	0.5	●			
	ø20—ø22.5	SOMX073505-US	7	3.5	0.5	●			
	ø23—ø27.5	SOMX084005-US	8.3	4	0.5	●			
For stainless steel inner edge	ø28—ø33	SOMX094506-US	9.7	4.5	0.6	●			





*MC1020 and MC5020 are made exclusively for use as an outer insert.
*US breaker is designed exclusively for use as an inner insert.

RECOMMENDED CUTTING CONDITIONS

	Work material	Hardness	Cutting Speed Centre value (Min.—Max.) (m/min) l/d=2—6	ϕ17—ϕ19.5 Feed per Tooth Centre value (Min.—Max.) (mm/rev) l/d=2, 3	l/d=4, 5	l/d=6	ϕ20—ϕ23.5 Feed per Tooth Centre value (Min.—Max.) (mm/rev) l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel (ASTM A36, AISI 1010etc.)	≤180HB	200 (180—235)	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)	0.04 (0.04—0.05)
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140etc.)	180—280HB	140 (115—180)	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.07 (0.06—0.08)
	Carbon Steel, Alloy Steel (AISI 4340etc.)	280—350HB	100 (75—140)	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.07 (0.06—0.08)
	Alloy Tool Steel (SKD, SKTetc.)	≤350HB	135 (100—170)	0.08 (0.06—0.14)	0.08 (0.06—0.09)	0.05 (0.04—0.06)	0.10 (0.06—0.18)	0.09 (0.06—0.12)	0.07 (0.06—0.08)
M	Austenitic Stainless Steel (AISI 304, AISI 316etc.)	≤200HB	130 (80—180)	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.06 (0.06—0.07)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LNetc.)	>200HB	130 (80—180)	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.06 (0.06—0.07)
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430etc.)	≤200HB	120 (80—165)	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.06 (0.06—0.07)
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420J2etc.)	>200HB	120 (80—165)	0.08 (0.06—0.12)	0.06 (0.04—0.08)	0.05 (0.04—0.06)	0.10 (0.06—0.14)	0.07 (0.06—0.08)	0.06 (0.06—0.07)
K	Gray Cast Iron (FC300etc.)	Tensile Strength ≤350MPa	160 (130—195)	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.14 (0.10—0.18)	0.10 (0.10—0.12)	0.07 (0.06—0.08)
	Ductile Cast Iron (FCD450etc.)	Tensile Strength ≤450MPa	100 (80—135)	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.13 (0.10—0.16)	0.10 (0.10—0.11)	0.07 (0.06—0.08)
	Ductile Cast Iron (FCD700etc.)	Tensile Strength ≤800MPa	100 (70—125)	0.11 (0.08—0.14)	0.09 (0.08—0.10)	0.05 (0.04—0.06)	0.13 (0.10—0.16)	0.10 (0.10—0.11)	0.07 (0.06—0.08)

Note 1) Reduce the cutting speed by 30% 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.

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

	Work material	Hardness	Cutting Speed Centre value (Min.–Max.) (m/min)	ϕ24–ϕ29.5 Feed per Tooth Centre value (Min.–Max.) (mm/rev)			ϕ30–ϕ33 Feed per Tooth Centre value (Min.–Max.) (mm/rev)		
			l/d=2–6	l/d=2, 3	l/d=4, 5	l/d=6	l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel (ASTM A36, AISI 1010etc.)	≤180HB	200 (180–235)	0.07 (0.04–0.08)	0.06 (0.04–0.07)	0.05 (0.04–0.06)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.06 (0.06–0.07)
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140etc.)	180–280HB	140 (115–180)	0.12 (0.08–0.18)	0.10 (0.08–0.12)	0.09 (0.08–0.10)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.11 (0.10–0.12)
	Carbon Steel, Alloy Steel (AISI 4340etc.)	280–350HB	100 (75–140)	0.12 (0.08–0.18)	0.10 (0.08–0.12)	0.09 (0.08–0.10)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.11 (0.10–0.12)
	Alloy Tool Steel (SKD, SKTetc.)	≤350HB	135 (100–170)	0.12 (0.08–0.18)	0.10 (0.08–0.12)	0.09 (0.08–0.10)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.10 (0.08–0.12)
M	Austenitic Stainless Steel (AISI 304, AISI 316etc.)	≤200HB	130 (80–180)	0.10 (0.06–0.14)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.10 (0.06–0.14)	0.09 (0.06–0.12)	0.07 (0.06–0.10)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LNetc.)	>200HB	130 (80–180)	0.10 (0.06–0.14)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.10 (0.06–0.14)	0.09 (0.06–0.12)	0.07 (0.06–0.10)
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430etc.)	≤200HB	120 (80–165)	0.10 (0.06–0.14)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.10 (0.06–0.14)	0.09 (0.06–0.12)	0.07 (0.06–0.10)
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420J2etc.)	>200HB	120 (80–165)	0.10 (0.06–0.14)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.10 (0.06–0.14)	0.09 (0.06–0.12)	0.07 (0.06–0.10)
K	Gray Cast Iron (FC300etc.)	Tensile Strength ≤350MPa	160 (130–195)	0.15 (0.10–0.20)	0.11 (0.10–0.13)	0.09 (0.08–0.10)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)
	Ductile Cast Iron (FCD450etc.)	Tensile Strength ≤450MPa	100 (80–135)	0.14 (0.10–0.18)	0.11 (0.10–0.12)	0.09 (0.08–0.10)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)
	Ductile Cast Iron (FCD700etc.)	Tensile Strength ≤800MPa	100 (70–125)	0.14 (0.10–0.18)	0.11 (0.10–0.12)	0.09 (0.08–0.10)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)

Note 1) Reduce the cutting speed by 30% 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.

	Work material	Hardness	Cutting Speed Centre value (Min.–Max.) (m/min)	ϕ33.5–ϕ63 Feed per Tooth Centre value (Min.–Max.) (mm/rev)		
			l/d=2–6	l/d=2, 3	l/d=4, 5	l/d=6
P	Mild Steel (ASTM A36, AISI 1010etc.)	≤180HB	200 (180–235)	0.08 (0.06–0.10)	0.07 (0.06–0.08)	0.06 (0.06–0.07)
	Carbon Steel,Alloy Steel (AISI 1045, AISI 4140etc.)	180–280HB	140 (115–180)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.11 (0.10–0.12)
	Carbon Steel,Alloy Steel (AISI 4340etc.)	280–350HB	100 (75–140)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.11 (0.10–0.12)
	Alloy Tool Steel (SKD, SKTetc.)	≤350HB	135 (100–170)	0.14 (0.08–0.24)	0.12 (0.08–0.16)	0.10 (0.08–0.12)
M	Austenitic Stainless Steel (AISI 304, AISI 316etc.)	≤200HB	130 (80–180)	0.09 (0.06–0.12)	0.08 (0.06–0.10)	0.07 (0.06–0.08)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LNetc.)	>200HB	130 (80–180)	0.09 (0.06–0.12)	0.08 (0.06–0.10)	0.07 (0.06–0.08)
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430etc.)	≤200HB	120 (80–165)	0.09 (0.06–0.12)	0.08 (0.06–0.10)	0.07 (0.06–0.08)
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420J2etc.)	>200HB	120 (80–165)	0.09 (0.06–0.12)	0.08 (0.06–0.10)	0.07 (0.06–0.08)
K	Gray Cast Iron (FC300etc.)	Tensile Strength ≤350MPa	160 (130–195)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)
	Ductile Cast Iron (FCD450etc.)	Tensile Strength ≤450MPa	100 (80–135)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)
	Ductile Cast Iron (FCD700etc.)	Tensile Strength ≤800MPa	100 (70–125)	0.15 (0.10–0.20)	0.12 (0.10–0.13)	0.11 (0.10–0.12)

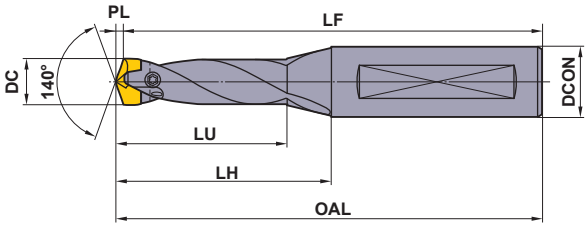
Note 1) L/D=3 is the recommended maximum depth when only external coolant is used.
Note 2) Internal through coolant is highly necessary when drilling stainless steel.

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	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			



HOLDERS

DC (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Dimensions (mm) LU	LH	OAL	LF	PL	DCON	Wrench	Insert DC (mm)	Insert Order Number	Stock VP15TF	VP10H	DP5010
10.0 – 10.4	1.5	STAWSS1000S16	●	23.8	33.8	81.8	80	1.8	16	TIP06F	10.0	* STAWN1000TH	●	□	
												STAWK1000TG			●
	3	STAWSN1000S16	●	38.8	48.8	96.8	95	1.8	16	TIP06F	10.1	STAWN1010TH	●	□	
												STAWK1010TG			●
	5	STAWMN1000S16	●	58.8	68.8	116.8	115	1.8	16	TIP06F	10.2	STAWN1020TH	●	□	
												STAWK1020TG			●
	8	STAWLN1000S16	●	88.8	98.8	146.8	145	1.8	16	TIP06F	10.3	STAWN1030TH	●	□	
												STAWK1030TG			●
											10.4	STAWN1040TH	●	□	
												STAWK1040TG			●
10.5 – 10.9	1.5	STAWSS1050S16	●	23.9	33.9	81.9	80	1.9	16	TIP06F	10.5	* STAWN1050TH	●	□	
												STAWK1050TG			●
	3	STAWSN1050S16	●	38.9	48.9	96.9	95	1.9	16	TIP06F	10.6	STAWN1060TH	●	□	
												STAWK1060TG			●
	5	STAWMN1050S16	●	58.9	68.9	116.9	115	1.9	16	TIP06F	10.7	STAWN1070TH	●	□	
												STAWK1070TG			●
											10.8	STAWN1080TH	●	□	
												STAWK1080TG			●
	8	STAWLN1050S16	●	88.9	98.9	146.9	145	1.9	16	TIP06F	10.9	STAWN1090TH	●	□	
												STAWK1090TG			●
11.0 – 11.4	1.5	STAWSS1100S16	●	27.0	38.0	86.0	84	2.0	16	TIP06F	11.0	* STAWN1100TH	●	□	
												STAWK1100TG			●
	3	STAWSN1100S16	●	43.0	54.0	102.0	100	2.0	16	TIP06F	11.1	STAWN1110TH	●	□	
												STAWK1110TG			●
	5	STAWMN1100S16	●	68.0	79.0	127.0	125	2.0	16	TIP06F	11.2	STAWN1120TH	●	□	
												STAWK1120TG			●
											11.3	STAWN1130TH	●	□	
												STAWK1130TG			●
	8	STAWLN1100S16	●	98.0	109.0	157.0	155	2.0	16	TIP06F	11.4	STAWN1140TH	●	□	
												STAWK1140TG			●
11.5 – 11.9	1.5	STAWSS1150S16	●	27.1	38.1	86.1	84	2.1	16	TIP06F	11.5	* STAWN1150TH	●	□	
												STAWK1150TG			●
	3	STAWSN1150S16	●	43.1	54.1	102.1	100	2.1	16	TIP06F	11.6	STAWN1160TH	●	□	
												STAWK1160TG			●
	5	STAWMN1150S16	●	68.1	79.1	127.1	125	2.1	16	TIP06F	11.7	STAWN1170TH	●	□	
												STAWK1170TG			●
											11.8	STAWN1180TH	●	□	
												STAWK1180TG			●
	8	STAWLN1150S16	●	98.1	109.1	157.1	155	2.1	16	TIP06F	11.9	STAWN1190TH	●	□	
												STAWK1190TG			●
12.0 – 12.4	1.5	STAWSS1200S16	●	29.2	41.2	89.2	87	2.2	16	TIP06F	12.0	* STAWN1200TH	●	□	
												STAWK1200TG			●
	3	STAWSN1200S16	●	47.2	59.2	107.2	105	2.2	16	TIP06F	12.1	STAWN1210TH	●	□	
												STAWK1210TG			●
	5	STAWMN1200S16	●	72.2	84.2	132.2	130	2.2	16	TIP06F	12.2	STAWN1220TH	●	□	
												STAWK1220TG			●
											12.3	STAWN1230TH	●	□	
												STAWK1230TG			●
	8	STAWLN1200S16	●	107.2	119.2	167.2	165	2.2	16	TIP06F	12.4	STAWN1240TH	●	□	
												STAWK1240TG			●

(Note 1) The above dimensions are for when installing the STAWN (VP15TF) insert.
(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.**
(1 insert in one case)

DC (mm)	Hole Depth (l/d)	Holder Order Number	Stock	LU	LH	OAL	LF	PL	DCON	Wrench	DC (mm)	Insert Order Number	VP15TF	VP10H	DP5010
12.5 – 12.9	1.5	STAWSS1250S16	●	29.3	41.3	89.3	87	2.3	16	①TIP06F	12.5	* STAWN1250TH	●	□	
												STAWK1250TG			●
	3	STAWSN1250S16	●	47.3	59.3	107.3	105	2.3	16	①TIP06F	12.6	STAWN1260TH	●	□	
												STAWK1260TG			●
	5	STAWMN1250S16	●	72.3	84.3	132.3	130	2.3	16	①TIP06F	12.7	STAWN1270TH	●	□	
												STAWK1270TG			●
	8	STAWLN1250S16	●	107.3	119.3	167.3	165	2.3	16	①TIP06F	12.8	STAWN1280TH	●	□	
												STAWK1280TG			●
											12.9	STAWN1290TH	●	□	
												STAWK1290TG			●
13.0 – 13.4	1.5	STAWSS1300S16	●	32.4	45.4	93.4	91	2.4	16	②TIP08W	13.0	* STAWN1300TH	●	□	
												STAWK1300TG			●
	3	STAWSN1300S16	●	51.4	64.4	112.4	110	2.4	16	②TIP08W	13.1	STAWN1310TH	●	□	
												STAWK1310TG			●
	5	STAWMN1300S16	●	76.4	89.4	137.4	135	2.4	16	②TIP08W	13.2	STAWN1320TH	●	□	
												STAWK1320TG			●
											13.3	STAWN1330TH	●	□	
												STAWK1330TG			●
	8	STAWLN1300S16	●	116.4	129.4	177.4	175	2.4	16	②TIP08W	13.4	STAWN1340TH	●	□	
												STAWK1340TG			●
13.5 – 13.9	1.5	STAWSS1350S16	●	32.5	45.5	93.5	91	2.5	16	②TIP08W	13.5	* STAWN1350TH	●	□	
												STAWK1350TG			●
	3	STAWSN1350S16	●	51.5	64.5	112.5	110	2.5	16	②TIP08W	13.6	STAWN1360TH	●	□	
												STAWK1360TG			●
	5	STAWMN1350S16	●	76.5	89.5	137.5	135	2.5	16	②TIP08W	13.7	STAWN1370TH	●	□	
												STAWK1370TG			●
											13.8	STAWN1380TH	●	□	
												STAWK1380TG			●
	8	STAWLN1350S16	●	116.5	129.5	177.5	175	2.5	16	②TIP08W	13.9	STAWN1390TH	●	□	
												STAWK1390TG			●
14.0 – 14.4	1.5	STAWSS1400S16	●	33.5	47.5	95.5	93	2.5	16	②TIP08W	14.0	* STAWN1400TH	●		
												STAWK1400TG			●
	3	STAWSN1400S16	●	55.5	69.5	117.5	115	2.5	16	②TIP08W	14.1	STAWN1410TH	●		
												STAWK1410TG			●
	5	STAWMN1400S16	●	85.5	99.5	147.5	145	2.5	16	②TIP08W	14.2	STAWN1420TH	●		
												STAWK1420TG			●
											14.3	STAWN1430TH	●		
												STAWK1430TG			●
	8	STAWLN1400S16	●	124.5	139.5	187.5	185	2.5	16	②TIP08W	14.4	STAWN1440TH	●		
												STAWK1440TG			●
14.5 – 14.9	1.5	STAWSS1450S16	●	33.6	47.6	95.6	93	2.6	16	②TIP08W	14.5	* STAWN1450TH	●		
												STAWK1450TG			●
	3	STAWSN1450S16	●	55.6	69.6	117.6	115	2.6	16	②TIP08W	14.6	STAWN1460TH	●		
												STAWK1460TG			●
	5	STAWMN1450S16	●	85.6	99.6	147.6	145	2.6	16	②TIP08W	14.7	STAWN1470TH	●		
												STAWK1470TG			●
											14.8	STAWN1480TH	●		
												STAWK1480TG			●
	8	STAWLN1450S16	●	124.6	139.6	187.6	185	2.6	16	②TIP08W	14.9	STAWN1490TH	●		
												STAWK1490TG			●
15.0 – 15.4	1.5	STAWSS1500S20	●	35.7	50.7	100.7	98	2.7	20	②TIP08W	15.0	* STAWN1500TH	●		
												STAWK1500TG			●
	3	STAWSN1500S20	●	62.7	77.7	127.7	125	2.7	20	②TIP08W	15.1	STAWN1510TH	●		
												STAWK1510TG			●
	5	STAWMN1500S20	●	92.7	107.7	157.7	155	2.7	20	②TIP08W	15.2	STAWN1520TH	●		
												STAWK1520TG			●
											15.3	STAWN1530TH	●		
												STAWK1530TG			●
	8	STAWLN1500S20	●	132.7	150.7	200.7	198	2.7	20	②TIP08W	15.4	STAWN1540TH	●		
												STAWK1540TG			●

INSERT DESCRIPTION ➤ N223
CUTTING CONDITIONS ➤ N227
USAGE NOTE ➤ N228
TECHNICAL DATA ➤ Q001

STAW

Small Diameter Indexable Drill

DC (mm)	Hole Depth (l/d)	Holder Order Number	Holder Stock	LU	LH	OAL	LF	PL	DCON	Wrench	Insert DC (mm)	Insert Order Number	VP15TF	VP10H	DP5010
15.5 – 16.4	1.5	STAWSS1600S20	●	36.8	52.8	102.8	100	2.8	20	TIP10W	15.5	* STAWN1550T	●		
												STAWK1550TG			●
											15.6	STAWN1560T	●		
												STAWK1560TG			●
											15.7	STAWN1570T	●		
												STAWK1570TG			●
	3	STAWSN1600S20	●	62.8	82.8	132.8	130	2.8	20	TIP10W	15.8	STAWN1580T	●		
												STAWK1580TG			●
											15.9	STAWN1590T	●		
												STAWK1590TG			●
	5	STAWMN1600S20	●	92.8	117.8	167.8	165	2.8	20	TIP10W	16.0	STAWN1600T	●		
												STAWK1600TG			●
											16.1	STAWN1610T	●		
												STAWK1610TG			●
											16.2	STAWN1620T	●		
												STAWK1620TG			●
	8	STAWLN1600S20	●	140.8	160.8	210.8	208	2.8	20	TIP10W	16.3	STAWN1630T	●		
												STAWK1630TG			●
											16.4	STAWN1640T	●		
												STAWK1640TG			●
16.5 – 17.4	1.5	STAWSS1700S20	●	39.0	56.0	106.0	103	3.0	20	TIP10W	16.5	* STAWN1650T	●		
												STAWK1650TG			●
											16.6	STAWN1660T	●		
												STAWK1660TG			●
											16.7	STAWN1670T	●		
												STAWK1670TG			●
	3	STAWSN1700S20	●	64.0	88.0	138.0	135	3.0	20	TIP10W	16.8	STAWN1680T	●		
												STAWK1680TG			●
											16.9	STAWN1690T	●		
												STAWK1690TG			●
	5	STAWMN1700S20	●	98.0	123.0	173.0	170	3.0	20	TIP10W	17.0	STAWN1700T	●		
												STAWK1700TG			●
											17.1	STAWN1710T	●		
												STAWK1710TG			●
											17.2	STAWN1720T	●		
												STAWK1720TG			●
	8	STAWLN1700S20	●	149.0	169.0	219.0	216	3.0	20	TIP10W	17.3	STAWN1730T	●		
												STAWK1730TG			●
											17.4	STAWN1740T	●		
												STAWK1740TG			●
17.5 – 18.4	1.5	STAWSS1800S20	●	40.2	58.2	108.2	105	3.2	20	TIP10W	17.5	* STAWN1750T	●		
												STAWK1750TG			●
											17.6	STAWN1760T	●		
												STAWK1760TG			●
											17.7	STAWN1770T	●		
												STAWK1770TG			●
	3	STAWSN1800S20	●	67.2	93.2	143.2	140	3.2	20	TIP10W	17.8	STAWN1780T	●		
												STAWK1780TG			●
											17.9	STAWN1790T	●		
												STAWK1790TG			●
	5	STAWMN1800S20	●	103.2	128.2	178.2	175	3.2	20	TIP10W	18.0	STAWN1800T	●		
												STAWK1800TG			●
											18.1	STAWN1810T	●		
												STAWK1810TG			●
											18.2	STAWN1820T	●		
												STAWK1820TG			●
	8	STAWLN1800S20	●	157.2	177.2	227.2	224	3.2	20	TIP10W	18.3	STAWN1830T	●		
												STAWK1830TG			●
											18.4	STAWN1840T	●		
												STAWK1840TG			●

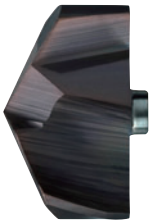
(Note 1) The above dimensions are for when installing the STAWN (VP15TF) insert.

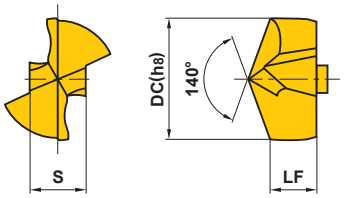
(Note 2) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

● : Inventory maintained in Japan. □ : Non stock, produced to order only.

(1 insert in one case)

INSERTS





Order Number	Stock VP15TF	Stock VP10H	Dimensions (mm) DC	LF	S	Applicable Holder
STAWN1000TH	●	□	10.0	3.8	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
STAWN**1010TH**	●	□	10.1	3.8	4.6	
STAWN**1020TH**	●	□	10.2	3.8	4.6	
STAWN**1030TH**	●	□	10.3	3.8	4.6	
STAWN**1040TH**	●	□	10.4	3.8	4.6	
STAWN**1050TH**	●	□	10.5	4.0	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
STAWN**1060TH**	●	□	10.6	4.0	4.8	
STAWN**1070TH**	●	□	10.7	4.0	4.8	
STAWN**1080TH**	●	□	10.8	4.0	4.8	
STAWN**1090TH**	●	□	10.9	4.0	4.8	
STAWN**1100TH**	●	□	11.0	4.2	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
STAWN**1110TH**	●	□	11.1	4.2	5.1	
STAWN**1120TH**	●	□	11.2	4.2	5.1	
STAWN**1130TH**	●	□	11.3	4.2	5.1	
STAWN**1140TH**	●	□	11.4	4.2	5.1	
STAWN**1150TH**	●	□	11.5	4.4	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
STAWN**1160TH**	●	□	11.6	4.4	5.3	
STAWN**1170TH**	●	□	11.7	4.4	5.3	
STAWN**1180TH**	●	□	11.8	4.4	5.3	
STAWN**1190TH**	●	□	11.9	4.4	5.3	
STAWN**1200TH**	●	□	12.0	4.6	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
STAWN**1210TH**	●	□	12.1	4.6	5.5	
STAWN**1220TH**	●	□	12.2	4.6	5.5	
STAWN**1230TH**	●	□	12.3	4.6	5.5	
STAWN**1240TH**	●	□	12.4	4.6	5.5	
STAWN**1250TH**	●	□	12.5	4.8	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
STAWN**1260TH**	●	□	12.6	4.8	5.8	
STAWN**1270TH**	●	□	12.7	4.8	5.8	
STAWN**1280TH**	●	□	12.8	4.8	5.8	
STAWN**1290TH**	●	□	12.9	4.8	5.8	
STAWN**1300TH**	●	□	13.0	4.9	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
STAWN**1310TH**	●	□	13.1	4.9	6.0	
STAWN**1320TH**	●	□	13.2	4.9	6.0	
STAWN**1330TH**	●	□	13.3	4.9	6.0	
STAWN**1340TH**	●	□	13.4	4.9	6.0	
STAWN**1350TH**	●	□	13.5	5.1	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
STAWN**1360TH**	●	□	13.6	5.1	6.2	
STAWN**1370TH**	●	□	13.7	5.1	6.2	
STAWN**1380TH**	●	□	13.8	5.1	6.2	
STAWN**1390TH**	●	□	13.9	5.1	6.2	

CUTTING CONDITIONS ➤ N227
USAGE NOTE ➤ N228
TECHNICAL DATA ➤ Q001

STAW

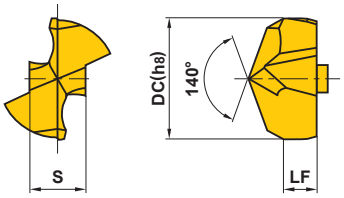
Small Diameter Indexable Drill

Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	DC	LF	S	
STAWN1400TH	●		14.0	5.3	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
STAWN1410TH	●		14.1	5.3	6.4	
STAWN1420TH	●		14.2	5.3	6.4	
STAWN1430TH	●		14.3	5.3	6.4	
STAWN1440TH	●		14.4	5.3	6.4	
STAWN1450TH	●		14.5	5.5	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
STAWN1460TH	●		14.6	5.5	6.7	
STAWN1470TH	●		14.7	5.5	6.7	
STAWN1480TH	●		14.8	5.5	6.7	
STAWN1490TH	●		14.9	5.5	6.7	
STAWN1500TH	●		15.0	5.7	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
STAWN1510TH	●		15.1	5.7	6.9	
STAWN1520TH	●		15.2	5.7	6.9	
STAWN1530TH	●		15.3	5.7	6.9	
STAWN1540TH	●		15.4	5.7	6.9	
STAWN1550T	●		15.5	5.9	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
STAWN1560T	●		15.6	5.9	7.1	
STAWN1570T	●		15.7	5.9	7.1	
STAWN1580T	●		15.8	5.9	7.1	
STAWN1590T	●		15.9	5.9	7.1	
STAWN1600T	●		16.0	5.9	7.1	
STAWN1610T	●		16.1	5.9	7.1	
STAWN1620T	●		16.2	5.9	7.1	
STAWN1630T	●		16.3	5.9	7.1	
STAWN1640T	●		16.4	5.9	7.1	
STAWN1650T	●		16.5	6.3	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
STAWN1660T	●		16.6	6.3	7.6	
STAWN1670T	●		16.7	6.3	7.6	
STAWN1680T	●		16.8	6.3	7.6	
STAWN1690T	●		16.9	6.3	7.6	
STAWN1700T	●		17.0	6.3	7.6	
STAWN1710T	●		17.1	6.3	7.6	
STAWN1720T	●		17.2	6.3	7.6	
STAWN1730T	●		17.3	6.3	7.6	
STAWN1740T	●		17.4	6.3	7.6	
STAWN1750T	●		17.5	6.7	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
STAWN1760T	●		17.6	6.7	8.1	
STAWN1770T	●		17.7	6.7	8.1	
STAWN1780T	●		17.8	6.7	8.1	
STAWN1790T	●		17.9	6.7	8.1	
STAWN1800T	●		18.0	6.7	8.1	
STAWN1810T	●		18.1	6.7	8.1	
STAWN1820T	●		18.2	6.7	8.1	
STAWN1830T	●		18.3	6.7	8.1	
STAWN1840T	●		18.4	6.7	8.1	

● : Inventory maintained in Japan.
(1 insert in one case)

INSERTS

(Cast Iron)



Order Number	Stock DP5010		Dimensions (mm) DC	LF	S	Applicable Holder
STAWK1000TG	●		10.0	3.3	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
STAWK**1010TG**	●		10.1	3.3	4.6	
STAWK**1020TG**	●		10.2	3.3	4.6	
STAWK**1030TG**	●		10.3	3.3	4.6	
STAWK**1040TG**	●		10.4	3.3	4.6	
STAWK**1050TG**	●		10.5	3.5	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
STAWK**1060TG**	●		10.6	3.5	4.8	
STAWK**1070TG**	●		10.7	3.5	4.8	
STAWK**1080TG**	●		10.8	3.5	4.8	
STAWK**1090TG**	●		10.9	3.5	4.8	
STAWK**1100TG**	●		11.0	3.7	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
STAWK**1110TG**	●		11.1	3.7	5.1	
STAWK**1120TG**	●		11.2	3.7	5.1	
STAWK**1130TG**	●		11.3	3.7	5.1	
STAWK**1140TG**	●		11.4	3.7	5.1	
STAWK**1150TG**	●		11.5	3.9	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
STAWK**1160TG**	●		11.6	3.9	5.3	
STAWK**1170TG**	●		11.7	3.9	5.3	
STAWK**1180TG**	●		11.8	3.9	5.3	
STAWK**1190TG**	●		11.9	3.9	5.3	
STAWK**1200TG**	●		12.0	4.1	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
STAWK**1210TG**	●		12.1	4.1	5.5	
STAWK**1220TG**	●		12.2	4.1	5.5	
STAWK**1230TG**	●		12.3	4.1	5.5	
STAWK**1240TG**	●		12.4	4.1	5.5	
STAWK**1250TG**	●		12.5	4.2	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
STAWK**1260TG**	●		12.6	4.2	5.8	
STAWK**1270TG**	●		12.7	4.2	5.8	
STAWK**1280TG**	●		12.8	4.2	5.8	
STAWK**1290TG**	●		12.9	4.2	5.8	
STAWK**1300TG**	●		13.0	4.4	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
STAWK**1310TG**	●		13.1	4.4	6.0	
STAWK**1320TG**	●		13.2	4.4	6.0	
STAWK**1330TG**	●		13.3	4.4	6.0	
STAWK**1340TG**	●		13.4	4.4	6.0	
STAWK**1350TG**	●		13.5	4.6	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
STAWK**1360TG**	●		13.6	4.6	6.2	
STAWK**1370TG**	●		13.7	4.6	6.2	
STAWK**1380TG**	●		13.8	4.6	6.2	
STAWK**1390TG**	●		13.9	4.6	6.2	

STAW

Small Diameter Indexable Drill

Order Number	Stock DP5010	Stock	Dimensions (mm) DC	LF	S	Applicable Holder
STAWK1400TG	●		14.0	4.8	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
STAWK1410TG	●		14.1	4.8	6.4	
STAWK1420TG	●		14.2	4.8	6.4	
STAWK1430TG	●		14.3	4.8	6.4	
STAWK1440TG	●		14.4	4.8	6.4	
STAWK1450TG	●		14.5	5.0	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
STAWK1460TG	●		14.6	5.0	6.7	
STAWK1470TG	●		14.7	5.0	6.7	
STAWK1480TG	●		14.8	5.0	6.7	
STAWK1490TG	●		14.9	5.0	6.7	
STAWK1500TG	●		15.0	5.2	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
STAWK1510TG	●		15.1	5.2	6.9	
STAWK1520TG	●		15.2	5.2	6.9	
STAWK1530TG	●		15.3	5.2	6.9	
STAWK1540TG	●		15.4	5.2	6.9	
STAWK1550TG	●		15.5	5.3	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
STAWK1560TG	●		15.6	5.3	7.1	
STAWK1570TG	●		15.7	5.3	7.1	
STAWK1580TG	●		15.8	5.3	7.1	
STAWK1590TG	●		15.9	5.3	7.1	
STAWK1600TG	●		16.0	5.3	7.1	
STAWK1610TG	●		16.1	5.3	7.1	
STAWK1620TG	●		16.2	5.3	7.1	
STAWK1630TG	●		16.3	5.3	7.1	
STAWK1640TG	●		16.4	5.3	7.1	
STAWK1650TG	●		16.5	5.7	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
STAWK1660TG	●		16.6	5.7	7.6	
STAWK1670TG	●		16.7	5.7	7.6	
STAWK1680TG	●		16.8	5.7	7.6	
STAWK1690TG	●		16.9	5.7	7.6	
STAWK1700TG	●		17.0	5.7	7.6	
STAWK1710TG	●		17.1	5.7	7.6	
STAWK1720TG	●		17.2	5.7	7.6	
STAWK1730TG	●		17.3	5.7	7.6	
STAWK1740TG	●		17.4	5.7	7.6	
STAWK1750TG	●		17.5	6.0	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
STAWK1760TG	●		17.6	6.0	8.1	
STAWK1770TG	●		17.7	6.0	8.1	
STAWK1780TG	●		17.8	6.0	8.1	
STAWK1790TG	●		17.9	6.0	8.1	
STAWK1800TG	●		18.0	6.0	8.1	
STAWK1810TG	●		18.1	6.0	8.1	
STAWK1820TG	●		18.2	6.0	8.1	
STAWK1830TG	●		18.3	6.0	8.1	
STAWK1840TG	●		18.4	6.0	8.1	

● : Inventory maintained in Japan.
(1 insert in one case)

HONE WIDTH

If an insert with honing other than standard is needed, please order using the symbols below.

(Insert Order Number)

S T A W N 1 0 0 0 T ◌

- S T A W: STAW Product Name
- N: N : General Use / K : For Cast Iron
- 1 0 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
-	0.10—0.15
K	0.15—0.20
S	0.20—0.25
M	0.25—0.30

RECOMMENDED CUTTING CONDITIONS

	Work 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)
P	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)
P	Carbon Steel Alloy Steel	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)
K	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 1.5DC depth of hole, it is possible to increase the feed rate by approx. 20%.
(Note 2) When using the 8DC type holder, reduce the cutting speed by approx. 20%.
(Note 3) When using the 8DC type holder, it is recommended to drill a pilot guide hole.
(Note 4) For stainless steel, please use internal coolant. (Mist & MQL are not recommended).

STAW

Small Diameter Indexable Drill

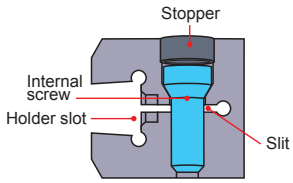
NOTES ON USE

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.



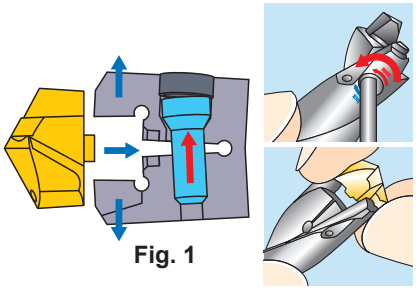


Fig. 1

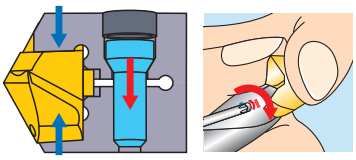
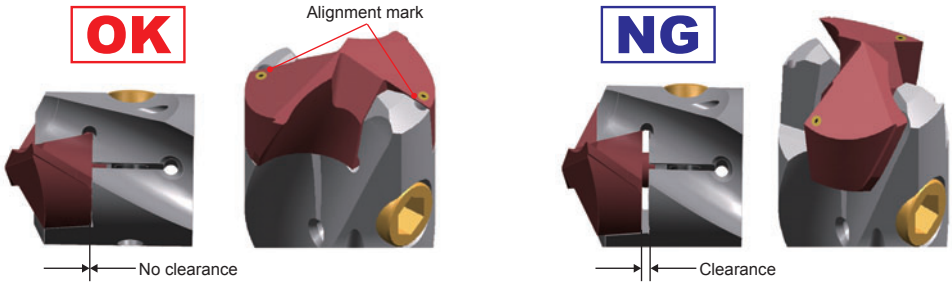


Fig. 2

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 there is no gap between the bottom of the insert and holder slot.



(Note) 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

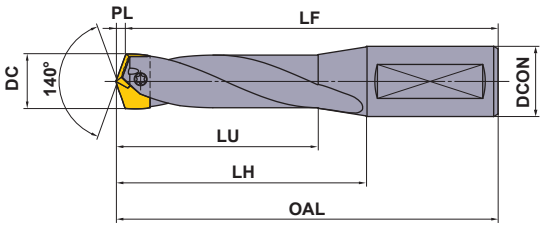
(Note) The parts are packaged internal screw, stopper and operation manual. Please replace the parts in accordance with the operation manual.

TAW

●Wavy cutting edge design for good chip control.
●Serration geometry for accurate insert location.

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

(General Use)



HOLDERS

DC (mm)	Hole Depth (l/d)	Holder: Order Number	Holder: Stock	Dimensions (mm): LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant
18.5 – 19.4	3	TAWSN1900S25	●	71.4	102.4	158.4	155	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS
18.5 – 19.4	5	TAWMN1900S25	●	110.4	137.4	193.4	190	3.4	25	WS304517T	TKY10T	WPT4405	MK1KS
18.5 – 19.4	8	TAWLN1900S25	●	165.5	188.5	244.5	241	3.5	25	WS304517T	TKY10T	WPT4405	MK1KS
19.5 – 20.4	3	TAWSN2000S25	●	75.5	102.5	158.5	155	3.5	25	WS304518T	TKY10T	WPT4405	MK1KS
19.5 – 20.4	5	TAWMN2000S25	●	116.6	142.6	198.6	195	3.6	25	WS304518T	TKY10T	WPT4405	MK1KS
19.5 – 20.4	8	TAWLN2000S25	●	173.7	196.7	252.7	249	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS

Insert: DC (mm)	Order Number	Stock: VP15TF	DP5010	VP10H
18.5	TAWNH1850T	●		□
	TAWKH1850TG		●	
18.6	TAWNH1860T	●		□
	TAWKH1860TG		●	
18.7	TAWNH1870T	●		□
	TAWKH1870TG		●	
18.8	TAWNH1880T	●		□
	TAWKH1880TG		●	
18.9	TAWNH1890T	●		□
	TAWKH1890TG		●	
19.0	TAWNH1900T	●		□
	TAWKH1900TG		●	
19.1	TAWNH1910T	●		□
	TAWKH1910TG		●	
19.2	TAWNH1920T	●		□
	TAWKH1920TG		●	
19.3	TAWNH1930T	●		□
	TAWKH1930TG		●	
19.4	TAWNH1940T	●		□
	TAWKH1940TG		●	
19.5	TAWNH1950T	●		□
	TAWKH1950TG		●	
19.6	TAWNH1960T	●		□
	TAWKH1960TG		●	
19.7	TAWNH1970T	●		□
	TAWKH1970TG		●	
19.8	TAWNH1980T	●		□
	TAWKH1980TG		●	
19.9	TAWNH1990T	●		□
	TAWKH1990TG		●	
20.0	TAWNH2000T	●		□
	TAWKH2000TG		●	
20.1	TAWNH2010T	□		□
	TAWKH2010TG		□	
20.2	TAWNH2020T	□		□
	TAWKH2020TG		□	
20.3	TAWNH2030T	□		□
	TAWKH2030TG		□	
20.4	TAWNH2040T	□		□
	TAWKH2040TG		□	

(Note 1) The dimensions in brackets represent the sizes when TAWNH type inserts are used.
(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.

INSERT DESCRIPTION ➤ N234
CUTTING CONDITIONS ➤ N238
USAGE NOTE ➤ N238
TECHNICAL DATA ➤ Q001

TAW

DC (mm)	Hole Depth (l/d)	Holder Order Number	Holder Stock	LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010	Stock VP10H
20.5 – 21.4	3	TAWSN2100S25	●	78.7	102.7	158.7	155.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	20.5	*TAWNH2050T	●		□
															TAWKH2050TG		●	
														20.6	TAWNH2060T	□		□
															TAWKH2060TG		□	
														20.7	TAWNH2070T	□		□
															TAWKH2070TG		□	
														20.8	TAWNH2080T	□		□
															TAWKH2080TG		□	
	5	TAWMN2100S25	●	121.8	142.8	198.7	195.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	20.9	TAWNH2090T	□		□
															TAWKH2090TG		□	
														21.0	TAWNH2100T	●		□
															TAWKH2100TG		●	
														21.1	TAWNH2110T	□		□
															TAWKH2110TG		□	
	8	TAWLN2100S25	●	181.7	205.7	261.7	258.0	3.7	25	WS304518T	TKY10T	WPT4405	MK1KS	21.2	TAWNH2120T	□		□
															TAWKH2120TG		□	
														21.3	TAWNH2130T	□		□
															TAWKH2130TG		□	
														21.4	TAWNH2140T	□		□
															TAWKH2140TG		□	
21.5 – 22.4	3	TAWSN2200S25	●	83.2	108.2	164.2	160.3	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	*TAWNH2150T	●		□
															TAWKH2150TG		●	
														21.6	TAWNH2160T	□		□
															TAWKH2160TG		□	
														21.7	TAWNH2170T	□		□
															TAWKH2170TG		□	
														21.8	TAWNH2180T	□		□
															TAWKH2180TG		□	
	5	TAWMN2200S25	●	128.2	148.2	204.2	200.3	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	21.9	TAWNH2190T	□		□
															TAWKH2190TG		□	
														22.0	TAWNH2200T	●		□
															TAWKH2200TG		●	
														22.1	TAWNH2210T	□		□
															TAWKH2210TG		□	
	8	TAWLN2200S25	●	189.9	213.9	269.9	266.0	3.9	25	WS355520T	TKY15T	WPT4405	MK1KS	22.2	TAWNH2220T	□		□
															TAWKH2220TG		□	
														22.3	TAWNH2230T	□		□
															TAWKH2230TG		□	
														22.4	TAWNH2240T	□		□
															TAWKH2240TG		□	
22.5 – 23.4	3	TAWSN2300S25	●	86.4	108.4	164.4	160.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	*TAWNH2250T	●		□
															TAWKH2250TG		●	
														22.6	TAWNH2260T	□		□
															TAWKH2260TG		□	
														22.7	TAWNH2270T	□		□
															TAWKH2270TG		□	
														22.8	TAWNH2280T	□		□
															TAWKH2280TG		□	
	5	TAWMN2300S25	●	133.4	158.4	214.4	210.3	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	22.9	TAWNH2290T	□		□
															TAWKH2290TG		□	
														23.0	TAWNH2300T	●		□
															TAWKH2300TG		●	
														23.1	TAWNH2310T	□		□
															TAWKH2310TG		□	
	8	TAWLN2300S25	●	198.1	227.1	283.1	279.0	4.1	25	WS355521T	TKY15T	WPT4405	MK1KS	23.2	TAWNH2320T	□		□
															TAWKH2320TG		□	
														23.3	TAWNH2330T	□		□
															TAWKH2330TG		□	
														23.4	TAWNH2340T	□		□
															TAWKH2340TG		□	

(Note 1) The dimensions in brackets represent the sizes when TAWNH type inserts are used.
(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.

DC (mm)	Hole Depth (l/d)	Holder: Order Number	Holder: Stock	LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant
23.5 – 24.4	3	TAWSN2400S32	●	90.6	114.6	174.6	170.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS
	5	TAWMN2400S32	●	139.6	164.6	224.6	220.3	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS
	8	TAWLN2400S32	●	206.3	236.3	296.3	292.0	4.3	32	WS355521T	TKY15T	WPT4405	MK1KS
24.5 – 25.4	3	TAWSN2500S32	●	93.1	115.1	175.1	170.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS
	5	TAWMN2500S32	●	145.1	170.1	230.1	225.6	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS
	8	TAWLN2500S32	●	214.5	244.5	304.5	300.0	4.5	32	WS406023T	TKY25T	WPT4405	MK1KS
25.5 – 26.4	3	TAWSN2600S32	●	97.2	120.2	180.2	175.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS
	5	TAWMN2600S32	●	151.2	175.2	235.2	230.6	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS
	8	TAWLN2600S32	●	222.6	252.6	312.6	308.0	4.6	32	WS406024T	TKY25T	WPT4405	MK1KS

Insert DC (mm)	Order Number	Stock: VP15TF	Stock: DP5010	Stock: VP10H
23.5	*TAWNH2350T	●		□
	TAWKH2350TG		●	
23.6	TAWNH2360T	□		□
	TAWKH2360TG		□	
23.7	TAWNH2370T	□		□
	TAWKH2370TG		□	
23.8	TAWNH2380T	□		□
	TAWKH2380TG		□	
23.9	TAWNH2390T	□		□
	TAWKH2390TG		□	
24.0	TAWNH2400T	●		□
	TAWKH2400TG		●	
24.1	TAWNH2410T	□		□
	TAWKH2410TG		□	
24.2	TAWNH2420T	□		□
	TAWKH2420TG		□	
24.3	TAWNH2430T	□		□
	TAWKH2430TG		□	
24.4	TAWNH2440T	□		□
	TAWKH2440TG		□	
24.5	*TAWNH2450T	●		□
	TAWKH2450TG		●	
24.6	TAWNH2460T	□		□
	TAWKH2460TG		□	
24.7	TAWNH2470T	□		□
	TAWKH2470TG		□	
24.8	TAWNH2480T	□		□
	TAWKH2480TG		□	
24.9	TAWNH2490T	□		□
	TAWKH2490TG		□	
25.0	TAWNH2500T	●		□
	TAWKH2500TG		●	
25.1	TAWNH2510T	□		□
	TAWKH2510TG		□	
25.2	TAWNH2520T	□		□
	TAWKH2520TG		□	
25.3	TAWNH2530T	□		□
	TAWKH2530TG		□	
25.4	TAWNH2540T	□		□
	TAWKH2540TG		□	
25.5	*TAWNH2550T	●		□
	TAWKH2550TG		●	
25.6	TAWNH2560T	□		□
	TAWKH2560TG		□	
25.7	TAWNH2570T	□		□
	TAWKH2570TG		□	
25.8	TAWNH2580T	□		□
	TAWKH2580TG		□	
25.9	TAWNH2590T	□		□
	TAWKH2590TG		□	
26.0	TAWNH2600T	●		□
	TAWKH2600TG		●	
26.1	TAWNH2610T	□		□
	TAWKH2610TG		□	
26.2	TAWNH2620T	□		□
	TAWKH2620TG		□	
26.3	TAWNH2630T	□		□
	TAWKH2630TG		□	
26.4	TAWNH2640T	□		□
	TAWKH2640TG		□	

INSERT DESCRIPTION ➤ N234
CUTTING CONDITIONS ➤ N238
USAGE NOTE ➤ N238
TECHNICAL DATA ➤ Q001

TAW

DC (mm)	Hole Depth (l/d)	Holder Order Number	Holder Stock	LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert DC (mm)	Insert Order Number	Stock VP15TF	Stock DP5010	Stock VP10H
26.5 – 27.4	3	TAWSN2700S32	●	99.4	120.4	180.4	175.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	*TAWNH2650T	●		□
															TAWKH2650TG		●	
														26.6	TAWNH2660T	□		□
															TAWKH2660TG		□	
														26.7	TAWNH2670T	□		□
															TAWKH2670TG		□	
														26.8	TAWNH2680T	□		□
															TAWKH2680TG		□	
	5	TAWMN2700S32	●	156.4	180.4	240.4	235.6	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	26.9	TAWNH2690T	□		□
															TAWKH2690TG		□	
														27.0	TAWNH2700T	●		□
															TAWKH2700TG		●	
														27.1	TAWNH2710T	□		□
															TAWKH2710TG		□	
	8	TAWLN2700S32	●	230.8	260.8	320.8	316.0	4.8	32	WS406024T	TKY25T	WPT4405	MK1KS	27.2	TAWNH2720T	□		□
															TAWKH2720TG		□	
														27.3	TAWNH2730T	□		□
															TAWKH2730TG		□	
														27.4	TAWNH2740T	□		□
															TAWKH2740TG		□	
27.5 – 28.4	3	TAWSN2800S32	●	102.2	125.2	185.2	180.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	*TAWNH2750T	●		□
															TAWKH2750TG		●	
														27.6	TAWNH2760T	□		□
															TAWKH2760TG		□	
														27.7	TAWNH2770T	□		□
															TAWKH2770TG		□	
														27.8	TAWNH2780T	□		□
															TAWKH2780TG		□	
	5	TAWMN2800S32	●	162.2	185.2	245.2	240.2	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	27.9	TAWNH2790T	□		□
															TAWKH2790TG		□	
														28.0	TAWNH2800T	●		□
															TAWKH2800TG		●	
														28.1	TAWNH2810T	□		□
															TAWKH2810TG		□	
														28.2	TAWNH2820T	□		□
															TAWKH2820TG		□	
	8	TAWLN2800S32	●	239.0	269.0	329.0	324.0	5.0	32	WS508026T	TKY27T	WPT4405	MK1KS	28.3	TAWNH2830T	□		□
															TAWKH2830TG		□	
														28.4	TAWNH2840T	□		□
															TAWKH2840TG		□	
28.5 – 29.4	3	TAWSN2900S32	●	105.4	130.4	190.4	185.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	*TAWNH2850T	●		□
															TAWKH2850TG		●	
														28.6	TAWNH2860T	□		□
															TAWKH2860TG		□	
														28.7	TAWNH2870T	□		□
															TAWKH2870TG		□	
														28.8	TAWNH2880T	□		□
															TAWKH2880TG		□	
	5	TAWMN2900S32	●	167.4	190.4	250.4	245.2	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.9	TAWNH2890T	□		□
															TAWKH2890TG		□	
														29.0	TAWNH2900T	●		□
															TAWKH2900TG		●	
														29.1	TAWNH2910T	□		□
															TAWKH2910TG		□	
	8	TAWLN2900S32	●	247.2	277.2	337.2	332.0	5.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.2	TAWNH2920T	□		□
															TAWKH2920TG		□	
														29.3	TAWNH2930T	□		□
															TAWKH2930TG		□	
														29.4	TAWNH2940T	□		□
															TAWKH2940TG		□	

(Note 1) The dimensions in brackets represent the sizes when TAWNH type inserts are used.
(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.

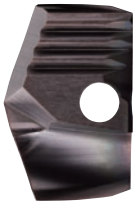
DC (mm)	Hole Depth (l/d)	Holder: Order Number	Holder: Stock	Dimensions (mm): LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert: DC (mm)	Insert: Order Number	Stock: VP15TF	DP5010	VP10H
29.5 – 30.4	3	TAWSN3000S32	●	109.6	130.6	190.6	185.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	*TAWNH2950T	●		□
															TAWKH2950TG		●	
														29.6	TAWNH2960T	□		□
															TAWKH2960TG		□	
														29.7	TAWNH2970T	□		□
															TAWKH2970TG		□	
														29.8	TAWNH2980T	□		□
															TAWKH2980TG		□	
														29.9	TAWNH2990T	□		□
															TAWKH2990TG		□	
	5	TAWMN3000S32	●	172.6	200.6	260.6	255.2	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	30.0	TAWNH3000T	●		□
															TAWKH3000TG		●	
														30.1	TAWNH3010T	□		□
															TAWKH3010TG		□	
														30.2	TAWNH3020T	□		□
															TAWKH3020TG		□	
	8	TAWLN3000S32	●	255.4	290.4	350.4	345.0	5.4	32	WS508027T	TKY27T	WPT4405	MK1KS	30.3	TAWNH3030T	□		□
															TAWKH3030TG		□	
														30.4	TAWNH3040T	□		□
															TAWKH3040TG		□	

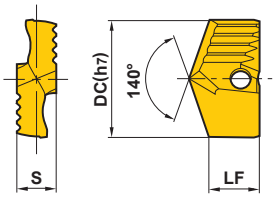
INSERT DESCRIPTION ➤ N234
CUTTING CONDITIONS ➤ N238
USAGE NOTE ➤ N238
TECHNICAL DATA ➤ Q001

TAW

INSERTS

H Type





Order Number	Stock VP15TF	Stock VP10H	Dimensions (mm) DC	LF	S	Applicable Holder
TAWNH1400T	▲		14.0	7.6	5.0	TAWSNH 1400S16 TAWMNH 1400S16 TAWLNH 1400S16
TAWNH1410T	▲		14.1	7.6	5.0	
TAWNH1420T	▲		14.2	7.6	5.0	
TAWNH1430T	▲		14.3	7.6	5.0	
TAWNH1440T	▲		14.4	7.6	5.0	
TAWNH1450T	▲		14.5	7.5	5.0	TAWSNH 1500S20 TAWMNH 1500S20 TAWLNH 1500S20
TAWNH1460T	▲		14.6	7.5	5.0	
TAWNH1470T	▲		14.7	7.5	5.0	
TAWNH1480T	▲		14.8	7.5	5.0	
TAWNH1490T	▲		14.9	7.5	5.0	
TAWNH1500T	▲		15.0	7.4	5.0	
TAWNH1510T	▲		15.1	7.4	5.0	
TAWNH1520T	▲		15.2	7.4	5.0	
TAWNH1530T	▲		15.3	7.4	5.0	
TAWNH1540T	▲		15.4	7.4	5.0	
TAWNH1550T	▲		15.5	7.9	6.0	TAWSN 1600S20 TAWMN 1600S20 TAWLN 1600S20
TAWNH1560T	▲		15.6	7.9	6.0	
TAWNH1570T	▲		15.7	7.9	6.0	
TAWNH1580T	▲		15.8	7.9	6.0	
TAWNH1590T	▲		15.9	7.9	6.0	
TAWNH1600T	▲		16.0	7.8	6.0	
TAWNH1610T	▲		16.1	7.8	6.0	
TAWNH1620T	▲		16.2	7.8	6.0	
TAWNH1630T	▲		16.3	7.8	6.0	
TAWNH1640T	▲		16.4	7.8	6.0	
TAWNH1650T	▲		16.5	7.7	6.0	TAWSN 1700S20 TAWMN 1700S20 TAWLN 1700S20
TAWNH1660T	▲		16.6	7.7	6.0	
TAWNH1670T	▲		16.7	7.7	6.0	
TAWNH1680T	▲		16.8	7.7	6.0	
TAWNH1690T	▲		16.9	7.7	6.0	
TAWNH1700T	▲		17.0	7.6	6.0	
TAWNH1710T	▲		17.1	7.6	6.0	
TAWNH1720T	▲		17.2	7.6	6.0	
TAWNH1730T	▲		17.3	7.6	6.0	
TAWNH1740T	▲		17.4	7.6	6.0	
TAWNH1750T	▲		17.5	7.5	6.0	TAWSN 1800S20 TAWMN 1800S20 TAWLN 1800S20
TAWNH1760T	▲		17.6	7.5	6.0	
TAWNH1770T	▲		17.7	7.5	6.0	
TAWNH1780T	▲		17.8	7.5	6.0	
TAWNH1790T	▲		17.9	7.5	6.0	
TAWNH1800T	▲		18.0	7.4	6.0	
TAWNH1810T	▲		18.1	7.4	6.0	
TAWNH1820T	▲		18.2	7.4	6.0	
TAWNH1830T	▲		18.3	7.4	6.0	
TAWNH1840T	▲		18.4	7.4	6.0	

Order Number	Stock VP15TF	Stock VP10H	Dimensions (mm) DC	LF	S	Applicable Holder
TAWNH1850T	●	□	18.5	9.3	7.0	TAWSN 1900S25 TAWMN 1900S25 TAWLN 1900S25
TAWNH1860T	●	□	18.6	9.3	7.0	
TAWNH1870T	●	□	18.7	9.3	7.0	
TAWNH1880T	●	□	18.8	9.3	7.0	
TAWNH1890T	●	□	18.9	9.3	7.0	
TAWNH1900T	●	□	19.0	9.2	7.0	
TAWNH1910T	●	□	19.1	9.2	7.0	
TAWNH1920T	●	□	19.2	9.2	7.0	
TAWNH1930T	●	□	19.3	9.2	7.0	
TAWNH1940T	●	□	19.4	9.2	7.0	
TAWNH1950T	●	□	19.5	9.1	7.0	TAWSN 2000S25 TAWMN 2000S25 TAWLN 2000S25
TAWNH1960T	●	□	19.6	9.1	7.0	
TAWNH1970T	●	□	19.7	9.1	7.0	
TAWNH1980T	●	□	19.8	9.1	7.0	
TAWNH1990T	●	□	19.9	9.1	7.0	
TAWNH2000T	●	□	20.0	9.0	7.0	
TAWNH2010T	□	□	20.1	9.0	7.0	
TAWNH2020T	□	□	20.2	9.0	7.0	
TAWNH2030T	□	□	20.3	9.0	7.0	
TAWNH2040T	□	□	20.4	9.0	7.0	
TAWNH2050T	●	□	20.5	8.9	7.0	TAWSN 2100S25 TAWMN 2100S25 TAWLN 2100S25
TAWNH2060T	□	□	20.6	8.9	7.0	
TAWNH2070T	□	□	20.7	8.9	7.0	
TAWNH2080T	□	□	20.8	8.9	7.0	
TAWNH2090T	□	□	20.9	8.9	7.0	
TAWNH2100T	●	□	21.0	8.8	7.0	
TAWNH2110T	□	□	21.1	8.8	7.0	
TAWNH2120T	□	□	21.2	8.8	7.0	
TAWNH2130T	□	□	21.3	8.8	7.0	
TAWNH2140T	□	□	21.4	8.8	7.0	
TAWNH2150T	●	□	21.5	10.6	8.0	TAWSN 2200S25 TAWMN 2200S25 TAWLN 2200S25
TAWNH2160T	□	□	21.6	10.6	8.0	
TAWNH2170T	□	□	21.7	10.6	8.0	
TAWNH2180T	□	□	21.8	10.6	8.0	
TAWNH2190T	□	□	21.9	10.6	8.0	
TAWNH2200T	●	□	22.0	10.5	8.0	
TAWNH2210T	□	□	22.1	10.5	8.0	
TAWNH2220T	□	□	22.2	10.5	8.0	
TAWNH2230T	□	□	22.3	10.5	8.0	
TAWNH2240T	□	□	22.4	10.5	8.0	
TAWNH2250T	●	□	22.5	10.4	8.0	TAWSN 2300S25 TAWMN 2300S25 TAWLN 2300S25
TAWNH2260T	□	□	22.6	10.4	8.0	
TAWNH2270T	□	□	22.7	10.4	8.0	
TAWNH2280T	□	□	22.8	10.4	8.0	
TAWNH2290T	□	□	22.9	10.4	8.0	

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.
(1 insert in one case)

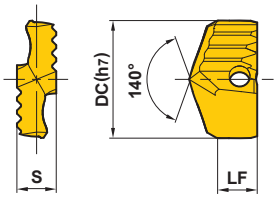
Order Number	Stock VP15TF	Stock VP10H	Dimensions (mm) DC	LF	S	Applicable Holder
TAWNH2300T	●	□	23.0	10.3	8.0	TAWSN 2300S25 TAWMN 2300S25 TAWLN 2300S25
TAWNH2310T	□	□	23.1	10.3	8.0	
TAWNH2320T	□	□	23.2	10.3	8.0	
TAWNH2330T	□	□	23.3	10.3	8.0	
TAWNH2340T	□	□	23.4	10.3	8.0	
TAWNH2350T	●	□	23.5	10.2	8.0	TAWSN 2400S32 TAWMN 2400S32 TAWLN 2400S32
TAWNH2360T	□	□	23.6	10.2	8.0	
TAWNH2370T	□	□	23.7	10.2	8.0	
TAWNH2380T	□	□	23.8	10.2	8.0	
TAWNH2390T	□	□	23.9	10.2	8.0	
TAWNH2400T	●	□	24.0	10.1	8.0	
TAWNH2410T	□	□	24.1	10.1	8.0	
TAWNH2420T	□	□	24.2	10.1	8.0	
TAWNH2430T	□	□	24.3	10.1	8.0	
TAWNH2440T	□	□	24.4	10.1	8.0	
TAWNH2450T	●	□	24.5	11.7	9.0	TAWSN 2500S32 TAWMN 2500S32 TAWLN 2500S32
TAWNH2460T	□	□	24.6	11.7	9.0	
TAWNH2470T	□	□	24.7	11.7	9.0	
TAWNH2480T	□	□	24.8	11.7	9.0	
TAWNH2490T	□	□	24.9	11.7	9.0	
TAWNH2500T	●	□	25.0	11.6	9.0	
TAWNH2510T	□	□	25.1	11.6	9.0	
TAWNH2520T	□	□	25.2	11.6	9.0	
TAWNH2530T	□	□	25.3	11.6	9.0	
TAWNH2540T	□	□	25.4	11.6	9.0	
TAWNH2550T	●	□	25.5	11.5	9.0	TAWSN 2600S32 TAWMN 2600S32 TAWLN 2600S32
TAWNH2560T	□	□	25.6	11.5	9.0	
TAWNH2570T	□	□	25.7	11.5	9.0	
TAWNH2580T	□	□	25.8	11.5	9.0	
TAWNH2590T	□	□	25.9	11.5	9.0	
TAWNH2600T	●	□	26.0	11.4	9.0	
TAWNH2610T	□	□	26.1	11.4	9.0	
TAWNH2620T	□	□	26.2	11.4	9.0	
TAWNH2630T	□	□	26.3	11.4	9.0	
TAWNH2640T	□	□	26.4	11.4	9.0	
TAWNH2650T	●	□	26.5	11.3	9.0	TAWSN 2700S32 TAWMN 2700S32 TAWLN 2700S32
TAWNH2660T	□	□	26.6	11.3	9.0	
TAWNH2670T	□	□	26.7	11.3	9.0	
TAWNH2680T	□	□	26.8	11.3	9.0	
TAWNH2690T	□	□	26.9	11.3	9.0	
TAWNH2700T	●	□	27.0	11.2	9.0	
TAWNH2710T	□	□	27.1	11.2	9.0	
TAWNH2720T	□	□	27.2	11.2	9.0	
TAWNH2730T	□	□	27.3	11.2	9.0	
TAWNH2740T	□	□	27.4	11.2	9.0	

Order Number	Stock VP15TF	Stock VP10H	Dimensions (mm) DC	LF	S	Applicable Holder
TAWNH2750T	●	□	27.5	12.3	10.0	TAWSN 2800S32 TAWMN 2800S32 TAWLN 2800S32
TAWNH2760T	□	□	27.6	12.3	10.0	
TAWNH2770T	□	□	27.7	12.3	10.0	
TAWNH2780T	□	□	27.8	12.3	10.0	
TAWNH2790T	□	□	27.9	12.3	10.0	
TAWNH2800T	●	□	28.0	12.2	10.0	
TAWNH2810T	□	□	28.1	12.2	10.0	
TAWNH2820T	□	□	28.2	12.2	10.0	
TAWNH2830T	□	□	28.3	12.2	10.0	
TAWNH2840T	□	□	28.4	12.2	10.0	
TAWNH2850T	●	□	28.5	12.1	10.0	TAWSN 2900S32 TAWMN 2900S32 TAWLN 2900S32
TAWNH2860T	□	□	28.6	12.1	10.0	
TAWNH2870T	□	□	28.7	12.1	10.0	
TAWNH2880T	□	□	28.8	12.1	10.0	
TAWNH2890T	□	□	28.9	12.1	10.0	
TAWNH2900T	●	□	29.0	12.0	10.0	
TAWNH2910T	□	□	29.1	12.0	10.0	
TAWNH2920T	□	□	29.2	12.0	10.0	
TAWNH2930T	□	□	29.3	12.0	10.0	
TAWNH2940T	□	□	29.4	12.0	10.0	
TAWNH2950T	●	□	29.5	11.9	10.0	TAWSN 3000S32 TAWMN 3000S32 TAWLN 3000S32
TAWNH2960T	□	□	29.6	11.9	10.0	
TAWNH2970T	□	□	29.7	11.9	10.0	
TAWNH2980T	□	□	29.8	11.9	10.0	
TAWNH2990T	□	□	29.9	11.9	10.0	
TAWNH3000T	●	□	30.0	11.8	10.0	
TAWNH3010T	□	□	30.1	11.8	10.0	
TAWNH3020T	□	□	30.2	11.8	10.0	
TAWNH3030T	□	□	30.3	11.8	10.0	
TAWNH3040T	□	□	30.4	11.8	10.0	

TAW

INSERTS

H Type
(Cast Iron)



Order Number	Stock DP5010	Dimensions (mm) DC	LF	S	Applicable Holder
TAWKH1400TG	▲	14.0	7.1	5.0	TAWSNH 1400S16 TAWMNH 1400S16 TAWLNH 1400S16
TAWKH1410TG	▲	14.1	7.1	5.0	
TAWKH1420TG	▲	14.2	7.1	5.0	
TAWKH1430TG	▲	14.3	7.1	5.0	
TAWKH1440TG	▲	14.4	7.1	5.0	
TAWKH1450TG	▲	14.5	7.0	5.0	TAWSNH 1500S20 TAWMNH 1500S20 TAWLNH 1500S20
TAWKH1460TG	▲	14.6	7.0	5.0	
TAWKH1470TG	▲	14.7	7.0	5.0	
TAWKH1480TG	▲	14.8	7.0	5.0	
TAWKH1490TG	▲	14.9	7.0	5.0	
TAWKH1500TG	▲	15.0	6.9	5.0	
TAWKH1510TG	▲	15.1	6.9	5.0	
TAWKH1520TG	▲	15.2	6.9	5.0	
TAWKH1530TG	▲	15.3	6.9	5.0	
TAWKH1540TG	▲	15.4	6.9	5.0	
TAWKH1550TG	▲	15.5	7.3	6.0	TAWSN 1600S20 TAWMN 1600S20 TAWLN 1600S20
TAWKH1560TG	▲	15.6	7.3	6.0	
TAWKH1570TG	▲	15.7	7.3	6.0	
TAWKH1580TG	▲	15.8	7.3	6.0	
TAWKH1590TG	▲	15.9	7.3	6.0	
TAWKH1600TG	▲	16.0	7.2	6.0	
TAWKH1610TG	▲	16.1	7.2	6.0	
TAWKH1620TG	▲	16.2	7.2	6.0	
TAWKH1630TG	▲	16.3	7.2	6.0	
TAWKH1640TG	▲	16.4	7.2	6.0	
TAWKH1650TG	▲	16.5	7.1	6.0	TAWSN 1700S20 TAWMN 1700S20 TAWLN 1700S20
TAWKH1660TG	▲	16.6	7.1	6.0	
TAWKH1670TG	▲	16.7	7.1	6.0	
TAWKH1680TG	▲	16.8	7.1	6.0	
TAWKH1690TG	▲	16.9	7.1	6.0	
TAWKH1700TG	▲	17.0	7.0	6.0	
TAWKH1710TG	▲	17.1	7.0	6.0	
TAWKH1720TG	▲	17.2	7.0	6.0	
TAWKH1730TG	▲	17.3	7.0	6.0	
TAWKH1740TG	▲	17.4	7.0	6.0	
TAWKH1750TG	▲	17.5	6.8	6.0	TAWSN 1800S20 TAWMN 1800S20 TAWLN 1800S20
TAWKH1760TG	▲	17.6	6.8	6.0	
TAWKH1770TG	▲	17.7	6.8	6.0	
TAWKH1780TG	▲	17.8	6.8	6.0	
TAWKH1790TG	▲	17.9	6.8	6.0	
TAWKH1800TG	▲	18.0	6.8	6.0	
TAWKH1810TG	▲	18.1	6.8	6.0	
TAWKH1820TG	▲	18.2	6.8	6.0	
TAWKH1830TG	▲	18.3	6.8	6.0	
TAWKH1840TG	▲	18.4	6.8	6.0	

Order Number	Stock DP5010	Dimensions (mm) DC	LF	S	Applicable Holder
TAWKH1850TG	●	18.5	8.6	7.0	TAWSN 1900S25 TAWMN 1900S25 TAWLN 1900S25
TAWKH1860TG	●	18.6	8.6	7.0	
TAWKH1870TG	●	18.7	8.6	7.0	
TAWKH1880TG	●	18.8	8.6	7.0	
TAWKH1890TG	●	18.9	8.6	7.0	
TAWKH1900TG	●	19.0	8.5	7.0	
TAWKH1910TG	●	19.1	8.5	7.0	
TAWKH1920TG	●	19.2	8.5	7.0	
TAWKH1930TG	●	19.3	8.5	7.0	
TAWKH1940TG	●	19.4	8.5	7.0	
TAWKH1950TG	●	19.5	8.4	7.0	TAWSN 2000S25 TAWMN 2000S25 TAWLN 2000S25
TAWKH1960TG	●	19.6	8.4	7.0	
TAWKH1970TG	●	19.7	8.4	7.0	
TAWKH1980TG	●	19.8	8.4	7.0	
TAWKH1990TG	●	19.9	8.4	7.0	
TAWKH2000TG	●	20.0	8.3	7.0	
TAWKH2010TG	□	20.1	8.3	7.0	
TAWKH2020TG	□	20.2	8.3	7.0	
TAWKH2030TG	□	20.3	8.3	7.0	
TAWKH2040TG	□	20.4	8.3	7.0	
TAWKH2050TG	●	20.5	8.2	7.0	TAWSN 2100S25 TAWMN 2100S25 TAWLN 2100S25
TAWKH2060TG	□	20.6	8.2	7.0	
TAWKH2070TG	□	20.7	8.2	7.0	
TAWKH2080TG	□	20.8	8.2	7.0	
TAWKH2090TG	□	20.9	8.2	7.0	
TAWKH2100TG	●	21.0	8.1	7.0	
TAWKH2110TG	□	21.1	8.1	7.0	
TAWKH2120TG	□	21.2	8.1	7.0	
TAWKH2130TG	□	21.3	8.1	7.0	
TAWKH2140TG	□	21.4	8.1	7.0	
TAWKH2150TG	●	21.5	9.8	8.0	TAWSN 2200S25 TAWMN 2200S25 TAWLN 2200S25
TAWKH2160TG	□	21.6	9.8	8.0	
TAWKH2170TG	□	21.7	9.8	8.0	
TAWKH2180TG	□	21.8	9.8	8.0	
TAWKH2190TG	□	21.9	9.8	8.0	
TAWKH2200TG	●	22.0	9.7	8.0	
TAWKH2210TG	□	22.1	9.7	8.0	
TAWKH2220TG	□	22.2	9.7	8.0	
TAWKH2230TG	□	22.3	9.7	8.0	
TAWKH2240TG	□	22.4	9.7	8.0	
TAWKH2250TG	●	22.5	9.6	8.0	TAWSN 2300S25 TAWMN 2300S25 TAWLN 2300S25
TAWKH2260TG	□	22.6	9.6	8.0	
TAWKH2270TG	□	22.7	9.6	8.0	
TAWKH2280TG	□	22.8	9.6	8.0	
TAWKH2290TG	□	22.9	9.6	8.0	

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.
(1 insert in one case)

Order Number	Stock DP5010	Dimensions (mm) DC	LF	S	Applicable Holder
TAWKH2300TG	●	23.0	9.5	8.0	TAWSN 2300S25 TAWMN 2300S25 TAWLN 2300S25
TAWKH2310TG	□	23.1	9.5	8.0	
TAWKH2320TG	□	23.2	9.5	8.0	
TAWKH2330TG	□	23.3	9.5	8.0	
TAWKH2340TG	□	23.4	9.5	8.0	
TAWKH2350TG	●	23.5	9.4	8.0	TAWSN 2400S32 TAWMN 2400S32 TAWLN 2400S32
TAWKH2360TG	□	23.6	9.4	8.0	
TAWKH2370TG	□	23.7	9.4	8.0	
TAWKH2380TG	□	23.8	9.4	8.0	
TAWKH2390TG	□	23.9	9.4	8.0	
TAWKH2400TG	●	24.0	9.3	8.0	
TAWKH2410TG	□	24.1	9.3	8.0	
TAWKH2420TG	□	24.2	9.3	8.0	
TAWKH2430TG	□	24.3	9.3	8.0	
TAWKH2440TG	□	24.4	9.3	8.0	
TAWKH2450TG	●	24.5	10.8	9.0	TAWSN 2500S32 TAWMN 2500S32 TAWLN 2500S32
TAWKH2460TG	□	24.6	10.8	9.0	
TAWKH2470TG	□	24.7	10.8	9.0	
TAWKH2480TG	□	24.8	10.8	9.0	
TAWKH2490TG	□	24.9	10.8	9.0	
TAWKH2500TG	●	25.0	10.7	9.0	
TAWKH2510TG	□	25.1	10.7	9.0	
TAWKH2520TG	□	25.2	10.7	9.0	
TAWKH2530TG	□	25.3	10.7	9.0	
TAWKH2540TG	□	25.4	10.7	9.0	
TAWKH2550TG	●	25.5	10.6	9.0	TAWSN 2600S32 TAWMN 2600S32 TAWLN 2600S32
TAWKH2560TG	□	25.6	10.6	9.0	
TAWKH2570TG	□	25.7	10.6	9.0	
TAWKH2580TG	□	25.8	10.6	9.0	
TAWKH2590TG	□	25.9	10.6	9.0	
TAWKH2600TG	●	26.0	10.5	9.0	
TAWKH2610TG	□	26.1	10.5	9.0	
TAWKH2620TG	□	26.2	10.5	9.0	
TAWKH2630TG	□	26.3	10.5	9.0	
TAWKH2640TG	□	26.4	10.5	9.0	
TAWKH2650TG	●	26.5	10.4	9.0	TAWSN 2700S32 TAWMN 2700S32 TAWLN 2700S32
TAWKH2660TG	□	26.6	10.4	9.0	
TAWKH2670TG	□	26.7	10.4	9.0	
TAWKH2680TG	□	26.8	10.4	9.0	
TAWKH2690TG	□	26.9	10.4	9.0	
TAWKH2700TG	●	27.0	10.3	9.0	
TAWKH2710TG	□	27.1	10.3	9.0	
TAWKH2720TG	□	27.2	10.3	9.0	
TAWKH2730TG	□	27.3	10.3	9.0	
TAWKH2740TG	□	27.4	10.3	9.0	

Order Number	Stock DP5010	Dimensions (mm) DC	LF	S	Applicable Holder
TAWKH2750TG	●	27.5	11.3	10.0	TAWSN 2800S32 TAWMN 2800S32 TAWLN 2800S32
TAWKH2760TG	□	27.6	11.3	10.0	
TAWKH2770TG	□	27.7	11.3	10.0	
TAWKH2780TG	□	27.8	11.3	10.0	
TAWKH2790TG	□	27.9	11.3	10.0	
TAWKH2800TG	●	28.0	11.2	10.0	
TAWKH2810TG	□	28.1	11.2	10.0	
TAWKH2820TG	□	28.2	11.2	10.0	
TAWKH2830TG	□	28.3	11.2	10.0	
TAWKH2840TG	□	28.4	11.2	10.0	
TAWKH2850TG	●	28.5	11.1	10.0	TAWSN 2900S32 TAWMN 2900S32 TAWLN 2900S32
TAWKH2860TG	□	28.6	11.1	10.0	
TAWKH2870TG	□	28.7	11.1	10.0	
TAWKH2880TG	□	28.8	11.1	10.0	
TAWKH2890TG	□	28.9	11.1	10.0	
TAWKH2900TG	●	29.0	11.0	10.0	
TAWKH2910TG	□	29.1	11.0	10.0	
TAWKH2920TG	□	29.2	11.0	10.0	
TAWKH2930TG	□	29.3	11.0	10.0	
TAWKH2940TG	□	29.4	11.0	10.0	
TAWKH2950TG	●	29.5	10.9	10.0	TAWSN 3000S32 TAWMN 3000S32 TAWLN 3000S32
TAWKH2960TG	□	29.6	10.9	10.0	
TAWKH2970TG	□	29.7	10.9	10.0	
TAWKH2980TG	□	29.8	10.9	10.0	
TAWKH2990TG	□	29.9	10.9	10.0	
TAWKH3000TG	●	30.0	10.8	10.0	
TAWKH3010TG	□	30.1	10.8	10.0	
TAWKH3020TG	□	30.2	10.8	10.0	
TAWKH3030TG	□	30.3	10.8	10.0	
TAWKH3040TG	□	30.4	10.8	10.0	

TAW

RECOMMENDED CUTTING CONDITIONS

Work Material		Drill Diameter / Conditions / Hardness	ϕ14.0—ϕ15.4 Cutting Speed (m/min)	ϕ14.0—ϕ15.4 Feed (mm/rev)	ϕ15.5—ϕ18.4 Cutting Speed (m/min)	ϕ15.5—ϕ18.4 Feed (mm/rev)	ϕ18.5—ϕ21.4 Cutting Speed (m/min)	ϕ18.5—ϕ21.4 Feed (mm/rev)
P	Mild Steel	≤180HB	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)
P	Carbon Steel Alloy Steel	180—280HB	70 (60—90)	0.20 (0.15—0.25)	80 (60—100)	0.25 (0.20—0.30)	80 (60—100)	0.25 (0.20—0.30)
P	Carbon Steel Alloy Steel	280—350HB	60 (50—80)	0.15 (0.12—0.18)	70 (50—90)	0.20 (0.15—0.25)	70 (50—90)	0.20 (0.15—0.25)
M	Stainless Steel	≤200HB	50 (40—60)	0.15 (0.12—0.18)	50 (40—60)	0.15 (0.12—0.18)	60 (50—70)	0.20 (0.15—0.22)
K	Gray Cast Iron	Tensile Strength ≤350MPa	70 (50—90)	0.20 (0.15—0.25)	100 (60—120)	0.25 (0.20—0.30)	120 (60—140)	0.25 (0.20—0.30)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	70 (50—90)	0.20 (0.15—0.25)	80 (60—90)	0.25 (0.20—0.30)	80 (60—90)	0.25 (0.20—0.30)

Work Material		Drill Diameter / Conditions / Hardness	ϕ21.5—ϕ24.4 Cutting Speed (m/min)	ϕ21.5—ϕ24.4 Feed (mm/rev)	ϕ24.5—ϕ27.4 Cutting Speed (m/min)	ϕ24.5—ϕ27.4 Feed (mm/rev)	ϕ27.5—ϕ30.4 Cutting Speed (m/min)	ϕ27.5—ϕ30.4 Feed (mm/rev)
P	Mild Steel	≤180HB	100 (80—120)	0.30 (0.25—0.35)	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	90 (70—110)	0.30 (0.25—0.35)	100 (80—120)	0.30 (0.25—0.35)	100 (80—120)	0.30 (0.25—0.35)
P	Carbon Steel Alloy Steel	280—350HB	80 (60—100)	0.25 (0.20—0.30)	90 (70—110)	0.25 (0.20—0.30)	90 (70—110)	0.25 (0.20—0.30)
M	Stainless Steel	≤200HB	60 (50—70)	0.20 (0.15—0.22)	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	130 (80—150)	0.35 (0.25—0.40)	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	90 (60—100)	0.30 (0.25—0.35)	100 (80—110)	0.30 (0.25—0.35)	100 (80—110)	0.30 (0.25—0.35)

(Note 1) When using the 8DC type holder, reduce the cutting speed by approx. 20%.
(Note 2) When using the 8DC type holder, it is recommended to drill a pilot guide hole.
(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 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

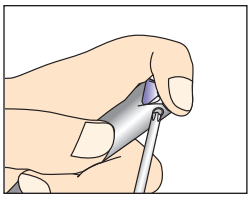


Fig. 1

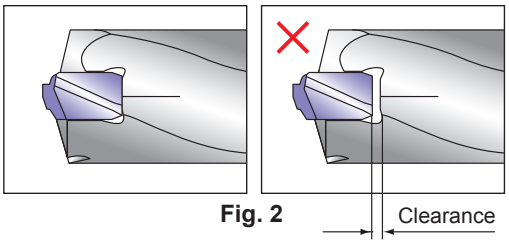


Fig. 2

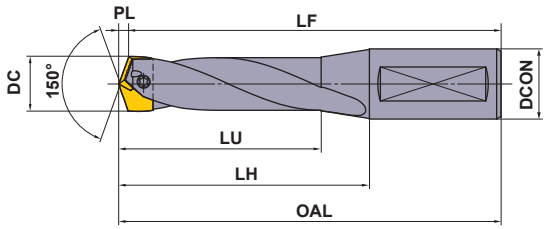
INSERT REPLACEMENT

- 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	M	K	N	S	H
Steel					

(For Bridge Construction)

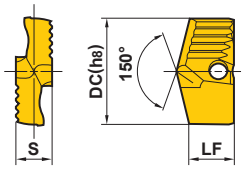


HOLDERS

DC (mm)	Hole Depth (l/d)	Holder: Order Number	Holder: Stock	Insert: DC (mm)	Insert: Order Number	Insert: Stock VP15TF	LU	LH	OAL	LF	PL	DCON	Clamp Screw	Wrench	Plate	Anti-seize Lubricant
24.5	3	TAWSB2500S32	●	24.5	TAWBH2450T	●	91.9	113.9	173.9	170.6	3.3	32	WS406023T	TKY25T	WPT4405	MK1KS
24.6	5	TAWMB2500S32	□	24.6	TAWBH2460T	□	143.9	168.9	228.9	225.6	3.3	32	WS406023T	TKY25T	WPT4405	MK1KS
24.7				24.7	TAWBH2470T	●										
26.5	3	TAWSB2700S32	●	26.5	TAWBH2650T	□	98.2	119.2	179.2	175.6	3.6	32	WS406024T	TKY25T	WPT4405	MK1KS
26.7	5	TAWMB2700S32	□	26.7	TAWB2670T	●	155.2	179.2	239.2	235.6	3.6	32	WS406024T	TKY25T	WPT4405	MK1KS
					TAWBH2670T	●										

(Note 1) The above dimensions are for when installing the TAWBH (H type) insert.
(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.

INSERTS

Shape	Order Number	Stock VP15TF	Dimensions (mm) DC	LF	S	Applicable Holder	Hone Width (mm)	Geometry
H Type	TAWBH2450T	●	24.5	11.7	9.0	TAWSB2500S32 TAWMB2500S32	0.20—0.25	
	TAWBH2460T	□	24.6	11.7	9.0			
	TAWBH2470T	●	24.7	11.7	9.0			
	TAWBH2650T	□	26.5	11.3	9.0	TAWSB2700S32 TAWMB2700S32		
	TAWBH2670T	●	26.7	11.3	9.0			

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
(1 insert in one case)

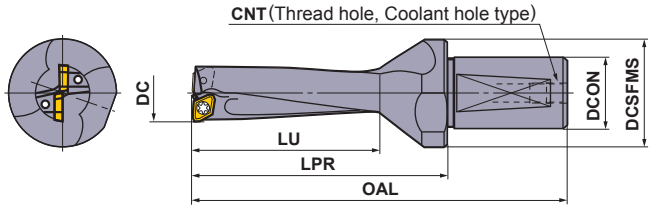
RECOMMENDED CUTTING CONDITIONS

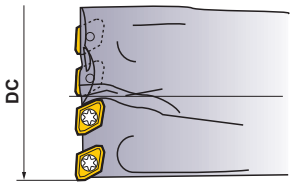
Work Material			Drill Diameter / Conditions / Hardness	ϕ24.5, ϕ24.6, ϕ24.7 Cutting Speed (m/min)	ϕ24.5, ϕ24.6, ϕ24.7 Feed (mm/rev)	ϕ26.5, ϕ26.7 Cutting Speed (m/min)	ϕ26.5, ϕ26.7 Feed (mm/rev)
P	Structural Steel	SS400 (JIS)	Tensile Strength ≦400—500MPa	70 (60—80)	0.30 (0.25—0.35)	70 (60—80)	0.30 (0.25—0.35)
		SM490 (JIS)	Tensile Strength ≦490—610MPa	65 (55—75)	0.30 (0.25—0.35)	65 (55—75)	0.30 (0.25—0.35)
		SM570 (JIS)	Tensile Strength ≦570—720MPa	60 (50—70)	0.30 (0.25—0.35)	60 (50—70)	0.30 (0.25—0.35)

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			





Number of Teeth = 4 (ϕDC ≥ 49)

*A screw hole on the flange section is not a coolant hole.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	Wrench
12.0	2	TAFS1200F20	●	2	29	39	82	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1200F20	●	2	41	51	94	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
12.5	2	TAFS1250F20	●	2	29	39	82	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1250F20	●	2	41	51	94	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
13.0	2	TAFS1300F20	●	2	31	41	84	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1300F20	●	2	44	54	97	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
13.5	2	TAFS1350F20	●	2	31	41	84	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1350F20	●	2	44	54	97	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
14.0	2	TAFS1400F20	●	2	33	43	86	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1400F20	●	2	47	57	100	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
14.5	2	TAFS1450F20	●	2	33	43	86	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
	3	TAFM1450F20	●	2	47	57	100	20	25	PT1/8	GCMT040204-U◌	TS2	TKY06F
15.0	2	TAFS1500F20	●	2	35	45	88	20	25	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1500F20	●	2	50	60	103	20	25	PT1/8	GPMT060204-U◌	TS2	TKY06F
15.5	2	TAFS1550F20	●	2	35	45	88	20	25	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1550F20	●	2	50	60	103	20	25	PT1/8	GPMT060204-U◌	TS2	TKY06F
16.0	2	TAFS1600F25	●	2	38	57	107	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1600F25	●	2	54	73	123	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	4	TAFL1600F25	●	2	70	89	139	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
16.5	2	TAFS1650F25	●	2	38	57	107	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1650F25	●	2	54	73	123	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
17.0	2	TAFS1700F25	●	2	41	59	109	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1700F25	●	2	58	76	126	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	4	TAFL1700F25	●	2	75	93	143	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
17.5	2	TAFS1750F25	●	2	41	59	109	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
	3	TAFM1750F25	●	2	58	76	126	25	35	PT1/8	GPMT060204-U◌	TS2	TKY06F
18.0	2	TAFS1800F25	●	2	43	61	111	25	35	PT1/8	GPMT070204-U◌	TS25	TKY08F
	3	TAFM1800F25	●	2	61	79	129	25	35	PT1/8	GPMT070204-U◌	TS25	TKY08F
	4	TAFL1800F25	●	2	79	97	147	25	35	PT1/8	GPMT070204-U◌	TS25	TKY08F
18.5	2	TAFS1850F25	●	2	43	61	111	25	35	PT1/8	GPMT070204-U◌	TS25	TKY08F
	3	TAFM1850F25	●	2	61	79	129	25	35	PT1/8	GPMT070204-U◌	TS25	TKY08F

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	Wrench
19.0	2	TAFS1900F25	●	2	46	63	113	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM1900F25	●	2	65	82	132	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	4	TAFL1900F25	●	2	84	101	151	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
19.5	2	TAFS1950F25	●	2	46	63	113	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM1950F25	●	2	65	82	132	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
20.0	2	TAFS2000F25	●	2	48	65	115	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2000F25	●	2	68	85	135	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	4	TAFL2000F25	●	2	88	105	155	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
20.5	2	TAFS2050F25	●	2	48	65	115	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2050F25	●	2	68	85	135	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
21.0	2	TAFS2100F25	●	2	50	67	117	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2100F25	●	2	71	88	138	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	4	TAFL2100F25	●	2	92	109	159	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
21.5	2	TAFS2150F25	●	2	50	67	117	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2150F25	●	2	71	88	138	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
22.0	2	TAFS2200F25	●	2	53	69	119	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2200F25	●	2	75	91	141	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	4	TAFL2200F25	●	2	97	113	163	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
22.5	2	TAFS2250F25	●	2	53	69	119	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
	3	TAFM2250F25	●	2	75	91	141	25	35	PT1/8	GPMT070204-U◌	TS25	①TKY08F
23.0	2	TAFS2300F25	●	2	55	71	121	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2300F25	●	2	78	94	144	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	4	TAFL2300F25	●	2	101	117	167	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
23.5	2	TAFS2350F25	●	2	55	71	121	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2350F25	●	2	78	94	144	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
24.0	2	TAFS2400F25	●	2	58	73	123	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2400F25	●	2	82	97	147	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	4	TAFL2400F25	●	2	106	121	171	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
24.5	2	TAFS2450F25	●	2	58	73	123	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2450F25	●	2	82	97	147	25	35	PT1/8	GPMT090304-U◌	TS3	①TKY08F
25.0	2	TAFS2500F32	●	2	60	75	130	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2500F32	●	2	85	100	155	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	4	TAFL2500F32	●	2	110	125	180	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
25.5	2	TAFS2550F32	●	2	60	75	130	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2550F32	●	2	85	100	155	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
26.0	2	TAFS2600F32	●	2	62	77	132	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2600F32	●	2	88	103	158	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	4	TAFL2600F32	●	2	114	129	184	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
26.5	2	TAFS2650F32	●	2	62	77	132	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2650F32	●	2	88	103	158	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
27.0	2	TAFS2700F32	●	2	65	79	134	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2700F32	●	2	92	106	161	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	4	TAFL2700F32	●	2	119	133	188	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
27.5	2	TAFS2750F32	●	2	65	79	134	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
	3	TAFM2750F32	●	2	92	106	161	32	42	PT1/8	GPMT090304-U◌	TS3	①TKY08F
28.0	2	TAFS2800F32	●	2	67	81	136	32	42	PT1/8	GPMT11T308-U◌	TS4	②TKY15D
	3	TAFM2800F32	●	2	95	109	164	32	42	PT1/8	GPMT11T308-U◌	TS4	②TKY15D
	4	TAFL2800F32	●	2	123	137	192	32	42	PT1/8	GPMT11T308-U◌	TS4	②TKY15D

INSERT DESCRIPTION ➤ N244
CUTTING CONDITIONS ➤ N245
USAGE NOTE ➤ N248
TECHNICAL DATA ➤ Q001

DRILLING(INDEXABLE TYPE)

TAFS/TAFM/TAFL

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	Wrench
28.5	2	TAFS2850F32	●	2	67	81	136	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM2850F32	●	2	95	109	164	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
29.0	2	TAFS2900F32	●	2	70	83	138	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM2900F32	●	2	99	112	167	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL2900F32	●	2	128	141	196	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
29.5	2	TAFS2950F32	●	2	70	83	138	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM2950F32	●	2	99	112	167	32	42	PT1/8	GPMT11T308-U◌	TS4	TKY15D
30.0	2	TAFS3000F40	●	2	72	90	155	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM3000F40	●	2	102	120	185	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL3000F40	●	2	132	150	215	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
31.0	2	TAFS3100F40	●	2	74	92	157	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM3100F40	●	2	105	123	188	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL3100F40	●	2	136	154	219	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
32.0	2	TAFS3200F40	●	2	77	94	159	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM3200F40	●	2	109	126	191	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL3200F40	●	2	141	158	223	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
33.0	2	TAFS3300F40	●	2	79	96	161	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM3300F40	●	2	112	129	194	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL3300F40	●	2	145	162	227	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
34.0	2	TAFS3400F40	●	2	82	98	163	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	3	TAFM3400F40	●	2	116	132	197	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
	4	TAFL3400F40	●	2	150	166	231	40	50	PT1/4	GPMT11T308-U◌	TS4	TKY15D
35.0	2	TAFS3500F40	●	2	84	100	165	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM3500F40	●	2	119	135	200	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
36.0	2	TAFS3600F40	●	2	86	102	167	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM3600F40	●	2	122	138	203	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
37.0	2	TAFS3700F40	●	2	89	104	169	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM3700F40	●	2	126	141	206	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
38.0	2	TAFS3800F40	●	2	91	106	171	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM3800F40	●	2	129	144	209	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
39.0	2	TAFS3900F40	●	2	94	108	173	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM3900F40	●	2	133	147	212	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
40.0	2	TAFS4000F40	●	2	96	110	175	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4000F40	●	2	136	150	215	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
41.0	2	TAFS4100F40	●	2	98	112	177	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4100F40	●	2	139	153	218	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
42.0	2	TAFS4200F40	●	2	101	114	179	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4200F40	●	2	143	156	221	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
43.0	2	TAFS4300F40	●	2	103	116	181	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4300F40	●	2	146	159	224	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
44.0	2	TAFS4400F40	●	2	106	118	183	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4400F40	●	2	150	162	227	40	50	PT1/4	GPMT140408-U◌	TS55	TKY25D
45.0	2	TAFS4500F40	●	2	108	120	185	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4500F40	●	2	153	165	230	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
46.0	2	TAFS4600F40	●	2	110	122	187	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4600F40	●	2	156	168	233	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
47.0	2	TAFS4700F40	●	2	113	124	189	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4700F40	●	2	160	171	236	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
48.0	2	TAFS4800F40	●	2	115	126	191	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D
	3	TAFM4800F40	●	2	163	174	239	40	54	PT1/4	GPMT140408-U◌	TS55	TKY25D

● : Inventory maintained in Japan.

DC (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm) LU	LPR	OAL	DCON	DCSFMS	CNT	Insert Number	Clamp Screw	Wrench
49.0	2	TAFS4900F40	●	4	118	133	198	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM4900F40	●	4	167	182	247	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
50.0	2	TAFS5000F40	●	4	120	135	200	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5000F40	●	4	170	185	250	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
51.0	2	TAFS5100F40	●	4	122	137	202	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5100F40	●	4	173	188	253	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
52.0	2	TAFS5200F40	●	4	125	139	204	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5200F40	●	4	177	191	256	40	58	PT1/4	GPMT090304-U◌	TS3	TKY08F
53.0	2	TAFS5300F40	●	4	127	141	206	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5300F40	●	4	180	194	259	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
54.0	2	TAFS5400F40	●	4	128	143	208	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5400F40	●	4	182	197	262	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
55.0	2	TAFS5500F40	●	4	130	145	210	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5500F40	●	4	185	200	265	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
56.0	2	TAFS5600F40	●	4	132	147	212	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F
	3	TAFM5600F40	●	4	188	203	268	40	63	PT1/4	GPMT090304-U◌	TS3	TKY08F

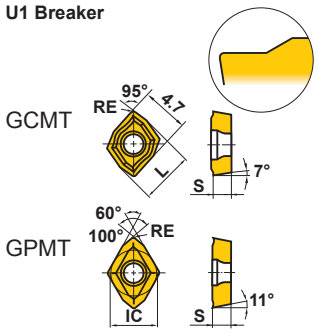
INSERT DESCRIPTION ➢ N244
CUTTING CONDITIONS ➢ N245
USAGE NOTE ➢ N248
TECHNICAL DATA ➢ Q001

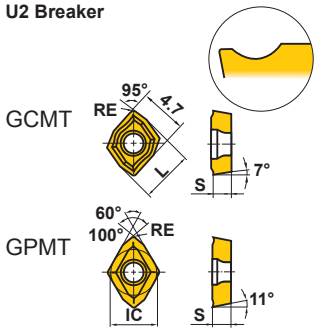
DRILLING(INDEXABLE TYPE)

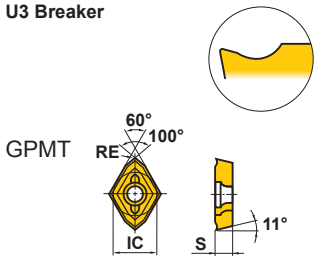
TAFS/TAFM/TAFL

INSERTS

Geometry	Drill Dia.	Insert Number	Dimensions (mm) IC	L	S	RE	Stock VP15TF	UP20M	GP20M	UE6020	US735
U1 Breaker	ø12—ø14.5	GCMT040204-U1	–	5.0	2.38	0.4		●			
	ø15—ø17.5	GPMT060204-U1	5.56	–	2.38	0.4		●		●	
	ø18—ø22.5	GPMT070204-U1	6.35	–	2.38	0.4		●		●	
	ø23—ø27.5 ø49—ø56	GPMT090304-U1	7.94	–	3.18	0.4		●		●	
	ø28—ø34	GPMT11T308-U1	9.525	–	3.97	0.8		●		●	
	ø35—ø48	GPMT140408-U1	12.70	–	4.76	0.8		●		●	
U2 Breaker	ø12—ø14.5	GCMT040204-U2	–	5.0	2.38	0.4	●		●		
	ø15—ø17.5	GPMT060204-U2	5.56	–	2.38	0.4	●	●		●	●
	ø18—ø22.5	GPMT070204-U2	6.35	–	2.38	0.4	●	●		●	●
	ø23—ø27.5 ø49—ø56	GPMT090304-U2	7.94	–	3.18	0.4	●	●		●	●
	ø28—ø34	GPMT11T308-U2	9.525	–	3.97	0.8	●	●		●	●
	ø35—ø48	GPMT140408-U2	12.70		4.76	0.8	●	●		●	●
U3 Breaker	ø15—ø17.5	GPMT060204-U3	5.56	–	2.38	0.4		●		●	●
	ø18—ø22.5	GPMT070204-U3	6.35	–	2.38	0.4		●		●	●
	ø23—ø27.5 ø49—ø56	GPMT090304-U3	7.94	–	3.18	0.4		●		●	●
	ø28—ø34	GPMT11T308-U3	9.525	–	3.97	0.8		●		●	●
	ø35—ø48	GPMT140408-U3	12.70	–	4.76	0.8		●		●	●







INSERT RECOMMENDATION

CHIP BREAKER RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Work Material / Breaker	P Mild Steel GCMT	P Mild Steel GPMT	P Carbon Steel GCMT	P Carbon Steel GPMT	P Alloy Steel GCMT	P Alloy Steel GPMT	M Stainless Steel GCMT	M Stainless Steel GPMT	K Gray Cast Iron GCMT	K Gray Cast Iron GPMT	K Ductile Cast Iron GCMT	K Ductile Cast Iron GPMT
U1	◎	◎	○	○	○	○	○	○	○	○	○	○
U2	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
U3		○		○		○		○		○		○

INSERT GRADE RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

Work Material / Grade	P Mild Steel GCMT	P Mild Steel GPMT	P Carbon Steel GCMT	P Carbon Steel GPMT	P Alloy Steel GCMT	P Alloy Steel GPMT	M Stainless Steel GCMT	M Stainless Steel GPMT	K Gray Cast Iron GCMT	K Gray Cast Iron GPMT	K Ductile Cast Iron GCMT	K Ductile Cast Iron GPMT
VP15TF		○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
UP20M	◎	◎	○	○	○	○	○	○	○	○	○	○
GP20M	○		○		○		○		○		○	
UE6020		○		○		○		○		○		○
US735		○		○		○		○		○		○

● : Inventory maintained in Japan. (1 insert in one case)

RECOMMENDED CUTTING CONDITIONS

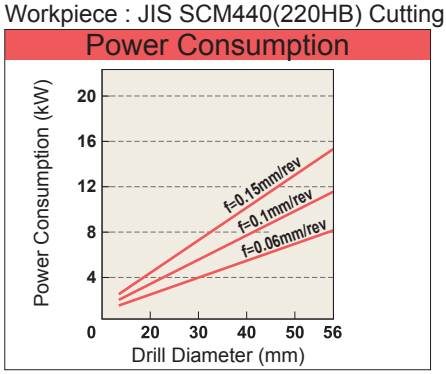
	Work Material	Hardness	Cutting Speed (m/min) For l/d=2,3 (ϕ12–ϕ14.5)	Cutting Speed (m/min) For l/d=2,3 (ϕ15–)	Cutting Speed (m/min) For l/d=4 (ϕ16–)	Breaker	Feed (mm/rev) Drill Diameter (mm) ϕ12–ϕ14.5	ϕ15–ϕ22.5	ϕ23–ϕ34	ϕ35–ϕ48	ϕ49–ϕ56
P	Mild Steel	≤180HB	150 (100–200)	200 (150–300)	140 (100–200)	U1	0.06 (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) When using drills for l/d= 4, the feed should be reduced to 80% of the above recommendations.

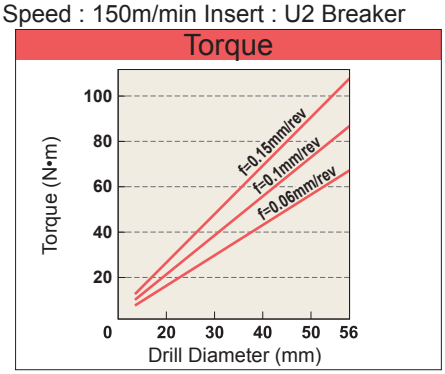
CUTTING RESISTANCE

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

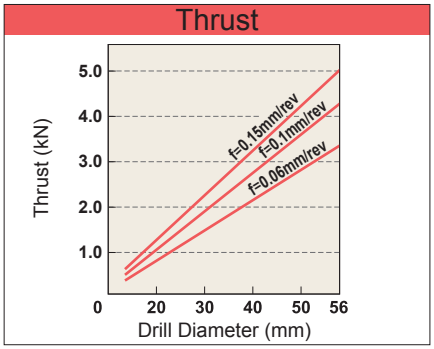
Power Consumption



Torque



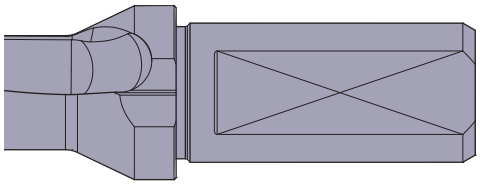
Thrust

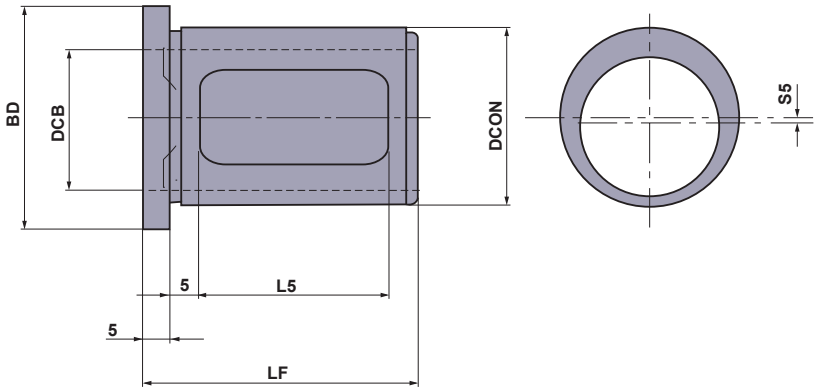


USAGE NOTE ➤ N248
TECHNICAL DATA ➤ Q001

JUST FIT SLEEVE [JFS]

- A sleve designed to improve the performance of MVX/TAF drills, allowing the cutting diameter to be increased in increments of 0.1mm
- 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)





*Increase : Size of the increase in the cutting diameter.

Set Order Number	Individual Order Number	Stock	Dimensions (mm)					*Increase (S5×2)	Suitable MVX Type Drill TAF Type Drill
			BD	DCON	DCB	LF	L5		
JFS-1	JFS2520-10	●	33	25	20	43	30	0.10	MVX1700 X ◌F20 TAFS/M/L1200F20 ~ TAFS/M/L1550F20
	JFS2520-20	●	33	25	20	43	30	0.20	
	JFS2520-30	●	33	25	20	43	30	0.30	
	JFS2520-40	●	33	25	20	43	30	0.40	
	JFS2520-50	●	33	25	20	43	30	0.50	
JFS-2	JFS3225-10	●	40	32	25	50	34	0.10	MVX1750 X ◌F25 ~ MVX2550 X ◌F25 TAFS/M/L1600F25 ~ TAFS/M/L2450F25
	JFS3225-20	●	40	32	25	50	34	0.20	
	JFS3225-30	●	40	32	25	50	34	0.30	
	JFS3225-40	●	40	32	25	50	34	0.40	
	JFS3225-50	●	40	32	25	50	34	0.50	
JFS-3	JFS4032-10	●	48	40	32	55	40	0.10	MVX2600 X ◌F32 ~ MVX3050 X ◌F32 TAFS/M/L2500F32 ~ TAFS/M/L2950F32
	JFS4032-20	●	48	40	32	55	40	0.20	
	JFS4032-30	●	48	40	32	55	40	0.30	
	JFS4032-40	●	48	40	32	55	40	0.40	
	JFS4032-50	●	48	40	32	55	40	0.50	

(Note) Cannot be used for shank diameter Ø40.

GUIDELINE FOR SELECTING A JUST FIT SLEEVE

Desired = (Drillϕ+ Increase of JFS) + 0.1mm

(Eg.) Desired diameter is 20.3mm (oversize is taken as 0.1mm).

ø20.3=(MVX2000 X ◌F25+JFS3225-20)+0.1

- MVX2000 X ◌F25 → 20mm Drill
- JFS3225-20 → Using JFS an Increase of 0.2mm.
- 0.1 → Oversize

<Tool Selected>
Drill : **MVX2000 X ◌F25**
JUST FIT SLEEVE [JFS]
: **JFS3225-20**

(Note) 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. When placing an order, please use the set order number. (5 sleeves/set)

●Purchasing Method 2
It is possible to order individually. When placing an order, please use the individual order number.

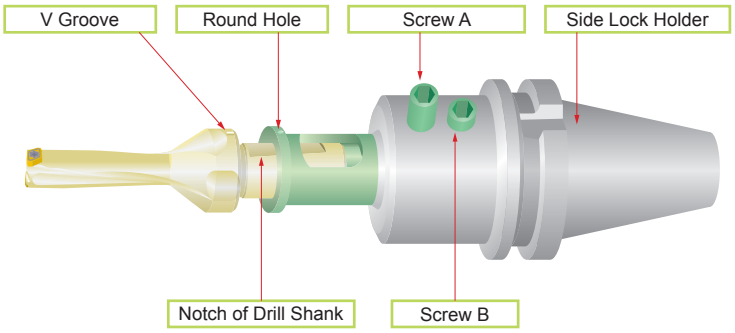
● : Inventory maintained in Japan.

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 screws 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.

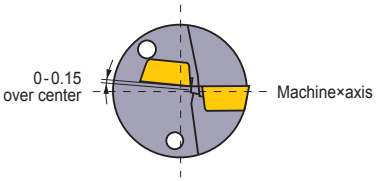


APPLICATION OF MVX TYPE DRILL

●Use on a Lathe

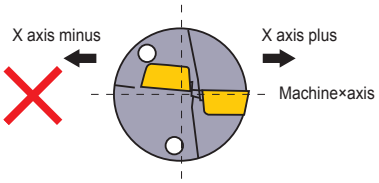
(1)The outer insert and machine X axis must be set parallel. The drill is designed so that when the drill center and the machine spindle center are aligned then the inner insert height is 0-0.15mm lower.

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

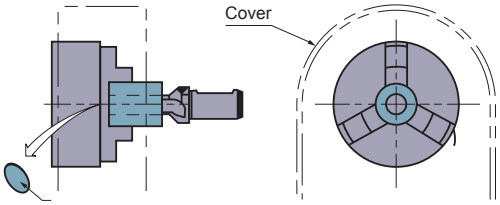


(2)By off setting it is possible to adjust the hole diameter. To do this adjust in the positive X axis direction (hole oversize direction). For the amount of possible adjustment please refer to the dimensions list.

*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.



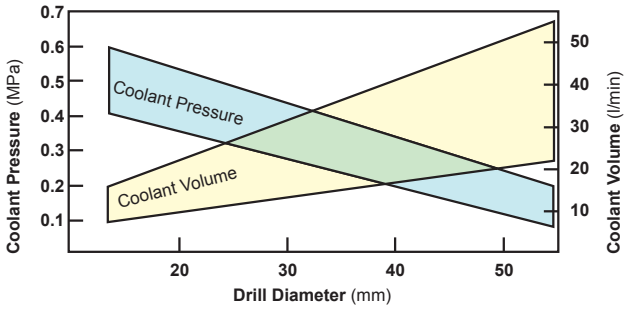
JUST FIT SLEEVE [JFS]

APPLICATION OF TAF TYPE DRILL

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

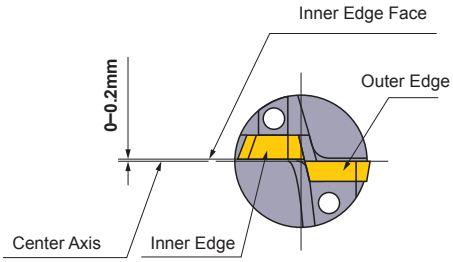
●Refer to the following graph on the right for coolant pressure and volume. Coolant is an important factor in the efficient use of these drills.

●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.

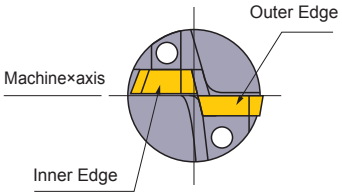


●Use on a Lathe

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

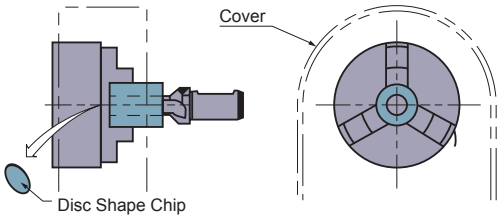


(2)To adjust the hole diameter by off-setting the drill, the outer cutting edge and machine axis must be set parallel.



(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.

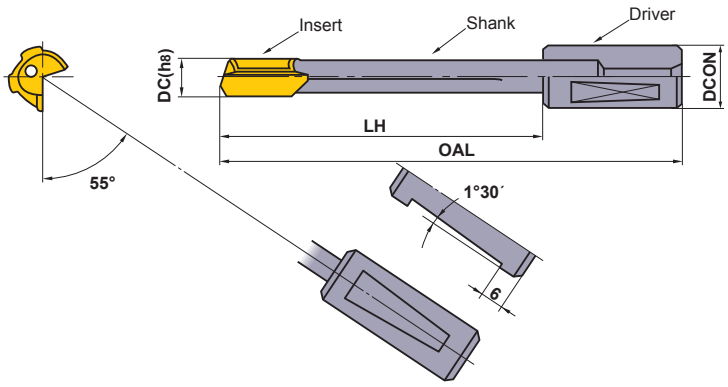
(4)When through hole drilling on a lathe the disc produced by the drill exiting the workpiece may be expelled at high velocity.
To reduce the danger of injury or damage a cover guard is highly recommended.



GUN DRILL

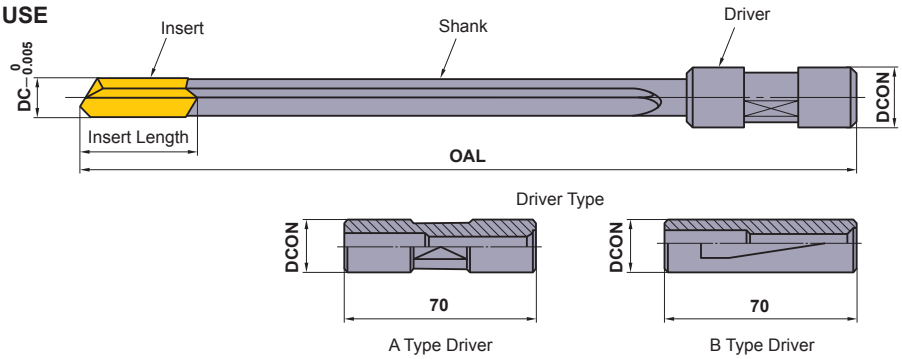
●GUN DRILL FOR MACHINING CENTER

- ●Suitable for deep hole drilling on Machining Center.
- ●Drill Diameter :ϕ6.0—ϕ20.0



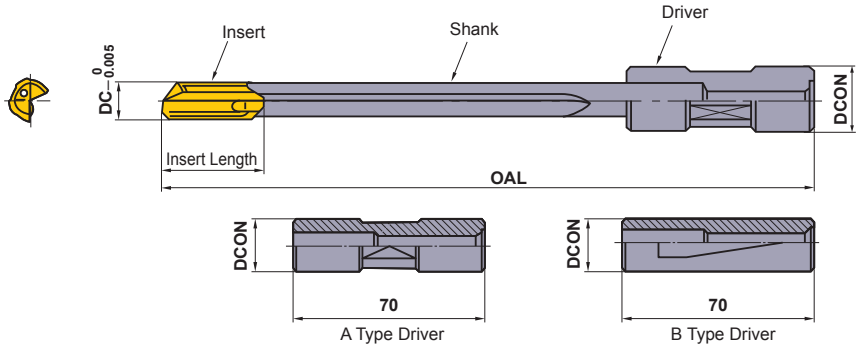
●GUN DRILL FOR GENERAL USE

- ●Suitable for deep hole drilling.
- ●Drill Diameter : ϕ2.0—ϕ30.3



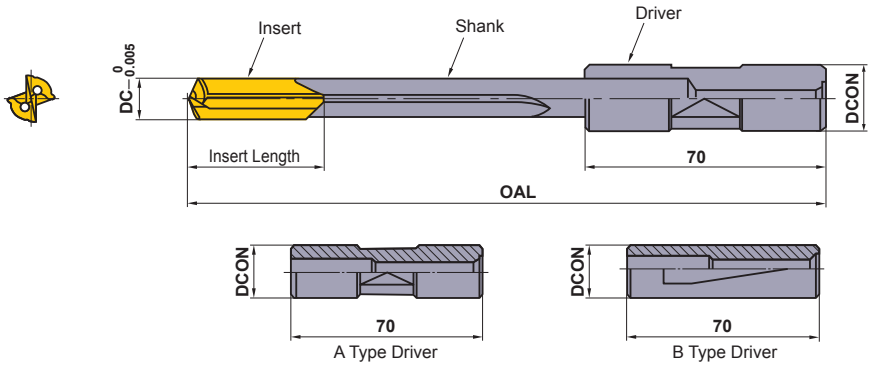
●SAMMIKA GUN DRILL

- ●The unique uneven cutting edge shape displays excellent chip dividing and enables high feed machining.
- ●Drill Diameter : ϕ5.0—ϕ30.3



●ARROW JET GUN DRILL

- ●Excellent chip discharge due to the double-tooth design and chip breaker.
- ●Drill Diameter : ϕ6.0—ϕ30.0



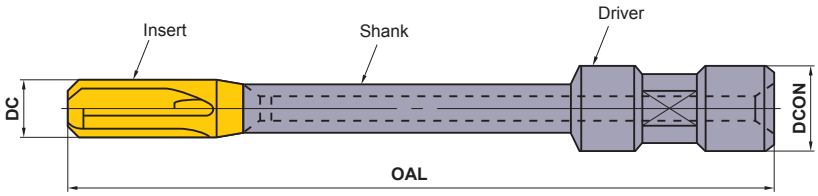
■ORDERING METHOD

Please specify the following when ordering.
①Drill Name ②Diameter of Drill (DC) ③Length of Drill (OAL) ④Outside Diameter of Driver (DCON) and Type ⑤Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)
e.g.) General Gun Drill ϕ8 x 500 x ϕ19.5 A type Driver, SCM440(250HB) x $\phi 8^{\pm 0.020}$ 300 x Through Hole

GUN REAMER

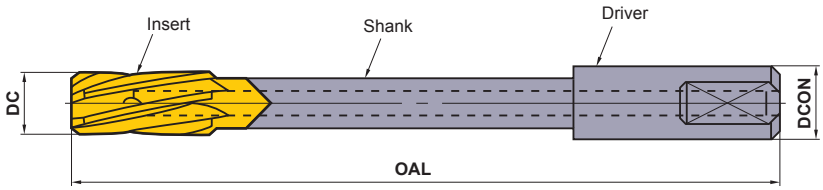
●Straight Reamer Type

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



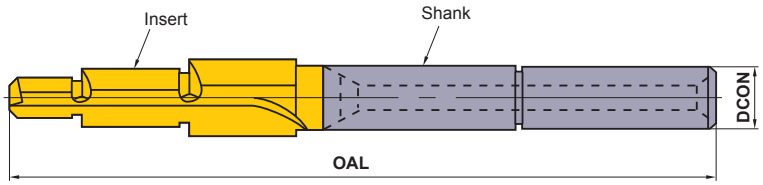
●Spiral Reamer Type

●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

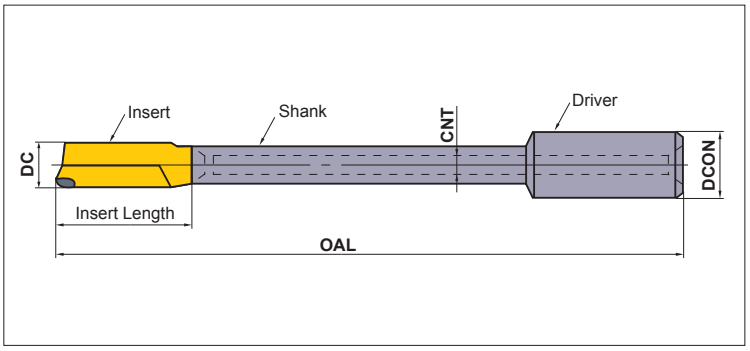


■ORDERING METHOD

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

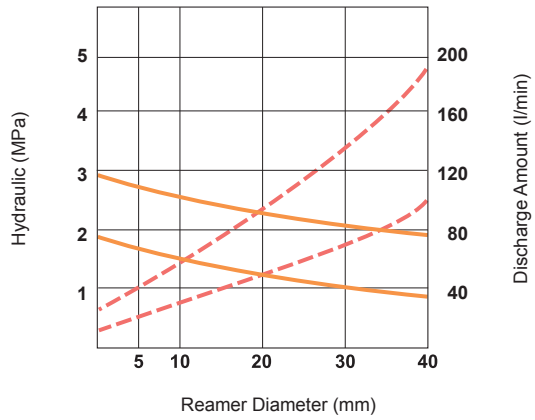
*Please contact us for any geometry (different diameter of reamer, insert length, tool length, number of teeth) that is not in this list.

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

Work Material	Cutting Speed (m/min)	Feed (mm/rev)		
		ø5 − ø10	ø10 − ø20	ø25 − ø30
Aluminium Alloy	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

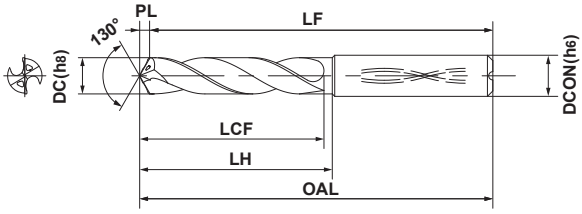
CVD DIAMOND COATED DRILLS

MCS
For CFRP

- For high accuracy and efficient drilling of CFRP.
- Unique diamond coating produces excellent wear resistance and smooth hole surface.

CFRP	CFRP with Aluminium stack	CFRP/Titanium Alloy stacks
◎	◎	

	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
	0 −0.018	0 −0.022	0 −0.027	0 −0.033
h6	0 −0.008	0 −0.009	0 −0.011	0 −0.013



Internal Coolant

DC (inch)	DC (mm)	Hole Depth (l/d)	Stock DD2010	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON
.1719	4.366	3	●	MCS01719X3DB	24.0	29.0	66.0	65	1.0	6
.1915	4.864	3	●	MCS01915X3DB	28.1	29.1	66.1	65	1.1	6
.2510	6.375	3	●	MCS02510X3DB	34.5	42.5	79.5	78	1.5	8
.3125	7.938	3	●	MCS03125X3DB	41.9	42.9	79.9	78	1.9	8
.3760	9.550	3	●	MCS03760X3DB	47.2	48.2	89.2	87	2.2	10
.3765	9.563	3	●	MCS03765X3DB	47.2	48.2	89.2	87	2.2	10
.4380	11.125	3	●	MCS04380X3DB	55.6	56.6	102.6	100	2.6	12
.5010	12.725	3	●	MCS05010X3DB	61.0	62.0	108.0	105	3.0	14

(Note 1) MCS drills are suitable for use with shrink fit holders.
(Note 2) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

For non stocked sizes please enter details into the □ below.
Please contact us for details of any geometry that is not mentioned.
*Recommended carbide grade TF15 for CFRP/titanium stacks.

Order number of straight type

MC□ □□□□ X□D □□□

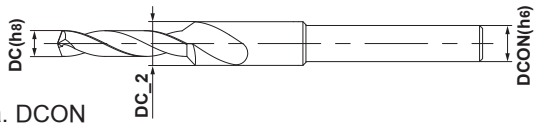
- Coolant: S : Int. / E : Ext.
- Drill Dia. DC: Size range : 0300-2000 *Minimum diameter with internal coolant is ϕ4mm (ϕ.1575").
- Hole Depth (l/d): Size range : 2-5
- Shank Dia. DCON: Size range : 030-200

Size range of drill dia. : ϕ3mm-ϕ20mm
Size range of shank dia. : ϕ3mm -ϕ20mm
For cutting dia DC - Please indicate with 4 digits
E.g. ϕ3mm - 0300
For shank dia DCON - Please use 3 digits
E.g. ϕ12mm - 120
*For inch sizes please convert to metric (1"= 25.4mm)
ex. : ø.3760"→ø9.550mm→0955

Order number of stepped type

MC□ □□□□ X□□□□ X□D □□□

- Coolant: S : Int. / E :Ext.
- Drill Dia. DC: Size range : 0300-2000 *Minimum diameter with internal coolant is ϕ4mm (ϕ.1575").
- Stepped Drill Dia. DC_2
- Hole Depth (l/d): Size range : 2-5
- Shank Dia. DCON: Size range : 030-200



● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

DD2010

Work material		CFRP				CFRP with Aluminium stack			
Dia. DC (inch)	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)
.1719	**4.366**	85	6100	0.04 (0.03—0.08)	240	55	4000	0.04 (0.03—0.06)	160
.1915	**4.864**	85	5500	0.04 (0.03—0.08)	220	55	3500	0.04 (0.03—0.06)	140
.251	**6.375**	95	4700	0.05 (0.03—0.10)	235	65	3200	0.05 (0.03—0.07)	160
.3125	**7.938**	95	3800	0.05 (0.03—0.10)	190	65	2600	0.05 (0.03—0.07)	130
.376	**9.55**	95	3100	0.07 (0.04—0.12)	215	65	2100	0.06 (0.04—0.08)	125
.3765	**9.563**	95	3100	0.07 (0.04—0.12)	215	65	2100	0.06 (0.04—0.08)	125
.438	**11.125**	100	2800	0.1 (0.05—0.15)	280	70	2000	0.07 (0.05—0.10)	140
.501	**12.725**	100	2500	0.1 (0.05—0.15)	250	70	1700	0.08 (0.05—0.12)	135

TF15

Work material		CFRP with Titanium alloy stack			
Dia. DC (inch)	Dia. DC (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (min.–max.) (mm/rev)	Table Feed (mm/min)
.1719	**4.366**	8	500	0.03 (0.02—0.04)	15
.1915	**4.864**	8	500	0.03 (0.02—0.04)	15
.251	**6.375**	8	300	0.03 (0.02—0.04)	5
.3125	**7.938**	8	300	0.03 (0.02—0.04)	5
.376	**9.55**	10	300	0.04 (0.03—0.05)	10
.3765	**9.563**	10	300	0.04 (0.03—0.05)	10
.438	**11.125**	10	200	0.04 (0.03—0.05)	5
.501	**12.725**	10	200	0.04 (0.03—0.05)	5

CVD DIAMOND COATED DRILLS

DCSSS

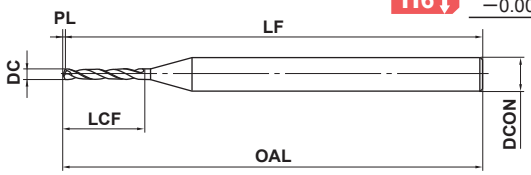
Short, For non-ferrous material

UWC | DC | 130° DC<1.5 | 135° DC≥1.5 | X Thinning DC≥1.5

P | M | K | **N** Non-ferrous Metal | S | H

0.2≤DC≤2

h6 $^{0}_{-0.014}$ $^{0}_{-0.006}$



● The original CVD diamond coating technology provides excellent adhesion for coating layer and enables stable drilling without peeling or chipping.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
DCSSSD0020	0.2	2.05	38.05	38	0.05	3	●
DCSSSD0030	0.3	3.07	38.07	38	0.07	3	●
DCSSSD0040	0.4	4.09	38.09	38	0.09	3	●
DCSSSD0050	0.5	4.12	38.12	38	0.12	3	●
DCSSSD0060	0.6	5.14	38.14	38	0.14	3	●
DCSSSD0070	0.7	5.16	38.16	38	0.16	3	●
DCSSSD0080	0.8	6.19	38.19	38	0.19	3	●
DCSSSD0090	0.9	6.21	38.21	38	0.21	3	●
DCSSSD0100	1.0	8.2	38.2	38	0.2	3	●
DCSSSD0110	1.1	8.3	38.3	38	0.3	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
DCSSSD0120	1.2	8.3	38.3	38	0.3	3	●
DCSSSD0130	1.3	8.3	38.3	38	0.3	3	●
DCSSSD0140	1.4	8.3	38.3	38	0.3	3	●
DCSSSD0150	1.5	10.3	45.3	45	0.3	3	●
DCSSSD0160	1.6	10.3	45.3	45	0.3	3	●
DCSSSD0170	1.7	10.4	45.4	45	0.4	3	●
DCSSSD0180	1.8	10.4	45.4	45	0.4	3	●
DCSSSD0190	1.9	10.4	45.4	45	0.4	3	●
DCSSSD0200	2.0	12.4	45.4	45	0.4	3	●

DCSSM

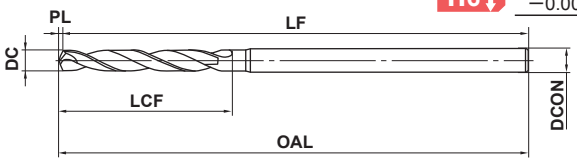
Medium, For non-ferrous material

UWC | DC | 135° | X Thinning

P | M | K | **N** Non-ferrous Metal | S | H

2.1≤DC≤3

h6 $^{0}_{-0.014}$ $^{0}_{-0.006}$



● The original CVD diamond coating technology provides excellent adhesion for coating layer and enables stable drilling without peeling or chipping.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
DCSSMD0210	2.1	17.4	60.4	60	0.4	3	●
DCSSMD0220	2.2	17.5	60.5	60	0.5	3	●
DCSSMD0230	2.3	17.5	60.5	60	0.5	3	●
DCSSMD0240	2.4	17.5	60.5	60	0.5	3	●
DCSSMD0250	2.5	21.5	60.5	60	0.5	3	●

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
DCSSMD0260	2.6	21.5	60.5	60	0.5	3	●
DCSSMD0270	2.7	21.6	60.6	60	0.6	3	●
DCSSMD0280	2.8	21.6	60.6	60	0.6	3	●
DCSSMD0290	2.9	21.6	60.6	60	0.6	3	●
DCSSMD0300	3.0	21.6	60.6	60	0.6	3	●

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work Material	Aluminium alloy		Aluminium alloy		Copper Copper alloy		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

1) When drilling very hard work materials, reduce the feed.
2) Use water soluble coolant or grinding fluid when working.
3) When drilling deep holes, moderate the cutting conditions.
4) The revolution can be increased by using a high speed spindle.

DCBSS

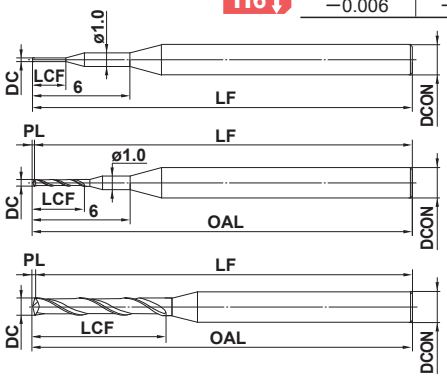
Drill for hard brittle materials

166° DC≥0.07 UWC DC

P M K **N** S H

Non-ferrous Metal

	0.05≤DC<0.2	0.2≤DC≤3
	0 −0.009	0 −0.014
h6	0 −0.006	0 −0.006



● For machining materials such as sintered ceramics and quartz glass that cannot be machined with conventional drills.

Unit : mm

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock	Type	Short Delivery
DCBSSD0005	0.05	(0.5)	—	38	—	3	□	1	◎
DCBSSD0006	0.06	(0.6)	—	38	—	3	□	1	
DCBSSD0007	0.07	0.704	38.004	38	0.004	3	□	2	◎
DCBSSD0008	0.08	0.805	38.005	38	0.005	3	□	2	◎
DCBSSD0009	0.09	0.906	38.006	38	0.006	3	□	2	◎
DCBSSD0010	0.10	1.01	38.01	38	0.01	3	●	2	
DCBSSD0011	0.11	1.21	38.01	38	0.01	3	●	2	
DCBSSD0012	0.12	1.41	38.01	38	0.01	3	●	2	
DCBSSD0013	0.13	1.51	38.01	38	0.01	3	●	2	
DCBSSD0014	0.14	1.51	38.01	38	0.01	3	●	2	
DCBSSD0015	0.15	1.51	38.01	38	0.01	3	●	2	
DCBSSD0016	0.16	1.51	38.01	38	0.01	3	●	2	
DCBSSD0017	0.17	1.51	38.01	38	0.01	3	●	2	
DCBSSD0018	0.18	1.51	38.01	38	0.01	3	●	2	
DCBSSD0019	0.19	1.51	38.01	38	0.01	3	●	2	
DCBSSD0020	0.20	2.01	38.01	38	0.01	3	●	3	
DCBSSD0021	0.21	2.01	38.01	38	0.01	3	□	3	◎
DCBSSD0022	0.22	2.01	38.01	38	0.01	3	□	3	◎
DCBSSD0023	0.23	2.01	38.01	38	0.01	3	□	3	◎
DCBSSD0024	0.24	2.01	38.01	38	0.01	3	□	3	◎
DCBSSD0025	0.25	2.52	38.02	38	0.02	3	●	3	
DCBSSD0026	0.26	2.52	38.02	38	0.02	3	□	3	◎
DCBSSD0027	0.27	2.52	38.02	38	0.02	3	□	3	◎
DCBSSD0028	0.28	2.52	38.02	38	0.02	3	□	3	◎
DCBSSD0029	0.29	2.52	38.02	38	0.02	3	□	3	◎
DCBSSD0030	0.30	3.02	38.02	38	0.02	3	●	3	
DCBSSD0031	0.31	3.02	38.02	38	0.02	3	□	3	◎
DCBSSD0032	0.32	3.02	38.02	38	0.02	3	□	3	◎
DCBSSD0033	0.33	3.02	38.02	38	0.02	3	□	3	◎
DCBSSD0034	0.34	3.52	38.02	38	0.02	3	□	3	◎
DCBSSD0035	0.35	3.52	38.02	38	0.02	3	●	3	
DCBSSD0036	0.36	3.52	38.02	38	0.02	3	□	3	◎

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock	Type	Short Delivery
DCBSSD0040	0.40	4.02	38.02	38	0.02	3	●	3	
DCBSSD0045	0.45	4.03	38.03	38	0.03	3	□	3	◎
DCBSSD0050	0.50	4.03	38.03	38	0.03	3	●	3	
DCBSSD0055	0.55	4.53	38.03	38	0.03	3	□	3	◎
DCBSSD0060	0.60	5.04	38.04	38	0.04	3	●	3	
DCBSSD0070	0.70	5.04	38.04	38	0.04	3	●	3	
DCBSSD0080	0.80	6.05	38.05	38	0.05	3	●	3	
DCBSSD0085	0.85	6.05	38.05	38	0.05	3	□	3	◎
DCBSSD0090	0.90	6.06	38.06	38	0.06	3	●	3	
DCBSSD0100	1.00	8.1	38.1	38	0.1	3	●	3	
DCBSSD0110	1.10	8.1	38.1	38	0.1	3	●	3	
DCBSSD0120	1.20	8.1	38.1	38	0.1	3	●	3	
DCBSSD0130	1.30	8.1	38.1	38	0.1	3	●	3	
DCBSSD0140	1.40	8.1	38.1	38	0.1	3	●	3	
DCBSSD0150	1.50	10.1	38.1	38	0.1	3	●	3	
DCBSSD0160	1.60	10.1	38.1	38	0.1	3	●	3	
DCBSSD0170	1.70	10.1	38.1	38	0.1	3	●	3	
DCBSSD0180	1.80	10.1	38.1	38	0.1	3	●	3	
DCBSSD0190	1.90	10.1	38.1	38	0.1	3	●	3	
DCBSSD0200	2.00	12.1	38.1	38	0.1	3	●	3	
DCBSSD0210	2.10	12.1	38.1	38	0.1	3	□	3	◎
DCBSSD0220	2.20	12.1	38.1	38	0.1	3	□	3	◎
DCBSSD0230	2.30	12.1	38.1	38	0.1	3	□	3	
DCBSSD0240	2.40	12.2	38.2	38	0.2	3	□	3	◎
DCBSSD0250	2.50	12.2	38.2	38	0.2	3	●	3	
DCBSSD0260	2.60	12.2	38.2	38	0.2	3	□	3	
DCBSSD0270	2.70	12.2	38.2	38	0.2	3	□	3	
DCBSSD0280	2.80	12.2	38.2	38	0.2	3	□	3	
DCBSSD0290	2.90	12.2	38.2	38	0.2	3	□	3	
DCBSSD0300	3.00	12.2	38.2	38	0.2	3	□	3	◎

(Note 1) Stock mark □(produced on order products) shows the basic sizes. Consult us, if different diameters and flute lengths.
(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.

RECOMMENDED CUTTING CONDITIONS

Work 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	20,000	0.000015	0.001	3	20,000	0.00001	0.001	3	20,000	0.00001	0.001
0.08	5	20,000	0.00003	0.003	5	20,000	0.00002	0.002	5	20,000	0.00002	0.001
0.1	6	20,000	0.0002	0.01	6	20,000	0.0001	0.005	6	20,000	0.0001	0.003
0.16	9	18,000	0.0002	0.01	9	18,000	0.0001	0.005	9	18,000	0.0001	0.003
0.2	9	15,000	0.0002	0.01	9	15,000	0.0001	0.005	9	15,000	0.0001	0.003
0.32	12	12,000	0.0002	0.01	12	12,000	0.0001	0.005	12	12,000	0.0001	0.003
0.4	15	12,000	0.0002	0.01	15	12,000	0.0001	0.005	15	12,000	0.0001	0.003
0.5	19	12,000	0.0002	0.01	19	12,000	0.0001	0.005	19	12,000	0.0001	0.003
0.6	19	10,000	0.0002	0.01	19	10,000	0.0001	0.005	19	10,000	0.0001	0.003
0.8	25	10,000	0.0002	0.01	25	10,000	0.0001	0.005	25	10,000	0.0001	0.003
1	31	10,000	0.0002	0.01	31	10,000	0.0001	0.005	31	10,000	0.0001	0.003
1.2	30	8,000	0.00025	0.01	30	8,000	0.00015	0.005	30	8,000	0.00015	0.003
1.6	40	8,000	0.0003	0.01	40	8,000	0.0002	0.005	40	8,000	0.0002	0.003
2	38	6,000	0.0003	0.01	38	6,000	0.0002	0.005	38	6,000	0.0002	0.003
3	47	5,000	0.0003	0.01	47	5,000	0.0003	0.005	47	5,000	0.0002	0.003

Work 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	20,000	0.000005	0.0005	3	20,000	0.000015	0.001
0.08	5	20,000	0.00001	0.001	5	20,000	0.00003	0.005
0.1	6	20,000	0.00005	0.002	6	20,000	0.0002	0.05
0.16	9	18,000	0.00005	0.002	9	18,000	0.0002	0.05
0.2	9	15,000	0.00005	0.002	9	15,000	0.0002	0.05
0.32	12	12,000	0.00005	0.002	12	12,000	0.0002	0.05
0.4	15	12,000	0.00005	0.002	15	12,000	0.0003	0.05
0.5	19	12,000	0.00005	0.002	19	12,000	0.0003	0.05
0.6	19	10,000	0.00005	0.002	19	10,000	0.0003	0.05
0.8	25	10,000	0.00005	0.002	25	10,000	0.0003	0.05
1	31	10,000	0.00005	0.002	31	10,000	0.0003	0.05
1.2	30	8,000	0.00007	0.002	30	8,000	0.0004	0.05
1.6	40	8,000	0.0001	0.002	40	8,000	0.0004	0.05
2	38	6,000	0.0001	0.002	38	6,000	0.0004	0.05
3	47	5,000	0.0001	0.002	47	5,000	0.0005	0.05

1) Depending on the type of machine, it is possible to apply cutting speeds over 20000min^{-1}.
2) Use water soluble coolant or grinding fluid when working.
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 feedrate per revolution to a suitable value with the recommended feedrate of the closest drill diameter as the standard.

Memo