

HOW TO READ THE STANDARD OF DRILLING TOOLS

● How this section page is organized

- ① Arranged 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

DRILLING(SOLID CARBIDE)

MVS NEW

● New grade DP120 offers long tool life for a wide range of work materials.
 ● Unique coolant supply technology, TiN coating offers high machining efficiency (up 90% over 6r)

Carbon Steel (Soft Steel)	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Aluminum
○	○	○	○	○	○

$D \leq 3$ $3 < D \leq 5$ $6 < D \leq 10$ $10 < D \leq 15$
 -0.014 -0.018 -0.022 -0.027
 0 0 0 0
 -0.006 -0.008 -0.009 -0.011

Drill Dia. Range (mm)	Stock	Order Number	Dimensions (mm)			Type	Drill Dia. Range (mm)	Stock	Order Number	Dimensions (mm)			Type
			Flute Length	Neck Length	Overall Length					Flute Length	Neck Length	Overall Length	
3.0	3 Int.	MVS0300X03S030	21	21	72	3	3 Int.	MVS0300X03S040	23	23	80	4	
	3 Int.	0300X03S060	21	24.2	72	6	3 Int.	0300X03S060	23	25.6	80	6	
	5 Int.	0300X05S030	28	28	81	3	5 Int.	0300X05S040	36	36	92	4	
	5 Int.	0300X05S060	28	31.2	81	6	5 Int.	0300X05S060	36	38.6	92	6	
	8 Int.	0300X08S030	35	35	91	3	8 Int.	0300X08S040	46	46	92	4	
	8 Int.	0300X08S060	35	38.2	91	6	8 Int.	0300X08S060	46	48.6	92	6	
3.1	3 Int.	0310X03S040	21	23	76	4	3 Int.	0370X03S040	23	23	80	4	
	3 Int.	0310X03S060	21	24.3	76	6	3 Int.	0370X03S060	23	25.5	80	6	
	5 Int.	0310X05S040	32	32	87	4	5 Int.	0370X05S040	36	36	92	4	
	5 Int.	0310X05S060	32	35.1	87	6	5 Int.	0370X05S060	36	38.5	92	6	
	8 Int.	0310X08S040	41	41	97	4	8 Int.	0370X08S040	46	46	92	4	
	8 Int.	0310X08S060	41	44.3	97	6	8 Int.	0370X08S060	46	48.5	92	6	
3.2	3 Int.	0320X03S040	21	23	76	4	3 Int.	0380X03S040	23	23	80	4	
	3 Int.	0320X03S060	21	24	76	6	3 Int.	0380X03S060	23	25.4	80	6	
	5 Int.	0320X05S040	32	32	87	4	5 Int.	0380X05S040	36	36	92	4	
	5 Int.	0320X05S060	32	35	87	6	5 Int.	0380X05S060	36	38.4	92	6	
	8 Int.	0320X08S040	41	41	97	4	8 Int.	0380X08S040	46	46	92	4	
	8 Int.	0320X08S060	41	44.4	97	6	8 Int.	0380X08S060	46	48.4	92	6	
3.3	3 Int.	0330X03S040	21	23	76	4	3 Int.	0390X03S040	23	23	80	4	
	3 Int.	0330X03S060	21	23.9	76	6	3 Int.	0390X03S060	23	25.3	80	6	
	5 Int.	0330X05S040	32	32	87	4	5 Int.	0390X05S040	36	36	92	4	
	5 Int.	0330X05S060	32	34.9	87	6	5 Int.	0390X05S060	36	38.3	92	6	
	8 Int.	0330X08S040	41	41	97	4	8 Int.	0390X08S040	46	46	92	4	
	8 Int.	0330X08S060	41	43.9	97	6	8 Int.	0390X08S060	46	48.3	92	6	
3.4	3 Int.	0340X03S040	21	23	76	4	3 Int.	0400X03S040	23	23	80	4	
	3 Int.	0340X03S060	21	23.8	76	6	3 Int.	0400X03S060	23	25.1	80	6	
	5 Int.	0340X05S040	32	32	87	4	5 Int.	0400X05S040	36	36	92	4	
	5 Int.	0340X05S060	32	34.8	87	6	5 Int.	0400X05S060	36	38.1	92	6	
	8 Int.	0340X08S040	41	41	97	4	8 Int.	0400X08S040	46	46	92	4	
	8 Int.	0340X08S060	41	43.8	97	6	8 Int.	0400X08S060	46	48.1	92	6	
3.5	3 Int.	0350X03S040	21	23	76	4	3 Int.	0410X03S050	25	25	86	5	
	3 Int.	0350X03S060	21	23.7	76	6	3 Int.	0410X03S060	25	27	86	6	
	5 Int.	0350X05S040	32	32	87	4	5 Int.	0410X05S050	40	40	100	5	
	5 Int.	0350X05S060	32	34.7	87	6	5 Int.	0410X05S060	40	42	100	6	
	8 Int.	0350X08S040	41	41	97	4	8 Int.	0410X08S050	52	52	100	5	
	8 Int.	0350X08S060	41	43.7	97	6	8 Int.	0410X08S060	52	54	100	6	

● Inventory maintained in Japan.

DIAMETER TOLERANCE GEOMETRY
 SUITABLE WORK MATERIALS

TAW

● Heavy cutting edge design for good chip control.
 ● Precision geometry for accurate insert location.

Carbon Steel (Soft Steel)	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Aluminum
○	○	○	○	○	○

(General Use)

HOLDERS

Drill Dia. Range (mm)	Holder Order Number	Dimensions (mm)				Wrench	Plate	Anti-rotate Lubricant	Insert Drill Dia. (mm)	Stock			
		Flute Length	Neck Length	Overall Length	Shank Dia.								
14.0	3 TAWSNH1400S16	▲	51	67	115	16	WS254012T	TKY08W	WPT440S	MK1KS	14.0	TAWNH1400T	▲
	5 TAWMNH1400S16	▲	80	97	145	16	WS254012T	TKY08W	WPT440S	MK1KS	14.1	TAWNH1400T	▲
	8 TAWLNH1400S16	▲	122	137	185	16	WS254012T	TKY08W	WPT440S	MK1KS	14.2	TAWNH1400T	▲
	3 TAWSNH1500S20	▲	54	75	125	20	WS254013T	TKY08W	WPT440S	MK1KS	14.3	TAWNH1400T	▲
	5 TAWMNH1500S20	▲	85	105	155	20	WS254013T	TKY08W	WPT440S	MK1KS	14.4	TAWNH1400T	▲
	8 TAWLNH1500S20	▲	130	148	198	20	WS254013T	TKY08W	WPT440S	MK1KS	14.5	TAWNH1400T	▲
15.5	3 TAWSN1600S20	▲	58	80	130	20	WS254014T	TKY08W	WPT440S	MK1KS	14.6	TAWNH1400T	▲
	5 TAWMNH1600S20	▲	91	115	165	20	WS254014T	TKY08W	WPT440S	MK1KS	14.7	TAWNH1400T	▲
	8 TAWLNH1600S20	▲	138	158	208	20	WS254014T	TKY08W	WPT440S	MK1KS	14.8	TAWNH1400T	▲
	3 TAWSN1400T	▲									14.9	TAWNH1400T	▲
	5 TAWMNH1400T	▲									15.0	TAWNH1400T	▲
	8 TAWLNH1400T	▲									15.1	TAWNH1400T	▲
15.5	3 TAWSN1500T	▲									15.2	TAWNH1400T	▲
	5 TAWMNH1500T	▲									15.3	TAWNH1400T	▲
	8 TAWLNH1500T	▲									15.4	TAWNH1400T	▲
	3 TAWSN1300T	▲									15.5	TAWNH1400T	▲
	5 TAWMNH1300T	▲									15.6	TAWNH1400T	▲
	8 TAWLNH1300T	▲									15.7	TAWNH1400T	▲
16.4	3 TAWSN1200T	▲									15.8	TAWNH1400T	▲
	5 TAWMNH1200T	▲									15.9	TAWNH1400T	▲
	8 TAWLNH1200T	▲									16.0	TAWNH1400T	▲
	3 TAWSN1100T	▲									16.1	TAWNH1400T	▲
	5 TAWMNH1100T	▲									16.2	TAWNH1400T	▲
	8 TAWLNH1100T	▲									16.3	TAWNH1400T	▲
16.4	3 TAWSN1000T	▲									16.4	TAWNH1400T	▲
	5 TAWMNH1000T	▲									16.5	TAWNH1400T	▲
	8 TAWLNH1000T	▲									16.6	TAWNH1400T	▲
	3 TAWSN900T	▲									16.7	TAWNH1400T	▲
	5 TAWMNH900T	▲									16.8	TAWNH1400T	▲
	8 TAWLNH900T	▲									16.9	TAWNH1400T	▲

(Note 1) The dimensions in brackets represent the sizes when TAWNH-J 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.
 ▲ To be replaced by new products.

INSERT DESCRIPTION > N206 USAGE NOTE > N209
 CUTTING CONDITIONS > N209 TECHNICAL DATA > Q001

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) ---	N053
WSTAR DRILLS (FOR MACHINING OF STAINLESS STEEL) ---	N060
WSTAR DRILLS (FOR MACHINING OF ALUMINIUM ALLOYS) ---	N067
WSTAR DRILLS (FOR DIE & MOULD MACHINING) ---	N075
MZE/MZS DRILLS	N086
MSE DRILLS	N101
SOLID GUN DRILL	N105
MIRACLE DRILLS	N108
MAE/MAS DRILLS	N110

High-Speed Steel Solid Type

Violet coated precision drills ---	N116
VIOLET DRILLS	N141
STRAIGHT SHANK DRILLS	N148
TAPER SHANK DRILLS	N160
TRIANGULAR SHANK DRILLS	N173

BRAZED TYPE

BRS/BRM/BRK DRILLS	N176
BRSB/BRB DRILLS (FOR BRIDGE CONSTRUCTION)	N182
BRA/BRL DRILLS	N184

Exchangeable head

TAW DRILLS	N190
-------------------------	------

INDEXABLE TYPE

MVX TYPE DRILLS	N213
TAF TYPE DRILLS	N217

GUN DRILL • GUN REAMER N226

Diamond coated drills
 N229 |

*Arranged by Alphabetical order

N173 3KD	N229 MCS	N125 VA-PDS-SUS
N184 BRA	N106 MGD	N109 VC-HSM
N183 BRB	N105 MGS	N108 VC-SSS
N180 BRK	N075 MHS	N141 V-SD
N186 BRL	N060 MMS	N143 V-TDS
N178 BRM	N067 MNS	
N182 BRMB	N053 MQS	
N176 BRS	N101 MSE	
N182 BRSB	N104 MSP	
N232 DC-BSS	N018 MVE	
N231 DC-SSM	N012 MVS	
N231 DC-SSS	N213 MVX	
N159 E-PSS	N044 MWE	
N145 G-SD	N022 MWS	
N160 G-TD	N086 MZE	
N171 G-TTD	N086 MZS	
N154 G-WSL	N147 SD	
N152 G-WSS	N190 STAW	
N167 G-WTS	N217 TAF	
N223 JFS	N199 TAW	
N150 KSD	N161 TD	
N165 KTD	N172 TTD	
N156 LSD	N121 VA-PDM	
N168 LTD	N131 VA-PDM-SUS	
N110 MAE	N116 VA-PDS	
N110 MAS	N138 VA-PDS-CB	

IDENTIFICATION

PRODUCT CODE OF DRILLS

MW	E	0300	S	A
Product name	Coolant	Diameter	l/d	Type of shank
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	E : External Coolant S : Internal Coolant	ex. 0050 → ϕ 0.5 0300 → ϕ 3.0	S : 2D M : 3D L : 5D (MAE, MAS : 6D) X : 12D X**D : **D	A : Straight shank B : Integral shank S*** : Shank Diameter (MV Series)

*Other special types can be ordered.

VC	S	S	S	D0300	***
Product name	Applications	Type of shank	Flute length	Diameter	Others
VC : Miracle drills DC : Diamond coated drills VA : Violet coated precision drills (High Grade, 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	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	S : Straight T : Taper 3K : Triangular 6K : Hexagonal	S : Short M : Medium L : Long	ex. D0050 → ϕ 0.5 D0300 → ϕ 3.0	A*** : Overall Length S** : Shank Diameter M* : M.T.No.

*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.



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











































































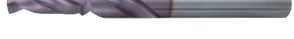







































Point angle
Indicates drill point angle the tip.

















DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material						Shape	Page Number	
								P	H	M	K	N	S		Dimensions	Cutting Conditions
								Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy			
Solid Drills	WSTAR DRILLS SERIES	New generation for general-purpose	MVE...X02 <small>NEW</small>	φ3.0 -φ12.0	2	External	○	⊙	○	⊙	○	○		N018	N021	
			MVE...X03 <small>NEW</small>		3	External	○	⊙	○	⊙	○	○				
			MVS...X03 <small>NEW</small>		3	Internal	○	⊙	⊙	○	○		N012	N017		
			MVS...X05 <small>NEW</small>		5	Internal	○	⊙	⊙	○	○					
			MVS...X08 <small>NEW</small>		8	Internal	○	⊙	⊙	○	○					
		For small Diameter	MWS...SB	φ0.5 -φ2.95	1	Internal	○	⊙	⊙	○	○		N022	N037		
			MWS...LB		5	Internal	○	⊙	⊙	○	○		N022	N038 N040		
			MWS...XB		12	Internal	○	⊙	⊙	○	○					
			MWS...X20DB	φ1.0 -φ2.95	20	Internal	○	⊙	⊙	○	○		N022	N039		
			MWS...X25DB		25	Internal	○	⊙	⊙	○	○					
			MWS...X30DB		30	Internal	○	⊙	⊙	○	○					
		General Drilling	MWE...SA/SB	φ3.0 -φ20.0	2	External	○	⊙	○	⊙	○	○		N044	N051	
			MWE...MA/MB		3	External	○	⊙	○	⊙	○	○				
			MWS...MB	φ3.0 -φ25.0	3	Internal	○	⊙	⊙	○	○		N022	N037		
			MWS...LB		5	Internal	○	⊙	⊙	○	○					
			MWS...X8DB		8	Internal	○	⊙	⊙	○	○					

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material						Shape	Page Number		
								P	H	M	K	N	S		Dimensions	Cutting Conditions	
								Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy				
Solid Drills	WSTAR DRILLS SERIES	For deep hole	MWS...X10DB	φ3.0 -φ14.0	10	Internal	○	◎		◎	◎	○	○		N022	N040	
			MWS...X15DB		15	Internal	○	◎		◎	◎	○	○				
			MWS...X20DB		20	Internal	○	◎		◎	◎	○	○				
			MWS...X25DB	25	Internal	○	◎		◎	◎	○	○					
			MWS...X30DB	30	Internal	○	◎		◎	◎	○	○					
		For Machining Of Steel And Cast Iron	MQS...X3DB	φ3.0 -φ20.0	3	Internal	○	◎			◎					N053	N057
			MQS...X5DB		5	Internal	○	◎			◎						
		For Machining Of Stainless Steel	MMS...X3DB	φ3.0 -φ20.0	3	Internal	○				◎					N060	N064
			MMS...X5DB		5	Internal	○				◎						
		For Machining Of Aluminium Alloys	MNS...LB	φ3.0 -φ14.0	5	Internal	-					◎				N067	N072
			MNS...X10DB		10	Internal	-					◎					
			MNS...X20DB		20	Internal	-					◎					
			MNS...X30DB		30	Internal	-					◎					
		For Oil & Multi Machining	MHS...L020B -L300B	φ0.95 -φ12.0	1 -30	Internal	○	○	◎	○			○			N075	N083
		DIAMOND COATED DRILLS	For CFRP	MCS	φ4.366 -φ12.725	3	Internal	○	For CFRP							N229	N230
For non-ferrous material	DC-SSS		φ0.2 -φ2.0	-	External	-						○			N231	N233	
	DC-SSM		φ2.1 -φ3.0	-	External	-						○			N231	N233	

DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material						Shape	Page Number	
								P	H	M	K	N	S		Dimensions	Cutting Conditions
								Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy			
Solid Drills	DIAMOND COATED DRILLS	For hard brittle materials	DC-BSS	φ0.05 -φ3.0	-	External	-	Hard brittle materials such as ceramics							N232	N233
	ZET1 DRILLS SERIES	General Drilling	MZE...SA/SB	φ1.0 -φ20.0	2	External									N086	N096
			MZE...MA	φ3.0 -φ20.0	3	External										
			MZS...MB	φ2.0 -φ20.0	3	Internal									N086	N096
			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									N095	N096
			MZE...MM	φ3.4 -φ10.3	3	External										
			MZS...SM	φ3.4 -φ10.3	2	Internal									N095	N096
			MZS...MM	φ3.4 -φ10.3	3	Internal										
		MIRACLE MINI STAR DRILL SERIES	For small Diameter	MSE...SB	φ0.1 -φ0.99	5 -12	External									N101
	MSP0300SB			-	-	External									N104	N104
	MGS GUN DRILL SERIES	Deep Hole Drilling	MGS...SB	φ0.7 -φ3.0	-100	Internal	-								N105	N106
	MIRACLE DRILLS SERIES	Hardened Steel	VC-SSS (3mm shank)	φ0.3 -φ2.4	5	External									N108	N108
			VC-HSM	φ2.5 -φ16.0	3	External									N109	N109

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material						Shape	Page Number		
								P	H	M	K	N	S		Dimensions	Cutting Conditions	
								Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy				
Solid Drills	MAE/MAS DRILLS SERIES	Aluminium Alloy, Cast Iron	MAE...MB	φ3.0 -φ16.0	3	External	-				○	◎		N110	N115		
			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	-	◎		○	◎	○		N190	N197		
			STAWSN		3	Internal	-	◎		○	◎	○					
			STAWMN		5	Internal	-	◎		○	◎	○					
			STAWLN		8	Internal	-	◎		○	◎	○					
		For Bridge Construction	TAWSN(H)	φ14.0 -φ30.4	3	Internal	-	◎		○	◎				N199	N209	
			TAWMN(H)		5	Internal	-	◎		○	◎						
			TAWLN(H)		8	Internal	-	◎		○	◎						
		Brazed Drills	BRS/BRM/BRK DRILLS	General Drilling	TAWSB	φ24.5 -φ26.7	3	Internal	-	◎						N210	N210
					TAWMB		5	Internal	-	◎							
BRS	3				Internal		-	◎		◎	○						
Brazed Drills	BRS/BRM/BRK DRILLS	General Drilling	BRM	φ14.0 -φ30.0	5	Internal	-	◎		◎	○			N176	N177		
			BRK		7	Internal	-	◎		○			N178	N179			
			BRK		7	Internal	-	◎		○			N180	N181			

DRILLS SELECTION CHART CEMENTED CARBIDE

Tool material	Drill Type (Series Title)	Applications	Product Code	Size Range	Hole Depth (l/d)	Coolant	Coating	Work Material						Shape	Page Number			
								P	H	M	K	N	S		Dimensions	Cutting Conditions		
								Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy					
Braze Drills	BRA/BRL DRILLS	For Bridge Construction	BRSB	φ24.5 -φ26.7	3	Internal	-	⊙								N183	N183	
			BRMB		5	Internal	-	⊙								N182	N183	
		General Drilling	BRA	φ8.0 -φ40.0	3	Internal	-	⊙		○	○						N184	N188
		General Drilling (For turning)	BRL		3	Internal	-	⊙		○	○						N186	N188
		For Bridge Construction	BRB	φ24.5 -φ26.7	3	Internal	-	⊙									N183	N183
	GUN DRILL	Ultra Deep Holes	-	φ2.0 -φ30.3	-	Internal	-	⊙		○	○	○					N226	-
	GUN REAMER	Ultra Deep Holes	-	φ6.0 -φ30.0	-	Internal	-	○		○	○	○					N227	-
GUN REAMER with Diamond Compound	Ultra Deep Holes	-	φ6.0 -φ30.3	-	Internal	-				⊙	⊙					N228	-	
Indexable Drills	MVX DRILLS SERIES	New generation for general-purpose	NEW MVX...X2	φ17.0 -φ33.0	2	Internal	-	⊙		○	⊙						N213	N216
			NEW MVX...X3		3	Internal	-	⊙		○	⊙							
			NEW MVX...X4		4	Internal	-	⊙		○	⊙							
			NEW MVX...X5		5	Internal	-	⊙		○	⊙							
			NEW MVX...X6		6	Internal	-	⊙		○	⊙							
	TAF DRILLS SERIES	General Drilling	TAFS	φ12.0 -φ56.0	2	Internal	-	⊙		⊙	⊙						N217	N222
			TAFM		3	Internal	-	⊙		⊙	⊙							
			T AFL	φ16.0 -φ34.0	4	Internal	-	⊙		⊙	⊙							

WSTAR DRILLS SERIES

SOLID CARBIDE

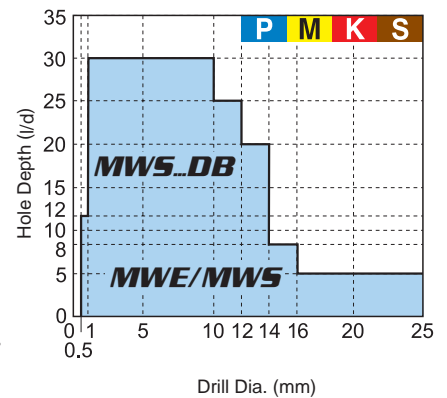
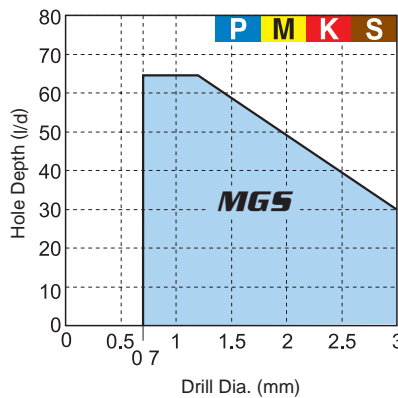
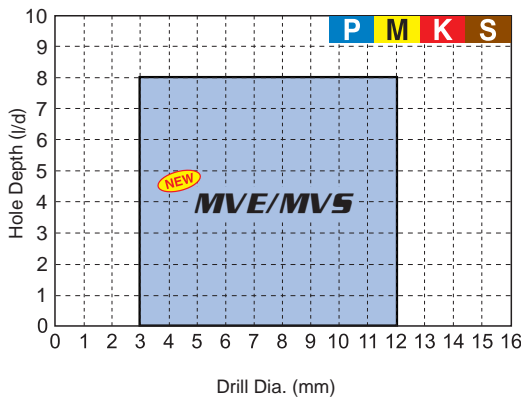
SOLID CARBIDE(For small diameter and deep hole)

SOLID CARBIDE (General Drilling)

MVE/MVS New generation for general-purpose

MGS

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



SOLID CARBIDE

SOLID CARBIDE

SOLID CARBIDE

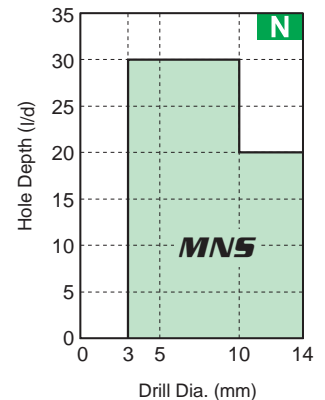
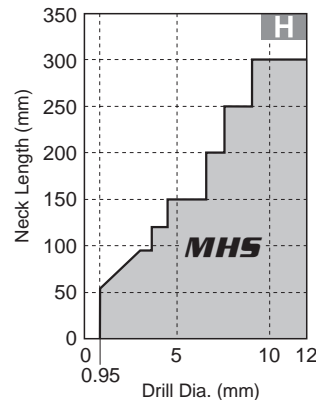
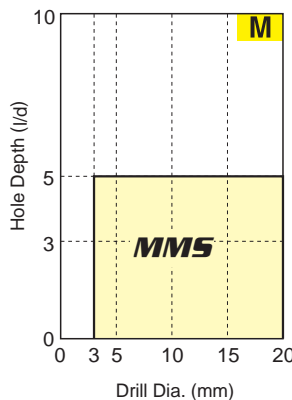
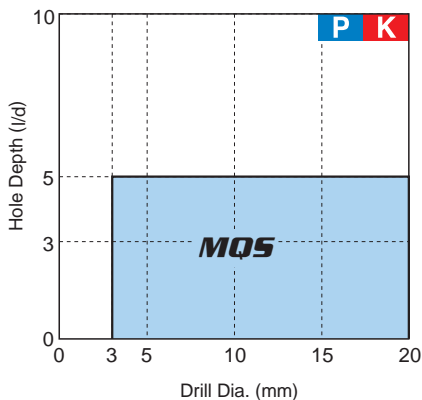
SOLID CARBIDE

MQS High-precision, Long tool life
Steel • For high feed cast iron machining

MMS Highly efficient drilling, Long tool life
For machining of stainless steel

MHS High-precision deep hole
For die & mould machining

MNS Highly efficient drilling
For machining of aluminium alloys



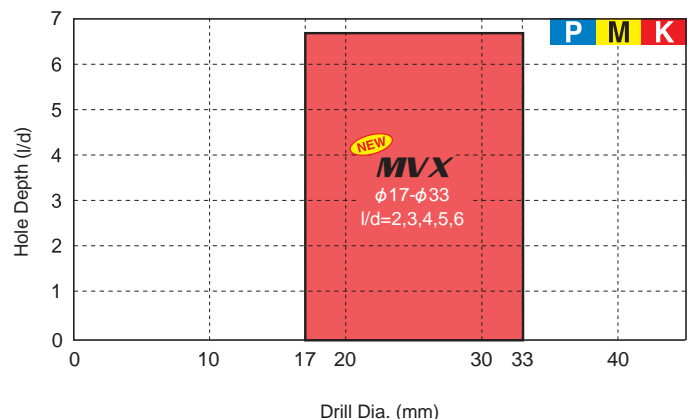
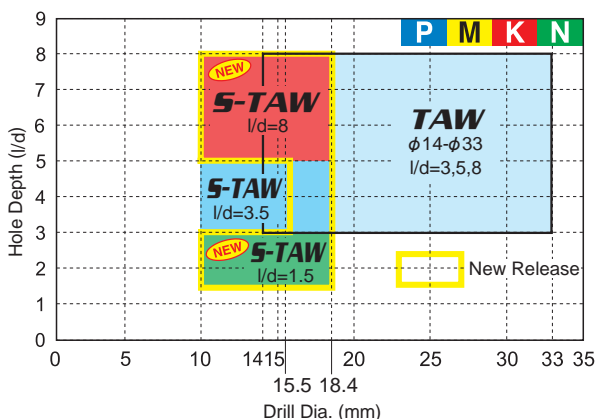
Indexable carbide drills

INDEXABLE HEAD

INDEXABLE TYPE

S-TAW, TAW













MVX



DRILLING

DRILLS SELECTION CHART

Drill Type (Series Title)	Applications	Product Code	Size Range	Tool material	Coolant	Coating	Work Material						Shape	Page Number		
							P	H	M	K	N	S		Dimensions	Cutting Conditions	
							Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy				
VIOLET COATED DRILLS	General, High Precision	VA-PDS	φ0.5 -φ13.0	High Grade, High Speed Steel	External	V	○		○	○					N116	N120
		VA-PDM	φ0.5 -φ32.0		External	V	○		○	○				N121	N124	
	General, High Precision Steel	VA-PDS-SUS	φ0.5 -φ20.0	Cobalt High Speed Steel	External	V	○		◎	○	○				N125	N137
		VA-PDM-SUS	φ0.5 -φ13.0		External	V	○		◎	○	○			N131	N137	
	Spot Milling	VA-PDS-CB	φ3.0 -φ32.0	High Grade, High Speed Steel	External	V	◎		○	○	○				N138	N140
VIOLET DRILL	General Drilling	V-SD	φ0.5 -φ13.0	High Speed Steel	External	V	◎		○	○					N141	N142
		V-TDS	φ6.0 -φ32.0		External	V	◎		◎	○				N143	N144	
STRAIGHT SHANK DRILL	General Drilling	G-SD	φ0.5 -φ13.0	High Speed Steel	External	G	◎		○	○	○				N145	N174
		SD	φ0.2 -φ17.5		External	-	◎		○	○	○			N147	N175	
		SD (1/100 Straight)	φ0.25 -φ5.95		External	-	◎		○	○	○			N149	N175	
		KSD	φ1.0 -φ13.0	External	-	◎		◎		○			N150	N175		

Drill Type (Series Title)	Applications	Product Code	Size Range	Tool material	Coolant	Coating	Work Material						Shape	Page Number	
							P	H	M	K	N	S		Dimensions	Cutting Conditions
							Carbon Steel, Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy			
STRAIGHT SHANK DRILL	Deep Hole Drilling	G-WSS	φ1.0 -φ13.0	Cobalt High Speed Steel	External	G	○		○	○	○			N152	N174
		G-WSL	φ2.0 -φ13.0	Cobalt High Speed Steel	External	G	○		○	○	○			N154	N174
		LSD	φ1.0 -φ13.0	High Speed Steel	External	-	○			○	○			N156	N175
	Sheet Steel	E-PSS	φ2.0 -φ13.0	High Speed Steel	External	-	○		○	○	○			N159	-
TAPER SHANK DRILL	General Drilling	G-TD	φ6.0 -φ40.0	High Speed Steel	External	G	○		○	○	○			N160	N174
		TD	φ3.0 -φ75.0	High Speed Steel	External	-	○		○	○	○			N161	N175
		KTD	φ5.0 -φ50.0	Cobalt High Speed Steel	External	-	○		○	○	○			N165	N175
	Deep Hole Drilling	G-WTS	φ6.0 -φ32.0	Cobalt High Speed Steel	External	G	○		○	○	○			N167	N174
		LTD	φ6.0 -φ40.0	High Speed Steel	External	-	○			○	○			N168	-
	For steel frame	G-TTD	φ17.0 -φ32.0	High Speed Steel	External	G	○							N171	N174
TTD		φ17.0 -φ32.0	High Speed Steel	External	-	○							N172	N175	
TRIANGULAR SHANK DRILL	For General-purpose Electric Drills	3KD	φ7.0 -φ26.0	High Speed Steel	External	-	○		○	○			N173	-	

DRILLING(SOLID CARBIDE)

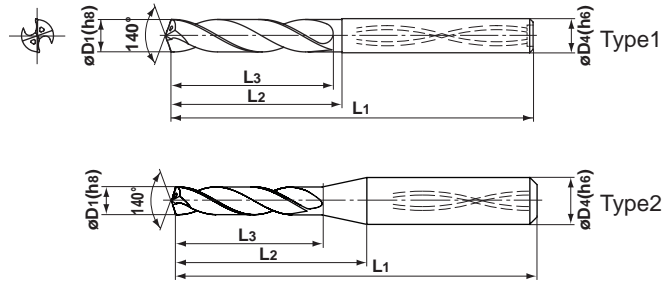
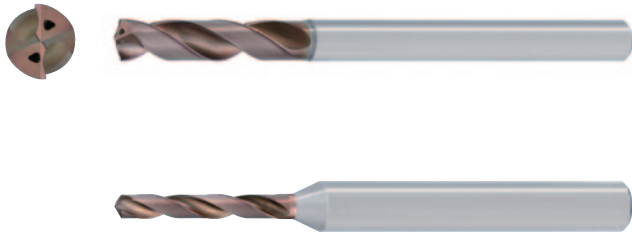
MVS **NEW**

- 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 $\phi 6$)

WSTAR DRILLS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	○	○

	D1=3	3<D1≤6	6<D1≤10	10<D1≤12
\pm	0 -0.014	0 -0.018	0 -0.022	0 -0.027
h_6	0 -0.006	0 -0.008	0 -0.009	0 -0.011



Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)					Type
					Flute Length	Neck Length	Overall Length	Shank Dia.		
					L3	L2	L1	D4		
3.0	3	Int.	●	MVS0300X03S030	21	21	72	3	1	
	3	Int.	●	0300X03S060	21	24.2	72	6	2	
	5	Int.	●	0300X05S030	28	28	81	3	1	
	5	Int.	●	0300X05S060	28	31.2	81	6	2	
	8	Int.	●	0300X08S030	35	35	81	3	1	
	8	Int.	●	0300X08S060	35	38.2	81	6	2	
3.1	3	Int.	●	0310X03S040	21	23	76	4	1	
	3	Int.	●	0310X03S060	21	24.1	76	6	2	
	5	Int.	●	0310X05S040	32	32	87	4	1	
	5	Int.	●	0310X05S060	32	35.1	87	6	2	
	8	Int.	●	0310X08S040	41	41	87	4	1	
	8	Int.	●	0310X08S060	41	44.1	87	6	2	
3.2	3	Int.	●	0320X03S040	21	23	76	4	1	
	3	Int.	●	0320X03S060	21	24	76	6	2	
	5	Int.	●	0320X05S040	32	32	87	4	1	
	5	Int.	●	0320X05S060	32	35	87	6	2	
	8	Int.	●	0320X08S040	41	41	87	4	1	
	8	Int.	●	0320X08S060	41	44	87	6	2	
3.3	3	Int.	●	0330X03S040	21	23	76	4	1	
	3	Int.	●	0330X03S060	21	23.9	76	6	2	
	5	Int.	●	0330X05S040	32	32	87	4	1	
	5	Int.	●	0330X05S060	32	34.9	87	6	2	
	8	Int.	●	0330X08S040	41	41	87	4	1	
	8	Int.	●	0330X08S060	41	43.9	87	6	2	
3.4	3	Int.	●	0340X03S040	21	23	76	4	1	
	3	Int.	●	0340X03S060	21	23.8	76	6	2	
	5	Int.	●	0340X05S040	32	32	87	4	1	
	5	Int.	●	0340X05S060	32	34.8	87	6	2	
	8	Int.	●	0340X08S040	41	41	87	4	1	
	8	Int.	●	0340X08S060	41	43.8	87	6	2	
3.5	3	Int.	●	0350X03S040	21	23	76	4	1	
	3	Int.	●	0350X03S060	21	23.7	76	6	2	
	5	Int.	●	0350X05S040	32	32	87	4	1	
	5	Int.	●	0350X05S060	32	34.7	87	6	2	
	8	Int.	●	0350X08S040	41	41	87	4	1	
	8	Int.	●	0350X08S060	41	43.7	87	6	2	

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)					Type
					Flute Length	Neck Length	Overall Length	Shank Dia.		
					L3	L2	L1	D4		
3.6	3	Int.	●	MVS0360X03S040	23	23	80	4	1	
	3	Int.	●	0360X03S060	23	25.6	80	6	2	
	5	Int.	●	0360X05S040	36	36	92	4	1	
	5	Int.	●	0360X05S060	36	38.6	92	6	2	
	8	Int.	●	0360X08S040	46	46	92	4	1	
	8	Int.	●	0360X08S060	46	48.6	92	6	2	
3.7	3	Int.	●	0370X03S040	23	23	80	4	1	
	3	Int.	●	0370X03S060	23	25.5	80	6	2	
	5	Int.	●	0370X05S040	36	36	92	4	1	
	5	Int.	●	0370X05S060	36	38.5	92	6	2	
	8	Int.	●	0370X08S040	46	46	92	4	1	
	8	Int.	●	0370X08S060	46	48.5	92	6	2	
3.8	3	Int.	●	0380X03S040	23	23	80	4	1	
	3	Int.	●	0380X03S060	23	25.4	80	6	2	
	5	Int.	●	0380X05S040	36	36	92	4	1	
	5	Int.	●	0380X05S060	36	38.4	92	6	2	
	8	Int.	●	0380X08S040	46	46	92	4	1	
	8	Int.	●	0380X08S060	46	48.4	92	6	2	
3.9	3	Int.	●	0390X03S040	23	23	80	4	1	
	3	Int.	●	0390X03S060	23	25.3	80	6	2	
	5	Int.	●	0390X05S040	36	36	92	4	1	
	5	Int.	●	0390X05S060	36	38.3	92	6	2	
	8	Int.	●	0390X08S040	46	46	92	4	1	
	8	Int.	●	0390X08S060	46	48.3	92	6	2	
4.0	3	Int.	●	0400X03S040	23	23	80	4	1	
	3	Int.	●	0400X03S060	23	25.1	80	6	2	
	5	Int.	●	0400X05S040	36	36	92	4	1	
	5	Int.	●	0400X05S060	36	38.1	92	6	2	
	8	Int.	●	0400X08S040	46	46	92	4	1	
	8	Int.	●	0400X08S060	46	48.1	92	6	2	
4.1	3	Int.	●	0410X03S050	25	25	86	5	1	
	3	Int.	●	0410X03S060	25	27	86	6	2	
	5	Int.	●	0410X05S050	40	40	100	5	1	
	5	Int.	●	0410X05S060	40	42	100	6	2	
	8	Int.	●	0410X08S050	52	52	100	5	1	
	8	Int.	●	0410X08S060	52	54	100	6	2	

(Note) The coolant hole of $\phi 5.9$ mm or less will be round shape.

● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
4.2	3	Int.	●	MVS0420X03S050	25	25	86	5	1
	3	Int.	●	0420X03S060	25	26.9	86	6	2
	5	Int.	●	0420X05S050	40	40	100	5	1
	5	Int.	●	0420X05S060	40	41.9	100	6	2
	8	Int.	●	0420X08S050	52	52	100	5	1
	8	Int.	●	0420X08S060	52	53.9	100	6	2
4.3	3	Int.	●	0430X03S050	25	25	86	5	1
	3	Int.	●	0430X03S060	25	26.8	86	6	2
	5	Int.	●	0430X05S050	40	40	100	5	1
	5	Int.	●	0430X05S060	40	41.8	100	6	2
	8	Int.	●	0430X08S050	52	52	100	5	1
	8	Int.	●	0430X08S060	52	53.8	100	6	2
4.4	3	Int.	●	0440X03S050	25	25	86	5	1
	3	Int.	●	0440X03S060	25	26.7	86	6	2
	5	Int.	●	0440X05S050	40	40	100	5	1
	5	Int.	●	0440X05S060	40	41.7	100	6	2
	8	Int.	●	0440X08S050	52	52	100	5	1
	8	Int.	●	0440X08S060	52	53.7	100	6	2
4.5	3	Int.	●	0450X03S050	25	25	86	5	1
	3	Int.	●	0450X03S060	25	26.6	86	6	2
	5	Int.	●	0450X05S050	40	40	100	5	1
	5	Int.	●	0450X05S060	40	41.6	100	6	2
	8	Int.	●	0450X08S050	52	52	100	5	1
	8	Int.	●	0450X08S060	52	53.6	100	6	2
4.6	3	Int.	●	0460X03S050	27.5	27.5	90	5	1
	3	Int.	●	0460X03S060	27.5	30.5	90	6	1
	5	Int.	●	0460X05S050	44	44	105	5	1
	5	Int.	●	0460X05S060	44	47	105	6	1
	8	Int.	●	0460X08S050	57	57	105	5	1
	8	Int.	●	0460X08S060	57	60	105	6	1
4.7	3	Int.	●	0470X03S050	27.5	27.5	90	5	1
	3	Int.	●	0470X03S060	27.5	30.5	90	6	1
	5	Int.	●	0470X05S050	44	44	105	5	1
	5	Int.	●	0470X05S060	44	47	105	6	1
	8	Int.	●	0470X08S050	57	57	105	5	1
	8	Int.	●	0470X08S060	57	60	105	6	1
4.8	3	Int.	●	0480X03S050	27.5	27.5	90	5	1
	3	Int.	●	0480X03S060	27.5	30.5	90	6	1
	5	Int.	●	0480X05S050	44	44	105	5	1
	5	Int.	●	0480X05S060	44	47	105	6	1
	8	Int.	●	0480X08S050	57	57	105	5	1
	8	Int.	●	0480X08S060	57	60	105	6	1
4.9	3	Int.	●	0490X03S050	27.5	27.5	90	5	1
	3	Int.	●	0490X03S060	27.5	30.5	90	6	1
	5	Int.	●	0490X05S050	44	44	105	5	1
	5	Int.	●	0490X05S060	44	47	105	6	1
	8	Int.	●	0490X08S050	57	57	105	5	1
	8	Int.	●	0490X08S060	57	60	105	6	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
5.0	3	Int.	●	MVS0500X03S050	27.5	27.5	90	5	1
	3	Int.	●	0500X03S060	27.5	30.5	90	6	1
	5	Int.	●	0500X05S050	44	44	105	5	1
	5	Int.	●	0500X05S060	44	47	105	6	1
	8	Int.	●	0500X08S050	57	57	105	5	1
	8	Int.	●	0500X08S060	57	60	105	6	1
5.1	3	Int.	●	0510X03S060	27.5	30	82	6	1
	5	Int.	●	0510X05S060	44	48	100	6	1
	8	Int.	●	0510X08S060	61	66	118	6	1
5.2	3	Int.	●	0520X03S060	27.5	30	82	6	1
	5	Int.	●	0520X05S060	44	48	100	6	1
	8	Int.	●	0520X08S060	61	66	118	6	1
5.3	3	Int.	●	0530X03S060	27.5	30	82	6	1
	5	Int.	●	0530X05S060	44	48	100	6	1
	8	Int.	●	0530X08S060	61	66	118	6	1
5.4	3	Int.	●	0540X03S060	27.5	30	82	6	1
	5	Int.	●	0540X05S060	44	48	100	6	1
	8	Int.	●	0540X08S060	61	66	118	6	1
5.5	3	Int.	●	0550X03S060	27.5	30	82	6	1
	5	Int.	●	0550X05S060	44	48	100	6	1
	8	Int.	●	0550X08S060	61	66	118	6	1
5.6	3	Int.	●	0560X03S060	30	30	82	6	1
	5	Int.	●	0560X05S060	48	48	100	6	1
	8	Int.	●	0560X08S060	66	66	118	6	1
5.7	3	Int.	●	0570X03S060	30	30	82	6	1
	5	Int.	●	0570X05S060	48	48	100	6	1
	8	Int.	●	0570X08S060	66	66	118	6	1
5.8	3	Int.	●	0580X03S060	30	30	82	6	1
	5	Int.	●	0580X05S060	48	48	100	6	1
	8	Int.	●	0580X08S060	66	66	118	6	1
5.9	3	Int.	●	0590X03S060	30	30	82	6	1
	5	Int.	●	0590X05S060	48	48	100	6	1
	8	Int.	●	0590X08S060	66	66	118	6	1
6.0	3	Int.	●	0600X03S060	30	30	82	6	1
	5	Int.	●	0600X05S060	48	48	100	6	1
	8	Int.	●	0600X08S060	66	66	118	6	1
6.1	3	Int.	●	0610X03S070	32.5	35	88	7	1
	3	Int.	●	0610X03S080	32.5	35	88	8	1
	5	Int.	●	0610X05S070	52	56	109	7	1
	5	Int.	●	0610X05S080	52	56	109	8	1
	8	Int.	●	0610X08S070	72	77	130	7	1
	8	Int.	●	0610X08S080	72	77	130	8	1
6.2	3	Int.	●	0620X03S070	32.5	35	88	7	1
	3	Int.	●	0620X03S080	32.5	35	88	8	1
	5	Int.	●	0620X05S070	52	56	109	7	1
	5	Int.	●	0620X05S080	52	56	109	8	1
	8	Int.	●	0620X08S070	72	77	130	7	1
	8	Int.	●	0620X08S080	72	77	130	8	1

DRILLING

DRILLING(SOLID CARBIDE)

MVS NEW
WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.3	3	Int.	●	MVS0630X03S070	32.5	35	88	7	1
	3	Int.	●	0630X03S080	32.5	35	88	8	1
	5	Int.	●	0630X05S070	52	56	109	7	1
	5	Int.	●	0630X05S080	52	56	109	8	1
	8	Int.	●	0630X08S070	72	77	130	7	1
	8	Int.	●	0630X08S080	72	77	130	8	1
6.4	3	Int.	●	0640X03S070	32.5	35	88	7	1
	3	Int.	●	0640X03S080	32.5	35	88	8	1
	5	Int.	●	0640X05S070	52	56	109	7	1
	5	Int.	●	0640X05S080	52	56	109	8	1
	8	Int.	●	0640X08S070	72	77	130	7	1
	8	Int.	●	0640X08S080	72	77	130	8	1
6.5	3	Int.	●	0650X03S070	32.5	35	88	7	1
	3	Int.	●	0650X03S080	32.5	35	88	8	1
	5	Int.	●	0650X05S070	52	56	109	7	1
	5	Int.	●	0650X05S080	52	56	109	8	1
	8	Int.	●	0650X08S070	72	77	130	7	1
	8	Int.	●	0650X08S080	72	77	130	8	1
6.6	3	Int.	●	0660X03S070	35	35	88	7	1
	3	Int.	●	0660X03S080	35	37	88	8	1
	5	Int.	●	0660X05S070	56	56	109	7	1
	5	Int.	●	0660X05S080	56	58	109	8	1
	8	Int.	●	0660X08S070	77	77	130	7	1
	8	Int.	●	0660X08S080	77	79	130	8	1
6.7	3	Int.	●	0670X03S070	35	35	88	7	1
	3	Int.	●	0670X03S080	35	37	88	8	1
	5	Int.	●	0670X05S070	56	56	109	7	1
	5	Int.	●	0670X05S080	56	58	109	8	1
	8	Int.	●	0670X08S070	77	77	130	7	1
	8	Int.	●	0670X08S080	77	79	130	8	1
6.8	3	Int.	●	0680X03S070	35	35	88	7	1
	3	Int.	●	0680X03S080	35	37	88	8	1
	5	Int.	●	0680X05S070	56	56	109	7	1
	5	Int.	●	0680X05S080	56	58	109	8	1
	8	Int.	●	0680X08S070	77	77	130	7	1
	8	Int.	●	0680X08S080	77	79	130	8	1
6.9	3	Int.	●	0690X03S070	35	35	88	7	1
	3	Int.	●	0690X03S080	35	37	88	8	1
	5	Int.	●	0690X05S070	56	56	109	7	1
	5	Int.	●	0690X05S080	56	58	109	8	1
	8	Int.	●	0690X08S070	77	77	130	7	1
	8	Int.	●	0690X08S080	77	79	130	8	1
7.0	3	Int.	●	0700X03S070	35	35	88	7	1
	3	Int.	●	0700X03S080	35	37	88	8	1
	5	Int.	●	0700X05S070	56	56	109	7	1
	5	Int.	●	0700X05S080	56	58	109	8	1
	8	Int.	●	0700X08S070	77	77	130	7	1
	8	Int.	●	0700X08S080	77	79	130	8	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
7.1	3	Int.	●	MVS0710X03S080	37.5	40	94	8	1
	5	Int.	●	0710X05S080	60	64	118	8	1
	8	Int.	●	0710X08S080	83	88	142	8	1
7.2	3	Int.	●	0720X03S080	37.5	40	94	8	1
	5	Int.	●	0720X05S080	60	64	118	8	1
	8	Int.	●	0720X08S080	83	88	142	8	1
7.3	3	Int.	●	0730X03S080	37.5	40	94	8	1
	5	Int.	●	0730X05S080	60	64	118	8	1
	8	Int.	●	0730X08S080	83	88	142	8	1
7.4	3	Int.	●	0740X03S080	37.5	40	94	8	1
	5	Int.	●	0740X05S080	60	64	118	8	1
	8	Int.	●	0740X08S080	83	88	142	8	1
7.5	3	Int.	●	0750X03S080	37.5	40	94	8	1
	5	Int.	●	0750X05S080	60	64	118	8	1
	8	Int.	●	0750X08S080	83	88	142	8	1
7.6	3	Int.	●	0760X03S080	40	40	94	8	1
	5	Int.	●	0760X05S080	64	64	118	8	1
	8	Int.	●	0760X08S080	88	88	142	8	1
7.7	3	Int.	●	0770X03S080	40	40	94	8	1
	5	Int.	●	0770X05S080	64	64	118	8	1
	8	Int.	●	0770X08S080	88	88	142	8	1
7.8	3	Int.	●	0780X03S080	40	40	94	8	1
	5	Int.	●	0780X05S080	64	64	118	8	1
	8	Int.	●	0780X08S080	88	88	142	8	1
7.9	3	Int.	●	0790X03S080	40	40	94	8	1
	5	Int.	●	0790X05S080	64	64	118	8	1
	8	Int.	●	0790X08S080	88	88	142	8	1
8.0	3	Int.	●	0800X03S080	40	40	94	8	1
	5	Int.	●	0800X05S080	64	64	118	8	1
	8	Int.	●	0800X08S080	88	88	142	8	1
8.1	3	Int.	●	0810X03S090	42.5	45	100	9	1
	3	Int.	●	0810X03S100	42.5	45	100	10	1
	5	Int.	●	0810X05S090	68	72	127	9	1
	5	Int.	●	0810X05S100	68	72	127	10	1
	8	Int.	●	0810X08S090	94	99	154	9	1
	8	Int.	●	0810X08S100	94	99	154	10	1
8.2	3	Int.	●	0820X03S090	42.5	45	100	9	1
	3	Int.	●	0820X03S100	42.5	45	100	10	1
	5	Int.	●	0820X05S090	68	72	127	9	1
	5	Int.	●	0820X05S100	68	72	127	10	1
	8	Int.	●	0820X08S090	94	99	154	9	1
	8	Int.	●	0820X08S100	94	99	154	10	1
8.3	3	Int.	●	0830X03S090	42.5	45	100	9	1
	3	Int.	●	0830X03S100	42.5	45	100	10	1
	5	Int.	●	0830X05S090	68	72	127	9	1
	5	Int.	●	0830X05S100	68	72	127	10	1
	8	Int.	●	0830X08S090	94	99	154	9	1
	8	Int.	●	0830X08S100	94	99	154	10	1

● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.4	3	Int.	●	MVS0840X03S090	42.5	45	100	9	1
	3	Int.	●	0840X03S100	42.5	45	100	10	1
	5	Int.	●	0840X05S090	68	72	127	9	1
	5	Int.	●	0840X05S100	68	72	127	10	1
	8	Int.	●	0840X08S090	94	99	154	9	1
	8	Int.	●	0840X08S100	94	99	154	10	1
8.5	3	Int.	●	0850X03S090	42.5	45	100	9	1
	3	Int.	●	0850X03S100	42.5	45	100	10	1
	5	Int.	●	0850X05S090	68	72	127	9	1
	5	Int.	●	0850X05S100	68	72	127	10	1
	8	Int.	●	0850X08S090	94	99	154	9	1
	8	Int.	●	0850X08S100	94	99	154	10	1
8.6	3	Int.	●	0860X03S090	45	45	100	9	1
	3	Int.	●	0860X03S100	45	47	100	10	1
	5	Int.	●	0860X05S090	72	72	127	9	1
	5	Int.	●	0860X05S100	72	74	127	10	1
	8	Int.	●	0860X08S090	99	99	154	9	1
	8	Int.	●	0860X08S100	99	101	154	10	1
8.7	3	Int.	●	0870X03S090	45	45	100	9	1
	3	Int.	●	0870X03S100	45	47	100	10	1
	5	Int.	●	0870X05S090	72	72	127	9	1
	5	Int.	●	0870X05S100	72	74	127	10	1
	8	Int.	●	0870X08S090	99	99	154	9	1
	8	Int.	●	0870X08S100	99	101	154	10	1
8.8	3	Int.	●	0880X03S090	45	45	100	9	1
	3	Int.	●	0880X03S100	45	47	100	10	1
	5	Int.	●	0880X05S090	72	72	127	9	1
	5	Int.	●	0880X05S100	72	74	127	10	1
	8	Int.	●	0880X08S090	99	99	154	9	1
	8	Int.	●	0880X08S100	99	101	154	10	1
8.9	3	Int.	●	0890X03S090	45	45	100	9	1
	3	Int.	●	0890X03S100	45	47	100	10	1
	5	Int.	●	0890X05S090	72	72	127	9	1
	5	Int.	●	0890X05S100	72	74	127	10	1
	8	Int.	●	0890X08S090	99	99	154	9	1
	8	Int.	●	0890X08S100	99	101	154	10	1
9.0	3	Int.	●	0900X03S090	45	45	100	9	1
	3	Int.	●	0900X03S100	45	47	100	10	1
	5	Int.	●	0900X05S090	72	72	127	9	1
	5	Int.	●	0900X05S100	72	74	127	10	1
	8	Int.	●	0900X08S090	99	99	154	9	1
	8	Int.	●	0900X08S100	99	101	154	10	1
9.1	3	Int.	●	0910X03S100	47.5	50	106	10	1
	5	Int.	●	0910X05S100	76	80	136	10	1
	8	Int.	●	0910X08S100	105	110	166	10	1
9.2	3	Int.	●	0920X03S100	47.5	50	106	10	1
	5	Int.	●	0920X05S100	76	80	136	10	1
	8	Int.	●	0920X08S100	105	110	166	10	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
9.3	3	Int.	●	MVS0930X03S100	47.5	50	106	10	1
	5	Int.	●	0930X05S100	76	80	136	10	1
	8	Int.	●	0930X08S100	105	110	166	10	1
9.4	3	Int.	●	0940X03S100	47.5	50	106	10	1
	5	Int.	●	0940X05S100	76	80	136	10	1
	8	Int.	●	0940X08S100	105	110	166	10	1
9.5	3	Int.	●	0950X03S100	47.5	50	106	10	1
	5	Int.	●	0950X05S100	76	80	136	10	1
	8	Int.	●	0950X08S100	105	110	166	10	1
9.6	3	Int.	●	0960X03S100	50	50	106	10	1
	5	Int.	●	0960X05S100	80	80	136	10	1
	8	Int.	●	0960X08S100	110	110	166	10	1
9.7	3	Int.	●	0970X03S100	50	50	106	10	1
	5	Int.	●	0970X05S100	80	80	136	10	1
	8	Int.	●	0970X08S100	110	110	166	10	1
9.8	3	Int.	●	0980X03S100	50	50	106	10	1
	5	Int.	●	0980X05S100	80	80	136	10	1
	8	Int.	●	0980X08S100	110	110	166	10	1
9.9	3	Int.	●	0990X03S100	50	50	106	10	1
	5	Int.	●	0990X05S100	80	80	136	10	1
	8	Int.	●	0990X08S100	110	110	166	10	1
10.0	3	Int.	●	1000X03S100	50	50	106	10	1
	5	Int.	●	1000X05S100	80	80	136	10	1
	8	Int.	●	1000X08S100	110	110	166	10	1
10.1	3	Int.	●	1010X03S110	52.5	55	116	11	1
	3	Int.	●	1010X03S120	52.5	55	116	12	1
	5	Int.	●	1010X05S110	84	88	149	11	1
	5	Int.	●	1010X05S120	84	88	149	12	1
	8	Int.	●	1010X08S110	116	121	182	11	1
	8	Int.	●	1010X08S120	116	121	182	12	1
10.2	3	Int.	●	1020X03S110	52.5	55	116	11	1
	3	Int.	●	1020X03S120	52.5	55	116	12	1
	5	Int.	●	1020X05S110	84	88	149	11	1
	5	Int.	●	1020X05S120	84	88	149	12	1
	8	Int.	●	1020X08S110	116	121	182	11	1
	8	Int.	●	1020X08S120	116	121	182	12	1
10.3	3	Int.	●	1030X03S110	52.5	55	116	11	1
	3	Int.	●	1030X03S120	52.5	55	116	12	1
	5	Int.	●	1030X05S110	84	88	149	11	1
	5	Int.	●	1030X05S120	84	88	149	12	1
	8	Int.	●	1030X08S110	116	121	182	11	1
	8	Int.	●	1030X08S120	116	121	182	12	1
10.4	3	Int.	●	1040X03S110	52.5	55	116	11	1
	3	Int.	●	1040X03S120	52.5	55	116	12	1
	5	Int.	●	1040X05S110	84	88	149	11	1
	5	Int.	●	1040X05S120	84	88	149	12	1
	8	Int.	●	1040X08S110	116	121	182	11	1
	8	Int.	●	1040X08S120	116	121	182	12	1

DRILLING

DRILLING(SOLID CARBIDE)

MVS NEW
WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.5	3	Int.	●	MVS1050X03S110	52.5	55	116	11	1
	3	Int.	●	1050X03S120	52.5	55	116	12	1
	5	Int.	●	1050X05S110	84	88	149	11	1
	5	Int.	●	1050X05S120	84	88	149	12	1
	8	Int.	●	1050X08S110	116	121	182	11	1
	8	Int.	●	1050X08S120	116	121	182	12	1
10.6	3	Int.	●	1060X03S110	55	55	116	11	1
	3	Int.	●	1060X03S120	55	56	116	12	1
	5	Int.	●	1060X05S110	88	88	149	11	1
	5	Int.	●	1060X05S120	88	89	149	12	1
	8	Int.	●	1060X08S110	121	121	182	11	1
	8	Int.	●	1060X08S120	121	122	182	12	1
10.7	3	Int.	●	1070X03S110	55	55	116	11	1
	3	Int.	●	1070X03S120	55	56	116	12	1
	5	Int.	●	1070X05S110	88	88	149	11	1
	5	Int.	●	1070X05S120	88	89	149	12	1
	8	Int.	●	1070X08S110	121	121	182	11	1
	8	Int.	●	1070X08S120	121	122	182	12	1
10.8	3	Int.	●	1080X03S110	55	55	116	11	1
	3	Int.	●	1080X03S120	55	56	116	12	1
	5	Int.	●	1080X05S110	88	88	149	11	1
	5	Int.	●	1080X05S120	88	89	149	12	1
	8	Int.	●	1080X08S110	121	121	182	11	1
	8	Int.	●	1080X08S120	121	122	182	12	1
10.9	3	Int.	●	1090X03S110	55	55	116	11	1
	3	Int.	●	1090X03S120	55	56	116	12	1
	5	Int.	●	1090X05S110	88	88	149	11	1
	5	Int.	●	1090X05S120	88	89	149	12	1
	8	Int.	●	1090X08S110	121	121	182	11	1
	8	Int.	●	1090X08S120	121	122	182	12	1
11.0	3	Int.	●	1100X03S110	55	55	116	11	1
	3	Int.	●	1100X03S120	55	56	116	12	1
	5	Int.	●	1100X05S110	88	88	149	11	1
	5	Int.	●	1100X05S120	88	89	149	12	1
	8	Int.	●	1100X08S110	121	121	182	11	1
	8	Int.	●	1100X08S120	121	122	182	12	1
11.1	3	Int.	●	1110X03S120	57.5	60	122	12	1
	5	Int.	●	1110X05S120	92	96	158	12	1
	8	Int.	●	1110X08S120	127	132	194	12	1
11.2	3	Int.	●	1120X03S120	57.5	60	122	12	1
	5	Int.	●	1120X05S120	92	96	158	12	1
	8	Int.	●	1120X08S120	127	132	194	12	1
11.3	3	Int.	●	1130X03S120	57.5	60	122	12	1
	5	Int.	●	1130X05S120	92	96	158	12	1
	8	Int.	●	1130X08S120	127	132	194	12	1
11.4	3	Int.	●	1140X03S120	57.5	60	122	12	1
	5	Int.	●	1140X05S120	92	96	158	12	1
	8	Int.	●	1140X08S120	127	132	194	12	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
11.5	3	Int.	●	MVS1150X03S120	57.5	60	122	12	1
	5	Int.	●	1150X05S120	92	96	158	12	1
	8	Int.	●	1150X08S120	127	132	194	12	1
11.6	3	Int.	●	1160X03S120	60	60	122	12	1
	5	Int.	●	1160X05S120	96	96	158	12	1
	8	Int.	●	1160X08S120	132	132	194	12	1
11.7	3	Int.	●	1170X03S120	60	60	122	12	1
	5	Int.	●	1170X05S120	96	96	158	12	1
	8	Int.	●	1170X08S120	132	132	194	12	1
11.8	3	Int.	●	1180X03S120	60	60	122	12	1
	5	Int.	●	1180X05S120	96	96	158	12	1
	8	Int.	●	1180X08S120	132	132	194	12	1
11.9	3	Int.	●	1190X03S120	60	60	122	12	1
	5	Int.	●	1190X05S120	96	96	158	12	1
	8	Int.	●	1190X08S120	132	132	194	12	1
12.0	3	Int.	●	1200X03S120	60	60	122	12	1
	5	Int.	●	1200X05S120	96	96	158	12	1
	8	Int.	●	1200X08S120	132	132	194	12	1

DRILLING

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel ($\leq 180\text{HB}$)		Carbon steel, Alloy steel (180–280HB)		Carbon steel, Alloy steel (280–350HB)	
	AISI 1010 etc		AISI 1045, AISI 4140 etc		AISI 4340 etc	
Dia. (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 (0.06–0.13)	7900	0.1 (0.06–0.13)	6900	0.1 (0.06–0.13)
4.0	7900	0.12 (0.08–0.16)	7100	0.12 (0.08–0.16)	6300	0.11 (0.07–0.14)
5.0	6300	0.15 (0.10–0.20)	5700	0.15 (0.10–0.20)	5000	0.14 (0.09–0.18)
6.3	5500	0.2 (0.13–0.26)	5000	0.2 (0.13–0.26)	4500	0.18 (0.11–0.24)
8.0	4700	0.23 (0.18–0.28)	4300	0.23 (0.18–0.28)	3900	0.21 (0.16–0.25)
10.0	4100	0.27 (0.22–0.32)	3800	0.27 (0.22–0.32)	3500	0.23 (0.19–0.27)
12.0	3700	0.3 (0.26–0.34)	3400	0.3 (0.26–0.34)	3100	0.26 (0.22–0.29)

Work Material	Austenitic Stainless Steel ($\leq 200\text{HB}$)		Gray Cast Iron ($\leq 350\text{MPa}$)		Ductile Cast Iron ($\leq 450\text{MPa}$)	
	AISI 304, AISI 316 etc		No 45 B etc		60-40-8 etc	
Dia. (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	3900	0.08 (0.06–0.10)	8900	0.1 (0.06–0.13)	6400	0.1 (0.06–0.13)
4.0	3100	0.09 (0.06–0.11)	7900	0.12 (0.08–0.16)	5100	0.12 (0.08–0.16)
5.0	2500	0.11 (0.08–0.14)	6300	0.15 (0.10–0.20)	4100	0.15 (0.10–0.20)
6.3	2500	0.14 (0.09–0.18)	5500	0.2 (0.13–0.26)	3500	0.2 (0.13–0.26)
8.0	1900	0.15 (0.10–0.19)	4700	0.25 (0.18–0.31)	2700	0.23 (0.18–0.28)
10.0	1500	0.16 (0.12–0.20)	4100	0.29 (0.22–0.35)	2200	0.27 (0.22–0.32)
12.0	1500	0.18 (0.15–0.21)	3700	0.32 (0.26–0.37)	2300	0.3 (0.26–0.34)

Work Material	Aluminium Alloy (Si<5%)		Heat Resistant Alloy	
			Inconel718 etc	
Dia. (mm)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)
3.2	11900	0.23 (0.10–0.35)	1900	0.07 (0.05–0.09)
4.0	9500	0.24 (0.12–0.35)	1500	0.09 (0.06–0.11)
5.0	7600	0.25 (0.15–0.35)	1200	0.11 (0.08–0.14)
6.3	7500	0.35 (0.20–0.50)	1200	0.13 (0.09–0.16)
8.0	5900	0.35 (0.20–0.50)	900	0.14 (0.11–0.17)
10.0	4700	0.5 (0.20–0.80)	700	0.15 (0.12–0.17)
12.0	4200	0.5 (0.20–0.80)	600	0.16 (0.13–0.18)

DRILLING(SOLID CARBIDE)

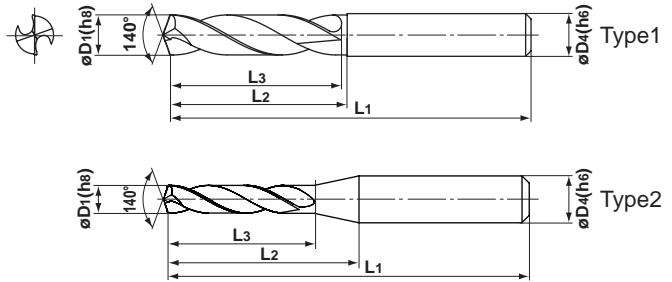
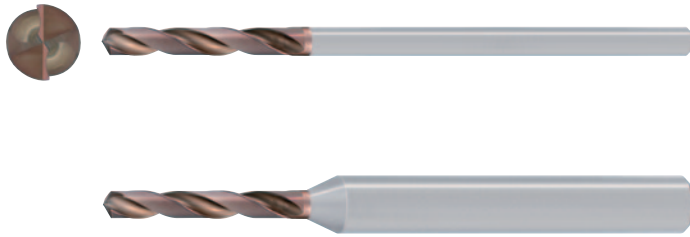
MVE NEW

- 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.

WSTAR DRILLS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○	○	◎	○	○

	D1=3	3<D1≤6	6<D1≤10	10<D1≤12
	0 -0.014	0 -0.018	0 -0.022	0 -0.027
	0 -0.006	0 -0.008	0 -0.009	0 -0.011



Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
3.0	2	Ext.	●	MVE0300X02S030	16	16	55	3	1
	2	Ext.	●	0300X02S060	16	19.2	55	6	2
	3	Ext.	●	0300X03S030	21	21	60	3	1
	3	Ext.	●	0300X03S060	21	24.2	60	6	2
3.1	2	Ext.	●	0310X02S040	18	20	55	4	1
	2	Ext.	●	0310X02S060	18	21.1	55	6	2
	3	Ext.	●	0310X03S040	24	26	60	4	1
	3	Ext.	●	0310X03S060	24	27.1	60	6	2
3.2	2	Ext.	●	0320X02S040	18	20	55	4	1
	2	Ext.	●	0320X02S060	18	21	55	6	2
	3	Ext.	●	0320X03S040	24	26	60	4	1
	3	Ext.	●	0320X03S060	24	27	60	6	2
3.3	2	Ext.	●	0330X02S040	18	20	55	4	1
	2	Ext.	●	0330X02S060	18	20.9	55	6	2
	3	Ext.	●	0330X03S040	24	26	60	4	1
	3	Ext.	●	0330X03S060	24	26.9	60	6	2
3.4	2	Ext.	●	0340X02S040	18	20	55	4	1
	2	Ext.	●	0340X02S060	18	20.8	55	6	2
	3	Ext.	●	0340X03S040	24	26	60	4	1
	3	Ext.	●	0340X03S060	24	26.8	60	6	2
3.5	2	Ext.	●	0350X02S040	18	20	55	4	1
	2	Ext.	●	0350X02S060	18	20.7	55	6	2
	3	Ext.	●	0350X03S040	24	26	60	4	1
	3	Ext.	●	0350X03S060	24	26.7	60	6	2
3.6	2	Ext.	●	0360X02S040	20	20	55	4	1
	2	Ext.	●	0360X02S060	20	22.6	55	6	2
	3	Ext.	●	0360X03S040	27	27	60	4	1
	3	Ext.	●	0360X03S060	27	29.6	60	6	2
3.7	2	Ext.	●	0370X02S040	20	20	55	4	1
	2	Ext.	●	0370X02S060	20	22.5	55	6	2
	3	Ext.	●	0370X03S040	27	27	60	4	1
	3	Ext.	●	0370X03S060	27	29.5	60	6	2
3.8	2	Ext.	●	0380X02S040	20	20	55	4	1
	2	Ext.	●	0380X02S060	20	22.4	55	6	2
	3	Ext.	●	0380X03S040	27	27	60	4	1
	3	Ext.	●	0380X03S060	27	29.4	60	6	2
3.9	2	Ext.	●	0390X02S040	20	20	55	4	1
	2	Ext.	●	0390X02S060	20	22.3	55	6	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
3.9	3	Ext.	●	MVE0390X03S040	27	27	60	4	1
	3	Ext.	●	0390X03S060	27	29.3	60	6	2
4.0	2	Ext.	●	0400X02S040	20	20	55	4	1
	2	Ext.	●	0400X02S060	20	22.1	55	6	2
	3	Ext.	●	0400X03S040	27	27	60	4	1
4.1	2	Ext.	●	0410X02S050	22	24	62	5	1
	2	Ext.	●	0410X02S060	22	24	62	6	2
	3	Ext.	●	0410X03S050	29	31	68	5	1
4.2	2	Ext.	●	0420X02S050	22	24	62	5	1
	2	Ext.	●	0420X02S060	22	23.9	62	6	2
	3	Ext.	●	0420X03S050	29	31	68	5	1
4.3	2	Ext.	●	0430X02S050	22	24	62	5	1
	2	Ext.	●	0430X02S060	22	23.8	62	6	2
	3	Ext.	●	0430X03S050	29	31	68	5	1
4.4	2	Ext.	●	0440X02S050	22	24	62	5	1
	2	Ext.	●	0440X02S060	22	23.7	62	6	2
	3	Ext.	●	0440X03S050	29	31	68	5	1
4.5	2	Ext.	●	0450X02S050	22	24	62	5	1
	2	Ext.	●	0450X02S060	22	23.6	62	6	2
	3	Ext.	●	0450X03S050	29	31	68	5	1
4.6	2	Ext.	●	0460X02S050	24	24	62	5	1
	2	Ext.	●	0460X02S060	24	27	62	6	1
	3	Ext.	●	0460X03S050	32	32	68	5	1
4.7	2	Ext.	●	0470X02S050	24	24	62	5	1
	2	Ext.	●	0470X02S060	24	27	62	6	1
	3	Ext.	●	0470X03S050	32	32	68	5	1
4.8	2	Ext.	●	0480X02S050	24	24	62	5	1
	2	Ext.	●	0480X02S060	24	27	62	6	1
	3	Ext.	●	0480X03S050	32	32	68	5	1
4.8	3	Ext.	●	0480X03S060	32	35	68	6	1

● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
4.9	2	Ext.	●	MVE0490X02S050	24	24	62	5	1
	2	Ext.	●	0490X02S060	24	27	62	6	1
	3	Ext.	●	0490X03S050	32	32	68	5	1
	3	Ext.	●	0490X03S060	32	35	68	6	1
5.0	2	Ext.	●	0500X02S050	24	24	62	5	1
	2	Ext.	●	0500X02S060	24	27	62	6	1
	3	Ext.	●	0500X03S050	32	32	68	5	1
	3	Ext.	●	0500X03S060	32	35	68	6	1
5.1	2	Ext.	●	0510X02S060	26	28	66	6	1
	3	Ext.	●	0510X03S060	34	36	74	6	1
5.2	2	Ext.	●	0520X02S060	26	28	66	6	1
	3	Ext.	●	0520X03S060	34	36	74	6	1
5.3	2	Ext.	●	0530X02S060	26	28	66	6	1
	3	Ext.	●	0530X03S060	34	36	74	6	1
5.4	2	Ext.	●	0540X02S060	26	28	66	6	1
	3	Ext.	●	0540X03S060	34	36	74	6	1
5.5	2	Ext.	●	0550X02S060	26	28	66	6	1
	3	Ext.	●	0550X03S060	34	36	74	6	1
5.6	2	Ext.	●	0560X02S060	28	28	66	6	1
	3	Ext.	●	0560X03S060	36	36	74	6	1
5.7	2	Ext.	●	0570X02S060	28	28	66	6	1
	3	Ext.	●	0570X03S060	36	36	74	6	1
5.8	2	Ext.	●	0580X02S060	28	28	66	6	1
	3	Ext.	●	0580X03S060	36	36	74	6	1
5.9	2	Ext.	●	0590X02S060	28	28	66	6	1
	3	Ext.	●	0590X03S060	36	36	74	6	1
6.0	2	Ext.	●	0600X02S060	28	28	66	6	1
	3	Ext.	●	0600X03S060	36	36	74	6	1
6.1	2	Ext.	●	0610X02S070	31	34	74	7	1
	2	Ext.	●	0610X02S080	31	34	74	8	1
	3	Ext.	●	0610X03S070	41	44	83	7	1
	3	Ext.	●	0610X03S080	41	44	83	8	1
6.2	2	Ext.	●	0620X02S070	31	34	74	7	1
	2	Ext.	●	0620X02S080	31	34	74	8	1
	3	Ext.	●	0620X03S070	41	44	83	7	1
	3	Ext.	●	0620X03S080	41	44	83	8	1
6.3	2	Ext.	●	0630X02S070	31	34	74	7	1
	2	Ext.	●	0630X02S080	31	34	74	8	1
	3	Ext.	●	0630X03S070	41	44	83	7	1
	3	Ext.	●	0630X03S080	41	44	83	8	1
6.4	2	Ext.	●	0640X02S070	31	34	74	7	1
	2	Ext.	●	0640X02S080	31	34	74	8	1
	3	Ext.	●	0640X03S070	41	44	83	7	1
	3	Ext.	●	0640X03S080	41	44	83	8	1
6.5	2	Ext.	●	0650X02S070	31	34	74	7	1
	2	Ext.	●	0650X02S080	31	34	74	8	1
	3	Ext.	●	0650X03S070	41	44	83	7	1
	3	Ext.	●	0650X03S080	41	44	83	8	1
6.6	2	Ext.	●	0660X02S070	34	34	74	7	1
	2	Ext.	●	0660X02S080	34	36	74	8	1
	3	Ext.	●	0660X03S070	43	43	83	7	1
	3	Ext.	●	0660X03S080	43	45	83	8	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.7	2	Ext.	●	MVE0670X02S070	34	34	74	7	1
	2	Ext.	●	0670X02S080	34	36	74	8	1
	3	Ext.	●	0670X03S070	43	43	83	7	1
	3	Ext.	●	0670X03S080	43	45	83	8	1
6.8	2	Ext.	●	0680X02S070	34	34	74	7	1
	2	Ext.	●	0680X02S080	34	36	74	8	1
	3	Ext.	●	0680X03S070	43	43	83	7	1
	3	Ext.	●	0680X03S080	43	45	83	8	1
6.9	2	Ext.	●	0690X02S070	34	34	74	7	1
	2	Ext.	●	0690X02S080	34	36	74	8	1
	3	Ext.	●	0690X03S070	43	43	83	7	1
	3	Ext.	●	0690X03S080	43	45	83	8	1
7.0	2	Ext.	●	0700X02S070	34	34	74	7	1
	2	Ext.	●	0700X02S080	34	36	74	8	1
	3	Ext.	●	0700X03S070	43	43	83	7	1
	3	Ext.	●	0700X03S080	43	45	83	8	1
7.1	2	Ext.	●	0710X02S080	34	37	79	8	1
	3	Ext.	●	0710X03S080	45	48	90	8	1
7.2	2	Ext.	●	0720X02S080	34	37	79	8	1
	3	Ext.	●	0720X03S080	45	48	90	8	1
7.3	2	Ext.	●	0730X02S080	34	37	79	8	1
	3	Ext.	●	0730X03S080	45	48	90	8	1
7.4	2	Ext.	●	0740X02S080	34	37	79	8	1
	3	Ext.	●	0740X03S080	45	48	90	8	1
7.5	2	Ext.	●	0750X02S080	34	37	79	8	1
	3	Ext.	●	0750X03S080	45	48	90	8	1
7.6	2	Ext.	●	0760X02S080	37	37	79	8	1
	3	Ext.	●	0760X03S080	48	48	90	8	1
7.7	2	Ext.	●	0770X02S080	37	37	79	8	1
	3	Ext.	●	0770X03S080	48	48	90	8	1
7.8	2	Ext.	●	0780X02S080	37	37	79	8	1
	3	Ext.	●	0780X03S080	48	48	90	8	1
7.9	2	Ext.	●	0790X02S080	37	37	79	8	1
	3	Ext.	●	0790X03S080	48	48	90	8	1
8.0	2	Ext.	●	0800X02S080	37	37	79	8	1
	3	Ext.	●	0800X03S080	48	48	90	8	1
8.1	2	Ext.	●	0810X02S090	37	40	84	9	1
	2	Ext.	●	0810X02S100	37	40	84	10	1
	3	Ext.	●	0810X03S090	53	56	98	9	1
	3	Ext.	●	0810X03S100	53	56	98	10	1
8.2	2	Ext.	●	0820X02S090	37	40	84	9	1
	2	Ext.	●	0820X02S100	37	40	84	10	1
	3	Ext.	●	0820X03S090	53	56	98	9	1
	3	Ext.	●	0820X03S100	53	56	98	10	1
8.3	2	Ext.	●	0830X02S090	37	40	84	9	1
	2	Ext.	●	0830X02S100	37	40	84	10	1
	3	Ext.	●	0830X03S090	53	56	98	9	1
	3	Ext.	●	0830X03S100	53	56	98	10	1
8.4	2	Ext.	●	0840X02S090	37	40	84	9	1
	2	Ext.	●	0840X02S100	37	40	84	10	1
	3	Ext.	●	0840X03S090	53	56	98	9	1
	3	Ext.	●	0840X03S100	53	56	98	10	1

DRILLING(SOLID CARBIDE)

MVE NEW
WSTAR DRILLS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.5	2	Ext.	●	MVE0850X02S090	37	40	84	9	1
	2	Ext.	●	0850X02S100	37	40	84	10	1
	3	Ext.	●	0850X03S090	53	56	98	9	1
	3	Ext.	●	0850X03S100	53	56	98	10	1
8.6	2	Ext.	●	0860X02S090	40	40	84	9	1
	2	Ext.	●	0860X02S100	40	42	84	10	1
	3	Ext.	●	0860X03S090	55	55	98	9	1
	3	Ext.	●	0860X03S100	55	57	98	10	1
8.7	2	Ext.	●	0870X02S090	40	40	84	9	1
	2	Ext.	●	0870X02S100	40	42	84	10	1
	3	Ext.	●	0870X03S090	55	55	98	9	1
	3	Ext.	●	0870X03S100	55	57	98	10	1
8.8	2	Ext.	●	0880X02S090	40	40	84	9	1
	2	Ext.	●	0880X02S100	40	42	84	10	1
	3	Ext.	●	0880X03S090	55	55	98	9	1
	3	Ext.	●	0880X03S100	55	57	98	10	1
8.9	2	Ext.	●	0890X02S090	40	40	84	9	1
	2	Ext.	●	0890X02S100	40	42	84	10	1
	3	Ext.	●	0890X03S090	55	55	98	9	1
	3	Ext.	●	0890X03S100	55	57	98	10	1
9.0	2	Ext.	●	0900X02S090	40	40	84	9	1
	2	Ext.	●	0900X02S100	40	42	84	10	1
	3	Ext.	●	0900X03S090	55	55	98	9	1
	3	Ext.	●	0900X03S100	55	57	98	10	1
9.1	2	Ext.	●	0910X02S100	40	43	89	10	1
	3	Ext.	●	0910X03S100	58	61	105	10	1
9.2	2	Ext.	●	0920X02S100	40	43	89	10	1
	3	Ext.	●	0920X03S100	58	61	105	10	1
9.3	2	Ext.	●	0930X02S100	40	43	89	10	1
	3	Ext.	●	0930X03S100	58	61	105	10	1
9.4	2	Ext.	●	0940X02S100	40	43	89	10	1
	3	Ext.	●	0940X03S100	58	61	105	10	1
9.5	2	Ext.	●	0950X02S100	40	43	89	10	1
	3	Ext.	●	0950X03S100	58	61	105	10	1
9.6	2	Ext.	●	0960X02S100	43	43	89	10	1
	3	Ext.	●	0960X03S100	60	60	105	10	1
9.7	2	Ext.	●	0970X02S100	43	43	89	10	1
	3	Ext.	●	0970X03S100	60	60	105	10	1
9.8	2	Ext.	●	0980X02S100	43	43	89	10	1
	3	Ext.	●	0980X03S100	60	60	105	10	1
9.9	2	Ext.	●	0990X02S100	43	43	89	10	1
	3	Ext.	●	0990X03S100	60	60	105	10	1
10.0	2	Ext.	●	1000X02S100	43	43	89	10	1
	3	Ext.	●	1000X03S100	60	60	105	10	1
10.1	2	Ext.	●	1010X02S110	43	46	95	11	1
	2	Ext.	●	1010X02S120	43	46	95	12	1
	3	Ext.	●	1010X03S110	66	69	114	11	1
	3	Ext.	●	1010X03S120	66	69	114	12	1
10.2	2	Ext.	●	1020X02S110	43	46	95	11	1
	2	Ext.	●	1020X02S120	43	46	95	12	1
	3	Ext.	●	1020X03S110	66	69	114	11	1
	3	Ext.	●	1020X03S120	66	69	114	12	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP1020	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.3	2	Ext.	●	MVE1030X02S110	43	46	95	11	1
	2	Ext.	●	1030X02S120	43	46	95	12	1
	3	Ext.	●	1030X03S110	66	69	114	11	1
	3	Ext.	●	1030X03S120	66	69	114	12	1
10.4	2	Ext.	●	1040X02S110	43	46	95	11	1
	2	Ext.	●	1040X02S120	43	46	95	12	1
	3	Ext.	●	1040X03S110	66	69	114	11	1
	3	Ext.	●	1040X03S120	66	69	114	12	1
10.5	2	Ext.	●	1050X02S110	43	46	95	11	1
	2	Ext.	●	1050X02S120	43	46	95	12	1
	3	Ext.	●	1050X03S110	66	69	114	11	1
	3	Ext.	●	1050X03S120	66	69	114	12	1
10.6	2	Ext.	●	1060X02S110	47	47	95	11	1
	2	Ext.	●	1060X02S120	47	48	95	12	1
	3	Ext.	●	1060X03S110	68	68	114	11	1
	3	Ext.	●	1060X03S120	68	69	114	12	1
10.7	2	Ext.	●	1070X02S110	47	47	95	11	1
	2	Ext.	●	1070X02S120	47	48	95	12	1
	3	Ext.	●	1070X03S110	68	68	114	11	1
	3	Ext.	●	1070X03S120	68	69	114	12	1
10.8	2	Ext.	●	1080X02S110	47	47	95	11	1
	2	Ext.	●	1080X02S120	47	48	95	12	1
	3	Ext.	●	1080X03S110	68	68	114	11	1
	3	Ext.	●	1080X03S120	68	69	114	12	1
10.9	2	Ext.	●	1090X02S110	47	47	95	11	1
	2	Ext.	●	1090X02S120	47	48	95	12	1
	3	Ext.	●	1090X03S110	68	68	114	11	1
	3	Ext.	●	1090X03S120	68	69	114	12	1
11.0	2	Ext.	●	1100X02S110	47	47	95	11	1
	2	Ext.	●	1100X02S120	47	48	95	12	1
	3	Ext.	●	1100X03S110	68	68	114	11	1
	3	Ext.	●	1100X03S120	68	69	114	12	1
11.1	2	Ext.	●	1110X02S120	47	50	95	12	1
	3	Ext.	●	1110X03S120	71	74	121	12	1
11.2	2	Ext.	●	1120X02S120	47	50	95	12	1
	3	Ext.	●	1120X03S120	71	74	121	12	1
11.3	2	Ext.	●	1130X02S120	47	50	95	12	1
	3	Ext.	●	1130X03S120	71	74	121	12	1
11.4	2	Ext.	●	1140X02S120	47	50	95	12	1
	3	Ext.	●	1140X03S120	71	74	121	12	1
11.5	2	Ext.	●	1150X02S120	47	50	95	12	1
	3	Ext.	●	1150X03S120	71	74	121	12	1
11.6	2	Ext.	●	1160X02S120	47	47	95	12	1
	3	Ext.	●	1160X03S120	73	73	121	12	1
11.7	2	Ext.	●	1170X02S120	47	47	95	12	1
	3	Ext.	●	1170X03S120	73	73	121	12	1
11.8	2	Ext.	●	1180X02S120	47	47	95	12	1
	3	Ext.	●	1180X03S120	73	73	121	12	1
11.9	2	Ext.	●	1190X02S120	47	47	95	12	1
	3	Ext.	●	1190X03S120	73	73	121	12	1
12.0	2	Ext.	●	1200X02S120	47	47	95	12	1
	3	Ext.	●	1200X03S120	73	73	121	12	1

● : Inventory maintained in Japan.

N020

DRILLING

CARBIDE

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel ($\leq 180\text{HB}$)		Carbon steel, Alloy steel (180–280HB)		Carbon steel, Alloy steel (280–350HB)	
	AISI 1010 etc		AISI 1045, AISI 4140 etc		AISI 4340 etc	
Dia. (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)

Work Material	Austenitic Stainless Steel ($\leq 200\text{HB}$)		Gray Cast Iron ($\leq 350\text{MPa}$)		Ductile Cast Iron ($\leq 450\text{MPa}$)	
	AISI 304, AISI 316 etc		No 45 B etc		60-40-8 etc	
Dia. (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)


Work Material	Aluminium Alloy (Si<5%)		Heat Resistant Alloy		Hardened Steel (40–55HRC)	
			Inconel718 etc		AISI H13, L6 etc	
Dia. (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)

DRILLING(SOLID CARBIDE)

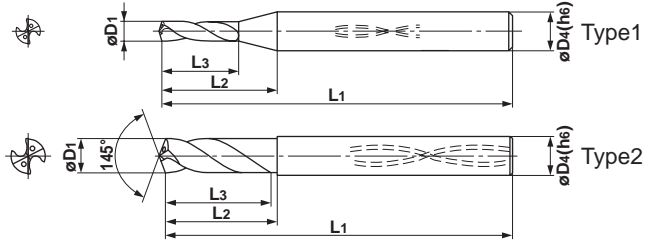
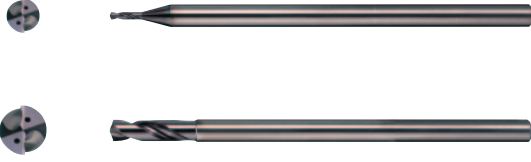
MWS WSTAR DRILLS

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

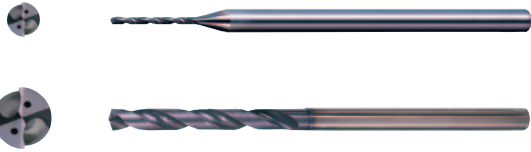
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	○	○


	0.5 ≤ D1 < 1	1 ≤ D1 < 2.95
	+0.009 0	+0.014 0
	0 -0.006	0 -0.006

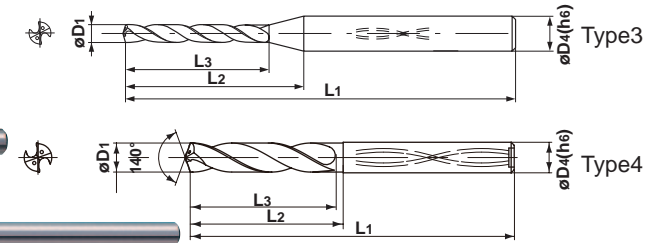
SB Type (For pilot holes)



LB/XB Type (φ0.50—φ2.95)



	0.5 ≤ D1 < 1	1 ≤ D1 < 2.95
	0 -0.009	0 -0.014
	0 -0.006	0 -0.006




DB Type (φ0.50—φ2.95)

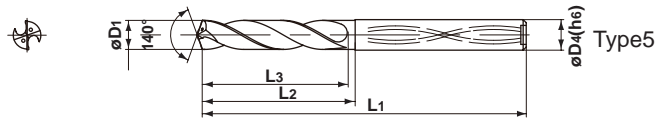


(Note) MWS drills are suitable for use with shrink fit holders.

MB/LB/X8DB Type (φ3—φ25)




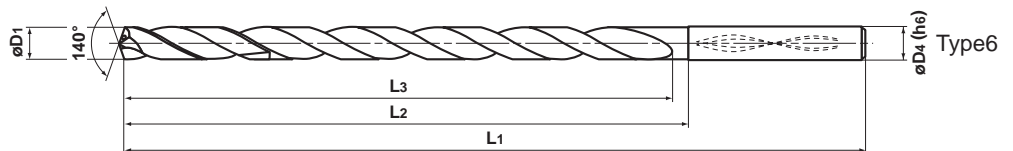
	D1=3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 18	18 < D1 ≤ 25
	0 -0.014	0 -0.018	0 -0.022	0 -0.027	0 -0.033
	0 -0.006	0 -0.008	0 -0.009	0 -0.011	0 -0.013



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



	D1=3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 14
	-0.017 -0.031	-0.025 -0.043	-0.033 -0.055	-0.041 -0.068
	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: Type 1 140° for drill diameter φ 0.50-2.0 and 145° for φ 2.05-2.95.

Type 3 135° 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.

- ① Drill name
- ② Workpiece material, drilling depth and required accuracy.
- ③ Drilling mode (through hole, blind hole, cross hole...)
- ④ Drill dimensions (dimensions specified in the drawing above).

Please contact us for inquiries.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
0.50	1	Int.	●	MWS0050SB	2.5	7.2	47	3	1
	5	Int.	●	0050LB	8	13	47	3	3
	12	Int.	●	0050XB	16	21	47	3	3
0.51	1	Int.	●	0051SB	2.6	7.2	47	3	1
	5	Int.	●	0051LB	8	13	47	3	3
	12	Int.	●	0051XB	16	21	47	3	3
0.52	1	Int.	●	0052SB	2.6	7.2	47	3	1
	5	Int.	●	0052LB	8	13	47	3	3
	12	Int.	●	0052XB	16	21	47	3	3
0.53	1	Int.	●	0053SB	2.6	7.2	47	3	1
	5	Int.	●	0053LB	8	13	47	3	3
	12	Int.	●	0053XB	16	21	47	3	3
0.54	1	Int.	●	0054SB	2.6	7.2	47	3	1
	5	Int.	●	0054LB	8	13	47	3	3
	12	Int.	●	0054XB	16	21	47	3	3
0.55	1	Int.	●	0055SB	2.6	7.2	47	3	1
	5	Int.	●	0055LB	8	13	47	3	3
	12	Int.	●	0055XB	16	21	47	3	3
0.56	1	Int.	●	0056SB	2.9	7.5	47	3	1
	5	Int.	●	0056LB	8	13	47	3	3
	12	Int.	●	0056XB	16	21	47	3	3
0.57	1	Int.	●	0057SB	2.9	7.4	47	3	1
	5	Int.	●	0057LB	8	13	47	3	3
	12	Int.	●	0057XB	16	21	47	3	3
0.58	1	Int.	●	0058SB	2.9	7.4	47	3	1
	5	Int.	●	0058LB	8	13	47	3	3
	12	Int.	●	0058XB	16	21	47	3	3
0.59	1	Int.	●	0059SB	2.9	7.4	47	3	1
	5	Int.	●	0059LB	8	12	47	3	3
	12	Int.	●	0059XB	16	20	47	3	3
0.60	1	Int.	●	0060SB	2.9	7.4	47	3	1
	5	Int.	●	0060LB	8	12	47	3	3
	12	Int.	●	0060XB	16	20	47	3	3
0.61	1	Int.	●	0061SB	3.1	7.6	47	3	1
	5	Int.	●	0061LB	8	12	47	3	3
	12	Int.	●	0061XB	16	20	47	3	3
0.62	1	Int.	●	0062SB	3.1	7.5	47	3	1
	5	Int.	●	0062LB	8	12	47	3	3
	12	Int.	●	0062XB	16	20	47	3	3
0.63	1	Int.	●	0063SB	3.1	7.5	47	3	1
	5	Int.	●	0063LB	8	12	47	3	3
	12	Int.	●	0063XB	16	20	47	3	3
0.64	1	Int.	●	0064SB	3.1	7.5	47	3	1
	5	Int.	●	0064LB	8	12	47	3	3
	12	Int.	●	0064XB	16	20	47	3	3
0.65	1	Int.	●	0065SB	3.1	7.5	47	3	1
	5	Int.	●	0065LB	8	12	47	3	3
	12	Int.	●	0065XB	16	20	47	3	3
0.66	1	Int.	●	0066SB	3.4	7.8	47	3	1
	5	Int.	●	0066LB	8	12	47	3	3
	12	Int.	●	0066XB	16	20	47	3	3

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
0.67	1	Int.	●	MWS0067SB	3.4	7.7	47	3	1
	5	Int.	●	0067LB	8	12	47	3	3
	12	Int.	●	0067XB	16	20	47	3	3
0.68	1	Int.	●	0068SB	3.4	7.7	47	3	1
	5	Int.	●	0068LB	8	12	47	3	3
	12	Int.	●	0068XB	16	20	47	3	3
0.69	1	Int.	●	0069SB	3.4	7.7	47	3	1
	5	Int.	●	0069LB	8	12	47	3	3
	12	Int.	●	0069XB	16	20	47	3	3
0.70	1	Int.	●	0070SB	3.4	7.7	47	3	1
	5	Int.	●	0070LB	8	12	47	3	3
	12	Int.	●	0070XB	16	20	47	3	3
0.71	1	Int.	●	0071SB	3.6	7.9	50	3	1
	5	Int.	●	0071LB	10	14	50	3	3
	12	Int.	●	0071XB	20	24	50	3	3
0.72	1	Int.	●	0072SB	3.6	7.9	50	3	1
	5	Int.	●	0072LB	10	14	50	3	3
	12	Int.	●	0072XB	20	24	50	3	3
0.73	1	Int.	●	0073SB	3.6	7.8	50	3	1
	5	Int.	●	0073LB	10	14	50	3	3
	12	Int.	●	0073XB	20	24	50	3	3
0.74	1	Int.	●	0074SB	3.6	7.8	50	3	1
	5	Int.	●	0074LB	10	14	50	3	3
	12	Int.	●	0074XB	20	24	50	3	3
0.75	1	Int.	●	0075SB	3.6	7.8	50	3	1
	5	Int.	●	0075LB	10	14	50	3	3
	12	Int.	●	0075XB	20	24	50	3	3
0.76	1	Int.	●	0076SB	3.9	8.1	50	3	1
	5	Int.	●	0076LB	10	14	50	3	3
	12	Int.	●	0076XB	20	24	50	3	3
0.77	1	Int.	●	0077SB	3.9	8.1	50	3	1
	5	Int.	●	0077LB	10	14	50	3	3
	12	Int.	●	0077XB	20	24	50	3	3
0.78	1	Int.	●	0078SB	3.9	8	50	3	1
	5	Int.	●	0078LB	10	14	50	3	3
	12	Int.	●	0078XB	20	24	50	3	3
0.79	1	Int.	●	0079SB	3.9	8	50	3	1
	5	Int.	●	0079LB	10	14	50	3	3
	12	Int.	●	0079XB	20	24	50	3	3
0.80	1	Int.	●	0080SB	3.9	8	50	3	1
	5	Int.	●	0080LB	10	14	50	3	3
	12	Int.	●	0080XB	20	24	50	3	3
0.81	1	Int.	●	0081SB	4.1	8.2	50	3	1
	5	Int.	●	0081LB	10	14	50	3	3
	12	Int.	●	0081XB	20	24	50	3	3
0.82	1	Int.	●	0082SB	4.1	8.2	50	3	1
	5	Int.	●	0082LB	10	14	50	3	3
	12	Int.	●	0082XB	20	24	50	3	3
0.83	1	Int.	●	0083SB	4.1	8.1	50	3	1
	5	Int.	●	0083LB	10	14	50	3	3
	12	Int.	●	0083XB	20	24	50	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

> N037

OPERATION GUIDANCE

> N041,N042

TECHNICAL DATA

> Q001

N023

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
0.84	1	Int.	●	MWS0084SB	4.1	8.1	50	3	1
	5	Int.	●	0084LB	10	14	50	3	3
	12	Int.	●	0084XB	20	24	50	3	3
0.85	1	Int.	●	0085SB	4.1	8.1	50	3	1
	5	Int.	●	0085LB	10	14	50	3	3
	12	Int.	●	0085XB	20	24	50	3	3
0.86	1	Int.	●	0086SB	4.4	8.4	50	3	1
	5	Int.	●	0086LB	10	14	50	3	3
	12	Int.	●	0086XB	20	24	50	3	3
0.87	1	Int.	●	0087SB	4.4	8.4	50	3	1
	5	Int.	●	0087LB	10	14	50	3	3
	12	Int.	●	0087XB	20	24	50	3	3
0.88	1	Int.	●	0088SB	4.4	8.4	50	3	1
	5	Int.	●	0088LB	10	14	50	3	3
	12	Int.	●	0088XB	20	24	50	3	3
0.89	1	Int.	●	0089SB	4.4	8.3	50	3	1
	5	Int.	●	0089LB	10	14	50	3	3
	12	Int.	●	0089XB	20	24	50	3	3
0.90	1	Int.	●	0090SB	4.4	8.3	50	3	1
	5	Int.	●	0090LB	10	14	50	3	3
	12	Int.	●	0090XB	20	24	50	3	3
0.91	1	Int.	●	0091SB	4.6	8.5	50	3	1
	5	Int.	●	0091LB	10	14	50	3	3
	12	Int.	●	0091XB	20	24	50	3	3
0.92	1	Int.	●	0092SB	4.6	8.5	50	3	1
	5	Int.	●	0092LB	10	14	50	3	3
	12	Int.	●	0092XB	20	24	50	3	3
0.93	1	Int.	●	0093SB	4.6	8.5	50	3	1
	5	Int.	●	0093LB	10	14	50	3	3
	12	Int.	●	0093XB	20	24	50	3	3
0.94	1	Int.	●	0094SB	4.6	8.4	50	3	1
	5	Int.	●	0094LB	10	14	50	3	3
	12	Int.	●	0094XB	20	24	50	3	3
0.95	1	Int.	●	0095SB	4.6	8.4	50	3	1
	5	Int.	●	0095LB	10	14	50	3	3
	12	Int.	●	0095XB	20	24	50	3	3
0.96	1	Int.	●	0096SB	4.9	8.7	50	3	1
	5	Int.	●	0096LB	10	14	50	3	3
	12	Int.	●	0096XB	20	24	50	3	3
0.97	1	Int.	●	0097SB	4.9	8.7	50	3	1
	5	Int.	●	0097LB	10	14	50	3	3
	12	Int.	●	0097XB	20	24	50	3	3
0.98	1	Int.	●	0098SB	4.9	8.7	50	3	1
	5	Int.	●	0098LB	10	14	50	3	3
	12	Int.	●	0098XB	20	24	50	3	3
0.99	1	Int.	●	0099SB	4.9	8.7	50	3	1
	5	Int.	●	0099LB	10	14	50	3	3
	12	Int.	●	0099XB	20	24	50	3	3

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
1.00	1	Int.	●	MWS0100SB	5	8.7	55	3	1
	5	Int.	●	0100LB	11	15	55	3	3
	12	Int.	●	0100XB	23	27	55	3	3
	20	Int.	●	0100X20DB	24	28	60	3	3
	25	Int.	●	0100X25DB	28	32	66	3	3
	30	Int.	●	0100X30DB	33	37	72	3	3
1.05	1	Int.	□	0105SB	5.2	8.8	55	3	1
	20	Int.	□	0105X20DB	24	28	60	3	3
	25	Int.	□	0105X25DB	29	33	66	3	3
	30	Int.	□	0105X30DB	35	38	72	3	3
1.10	1	Int.	●	0110SB	5.4	8.9	55	3	1
	5	Int.	●	0110LB	17	21	55	3	3
	12	Int.	●	0110XB	23	27	55	3	3
	20	Int.	●	0110X20DB	25	29	60	3	3
	25	Int.	●	0110X25DB	31	34	66	3	3
	30	Int.	●	0110X30DB	36	40	72	3	3
1.15	1	Int.	□	0115SB	5.6	9.1	55	3	1
	20	Int.	□	0115X20DB	26	30	60	3	3
	25	Int.	□	0115X25DB	32	36	66	3	3
	30	Int.	□	0115X30DB	38	41	72	3	3
1.20	1	Int.	●	0120SB	6	9.4	55	3	1
	5	Int.	●	0120LB	17	20	55	3	3
	12	Int.	●	0120XB	23	26	55	3	3
	20	Int.	●	0120X20DB	28	31	60	3	3
	25	Int.	●	0120X25DB	34	37	66	3	3
	30	Int.	●	0120X30DB	40	43	72	3	3
1.25	1	Int.	□	0125SB	6.2	9.5	55	3	1
	20	Int.	□	0125X20DB	29	32	68	3	3
	25	Int.	□	0125X25DB	35	38	74	3	3
	30	Int.	□	0125X30DB	41	45	82	3	3
1.30	1	Int.	●	0130SB	6.4	9.6	55	3	1
	5	Int.	●	0130LB	17	20	55	3	3
	12	Int.	●	0130XB	23	26	55	3	3
	20	Int.	●	0130X20DB	30	33	68	3	3
	25	Int.	●	0130X25DB	36	40	74	3	3
	30	Int.	●	0130X30DB	43	46	82	3	3
1.35	1	Int.	□	0135SB	6.6	9.7	55	3	1
	20	Int.	□	0135X20DB	31	34	68	3	3
	25	Int.	□	0135X25DB	38	41	74	3	3
	30	Int.	□	0135X30DB	45	48	82	3	3
1.40	1	Int.	●	0140SB	7	10	55	3	1
	5	Int.	●	0140LB	17	20	55	3	3
	12	Int.	●	0140XB	23	26	55	3	3
	20	Int.	●	0140X20DB	32	35	68	3	3
	25	Int.	●	0140X25DB	39	42	74	3	3
	30	Int.	●	0140X30DB	46	49	82	3	3
1.45	1	Int.	□	0145SB	7.2	10.1	55	3	1
	20	Int.	□	0145X20DB	33	36	68	3	3
	25	Int.	□	0145X25DB	41	43	74	3	3
	30	Int.	□	0145X30DB	48	51	82	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
1.50	1	Int.	●	MWS0150SB	7.4	10.2	55	3	1
	5	Int.	●	0150LB	17	20	55	3	3
	12	Int.	●	0150XB	23	26	55	3	3
	20	Int.	●	0150X20DB	35	37	68	3	3
	25	Int.	●	0150X25DB	42	45	74	3	3
	30	Int.	●	0150X30DB	50	52	82	3	3
1.55	1	Int.	□	0155SB	7.6	10.3	68	3	1
	20	Int.	□	0155X20DB	36	38	78	3	3
	25	Int.	□	0155X25DB	43	46	86	3	3
	30	Int.	□	0155X30DB	51	54	95	3	3
1.60	1	Int.	●	0160SB	8	10.6	68	3	1
	5	Int.	●	0160LB	22	25	68	3	3
	12	Int.	●	0160XB	30	33	68	3	3
	20	Int.	●	0160X20DB	37	39	78	3	3
	25	Int.	●	0160X25DB	45	47	86	3	3
	30	Int.	●	0160X30DB	53	55	95	3	3
1.65	1	Int.	□	0165SB	8.2	10.7	68	3	1
	20	Int.	□	0165X20DB	38	40	78	3	3
	25	Int.	□	0165X25DB	46	49	86	3	3
	30	Int.	□	0165X30DB	54	57	95	3	3
1.70	1	Int.	●	0170SB	8.4	10.8	68	3	1
	5	Int.	●	0170LB	22	24	68	3	3
	12	Int.	●	0170XB	30	32	68	3	3
	20	Int.	●	0170X20DB	39	42	78	3	3
	25	Int.	●	0170X25DB	48	50	86	3	3
	30	Int.	●	0170X30DB	56	59	95	3	3
1.75	1	Int.	□	0175SB	8.6	10.9	68	3	1
	20	Int.	□	0175X20DB	40	43	84	3	3
	25	Int.	□	0175X25DB	49	51	94	3	3
	30	Int.	□	0175X30DB	58	60	102	3	3
1.80	1	Int.	●	0180SB	9	11.2	68	3	1
	5	Int.	●	0180LB	22	24	68	3	3
	12	Int.	●	0180XB	30	32	68	3	3
	20	Int.	●	0180X20DB	41	44	84	3	3
	25	Int.	●	0180X25DB	50	53	94	3	3
	30	Int.	●	0180X30DB	59	62	102	3	3
1.85	1	Int.	□	0185SB	9.2	11.3	68	3	1
	20	Int.	□	0185X20DB	43	45	84	3	3
	25	Int.	□	0185X25DB	52	54	94	3	3
	30	Int.	□	0185X30DB	61	63	102	3	3
1.90	1	Int.	●	0190SB	9.4	11.5	68	3	1
	5	Int.	●	0190LB	22	24	68	3	3
	12	Int.	●	0190XB	30	32	68	3	3
	20	Int.	●	0190X20DB	44	46	84	3	3
	25	Int.	●	0190X25DB	53	55	94	3	3
	30	Int.	●	0190X30DB	63	65	102	3	3
1.95	1	Int.	□	0195SB	9.6	11.6	68	3	1
	20	Int.	□	0195X20DB	45	47	84	3	3
	25	Int.	□	0195X25DB	55	57	94	3	3
	30	Int.	□	0195X30DB	64	66	102	3	3

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
2.00	1	Int.	●	MWS0200SB	10	11.9	68	3	1
	5	Int.	●	0200LB	22	24	68	3	3
	12	Int.	●	0200XB	30	32	68	3	3
	20	Int.	●	0200X20DB	46	48	84	3	3
	25	Int.	●	0200X25DB	56	58	94	3	3
	30	Int.	●	0200X30DB	66	68	102	3	3
2.05	1	Int.	□	0205SB	10.2	12	74	3	1
	20	Int.	□	0205X20DB	47	49	94	3	3
	25	Int.	□	0205X25DB	57	59	107	3	3
	30	Int.	□	0205X30DB	68	69	118	3	3
2.10	1	Int.	●	0210SB	10.4	12.1	74	3	1
	5	Int.	●	0210LB	28	30	74	3	3
	12	Int.	●	0210XB	38	40	74	3	3
	20	Int.	●	0210X20DB	48	50	94	3	3
	25	Int.	●	0210X25DB	59	60	107	3	3
	30	Int.	●	0210X30DB	69	71	118	3	3
2.15	1	Int.	□	0215SB	10.6	12.2	74	3	1
	20	Int.	□	0215X20DB	49	51	94	3	3
	25	Int.	□	0215X25DB	60	62	107	3	3
	30	Int.	□	0215X30DB	71	73	118	3	3
2.20	1	Int.	●	0220SB	11	12.5	74	3	1
	5	Int.	●	0220LB	28	29	74	3	3
	12	Int.	●	0220XB	38	39	74	3	3
	20	Int.	●	0220X20DB	51	52	94	3	3
	25	Int.	●	0220X25DB	62	63	107	3	3
	30	Int.	●	0220X30DB	73	74	118	3	3
2.25	1	Int.	□	0225SB	11.2	12.6	74	3	1
	20	Int.	□	0225X20DB	52	53	94	3	3
	25	Int.	□	0225X25DB	63	64	107	3	3
	30	Int.	□	0225X30DB	74	76	118	3	3
2.30	1	Int.	●	0230SB	11.4	12.7	74	3	1
	5	Int.	●	0230LB	28	29	74	3	3
	12	Int.	●	0230XB	38	39	74	3	3
	20	Int.	●	0230X20DB	53	54	94	3	3
	25	Int.	●	0230X25DB	64	66	107	3	3
	30	Int.	●	0230X30DB	76	77	118	3	3
2.35	1	Int.	□	0235SB	11.6	12.8	74	3	1
	20	Int.	□	0235X20DB	54	55	94	3	3
	25	Int.	□	0235X25DB	66	67	107	3	3
	30	Int.	□	0235X30DB	78	79	118	3	3
2.40	1	Int.	●	0240SB	12	13.1	74	3	1
	5	Int.	●	0240LB	28	29	74	3	3
	12	Int.	●	0240XB	38	39	74	3	3
	20	Int.	●	0240X20DB	55	56	94	3	3
	25	Int.	●	0240X25DB	67	68	107	3	3
	30	Int.	●	0240X30DB	79	80	118	3	3
2.45	1	Int.	□	0245SB	12.2	13.2	74	3	1
	20	Int.	□	0245X20DB	56	57	94	3	3
	25	Int.	□	0245X25DB	69	70	107	3	3
	30	Int.	□	0245X30DB	81	82	118	3	3

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0250LB	28	29	74	3	3
	12	Int.	●	0250XB	38	39	74	3	3
	20	Int.	●	0250X20DB	58	59	94	3	3
	25	Int.	●	0250X25DB	70	71	107	3	3
	30	Int.	●	0250X30DB	83	84	118	3	3
2.55	1	Int.	□	0255SB	12.6	12.6	81	3	2
	20	Int.	□	0255X20DB	59	59	103	3	4
	25	Int.	□	0255X25DB	71	71	117	3	4
	30	Int.	□	0255X30DB	84	84	132	3	4
2.60	1	Int.	●	0260SB	13	13	81	3	2
	5	Int.	●	0260LB	33	33	81	3	4
	12	Int.	●	0260XB	45	45	81	3	4
	20	Int.	●	0260X20DB	60	60	103	3	4
	25	Int.	●	0260X25DB	73	73	117	3	4
	30	Int.	●	0260X30DB	86	86	132	3	4
2.65	1	Int.	□	0265SB	13.2	13.2	81	3	2
	20	Int.	□	0265X20DB	61	61	103	3	4
	25	Int.	□	0265X25DB	74	74	117	3	4
	30	Int.	□	0265X30DB	87	87	132	3	4
2.70	1	Int.	●	0270SB	13.4	13.4	81	3	2
	5	Int.	●	0270LB	33	33	81	3	4
	12	Int.	●	0270XB	45	45	81	3	4
	20	Int.	●	0270X20DB	62	62	103	3	4
	25	Int.	●	0270X25DB	76	76	117	3	4
	30	Int.	●	0270X30DB	89	89	132	3	4
2.75	1	Int.	□	0275SB	13.6	13.6	81	3	2
	20	Int.	□	0275X20DB	63	63	103	3	4
	25	Int.	□	0275X25DB	77	77	117	3	4
	30	Int.	□	0275X30DB	91	91	132	3	4
2.80	1	Int.	●	0280SB	14	14	81	3	2
	5	Int.	●	0280LB	33	33	81	3	4
	12	Int.	●	0280XB	45	45	81	3	4
	20	Int.	●	0280X20DB	64	64	103	3	4
	25	Int.	●	0280X25DB	78	78	117	3	4
	30	Int.	●	0280X30DB	92	92	132	3	4
2.85	1	Int.	□	0285SB	14.2	14.2	81	3	2
	20	Int.	□	0285X20DB	66	66	103	3	4
	25	Int.	□	0285X25DB	80	80	117	3	4
	30	Int.	□	0285X30DB	94	94	132	3	4
2.90	1	Int.	●	0290SB	14.4	14.4	81	3	2
	5	Int.	●	0290LB	33	33	81	3	4
	12	Int.	●	0290XB	45	45	81	3	4
	20	Int.	●	0290X20DB	67	67	103	3	4
	25	Int.	●	0290X25DB	81	81	117	3	4
	30	Int.	●	0290X30DB	96	96	132	3	4
2.95	1	Int.	□	0295SB	14.6	14.6	81	3	2
	20	Int.	□	0295X20DB	68	68	103	3	4
	25	Int.	□	0295X25DB	83	83	117	3	4
	30	Int.	□	0295X30DB	97	97	132	3	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0300LB	33	33	81	3	5
	8	Int.	●	0300X8DB	35	35	81	3	5
	10	Int.	●	0300X10DB	39	42	90	3	6
	15	Int.	●	0300X15DB	54	57	105	3	6
	20	Int.	●	0300X20DB	69	72	120	3	6
	25	Int.	●	0300X25DB	84	87	135	3	6
	30	Int.	●	0300X30DB	99	102	150	3	6
3.10	3	Int.	●	0310MB	28	28	76	4	5
	5	Int.	●	0310LB	39	39	87	4	5
	8	Int.	●	0310X8DB	41	41	87	4	5
	10	Int.	●	0310X10DB	46	49	97	4	6
	15	Int.	●	0310X15DB	63	66	114	4	6
	20	Int.	●	0310X20DB	81	84	132	4	6
	25	Int.	●	0310X25DB	98	101	149	4	6
	30	Int.	●	0310X30DB	116	119	167	4	6
3.20	3	Int.	●	0320MB	28	28	76	4	5
	5	Int.	●	0320LB	39	39	87	4	5
	8	Int.	●	0320X8DB	41	41	87	4	5
	10	Int.	●	0320X10DB	46	49	97	4	6
	15	Int.	●	0320X15DB	63	66	114	4	6
	20	Int.	●	0320X20DB	81	84	132	4	6
	25	Int.	●	0320X25DB	98	101	149	4	6
	30	Int.	●	0320X30DB	116	119	167	4	6
3.30	3	Int.	●	0330MB	28	28	76	4	5
	5	Int.	●	0330LB	39	39	87	4	5
	8	Int.	●	0330X8DB	41	41	87	4	5
	10	Int.	●	0330X10DB	46	49	97	4	6
	15	Int.	●	0330X15DB	63	66	114	4	6
	20	Int.	●	0330X20DB	81	84	132	4	6
	25	Int.	●	0330X25DB	98	101	149	4	6
	30	Int.	●	0330X30DB	116	119	167	4	6
3.40	3	Int.	●	0340MB	28	28	76	4	5
	5	Int.	●	0340LB	39	39	87	4	5
	8	Int.	●	0340X8DB	41	41	87	4	5
	10	Int.	●	0340X10DB	46	49	97	4	6
	15	Int.	●	0340X15DB	63	66	114	4	6
	20	Int.	●	0340X20DB	81	84	132	4	6
	25	Int.	●	0340X25DB	98	101	149	4	6
	30	Int.	●	0340X30DB	116	119	167	4	6
3.50	3	Int.	●	0350MB	28	28	76	4	5
	5	Int.	●	0350LB	39	39	87	4	5
	8	Int.	●	0350X8DB	41	41	87	4	5
	10	Int.	●	0350X10DB	46	49	97	4	6
	15	Int.	●	0350X15DB	63	66	114	4	6
	20	Int.	●	0350X20DB	81	84	132	4	6
	25	Int.	●	0350X25DB	98	101	149	4	6
	30	Int.	●	0350X30DB	116	119	167	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
3.6	5	Int.	●	0360LB	44	44	92	4	5
	8	Int.	●	0360X8DB	46	46	92	4	5
	10	Int.	●	0360X10DB	52	55	103	4	6
	15	Int.	●	0360X15DB	72	75	123	4	6
	20	Int.	●	0360X20DB	92	95	143	4	6
	25	Int.	●	0360X25DB	112	115	163	4	6
	30	Int.	●	0360X30DB	132	135	183	4	6
3.7	3	Int.	●	0370MB	32	32	80	4	5
	5	Int.	●	0370LB	44	44	92	4	5
	8	Int.	●	0370X8DB	46	46	92	4	5
	10	Int.	●	0370X10DB	52	55	103	4	6
	15	Int.	●	0370X15DB	72	75	123	4	6
	20	Int.	●	0370X20DB	92	95	143	4	6
	30	Int.	●	0370X30DB	132	135	183	4	6
3.8	3	Int.	●	0380MB	32	32	80	4	5
	5	Int.	●	0380LB	44	44	92	4	5
	8	Int.	●	0380X8DB	46	46	92	4	5
	10	Int.	●	0380X10DB	52	55	103	4	6
	15	Int.	●	0380X15DB	72	75	123	4	6
	20	Int.	●	0380X20DB	92	95	143	4	6
	30	Int.	●	0380X30DB	132	135	183	4	6
3.9	3	Int.	●	0390MB	32	32	80	4	5
	5	Int.	●	0390LB	44	44	92	4	5
	8	Int.	●	0390X8DB	46	46	92	4	5
	10	Int.	●	0390X10DB	52	55	103	4	6
	15	Int.	●	0390X15DB	72	75	123	4	6
	20	Int.	●	0390X20DB	92	95	143	4	6
	30	Int.	●	0390X30DB	132	135	183	4	6
4.0	3	Int.	●	0400MB	32	32	80	4	5
	5	Int.	●	0400LB	44	44	92	4	5
	8	Int.	●	0400X8DB	46	46	92	4	5
	10	Int.	●	0400X10DB	52	55	103	4	6
	15	Int.	●	0400X15DB	72	75	123	4	6
	20	Int.	●	0400X20DB	92	95	143	4	6
	30	Int.	●	0400X30DB	132	135	183	4	6
4.1	3	Int.	●	0410MB	36	36	86	5	5
	5	Int.	●	0410LB	50	50	100	5	5
	8	Int.	●	0410X8DB	52	52	100	5	5
	10	Int.	●	0410X10DB	59	62	112	5	6
	15	Int.	●	0410X15DB	81	84	134	5	6
	20	Int.	●	0410X20DB	104	107	157	5	6
	30	Int.	●	0410X30DB	149	152	202	5	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
4.2	5	Int.	●	0420LB	50	50	100	5	5
	8	Int.	●	0420X8DB	52	52	100	5	5
	10	Int.	●	0420X10DB	59	62	112	5	6
	15	Int.	●	0420X15DB	81	84	134	5	6
	20	Int.	●	0420X20DB	104	107	157	5	6
	25	Int.	●	0420X25DB	126	129	179	5	6
	30	Int.	●	0420X30DB	149	152	202	5	6
4.3	3	Int.	●	0430MB	36	36	86	5	5
	5	Int.	●	0430LB	50	50	100	5	5
	8	Int.	●	0430X8DB	52	52	100	5	5
	10	Int.	●	0430X10DB	59	62	112	5	6
	15	Int.	●	0430X15DB	81	84	134	5	6
	20	Int.	●	0430X20DB	104	107	157	5	6
	30	Int.	●	0430X30DB	149	152	202	5	6
4.4	3	Int.	●	0440MB	36	36	86	5	5
	5	Int.	●	0440LB	50	50	100	5	5
	8	Int.	●	0440X8DB	52	52	100	5	5
	10	Int.	●	0440X10DB	59	62	112	5	6
	15	Int.	●	0440X15DB	81	84	134	5	6
	20	Int.	●	0440X20DB	104	107	157	5	6
	30	Int.	●	0440X30DB	149	152	202	5	6
4.5	3	Int.	●	0450MB	36	36	86	5	5
	5	Int.	●	0450LB	50	50	100	5	5
	8	Int.	●	0450X8DB	52	52	100	5	5
	10	Int.	●	0450X10DB	59	62	112	5	6
	15	Int.	●	0450X15DB	81	84	134	5	6
	20	Int.	●	0450X20DB	104	107	157	5	6
	30	Int.	●	0450X30DB	149	152	202	5	6
4.6	3	Int.	●	0460MB	40	40	90	5	5
	5	Int.	●	0460LB	55	55	105	5	5
	8	Int.	●	0460X8DB	57	57	105	5	5
	10	Int.	●	0460X10DB	65	68	118	5	6
	15	Int.	●	0460X15DB	90	93	143	5	6
	20	Int.	●	0460X20DB	115	118	168	5	6
	30	Int.	●	0460X30DB	165	168	218	5	6
4.7	3	Int.	●	0470MB	40	40	90	5	5
	5	Int.	●	0470LB	55	55	105	5	5
	8	Int.	●	0470X8DB	57	57	105	5	5
	10	Int.	●	0470X10DB	65	68	118	5	6
	15	Int.	●	0470X15DB	90	93	143	5	6
	20	Int.	●	0470X20DB	115	118	168	5	6
	30	Int.	●	0470X30DB	165	168	218	5	6

DRILLING

CUTTING CONDITIONS > N037
 OPERATION GUIDANCE > N041,N042
 TECHNICAL DATA > Q001

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
4.8	3	Int.	●	MWS0480MB	40	40	90	5	5
	5	Int.	●	0480LB	55	55	105	5	5
	8	Int.	●	0480X8DB	57	57	105	5	5
	10	Int.	●	0480X10DB	65	68	118	5	6
	15	Int.	●	0480X15DB	90	93	143	5	6
	20	Int.	●	0480X20DB	115	118	168	5	6
	25	Int.	●	0480X25DB	140	143	193	5	6
	30	Int.	●	0480X30DB	165	168	218	5	6
4.9	3	Int.	●	0490MB	40	40	90	5	5
	5	Int.	●	0490LB	55	55	105	5	5
	8	Int.	●	0490X8DB	57	57	105	5	5
	10	Int.	●	0490X10DB	65	68	118	5	6
	15	Int.	●	0490X15DB	90	93	143	5	6
	20	Int.	●	0490X20DB	115	118	168	5	6
	25	Int.	●	0490X25DB	140	143	193	5	6
	30	Int.	●	0490X30DB	165	168	218	5	6
5.0	3	Int.	●	0500MB	27.5	30	82	6	5
	5	Int.	●	0500LB	44	48	100	6	5
	8	Int.	●	0500X8DB	57	57	105	5	5
	10	Int.	●	0500X10DB	65	68	118	5	6
	15	Int.	●	0500X15DB	90	93	143	5	6
	20	Int.	●	0500X20DB	115	118	168	5	6
	25	Int.	●	0500X25DB	140	143	193	5	6
	30	Int.	●	0500X30DB	165	168	218	5	6
5.1	3	Int.	●	0510MB	27.5	30	82	6	5
	5	Int.	●	0510LB	44	48	100	6	5
	8	Int.	●	0510X8DB	61	66	118	6	5
	10	Int.	●	0510X10DB	72	75	127	6	6
	15	Int.	●	0510X15DB	99	102	154	6	6
	20	Int.	●	0510X20DB	127	130	182	6	6
	25	Int.	●	0510X25DB	154	157	209	6	6
	30	Int.	●	0510X30DB	182	185	237	6	6
5.2	3	Int.	●	0520MB	27.5	30	82	6	5
	5	Int.	●	0520LB	44	48	100	6	5
	8	Int.	●	0520X8DB	61	66	118	6	5
	10	Int.	●	0520X10DB	72	75	127	6	6
	15	Int.	●	0520X15DB	99	102	154	6	6
	20	Int.	●	0520X20DB	127	130	182	6	6
	25	Int.	●	0520X25DB	154	157	209	6	6
	30	Int.	●	0520X30DB	182	185	237	6	6
5.3	3	Int.	●	0530MB	27.5	30	82	6	5
	5	Int.	●	0530LB	44	48	100	6	5
	8	Int.	●	0530X8DB	61	66	118	6	5
	10	Int.	●	0530X10DB	72	75	127	6	6
	15	Int.	●	0530X15DB	99	102	154	6	6
	20	Int.	●	0530X20DB	127	130	182	6	6
	25	Int.	●	0530X25DB	154	157	209	6	6
	30	Int.	●	0530X30DB	182	185	237	6	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
5.4	3	Int.	●	MWS0540MB	27.5	30	82	6	5
	5	Int.	●	0540LB	44	48	100	6	5
	8	Int.	●	0540X8DB	61	66	118	6	5
	10	Int.	●	0540X10DB	72	75	127	6	6
	15	Int.	●	0540X15DB	99	102	154	6	6
	20	Int.	●	0540X20DB	127	130	182	6	6
	25	Int.	●	0540X25DB	154	157	209	6	6
	30	Int.	●	0540X30DB	182	185	237	6	6
5.5	3	Int.	●	0550MB	27.5	30	82	6	5
	5	Int.	●	0550LB	44	48	100	6	5
	8	Int.	●	0550X8DB	61	66	118	6	5
	10	Int.	●	0550X10DB	72	75	127	6	6
	15	Int.	●	0550X15DB	99	102	154	6	6
	20	Int.	●	0550X20DB	127	130	182	6	6
	25	Int.	●	0550X25DB	154	157	209	6	6
	30	Int.	●	0550X30DB	182	185	237	6	6
5.6	3	Int.	●	0560MB	30	30	82	6	5
	5	Int.	●	0560LB	48	48	100	6	5
	8	Int.	●	0560X8DB	66	66	118	6	5
	10	Int.	●	0560X10DB	78	81	133	6	6
	15	Int.	●	0560X15DB	108	111	163	6	6
	20	Int.	●	0560X20DB	138	141	193	6	6
	25	Int.	●	0560X25DB	168	171	223	6	6
	30	Int.	●	0560X30DB	198	201	253	6	6
5.7	3	Int.	●	0570MB	30	30	82	6	5
	5	Int.	●	0570LB	48	48	100	6	5
	8	Int.	●	0570X8DB	66	66	118	6	5
	10	Int.	●	0570X10DB	78	81	133	6	6
	15	Int.	●	0570X15DB	108	111	163	6	6
	20	Int.	●	0570X20DB	138	141	193	6	6
	25	Int.	●	0570X25DB	168	171	223	6	6
	30	Int.	●	0570X30DB	198	201	253	6	6
5.8	3	Int.	●	0580MB	30	30	82	6	5
	5	Int.	●	0580LB	48	48	100	6	5
	8	Int.	●	0580X8DB	66	66	118	6	5
	10	Int.	●	0580X10DB	78	81	133	6	6
	15	Int.	●	0580X15DB	108	111	163	6	6
	20	Int.	●	0580X20DB	138	141	193	6	6
	25	Int.	●	0580X25DB	168	171	223	6	6
	30	Int.	●	0580X30DB	198	201	253	6	6
5.9	3	Int.	●	0590MB	30	30	82	6	5
	5	Int.	●	0590LB	48	48	100	6	5
	8	Int.	●	0590X8DB	66	66	118	6	5
	10	Int.	●	0590X10DB	78	81	133	6	6
	15	Int.	●	0590X15DB	108	111	163	6	6
	20	Int.	●	0590X20DB	138	141	193	6	6
	25	Int.	●	0590X25DB	168	171	223	6	6
	30	Int.	●	0590X30DB	198	201	253	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.0	3	Int.	●	MWS0600MB	30	30	82	6	5
	5	Int.	●	0600LB	48	48	100	6	5
	8	Int.	●	0600X8DB	66	66	118	6	5
	10	Int.	●	0600X10DB	78	81	133	6	6
	15	Int.	●	0600X15DB	108	111	163	6	6
	20	Int.	●	0600X20DB	138	141	193	6	6
	25	Int.	●	0600X25DB	168	171	223	6	6
	30	Int.	●	0600X30DB	198	201	253	6	6
6.1	3	Int.	●	0610MB	32.5	35	88	7	5
	5	Int.	●	0610LB	52	56	109	7	5
	8	Int.	●	0610X8DB	72	77	130	7	5
	10	Int.	●	0610X10DB	85	88	141	7	6
6.1	15	Int.	●	0610X15DB	117	120	173	7	6
	20	Int.	●	0610X20DB	150	153	206	7	6
	25	Int.	●	0610X25DB	182	185	238	7	6
	30	Int.	●	0610X30DB	215	218	271	7	6
6.2	3	Int.	●	0620MB	32.5	35	88	7	5
	5	Int.	●	0620LB	52	56	109	7	5
	8	Int.	●	0620X8DB	72	77	130	7	5
	10	Int.	●	0620X10DB	85	88	141	7	6
	15	Int.	●	0620X15DB	117	120	173	7	6
	20	Int.	●	0620X20DB	150	153	206	7	6
	25	Int.	●	0620X25DB	182	185	238	7	6
	30	Int.	●	0620X30DB	215	218	271	7	6
6.3	3	Int.	●	0630MB	32.5	35	88	7	5
	5	Int.	●	0630LB	52	56	109	7	5
	8	Int.	●	0630X8DB	72	77	130	7	5
	10	Int.	●	0630X10DB	85	88	141	7	6
	15	Int.	●	0630X15DB	117	120	173	7	6
	20	Int.	●	0630X20DB	150	153	206	7	6
	25	Int.	●	0630X25DB	182	185	238	7	6
	30	Int.	●	0630X30DB	215	218	271	7	6
6.4	3	Int.	●	0640MB	32.5	35	88	7	5
	5	Int.	●	0640LB	52	56	109	7	5
	8	Int.	●	0640X8DB	72	77	130	7	5
	10	Int.	●	0640X10DB	85	88	141	7	6
	15	Int.	●	0640X15DB	117	120	173	7	6
	20	Int.	●	0640X20DB	150	153	206	7	6
	25	Int.	●	0640X25DB	182	185	238	7	6
	30	Int.	●	0640X30DB	215	218	271	7	6
6.5	3	Int.	●	0650MB	32.5	35	88	7	5
	5	Int.	●	0650LB	52	56	109	7	5
	8	Int.	●	0650X8DB	72	77	130	7	5
	10	Int.	●	0650X10DB	85	88	141	7	6
	15	Int.	●	0650X15DB	117	120	173	7	6
	20	Int.	●	0650X20DB	150	153	206	7	6
	25	Int.	●	0650X25DB	182	185	238	7	6
	30	Int.	●	0650X30DB	215	218	271	7	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.6	3	Int.	●	MWS0660MB	35	35	88	7	5
	5	Int.	●	0660LB	56	56	109	7	5
	8	Int.	●	0660X8DB	77	77	130	7	5
	10	Int.	●	0660X10DB	91	94	147	7	6
	15	Int.	●	0660X15DB	126	129	182	7	6
	20	Int.	●	0660X20DB	161	164	217	7	6
	25	Int.	●	0660X25DB	196	199	252	7	6
	30	Int.	●	0660X30DB	231	234	287	7	6
6.7	3	Int.	●	0670MB	35	35	88	7	5
	5	Int.	●	0670LB	56	56	109	7	5
	8	Int.	●	0670X8DB	77	77	130	7	5
	10	Int.	●	0670X10DB	91	94	147	7	6
	15	Int.	●	0670X15DB	126	129	182	7	6
	20	Int.	●	0670X20DB	161	164	217	7	6
	25	Int.	●	0670X25DB	196	199	252	7	6
	30	Int.	●	0670X30DB	231	234	287	7	6
6.8	3	Int.	●	0680MB	35	35	88	7	5
	5	Int.	●	0680LB	56	56	109	7	5
	8	Int.	●	0680X8DB	77	77	130	7	5
	10	Int.	●	0680X10DB	91	94	147	7	6
	15	Int.	●	0680X15DB	126	129	182	7	6
	20	Int.	●	0680X20DB	161	164	217	7	6
	25	Int.	●	0680X25DB	196	199	252	7	6
	30	Int.	●	0680X30DB	231	234	287	7	6
6.9	3	Int.	●	0690MB	35	35	88	7	5
	5	Int.	●	0690LB	56	56	109	7	5
	8	Int.	●	0690X8DB	77	77	130	7	5
	10	Int.	●	0690X10DB	91	94	147	7	6
	15	Int.	●	0690X15DB	126	129	182	7	6
	20	Int.	●	0690X20DB	161	164	217	7	6
	25	Int.	●	0690X25DB	196	199	252	7	6
	30	Int.	●	0690X30DB	231	234	287	7	6
7.0	3	Int.	●	0700MB	35	35	88	7	5
	5	Int.	●	0700LB	56	56	109	7	5
	8	Int.	●	0700X8DB	77	77	130	7	5
	10	Int.	●	0700X10DB	91	94	147	7	6
	15	Int.	●	0700X15DB	126	129	182	7	6
	20	Int.	●	0700X20DB	161	164	217	7	6
	25	Int.	●	0700X25DB	196	199	252	7	6
	30	Int.	●	0700X30DB	231	234	287	7	6
7.1	3	Int.	●	0710MB	37.5	40	94	8	5
	5	Int.	●	0710LB	60	64	118	8	5
	8	Int.	●	0710X8DB	83	88	142	8	5
	10	Int.	●	0710X10DB	98	101	155	8	6
	15	Int.	●	0710X15DB	135	138	192	8	6
	20	Int.	●	0710X20DB	173	176	230	8	6
	25	Int.	●	0710X25DB	210	213	267	8	6
	30	Int.	●	0710X30DB	248	251	305	8	6

DRILLING

CUTTING CONDITIONS > N037
 OPERATION GUIDANCE > N041,N042
 TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0720LB	60	64	118	8	5
	8	Int.	●	0720X8DB	83	88	142	8	5
	10	Int.	●	0720X10DB	98	101	155	8	6
	15	Int.	●	0720X15DB	135	138	192	8	6
	20	Int.	●	0720X20DB	173	176	230	8	6
	25	Int.	●	0720X25DB	210	213	267	8	6
	30	Int.	●	0720X30DB	248	251	305	8	6
7.3	3	Int.	●	0730MB	37.5	40	94	8	5
	5	Int.	●	0730LB	60	64	118	8	5
	8	Int.	●	0730X8DB	83	88	142	8	5
	10	Int.	●	0730X10DB	98	101	155	8	6
	15	Int.	●	0730X15DB	135	138	192	8	6
	20	Int.	●	0730X20DB	173	176	230	8	6
	25	Int.	●	0730X25DB	210	213	267	8	6
	30	Int.	●	0730X30DB	248	251	305	8	6
7.4	3	Int.	●	0740MB	37.5	40	94	8	5
	5	Int.	●	0740LB	60	64	118	8	5
	8	Int.	●	0740X8DB	83	88	142	8	5
	10	Int.	●	0740X10DB	98	101	155	8	6
	15	Int.	●	0740X15DB	135	138	192	8	6
	20	Int.	●	0740X20DB	173	176	230	8	6
	25	Int.	●	0740X25DB	210	213	267	8	6
	30	Int.	●	0740X30DB	248	251	305	8	6
7.5	3	Int.	●	0750MB	37.5	40	94	8	5
	5	Int.	●	0750LB	60	64	118	8	5
	8	Int.	●	0750X8DB	83	88	142	8	5
	10	Int.	●	0750X10DB	98	101	155	8	6
	15	Int.	●	0750X15DB	135	138	192	8	6
	20	Int.	●	0750X20DB	173	176	230	8	6
	25	Int.	●	0750X25DB	210	213	267	8	6
	30	Int.	●	0750X30DB	248	251	305	8	6
7.6	3	Int.	●	0760MB	40	40	94	8	5
	5	Int.	●	0760LB	64	64	118	8	5
	8	Int.	●	0760X8DB	88	88	142	8	5
	10	Int.	●	0760X10DB	104	107	161	8	6
	15	Int.	●	0760X15DB	144	147	201	8	6
	20	Int.	●	0760X20DB	184	187	241	8	6
	25	Int.	●	0760X25DB	224	227	281	8	6
	30	Int.	●	0760X30DB	264	267	321	8	6
7.7	3	Int.	●	0770MB	40	40	94	8	5
	5	Int.	●	0770LB	64	64	118	8	5
	8	Int.	●	0770X8DB	88	88	142	8	5
	10	Int.	●	0770X10DB	104	107	161	8	6
	15	Int.	●	0770X15DB	144	147	201	8	6
	20	Int.	●	0770X20DB	184	187	241	8	6
	25	Int.	●	0770X25DB	224	227	281	8	6
	30	Int.	●	0770X30DB	264	267	321	8	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0780LB	64	64	118	8	5
	8	Int.	●	0780X8DB	88	88	142	8	5
	10	Int.	●	0780X10DB	104	107	161	8	6
	15	Int.	●	0780X15DB	144	147	201	8	6
	20	Int.	●	0780X20DB	184	187	241	8	6
	25	Int.	●	0780X25DB	224	227	281	8	6
	30	Int.	●	0780X30DB	264	267	321	8	6
7.9	3	Int.	●	0790MB	40	40	94	8	5
	5	Int.	●	0790LB	64	64	118	8	5
	8	Int.	●	0790X8DB	88	88	142	8	5
	10	Int.	●	0790X10DB	104	107	161	8	6
	15	Int.	●	0790X15DB	144	147	201	8	6
	20	Int.	●	0790X20DB	184	187	241	8	6
	25	Int.	●	0790X25DB	224	227	281	8	6
	30	Int.	●	0790X30DB	264	267	321	8	6
8.0	3	Int.	●	0800MB	40	40	94	8	5
	5	Int.	●	0800LB	64	64	118	8	5
	8	Int.	●	0800X8DB	88	88	142	8	5
	10	Int.	●	0800X10DB	104	107	161	8	6
	15	Int.	●	0800X15DB	144	147	201	8	6
	20	Int.	●	0800X20DB	184	187	241	8	6
	25	Int.	●	0800X25DB	224	227	281	8	6
	30	Int.	●	0800X30DB	264	267	321	8	6
8.1	3	Int.	●	0810MB	42.5	45	100	9	5
	5	Int.	●	0810LB	68	72	127	9	5
	8	Int.	●	0810X8DB	94	99	154	9	5
	10	Int.	●	0810X10DB	111	114	169	9	6
	15	Int.	●	0810X15DB	153	156	211	9	6
	20	Int.	●	0810X20DB	196	199	254	9	6
	25	Int.	●	0810X25DB	238	241	296	9	6
	30	Int.	●	0810X30DB	281	284	339	9	6
8.2	3	Int.	●	0820MB	42.5	45	100	9	5
	5	Int.	●	0820LB	68	72	127	9	5
	8	Int.	●	0820X8DB	94	99	154	9	5
	10	Int.	●	0820X10DB	111	114	169	9	6
	15	Int.	●	0820X15DB	153	156	211	9	6
	20	Int.	●	0820X20DB	196	199	254	9	6
	25	Int.	●	0820X25DB	238	241	296	9	6
	30	Int.	●	0820X30DB	281	284	339	9	6
8.3	3	Int.	●	0830MB	42.5	45	100	9	5
	5	Int.	●	0830LB	68	72	127	9	5
	8	Int.	●	0830X8DB	94	99	154	9	5
	10	Int.	●	0830X10DB	111	114	169	9	6
	15	Int.	●	0830X15DB	153	156	211	9	6
	20	Int.	●	0830X20DB	196	199	254	9	6
	25	Int.	●	0830X25DB	238	241	296	9	6
	30	Int.	●	0830X30DB	281	284	339	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0840LB	68	72	127	9	5
	8	Int.	●	0840X8DB	94	99	154	9	5
	10	Int.	●	0840X10DB	111	114	169	9	6
	15	Int.	●	0840X15DB	153	156	211	9	6
	20	Int.	●	0840X20DB	196	199	254	9	6
	25	Int.	●	0840X25DB	238	241	296	9	6
	30	Int.	●	0840X30DB	281	284	339	9	6
8.5	3	Int.	●	0850MB	42.5	45	100	9	5
	5	Int.	●	0850LB	68	72	127	9	5
	8	Int.	●	0850X8DB	94	99	154	9	5
	10	Int.	●	0850X10DB	111	114	169	9	6
	15	Int.	●	0850X15DB	153	156	211	9	6
	20	Int.	●	0850X20DB	196	199	254	9	6
	25	Int.	●	0850X25DB	238	241	296	9	6
	30	Int.	●	0850X30DB	281	284	339	9	6
8.6	3	Int.	●	0860MB	45	45	100	9	5
	5	Int.	●	0860LB	72	72	127	9	5
	8	Int.	●	0860X8DB	99	99	154	9	5
	10	Int.	●	0860X10DB	117	120	175	9	6
	15	Int.	●	0860X15DB	162	165	220	9	6
	20	Int.	●	0860X20DB	207	210	265	9	6
	25	Int.	●	0860X25DB	252	255	310	9	6
	30	Int.	●	0860X30DB	297	300	355	9	6
8.7	3	Int.	●	0870MB	45	45	100	9	5
	5	Int.	●	0870LB	72	72	127	9	5
	8	Int.	●	0870X8DB	99	99	154	9	5
	10	Int.	●	0870X10DB	117	120	175	9	6
	15	Int.	●	0870X15DB	162	165	220	9	6
	20	Int.	●	0870X20DB	207	210	265	9	6
	25	Int.	●	0870X25DB	252	255	310	9	6
	30	Int.	●	0870X30DB	297	300	355	9	6
8.8	3	Int.	●	0880MB	45	45	100	9	5
	5	Int.	●	0880LB	72	72	127	9	5
	8	Int.	●	0880X8DB	99	99	154	9	5
	10	Int.	●	0880X10DB	117	120	175	9	6
	15	Int.	●	0880X15DB	162	165	220	9	6
	20	Int.	●	0880X20DB	207	210	265	9	6
	25	Int.	●	0880X25DB	252	255	310	9	6
	30	Int.	●	0880X30DB	297	300	355	9	6
8.9	3	Int.	●	0890MB	45	45	100	9	5
	5	Int.	●	0890LB	72	72	127	9	5
	8	Int.	●	0890X8DB	99	99	154	9	5
	10	Int.	●	0890X10DB	117	120	175	9	6
	15	Int.	●	0890X15DB	162	165	220	9	6
	20	Int.	●	0890X20DB	207	210	265	9	6
	25	Int.	●	0890X25DB	252	255	310	9	6
	30	Int.	●	0890X30DB	297	300	355	9	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	0900LB	72	72	127	9	5
	8	Int.	●	0900X8DB	99	99	154	9	5
	10	Int.	●	0900X10DB	117	120	175	9	6
	15	Int.	●	0900X15DB	162	165	220	9	6
	20	Int.	●	0900X20DB	207	210	265	9	6
	25	Int.	●	0900X25DB	252	255	310	9	6
	30	Int.	●	0900X30DB	297	300	355	9	6
9.1	3	Int.	●	0910MB	47.5	50	106	10	5
	5	Int.	●	0910LB	76	80	136	10	5
	8	Int.	●	0910X8DB	105	110	166	10	5
	10	Int.	●	0910X10DB	124	127	182	10	6
	15	Int.	●	0910X15DB	171	174	229	10	6
	20	Int.	●	0910X20DB	219	222	277	10	6
	25	Int.	●	0910X25DB	266	269	324	10	6
	30	Int.	●	0910X30DB	314	317	372	10	6
9.2	3	Int.	●	0920MB	47.5	50	106	10	5
	5	Int.	●	0920LB	76	80	136	10	5
	8	Int.	●	0920X8DB	105	110	166	10	5
	10	Int.	●	0920X10DB	124	127	182	10	6
	15	Int.	●	0920X15DB	171	174	229	10	6
	20	Int.	●	0920X20DB	219	222	277	10	6
	25	Int.	●	0920X25DB	266	269	324	10	6
	30	Int.	●	0920X30DB	314	317	372	10	6
9.3	3	Int.	●	0930MB	47.5	50	106	10	5
	5	Int.	●	0930LB	76	80	136	10	5
	8	Int.	●	0930X8DB	105	110	166	10	5
	10	Int.	●	0930X10DB	124	127	182	10	6
	15	Int.	●	0930X15DB	171	174	229	10	6
	20	Int.	●	0930X20DB	219	222	277	10	6
	25	Int.	●	0930X25DB	266	269	324	10	6
	30	Int.	●	0930X30DB	314	317	372	10	6
9.4	3	Int.	●	0940MB	47.5	50	106	10	5
	5	Int.	●	0940LB	76	80	136	10	5
	8	Int.	●	0940X8DB	105	110	166	10	5
	10	Int.	●	0940X10DB	124	127	182	10	6
	15	Int.	●	0940X15DB	171	174	229	10	6
	20	Int.	●	0940X20DB	219	222	277	10	6
	25	Int.	●	0940X25DB	266	269	324	10	6
	30	Int.	●	0940X30DB	314	317	372	10	6
9.5	3	Int.	●	0950MB	47.5	50	106	10	5
	5	Int.	●	0950LB	76	80	136	10	5
	8	Int.	●	0950X8DB	105	110	166	10	5
	10	Int.	●	0950X10DB	124	127	182	10	6
	15	Int.	●	0950X15DB	171	174	229	10	6
	20	Int.	●	0950X20DB	219	222	277	10	6
	25	Int.	●	0950X25DB	266	269	324	10	6
	30	Int.	●	0950X30DB	314	317	372	10	6

DRILLING

CUTTING CONDITIONS > N037
 OPERATION GUIDANCE > N041,N042
 TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
9.6	3	Int.	●	MWS0960MB	50	50	106	10	5
	5	Int.	●	0960LB	80	80	136	10	5
	8	Int.	●	0960X8DB	110	110	166	10	5
	10	Int.	●	0960X10DB	130	133	188	10	6
	15	Int.	●	0960X15DB	180	183	238	10	6
	20	Int.	●	0960X20DB	230	233	288	10	6
	25	Int.	●	0960X25DB	280	283	338	10	6
	30	Int.	●	0960X30DB	330	333	388	10	6
9.7	3	Int.	●	0970MB	50	50	106	10	5
	5	Int.	●	0970LB	80	80	136	10	5
	8	Int.	●	0970X8DB	110	110	166	10	5
	10	Int.	●	0970X10DB	130	133	188	10	6
	15	Int.	●	0970X15DB	180	183	238	10	6
	20	Int.	●	0970X20DB	230	233	288	10	6
	25	Int.	●	0970X25DB	280	283	338	10	6
	30	Int.	●	0970X30DB	330	333	388	10	6
9.8	3	Int.	●	0980MB	50	50	106	10	5
	5	Int.	●	0980LB	80	80	136	10	5
	8	Int.	●	0980X8DB	110	110	166	10	5
	10	Int.	●	0980X10DB	130	133	188	10	6
	15	Int.	●	0980X15DB	180	183	238	10	6
	20	Int.	●	0980X20DB	230	233	288	10	6
	25	Int.	●	0980X25DB	280	283	338	10	6
	30	Int.	●	0980X30DB	330	333	388	10	6
9.9	3	Int.	●	0990MB	50	50	106	10	5
	5	Int.	●	0990LB	80	80	136	10	5
	8	Int.	●	0990X8DB	110	110	166	10	5
	10	Int.	●	0990X10DB	130	133	188	10	6
	15	Int.	●	0990X15DB	180	183	238	10	6
	20	Int.	●	0990X20DB	230	233	288	10	6
	25	Int.	●	0990X25DB	280	283	338	10	6
	30	Int.	●	0990X30DB	330	333	388	10	6
10.0	3	Int.	●	1000MB	50	50	106	10	5
	5	Int.	●	1000LB	80	80	136	10	5
	8	Int.	●	1000X8DB	110	110	166	10	5
	10	Int.	●	1000X10DB	130	133	188	10	6
	15	Int.	●	1000X15DB	180	183	238	10	6
	20	Int.	●	1000X20DB	230	233	288	10	6
	25	Int.	●	1000X25DB	280	283	338	10	6
	30	Int.	●	1000X30DB	330	333	388	10	6
10.1	3	Int.	●	1010MB	52.5	55	116	11	5
	5	Int.	●	1010LB	84	88	149	11	5
	8	Int.	●	1010X8DB	116	121	182	11	5
	10	Int.	●	1010X10DB	137	140	201	11	6
	15	Int.	●	1010X15DB	189	192	253	11	6
	20	Int.	●	1010X20DB	242	245	306	11	6
	25	Int.	●	1010X25DB	294	297	358	11	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.2	3	Int.	●	MWS1020MB	52.5	55	116	11	5
	5	Int.	●	1020LB	84	88	149	11	5
	8	Int.	●	1020X8DB	116	121	182	11	5
	10	Int.	●	1020X10DB	137	140	201	11	6
	15	Int.	●	1020X15DB	189	192	253	11	6
	20	Int.	●	1020X20DB	242	245	306	11	6
	25	Int.	●	1020X25DB	294	297	358	11	6
	10.3	3	Int.	●	1030MB	52.5	55	116	11
5		Int.	●	1030LB	84	88	149	11	5
8		Int.	●	1030X8DB	116	121	182	11	5
10		Int.	●	1030X10DB	137	140	201	11	6
15		Int.	●	1030X15DB	189	192	253	11	6
20		Int.	●	1030X20DB	242	245	306	11	6
25		Int.	●	1030X25DB	294	297	358	11	6
10.4		3	Int.	●	1040MB	52.5	55	116	11
	5	Int.	●	1040LB	84	88	149	11	5
	8	Int.	●	1040X8DB	116	121	182	11	5
	10	Int.	●	1040X10DB	137	140	201	11	6
	15	Int.	●	1040X15DB	189	192	253	11	6
	20	Int.	●	1040X20DB	242	245	306	11	6
	25	Int.	●	1040X25DB	294	297	358	11	6
	10.5	3	Int.	●	1050MB	52.5	55	116	11
5		Int.	●	1050LB	84	88	149	11	5
8		Int.	●	1050X8DB	116	121	182	11	5
10		Int.	●	1050X10DB	137	140	201	11	6
15		Int.	●	1050X15DB	189	192	253	11	6
20		Int.	●	1050X20DB	242	245	306	11	6
25		Int.	●	1050X25DB	294	297	358	11	6
10.6		3	Int.	●	1060MB	55	55	116	11
	5	Int.	●	1060LB	88	88	149	11	5
	8	Int.	●	1060X8DB	121	121	182	11	5
	10	Int.	●	1060X10DB	143	146	207	11	6
	15	Int.	●	1060X15DB	198	201	262	11	6
	20	Int.	●	1060X20DB	253	256	317	11	6
	25	Int.	●	1060X25DB	308	311	372	11	6
	10.7	3	Int.	●	1070MB	55	55	116	11
5		Int.	●	1070LB	88	88	149	11	5
8		Int.	●	1070X8DB	121	121	182	11	5
10		Int.	●	1070X10DB	143	146	207	11	6
15		Int.	●	1070X15DB	198	201	262	11	6
20		Int.	●	1070X20DB	253	256	317	11	6
25		Int.	●	1070X25DB	308	311	372	11	6
10.8		3	Int.	●	1080MB	55	55	116	11
	5	Int.	●	1080LB	88	88	149	11	5
	8	Int.	●	1080X8DB	121	121	182	11	5
	10	Int.	●	1080X10DB	143	146	207	11	6
	15	Int.	●	1080X15DB	198	201	262	11	6
	20	Int.	●	1080X20DB	253	256	317	11	6
	25	Int.	●	1080X25DB	308	311	372	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	1090LB	88	88	149	11	5
	8	Int.	●	1090X8DB	121	121	182	11	5
	10	Int.	●	1090X10DB	143	146	207	11	6
	15	Int.	●	1090X15DB	198	201	262	11	6
	20	Int.	●	1090X20DB	253	256	317	11	6
	25	Int.	●	1090X25DB	308	311	372	11	6
11.0	3	Int.	●	1100MB	55	55	116	11	5
	5	Int.	●	1100LB	88	88	149	11	5
	8	Int.	●	1100X8DB	121	121	182	11	5
	10	Int.	●	1100X10DB	143	146	207	12	6
	15	Int.	●	1100X15DB	198	201	262	12	6
	20	Int.	●	1100X20DB	253	256	317	12	6
	25	Int.	●	1100X25DB	308	311	372	11	6
11.1	3	Int.	●	1110MB	57.5	60	122	12	5
	5	Int.	●	1110LB	92	96	158	12	5
	8	Int.	●	1110X8DB	127	132	194	12	5
	10	Int.	●	1110X10DB	150	153	215	12	6
	15	Int.	●	1110X15DB	207	210	272	12	6
	20	Int.	●	1110X20DB	265	268	330	12	6
	25	Int.	●	1110X25DB	322	325	387	12	6
11.2	3	Int.	●	1120MB	57.5	60	122	12	5
	5	Int.	●	1120LB	92	96	158	12	5
	8	Int.	●	1120X8DB	127	132	194	12	5
	10	Int.	●	1120X10DB	150	153	215	12	6
	15	Int.	●	1120X15DB	207	210	272	12	6
	20	Int.	●	1120X20DB	265	268	330	12	6
	25	Int.	●	1120X25DB	322	325	387	12	6
11.3	3	Int.	●	1130MB	57.5	60	122	12	5
	5	Int.	●	1130LB	92	96	158	12	5
	8	Int.	●	1130X8DB	127	132	194	12	5
	10	Int.	●	1130X10DB	150	153	215	12	6
	15	Int.	●	1130X15DB	207	210	272	12	6
	20	Int.	●	1130X20DB	265	268	330	12	6
	25	Int.	●	1130X25DB	322	325	387	12	6
11.4	3	Int.	●	1140MB	57.5	60	122	12	5
	5	Int.	●	1140LB	92	96	158	12	5
	8	Int.	●	1140X8DB	127	132	194	12	5
	10	Int.	●	1140X10DB	150	153	215	12	6
	15	Int.	●	1140X15DB	207	210	272	12	6
	20	Int.	●	1140X20DB	265	268	330	12	6
	25	Int.	●	1140X25DB	322	325	387	12	6
11.5	3	Int.	●	1150MB	57.5	60	122	12	5
	5	Int.	●	1150LB	92	96	158	12	5
	8	Int.	●	1150X8DB	127	132	194	12	5
	10	Int.	●	1150X10DB	150	153	215	12	6
	15	Int.	●	1150X15DB	207	210	272	12	6
	20	Int.	●	1150X20DB	265	268	330	12	6
	25	Int.	●	1150X25DB	322	325	387	12	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
	5	Int.	●	1160LB	96	96	158	12	5
	8	Int.	●	1160X8DB	132	132	194	12	5
	10	Int.	●	1160X10DB	156	159	221	12	6
	15	Int.	●	1160X15DB	216	219	281	12	6
	20	Int.	●	1160X20DB	276	279	341	12	6
	25	Int.	●	1160X25DB	336	339	401	12	6
11.7	3	Int.	●	1170MB	60	60	122	12	5
	5	Int.	●	1170LB	96	96	158	12	5
	8	Int.	●	1170X8DB	132	132	194	12	5
	10	Int.	●	1170X10DB	156	159	221	12	6
	15	Int.	●	1170X15DB	216	219	281	12	6
	20	Int.	●	1170X20DB	276	279	341	12	6
	25	Int.	●	1170X25DB	336	339	401	12	6
11.8	3	Int.	●	1180MB	60	60	122	12	5
	5	Int.	●	1180LB	96	96	158	12	5
	8	Int.	●	1180X8DB	132	132	194	12	5
	10	Int.	●	1180X10DB	156	159	221	12	6
	15	Int.	●	1180X15DB	216	219	281	12	6
	20	Int.	●	1180X20DB	276	279	341	12	6
	25	Int.	●	1180X25DB	336	339	401	12	6
11.9	3	Int.	●	1190MB	60	60	122	12	5
	5	Int.	●	1190LB	96	96	158	12	5
	8	Int.	●	1190X8DB	132	132	194	12	5
	10	Int.	●	1190X10DB	156	159	221	12	6
	15	Int.	●	1190X15DB	216	219	281	12	6
	20	Int.	●	1190X20DB	276	279	341	12	6
	25	Int.	●	1190X25DB	336	339	401	12	6
12.0	3	Int.	●	1200MB	60	60	122	12	5
	5	Int.	●	1200LB	96	96	158	12	5
	8	Int.	●	1200X8DB	132	132	194	12	5
	10	Int.	●	1200X10DB	156	159	221	12	6
	15	Int.	●	1200X15DB	216	219	281	12	6
	20	Int.	●	1200X20DB	276	279	341	12	6
	25	Int.	●	1200X25DB	336	339	401	12	6
12.1	3	Int.	●	1210MB	62.5	65	128	13	5
	5	Int.	●	1210LB	100	104	167	13	5
	8	Int.	□	1210X8DB	138	143	206	13	5
	10	Int.	□	1210X10DB	163	166	229	13	6
	15	Int.	□	1210X15DB	225	228	291	13	6
	20	Int.	□	1210X20DB	288	291	354	13	6
12.2	3	Int.	●	1220MB	62.5	65	128	13	5
	5	Int.	●	1220LB	100	104	167	13	5
	8	Int.	□	1220X8DB	138	143	206	13	5
	10	Int.	□	1220X10DB	163	166	229	13	6
	15	Int.	□	1220X15DB	225	228	291	13	6
	20	Int.	□	1220X20DB	288	291	354	13	6

DRILLING

CUTTING CONDITIONS > N037
 OPERATION GUIDANCE > N041,N042
 TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
12.3	3	Int.	●	MWS1230MB	62.5	65	128	13	5
	5	Int.	●	1230LB	100	104	167	13	5
	8	Int.	□	1230X8DB	138	143	206	13	5
	10	Int.	□	1230X10DB	163	166	229	13	6
	15	Int.	□	1230X15DB	225	228	291	13	6
	20	Int.	□	1230X20DB	288	291	354	13	6
12.4	3	Int.	●	1240MB	62.5	65	128	13	5
	5	Int.	●	1240LB	100	104	167	13	5
	8	Int.	□	1240X8DB	138	143	206	13	5
	10	Int.	□	1240X10DB	163	166	229	13	6
	15	Int.	□	1240X15DB	225	228	291	13	6
	20	Int.	□	1240X20DB	288	291	354	13	6
12.5	3	Int.	●	1250MB	62.5	65	128	13	5
	5	Int.	●	1250LB	100	104	167	13	5
	8	Int.	●	1250X8DB	138	143	206	13	5
	10	Int.	●	1250X10DB	163	166	229	13	6
	15	Int.	●	1250X15DB	225	228	291	13	6
	20	Int.	●	1250X20DB	288	291	354	13	6
12.6	3	Int.	●	1260MB	65	65	128	13	5
	5	Int.	●	1260LB	104	104	167	13	5
	8	Int.	□	1260X8DB	143	143	206	13	5
	10	Int.	□	1260X10DB	169	172	235	13	6
	15	Int.	□	1260X15DB	234	237	300	13	6
	20	Int.	□	1260X20DB	299	302	365	13	6
12.7	3	Int.	●	1270MB	65	65	128	13	5
	5	Int.	●	1270LB	104	104	167	13	5
	8	Int.	□	1270X8DB	143	143	206	13	5
	10	Int.	□	1270X10DB	169	172	235	13	6
	15	Int.	□	1270X15DB	234	237	300	13	6
	20	Int.	□	1270X20DB	299	302	365	13	6
12.8	3	Int.	●	1280MB	65	65	128	13	5
	5	Int.	●	1280LB	104	104	167	13	5
	8	Int.	□	1280X8DB	143	143	206	13	5
	10	Int.	□	1280X10DB	169	172	235	13	6
	15	Int.	□	1280X15DB	234	237	300	13	6
	20	Int.	□	1280X20DB	299	302	365	13	6
12.9	3	Int.	●	1290MB	65	65	128	13	5
	5	Int.	●	1290LB	104	104	167	13	5
	8	Int.	□	1290X8DB	143	143	206	13	5
	10	Int.	□	1290X10DB	169	172	235	13	6
	15	Int.	□	1290X15DB	234	237	300	13	6
	20	Int.	□	1290X20DB	299	302	365	13	6
13.0	3	Int.	●	1300MB	65	65	128	13	5
	5	Int.	●	1300LB	104	104	167	13	5
	8	Int.	●	1300X8DB	143	143	206	13	5
	10	Int.	●	1300X10DB	169	172	235	13	6
	15	Int.	●	1300X15DB	234	237	300	13	6
	20	Int.	●	1300X20DB	299	302	365	13	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
13.1	3	Int.	●	MWS1310MB	87.5	70	134	14	5
	5	Int.	●	1310LB	108	112	176	14	5
	8	Int.	□	1310X8DB	149	154	218	14	5
	10	Int.	□	1310X10DB	176	179	243	14	6
	15	Int.	□	1310X15DB	243	246	310	14	6
	20	Int.	□	1310X20DB	311	314	378	14	6
13.2	3	Int.	●	1320MB	67.5	70	134	14	5
	5	Int.	●	1320LB	108	112	176	14	5
	8	Int.	□	1320X8DB	149	154	218	14	5
	10	Int.	□	1320X10DB	176	179	243	14	6
	15	Int.	□	1320X15DB	243	246	310	14	6
	20	Int.	□	1320X20DB	311	314	378	14	6
13.3	3	Int.	●	1330MB	67.5	70	134	14	5
	5	Int.	●	1330LB	108	112	176	14	5
	8	Int.	□	1330X8DB	149	154	218	14	5
	10	Int.	□	1330X10DB	176	179	243	14	6
	15	Int.	□	1330X15DB	243	246	310	14	6
	20	Int.	□	1330X20DB	311	314	378	14	6
13.4	3	Int.	●	1340MB	67.5	70	134	14	5
	5	Int.	●	1340LB	108	112	176	14	5
	8	Int.	□	1340X8DB	149	154	218	14	5
	10	Int.	□	1340X10DB	176	179	243	14	6
	15	Int.	□	1340X15DB	243	246	310	14	6
	20	Int.	□	1340X20DB	311	314	378	14	6
13.5	3	Int.	●	1350MB	67.5	70	134	14	5
	5	Int.	●	1350LB	108	112	176	14	5
	8	Int.	●	1350X8DB	149	154	218	14	5
	10	Int.	●	1350X10DB	176	179	243	14	6
	15	Int.	●	1350X15DB	243	246	310	14	6
	20	Int.	●	1350X20DB	311	314	378	14	6
13.6	3	Int.	●	1360MB	70	70	134	14	5
	5	Int.	●	1360LB	112	112	176	14	5
	8	Int.	□	1360X8DB	154	154	218	14	5
	10	Int.	□	1360X10DB	182	185	249	14	6
	15	Int.	□	1360X15DB	252	255	319	14	6
	20	Int.	□	1360X20DB	322	325	389	14	6
13.7	3	Int.	●	1370MB	70	70	134	14	5
	5	Int.	●	1370LB	112	112	176	14	5
	8	Int.	□	1370X8DB	154	154	218	14	5
	10	Int.	□	1370X10DB	182	185	249	14	6
	15	Int.	□	1370X15DB	252	255	319	14	6
	20	Int.	□	1370X20DB	322	325	389	14	6
13.8	3	Int.	●	1380MB	70	70	134	14	5
	5	Int.	●	1380LB	112	112	176	14	5
	8	Int.	□	1380X8DB	154	154	218	14	5
	10	Int.	□	1380X10DB	182	185	249	14	6
	15	Int.	□	1380X15DB	252	255	319	14	6
	20	Int.	□	1380X20DB	322	325	389	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
13.9	3	Int.	●	MWS1390MB	70	70	134	14	5
	5	Int.	●	1390LB	112	112	176	14	5
	8	Int.	□	1390X8DB	154	154	218	14	5
	10	Int.	□	1390X10DB	182	185	249	14	6
	15	Int.	□	1390X15DB	252	255	319	14	6
	20	Int.	□	1390X20DB	322	325	389	14	6
14.0	3	Int.	●	1400MB	70	70	134	14	5
	5	Int.	●	1400LB	112	112	176	14	5
	8	Int.	●	1400X8DB	154	154	218	14	5
	10	Int.	●	1400X10DB	182	185	249	14	6
	15	Int.	●	1400X15DB	252	255	319	14	6
	20	Int.	●	1400X20DB	322	325	389	14	6
14.1	3	Int.	●	1410MB	72.5	75	140	15	5
	5	Int.	●	1410LB	116	120	185	15	5
	8	Int.	□	1410X8DB	160	165	225	15	5
14.2	3	Int.	●	1420MB	72.5	75	140	15	5
	5	Int.	●	1420LB	116	120	185	15	5
	8	Int.	●	1420X8DB	160	165	225	15	5
14.3	3	Int.	●	1430MB	72.5	75	140	15	5
	5	Int.	●	1430LB	116	120	185	15	5
	8	Int.	□	1430X8DB	160	165	225	15	5
14.4	3	Int.	●	1440MB	72.5	75	140	15	5
	5	Int.	●	1440LB	116	120	185	15	5
	8	Int.	□	1440X8DB	160	165	225	15	5
14.5	3	Int.	●	1450MB	72.5	75	140	15	5
	5	Int.	●	1450LB	116	120	185	15	5
	8	Int.	●	1450X8DB	160	165	225	15	5
14.6	3	Int.	●	1460MB	75	75	140	15	5
	5	Int.	●	1460LB	120	120	185	15	5
	8	Int.	□	1460X8DB	165	165	225	15	5
14.7	3	Int.	●	1470MB	75	75	140	15	5
	5	Int.	●	1470LB	120	120	185	15	5
	8	Int.	□	1470X8DB	165	165	225	15	5
14.8	3	Int.	●	1480MB	75	75	140	15	5
	5	Int.	●	1480LB	120	120	185	15	5
	8	Int.	□	1480X8DB	165	165	225	15	5
14.9	3	Int.	●	1490MB	75	75	140	15	5
	5	Int.	●	1490LB	120	120	185	15	5
	8	Int.	□	1490X8DB	165	165	225	15	5
15.0	3	Int.	●	1500MB	75	75	140	15	5
	5	Int.	●	1500LB	120	120	185	15	5
	8	Int.	●	1500X8DB	165	165	225	15	5
15.1	3	Int.	●	1510MB	77.5	80	145	16	5
	5	Int.	●	1510LB	124	128	193	16	5
	8	Int.	□	1510X8DB	171	181	241	16	5
15.2	3	Int.	●	1520MB	77.5	80	145	16	5
	5	Int.	●	1520LB	124	128	193	16	5
	8	Int.	□	1520X8DB	171	181	241	16	5
15.3	3	Int.	●	1530MB	77.5	80	145	16	5
	5	Int.	●	1530LB	124	128	193	16	5
	8	Int.	□	1530X8DB	171	181	241	16	5

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
15.4	3	Int.	●	MWS1540MB	77.5	80	145	16	5
	5	Int.	●	1540LB	124	128	193	16	5
	8	Int.	□	1540X8DB	171	181	241	16	5
15.5	3	Int.	●	1550MB	77.5	80	145	16	5
	5	Int.	●	1550LB	124	128	193	16	5
	8	Int.	●	1550X8DB	171	181	241	16	5
15.6	3	Int.	●	1560MB	80	80	145	16	5
	5	Int.	●	1560LB	128	128	193	16	5
	8	Int.	□	1560X8DB	176	181	241	16	5
15.7	3	Int.	●	1570MB	80	80	145	16	5
	5	Int.	●	1570LB	128	128	193	16	5
	8	Int.	□	1570X8DB	176	181	241	16	5
15.8	3	Int.	●	1580MB	80	80	145	16	5
	5	Int.	●	1580LB	128	128	193	16	5
	8	Int.	□	1580X8DB	176	181	241	16	5
15.9	3	Int.	●	1590MB	80	80	145	16	5
	5	Int.	●	1590LB	128	128	193	16	5
	8	Int.	□	1590X8DB	176	181	241	16	5
16.0	3	Int.	●	1600MB	80	80	145	16	5
	5	Int.	●	1600LB	128	128	193	16	5
	8	Int.	●	1600X8DB	176	181	241	16	5
16.1	3	Int.	□	1610MB	82.5	85	150	17	5
	5	Int.	□	1610LB	132	136	201	17	5
16.2	3	Int.	□	1620MB	82.5	85	150	17	5
	5	Int.	□	1620LB	132	136	201	17	5
16.3	3	Int.	□	1630MB	82.5	85	150	17	5
	5	Int.	□	1630LB	132	136	201	17	5
16.4	3	Int.	□	1640MB	82.5	85	150	17	5
	5	Int.	□	1640LB	132	136	201	17	5
16.5	3	Int.	●	1650MB	82.5	85	150	17	5
	5	Int.	●	1650LB	132	136	201	17	5
16.6	3	Int.	□	1660MB	85	85	150	17	5
	5	Int.	□	1660LB	136	136	201	17	5
16.7	3	Int.	□	1670MB	85	85	150	17	5
	5	Int.	□	1670LB	136	136	201	17	5
16.8	3	Int.	□	1680MB	85	85	150	17	5
	5	Int.	□	1680LB	136	136	201	17	5
16.9	3	Int.	□	1690MB	85	85	150	17	5
	5	Int.	□	1690LB	136	136	201	17	5
17.0	3	Int.	●	1700MB	85	85	150	17	5
	5	Int.	●	1700LB	136	136	201	17	5
17.1	3	Int.	□	1710MB	87.5	90	155	18	5
	5	Int.	□	1710LB	140	144	209	18	5
17.2	3	Int.	□	1720MB	87.5	90	155	18	5
	5	Int.	□	1720LB	140	144	209	18	5
17.3	3	Int.	□	1730MB	87.5	90	155	18	5
	5	Int.	□	1730LB	140	144	209	18	5
17.4	3	Int.	□	1740MB	87.5	90	155	18	5
	5	Int.	□	1740LB	140	144	209	18	5
17.5	3	Int.	●	1750MB	87.5	90	155	18	5
	5	Int.	●	1750LB	140	144	209	18	5

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
17.6	3	Int.	□	MWS1760MB	90	90	155	18	5
	5	Int.	□	1760LB	144	144	209	18	5
17.7	3	Int.	□	1770MB	90	90	155	18	5
	5	Int.	□	1770LB	144	144	209	18	5
17.8	3	Int.	□	1780MB	90	90	155	18	5
	5	Int.	□	1780LB	144	144	209	18	5
17.9	3	Int.	□	1790MB	90	90	155	18	5
	5	Int.	□	1790LB	144	144	209	18	5
18.0	3	Int.	●	1800MB	90	90	155	18	5
	5	Int.	●	1800LB	144	144	209	18	5
18.1	3	Int.	□	1810MB	92.5	95	160	19	5
	5	Int.	□	1810LB	148	152	217	19	5
18.2	3	Int.	□	1820MB	92.5	95	160	19	5
	5	Int.	□	1820LB	148	152	217	19	5
18.3	3	Int.	□	1830MB	92.5	95	160	19	5
	5	Int.	□	1830LB	148	152	217	19	5
18.4	3	Int.	□	1840MB	92.5	95	160	19	5
	5	Int.	□	1840LB	148	152	217	19	5
18.5	3	Int.	●	1850MB	92.5	95	160	19	5
	5	Int.	●	1850LB	148	152	217	19	5
18.6	3	Int.	□	1860MB	95	95	160	19	5
	5	Int.	□	1860LB	152	152	217	19	5
18.7	3	Int.	□	1870MB	95	95	160	19	5
	5	Int.	□	1870LB	152	152	217	19	5
18.8	3	Int.	□	1880MB	95	95	160	19	5
	5	Int.	□	1880LB	152	152	217	19	5
18.9	3	Int.	□	1890MB	95	95	160	19	5
	5	Int.	□	1890LB	152	152	217	19	5
19.0	3	Int.	●	1900MB	95	95	160	19	5
	5	Int.	●	1900LB	152	152	217	19	5
19.1	3	Int.	□	1910MB	97.5	100	165	20	5
	5	Int.	□	1910LB	156	160	225	20	5
19.2	3	Int.	□	1920MB	97.5	100	165	20	5
	5	Int.	□	1920LB	156	160	225	20	5
19.3	3	Int.	□	1930MB	97.5	100	165	20	5
	5	Int.	□	1930LB	156	160	225	20	5
19.4	3	Int.	□	1940MB	97.5	100	165	20	5
	5	Int.	□	1940LB	156	160	225	20	5
19.5	3	Int.	●	1950MB	97.5	100	165	20	5
	5	Int.	●	1950LB	156	160	225	20	5
19.6	3	Int.	□	1960MB	100	100	165	20	5
	5	Int.	□	1960LB	160	160	225	20	5
19.7	3	Int.	□	1970MB	100	100	165	20	5
	5	Int.	□	1970LB	160	160	225	20	5
19.8	3	Int.	□	1980MB	100	100	165	20	5
	5	Int.	□	1980LB	160	160	225	20	5
19.9	3	Int.	□	1990MB	100	100	165	20	5
	5	Int.	□	1990LB	160	160	225	20	5
20.0	3	Int.	●	2000MB	100	100	165	20	5
	5	Int.	●	2000LB	160	160	225	20	5

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
20.5	3	Int.	●	MWS2050MB	103	105	176	21	5
	5	Int.	●	2050LB	166	168	239	21	5
21.0	3	Int.	●	2100MB	105	105	176	21	5
	5	Int.	●	2100LB	168	168	239	21	5
21.5	3	Int.	●	2150MB	108	110	182	22	5
	5	Int.	●	2150LB	174	176	248	22	5
22.0	3	Int.	●	2200MB	110	110	182	22	5
	5	Int.	●	2200LB	176	176	248	22	5
22.5	3	Int.	●	2250MB	113	115	188	23	5
	5	Int.	●	2250LB	182	184	257	23	5
23.0	3	Int.	●	2300MB	115	115	188	23	5
	5	Int.	●	2300LB	184	184	257	23	5
23.5	3	Int.	●	2350MB	118	120	194	24	5
	5	Int.	●	2350LB	190	192	266	24	5
24.0	3	Int.	●	2400MB	120	120	194	24	5
	5	Int.	●	2400LB	192	192	266	24	5
24.5	3	Int.	●	2450MB	123	125	200	25	5
	5	Int.	●	2450LB	198	200	270	25	5
25.0	3	Int.	●	2500MB	125	125	200	25	5
	5	Int.	●	2500LB	200	200	270	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.

CUTTING CONDITIONS > N037
 OPERATION GUIDANCE > N041,N042
 TECHNICAL DATA > Q001

RECOMMENDED CUTTING CONDITIONS

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

Work Material	Mild Steel ($\leq 180\text{HB}$)				Carbon Steel·Alloy Steel (180—280HB)			
	AISI 1010 etc				AISI 1045, AISI 4140 etc			
Drill Dia. (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)				Austenitic Stainless Steel ($\leq 200\text{HB}$)			
	AISI 4340 etc				AISI 304, AISI 316 etc			
Drill Dia. (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

DRILLING(SOLID CARBIDE)

MWS WSTAR DRILLS

CARBIDE

Work Material	Gray Cast Iron ($\leq 350\text{MPa}$)					Ductile Cast Iron ($\leq 450\text{MPa}$)				
	No 45 B etc					60-40-8 etc				
Drill Dia. (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%)					Heat Resistant Alloy				
	ASTM A6061, ASTM A7075 etc					Inconel718				
Drill Dia. (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		

DRILLING

RECOMMENDED CUTTING CONDITIONS

■ DB Type Drill ($l/d \geq 10$)

Work Material	Mild Steel (≤ 180 HB)				Carbon Steel·Alloy Steel (180—280HB)			
	AISI 1010 etc				AISI 1045, AISI 4140 etc			
Drill Dia. (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)				Austenitic Stainless Steel (≤ 200 HB)			
	AISI 4340 etc				AISI 304, AISI 316 etc			
Drill Dia. (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

DRILLING(SOLID CARBIDE)

MWS
WSTAR DRILLS

CARBIDE

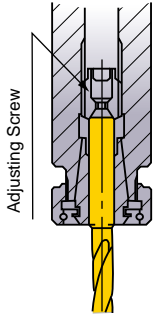
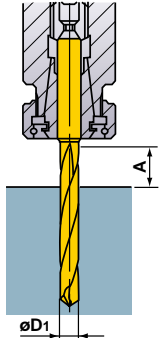
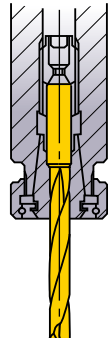
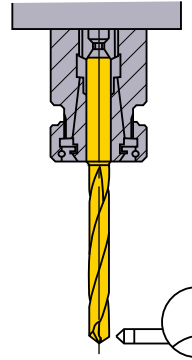
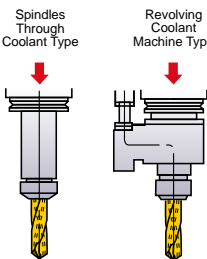
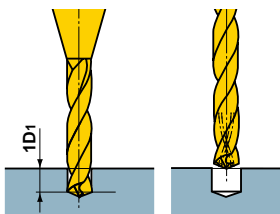
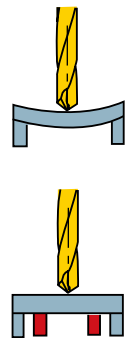
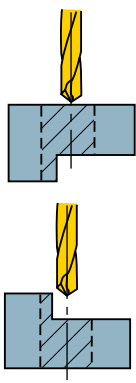
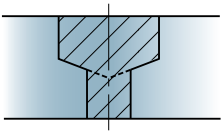
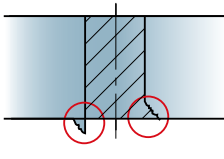
Work Material	Gray Cast Iron ($\leq 350\text{MPa}$)					Ductile Cast Iron ($\leq 450\text{MPa}$)			
	No 45 B etc					60-40-8 etc			
Drill Dia. (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min^{-1})	Feed rate (Min.—Max.) (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%)					Heat Resistant Alloy			
	ASTM A6061, ASTM A7075 etc					Inconel718			
Drill Dia. (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	

DRILLING

N040

SB/MB/LB/XB Type Drill OPERATIONAL GUIDANCE

<p>Drill Holding</p>  <p>Adjusting Screw</p> <p>Thrust bearing type collet chuck holds the drill securely.</p>	<p>Drill Length</p>  <p>$A \geq D_1 \times 1.5$ (D_1 over 2.0 for $D_1 < 3$)</p>	<p>Drill Installation</p>  <p>Do not clamp on the flutes.</p>	<p>Installation Tolerance ($D_1 \geq 3$)</p>  <p>Run-out $\leq 0.03\text{mm}$</p>
<p>Through Coolant Type ($D_1 \geq 3$)</p>  <p>Coolant pressure is approx. 0.5—1MPa (2-3MPa for $D_1 \leq 5$, 1.5MPa at minimum for $D_1 < 3$). Recommended coolant pressure: $> 3\text{MPa}$. Coolant volume is 1.5—4.0l/min. (For $D_1 \geq 3$)</p>	<p>Drill Installation</p>  <p>① When machining a prepared hole with the MWE-SB please set the depth to 1D (D=drill diameter). For pilot hole drilling when D_1 is up to 3, use the SB type drill. ② Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.</p>	<p>Coolant Handling</p> <ol style="list-style-type: none"> Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure. Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended. 	<p>Thin Workpiece</p>  <p>If Bending Occurs \times</p> <p>Support the Workpiece \circ</p>
<p>Interrupted Cutting ($D_1 \geq 3$)</p>  <p>One Process \circ ① Lower the feed when drilling the interrupted part.</p> <p>Requires Prior Machining \triangle ① Spot face with an end mill prior to drilling.</p>	<p>Stepped Holes ($D_1 \geq 3$)</p>  <p>① Divide the two processes. ② Drill the larger hole first. *A tool for machining both chamfer and spot face can be produced to order.</p>	<p>Burring and Workpiece Chipping ($D_1 \geq 3$)</p>  <ol style="list-style-type: none"> Lower the feed rate by 50% at the end of through cutting. Add a 45° chamfer. Change the point angle. 	

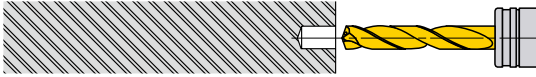
NOTES ON USE (For $D_1 < 3$)

- Please use a fine mesh filter (mesh $\leq 3\mu\text{m}$) 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.)

DB Type Drill (L/D ≥ 10, D₁ > 3) OPERATIONAL GUIDANCE

FLAT FACE DRILLING ● Drilling a blind hole

1. Drilling a pilot hole



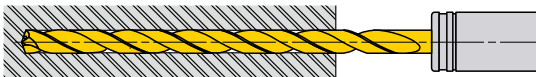
- ① Use the SB type drill.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



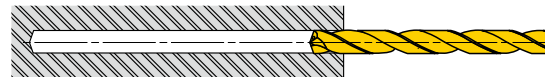
- ① Penetrate the guide hole at low revolution. (Revolution 1000min⁻¹, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1.0mm short of the guide hole bottom.

3. Drill the deep hole



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

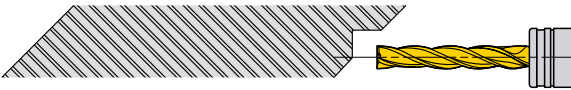
4. Drill retraction



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

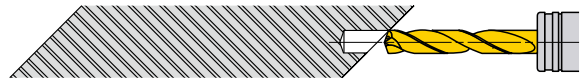
INTERRUPTED DRILLING ● Drilling and breaking through on irregular faces or angles

1. Spot facing



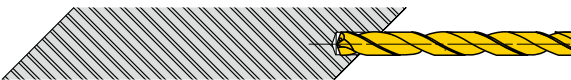
- ① Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



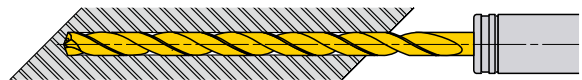
- ① Use a drill with a larger (flatter) point angle than the long type. The MWS-SB type is recommended.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



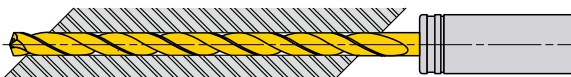
- ① Penetrate the guide hole at a low revolution. (Revolution 1000min⁻¹, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1.0mm short of the guide hole bottom.

4. Drill the deep hole



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

5. Breaking through



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

6. Drill retraction

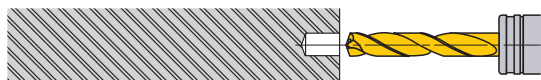


- ① Finally clear the hole at a revolution speed of 1000min⁻¹ and feed rate of 0.2–0.3mm/rev.
- ② Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

OPERATIONAL GUIDANCE FOR THE DB LONG TYPE DRILL (L/D \geq 10)

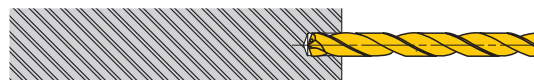
FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



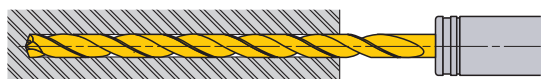
- ① Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MZE, MZS, MWE or MWS is recommended.
- ② Use a drill with the same diameter as the deep hole drill.
- ③ Drill depth : Approx 1D or deeper.
- ④ Ensure a high precision hole is drilled for the guide.

2. Initial cutting with the long type drill



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

3. Drill the deep hole



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

4. Drill retraction



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

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

1. Spot facing



- ① Machine 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



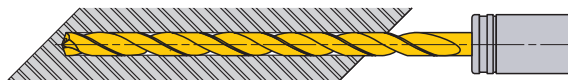
- ① Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MZE, MZS, MWE or MWS is recommended.
- ② Use a drill with the same diameter as the deep hole drill.
- ③ Drill depth : Approx 1D or deeper.
- ④ Ensure a high precision hole is drilled for the guide.

3. Initial cutting with the long type drill



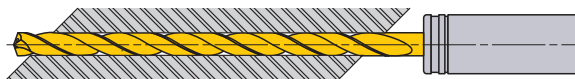
- ① Penetrate the guide hole at a low revolution.
(Cutting speed 20–30m/min, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 1–3mm short of the guide hole bottom.

4. Drill the deep hole



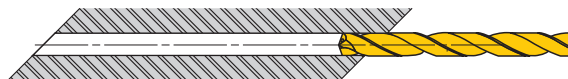
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



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

6. Drill retraction



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

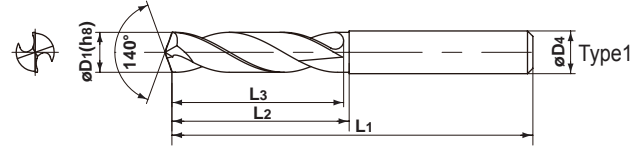
DRILLING(SOLID CARBIDE)

MWE WSTAR DRILLS

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

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○	○	◎	○	○

	D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤25
h8 ↓	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$
h6 ↓	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$
	$\begin{matrix} 0 \\ -0.006 \end{matrix}$	$\begin{matrix} 0 \\ -0.008 \end{matrix}$	$\begin{matrix} 0 \\ -0.009 \end{matrix}$	$\begin{matrix} 0 \\ -0.011 \end{matrix}$	$\begin{matrix} 0 \\ -0.013 \end{matrix}$



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
3.0	2	Ext.	●	MWE0300SA	16	16	55	3	1
	2	Ext.	●	MWE0300SB	16	16	55	3	1
	3	Ext.	●	MWE0300MA	21	21	60	3	1
	3	Ext.	●	MWE0300MB	21	21	60	3	1
3.1	2	Ext.	●	MWE0310SA	18	18	55	3.1	1
	2	Ext.	□	MWE0310SB	18	20	55	4	1
	3	Ext.	●	MWE0310MA	24	24	60	3.1	1
	3	Ext.	□	MWE0310MB	24	26	60	4	1
3.2	2	Ext.	●	MWE0320SA	18	18	55	3.2	1
	2	Ext.	□	MWE0320SB	18	20	55	4	1
	3	Ext.	●	MWE0320MA	24	24	60	3.2	1
	3	Ext.	□	MWE0320MB	24	26	60	4	1
3.3	2	Ext.	●	MWE0330SA	18	18	55	3.3	1
	2	Ext.	●	MWE0330SB	18	20	55	4	1
	3	Ext.	●	MWE0330MA	24	24	60	3.3	1
	3	Ext.	●	MWE0330MB	24	26	60	4	1
3.4	2	Ext.	●	MWE0340SA	20	20	55	3.4	1
	2	Ext.	●	MWE0340SB	18	20	55	4	1
	3	Ext.	●	MWE0340MA	24	24	60	3.4	1
	3	Ext.	●	MWE0340MB	24	26	60	4	1
3.5	2	Ext.	●	MWE0350SA	20	20	55	3.5	1
	2	Ext.	●	MWE0350SB	18	20	55	4	1
	3	Ext.	●	MWE0350MA	24	24	60	3.5	1
	3	Ext.	●	MWE0350MB	24	26	60	4	1
3.6	2	Ext.	●	MWE0360SA	20	20	55	3.6	1
	2	Ext.	□	MWE0360SB	20	20	55	4	1
	3	Ext.	●	MWE0360MA	27	27	60	3.6	1
	3	Ext.	□	MWE0360MB	27	27	60	4	1
3.7	2	Ext.	●	MWE0370SA	20	20	55	3.7	1
	2	Ext.	●	MWE0370SB	20	20	55	4	1
	3	Ext.	●	MWE0370MA	27	27	60	3.7	1
	3	Ext.	●	MWE0370MB	27	27	60	4	1
3.8	2	Ext.	●	MWE0380SA	22	22	55	3.8	1
	2	Ext.	●	MWE0380SB	20	20	55	4	1
	3	Ext.	●	MWE0380MA	27	27	60	3.8	1
	3	Ext.	●	MWE0380MB	27	27	60	4	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
3.9	2	Ext.	●	MWE0390SA	22	22	55	3.9	1
	2	Ext.	●	MWE0390SB	20	20	55	4	1
	3	Ext.	●	MWE0390MA	27	27	60	3.9	1
	3	Ext.	●	MWE0390MB	27	27	60	4	1
4.0	2	Ext.	●	MWE0400SA	22	22	55	4	1
	2	Ext.	●	MWE0400SB	20	20	55	4	1
	3	Ext.	●	MWE0400MA	27	27	60	4	1
	3	Ext.	●	MWE0400MB	27	27	60	4	1
4.1	2	Ext.	●	MWE0410SA	22	22	55	4.1	1
	2	Ext.	□	MWE0410SB	22	24	62	5	1
	3	Ext.	●	MWE0410MA	29	29	63	4.1	1
	3	Ext.	□	MWE0410MB	29	31	68	5	1
4.2	2	Ext.	●	MWE0420SA	22	22	55	4.2	1
	2	Ext.	●	MWE0420SB	22	24	62	5	1
	3	Ext.	●	MWE0420MA	29	29	63	4.2	1
	3	Ext.	●	MWE0420MB	29	31	68	5	1
4.3	2	Ext.	●	MWE0430SA	24	24	58	4.3	1
	2	Ext.	●	MWE0430SB	22	24	62	5	1
	3	Ext.	●	MWE0430MA	29	29	63	4.3	1
	3	Ext.	●	MWE0430MB	29	31	68	5	1
4.4	2	Ext.	●	MWE0440SA	24	24	58	4.4	1
	2	Ext.	●	MWE0440SB	22	24	62	5	1
	3	Ext.	●	MWE0440MA	29	29	63	4.4	1
	3	Ext.	●	MWE0440MB	29	31	68	5	1
4.5	2	Ext.	●	MWE0450SA	24	24	58	4.5	1
	2	Ext.	●	MWE0450SB	22	24	62	5	1
	3	Ext.	●	MWE0450MA	29	29	63	4.5	1
	3	Ext.	●	MWE0450MB	29	31	68	5	1
4.6	2	Ext.	●	MWE0460SA	24	24	58	4.6	1
	2	Ext.	□	MWE0460SB	24	24	62	5	1
	3	Ext.	●	MWE0460MA	32	32	68	4.6	1
	3	Ext.	□	MWE0460MB	32	32	68	5	1
4.7	2	Ext.	●	MWE0470SA	24	24	58	4.7	1
	2	Ext.	□	MWE0470SB	24	24	62	5	1
	3	Ext.	●	MWE0470MA	32	32	68	4.7	1
	3	Ext.	□	MWE0470MB	32	32	68	5	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)				Type
					VP15TF	Flute Length	Neck Length	Overall Length	
			L3			L2	L1	D4	
4.8	2	Ext.	●	MWE0480SA	26	26	62	4.8	1
	2	Ext.	□	MWE0480SB	24	24	62	5	1
	3	Ext.	●	MWE0480MA	32	32	68	4.8	1
	3	Ext.	□	MWE0480MB	32	32	68	5	1
4.9	2	Ext.	●	MWE0490SA	26	26	62	4.9	1
	2	Ext.	□	MWE0490SB	24	24	62	5	1
	3	Ext.	●	MWE0490MA	32	32	68	4.9	1
	3	Ext.	□	MWE0490MB	32	32	68	5	1
5.0	2	Ext.	●	MWE0500SA	26	26	62	5	1
	2	Ext.	●	MWE0500SB	24	24	62	5	1
	3	Ext.	●	MWE0500MA	32	32	68	5	1
	3	Ext.	●	MWE0500MB	32	32	68	5	1
5.1	2	Ext.	●	MWE0510SA	26	26	62	5.1	1
	2	Ext.	●	MWE0510SB	26	28	66	6	1
	3	Ext.	●	MWE0510MA	34	34	72	5.1	1
	3	Ext.	●	MWE0510MB	34	36	74	6	1
5.2	2	Ext.	●	MWE0520SA	26	26	62	5.2	1
	2	Ext.	●	MWE0520SB	26	28	66	6	1
	3	Ext.	●	MWE0520MA	34	34	72	5.2	1
	3	Ext.	●	MWE0520MB	34	36	74	6	1
5.3	2	Ext.	●	MWE0530SA	26	26	62	5.3	1
	2	Ext.	□	MWE0530SB	26	28	66	6	1
	3	Ext.	●	MWE0530MA	34	34	72	5.3	1
	3	Ext.	□	MWE0530MB	34	36	74	6	1
5.4	2	Ext.	●	MWE0540SA	28	28	66	5.4	1
	2	Ext.	□	MWE0540SB	26	28	66	6	1
	3	Ext.	●	MWE0540MA	34	34	72	5.4	1
	3	Ext.	□	MWE0540MB	34	36	74	6	1
5.5	2	Ext.	●	MWE0550SA	28	28	66	5.5	1
	2	Ext.	●	MWE0550SB	26	28	66	6	1
	3	Ext.	●	MWE0550MA	34	34	72	5.5	1
	3	Ext.	●	MWE0550MB	34	36	74	6	1
5.6	2	Ext.	●	MWE0560SA	28	28	66	5.6	1
	2	Ext.	□	MWE0560SB	28	28	66	6	1
	3	Ext.	●	MWE0560MA	36	36	74	5.6	1
	3	Ext.	□	MWE0560MB	36	36	74	6	1
5.7	2	Ext.	●	MWE0570SA	28	28	66	5.7	1
	2	Ext.	□	MWE0570SB	28	28	66	6	1
	3	Ext.	●	MWE0570MA	36	36	74	5.7	1
	3	Ext.	□	MWE0570MB	36	36	74	6	1
5.8	2	Ext.	●	MWE0580SA	28	28	66	5.8	1
	2	Ext.	□	MWE0580SB	28	28	66	6	1
	3	Ext.	●	MWE0580MA	36	36	74	5.8	1
	3	Ext.	□	MWE0580MB	36	36	74	6	1
5.9	2	Ext.	●	MWE0590SA	28	28	66	5.9	1
	2	Ext.	□	MWE0590SB	28	28	66	6	1
	3	Ext.	●	MWE0590MA	36	36	74	5.9	1
	3	Ext.	□	MWE0590MB	36	36	74	6	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)				Type
					VP15TF	Flute Length	Neck Length	Overall Length	
			L3			L2	L1	D4	
6.0	2	Ext.	●	MWE0600SA	28	28	66	6	1
	2	Ext.	●	MWE0600SB	28	28	66	6	1
	3	Ext.	●	MWE0600MA	41	41	81	6	1
	3	Ext.	●	MWE0600MB	36	36	74	6	1
6.1	2	Ext.	●	MWE0610SA	31	31	70	6.1	1
	2	Ext.	●	MWE0610SB	31	34	74	7	1
	3	Ext.	●	MWE0610MA	41	41	81	6.1	1
	3	Ext.	●	MWE0610MB	41	44	83	7	1
6.2	2	Ext.	●	MWE0620SA	31	31	70	6.2	1
	2	Ext.	●	MWE0620SB	31	34	74	7	1
	3	Ext.	●	MWE0620MA	41	41	81	6.2	1
	3	Ext.	●	MWE0620MB	41	44	83	7	1
6.3	2	Ext.	●	MWE0630SA	31	31	70	6.3	1
	2	Ext.	□	MWE0630SB	31	34	74	7	1
	3	Ext.	●	MWE0630MA	41	41	71	6.3	1
	3	Ext.	□	MWE0630MB	41	44	83	7	1
6.4	2	Ext.	●	MWE0640SA	31	31	70	6.4	1
	2	Ext.	□	MWE0640SB	31	34	74	7	1
	3	Ext.	●	MWE0640MA	41	41	81	6.4	1
	3	Ext.	□	MWE0640MB	41	44	83	7	1
6.5	2	Ext.	●	MWE0650SA	31	31	70	6.5	1
	2	Ext.	●	MWE0650SB	31	34	74	7	1
	3	Ext.	●	MWE0650MA	41	41	81	6.5	1
	3	Ext.	●	MWE0650MB	41	44	83	7	1
6.6	2	Ext.	●	MWE0660SA	31	31	70	6.6	1
	2	Ext.	□	MWE0660SB	34	34	74	7	1
	3	Ext.	●	MWE0660MA	43	43	83	6.6	1
	3	Ext.	□	MWE0660MB	43	43	83	7	1
6.7	2	Ext.	●	MWE0670SA	31	31	70	6.7	1
	2	Ext.	●	MWE0670SB	34	34	74	7	1
	3	Ext.	●	MWE0670MA	43	43	83	6.7	1
	3	Ext.	●	MWE0670MB	43	43	83	7	1
6.8	2	Ext.	●	MWE0680SA	34	34	74	6.8	1
	2	Ext.	●	MWE0680SB	34	34	74	7	1
	3	Ext.	●	MWE0680MA	43	43	83	6.8	1
	3	Ext.	●	MWE0680MB	43	43	83	7	1
6.9	2	Ext.	●	MWE0690SA	34	34	74	6.9	1
	2	Ext.	●	MWE0690SB	34	34	74	7	1
	3	Ext.	●	MWE0690MA	43	43	83	6.9	1
	3	Ext.	●	MWE0690MB	43	43	83	7	1
7.0	2	Ext.	●	MWE0700SA	34	34	74	7	1
	2	Ext.	●	MWE0700SB	34	34	74	8	1
	3	Ext.	●	MWE0700MA	43	43	83	7	1
	3	Ext.	●	MWE0700MB	43	43	83	8	1
7.1	2	Ext.	●	MWE0710SA	34	34	74	7.1	1
	2	Ext.	□	MWE0710SB	34	37	79	8	1
	3	Ext.	●	MWE0710MA	45	45	87	7.1	1
	3	Ext.	□	MWE0710MB	45	48	90	8	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
7.2	2	Ext.	●	MWE0720SA	34	34	74	7.2	1
	2	Ext.	□	MWE0720SB	34	37	79	8	1
	3	Ext.	●	MWE0720MA	45	45	87	7.2	1
	3	Ext.	□	MWE0720MB	45	48	90	8	1
7.3	2	Ext.	●	MWE0730SA	34	34	74	7.3	1
	2	Ext.	□	MWE0730SB	34	37	79	8	1
	3	Ext.	●	MWE0730MA	45	45	87	7.3	1
	3	Ext.	□	MWE0730MB	45	48	90	8	1
7.4	2	Ext.	●	MWE0740SA	34	34	74	7.4	1
	2	Ext.	□	MWE0740SB	34	37	79	8	1
	3	Ext.	●	MWE0740MA	45	45	87	7.4	1
	3	Ext.	□	MWE0740MB	45	48	90	8	1
7.5	2	Ext.	●	MWE0750SA	34	34	74	7.5	1
	2	Ext.	●	MWE0750SB	34	37	79	8	1
	3	Ext.	●	MWE0750MA	45	45	87	7.5	1
	3	Ext.	●	MWE0750MB	45	48	90	8	1
7.6	2	Ext.	●	MWE0760SA	37	37	79	7.6	1
	2	Ext.	□	MWE0760SB	37	37	79	8	1
	3	Ext.	●	MWE0760MA	48	48	90	7.6	1
	3	Ext.	□	MWE0760MB	48	48	90	8	1
7.7	2	Ext.	●	MWE0770SA	37	37	79	7.7	1
	2	Ext.	●	MWE0770SB	37	37	79	8	1
	3	Ext.	●	MWE0770MA	48	48	90	7.7	1
	3	Ext.	●	MWE0770MB	48	48	90	8	1
7.8	2	Ext.	●	MWE0780SA	37	37	79	7.8	1
	2	Ext.	●	MWE0780SB	37	37	79	8	1
	3	Ext.	●	MWE0780MA	48	48	90	7.8	1
	3	Ext.	●	MWE0780MB	48	48	90	8	1
7.9	2	Ext.	●	MWE0790SA	37	37	79	7.9	1
	2	Ext.	●	MWE0790SB	37	37	79	8	1
	3	Ext.	●	MWE0790MA	48	48	90	7.9	1
	3	Ext.	●	MWE0790MB	48	48	90	8	1
8.0	2	Ext.	●	MWE0800SA	37	37	79	8	1
	2	Ext.	●	MWE0800SB	37	37	79	8	1
	3	Ext.	●	MWE0800MA	48	48	90	8	1
	3	Ext.	●	MWE0800MB	48	48	90	8	1
8.1	2	Ext.	●	MWE0810SA	37	37	79	8.1	1
	2	Ext.	□	MWE0810SB	37	40	84	9	1
	3	Ext.	●	MWE0810MA	53	53	96	8.1	1
	3	Ext.	□	MWE0810MB	53	56	98	9	1
8.2	2	Ext.	●	MWE0820SA	37	37	79	8.2	1
	2	Ext.	□	MWE0820SB	37	40	84	9	1
	3	Ext.	●	MWE0820MA	53	53	96	8.2	1
	3	Ext.	□	MWE0820MB	53	56	98	9	1
8.3	2	Ext.	●	MWE0830SA	37	37	79	8.3	1
	2	Ext.	□	MWE0830SB	37	40	84	9	1
	3	Ext.	●	MWE0830MA	53	53	96	8.3	1
	3	Ext.	□	MWE0830MB	53	56	98	9	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
8.4	2	Ext.	●	MWE0840SA	37	37	79	8.4	1
	2	Ext.	●	MWE0840SB	37	40	84	9	1
	3	Ext.	●	MWE0840MA	53	53	96	8.4	1
	3	Ext.	●	MWE0840MB	53	56	98	9	1
8.5	2	Ext.	●	MWE0850SA	37	37	79	8.5	1
	2	Ext.	●	MWE0850SB	37	40	84	9	1
	3	Ext.	●	MWE0850MA	53	53	96	8.5	1
	3	Ext.	●	MWE0850MB	53	56	98	9	1
8.6	2	Ext.	●	MWE0860SA	40	40	84	8.6	1
	2	Ext.	●	MWE0860SB	40	40	84	9	1
	3	Ext.	●	MWE0860MA	55	55	98	8.6	1
	3	Ext.	●	MWE0860MB	55	55	98	9	1
8.7	2	Ext.	●	MWE0870SA	40	40	84	8.7	1
	2	Ext.	□	MWE0870SB	40	40	84	9	1
	3	Ext.	●	MWE0870MA	55	55	98	8.7	1
	3	Ext.	□	MWE0870MB	55	55	98	9	1
8.8	2	Ext.	●	MWE0880SA	40	40	84	8.8	1
	2	Ext.	□	MWE0880SB	40	40	84	9	1
	3	Ext.	●	MWE0880MA	55	55	98	8.8	1
	3	Ext.	□	MWE0880MB	55	55	98	9	1
8.9	2	Ext.	●	MWE0890SA	40	40	84	8.9	1
	2	Ext.	□	MWE0890SB	40	40	84	9	1
	3	Ext.	●	MWE0890MA	55	55	98	8.9	1
	3	Ext.	□	MWE0890MB	55	55	98	9	1
9.0	2	Ext.	●	MWE0900SA	40	40	84	9	1
	2	Ext.	●	MWE0900SB	40	40	84	9	1
	3	Ext.	●	MWE0900MA	55	55	98	9	1
	3	Ext.	●	MWE0900MB	55	55	98	9	1
9.1	2	Ext.	●	MWE0910SA	40	40	84	9.1	1
	2	Ext.	□	MWE0910SB	40	43	89	10	1
	3	Ext.	●	MWE0910MA	58	58	102	9.1	1
	3	Ext.	□	MWE0910MB	58	61	105	10	1
9.2	2	Ext.	●	MWE0920SA	40	40	84	9.2	1
	2	Ext.	□	MWE0920SB	40	43	89	10	1
	3	Ext.	●	MWE0920MA	58	58	102	9.2	1
	3	Ext.	□	MWE0920MB	58	61	105	10	1
9.3	2	Ext.	●	MWE0930SA	40	40	81	9.3	1
	2	Ext.	□	MWE0930SB	40	43	89	10	1
	3	Ext.	●	MWE0930MA	58	58	102	9.3	1
	3	Ext.	□	MWE0930MB	58	61	105	10	1
9.4	2	Ext.	●	MWE0940SA	40	40	84	9.4	1
	2	Ext.	●	MWE0940SB	40	43	89	10	1
	3	Ext.	●	MWE0940MA	58	58	102	9.4	1
	3	Ext.	●	MWE0940MB	58	61	105	10	1
9.5	2	Ext.	●	MWE0950SA	40	40	84	9.5	1
	2	Ext.	●	MWE0950SB	40	43	89	10	1
	3	Ext.	●	MWE0950MA	58	58	102	9.5	1
	3	Ext.	●	MWE0950MB	58	61	105	10	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
9.6	2	Ext.	●	MWE0960SA	43	43	89	9.6	1
	2	Ext.	●	MWE0960SB	43	43	89	10	1
	3	Ext.	●	MWE0960MA	60	60	105	9.6	1
	3	Ext.	●	MWE0960MB	60	60	105	10	1
9.7	2	Ext.	●	MWE0970SA	43	43	89	9.7	1
	2	Ext.	□	MWE0970SB	43	43	89	10	1
	3	Ext.	●	MWE0970MA	60	60	105	9.7	1
	3	Ext.	□	MWE0970MB	60	60	105	10	1
9.8	2	Ext.	●	MWE0980SA	43	43	89	9.8	1
	2	Ext.	□	MWE0980SB	43	43	89	10	1
	3	Ext.	●	MWE0980MA	60	60	105	9.8	1
	3	Ext.	□	MWE0980MB	60	60	105	10	1
9.9	2	Ext.	●	MWE0990SA	43	43	89	9.9	1
	2	Ext.	□	MWE0990SB	43	43	89	10	1
	3	Ext.	●	MWE0990MA	60	60	105	9.9	1
	3	Ext.	□	MWE0990MB	60	60	105	10	1
10.0	2	Ext.	●	MWE1000SA	43	43	89	10	1
	2	Ext.	●	MWE1000SB	43	43	89	10	1
	3	Ext.	●	MWE1000MA	60	60	105	10	1
	3	Ext.	●	MWE1000MB	60	60	105	10	1
10.1	2	Ext.	●	MWE1010SA	43	43	89	10.1	1
	2	Ext.	□	MWE1010SB	43	46	95	11	1
	3	Ext.	●	MWE1010MA	66	66	112	10.1	1
	3	Ext.	□	MWE1010MB	66	69	114	11	1
10.2	2	Ext.	●	MWE1020SA	43	43	89	10.2	1
	2	Ext.	●	MWE1020SB	43	46	95	11	1
	3	Ext.	●	MWE1020MA	66	66	112	10.2	1
	3	Ext.	●	MWE1020MB	66	69	114	11	1
10.3	2	Ext.	●	MWE1030SA	43	43	89	10.3	1
	2	Ext.	●	MWE1030SB	43	46	95	11	1
	3	Ext.	●	MWE1030MA	66	66	112	10.3	1
	3	Ext.	●	MWE1030MB	66	69	114	11	1
10.4	2	Ext.	●	MWE1040SA	43	43	89	10.4	1
	2	Ext.	●	MWE1040SB	43	46	95	11	1
	3	Ext.	●	MWE1040MA	66	66	112	10.4	1
	3	Ext.	●	MWE1040MB	66	69	114	11	1
10.5	2	Ext.	●	MWE1050SA	43	43	89	10.5	1
	2	Ext.	●	MWE1050SB	43	46	95	11	1
	3	Ext.	●	MWE1050MA	66	66	112	10.5	1
	3	Ext.	●	MWE1050MB	66	69	114	11	1
10.6	2	Ext.	●	MWE1060SA	43	43	89	10.6	1
	2	Ext.	□	MWE1060SB	47	47	95	11	1
	3	Ext.	●	MWE1060MA	68	68	114	10.6	1
	3	Ext.	□	MWE1060MB	68	68	114	11	1
10.7	2	Ext.	●	MWE1070SA	47	47	95	10.7	1
	2	Ext.	□	MWE1070SB	47	47	95	11	1
	3	Ext.	●	MWE1070MA	68	68	114	10.7	1
	3	Ext.	□	MWE1070MB	68	68	114	11	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.8	2	Ext.	●	MWE1080SA	47	47	95	10.8	1
	2	Ext.	□	MWE1080SB	47	47	95	11	1
	3	Ext.	●	MWE1080MA	68	68	114	10.8	1
	3	Ext.	□	MWE1080MB	68	68	114	11	1
10.9	2	Ext.	●	MWE1090SA	47	47	95	10.9	1
	2	Ext.	□	MWE1090SB	47	47	95	11	1
	3	Ext.	●	MWE1090MA	68	68	114	10.9	1
	3	Ext.	□	MWE1090MB	68	68	114	11	1
11.0	2	Ext.	●	MWE1100SA	47	47	95	11	1
	2	Ext.	●	MWE1100SB	47	47	95	11	1
	3	Ext.	●	MWE1100MA	68	68	114	11	1
	3	Ext.	●	MWE1100MB	68	68	114	11	1
11.1	2	Ext.	●	MWE1110SA	47	47	95	11.1	1
	2	Ext.	□	MWE1110SB	47	50	95	12	1
	3	Ext.	●	MWE1110MA	71	71	118	11.1	1
	3	Ext.	□	MWE1110MB	71	74	121	12	1
11.2	2	Ext.	●	MWE1120SA	47	47	95	11.2	1
	2	Ext.	□	MWE1120SB	47	50	95	12	1
	3	Ext.	●	MWE1120MA	71	71	118	11.2	1
	3	Ext.	□	MWE1120MB	71	74	121	12	1
11.3	2	Ext.	●	MWE1130SA	47	47	95	11.3	1
	2	Ext.	□	MWE1130SB	47	50	95	12	1
	3	Ext.	●	MWE1130MA	71	71	118	11.3	1
	3	Ext.	□	MWE1130MB	71	74	121	12	1
11.4	2	Ext.	●	MWE1140SA	47	47	95	11.4	1
	2	Ext.	□	MWE1140SB	47	50	95	12	1
	3	Ext.	●	MWE1140MA	71	71	118	11.4	1
	3	Ext.	□	MWE1140MB	71	74	121	12	1
11.5	2	Ext.	●	MWE1150SA	47	47	95	11.5	1
	2	Ext.	●	MWE1150SB	47	50	95	12	1
	3	Ext.	●	MWE1150MA	71	71	118	11.5	1
	3	Ext.	●	MWE1150MB	71	74	121	12	1
11.6	2	Ext.	●	MWE1160SA	47	47	95	11.6	1
	2	Ext.	□	MWE1160SB	47	47	95	12	1
	3	Ext.	●	MWE1160MA	73	73	121	11.6	1
	3	Ext.	□	MWE1160MB	73	73	121	12	1
11.7	2	Ext.	●	MWE1170SA	47	47	95	11.7	1
	2	Ext.	□	MWE1170SB	47	47	95	12	1
	3	Ext.	●	MWE1170MA	73	73	121	11.7	1
	3	Ext.	□	MWE1170MB	73	73	121	12	1
11.8	2	Ext.	●	MWE1180SA	47	47	95	11.8	1
	2	Ext.	□	MWE1180SB	47	47	95	12	1
	3	Ext.	●	MWE1180MA	73	73	121	11.8	1
	3	Ext.	□	MWE1180MB	73	73	121	12	1
11.9	2	Ext.	●	MWE1190SA	51	51	102	11.9	1
	2	Ext.	●	MWE1190SB	47	47	95	12	1
	3	Ext.	●	MWE1190MA	73	73	121	11.9	1
	3	Ext.	●	MWE1190MB	73	73	121	12	1

DRILLING(SOLID CARBIDE)

MWE WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
12.0	2	Ext.	●	MWE1200SA	51	51	102	12	1
	2	Ext.	●	MWE1200SB	47	47	95	12	1
	3	Ext.	●	MWE1200MA	73	73	121	12	1
	3	Ext.	●	MWE1200MB	73	73	121	12	1
12.1	2	Ext.	●	MWE1210SA	51	51	102	12.1	1
	2	Ext.	●	MWE1210SB	51	54	102	13	1
	3	Ext.	●	MWE1210MA	76	76	135	12.1	1
	3	Ext.	●	MWE1210MB	76	79	137	13	1
12.2	2	Ext.	●	MWE1220SA	51	51	102	12.2	1
	2	Ext.	□	MWE1220SB	51	54	102	13	1
	3	Ext.	●	MWE1220MA	76	76	135	12.2	1
	3	Ext.	□	MWE1220MB	76	79	137	13	1
12.3	2	Ext.	●	MWE1230SA	51	51	102	12.3	1
	2	Ext.	□	MWE1230SB	51	54	102	13	1
	3	Ext.	●	MWE1230MA	76	76	135	12.3	1
	3	Ext.	□	MWE1230MB	76	79	137	13	1
12.4	2	Ext.	●	MWE1240SA	51	51	102	12.4	1
	2	Ext.	□	MWE1240SB	51	54	102	13	1
	3	Ext.	●	MWE1240MA	76	76	135	12.4	1
	3	Ext.	□	MWE1240MB	76	79	137	13	1
12.5	2	Ext.	●	MWE1250SA	51	51	102	12.5	1
	2	Ext.	●	MWE1250SB	51	54	102	13	1
	3	Ext.	●	MWE1250MA	76	76	135	12.5	1
	3	Ext.	●	MWE1250MB	76	79	137	13	1
12.6	2	Ext.	●	MWE1260SA	51	51	102	12.6	1
	2	Ext.	□	MWE1260SB	51	51	102	13	1
	3	Ext.	●	MWE1260MA	78	78	137	12.6	1
	3	Ext.	□	MWE1260MB	78	78	137	13	1
12.7	2	Ext.	●	MWE1270SA	51	51	102	12.7	1
	2	Ext.	□	MWE1270SB	51	51	102	13	1
	3	Ext.	●	MWE1270MA	78	78	137	12.7	1
	3	Ext.	□	MWE1270MB	78	78	137	13	1
12.8	2	Ext.	●	MWE1280SA	51	51	102	12.8	1
	2	Ext.	□	MWE1280SB	51	51	102	13	1
	3	Ext.	●	MWE1280MA	78	78	137	12.8	1
	3	Ext.	□	MWE1280MB	78	78	137	13	1
12.9	2	Ext.	●	MWE1290SA	51	51	102	12.9	1
	2	Ext.	□	MWE1290SB	51	51	102	13	1
	3	Ext.	●	MWE1290MA	78	78	137	12.9	1
	3	Ext.	□	MWE1290MB	78	78	137	13	1
13.0	2	Ext.	●	MWE1300SA	51	51	102	13	1
	2	Ext.	●	MWE1300SB	51	51	102	13	1
	3	Ext.	●	MWE1300MA	78	78	137	13	1
	3	Ext.	●	MWE1300MB	78	78	137	13	1
13.1	2	Ext.	●	MWE1310SA	51	51	102	13.1	1
	2	Ext.	□	MWE1310SB	54	57	107	14	1
	3	Ext.	●	MWE1310MA	84	84	144	13.1	1
	3	Ext.	□	MWE1310MB	84	87	147	14	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
13.2	2	Ext.	●	MWE1320SA	51	51	102	13.2	1
	2	Ext.	□	MWE1320SB	54	57	107	14	1
	3	Ext.	●	MWE1320MA	84	84	144	13.2	1
	3	Ext.	□	MWE1320MB	84	87	147	14	1
13.3	2	Ext.	●	MWE1330SA	54	54	107	13.3	1
	2	Ext.	□	MWE1330SB	54	57	107	14	1
	3	Ext.	●	MWE1330MA	84	84	144	13.3	1
	3	Ext.	□	MWE1330MB	84	87	147	14	1
13.4	2	Ext.	●	MWE1340SA	54	54	107	13.4	1
	2	Ext.	□	MWE1340SB	54	57	107	14	1
	3	Ext.	●	MWE1340MA	84	84	144	13.4	1
	3	Ext.	□	MWE1340MB	84	87	147	14	1
13.5	2	Ext.	●	MWE1350SA	54	54	107	13.5	1
	2	Ext.	●	MWE1350SB	54	57	107	14	1
	3	Ext.	●	MWE1350MA	84	84	144	13.5	1
	3	Ext.	●	MWE1350MB	84	87	147	14	1
13.6	2	Ext.	●	MWE1360SA	54	54	107	13.6	1
	2	Ext.	□	MWE1360SB	54	54	107	14	1
	3	Ext.	●	MWE1360MA	86	86	147	13.6	1
	3	Ext.	□	MWE1360MB	86	86	147	14	1
13.7	2	Ext.	●	MWE1370SA	54	54	107	13.7	1
	2	Ext.	□	MWE1370SB	54	54	107	14	1
	3	Ext.	●	MWE1370MA	86	86	147	13.7	1
	3	Ext.	□	MWE1370MB	86	86	147	14	1
13.8	2	Ext.	●	MWE1380SA	54	54	107	13.8	1
	2	Ext.	□	MWE1380SB	54	54	107	14	1
	3	Ext.	●	MWE1380MA	86	86	147	13.8	1
	3	Ext.	□	MWE1380MB	86	86	147	14	1
13.9	2	Ext.	●	MWE1390SA	54	54	107	13.9	1
	2	Ext.	●	MWE1390SB	54	54	107	14	1
	3	Ext.	●	MWE1390MA	86	86	147	13.9	1
	3	Ext.	●	MWE1390MB	86	86	147	14	1
14.0	2	Ext.	●	MWE1400SA	54	54	107	14	1
	2	Ext.	●	MWE1400SB	54	54	107	14	1
	3	Ext.	●	MWE1400MA	86	86	147	14	1
	3	Ext.	●	MWE1400MB	86	86	147	14	1
14.1	2	Ext.	●	MWE1410SA	56	56	111	14.1	1
	2	Ext.	●	MWE1410SB	56	59	111	15	1
	3	Ext.	●	MWE1410MA	89	89	151	14.1	1
	3	Ext.	●	MWE1410MB	89	92	153	15	1
14.2	2	Ext.	●	MWE1420SA	56	56	111	14.2	1
	2	Ext.	□	MWE1420SB	56	59	111	15	1
	3	Ext.	●	MWE1420MA	89	89	151	14.2	1
	3	Ext.	□	MWE1420MB	89	92	153	15	1
14.3	2	Ext.	□	MWE1430SA	56	56	111	14.3	1
	2	Ext.	□	MWE1430SB	56	59	111	15	1
	3	Ext.	●	MWE1430MA	89	89	151	14.3	1
	3	Ext.	□	MWE1430MB	89	92	153	15	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
14.4	2	Ext.	□	MWE1440SA	56	56	111	14.4	1
	2	Ext.	□	MWE1440SB	56	59	111	15	1
	3	Ext.	●	MWE1440MA	89	89	151	14.4	1
	3	Ext.	□	MWE1440MB	89	92	153	15	1
14.5	2	Ext.	●	MWE1450SA	56	56	111	14.5	1
	2	Ext.	●	MWE1450SB	56	59	111	15	1
	3	Ext.	●	MWE1450MA	89	89	151	14.5	1
	3	Ext.	●	MWE1450MB	89	92	153	15	1
14.6	2	Ext.	□	MWE1460SA	56	56	111	14.6	1
	2	Ext.	□	MWE1460SB	56	56	111	15	1
	3	Ext.	●	MWE1460MA	91	91	153	14.6	1
	3	Ext.	□	MWE1460MB	91	91	153	15	1
14.7	2	Ext.	□	MWE1470SA	56	56	111	14.7	1
	2	Ext.	□	MWE1470SB	56	56	111	15	1
	3	Ext.	●	MWE1470MA	91	91	153	14.7	1
	3	Ext.	□	MWE1470MB	91	91	153	15	1
14.8	2	Ext.	□	MWE1480SA	56	56	111	14.8	1
	2	Ext.	□	MWE1480SB	56	56	111	15	1
	3	Ext.	●	MWE1480MA	91	91	153	14.8	1
	3	Ext.	□	MWE1480MB	91	91	153	15	1
14.9	2	Ext.	□	MWE1490SA	56	56	111	14.9	1
	2	Ext.	□	MWE1490SB	56	56	111	15	1
	3	Ext.	●	MWE1490MA	91	91	153	14.9	1
	3	Ext.	□	MWE1490MB	91	91	153	15	1
15.0	2	Ext.	●	MWE1500SA	56	56	111	15	1
	2	Ext.	●	MWE1500SB	56	56	111	15	1
	3	Ext.	●	MWE1500MA	91	91	153	15	1
	3	Ext.	●	MWE1500MB	91	91	153	15	1
15.1	2	Ext.	□	MWE1510SA	58	58	115	15.1	1
	2	Ext.	□	MWE1510SB	58	61	115	16	1
	3	Ext.	●	MWE1510MA	94	94	157	15.1	1
	3	Ext.	□	MWE1510MB	94	97	160	16	1
15.2	2	Ext.	●	MWE1520SA	58	58	115	15.2	1
	2	Ext.	□	MWE1520SB	58	61	115	16	1
	3	Ext.	●	MWE1520MA	94	94	157	15.2	1
	3	Ext.	□	MWE1520MB	94	97	160	16	1
15.3	2	Ext.	□	MWE1530SA	58	58	115	15.3	1
	2	Ext.	□	MWE1530SB	58	61	115	16	1
	3	Ext.	●	MWE1530MA	94	94	157	15.3	1
	3	Ext.	□	MWE1530MB	94	97	160	16	1
15.4	2	Ext.	□	MWE1540SA	58	58	115	15.4	1
	2	Ext.	●	MWE1540SB	58	61	115	16	1
	3	Ext.	●	MWE1540MA	94	94	157	15.4	1
	3	Ext.	●	MWE1540MB	94	97	160	16	1
15.5	2	Ext.	●	MWE1550SA	58	58	115	15.5	1
	2	Ext.	●	MWE1550SB	58	61	115	16	1
	3	Ext.	●	MWE1550MA	94	94	157	15.5	1
	3	Ext.	●	MWE1550MB	94	97	160	16	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
15.6	2	Ext.	□	MWE1560SA	58	58	115	15.6	1
	2	Ext.	●	MWE1560SB	58	58	115	16	1
	3	Ext.	●	MWE1560MA	96	96	160	15.6	1
	3	Ext.	●	MWE1560MB	96	96	160	16	1
15.7	2	Ext.	□	MWE1570SA	58	58	115	15.7	1
	2	Ext.	□	MWE1570SB	58	58	115	16	1
	3	Ext.	●	MWE1570MA	96	96	160	15.7	1
	3	Ext.	□	MWE1570MB	96	96	160	16	1
15.8	2	Ext.	□	MWE1580SA	58	58	115	15.8	1
	2	Ext.	□	MWE1580SB	58	58	115	16	1
	3	Ext.	●	MWE1580MA	96	96	160	15.8	1
	3	Ext.	□	MWE1580MB	96	96	160	16	1
15.9	2	Ext.	□	MWE1590SA	58	58	115	15.9	1
	2	Ext.	□	MWE1590SB	58	58	115	16	1
	3	Ext.	●	MWE1590MA	96	96	160	15.9	1
	3	Ext.	□	MWE1590MB	96	96	160	16	1
16.0	2	Ext.	●	MWE1600SA	58	58	115	16	1
	2	Ext.	●	MWE1600SB	58	58	115	16	1
	3	Ext.	●	MWE1600MA	96	96	160	16	1
	3	Ext.	●	MWE1600MB	96	96	160	16	1
16.1	2	Ext.	□	MWE1610SA	60	60	119	16.1	1
	3	Ext.	□	MWE1610MA	102	102	167	16.1	1
16.2	2	Ext.	●	MWE1620SA	60	60	119	16.2	1
	3	Ext.	□	MWE1620MA	102	102	167	16.2	1
16.3	2	Ext.	●	MWE1630SA	60	60	119	16.3	1
	3	Ext.	□	MWE1630MA	102	102	167	16.3	1
16.4	2	Ext.	□	MWE1640SA	60	60	119	16.4	1
	3	Ext.	□	MWE1640MA	102	102	167	16.4	1
16.5	2	Ext.	●	MWE1650SA	60	60	119	16.5	1
	3	Ext.	●	MWE1650MA	102	102	167	16.5	1
16.6	2	Ext.	□	MWE1660SA	60	60	119	16.6	1
	3	Ext.	□	MWE1660MA	102	102	167	16.6	1
16.7	2	Ext.	□	MWE1670SA	60	60	119	16.7	1
	3	Ext.	□	MWE1670MA	102	102	167	16.7	1
16.8	2	Ext.	□	MWE1680SA	60	60	119	16.8	1
	3	Ext.	□	MWE1680MA	102	102	167	16.8	1
16.9	2	Ext.	□	MWE1690SA	60	60	119	16.9	1
	3	Ext.	□	MWE1690MA	102	102	167	16.9	1
17.0	2	Ext.	●	MWE1700SA	60	60	119	17	1
	3	Ext.	●	MWE1700MA	102	102	167	17	1
17.1	2	Ext.	□	MWE1710SA	62	62	123	17.1	1
	3	Ext.	□	MWE1710MA	102	102	167	17.1	1
17.2	2	Ext.	□	MWE1720SA	62	62	123	17.2	1
	3	Ext.	□	MWE1720MA	102	102	167	17.2	1
17.3	2	Ext.	□	MWE1730SA	62	62	123	17.3	1
	3	Ext.	□	MWE1730MA	102	102	167	17.3	1
17.4	2	Ext.	□	MWE1740SA	62	62	123	17.4	1
	3	Ext.	□	MWE1740MA	102	102	167	17.4	1

DRILLING(SOLID CARBIDE)

MWE WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
17.5	2	Ext.	●	MWE1750SA	62	62	123	17.5	1
	3	Ext.	●	MWE1750MA	102	102	167	17.5	1
17.6	2	Ext.	□	MWE1760SA	62	62	123	17.6	1
	3	Ext.	□	MWE1760MA	102	102	167	17.6	1
17.7	2	Ext.	□	MWE1770SA	62	62	123	17.7	1
	3	Ext.	□	MWE1770MA	102	102	167	17.7	1
17.8	2	Ext.	●	MWE1780SA	62	62	123	17.8	1
	3	Ext.	□	MWE1780MA	102	102	167	17.8	1
17.9	2	Ext.	□	MWE1790SA	62	62	123	17.9	1
	3	Ext.	□	MWE1790MA	102	102	167	17.9	1
18.0	2	Ext.	●	MWE1800SA	62	62	123	18	1
	3	Ext.	●	MWE1800MA	102	102	167	18	1
18.1	2	Ext.	□	MWE1810SA	64	64	127	18.1	1
	3	Ext.	□	MWE1810MA	114	114	179	18.1	1
18.2	2	Ext.	□	MWE1820SA	64	64	127	18.2	1
	3	Ext.	□	MWE1820MA	114	114	179	18.2	1
18.3	2	Ext.	□	MWE1830SA	64	64	127	18.3	1
	3	Ext.	□	MWE1830MA	114	114	179	18.3	1
18.4	2	Ext.	□	MWE1840SA	64	64	127	18.4	1
	3	Ext.	□	MWE1840MA	114	114	179	18.4	1
18.5	2	Ext.	●	MWE1850SA	64	64	127	18.5	1
	3	Ext.	●	MWE1850MA	114	114	179	18.5	1
18.6	2	Ext.	□	MWE1860SA	64	64	127	18.6	1
	3	Ext.	□	MWE1860MA	114	114	179	18.6	1
18.7	2	Ext.	□	MWE1870SA	64	64	127	18.7	1
	3	Ext.	□	MWE1870MA	114	114	179	18.7	1
18.8	2	Ext.	□	MWE1880SA	64	64	127	18.8	1
	3	Ext.	□	MWE1880MA	114	114	179	18.8	1
18.9	2	Ext.	□	MWE1890SA	64	64	127	18.9	1
	3	Ext.	□	MWE1890MA	114	114	179	18.9	1
19.0	2	Ext.	●	MWE1900SA	64	64	127	19	1
	3	Ext.	●	MWE1900MA	114	114	179	19	1
19.1	2	Ext.	□	MWE1910SA	66	66	131	19.1	1
	3	Ext.	□	MWE1910MA	114	114	179	19.1	1
19.2	2	Ext.	□	MWE1920SA	66	66	131	19.2	1
	3	Ext.	□	MWE1920MA	114	114	179	19.2	1
19.3	2	Ext.	□	MWE1930SA	66	66	131	19.3	1
	3	Ext.	□	MWE1930MA	114	114	179	19.3	1
19.4	2	Ext.	□	MWE1940SA	66	66	131	19.4	1
	3	Ext.	□	MWE1940MA	114	114	179	19.4	1
19.5	2	Ext.	●	MWE1950SA	66	66	131	19.5	1
	3	Ext.	●	MWE1950MA	114	114	179	19.5	1
19.6	2	Ext.	□	MWE1960SA	66	66	131	19.6	1
	3	Ext.	□	MWE1960MA	114	114	179	19.6	1
19.7	2	Ext.	□	MWE1970SA	66	66	131	19.7	1
	3	Ext.	□	MWE1970MA	114	114	179	19.7	1
19.8	2	Ext.	□	MWE1980SA	66	66	131	19.8	1
	3	Ext.	□	MWE1980MA	114	114	179	19.8	1

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
19.9	2	Ext.	□	MWE1990SA	66	66	131	19.9	1
	3	Ext.	□	MWE1990MA	114	114	179	19.9	1
20.0	2	Ext.	●	MWE2000SA	66	66	131	20	1
	3	Ext.	●	MWE2000MA	114	114	179	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.

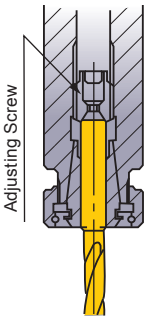
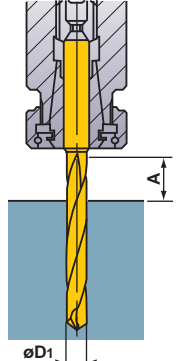
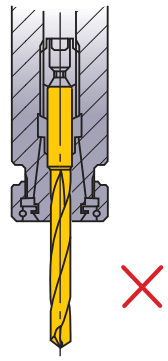
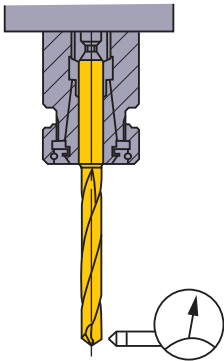
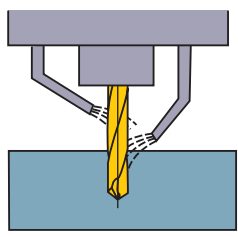
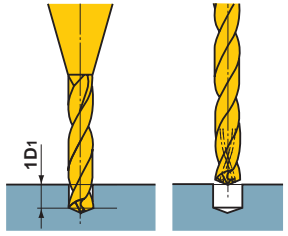
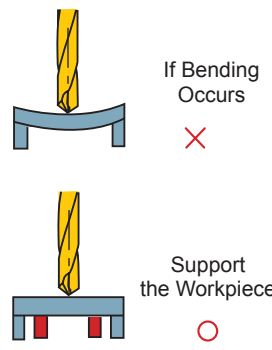
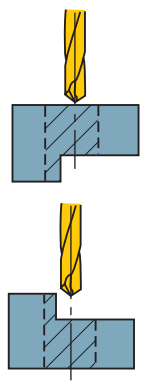
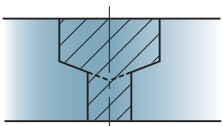
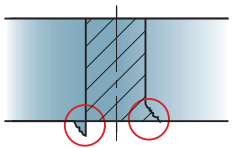
RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel ($\leq 180\text{HB}$)		Carbon steel, Alloy steel (180–280HB)		Carbon steel, Alloy steel (280–350HB)	
	AISI 1010 etc		AISI 1045, AISI 4140 etc		AISI 4340 etc	
Drill Dia. (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 ($\leq 200\text{HB}$)		Gray Cast Iron ($\leq 350\text{MPa}$)		Ductile Cast Iron ($\leq 450\text{MPa}$)	
	AISI 304, AISI 316 etc		No 45 B etc		60-40-8 etc	
Drill Dia. (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		Hardened Steel (40–55HRC)	
			Inconel718 etc		AISI H13, L6 etc	
Drill Dia. (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

<p>Drill Holding</p>  <p>Thrust bearing type collet chuck holds the drill securely.</p>	<p>Drill Length</p>  <p>$A \geq D_1 \times 1.5$</p>	<p>Drill Installation</p>  <p>Do not clamp on the flutes.</p>	<p>Installation Tolerance</p>  <p>Run-out $\leq 0.03\text{mm}$</p>
<p>Coolant Method</p>  <p>Two coolant positions, at the end and at the center are ideal.</p>	<p>Drill Installation</p>  <p>①When machining a prepared hole with the MZE-SB please set the depth to 1D (D=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.</p>	<p>Thin Workpiece</p>  <p>If Bending Occurs \times Support the Workpiece \circ</p>	<p>Interrupted Cutting</p>  <p>One Process \circ ①Lower the feed when drilling the interrupted part. Requires Prior Machining \triangle ①Spot face with an end mill prior to drilling.</p>
<p>Stepped Holes</p>  <p>①Divide the two processes. ②Drill the larger hole first. *A tool for machining both chamfer and spot face can be produced to order.</p>	<p>Burring and Workpiece Chipping</p>  <p>①Lower the feed rate by 50% at the end of through cutting. ②Add a 45° chamfer. ③Change the point angle.</p>		

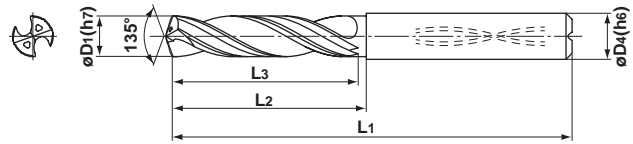
DRILLING(SOLID CARBIDE)

MQS WSTAR DRILLS

- New grade DP3020, unique coolant system, triple margin.
- Long tool life and high efficiency drilling for steel and cast iron.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤20
◎			◎			$\begin{matrix} 0 \\ -0.012 \end{matrix}$	$\begin{matrix} 0 \\ -0.012 \end{matrix}$	$\begin{matrix} 0 \\ -0.015 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.021 \end{matrix}$
						$\begin{matrix} 0 \\ -0.006 \end{matrix}$	$\begin{matrix} 0 \\ -0.008 \end{matrix}$	$\begin{matrix} 0 \\ -0.009 \end{matrix}$	$\begin{matrix} 0 \\ -0.011 \end{matrix}$	$\begin{matrix} 0 \\ -0.013 \end{matrix}$



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
3.0	3	Int.	●	MQS0300X3DB	21	23	70	3
	5	Int.	●	0300X5DB	28	31	78	3
3.1	3	Int.	●	0310X3DB	21	23	70	4
	5	Int.	●	0310X5DB	28	31	78	4
3.2	3	Int.	●	0320X3DB	21	23	70	4
	5	Int.	●	0320X5DB	28	31	78	4
3.3	3	Int.	●	0330X3DB	21	23	70	4
	5	Int.	●	0330X5DB	28	31	78	4
3.4	3	Int.	●	0340X3DB	21	23	70	4
	5	Int.	●	0340X5DB	28	31	78	4
3.5	3	Int.	●	0350X3DB	21	23	70	4
	5	Int.	●	0350X5DB	28	31	78	4
3.6	3	Int.	●	0360X3DB	22	23	70	4
	5	Int.	●	0360X5DB	30	31	78	4
3.7	3	Int.	●	0370X3DB	22	23	70	4
	5	Int.	●	0370X5DB	30	31	78	4
3.8	3	Int.	●	0380X3DB	22	23	70	4
	5	Int.	●	0380X5DB	30	31	78	4
3.9	3	Int.	●	0390X3DB	22	23	70	4
	5	Int.	●	0390X5DB	30	31	78	4
4.0	3	Int.	●	0400X3DB	22	23	70	4
	5	Int.	●	0400X5DB	30	31	78	4
4.1	3	Int.	●	0410X3DB	24	26	73	5
	5	Int.	●	0410X5DB	33	35	82	5
4.2	3	Int.	●	0420X3DB	24	26	73	5
	5	Int.	●	0420X5DB	33	35	82	5
4.3	3	Int.	●	0430X3DB	24	26	73	5
	5	Int.	●	0430X5DB	33	35	82	5
4.4	3	Int.	●	0440X3DB	24	26	73	5
	5	Int.	●	0440X5DB	33	35	82	5
4.5	3	Int.	●	0450X3DB	24	26	73	5
	5	Int.	●	0450X5DB	33	35	82	5
4.6	3	Int.	●	0460X3DB	25	28	75	5
	5	Int.	●	0460X5DB	35	38	85	5
4.7	3	Int.	●	0470X3DB	25	28	75	5
	5	Int.	●	0470X5DB	35	38	85	5
4.8	3	Int.	●	0480X3DB	25	28	75	5
	5	Int.	●	0480X5DB	35	38	85	5

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
4.9	3	Int.	●	MQS0490X3DB	25	28	75	5
	5	Int.	●	0490X5DB	35	38	85	5
5.0	3	Int.	●	0500X3DB	25	28	75	5
	5	Int.	●	0500X5DB	35	38	85	5
5.1	3	Int.	●	0510X3DB	28	30	81	6
	5	Int.	●	0510X5DB	39	42	89	6
5.2	3	Int.	●	0520X3DB	28	30	81	6
	5	Int.	●	0520X5DB	39	42	89	6
5.3	3	Int.	●	0530X3DB	28	30	81	6
	5	Int.	●	0530X5DB	39	42	89	6
5.4	3	Int.	●	0540X3DB	28	30	81	6
	5	Int.	●	0540X5DB	39	42	89	6
5.5	3	Int.	●	0550X3DB	28	30	81	6
	5	Int.	●	0550X5DB	39	42	89	6
5.6	3	Int.	●	0560X3DB	30	30	81	6
	5	Int.	●	0560X5DB	42	42	89	6
5.7	3	Int.	●	0570X3DB	30	30	81	6
	5	Int.	●	0570X5DB	42	42	89	6
5.8	3	Int.	●	0580X3DB	30	30	81	6
	5	Int.	●	0580X5DB	42	42	89	6
5.9	3	Int.	●	0590X3DB	30	30	81	6
	5	Int.	●	0590X5DB	42	42	89	6
6.0	3	Int.	●	0600X3DB	30	30	81	6
	5	Int.	●	0600X5DB	42	42	89	6
6.1	3	Int.	●	0610X3DB	33	35	86	7
	5	Int.	●	0610X5DB	46	48	95	7
6.2	3	Int.	●	0620X3DB	33	35	86	7
	5	Int.	●	0620X5DB	46	48	95	7
6.3	3	Int.	●	0630X3DB	33	35	86	7
	5	Int.	●	0630X5DB	46	48	95	7
6.4	3	Int.	●	0640X3DB	33	35	86	7
	5	Int.	●	0640X5DB	46	48	95	7
6.5	3	Int.	●	0650X3DB	33	35	86	7
	5	Int.	●	0650X5DB	46	48	95	7
6.6	3	Int.	●	0660X3DB	35	37	90	7
	5	Int.	●	0660X5DB	49	51	98	7
6.7	3	Int.	●	0670X3DB	35	37	90	7
	5	Int.	●	0670X5DB	49	51	98	7

(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 > N057
OPERATION GUIDANCE > N059
TECHNICAL DATA > Q001

N053

DRILLING

DRILLING(SOLID CARBIDE)

MQS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
6.8	3	Int.	●	MQS0680X3DB	35	37	90	7
	5	Int.	●	0680X5DB	49	51	98	7
6.9	3	Int.	●	0690X3DB	35	37	90	7
	5	Int.	●	0690X5DB	49	51	98	7
7.0	3	Int.	●	0700X3DB	35	37	90	7
	5	Int.	●	0700X5DB	49	51	98	7
7.1	3	Int.	●	0710X3DB	38	39	90	8
	5	Int.	●	0710X5DB	53	56	103	8
7.2	3	Int.	●	0720X3DB	38	39	90	8
	5	Int.	●	0720X5DB	53	56	103	8
7.3	3	Int.	●	0730X3DB	38	39	90	8
	5	Int.	●	0730X5DB	53	56	103	8
7.4	3	Int.	●	0740X3DB	38	39	90	8
	5	Int.	●	0740X5DB	53	56	103	8
7.5	3	Int.	●	0750X3DB	38	39	90	8
	5	Int.	●	0750X5DB	53	56	103	8
7.6	3	Int.	●	0760X3DB	40	40	90	8
	5	Int.	●	0760X5DB	56	56	103	8
7.7	3	Int.	●	0770X3DB	40	40	90	8
	5	Int.	●	0770X5DB	56	56	103	8
7.8	3	Int.	●	0780X3DB	40	40	90	8
	5	Int.	●	0780X5DB	56	56	103	8
7.9	3	Int.	●	0790X3DB	40	40	90	8
	5	Int.	●	0790X5DB	56	56	103	8
8.0	3	Int.	●	0800X3DB	40	40	90	8
	5	Int.	●	0800X5DB	56	56	103	8
8.1	3	Int.	●	0810X3DB	43	45	96	9
	5	Int.	●	0810X5DB	60	62	113	9
8.2	3	Int.	●	0820X3DB	43	45	96	9
	5	Int.	●	0820X5DB	60	62	113	9
8.3	3	Int.	●	0830X3DB	43	45	96	9
	5	Int.	●	0830X5DB	60	62	113	9
8.4	3	Int.	●	0840X3DB	43	45	96	9
	5	Int.	●	0840X5DB	60	62	113	9
8.5	3	Int.	●	0850X3DB	43	45	96	9
	5	Int.	●	0850X5DB	60	62	113	9
8.6	3	Int.	●	0860X3DB	45	47	101	9
	5	Int.	●	0860X5DB	63	65	116	9
8.7	3	Int.	●	0870X3DB	45	47	101	9
	5	Int.	●	0870X5DB	63	65	116	9
8.8	3	Int.	●	0880X3DB	45	47	101	9
	5	Int.	●	0880X5DB	63	65	116	9
8.9	3	Int.	●	0890X3DB	45	47	101	9
	5	Int.	●	0890X5DB	63	65	116	9
9.0	3	Int.	●	0900X3DB	45	47	101	9
	5	Int.	●	0900X5DB	63	65	116	9
9.1	3	Int.	●	0910X3DB	48	50	101	10
	5	Int.	●	0910X5DB	67	70	121	10
9.2	3	Int.	●	0920X3DB	48	50	101	10
	5	Int.	●	0920X5DB	67	70	121	10

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
9.3	3	Int.	●	MQS0930X3DB	48	50	101	10
	5	Int.	●	0930X5DB	67	70	121	10
9.4	3	Int.	●	0940X3DB	48	50	101	10
	5	Int.	●	0940X5DB	67	70	121	10
9.5	3	Int.	●	0950X3DB	48	50	101	10
	5	Int.	●	0950X5DB	67	70	121	10
9.6	3	Int.	●	0960X3DB	50	50	101	10
	5	Int.	●	0960X5DB	70	70	121	10
9.7	3	Int.	●	0970X3DB	50	50	101	10
	5	Int.	●	0970X5DB	70	70	121	10
9.8	3	Int.	●	0980X3DB	50	50	101	10
	5	Int.	●	0980X5DB	70	70	121	10
9.9	3	Int.	●	0990X3DB	50	50	101	10
	5	Int.	●	0990X5DB	70	70	121	10
10.0	3	Int.	●	1000X3DB	50	50	101	10
	5	Int.	●	1000X5DB	70	70	121	10
10.1	3	Int.	●	1010X3DB	53	55	111	11
	5	Int.	●	1010X5DB	74	78	134	11
10.2	3	Int.	●	1020X3DB	53	55	111	11
	5	Int.	●	1020X5DB	74	78	134	11
10.3	3	Int.	●	1030X3DB	53	55	111	11
	5	Int.	●	1030X5DB	74	78	134	11
10.4	3	Int.	●	1040X3DB	53	55	111	11
	5	Int.	●	1040X5DB	74	78	134	11
10.5	3	Int.	●	1050X3DB	53	55	111	11
	5	Int.	●	1050X5DB	74	78	134	11
10.6	3	Int.	●	1060X3DB	55	56	116	11
	5	Int.	●	1060X5DB	77	78	134	11
10.7	3	Int.	●	1070X3DB	55	56	116	11
	5	Int.	●	1070X5DB	77	78	134	11
10.8	3	Int.	●	1080X3DB	55	56	116	11
	5	Int.	●	1080X5DB	77	78	134	11
10.9	3	Int.	●	1090X3DB	55	56	116	11
	5	Int.	●	1090X5DB	77	78	134	11
11.0	3	Int.	●	1100X3DB	55	56	116	11
	5	Int.	●	1100X5DB	77	78	134	11
11.1	3	Int.	●	1110X3DB	58	60	116	12
	5	Int.	●	1110X5DB	81	84	140	12
11.2	3	Int.	●	1120X3DB	58	60	116	12
	5	Int.	●	1120X5DB	81	84	140	12
11.3	3	Int.	●	1130X3DB	58	60	116	12
	5	Int.	●	1130X5DB	81	84	140	12
11.4	3	Int.	●	1140X3DB	58	60	116	12
	5	Int.	●	1140X5DB	81	84	140	12
11.5	3	Int.	●	1150X3DB	58	60	116	12
	5	Int.	●	1150X5DB	81	84	140	12
11.6	3	Int.	●	1160X3DB	60	60	116	12
	5	Int.	●	1160X5DB	84	84	140	12
11.7	3	Int.	●	1170X3DB	60	60	116	12
	5	Int.	●	1170X5DB	84	84	140	12

(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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
11.8	3	Int.	●	MQS1180X3DB	60	60	116	12
	5	Int.	●	1180X5DB	84	84	140	12
11.9	3	Int.	●	1190X3DB	60	60	116	12
	5	Int.	●	1190X5DB	84	84	140	12
12.0	3	Int.	●	1200X3DB	60	60	116	12
	5	Int.	●	1200X5DB	84	84	140	12
12.1	3	Int.	●	1210X3DB	63	66	122	13
	5	Int.	●	1210X5DB	88	92	148	13
12.2	3	Int.	●	1220X3DB	63	66	122	13
	5	Int.	●	1220X5DB	88	92	148	13
12.3	3	Int.	●	1230X3DB	63	66	122	13
	5	Int.	●	1230X5DB	88	92	148	13
12.4	3	Int.	●	1240X3DB	63	66	122	13
	5	Int.	●	1240X5DB	88	92	148	13
12.5	3	Int.	●	1250X3DB	63	66	122	13
	5	Int.	●	1250X5DB	88	92	148	13
12.6	3	Int.	●	1260X3DB	65	66	122	13
	5	Int.	●	1260X5DB	91	92	148	13
12.7	3	Int.	●	1270X3DB	65	66	122	13
	5	Int.	●	1270X5DB	91	92	148	13
12.8	3	Int.	●	1280X3DB	65	66	122	13
	5	Int.	●	1280X5DB	91	92	148	13
12.9	3	Int.	●	1290X3DB	65	66	122	13
	5	Int.	●	1290X5DB	91	92	148	13
13.0	3	Int.	●	1300X3DB	65	66	122	13
	5	Int.	●	1300X5DB	91	92	148	13
13.1	3	Int.	●	1310X3DB	68	70	126	14
	5	Int.	●	1310X5DB	95	98	154	14
13.2	3	Int.	●	1320X3DB	68	70	126	14
	5	Int.	●	1320X5DB	95	98	154	14
13.3	3	Int.	●	1330X3DB	68	70	126	14
	5	Int.	●	1330X5DB	95	98	154	14
13.4	3	Int.	●	1340X3DB	68	70	126	14
	5	Int.	●	1340X5DB	95	98	154	14
13.5	3	Int.	●	1350X3DB	68	70	126	14
	5	Int.	●	1350X5DB	95	98	154	14
13.6	3	Int.	●	1360X3DB	70	70	126	14
	5	Int.	●	1360X5DB	98	98	154	14
13.7	3	Int.	●	1370X3DB	70	70	126	14
	5	Int.	●	1370X5DB	98	98	154	14
13.8	3	Int.	●	1380X3DB	70	70	126	14
	5	Int.	●	1380X5DB	98	98	154	14
13.9	3	Int.	●	1390X3DB	70	70	126	14
	5	Int.	●	1390X5DB	98	98	154	14
14.0	3	Int.	●	1400X3DB	70	70	126	14
	5	Int.	●	1400X5DB	98	98	154	14
14.1	3	Int.	●	1410X3DB	73	76	135	15
	5	Int.	●	1410X5DB	102	106	165	15
14.2	3	Int.	●	1420X3DB	73	76	135	15
	5	Int.	●	1420X5DB	102	106	165	15

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
14.3	3	Int.	●	MQS1430X3DB	73	76	135	15
	5	Int.	●	1430X5DB	102	106	165	15
14.4	3	Int.	●	1440X3DB	73	76	135	15
	5	Int.	●	1440X5DB	102	106	165	15
14.5	3	Int.	●	1450X3DB	73	76	135	15
	5	Int.	●	1450X5DB	102	106	165	15
14.6	3	Int.	●	1460X3DB	75	76	135	15
	5	Int.	●	1460X5DB	105	106	165	15
14.7	3	Int.	●	1470X3DB	75	76	135	15
	5	Int.	●	1470X5DB	105	106	165	15
14.8	3	Int.	●	1480X3DB	75	76	135	15
	5	Int.	●	1480X5DB	105	106	165	15
14.9	3	Int.	●	1490X3DB	75	76	135	15
	5	Int.	●	1490X5DB	105	106	165	15
15.0	3	Int.	●	1500X3DB	75	76	135	15
	5	Int.	●	1500X5DB	105	106	165	15
15.1	3	Int.	●	1510X3DB	78	80	139	16
	5	Int.	●	1510X5DB	109	112	171	16
15.2	3	Int.	●	1520X3DB	78	80	139	16
	5	Int.	●	1520X5DB	109	112	171	16
15.3	3	Int.	●	1530X3DB	78	80	139	16
	5	Int.	●	1530X5DB	109	112	171	16
15.4	3	Int.	●	1540X3DB	78	80	139	16
	5	Int.	●	1540X5DB	109	112	171	16
15.5	3	Int.	●	1550X3DB	78	80	139	16
	5	Int.	●	1550X5DB	109	112	171	16
15.6	3	Int.	●	1560X3DB	80	80	139	16
	5	Int.	●	1560X5DB	112	112	171	16
15.7	3	Int.	●	1570X3DB	80	80	139	16
	5	Int.	●	1570X5DB	112	112	171	16
15.8	3	Int.	●	1580X3DB	80	80	139	16
	5	Int.	●	1580X5DB	112	112	171	16
15.9	3	Int.	●	1590X3DB	80	80	139	16
	5	Int.	●	1590X5DB	112	112	171	16
16.0	3	Int.	●	1600X3DB	80	80	139	16
	5	Int.	●	1600X5DB	112	112	171	16
16.1	3	Int.	□	1610X3DB	83	86	145	17
	5	Int.	□	1610X5DB	116	120	179	17
16.2	3	Int.	□	1620X3DB	83	86	145	17
	5	Int.	□	1620X5DB	116	120	179	17
16.3	3	Int.	□	1630X3DB	83	86	145	17
	5	Int.	□	1630X5DB	116	120	179	17
16.4	3	Int.	□	1640X3DB	83	86	145	17
	5	Int.	□	1640X5DB	116	120	179	17
16.5	3	Int.	●	1650X3DB	83	86	145	17
	5	Int.	●	1650X5DB	116	120	179	17
16.6	3	Int.	□	1660X3DB	85	86	145	17
	5	Int.	□	1660X5DB	119	120	179	17
16.7	3	Int.	□	1670X3DB	85	86	145	17
	5	Int.	□	1670X5DB	119	120	179	17

CUTTING CONDITIONS > N057
OPERATION GUIDANCE > N059
TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MQS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
16.8	3	Int.	<input type="checkbox"/>	MQS1680X3DB	85	86	145	17
	5	Int.	<input type="checkbox"/>	1680X5DB	119	120	179	17
16.9	3	Int.	<input type="checkbox"/>	1690X3DB	85	86	145	17
	5	Int.	<input type="checkbox"/>	1690X5DB	119	120	179	17
17.0	3	Int.	<input checked="" type="checkbox"/>	1700X3DB	85	86	145	17
	5	Int.	<input checked="" type="checkbox"/>	1700X5DB	119	120	179	17
17.1	3	Int.	<input type="checkbox"/>	1710X3DB	88	90	149	18
	5	Int.	<input type="checkbox"/>	1710X5DB	123	126	185	18
17.2	3	Int.	<input type="checkbox"/>	1720X3DB	88	90	149	18
	5	Int.	<input type="checkbox"/>	1720X5DB	123	126	185	18
17.3	3	Int.	<input type="checkbox"/>	1730X3DB	88	90	149	18
	5	Int.	<input type="checkbox"/>	1730X5DB	123	126	185	18
17.4	3	Int.	<input type="checkbox"/>	1740X3DB	88	90	149	18
	5	Int.	<input type="checkbox"/>	1740X5DB	123	126	185	18
17.5	3	Int.	<input checked="" type="checkbox"/>	1750X3DB	88	90	149	18
	5	Int.	<input checked="" type="checkbox"/>	1750X5DB	123	126	185	18
17.6	3	Int.	<input type="checkbox"/>	1760X3DB	90	90	149	18
	5	Int.	<input type="checkbox"/>	1760X5DB	126	126	185	18
17.7	3	Int.	<input type="checkbox"/>	1770X3DB	90	90	149	18
	5	Int.	<input type="checkbox"/>	1770X5DB	126	126	185	18
17.8	3	Int.	<input type="checkbox"/>	1780X3DB	90	90	149	18
	5	Int.	<input type="checkbox"/>	1780X5DB	126	126	185	18
17.9	3	Int.	<input type="checkbox"/>	1790X3DB	90	90	149	18
	5	Int.	<input type="checkbox"/>	1790X5DB	126	126	185	18
18.0	3	Int.	<input checked="" type="checkbox"/>	1800X3DB	90	90	149	18
	5	Int.	<input checked="" type="checkbox"/>	1800X5DB	126	126	185	18
18.1	3	Int.	<input type="checkbox"/>	1810X3DB	93	96	157	19
	5	Int.	<input type="checkbox"/>	1810X5DB	130	134	195	19
18.2	3	Int.	<input type="checkbox"/>	1820X3DB	93	96	157	19
	5	Int.	<input type="checkbox"/>	1820X5DB	130	134	195	19
18.3	3	Int.	<input type="checkbox"/>	1830X3DB	93	96	157	19
	5	Int.	<input type="checkbox"/>	1830X5DB	130	134	195	19
18.4	3	Int.	<input type="checkbox"/>	1840X3DB	93	96	157	19
	5	Int.	<input type="checkbox"/>	1840X5DB	130	134	195	19
18.5	3	Int.	<input checked="" type="checkbox"/>	1850X3DB	93	96	157	19
	5	Int.	<input checked="" type="checkbox"/>	1850X5DB	130	134	195	19
18.6	3	Int.	<input type="checkbox"/>	1860X3DB	95	96	157	19
	5	Int.	<input type="checkbox"/>	1860X5DB	133	134	195	19
18.7	3	Int.	<input type="checkbox"/>	1870X3DB	95	96	157	19
	5	Int.	<input type="checkbox"/>	1870X5DB	133	134	195	19
18.8	3	Int.	<input type="checkbox"/>	1880X3DB	95	96	157	19
	5	Int.	<input type="checkbox"/>	1880X5DB	133	134	195	19
18.9	3	Int.	<input type="checkbox"/>	1890X3DB	95	96	157	19
	5	Int.	<input type="checkbox"/>	1890X5DB	133	134	195	19
19.0	3	Int.	<input checked="" type="checkbox"/>	1900X3DB	95	96	157	19
	5	Int.	<input checked="" type="checkbox"/>	1900X5DB	133	134	195	19
19.1	3	Int.	<input type="checkbox"/>	1910X3DB	98	100	161	20
	5	Int.	<input type="checkbox"/>	1910X5DB	137	140	201	20
19.2	3	Int.	<input type="checkbox"/>	1920X3DB	98	100	161	20
	5	Int.	<input type="checkbox"/>	1920X5DB	137	140	201	20

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP3020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
19.3	3	Int.	<input type="checkbox"/>	MQS1930X3DB	98	100	161	20
	5	Int.	<input type="checkbox"/>	1930X5DB	137	140	201	20
19.4	3	Int.	<input type="checkbox"/>	1940X3DB	98	100	161	20
	5	Int.	<input type="checkbox"/>	1940X5DB	137	140	201	20
19.5	3	Int.	<input checked="" type="checkbox"/>	1950X3DB	98	100	161	20
	5	Int.	<input checked="" type="checkbox"/>	1950X5DB	137	140	201	20
19.6	3	Int.	<input type="checkbox"/>	1960X3DB	100	100	161	20
	5	Int.	<input type="checkbox"/>	1960X5DB	140	140	201	20
19.7	3	Int.	<input type="checkbox"/>	1970X3DB	100	100	161	20
	5	Int.	<input type="checkbox"/>	1970X5DB	140	140	201	20
19.8	3	Int.	<input type="checkbox"/>	1980X3DB	100	100	161	20
	5	Int.	<input type="checkbox"/>	1980X5DB	140	140	201	20
19.9	3	Int.	<input type="checkbox"/>	1990X3DB	100	100	161	20
	5	Int.	<input type="checkbox"/>	1990X5DB	140	140	201	20
20.0	3	Int.	<input checked="" type="checkbox"/>	2000X3DB	100	100	161	20
	5	Int.	<input checked="" type="checkbox"/>	2000X5DB	140	140	201	20

(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

Drill Dia. (mm)	Mild Steel ($\leq 180\text{HB}$) AISI 1010 etc				Carbon steel, Alloy steel (180–280HB) AISI 1045, AISI 4140 etc			
	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	0.25 (0.20–0.30)	1100	130	4100	0.25 (0.20–0.30)	1025
12.0	160	4200	0.3 (0.25–0.35)	1260	140	3700	0.3 (0.25–0.35)	1110
16.0	180	3500	0.3 (0.25–0.35)	1050	150	2900	0.3 (0.25–0.35)	870
20.0	180	2800	0.35 (0.30–0.40)	980	150	2300	0.35 (0.30–0.40)	805

Drill Dia. (mm)	Carbon steel, Alloy steel (280–350HB) AISI 4340 etc				Gray Cast Iron ($\leq 350\text{MPa}$) No 45 B etc			
	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	70	5500	0.1 (0.06–0.15)	550	110	8700	0.28 (0.15–0.35)	2435
5.0	70	4400	0.1 (0.06–0.15)	440	110	7000	0.28 (0.15–0.35)	1960
6.3	80	4000	0.15 (0.10–0.20)	600	120	6000	0.32 (0.20–0.40)	1920
8.0	80	3100	0.2 (0.10–0.25)	620	120	4700	0.32 (0.20–0.40)	1500
10.0	80	2500	0.2 (0.10–0.25)	500	120	3800	0.32 (0.20–0.40)	1215
12.0	100	2600	0.25 (0.2–0.30)	650	150	3900	0.38 (0.25–0.45)	1480
16.0	100	1900	0.25 (0.2–0.30)	475	160	3100	0.38 (0.25–0.45)	1175
20.0	100	1500	0.3 (0.2–0.35)	450	160	2500	0.38 (0.25–0.45)	950

Drill Dia. (mm)	Ductile Cast Iron ($\leq 450\text{MPa}$) 60-40-8 etc				Ductile Cast Iron ($\leq 800\text{MPa}$) 100-70-03 etc			
	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 (0.20–0.38)	930	85	2700	0.2 (0.10–0.25)	540
12.0	110	2900	0.35 (0.25–0.40)	1015	95	2500	0.25 (0.2–0.30)	625
16.0	120	2300	0.35 (0.25–0.40)	805	110	2100	0.25 (0.2–0.30)	525
20.0	120	1900	0.35 (0.25–0.40)	665	110	1700	0.3 (0.2–0.35)	510

(Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.

(Note 2) Emulsion type of water coolant is recommended.

RECOMMENDED CUTTING CONDITIONS

M.Q.L.

Work Material	Mild Steel ($\leq 180\text{HB}$)				Carbon steel, Alloy steel (180–280HB)			
	AISI 1010 etc				AISI 1045, AISI 4140 etc			
Dia. (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	0.25 (0.20–0.30)	875	100	3100	0.25 (0.20–0.30)	775
12.0	130	3400	0.3 (0.25–0.35)	1020	110	2900	0.3 (0.25–0.35)	870
16.0	140	2700	0.35 (0.25–0.35)	945	120	2300	0.35 (0.25–0.35)	805
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)				Gray Cast Iron ($\leq 350\text{MPa}$)			
	AISI 4340 etc				No 45 B etc			
Dia. (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	0.1 (0.06–0.15)	470	90	7100	0.28 (0.15–0.35)	1985
5.0	60	3800	0.1 (0.06–0.15)	380	90	5700	0.28 (0.15–0.35)	1595
6.3	60	3000	0.15 (0.10–0.20)	450	100	5000	0.32 (0.20–0.40)	1600
8.0	60	2300	0.2 (0.10–0.25)	460	100	3900	0.32 (0.20–0.40)	1245
10.0	60	1900	0.2 (0.10–0.25)	380	100	3100	0.32 (0.20–0.40)	990
12.0	80	2100	0.22 (0.20–0.30)	460	120	3100	0.38 (0.25–0.45)	1175
16.0	80	1500	0.25 (0.20–0.30)	375	130	2500	0.38 (0.25–0.45)	950
20.0	80	1200	0.25 (0.25–0.35)	300	130	2000	0.38 (0.25–0.45)	760

Work Material	Ductile Cast Iron ($\leq 450\text{MPa}$)				Ductile Cast Iron ($\leq 800\text{MPa}$)			
	60-40-8 etc				100-70-03 etc			
Dia. (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 (0.20–0.38)	750	70	2200	0.2 (0.10–0.25)	440
12.0	90	2300	0.35 (0.25–0.40)	805	80	2100	0.25 (0.20–0.30)	525
16.0	100	1900	0.35 (0.25–0.40)	665	90	1700	0.25 (0.20–0.30)	425
20.0	100	1500	0.35 (0.25–0.40)	525	90	1400	0.3 (0.20–0.35)	420

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

Drill Holding

Adjusting Screw

Thrust bearing type collet chuck holds the drill securely.

Drill Length

$A \geq D1 \times 1.5$

Drill Installation

Do not clamp on the flutes.

Installation Tolerance

Run-out $\leq 0.03\text{mm}$

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 ○

① Lower the feed when drilling the interrupted part.

Requires Prior Machining △

① Spot face with an end mill prior to drilling.

Stepped Holes

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

Burring and Workpiece Chipping


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

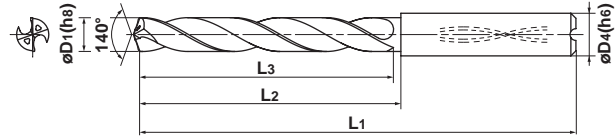
DRILLING(SOLID CARBIDE)

MMS WSTAR DRILLS

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

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
		◎			

	D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤20
	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$
		$\begin{matrix} 0 \\ -0.008 \end{matrix}$	$\begin{matrix} 0 \\ -0.009 \end{matrix}$	$\begin{matrix} 0 \\ -0.011 \end{matrix}$	$\begin{matrix} 0 \\ -0.013 \end{matrix}$



*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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
3.0	3	Int.	●	MMS0300X3DB	21	23	70	6
	5	Int.	●	0300X5DB	28	31	78	6
3.1	3	Int.	●	0310X3DB	21	23	70	6
	5	Int.	●	0310X5DB	28	31	78	6
3.2	3	Int.	●	0320X3DB	21	23	70	6
	5	Int.	●	0320X5DB	28	31	78	6
3.3	3	Int.	●	0330X3DB	21	23	70	6
	5	Int.	●	0330X5DB	28	31	78	6
3.4	3	Int.	●	0340X3DB	21	23	70	6
	5	Int.	●	0340X5DB	28	31	78	6
3.5	3	Int.	●	0350X3DB	21	23	70	6
	5	Int.	●	0350X5DB	28	31	78	6
3.6	3	Int.	●	0360X3DB	22	23	70	6
	5	Int.	●	0360X5DB	30	31	78	6
3.7	3	Int.	●	0370X3DB	22	23	70	6
	5	Int.	●	0370X5DB	30	31	78	6
3.8	3	Int.	●	0380X3DB	22	23	70	6
	5	Int.	●	0380X5DB	30	31	78	6
3.9	3	Int.	●	0390X3DB	22	23	70	6
	5	Int.	●	0390X5DB	30	31	78	6
4.0	3	Int.	●	0400X3DB	22	23	70	6
	5	Int.	●	0400X5DB	30	31	78	6
4.1	3	Int.	●	0410X3DB	24	26	73	6
	5	Int.	●	0410X5DB	33	35	82	6
4.2	3	Int.	●	0420X3DB	24	26	73	6
	5	Int.	●	0420X5DB	33	35	82	6
4.3	3	Int.	●	0430X3DB	24	26	73	6
	5	Int.	●	0430X5DB	33	35	82	6
4.4	3	Int.	●	0440X3DB	24	26	73	6
	5	Int.	●	0440X5DB	33	35	82	6
4.5	3	Int.	●	0450X3DB	24	26	73	6
	5	Int.	●	0450X5DB	33	35	82	6
4.6	3	Int.	●	0460X3DB	25	28	75	6
	5	Int.	●	0460X5DB	35	38	85	6
4.7	3	Int.	●	0470X3DB	25	28	75	6
	5	Int.	●	0470X5DB	35	38	85	6
4.8	3	Int.	●	0480X3DB	25	28	75	6
	5	Int.	●	0480X5DB	35	38	85	6

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
4.9	3	Int.	●	MMS0490X3DB	25	28	75	6
	5	Int.	●	0490X5DB	35	38	85	6
5.0	3	Int.	●	0500X3DB	25	28	75	6
	5	Int.	●	0500X5DB	35	38	85	6
5.1	3	Int.	●	0510X3DB	28	30	81	6
	5	Int.	●	0510X5DB	39	42	89	6
5.2	3	Int.	●	0520X3DB	28	30	81	6
	5	Int.	●	0520X5DB	39	42	89	6
5.3	3	Int.	●	0530X3DB	28	30	81	6
	5	Int.	●	0530X5DB	39	42	89	6
5.4	3	Int.	●	0540X3DB	28	30	81	6
	5	Int.	●	0540X5DB	39	42	89	6
5.5	3	Int.	●	0550X3DB	28	30	81	6
	5	Int.	●	0550X5DB	39	42	89	6
5.6	3	Int.	●	0560X3DB	30	30	81	6
	5	Int.	●	0560X5DB	42	42	89	6
5.7	3	Int.	●	0570X3DB	30	30	81	6
	5	Int.	●	0570X5DB	42	42	89	6
5.8	3	Int.	●	0580X3DB	30	30	81	6
	5	Int.	●	0580X5DB	42	42	89	6
5.9	3	Int.	●	0590X3DB	30	30	81	6
	5	Int.	●	0590X5DB	42	42	89	6
6.0	3	Int.	●	0600X3DB	30	30	81	6
	5	Int.	●	0600X5DB	42	42	89	6
6.1	3	Int.	●	0610X3DB	33	35	86	8
	5	Int.	●	0610X5DB	46	48	95	8
6.2	3	Int.	●	0620X3DB	33	35	86	8
	5	Int.	●	0620X5DB	46	48	95	8
6.3	3	Int.	●	0630X3DB	33	35	86	8
	5	Int.	●	0630X5DB	46	48	95	8
6.4	3	Int.	●	0640X3DB	33	35	86	8
	5	Int.	●	0640X5DB	46	48	95	8
6.5	3	Int.	●	0650X3DB	33	35	86	8
	5	Int.	●	0650X5DB	46	48	95	8
6.6	3	Int.	●	0660X3DB	35	37	90	8
	5	Int.	●	0660X5DB	49	51	98	8
6.7	3	Int.	●	0670X3DB	35	37	90	8
	5	Int.	●	0670X5DB	49	51	98	8

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

● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
6.8	3	Int.	●	MMS0680X3DB	35	37	90	8
	5	Int.	●	0680X5DB	49	51	98	8
6.9	3	Int.	●	0690X3DB	35	37	90	8
	5	Int.	●	0690X5DB	49	51	98	8
7.0	3	Int.	●	0700X3DB	35	37	90	8
	5	Int.	●	0700X5DB	49	51	98	8
7.1	3	Int.	●	0710X3DB	38	39	90	8
	5	Int.	●	0710X5DB	53	56	103	8
7.2	3	Int.	●	0720X3DB	38	39	90	8
	5	Int.	●	0720X5DB	53	56	103	8
7.3	3	Int.	●	0730X3DB	38	39	90	8
	5	Int.	●	0730X5DB	53	56	103	8
7.4	3	Int.	●	0740X3DB	38	39	90	8
	5	Int.	●	0740X5DB	53	56	103	8
7.5	3	Int.	●	0750X3DB	38	39	90	8
	5	Int.	●	0750X5DB	53	56	103	8
7.6	3	Int.	●	0760X3DB	40	40	90	8
	5	Int.	●	0760X5DB	56	56	103	8
7.7	3	Int.	●	0770X3DB	40	40	90	8
	5	Int.	●	0770X5DB	56	56	103	8
7.8	3	Int.	●	0780X3DB	40	40	90	8
	5	Int.	●	0780X5DB	56	56	103	8
7.9	3	Int.	●	0790X3DB	40	40	90	8
	5	Int.	●	0790X5DB	56	56	103	8
8.0	3	Int.	●	0800X3DB	40	40	90	8
	5	Int.	●	0800X5DB	56	56	103	8
8.1	3	Int.	●	0810X3DB	43	45	96	10
	5	Int.	●	0810X5DB	60	62	113	10
8.2	3	Int.	●	0820X3DB	43	45	96	10
	5	Int.	●	0820X5DB	60	62	113	10
8.3	3	Int.	●	0830X3DB	43	45	96	10
	5	Int.	●	0830X5DB	60	62	113	10
8.4	3	Int.	●	0840X3DB	43	45	96	10
	5	Int.	●	0840X5DB	60	62	113	10
8.5	3	Int.	●	0850X3DB	43	45	96	10
	5	Int.	●	0850X5DB	60	62	113	10
8.6	3	Int.	●	0860X3DB	45	47	101	10
	5	Int.	●	0860X5DB	63	65	116	10
8.7	3	Int.	●	0870X3DB	45	47	101	10
	5	Int.	●	0870X5DB	63	65	116	10
8.8	3	Int.	●	0880X3DB	45	47	101	10
	5	Int.	●	0880X5DB	63	65	116	10
8.9	3	Int.	●	0890X3DB	45	47	101	10
	5	Int.	●	0890X5DB	63	65	116	10
9.0	3	Int.	●	0900X3DB	45	47	101	10
	5	Int.	●	0900X5DB	63	65	116	10
9.1	3	Int.	●	0910X3DB	48	50	101	10
	5	Int.	●	0910X5DB	67	70	121	10
9.2	3	Int.	●	0920X3DB	48	50	101	10
	5	Int.	●	0920X5DB	67	70	121	10

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
9.3	3	Int.	●	MMS0930X3DB	48	50	101	10
	5	Int.	●	0930X5DB	67	70	121	10
9.4	3	Int.	●	0940X3DB	48	50	101	10
	5	Int.	●	0940X5DB	67	70	121	10
9.5	3	Int.	●	0950X3DB	48	50	101	10
	5	Int.	●	0950X5DB	67	70	121	10
9.6	3	Int.	●	0960X3DB	50	50	101	10
	5	Int.	●	0960X5DB	70	70	121	10
9.7	3	Int.	●	0970X3DB	50	50	101	10
	5	Int.	●	0970X5DB	70	70	121	10
9.8	3	Int.	●	0980X3DB	50	50	101	10
	5	Int.	●	0980X5DB	70	70	121	10
9.9	3	Int.	●	0990X3DB	50	50	101	10
	5	Int.	●	0990X5DB	70	70	121	10
10.0	3	Int.	●	1000X3DB	50	50	101	10
	5	Int.	●	1000X5DB	70	70	121	10
10.1	3	Int.	●	1010X3DB	53	55	111	12
	5	Int.	●	1010X5DB	74	78	134	12
10.2	3	Int.	●	1020X3DB	53	55	111	12
	5	Int.	●	1020X5DB	74	78	134	12
10.3	3	Int.	●	1030X3DB	53	55	111	12
	5	Int.	●	1030X5DB	74	78	134	12
10.4	3	Int.	●	1040X3DB	53	55	111	12
	5	Int.	●	1040X5DB	74	78	134	12
10.5	3	Int.	●	1050X3DB	53	55	111	12
	5	Int.	●	1050X5DB	74	78	134	12
10.6	3	Int.	●	1060X3DB	55	56	116	12
	5	Int.	●	1060X5DB	77	78	134	12
10.7	3	Int.	●	1070X3DB	55	56	116	12
	5	Int.	●	1070X5DB	77	78	134	12
10.8	3	Int.	●	1080X3DB	55	56	116	12
	5	Int.	●	1080X5DB	77	78	134	12
10.9	3	Int.	●	1090X3DB	55	56	116	12
	5	Int.	●	1090X5DB	77	78	134	12
11.0	3	Int.	●	1100X3DB	55	56	116	12
	5	Int.	●	1100X5DB	77	78	134	12
11.1	3	Int.	●	1110X3DB	58	60	116	12
	5	Int.	●	1110X5DB	81	84	140	12
11.2	3	Int.	●	1120X3DB	58	60	116	12
	5	Int.	●	1120X5DB	81	84	140	12
11.3	3	Int.	●	1130X3DB	58	60	116	12
	5	Int.	●	1130X5DB	81	84	140	12
11.4	3	Int.	●	1140X3DB	58	60	116	12
	5	Int.	●	1140X5DB	81	84	140	12
11.5	3	Int.	●	1150X3DB	58	60	116	12
	5	Int.	●	1150X5DB	81	84	140	12
11.6	3	Int.	●	1160X3DB	60	60	116	12
	5	Int.	●	1160X5DB	84	84	140	12
11.7	3	Int.	●	1170X3DB	60	60	116	12
	5	Int.	●	1170X5DB	84	84	140	12

CUTTING CONDITIONS > N064
OPERATION GUIDANCE > N066
TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MMS WSTAR DRILLS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
11.8	3	Int.	●	MMS1180X3DB	60	60	116	12
	5	Int.	●	1180X5DB	84	84	140	12
11.9	3	Int.	●	1190X3DB	60	60	116	12
	5	Int.	●	1190X5DB	84	84	140	12
12.0	3	Int.	●	1200X3DB	60	60	116	12
	5	Int.	●	1200X5DB	84	84	140	12
12.1	3	Int.	●	1210X3DB	63	66	122	14
	5	Int.	●	1210X5DB	88	92	148	14
12.2	3	Int.	●	1220X3DB	63	66	122	14
	5	Int.	●	1220X5DB	88	92	148	14
12.3	3	Int.	●	1230X3DB	63	66	122	14
	5	Int.	●	1230X5DB	88	92	148	14
12.4	3	Int.	●	1240X3DB	63	66	122	14
	5	Int.	●	1240X5DB	88	92	148	14
12.5	3	Int.	●	1250X3DB	63	66	122	14
	5	Int.	●	1250X5DB	88	92	148	14
12.6	3	Int.	●	1260X3DB	65	66	122	14
	5	Int.	●	1260X5DB	91	92	148	14
12.7	3	Int.	●	1270X3DB	65	66	122	14
	5	Int.	●	1270X5DB	91	92	148	14
12.8	3	Int.	●	1280X3DB	65	66	122	14
	5	Int.	●	1280X5DB	91	92	148	14
12.9	3	Int.	●	1290X3DB	65	66	122	14
	5	Int.	●	1290X5DB	91	92	148	14
13.0	3	Int.	●	1300X3DB	65	66	122	14
	5	Int.	●	1300X5DB	91	92	148	14
13.1	3	Int.	●	1310X3DB	68	70	126	14
	5	Int.	●	1310X5DB	95	98	154	14
13.2	3	Int.	●	1320X3DB	68	70	126	14
	5	Int.	●	1320X5DB	95	98	154	14
13.3	3	Int.	●	1330X3DB	68	70	126	14
	5	Int.	●	1330X5DB	95	98	154	14
13.4	3	Int.	●	1340X3DB	68	70	126	14
	5	Int.	●	1340X5DB	95	98	154	14
13.5	3	Int.	●	1350X3DB	68	70	126	14
	5	Int.	●	1350X5DB	95	98	154	14
13.6	3	Int.	●	1360X3DB	70	70	126	14
	5	Int.	●	1360X5DB	98	98	154	14
13.7	3	Int.	●	1370X3DB	70	70	126	14
	5	Int.	●	1370X5DB	98	98	154	14
13.8	3	Int.	●	1380X3DB	70	70	126	14
	5	Int.	●	1380X5DB	98	98	154	14
13.9	3	Int.	●	1390X3DB	70	70	126	14
	5	Int.	●	1390X5DB	98	98	154	14
14.0	3	Int.	●	1400X3DB	70	70	126	14
	5	Int.	●	1400X5DB	98	98	154	14
14.1	3	Int.	●	1410X3DB	73	76	135	16
	5	Int.	●	1410X5DB	102	106	165	16
14.2	3	Int.	●	1420X3DB	73	76	135	16
	5	Int.	●	1420X5DB	102	106	165	16

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
14.3	3	Int.	●	MMS1430X3DB	73	76	135	16
	5	Int.	●	1430X5DB	102	106	165	16
14.4	3	Int.	●	1440X3DB	73	76	135	16
	5	Int.	●	1440X5DB	102	106	165	16
14.5	3	Int.	●	1450X3DB	73	76	135	16
	5	Int.	●	1450X5DB	102	106	165	16
14.6	3	Int.	●	1460X3DB	75	76	135	16
	5	Int.	●	1460X5DB	105	106	165	16
14.7	3	Int.	●	1470X3DB	75	76	135	16
	5	Int.	●	1470X5DB	105	106	165	16
14.8	3	Int.	●	1480X3DB	75	76	135	16
	5	Int.	●	1480X5DB	105	106	165	16
14.9	3	Int.	●	1490X3DB	75	76	135	16
	5	Int.	●	1490X5DB	105	106	165	16
15.0	3	Int.	●	1500X3DB	75	76	135	16
	5	Int.	●	1500X5DB	105	106	165	16
15.1	3	Int.	●	1510X3DB	78	80	139	16
	5	Int.	●	1510X5DB	109	112	171	16
15.2	3	Int.	●	1520X3DB	78	80	139	16
	5	Int.	●	1520X5DB	109	112	171	16
15.3	3	Int.	●	1530X3DB	78	80	139	16
	5	Int.	●	1530X5DB	109	112	171	16
15.4	3	Int.	●	1540X3DB	78	80	139	16
	5	Int.	●	1540X5DB	109	112	171	16
15.5	3	Int.	●	1550X3DB	78	80	139	16
	5	Int.	●	1550X5DB	109	112	171	16
15.6	3	Int.	●	1560X3DB	80	80	139	16
	5	Int.	●	1560X5DB	112	112	171	16
15.7	3	Int.	●	1570X3DB	80	80	139	16
	5	Int.	●	1570X5DB	112	112	171	16
15.8	3	Int.	●	1580X3DB	80	80	139	16
	5	Int.	●	1580X5DB	112	112	171	16
15.9	3	Int.	●	1590X3DB	80	80	139	16
	5	Int.	●	1590X5DB	112	112	171	16
16.0	3	Int.	●	1600X3DB	80	80	139	16
	5	Int.	●	1600X5DB	112	112	171	16
16.1	3	Int.	□	1610X3DB	83	86	145	18
	5	Int.	□	1610X5DB	116	120	179	18
16.2	3	Int.	□	1620X3DB	83	86	145	18
	5	Int.	□	1620X5DB	116	120	179	18
16.3	3	Int.	□	1630X3DB	83	86	145	18
	5	Int.	□	1630X5DB	116	120	179	18
16.4	3	Int.	□	1640X3DB	83	86	145	18
	5	Int.	□	1640X5DB	116	120	179	18
16.5	3	Int.	●	1650X3DB	83	86	145	18
	5	Int.	●	1650X5DB	116	120	179	18
16.6	3	Int.	□	1660X3DB	85	86	145	18
	5	Int.	□	1660X5DB	119	120	179	18
16.7	3	Int.	□	1670X3DB	85	86	145	18
	5	Int.	□	1670X5DB	119	120	179	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
16.8	3	Int.	□	MMS1680X3DB	85	86	145	18
	5	Int.	□	1680X5DB	119	120	179	18
16.9	3	Int.	□	1690X3DB	85	86	145	18
	5	Int.	□	1690X5DB	119	120	179	18
17.0	3	Int.	●	1700X3DB	85	86	145	18
	5	Int.	●	1700X5DB	119	120	179	18
17.1	3	Int.	□	1710X3DB	88	90	149	18
	5	Int.	□	1710X5DB	123	126	185	18
17.2	3	Int.	□	1720X3DB	88	90	149	18
	5	Int.	□	1720X5DB	123	126	185	18
17.3	3	Int.	□	1730X3DB	88	90	149	18
	5	Int.	□	1730X5DB	123	126	185	18
17.4	3	Int.	□	1740X3DB	88	90	149	18
	5	Int.	□	1740X5DB	123	126	185	18
17.5	3	Int.	●	1750X3DB	88	90	149	18
	5	Int.	●	1750X5DB	123	126	185	18
17.6	3	Int.	□	1760X3DB	90	90	149	18
	5	Int.	□	1760X5DB	126	126	185	18
17.7	3	Int.	□	1770X3DB	90	90	149	18
	5	Int.	□	1770X5DB	126	126	185	18
17.8	3	Int.	□	1780X3DB	90	90	149	18
	5	Int.	□	1780X5DB	126	126	185	18
17.9	3	Int.	□	1790X3DB	90	90	149	18
	5	Int.	□	1790X5DB	126	126	185	18
18.0	3	Int.	●	1800X3DB	90	90	149	18
	5	Int.	●	1800X5DB	126	126	185	18
18.1	3	Int.	□	1810X3DB	93	96	157	20
	5	Int.	□	1810X5DB	130	134	195	20
18.2	3	Int.	□	1820X3DB	93	96	157	20
	5	Int.	□	1820X5DB	130	134	195	20
18.3	3	Int.	□	1830X3DB	93	96	157	20
	5	Int.	□	1830X5DB	130	134	195	20
18.4	3	Int.	□	1840X3DB	93	96	157	20
	5	Int.	□	1840X5DB	130	134	195	20
18.5	3	Int.	●	1850X3DB	93	96	157	20
	5	Int.	●	1850X5DB	130	134	195	20
18.6	3	Int.	□	1860X3DB	95	96	157	20
	5	Int.	□	1860X5DB	133	134	195	20
18.7	3	Int.	□	1870X3DB	95	96	157	20
	5	Int.	□	1870X5DB	133	134	195	20
18.8	3	Int.	□	1880X3DB	95	96	157	20
	5	Int.	□	1880X5DB	133	134	195	20
18.9	3	Int.	□	1890X3DB	95	96	157	20
	5	Int.	□	1890X5DB	133	134	195	20
19.0	3	Int.	●	1900X3DB	95	96	157	20
	5	Int.	●	1900X5DB	133	134	195	20
19.1	3	Int.	□	1910X3DB	98	100	161	20
	5	Int.	□	1910X5DB	137	140	201	20
19.2	3	Int.	□	1920X3DB	98	100	161	20
	5	Int.	□	1920X5DB	137	140	201	20

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock DP7020	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
19.3	3	Int.	□	MMS1930X3DB	98	100	161	20
	5	Int.	□	1930X5DB	137	140	201	20
19.4	3	Int.	□	1940X3DB	98	100	161	20
	5	Int.	□	1940X5DB	137	140	201	20
19.5	3	Int.	●	1950X3DB	98	100	161	20
	5	Int.	●	1950X5DB	137	140	201	20
19.6	3	Int.	□	1960X3DB	100	100	161	20
	5	Int.	□	1960X5DB	140	140	201	20
19.7	3	Int.	□	1970X3DB	100	100	161	20
	5	Int.	□	1970X5DB	140	140	201	20
19.8	3	Int.	□	1980X3DB	100	100	161	20
	5	Int.	□	1980X5DB	140	140	201	20
19.9	3	Int.	□	1990X3DB	100	100	161	20
	5	Int.	□	1990X5DB	140	140	201	20
20.0	3	Int.	●	2000X3DB	100	100	161	20
	5	Int.	●	2000X5DB	140	140	201	20

RECOMMENDED CUTTING CONDITIONS

Work Material	Austenitic Stainless Steel ($\leq 200\text{HB}$)				Austenitic Stainless Steel ($>200\text{HB}$)			
	AISI 304, AISI 316 etc				AISI 304LN, AISI 316LN etc			
Dia. (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 ($\leq 280\text{HB}$)				Ferritic, Precipitation hardening stainless steel ($\leq 200\text{HB}$)			
	AISI 329 etc				AISI 410, AISI 430 etc			
Dia. (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 ($>200\text{HB}$)				Precipitation hardening stainless steel ($<450\text{HB}$)			
	AISI 431, AISI 420 etc				ASTM 630, ASTM 631 etc			
Dia. (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.

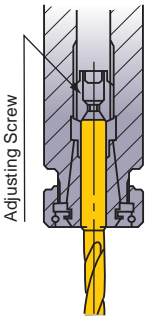
(Note 3) Recommended cutting conditions are for machining under the conditions of favourable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, and coolant property or discharge amount.

Stainless Steel Cross Reference List

Material		Japan	Germany		USA
		JIS	W-no.	DIN	AIS/SAE
Ferritic, Precipitation hardeningstainless 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 hardeningstainless 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	X2CrNi18 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

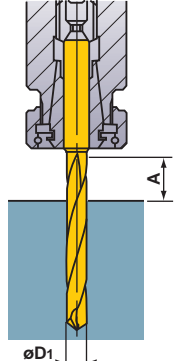
Operation Guidance for...X3DB and...X5DB

Drill Holding



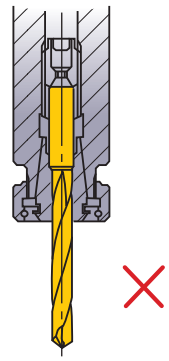
Thrust bearing type collet chuck holds the drill securely.

Drill Length



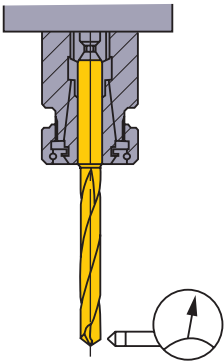
$A \geq D1 \times 1.5$

Drill Installation



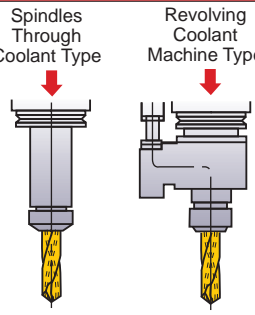
Do not clamp on the flutes.

Installation Tolerance



Run-out $\leq 0.03\text{mm}$

Through Coolant Type (MMS)



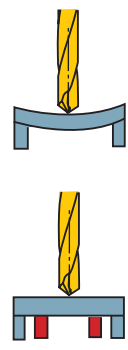
Coolant pressure is approx. 0.5MPa–7MPa

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.

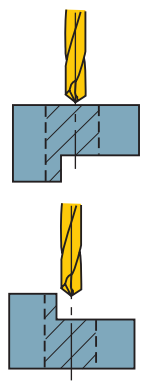
Thin Workpiece



If Bending Occurs

Support the Workpiece

Interrupted Cutting



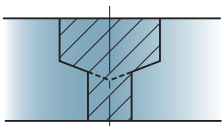
One Process

- ① Lower the feed when drilling the interrupted part.

Requires Prior Machining

- ① Spot face with an end mill prior to drilling.

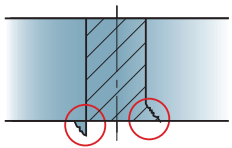
Stepped Holes



- ① Divide the two processes.
- ② Drill the larger hole first.

*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



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

SOLID CARBIDE DRILLS FOR MACHINING OF ALUMINIUM ALLOYS

MNS
WSTAR DRILLS

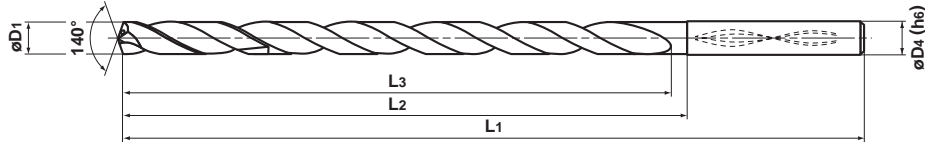
- 4 holes special coolant system, good for resistance to adhesion.
- High efficiency drilling for aluminium alloy.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast iron	Light Alloy	Heat Resistant Alloy	D1=3	3<D1≤6	6<D1≤10	10<D1≤14
				◎		0 -0.014	0 -0.018	0 -0.022	0 -0.027
						0 -0.006	0 -0.008	0 -0.009	0 -0.011



● 4.5 or smaller diameter drills are designed with 2 coolant holes.



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
3.0	5	Int.	●	MNS0300LB	33	33	81	3.0
	10	Int.	●	0300X10DB	39	42	90	3.0
	20	Int.	●	0300X20DB	69	72	120	3.0
	30	Int.	●	0300X30DB	99	102	150	3.0
3.1	5	Int.	●	0310LB	39	39	87	4.0
	10	Int.	□	0310X10DB	46	49	97	4.0
	20	Int.	□	0310X20DB	81	84	132	4.0
	30	Int.	□	0310X30DB	116	119	167	4.0
3.2	5	Int.	●	0320LB	39	39	87	4.0
	10	Int.	●	0320X10DB	46	49	97	4.0
	20	Int.	●	0320X20DB	81	84	132	4.0
	30	Int.	●	0320X30DB	116	119	167	4.0
3.3	5	Int.	●	0330LB	39	39	87	4.0
	10	Int.	□	0330X10DB	46	49	97	4.0
	20	Int.	□	0330X20DB	81	84	132	4.0
	30	Int.	□	0330X30DB	116	119	167	4.0
3.4	5	Int.	●	0340LB	39	39	87	4.0
	10	Int.	●	0340X10DB	46	49	97	4.0
	20	Int.	●	0340X20DB	81	84	132	4.0
	30	Int.	●	0340X30DB	116	119	167	4.0
3.5	5	Int.	●	0350LB	39	39	87	4.0
	10	Int.	□	0350X10DB	46	49	97	4.0
	20	Int.	□	0350X20DB	81	84	132	4.0
	30	Int.	□	0350X30DB	116	119	167	4.0
3.6	5	Int.	●	0360LB	44	44	92	4.0
	10	Int.	●	0360X10DB	52	55	103	4.0
	20	Int.	●	0360X20DB	92	95	143	4.0
	30	Int.	●	0360X30DB	132	135	183	4.0
3.7	5	Int.	●	0370LB	44	44	92	4.0
	10	Int.	□	0370X10DB	52	55	103	4.0
	20	Int.	□	0370X20DB	92	95	143	4.0
	30	Int.	□	0370X30DB	132	135	183	4.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
3.8	5	Int.	●	MNS0380LB	44	44	92	4.0
	10	Int.	□	0380X10DB	52	55	103	4.0
	20	Int.	□	0380X20DB	92	95	143	4.0
	30	Int.	□	0380X30DB	132	135	183	4.0
3.9	5	Int.	●	0390LB	44	44	92	4.0
	10	Int.	●	0390X10DB	52	55	103	4.0
	20	Int.	●	0390X20DB	92	95	143	4.0
	30	Int.	●	0390X30DB	132	135	183	4.0
4.0	5	Int.	●	0400LB	44	44	92	4.0
	10	Int.	●	0400X10DB	52	55	103	4.0
	20	Int.	●	0400X20DB	92	95	143	4.0
	30	Int.	●	0400X30DB	132	135	183	4.0
4.1	5	Int.	●	0410LB	50	50	100	5.0
	10	Int.	□	0410X10DB	59	62	112	5.0
	20	Int.	□	0410X20DB	104	107	157	5.0
	30	Int.	□	0410X30DB	149	152	202	5.0
4.2	5	Int.	●	0420LB	50	50	100	5.0
	10	Int.	□	0420X10DB	59	62	112	5.0
	20	Int.	□	0420X20DB	104	107	157	5.0
	30	Int.	□	0420X30DB	149	152	202	5.0
4.3	5	Int.	●	0430LB	50	50	100	5.0
	10	Int.	□	0430X10DB	59	62	112	5.0
	20	Int.	□	0430X20DB	104	107	157	5.0
	30	Int.	□	0430X30DB	149	152	202	5.0
4.4	5	Int.	●	0440LB	50	50	100	5.0
	10	Int.	□	0440X10DB	59	62	112	5.0
	20	Int.	□	0440X20DB	104	107	157	5.0
	30	Int.	□	0440X30DB	149	152	202	5.0
4.5	5	Int.	●	0450LB	50	50	100	5.0
	10	Int.	□	0450X10DB	59	62	112	5.0
	20	Int.	□	0450X20DB	104	107	157	5.0
	30	Int.	□	0450X30DB	149	152	202	5.0

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

DRILLING

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

CUTTING CONDITIONS > N072
OPERATION GUIDANCE > N073
TECHNICAL DATA > Q001

N067

SOLID CARBIDE DRILLS FOR MACHINING OF ALUMINIUM ALLOYS

MNS
WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
4.6	5	Int.	●	MNS0460LB	55	55	105	5.0
	10	Int.	□	0460X10DB	65	68	118	5.0
	20	Int.	□	0460X20DB	115	118	168	5.0
	30	Int.	□	0460X30DB	165	168	218	5.0
4.7	5	Int.	●	0470LB	55	55	105	5.0
	10	Int.	□	0470X10DB	65	68	118	5.0
	20	Int.	□	0470X20DB	115	118	168	5.0
	30	Int.	□	0470X30DB	165	168	218	5.0
4.8	5	Int.	●	0480LB	55	55	105	5.0
	10	Int.	□	0480X10DB	65	68	118	5.0
	20	Int.	□	0480X20DB	115	118	168	5.0
	30	Int.	□	0480X30DB	165	168	218	5.0
4.9	5	Int.	●	0490LB	55	55	105	5.0
	10	Int.	●	0490X10DB	65	68	118	5.0
	20	Int.	●	0490X20DB	115	118	168	5.0
	30	Int.	●	0490X30DB	165	168	218	5.0
5.0	5	Int.	●	0500LB	44	44	100	6.0
	10	Int.	●	0500X10DB	65	68	118	5.0
	20	Int.	●	0500X20DB	115	118	168	5.0
	30	Int.	●	0500X30DB	165	168	218	5.0
5.1	5	Int.	●	0510LB	44	44	100	6.0
	10	Int.	●	0510X10DB	72	75	127	6.0
	20	Int.	●	0510X20DB	127	130	182	6.0
	30	Int.	●	0510X30DB	182	185	237	6.0
5.2	5	Int.	●	0520LB	44	44	100	6.0
	10	Int.	□	0520X10DB	72	75	127	6.0
	20	Int.	□	0520X20DB	127	130	182	6.0
	30	Int.	□	0520X30DB	182	185	237	6.0
5.3	5	Int.	●	0530LB	44	44	100	6.0
	10	Int.	□	0530X10DB	72	75	127	6.0
	20	Int.	□	0530X20DB	127	130	182	6.0
	30	Int.	□	0530X30DB	182	185	237	6.0
5.4	5	Int.	●	0540LB	44	44	100	6.0
	10	Int.	□	0540X10DB	72	75	127	6.0
	20	Int.	□	0540X20DB	127	130	182	6.0
	30	Int.	□	0540X30DB	182	185	237	6.0
5.5	5	Int.	●	0550LB	44	44	100	6.0
	10	Int.	●	0550X10DB	72	75	127	6.0
	20	Int.	●	0550X20DB	127	130	182	6.0
	30	Int.	●	0550X30DB	182	185	237	6.0
5.6	5	Int.	●	0560LB	48	48	100	6.0
	10	Int.	□	0560X10DB	78	81	133	6.0
	20	Int.	□	0560X20DB	138	141	193	6.0
	30	Int.	□	0560X30DB	198	201	253	6.0
5.7	5	Int.	●	0570LB	48	48	100	6.0
	10	Int.	□	0570X10DB	78	81	133	6.0
	20	Int.	□	0570X20DB	138	141	193	6.0
	30	Int.	□	0570X30DB	198	201	253	6.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
5.8	5	Int.	●	MNS0580LB	48	48	100	6.0
	10	Int.	□	0580X10DB	78	81	133	6.0
	20	Int.	□	0580X20DB	138	141	193	6.0
	30	Int.	□	0580X30DB	198	201	253	6.0
5.9	5	Int.	●	0590LB	48	48	100	6.0
	10	Int.	□	0590X10DB	78	81	133	6.0
	20	Int.	□	0590X20DB	138	141	193	6.0
	30	Int.	□	0590X30DB	198	201	253	6.0
6.0	5	Int.	●	0600LB	48	48	100	6.0
	10	Int.	●	0600X10DB	78	81	133	6.0
	20	Int.	●	0600X20DB	138	141	193	6.0
	30	Int.	●	0600X30DB	198	201	253	6.0
6.1	5	Int.	●	0610LB	52	52	109	7.0
	10	Int.	●	0610X10DB	85	88	141	7.0
	20	Int.	●	0610X20DB	150	153	206	7.0
	30	Int.	●	0610X30DB	215	218	271	7.0
6.2	5	Int.	●	0620LB	52	52	109	7.0
	10	Int.	□	0620X10DB	85	88	141	7.0
	20	Int.	□	0620X20DB	150	153	206	7.0
	30	Int.	□	0620X30DB	215	218	271	7.0
6.3	5	Int.	●	0630LB	52	52	109	7.0
	10	Int.	□	0630X10DB	85	88	141	7.0
	20	Int.	□	0630X20DB	150	153	206	7.0
	30	Int.	□	0630X30DB	215	218	271	7.0
6.4	5	Int.	●	0640LB	52	52	109	7.0
	10	Int.	□	0640X10DB	85	88	141	7.0
	20	Int.	□	0640X20DB	150	153	206	7.0
	30	Int.	□	0640X30DB	215	218	271	7.0
6.5	5	Int.	●	0650LB	52	52	109	7.0
	10	Int.	●	0650X10DB	85	88	141	7.0
	20	Int.	●	0650X20DB	150	153	206	7.0
	30	Int.	●	0650X30DB	215	218	271	7.0
6.6	5	Int.	●	0660LB	56	56	109	7.0
	10	Int.	□	0660X10DB	91	94	147	7.0
	20	Int.	□	0660X20DB	161	164	217	7.0
	30	Int.	□	0660X30DB	231	234	287	7.0
6.7	5	Int.	●	0670LB	56	56	109	7.0
	10	Int.	●	0670X10DB	91	94	147	7.0
	20	Int.	●	0670X20DB	161	164	217	7.0
	30	Int.	●	0670X30DB	231	234	287	7.0
6.8	5	Int.	●	0680LB	56	56	109	7.0
	10	Int.	□	0680X10DB	91	94	147	7.0
	20	Int.	□	0680X20DB	161	164	217	7.0
	30	Int.	□	0680X30DB	231	234	287	7.0
6.9	5	Int.	●	0690LB	56	56	109	7.0
	10	Int.	□	0690X10DB	91	94	147	7.0
	20	Int.	□	0690X20DB	161	164	217	7.0
	30	Int.	□	0690X30DB	231	234	287	7.0

(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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
7.0	5	Int.	●	MNS0700LB	56	56	109	7.0
	10	Int.	●	0700X10DB	91	94	147	7.0
	20	Int.	●	0700X20DB	161	164	217	7.0
	30	Int.	●	0700X30DB	231	234	287	7.0
7.1	5	Int.	●	0710LB	60	64	118	8.0
	10	Int.	□	0710X10DB	98	101	155	8.0
	20	Int.	□	0710X20DB	173	176	230	8.0
	30	Int.	□	0710X30DB	248	251	305	8.0
7.2	5	Int.	●	0720LB	60	64	118	8.0
	10	Int.	●	0720X10DB	98	101	155	8.0
	20	Int.	●	0720X20DB	173	176	230	8.0
	30	Int.	●	0720X30DB	248	251	305	8.0
7.3	5	Int.	●	0730LB	60	64	118	8.0
	10	Int.	□	0730X10DB	98	101	155	8.0
	20	Int.	□	0730X20DB	173	176	230	8.0
	30	Int.	□	0730X30DB	248	251	305	8.0
7.4	5	Int.	●	0740LB	60	64	118	8.0
	10	Int.	□	0740X10DB	98	101	155	8.0
	20	Int.	□	0740X20DB	173	176	230	8.0
	30	Int.	□	0740X30DB	248	251	305	8.0
7.5	5	Int.	●	0750LB	60	64	118	8.0
	10	Int.	□	0750X10DB	98	101	155	8.0
	20	Int.	□	0750X20DB	173	176	230	8.0
	30	Int.	□	0750X30DB	248	251	305	8.0
7.6	5	Int.	●	0760LB	64	64	118	8.0
	10	Int.	□	0760X10DB	104	107	161	8.0
	20	Int.	□	0760X20DB	184	187	241	8.0
	30	Int.	□	0760X30DB	264	267	321	8.0
7.7	5	Int.	●	0770LB	64	64	118	8.0
	10	Int.	□	0770X10DB	104	107	161	8.0
	20	Int.	□	0770X20DB	184	187	241	8.0
	30	Int.	□	0770X30DB	264	267	321	8.0
7.8	5	Int.	●	0780LB	64	64	118	8.0
	10	Int.	●	0780X10DB	104	107	161	8.0
	20	Int.	●	0780X20DB	184	187	241	8.0
	30	Int.	●	0780X30DB	264	267	321	8.0
7.9	5	Int.	●	0790LB	64	64	118	8.0
	10	Int.	□	0790X10DB	104	107	161	8.0
	20	Int.	□	0790X20DB	184	187	241	8.0
	30	Int.	□	0790X30DB	264	267	321	8.0
8.0	5	Int.	●	0800LB	64	64	118	8.0
	10	Int.	●	0800X10DB	104	107	161	8.0
	20	Int.	●	0800X20DB	184	187	241	8.0
	30	Int.	●	0800X30DB	264	267	321	8.0
8.1	5	Int.	●	0810LB	68	72	127	9.0
	10	Int.	□	0810X10DB	111	114	169	9.0
	20	Int.	□	0810X20DB	196	199	254	9.0
	30	Int.	□	0810X30DB	281	284	339	9.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
8.2	5	Int.	●	MNS0820LB	68	72	127	9.0
	10	Int.	□	0820X10DB	111	114	169	9.0
	20	Int.	□	0820X20DB	196	199	254	9.0
	30	Int.	□	0820X30DB	281	284	339	9.0
8.3	5	Int.	●	0830LB	68	72	127	9.0
	10	Int.	□	0830X10DB	111	114	169	9.0
	20	Int.	□	0830X20DB	196	199	254	9.0
	30	Int.	□	0830X30DB	281	284	339	9.0
8.4	5	Int.	●	0840LB	68	72	127	9.0
	10	Int.	□	0840X10DB	111	114	169	9.0
	20	Int.	□	0840X20DB	196	199	254	9.0
	30	Int.	□	0840X30DB	281	284	339	9.0
8.5	5	Int.	●	0850LB	68	72	127	9.0
	10	Int.	□	0850X10DB	111	114	169	9.0
	20	Int.	□	0850X20DB	196	199	254	9.0
	30	Int.	□	0850X30DB	281	284	339	9.0
8.6	5	Int.	●	0860LB	72	72	127	9.0
	10	Int.	□	0860X10DB	117	120	175	9.0
	20	Int.	□	0860X20DB	207	210	265	9.0
	30	Int.	□	0860X30DB	297	300	355	9.0
8.7	5	Int.	●	0870LB	72	72	127	9.0
	10	Int.	□	0870X10DB	117	120	175	9.0
	20	Int.	□	0870X20DB	207	210	265	9.0
	30	Int.	□	0870X30DB	297	300	355	9.0
8.8	5	Int.	●	0880LB	72	72	127	9.0
	10	Int.	□	0880X10DB	117	120	175	9.0
	20	Int.	□	0880X20DB	207	210	265	9.0
	30	Int.	□	0880X30DB	297	300	355	9.0
8.9	5	Int.	●	0890LB	72	72	127	9.0
	10	Int.	□	0890X10DB	117	120	175	9.0
	20	Int.	□	0890X20DB	207	210	265	9.0
	30	Int.	□	0890X30DB	297	300	355	9.0
9.0	5	Int.	●	0900LB	72	72	127	9.0
	10	Int.	●	0900X10DB	117	120	175	9.0
	20	Int.	●	0900X20DB	207	210	265	9.0
	30	Int.	●	0900X30DB	297	300	355	9.0
9.1	5	Int.	●	0910LB	76	80	136	10.0
	10	Int.	□	0910X10DB	124	127	182	10.0
	20	Int.	□	0910X20DB	219	222	277	10.0
	30	Int.	□	0910X30DB	314	317	372	10.0
9.2	5	Int.	●	0920LB	76	80	136	10.0
	10	Int.	□	0920X10DB	124	127	182	10.0
	20	Int.	□	0920X20DB	219	222	277	10.0
	30	Int.	□	0920X30DB	314	317	372	10.0
9.3	5	Int.	●	0930LB	76	80	136	10.0
	10	Int.	□	0930X10DB	124	127	182	10.0
	20	Int.	□	0930X20DB	219	222	277	10.0
	30	Int.	□	0930X30DB	314	317	372	10.0

SOLID CARBIDE DRILLS FOR MACHINING OF ALUMINIUM ALLOYS

MNS
WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
9.4	5	Int.	●	MNS0940LB	76	80	136	10.0
	10	Int.	□	0940X10DB	124	127	182	10.0
	20	Int.	□	0940X20DB	219	222	277	10.0
	30	Int.	□	0940X30DB	314	317	372	10.0
9.5	5	Int.	●	0950LB	76	80	136	10.0
	10	Int.	□	0950X10DB	124	127	182	10.0
	20	Int.	□	0950X20DB	219	222	277	10.0
	30	Int.	□	0950X30DB	314	317	372	10.0
9.6	5	Int.	●	0960LB	80	80	136	10.0
	10	Int.	□	0960X10DB	130	133	188	10.0
	20	Int.	□	0960X20DB	230	233	288	10.0
	30	Int.	□	0960X30DB	330	333	388	10.0
9.7	5	Int.	●	0970LB	80	80	136	10.0
	10	Int.	□	0970X10DB	130	133	188	10.0
	20	Int.	□	0970X20DB	230	233	288	10.0
	30	Int.	□	0970X30DB	330	333	388	10.0
9.8	5	Int.	●	0980LB	80	80	136	10.0
	10	Int.	●	0980X10DB	130	133	188	10.0
	20	Int.	●	0980X20DB	230	233	288	10.0
	30	Int.	●	0980X30DB	330	333	388	10.0
9.9	5	Int.	●	0990LB	80	80	136	10.0
	10	Int.	□	0990X10DB	130	133	188	10.0
	20	Int.	□	0990X20DB	230	233	288	10.0
	30	Int.	□	0990X30DB	330	333	388	10.0
10.0	5	Int.	●	1000LB	80	80	136	10.0
	10	Int.	●	1000X10DB	130	133	188	10.0
	20	Int.	●	1000X20DB	230	233	288	10.0
	30	Int.	●	1000X30DB	330	333	388	10.0
10.1	5	Int.	●	1010LB	84	88	149	11.0
	10	Int.	□	1010X10DB	137	140	201	11.0
	20	Int.	□	1010X20DB	242	245	306	11.0
10.2	5	Int.	●	1020LB	84	88	149	11.0
	10	Int.	□	1020X10DB	137	140	201	11.0
	20	Int.	□	1020X20DB	242	245	306	11.0
10.3	5	Int.	●	1030LB	84	88	149	11.0
	10	Int.	□	1030X10DB	137	140	201	11.0
	20	Int.	□	1030X20DB	242	245	306	11.0
10.4	5	Int.	●	1040LB	84	88	149	11.0
	10	Int.	□	1040X10DB	137	140	201	11.0
	20	Int.	□	1040X20DB	242	245	306	11.0
10.5	5	Int.	●	1050LB	84	88	149	11.0
	10	Int.	●	1050X10DB	137	140	201	11.0
	20	Int.	●	1050X20DB	242	245	306	11.0
10.6	5	Int.	●	1060LB	88	88	149	11.0
	10	Int.	□	1060X10DB	143	146	207	11.0
	20	Int.	□	1060X20DB	253	256	317	11.0
10.7	5	Int.	●	1070LB	88	88	149	11.0
	10	Int.	□	1070X10DB	143	146	207	11.0
	20	Int.	□	1070X20DB	253	256	317	11.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
10.8	5	Int.	●	MNS1080LB	88	88	149	11.0
	10	Int.	□	1080X10DB	143	146	207	11.0
	20	Int.	□	1080X20DB	253	256	317	11.0
10.9	5	Int.	●	1090LB	88	88	149	11.0
	10	Int.	□	1090X10DB	143	146	207	11.0
	20	Int.	□	1090X20DB	253	256	317	11.0
11.0	5	Int.	●	1100LB	88	88	149	11.0
	10	Int.	●	1100X10DB	143	146	207	11.0
	20	Int.	●	1100X20DB	253	256	317	11.0
11.1	5	Int.	●	1110LB	92	96	158	12.0
	10	Int.	□	1110X10DB	150	153	215	12.0
	20	Int.	□	1110X20DB	265	268	330	12.0
11.2	5	Int.	●	1120LB	92	96	158	12.0
	10	Int.	□	1120X10DB	150	153	215	12.0
	20	Int.	□	1120X20DB	265	268	330	12.0
11.3	5	Int.	●	1130LB	92	96	158	12.0
	10	Int.	□	1130X10DB	150	153	215	12.0
	20	Int.	□	1130X20DB	265	268	330	12.0
11.4	5	Int.	●	1140LB	92	96	158	12.0
	10	Int.	□	1140X10DB	150	153	215	12.0
	20	Int.	□	1140X20DB	265	268	330	12.0
11.5	5	Int.	●	1150LB	92	96	158	12.0
	10	Int.	□	1150X10DB	150	153	215	12.0
	20	Int.	□	1150X20DB	265	268	330	12.0
11.6	5	Int.	●	1160LB	96	96	158	12.0
	10	Int.	□	1160X10DB	156	159	221	12.0
	20	Int.	□	1160X20DB	276	279	341	12.0
11.7	5	Int.	●	1170LB	96	96	158	12.0
	10	Int.	□	1170X10DB	156	159	221	12.0
	20	Int.	□	1170X20DB	276	279	341	12.0
11.8	5	Int.	●	1180LB	96	96	158	12.0
	10	Int.	□	1180X10DB	156	159	221	12.0
	20	Int.	□	1180X20DB	276	279	341	12.0
11.9	5	Int.	●	1190LB	96	96	158	12.0
	10	Int.	□	1190X10DB	156	159	221	12.0
	20	Int.	□	1190X20DB	276	279	341	12.0
12.0	5	Int.	●	1200LB	96	96	158	12.0
	10	Int.	●	1200X10DB	156	159	221	12.0
	20	Int.	●	1200X20DB	276	279	341	12.0
12.1	5	Int.	●	1210LB	100	104	167	13.0
	10	Int.	□	1210X10DB	163	166	229	13.0
	20	Int.	□	1210X20DB	288	291	354	13.0
12.2	5	Int.	●	1220LB	100	104	167	13.0
	10	Int.	□	1220X10DB	163	166	229	13.0
	20	Int.	□	1220X20DB	288	291	354	13.0
12.3	5	Int.	●	1230LB	100	104	167	13.0
	10	Int.	□	1230X10DB	163	166	229	13.0
	20	Int.	□	1230X20DB	288	291	354	13.0

(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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm)			
					Flute Length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
12.4	5	Int.	●	MNS1240LB	100	104	167	13.0
	10	Int.	□	1240X10DB	163	166	229	13.0
	20	Int.	□	1240X20DB	288	291	354	13.0
12.5	5	Int.	●	1250LB	100	104	167	13.0
	10	Int.	□	1250X10DB	163	166	229	13.0
	20	Int.	□	1250X20DB	288	291	354	13.0
12.6	5	Int.	●	1260LB	104	104	167	13.0
	10	Int.	□	1260X10DB	169	172	235	13.0
	20	Int.	□	1260X20DB	299	302	365	13.0
12.7	5	Int.	●	1270LB	104	104	167	13.0
	10	Int.	□	1270X10DB	169	172	235	13.0
	20	Int.	□	1270X20DB	299	302	365	13.0
12.8	5	Int.	●	1280LB	104	104	167	13.0
	10	Int.	□	1280X10DB	169	172	235	13.0
	20	Int.	□	1280X20DB	299	302	365	13.0
12.9	5	Int.	●	1290LB	104	104	167	13.0
	10	Int.	□	1290X10DB	169	172	235	13.0
	20	Int.	□	1290X20DB	299	302	365	13.0
13.0	5	Int.	●	1300LB	104	104	167	13.0
	10	Int.	●	1300X10DB	169	172	235	13.0
	20	Int.	●	1300X20DB	299	302	365	13.0
13.1	5	Int.	●	1310LB	108	112	176	14.0
	10	Int.	□	1310X10DB	176	179	243	14.0
	20	Int.	□	1310X20DB	311	314	378	14.0
13.2	5	Int.	●	1320LB	108	112	176	14.0
	10	Int.	□	1320X10DB	176	179	243	14.0
	20	Int.	□	1320X20DB	311	314	378	14.0
13.3	5	Int.	●	1330LB	108	112	176	14.0
	10	Int.	□	1330X10DB	176	179	243	14.0
	20	Int.	□	1330X20DB	311	314	378	14.0
13.4	5	Int.	●	1340LB	108	112	176	14.0
	10	Int.	□	1340X10DB	176	179	243	14.0
	20	Int.	□	1340X20DB	311	314	378	14.0
13.5	5	Int.	●	1350LB	108	112	176	14.0
	10	Int.	□	1350X10DB	176	179	243	14.0
	20	Int.	□	1350X20DB	311	314	378	14.0
13.6	5	Int.	●	1360LB	112	112	176	14.0
	10	Int.	□	1360X10DB	182	185	249	14.0
	20	Int.	□	1360X20DB	322	325	389	14.0
13.7	5	Int.	●	1370LB	112	112	176	14.0
	10	Int.	□	1370X10DB	182	185	249	14.0
	20	Int.	□	1370X20DB	322	325	389	14.0
13.8	5	Int.	●	1380LB	112	112	176	14.0
	10	Int.	□	1380X10DB	182	185	249	14.0
	20	Int.	□	1380X20DB	322	325	389	14.0
13.9	5	Int.	●	1390LB	112	112	176	14.0
	10	Int.	□	1390X10DB	182	185	249	14.0
	20	Int.	□	1390X20DB	322	325	389	14.0
14.0	5	Int.	●	1400LB	112	112	176	14.0
	10	Int.	●	1400X10DB	182	185	249	14.0
	20	Int.	●	1400X20DB	322	325	389	14.0

RECOMMENDED CUTTING CONDITIONS

LB Type Drill

Work material	Aluminium Alloy (Si<5%)		Aluminium Alloy (5%≤Si≤10%)		Aluminium Alloy (Si>10%)	
	ASTM A6061, ASTM A7075 etc		ASTM 333.0 etc		ASTM 383.0, ASTM A390.0 etc	
Dia. (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)
14.0	5300	0.5 (0.40—0.60)	5300	0.7 (0.60—0.80)	5300	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

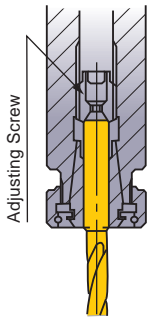
Work material	Aluminium Alloy (Si<5%)		Aluminium Alloy (5%≤Si≤10%)		Aluminium Alloy (Si>10%)	
	ASTM A6061, ASTM A7075 etc		ASTM 333.0 etc		ASTM 383.0, ASTM A390.0 etc	
Dia. (mm)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)	Feed 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)
14.0	4200	0.5 (0.40—0.60)	4200	0.7 (0.60—0.80)	4200	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.

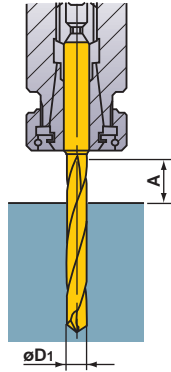
OPERATIONAL GUIDANCE

Drill Holding



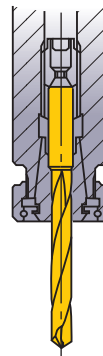
Thrust bearing type collet chuck holds the drill securely.

Drill Length



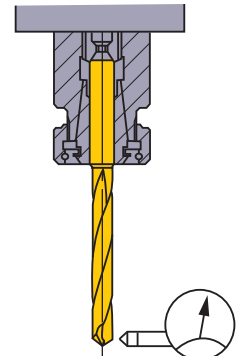
$$A \geq D1 \times 1.5$$

Drill Installation



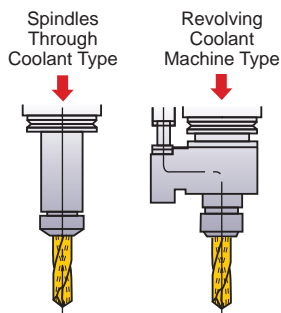
Do not clamp on the flutes.

Installation Tolerance



Run-out $\leq 0.03\text{mm}$

Through Coolant Type

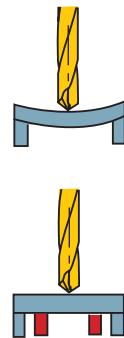


Coolant pressure is approx. 0.5MPa–7MPa

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



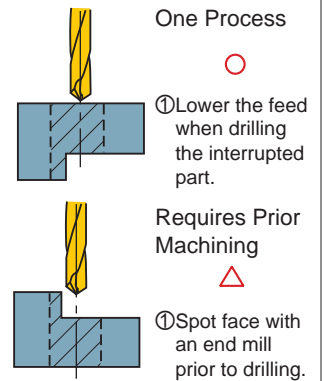
If Bending Occurs



Support the Workpiece



Interrupted Cutting



One Process



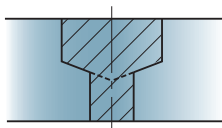
① Lower the feed when drilling the interrupted part.

Requires Prior Machining



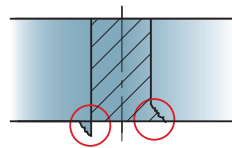
① Spot face with an end mill prior to drilling.

Stepped Holes



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

Burring and Workpiece Chipping

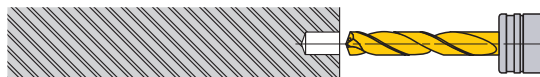


- ① Lower the feed rate by 50% at the end of through cutting.
- ② Add a 45° chamfer.
- ③ Change the point angle.

OPERATIONAL GUIDANCE FOR MNS...DB DRILLS

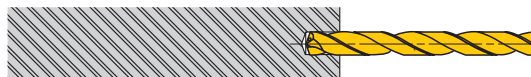
FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



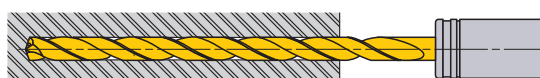
- ①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
- ②Ensure a high precision hole is drilled for the guide.
- ③Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



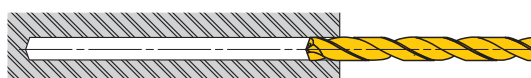
- ①Penetrate the guide hole at low revolution. (Cutting speed 20–30m/min, feed rate 0.2–0.3mm/rev)
- ②Stop the long type drill 1–3mm short of the guide hole bottom.

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.

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

1. Spot facing



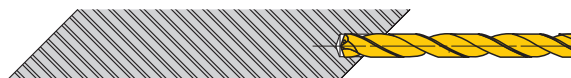
- ①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



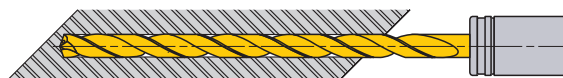
- ①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
- ②Ensure a high precision hole is drilled for the guide.
- ③Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



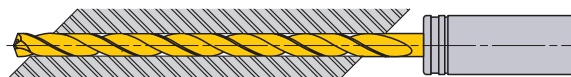
- ①Penetrate the guide hole at a low revolution. (Cutting speed 20–30m/min, feed rate 0.2–0.3mm/rev)
- ②Stop the long type drill 1–3mm short of the guide hole bottom.

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

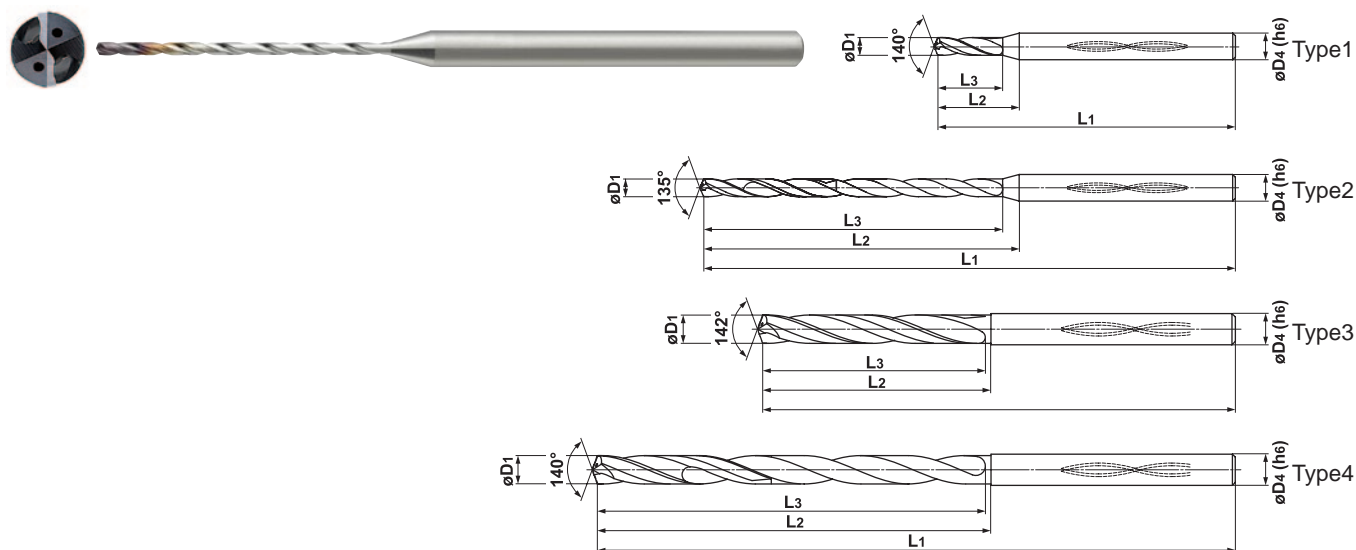
MHS WSTAR DRILLS

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

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast iron	Light Alloy	Heat Resistant Alloy
○	◎	○			○

	D1 ≤ 3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 12
h6	+0.010 -0.002	+0.010 -0.002	+0.010 -0.005	+0.010 -0.008
	0	0	0	0
	-0.006	-0.008	-0.009	-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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP-15TF	Order Number	Dimensions (mm)				
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	Type
NEW 0.95	3	Int.	●	MHS0095L006B	6	9.8	60	3	1
	6	Int.	●	0095L009B	9	12.8	60	3	2
	13	Int.	●	0095L015B	15	18.8	60	3	2
	23	Int.	●	0095L025B	25	28.8	60	3	2
	30	Int.	●	0095L035B	35	38.8	80	3	2
NEW 1.00	3	Int.	●	0100L006B	6	9.7	60	3	1
	6	Int.	●	0100L009B	9	12.7	60	3	2
	12	Int.	●	0100L015B	15	18.7	60	3	2
	22	Int.	●	0100L025B	25	28.7	60	3	2
	30	Int.	●	0100L035B	35	38.7	80	3	2
NEW 1.10	2	Int.	●	0110L006B	6	9.5	60	3	1
	5	Int.	●	0110L009B	9	12.5	60	3	2
	11	Int.	●	0110L015B	15	18.5	60	3	2
	20	Int.	●	0110L025B	25	28.5	60	3	2
	29	Int.	●	0110L035B	35	38.5	80	3	2
NEW 1.20	2	Int.	●	0120L006B	6	9.4	60	3	1
	5	Int.	●	0120L009B	9	12.4	60	3	2
	10	Int.	●	0120L015B	15	18.4	60	3	2
	18	Int.	●	0120L025B	25	28.4	60	3	2
	26	Int.	●	0120L035B	35	38.4	80	3	2
NEW 1.30	2	Int.	●	0130L007B	7	10.2	60	3	1
	5	Int.	●	0130L011B	11	14.2	60	3	2
	12	Int.	●	0130L020B	20	23.2	60	3	2
	20	Int.	●	0130L030B	30	33.2	80	3	2
	30	Int.	●	0130L045B	45	48.2	80	3	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP-15TF	Order Number	Dimensions (mm)				
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	Type
NEW 1.40	2	Int.	●	MHS0140L007B	7	10.0	60	3	1
	5	Int.	●	0140L011B	11	14.0	60	3	2
	11	Int.	●	0140L020B	20	23.0	60	3	2
	18	Int.	●	0140L030B	30	33.0	80	3	2
	29	Int.	●	0140L045B	45	48.0	80	3	2
NEW 1.45	3	Int.	●	0145L008B	8	10.9	60	3	1
	6	Int.	●	0145L013B	13	15.9	60	3	2
	11	Int.	●	0145L020B	20	22.9	60	3	2
	21	Int.	●	0145L035B	35	37.9	80	3	2
	30	Int.	●	0145L055B	55	57.9	100	3	2
NEW 1.50	2	Int.	●	0150L008B	8	10.8	60	3	1
	6	Int.	●	0150L013B	13	15.8	60	3	2
	10	Int.	●	0150L020B	20	22.8	60	3	2
	20	Int.	●	0150L035B	35	37.8	80	3	2
	30	Int.	●	0150L055B	55	57.8	100	3	2
NEW 1.60	2	Int.	●	0160L008B	8	10.6	60	3	1
	5	Int.	●	0160L013B	13	15.6	60	3	2
	10	Int.	●	0160L020B	20	22.6	60	3	2
	19	Int.	●	0160L035B	35	37.6	80	3	2
	30	Int.	●	0160L055B	55	57.6	100	3	2
NEW 1.70	2	Int.	●	0170L008B	8	10.4	60	3	1
	5	Int.	●	0170L013B	13	15.4	60	3	2
	9	Int.	●	0170L020B	20	22.4	60	3	2
	18	Int.	●	0170L035B	35	37.4	80	3	2
	29	Int.	●	0170L055B	55	57.4	100	3	2

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

DRILLING

● : Inventory maintained in Japan.

CUTTING CONDITIONS > N083
OPERATION GUIDANCE > N084
TECHNICAL DATA > Q001

N075

SOLID CARBIDE DRILLS FOR DIE & MOULD MACHINING

MHS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
NEW	3	Int.	●	MHS0180L010B	10	12.2	60	3	1
	5	Int.	●	0180L015B	15	17.2	60	3	2
1.80	11	Int.	●	0180L025B	25	27.2	60	3	2
	22	Int.	●	0180L045B	45	47.2	80	3	2
	30	Int.	●	0180L065B	65	67.2	100	3	2
NEW	2	Int.	●	0190L010B	10	12.1	60	3	1
	5	Int.	●	0190L015B	15	17.1	60	3	2
1.90	10	Int.	●	0190L025B	25	27.1	60	3	2
	21	Int.	●	0190L045B	45	47.1	80	3	2
	30	Int.	●	0190L065B	65	67.1	100	3	2
NEW	2	Int.	●	0195L010B	10	12.0	60	3	1
	5	Int.	●	0195L015B	15	17.0	60	3	2
1.95	10	Int.	●	0195L025B	25	27.0	60	3	2
	20	Int.	●	0195L045B	45	47.0	80	3	2
	30	Int.	●	0195L065B	65	67.0	100	3	2
NEW	2	Int.	●	0200L010B	10	11.9	60	3	1
	5	Int.	●	0200L015B	15	16.9	60	3	2
2.00	9	Int.	●	0200L025B	25	26.9	60	3	2
	20	Int.	●	0200L045B	45	46.9	80	3	2
	30	Int.	●	0200L065B	65	66.9	100	3	2
NEW	3	Int.	●	0210L012B	12	13.7	60	3	1
	7	Int.	●	0210L020B	20	21.7	60	3	2
2.10	11	Int.	●	0210L030B	30	31.7	80	3	2
	23	Int.	●	0210L055B	55	56.7	100	3	2
	30	Int.	●	0210L075B	75	76.7	120	3	2
NEW	2	Int.	●	0220L012B	12	13.5	60	3	1
	6	Int.	●	0220L020B	20	21.5	60	3	2
2.20	11	Int.	●	0220L030B	30	31.5	80	3	2
	22	Int.	●	0220L055B	55	56.5	100	3	2
	30	Int.	●	0220L075B	75	76.5	120	3	2
NEW	2	Int.	●	0230L012B	12	13.3	60	3	1
	6	Int.	●	0230L020B	20	21.3	60	3	2
2.30	10	Int.	●	0230L030B	30	31.3	80	3	2
	21	Int.	●	0230L055B	55	56.3	100	3	2
	30	Int.	●	0230L075B	75	76.3	120	3	2
NEW	2	Int.	●	0240L012B	12	13.1	60	3	1
	5	Int.	●	0240L020B	20	21.1	60	3	2
2.40	9	Int.	●	0240L030B	30	31.1	80	3	2
	20	Int.	●	0240L055B	55	56.1	100	3	2
	28	Int.	●	0240L075B	75	76.1	120	3	2
NEW	2	Int.	●	0245L013B	13	14.0	70	4	1
	5	Int.	●	0245L020B	20	21.0	70	4	2
2.45	11	Int.	●	0245L035B	35	36.0	90	4	2
	24	Int.	●	0245L065B	65	66.0	110	4	2
	30	Int.	●	0245L090B	90	91.0	140	4	2
NEW	2	Int.	●	0250L013B	13	15.8	70	4	1
	5	Int.	●	0250L020B	20	22.8	70	4	2
2.50	11	Int.	●	0250L035B	35	37.8	90	4	2
	23	Int.	●	0250L065B	65	67.8	110	4	2
	30	Int.	●	0250L090B	90	92.8	140	4	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
NEW	2	Int.	●	MHS0260L013B	13	15.6	70	4	1
	5	Int.	●	0260L020B	20	22.6	70	4	2
2.60	10	Int.	●	0260L035B	35	37.6	90	4	2
	22	Int.	●	0260L065B	65	67.6	110	4	2
	30	Int.	●	0260L090B	90	92.6	140	4	2
NEW	2	Int.	●	0270L013B	13	15.4	70	4	1
	4	Int.	●	0270L020B	20	22.4	70	4	2
2.70	10	Int.	●	0270L035B	35	37.4	90	4	2
	21	Int.	●	0270L065B	65	67.4	110	4	2
	30	Int.	●	0270L090B	90	92.4	140	4	2
NEW	2	Int.	●	0280L014B	14	16.2	70	4	1
	4	Int.	●	0280L020B	20	22.2	70	4	2
2.80	9	Int.	●	0280L035B	35	37.2	90	4	2
	20	Int.	●	0280L065B	65	67.2	110	4	2
	29	Int.	●	0280L090B	90	92.2	140	4	2
NEW	2	Int.	●	0290L014B	14	16.1	70	4	1
	4	Int.	●	0290L020B	20	22.1	70	4	2
2.90	9	Int.	●	0290L035B	35	37.1	90	4	2
	19	Int.	●	0290L065B	65	67.1	110	4	2
	28	Int.	●	0290L090B	90	92.1	140	4	2
NEW	2	Int.	●	0295L014B	14	16	70	4	1
	4	Int.	●	0295L020B	20	22	70	4	2
2.95	9	Int.	●	0295L035B	35	37	90	4	2
	19	Int.	●	0295L065B	65	67	110	4	2
	28	Int.	●	0295L090B	90	92	140	4	2
	4	Int.	●	0300L020B	19	20	70	4	3
3.0	10	Int.	●	0300L040B	39	40	90	4	4
	17	Int.	●	0300L060B	59	60	110	4	4
	27	Int.	●	0300L090B	89	90	140	4	4
ww	4	Int.	□	0310L020B	19.5	20	70	4	3
	10	Int.	□	0310L040B	39.5	40	90	4	4
3.1	17	Int.	□	0310L060B	59.5	60	110	4	4
	26	Int.	□	0310L090B	89.5	90	140	4	4
	4	Int.	□	0320L020B	19.5	20	70	4	3
3.2	10	Int.	□	0320L040B	39.5	40	90	4	4
	16	Int.	□	0320L060B	59.5	60	110	4	4
	25	Int.	□	0320L090B	89.5	90	140	4	4
	3	Int.	□	0330L020B	19.5	20	70	4	3
3.3	9	Int.	□	0330L040B	39.5	40	90	4	4
	16	Int.	□	0330L060B	59.5	60	110	4	4
	25	Int.	□	0330L090B	89.5	90	140	4	4
	3	Int.	□	0340L020B	19.5	20	70	4	3
3.4	9	Int.	□	0340L040B	39.5	40	90	4	4
	15	Int.	□	0340L060B	59.5	60	110	4	4
	24	Int.	□	0340L090B	89.5	90	140	4	4
	3	Int.	●	0350L020B	19.5	20	70	4	3
3.5	9	Int.	●	0350L040B	39.5	40	90	4	4
	14	Int.	●	0350L060B	59.5	60	110	4	4
	23	Int.	●	0350L090B	89.5	90	140	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
3.6	3	Int.	□	MHS0360L020B	20	20	70	4	3
	9	Int.	□	0360L040B	40	40	90	4	4
	14	Int.	□	0360L060B	60	60	110	4	4
	22	Int.	□	0360L090B	90	90	140	4	4
	30	Int.	□	0360L120B	120	120	170	4	4
3.7	3	Int.	□	0370L020B	20	20	70	4	3
	8	Int.	□	0370L040B	40	40	90	4	4
	14	Int.	□	0370L060B	60	60	110	4	4
	22	Int.	□	0370L090B	90	90	140	4	4
3.8	3	Int.	●	0380L020B	20	20	70	4	3
	8	Int.	●	0380L040B	40	40	90	4	4
	13	Int.	●	0380L060B	60	60	110	4	4
	21	Int.	●	0380L090B	90	90	140	4	4
	29	Int.	●	0380L120B	120	120	170	4	4
3.9	3	Int.	□	0390L020B	20	20	70	4	3
	8	Int.	□	0390L040B	40	40	90	4	4
	13	Int.	□	0390L060B	60	60	110	4	4
	21	Int.	□	0390L090B	90	90	140	4	4
	28	Int.	□	0390L120B	120	120	170	4	4
4.0	2	Int.	●	0400L020B	20	20	70	4	3
	7	Int.	●	0400L040B	40	40	90	4	4
	12	Int.	●	0400L060B	60	60	110	4	4
	20	Int.	●	0400L090B	90	90	140	4	4
	27	Int.	●	0400L120B	120	120	170	4	4
4.1	2	Int.	□	0410L020B	18.5	20	70	6	3
	7	Int.	□	0410L040B	38.5	40	90	6	4
	12	Int.	□	0410L060B	58.5	60	110	6	4
	19	Int.	□	0410L090B	88.5	90	140	6	4
	26	Int.	□	0410L120B	118.5	120	170	6	4
4.2	2	Int.	□	0420L020B	18.5	20	70	6	3
	7	Int.	□	0420L040B	38.5	40	90	6	4
	11	Int.	□	0420L060B	58.5	60	110	6	4
	19	Int.	□	0420L090B	88.5	90	140	6	4
	26	Int.	□	0420L120B	118.5	120	170	6	4
4.3	2	Int.	□	0430L020B	18.5	20	70	6	3
	6	Int.	□	0430L040B	38.5	40	90	6	4
	11	Int.	□	0430L060B	58.5	60	110	6	4
	18	Int.	□	0430L090B	88.5	90	140	6	4
	25	Int.	□	0430L120B	118.5	120	170	6	4
4.4	2	Int.	□	0440L020B	18.5	20	70	6	3
	6	Int.	□	0440L040B	38.5	40	90	6	4
	11	Int.	□	0440L060B	58.5	60	110	6	4
	18	Int.	□	0440L090B	88.5	90	140	6	4
	24	Int.	□	0440L120B	118.5	120	170	6	4
4.5	2	Int.	●	0450L020B	18.5	20	70	6	3
	6	Int.	●	0450L040B	38.5	40	90	6	4
	10	Int.	●	0450L060B	58.5	60	110	6	4
	17	Int.	●	0450L090B	88.5	90	140	6	4
	24	Int.	●	0450L120B	118.5	120	170	6	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
4.6	2	Int.	□	MHS0460L020B	19	20	70	6	3
	6	Int.	□	0460L040B	39	40	90	6	4
	10	Int.	□	0460L060B	59	60	110	6	4
	17	Int.	□	0460L090B	89	90	140	6	4
	23	Int.	□	0460L120B	119	120	170	6	4
	30	Int.	□	0460L150B	149	150	200	6	4
4.7	2	Int.	□	0470L020B	19	20	70	6	3
	6	Int.	□	0470L040B	39	40	90	6	4
	10	Int.	□	0470L060B	59	60	110	6	4
	16	Int.	□	0470L090B	89	90	140	6	4
	23	Int.	□	0470L120B	119	120	170	6	4
	29	Int.	□	0470L150B	149	150	200	6	4
4.8	1	Int.	●	0480L020B	19	20	70	6	3
	6	Int.	●	0480L040B	39	40	90	6	4
	10	Int.	●	0480L060B	59	60	110	6	4
	16	Int.	●	0480L090B	89	90	140	6	4
	22	Int.	●	0480L120B	119	120	170	6	4
4.9	1	Int.	□	0490L020B	19	20	70	6	3
	5	Int.	□	0490L040B	39	40	90	6	4
	10	Int.	□	0490L060B	59	60	110	6	4
	16	Int.	□	0490L090B	89	90	140	6	4
	22	Int.	□	0490L120B	119	120	170	6	4
5.0	1	Int.	●	0500L020B	19	20	70	6	3
	5	Int.	●	0500L040B	39	40	90	6	4
	9	Int.	●	0500L060B	59	60	110	6	4
	15	Int.	●	0500L090B	89	90	140	6	4
	21	Int.	●	0500L120B	119	120	170	6	4
	27	Int.	●	0500L150B	149	150	200	6	4
5.1	3	Int.	□	0510L030B	29.5	30	80	6	3
	9	Int.	□	0510L060B	59.5	60	110	6	4
	15	Int.	□	0510L090B	89.5	90	140	6	4
	21	Int.	□	0510L120B	119.5	120	170	6	4
	27	Int.	□	0510L150B	149.5	150	200	6	4
5.2	3	Int.	□	0520L030B	29.5	30	80	6	3
	9	Int.	□	0520L060B	59.5	60	110	6	4
	15	Int.	□	0520L090B	89.5	90	140	6	4
	20	Int.	□	0520L120B	119.5	120	170	6	4
	26	Int.	□	0520L150B	149.5	150	200	6	4
5.3	3	Int.	□	0530L030B	29.5	30	80	6	3
	9	Int.	□	0530L060B	59.5	60	110	6	4
	14	Int.	□	0530L090B	89.5	90	140	6	4
	20	Int.	□	0530L120B	119.5	120	170	6	4
	26	Int.	□	0530L150B	149.5	150	200	6	4
5.4	3	Int.	□	0540L030B	29.5	30	80	6	3
	9	Int.	□	0540L060B	59.5	60	110	6	4
	14	Int.	□	0540L090B	89.5	90	140	6	4
	20	Int.	□	0540L120B	119.5	120	170	6	4
	25	Int.	□	0540L150B	149.5	150	200	6	4

SOLID CARBIDE DRILLS FOR DIE & MOULD MACHINING

MHS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
5.5	3	Int.	●	MHS0550L030B	29.5	30	80	6	3
	8	Int.	●	0550L060B	59.5	60	110	6	4
	14	Int.	●	0550L090B	89.5	90	140	6	4
	19	Int.	●	0550L120B	119.5	120	170	6	4
	25	Int.	●	0550L150B	149.5	150	200	6	4
5.6	3	Int.	□	0560L030B	30	30	80	6	3
	8	Int.	□	0560L060B	60	60	110	6	4
	14	Int.	□	0560L090B	90	90	140	6	4
	19	Int.	□	0560L120B	120	120	170	6	4
	24	Int.	□	0560L150B	150	150	200	6	4
5.7	3	Int.	□	0570L030B	30	30	80	6	3
	8	Int.	□	0570L060B	60	60	110	6	4
	13	Int.	□	0570L090B	90	90	140	6	4
	19	Int.	□	0570L120B	120	120	170	6	4
	24	Int.	□	0570L150B	150	150	200	6	4
5.8	3	Int.	●	0580L030B	30	30	80	6	3
	8	Int.	●	0580L060B	60	60	110	6	4
	13	Int.	●	0580L090B	90	90	140	6	4
	18	Int.	●	0580L120B	120	120	170	6	4
	23	Int.	●	0580L150B	150	150	200	6	4
5.9	3	Int.	□	0590L030B	30	30	80	6	3
	8	Int.	□	0590L060B	60	60	110	6	4
	13	Int.	□	0590L090B	90	90	140	6	4
	18	Int.	□	0590L120B	120	120	170	6	4
	23	Int.	□	0590L150B	150	150	200	6	4
6.0	2	Int.	●	0600L030B	30	30	80	6	3
	7	Int.	●	0600L060B	60	60	110	6	4
	12	Int.	●	0600L090B	90	90	140	6	4
	17	Int.	●	0600L120B	120	120	170	6	4
	22	Int.	●	0600L150B	150	150	200	6	4
6.1	2	Int.	□	0610L030B	28.5	30	80	8	3
	7	Int.	□	0610L060B	58.5	60	110	8	4
	12	Int.	□	0610L090B	88.5	90	140	8	4
	17	Int.	□	0610L120B	118.5	120	170	8	4
	22	Int.	□	0610L150B	148.5	150	200	8	4
6.2	2	Int.	□	0620L030B	28.5	30	80	8	3
	7	Int.	□	0620L060B	58.5	60	110	8	4
	12	Int.	□	0620L090B	88.5	90	140	8	4
	17	Int.	□	0620L120B	118.5	120	170	8	4
	21	Int.	□	0620L150B	148.5	150	200	8	4
6.3	2	Int.	□	0630L030B	28.5	30	80	8	3
	7	Int.	□	0630L060B	58.5	60	110	8	4
	12	Int.	□	0630L090B	88.5	90	140	8	4
	16	Int.	□	0630L120B	118.5	120	170	8	4
	21	Int.	□	0630L150B	148.5	150	200	8	4
6.4	2	Int.	□	0640L030B	28.5	30	80	8	3
	7	Int.	□	0640L060B	58.5	60	110	8	4
	11	Int.	□	0640L090B	88.5	90	140	8	4
	16	Int.	□	0640L120B	118.5	120	170	8	4
	21	Int.	□	0640L150B	148.5	150	200	8	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.5	2	Int.	●	MHS0650L030B	28.5	30	80	8	3
	6	Int.	●	0650L060B	58.5	60	110	8	4
	11	Int.	●	0650L090B	88.5	90	140	8	4
	16	Int.	●	0650L120B	118.5	120	170	8	4
	20	Int.	●	0650L150B	148.5	150	200	8	4
6.6	2	Int.	□	0660L030B	29	30	80	8	3
	6	Int.	□	0660L060B	59	60	110	8	4
	11	Int.	□	0660L090B	89	90	140	8	4
	16	Int.	□	0660L120B	119	120	170	8	4
	20	Int.	□	0660L150B	149	150	200	8	4
6.7	2	Int.	□	0670L030B	29	30	80	8	3
	6	Int.	□	0670L060B	59	60	110	8	4
	11	Int.	□	0670L090B	89	90	140	8	4
	15	Int.	□	0670L120B	119	120	170	8	4
	20	Int.	□	0670L150B	149	150	200	8	4
6.8	2	Int.	●	0680L030B	29	30	80	8	3
	6	Int.	●	0680L060B	59	60	110	8	4
	11	Int.	●	0680L090B	89	90	140	8	4
	15	Int.	●	0680L120B	119	120	170	8	4
	19	Int.	●	0680L150B	149	150	200	8	4
6.9	2	Int.	□	0690L030B	29	30	80	8	3
	6	Int.	□	0690L060B	59	60	110	8	4
	10	Int.	□	0690L090B	89	90	140	8	4
	15	Int.	□	0690L120B	119	120	170	8	4
	19	Int.	□	0690L150B	149	150	200	8	4
7.0	2	Int.	●	0700L030B	29	30	80	8	3
	6	Int.	●	0700L060B	59	60	110	8	4
	10	Int.	●	0700L090B	89	90	140	8	4
	14	Int.	●	0700L120B	119	120	170	8	4
	19	Int.	●	0700L150B	149	150	200	8	4
7.1	2	Int.	□	0710L030B	29.5	30	80	8	3
	6	Int.	□	0710L060B	59.5	60	110	8	4
	10	Int.	□	0710L090B	89.5	90	140	8	4
	14	Int.	□	0710L120B	119.5	120	170	8	4
	19	Int.	□	0710L150B	149.5	150	200	8	4
7.2	2	Int.	□	0720L030B	29.5	30	80	8	3
	6	Int.	□	0720L060B	59.5	60	110	8	4
	10	Int.	□	0720L090B	89.5	90	140	8	4
	14	Int.	□	0720L120B	119.5	120	170	8	4
	18	Int.	□	0720L150B	149.5	150	200	8	4
25	Int.	□	0720L200B	199.5	200	250	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
7.3	2	Int.	□	MHS0730L030B	29.5	30	80	8	3
	6	Int.	□	0730L060B	59.5	60	110	8	4
	10	Int.	□	0730L090B	89.5	90	140	8	4
	14	Int.	□	0730L120B	119.5	120	170	8	4
	18	Int.	□	0730L150B	149.5	150	200	8	4
	25	Int.	□	0730L200B	199.5	200	250	8	4
7.4	1	Int.	□	0740L030B	29.5	30	80	8	3
	6	Int.	□	0740L060B	59.5	60	110	8	4
	10	Int.	□	0740L090B	89.5	90	140	8	4
	14	Int.	□	0740L120B	119.5	120	170	8	4
	18	Int.	□	0740L150B	149.5	150	200	8	4
	24	Int.	□	0740L200B	199.5	200	250	8	4
7.5	1	Int.	●	0750L030B	29.5	30	80	8	3
	5	Int.	●	0750L060B	59.5	60	110	8	4
	9	Int.	●	0750L090B	89.5	90	140	8	4
	13	Int.	●	0750L120B	119.5	120	170	8	4
	17	Int.	●	0750L150B	149.5	150	200	8	4
	24	Int.	●	0750L200B	199.5	200	250	8	4
7.6	1	Int.	□	0760L030B	30	30	80	8	3
	5	Int.	□	0760L060B	60	60	110	8	4
	9	Int.	□	0760L090B	90	90	140	8	4
	13	Int.	□	0760L120B	120	120	170	8	4
	17	Int.	□	0760L150B	150	150	200	8	4
	24	Int.	□	0760L200B	200	200	250	8	4
7.7	1	Int.	□	0770L030B	30	30	80	8	3
	5	Int.	□	0770L060B	60	60	110	8	4
	9	Int.	□	0770L090B	90	90	140	8	4
	13	Int.	□	0770L120B	120	120	170	8	4
	17	Int.	□	0770L150B	150	150	200	8	4
	23	Int.	□	0770L200B	200	200	250	8	4
7.8	1	Int.	●	0780L030B	30	30	80	8	3
	5	Int.	●	0780L060B	60	60	110	8	4
	9	Int.	●	0780L090B	90	90	140	8	4
	13	Int.	●	0780L120B	120	120	170	8	4
	17	Int.	●	0780L150B	150	150	200	8	4
	23	Int.	●	0780L200B	200	200	250	8	4
7.9	1	Int.	□	0790L030B	30	30	80	8	3
	5	Int.	□	0790L060B	60	60	110	8	4
	9	Int.	□	0790L090B	90	90	140	8	4
	13	Int.	□	0790L120B	120	120	170	8	4
	16	Int.	□	0790L150B	150	150	200	8	4
	23	Int.	□	0790L200B	200	200	250	8	4
7.9	1	Int.	□	0790L030B	30	30	80	8	3
	5	Int.	□	0790L060B	60	60	110	8	4
	9	Int.	□	0790L090B	90	90	140	8	4
	13	Int.	□	0790L120B	120	120	170	8	4
	16	Int.	□	0790L150B	150	150	200	8	4
	29	Int.	□	0790L250B	250	250	300	8	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.0	1	Int.	●	MHS0800L030B	30	30	80	8	3
	5	Int.	●	0800L060B	60	60	110	8	4
	9	Int.	●	0800L090B	90	90	140	8	4
	12	Int.	●	0800L120B	120	120	170	8	4
	16	Int.	●	0800L150B	150	150	200	8	4
	22	Int.	●	0800L200B	200	200	250	8	4
	29	Int.	●	0800L250B	250	250	300	8	4
	8.1	2	Int.	□	0810L040B	38.5	40	100	10
8		Int.	□	0810L090B	88.5	90	150	10	4
12		Int.	□	0810L120B	118.5	120	180	10	4
16		Int.	□	0810L150B	148.5	150	210	10	4
22		Int.	□	0810L200B	198.5	200	260	10	4
28		Int.	□	0810L250B	248.5	250	310	10	4
8.2	2	Int.	□	0820L040B	38.5	40	100	10	3
	8	Int.	□	0820L090B	88.5	90	150	10	4
	12	Int.	□	0820L120B	118.5	120	180	10	4
	16	Int.	□	0820L150B	148.5	150	210	10	4
	22	Int.	□	0820L200B	198.5	200	260	10	4
	28	Int.	□	0820L250B	248.5	250	310	10	4
8.3	2	Int.	□	0830L040B	38.5	40	100	10	3
	8	Int.	□	0830L090B	88.5	90	150	10	4
	12	Int.	□	0830L120B	118.5	120	180	10	4
	15	Int.	□	0830L150B	148.5	150	210	10	4
	21	Int.	□	0830L200B	198.5	200	260	10	4
	27	Int.	□	0830L250B	248.5	250	310	10	4
8.4	2	Int.	□	0840L040B	38.5	40	100	10	3
	8	Int.	□	0840L090B	88.5	90	150	10	4
	12	Int.	□	0840L120B	118.5	120	180	10	4
	15	Int.	□	0840L150B	148.5	150	210	10	4
	21	Int.	□	0840L200B	198.5	200	260	10	4
	27	Int.	□	0840L250B	248.5	250	310	10	4
8.5	2	Int.	●	0850L040B	38.5	40	100	10	3
	8	Int.	●	0850L090B	88.5	90	150	10	4
	11	Int.	●	0850L120B	118.5	120	180	10	4
	15	Int.	●	0850L150B	148.5	150	210	10	4
	21	Int.	●	0850L200B	198.5	200	260	10	4
	27	Int.	●	0850L250B	248.5	250	310	10	4
8.6	2	Int.	□	0860L040B	39	40	100	10	3
	8	Int.	□	0860L090B	89	90	150	10	4
	11	Int.	□	0860L120B	119	120	180	10	4
	15	Int.	□	0860L150B	149	150	210	10	4
	21	Int.	□	0860L200B	199	200	260	10	4
	26	Int.	□	0860L250B	249	250	310	10	4
8.7	2	Int.	□	0870L040B	39	40	100	10	3
	8	Int.	□	0870L090B	89	90	150	10	4
	11	Int.	□	0870L120B	119	120	180	10	4
	15	Int.	□	0870L150B	149	150	210	10	4
	20	Int.	□	0870L200B	199	200	260	10	4
	26	Int.	□	0870L250B	249	250	310	10	4

SOLID CARBIDE DRILLS FOR DIE & MOULD MACHINING

MHS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.8	2	Int.	●	MHS0880L040B	39	40	100	10	3
	8	Int.	●	0880L090B	89	90	150	10	4
	11	Int.	●	0880L120B	119	120	180	10	4
	14	Int.	●	0880L150B	149	150	210	10	4
	20	Int.	●	0880L200B	199	200	260	10	4
	26	Int.	●	0880L250B	249	250	310	10	4
8.9	2	Int.	□	0890L040B	39	40	100	10	3
	7	Int.	□	0890L090B	89	90	150	10	4
	11	Int.	□	0890L120B	119	120	180	10	4
	14	Int.	□	0890L150B	149	150	210	10	4
	20	Int.	□	0890L200B	199	200	260	10	4
	25	Int.	□	0890L250B	249	250	310	10	4
9.0	2	Int.	●	0900L040B	39	40	100	10	3
	7	Int.	●	0900L090B	89	90	150	10	4
	11	Int.	●	0900L120B	119	120	180	10	4
	14	Int.	●	0900L150B	149	150	210	10	4
	20	Int.	●	0900L200B	199	200	260	10	4
	25	Int.	●	0900L250B	249	250	310	10	4
9.1	2	Int.	□	0910L040B	39.5	40	100	10	3
	7	Int.	□	0910L090B	89.5	90	150	10	4
	11	Int.	□	0910L120B	119.5	120	180	10	4
	14	Int.	□	0910L150B	149.5	150	210	10	4
	19	Int.	□	0910L200B	199.5	200	260	10	4
	30	Int.	□	0910L300B	299.5	300	360	10	4
9.2	2	Int.	□	0920L040B	39.5	40	100	10	3
	7	Int.	□	0920L090B	89.5	90	150	10	4
	10	Int.	□	0920L120B	119.5	120	180	10	4
	14	Int.	□	0920L150B	149.5	150	210	10	4
	19	Int.	□	0920L200B	199.5	200	260	10	4
	30	Int.	□	0920L300B	299.5	300	360	10	4
9.3	2	Int.	□	0930L040B	39.5	40	100	10	3
	7	Int.	□	0930L090B	89.5	90	150	10	4
	10	Int.	□	0930L120B	119.5	120	180	10	4
	14	Int.	□	0930L150B	149.5	150	210	10	4
	19	Int.	□	0930L200B	199.5	200	260	10	4
	30	Int.	□	0930L300B	299.5	300	360	10	4
9.4	2	Int.	□	0940L040B	39.5	40	100	10	3
	7	Int.	□	0940L090B	89.5	90	150	10	4
	10	Int.	□	0940L120B	119.5	120	180	10	4
	13	Int.	□	0940L150B	149.5	150	210	10	4
	19	Int.	□	0940L200B	199.5	200	260	10	4
	29	Int.	□	0940L300B	299.5	300	360	10	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
9.5	2	Int.	●	MHS0950L040B	39.5	40	100	10	3
	7	Int.	●	0950L090B	89.5	90	150	10	4
	10	Int.	●	0950L120B	119.5	120	180	10	4
	13	Int.	●	0950L150B	149.5	150	210	10	4
	18	Int.	●	0950L200B	199.5	200	260	10	4
	24	Int.	●	0950L250B	249.5	250	310	10	4
	29	Int.	●	0950L300B	299.5	300	360	10	4
	9.6	2	Int.	□	0960L040B	40	40	100	10
7		Int.	□	0960L090B	90	90	150	10	4
10		Int.	□	0960L120B	120	120	180	10	4
13		Int.	□	0960L150B	150	150	210	10	4
18		Int.	□	0960L200B	200	200	260	10	4
24		Int.	□	0960L250B	250	250	310	10	4
29		Int.	□	0960L300B	300	300	360	10	4
9.7		2	Int.	□	0970L040B	40	40	100	10
	7	Int.	□	0970L090B	90	90	150	10	4
	10	Int.	□	0970L120B	120	120	180	10	4
	13	Int.	□	0970L150B	150	150	210	10	4
	18	Int.	□	0970L200B	200	200	260	10	4
	23	Int.	□	0970L250B	250	250	310	10	4
	28	Int.	□	0970L300B	300	300	360	10	4
	9.8	2	Int.	●	0980L040B	40	40	100	10
7		Int.	●	0980L090B	90	90	150	10	4
10		Int.	●	0980L120B	120	120	180	10	4
13		Int.	●	0980L150B	150	150	210	10	4
18		Int.	●	0980L200B	200	200	260	10	4
23		Int.	●	0980L250B	250	250	310	10	4
28		Int.	●	0980L300B	300	300	360	10	4
9.9		2	Int.	□	0990L040B	40	40	100	10
	7	Int.	□	0990L090B	90	90	150	10	4
	10	Int.	□	0990L120B	120	120	180	10	4
	13	Int.	□	0990L150B	150	150	210	10	4
	18	Int.	□	0990L200B	200	200	260	10	4
	23	Int.	□	0990L250B	250	250	310	10	4
	28	Int.	□	0990L300B	300	300	360	10	4
	10.0	1	Int.	●	1000L040B	40	40	100	10
6		Int.	●	1000L090B	90	90	150	10	4
9		Int.	●	1000L120B	120	120	180	10	4
12		Int.	●	1000L150B	150	150	210	10	4
17		Int.	●	1000L200B	200	200	260	10	4
22		Int.	●	1000L250B	250	250	310	10	4
27		Int.	●	1000L300B	300	300	360	10	4
10.1		1	Int.	□	1010L040B	38.5	40	100	12
	6	Int.	□	1010L090B	88.5	90	150	12	4
	9	Int.	□	1010L120B	118.5	120	180	12	4
	12	Int.	□	1010L150B	148.5	150	210	12	4
	17	Int.	□	1010L200B	198.5	200	260	12	4
	22	Int.	□	1010L250B	248.5	250	310	12	4
	27	Int.	□	1010L300B	298.5	300	360	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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.2	1	Int.	□	MHS1020L040B	38.5	40	100	12	3
	6	Int.	□	1020L090B	88.5	90	150	12	4
	9	Int.	□	1020L120B	118.5	120	180	12	4
	12	Int.	□	1020L150B	148.5	150	210	12	4
	17	Int.	□	1020L200B	198.5	200	260	12	4
	22	Int.	□	1020L250B	248.5	250	310	12	4
	27	Int.	□	1020L300B	298.5	300	360	12	4
10.3	1	Int.	□	1030L040B	38.5	40	100	12	3
	6	Int.	□	1030L090B	88.5	90	150	12	4
	9	Int.	□	1030L120B	118.5	120	180	12	4
	12	Int.	□	1030L150B	148.5	150	210	12	4
	17	Int.	□	1030L200B	198.5	200	260	12	4
	22	Int.	□	1030L250B	248.5	250	310	12	4
	26	Int.	□	1030L300B	298.5	300	360	12	4
10.4	1	Int.	□	1040L040B	38.5	40	100	12	3
	6	Int.	□	1040L090B	88.5	90	150	12	4
	9	Int.	□	1040L120B	118.5	120	180	12	4
	12	Int.	□	1040L150B	148.5	150	210	12	4
	17	Int.	□	1040L200B	198.5	200	260	12	4
	21	Int.	□	1040L250B	248.5	250	310	12	4
	26	Int.	□	1040L300B	298.5	300	360	12	4
10.5	1	Int.	●	1050L040B	38.5	40	100	12	3
	6	Int.	●	1050L090B	88.5	90	150	12	4
	9	Int.	●	1050L120B	118.5	120	180	12	4
	12	Int.	●	1050L150B	148.5	150	210	12	4
	16	Int.	●	1050L200B	198.5	200	260	12	4
	21	Int.	●	1050L250B	248.5	250	310	12	4
	26	Int.	●	1050L300B	298.5	300	360	12	4
10.6	1	Int.	□	1060L040B	39	40	100	12	3
	6	Int.	□	1060L090B	89	90	150	12	4
	9	Int.	□	1060L120B	119	120	180	12	4
	12	Int.	□	1060L150B	149	150	210	12	4
	16	Int.	□	1060L200B	199	200	260	12	4
	21	Int.	□	1060L250B	249	250	310	12	4
	26	Int.	□	1060L300B	299	300	360	12	4
10.7	1	Int.	□	1070L040B	39	40	100	12	3
	6	Int.	□	1070L090B	89	90	150	12	4
	9	Int.	□	1070L120B	119	120	180	12	4
	11	Int.	□	1070L150B	149	150	210	12	4
	16	Int.	□	1070L200B	199	200	260	12	4
	21	Int.	□	1070L250B	249	250	310	12	4
	25	Int.	□	1070L300B	299	300	360	12	4
10.8	1	Int.	●	1080L040B	39	40	100	12	3
	6	Int.	●	1080L090B	89	90	150	12	4
	9	Int.	●	1080L120B	119	120	180	12	4
	11	Int.	●	1080L150B	149	150	210	12	4
	16	Int.	●	1080L200B	199	200	260	12	4
	21	Int.	●	1080L250B	249	250	310	12	4
	25	Int.	●	1080L300B	299	300	360	12	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.9	1	Int.	□	MHS1090L040B	39	40	100	12	3
	6	Int.	□	1090L090B	89	90	150	12	4
	8	Int.	□	1090L120B	119	120	180	12	4
	11	Int.	□	1090L150B	149	150	210	12	4
	16	Int.	□	1090L200B	199	200	260	12	4
	20	Int.	□	1090L250B	249	250	310	12	4
	25	Int.	□	1090L300B	299	300	360	12	4
11.0	1	Int.	●	1100L040B	39	40	100	12	3
	6	Int.	●	1100L090B	89	90	150	12	4
	8	Int.	●	1100L120B	119	120	180	12	4
	11	Int.	●	1100L150B	149	150	210	12	4
	16	Int.	●	1100L200B	199	200	260	12	4
	20	Int.	●	1100L250B	249	250	310	12	4
	25	Int.	●	1100L300B	299	300	360	12	4
11.1	1	Int.	□	1110L040B	39.5	40	100	12	3
	6	Int.	□	1110L090B	89.5	90	150	12	4
	8	Int.	□	1110L120B	119.5	120	180	12	4
	11	Int.	□	1110L150B	149.5	150	210	12	4
	15	Int.	□	1110L200B	199.5	200	260	12	4
	20	Int.	□	1110L250B	249.5	250	310	12	4
	24	Int.	□	1110L300B	299.5	300	360	12	4
11.2	1	Int.	□	1120L040B	39.5	40	100	12	3
	5	Int.	□	1120L090B	89.5	90	150	12	4
	8	Int.	□	1120L120B	119.5	120	180	12	4
	11	Int.	□	1120L150B	149.5	150	210	12	4
	15	Int.	□	1120L200B	199.5	200	260	12	4
	20	Int.	□	1120L250B	249.5	250	310	12	4
	24	Int.	□	1120L300B	299.5	300	360	12	4
11.3	1	Int.	□	1130L040B	39.5	40	100	12	3
	5	Int.	□	1130L090B	89.5	90	150	12	4
	8	Int.	□	1130L120B	119.5	120	180	12	4
	11	Int.	□	1130L150B	149.5	150	210	12	4
	15	Int.	□	1130L200B	199.5	200	260	12	4
	20	Int.	□	1130L250B	249.5	250	310	12	4
	24	Int.	□	1130L300B	299.5	300	360	12	4
11.4	1	Int.	□	1140L040B	39.5	40	100	12	3
	5	Int.	□	1140L090B	89.5	90	150	12	4
	8	Int.	□	1140L120B	119.5	120	180	12	4
	11	Int.	□	1140L150B	149.5	150	210	12	4
	15	Int.	□	1140L200B	199.5	200	260	12	4
	19	Int.	□	1140L250B	249.5	250	310	12	4
	24	Int.	□	1140L300B	299.5	300	360	12	4
11.5	1	Int.	●	1150L040B	39.5	40	100	12	3
	5	Int.	●	1150L090B	89.5	90	150	12	4
	8	Int.	●	1150L120B	119.5	120	180	12	4
	10	Int.	●	1150L150B	149.5	150	210	12	4
	15	Int.	●	1150L200B	199.5	200	260	12	4
	19	Int.	●	1150L250B	249.5	250	310	12	4
	24	Int.	●	1150L300B	299.5	300	360	12	4

DRILLING

SOLID CARBIDE DRILLS FOR DIE & MOULD MACHINING

MHS WSTAR DRILLS

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
11.6	1	Int.	<input type="checkbox"/>	MHS1160L040B	40	40	100	12	3
	5	Int.	<input type="checkbox"/>	1160L090B	90	90	150	12	4
	8	Int.	<input type="checkbox"/>	1160L120B	120	120	180	12	4
	10	Int.	<input type="checkbox"/>	1160L150B	150	150	210	12	4
	15	Int.	<input type="checkbox"/>	1160L200B	200	200	260	12	4
	19	Int.	<input type="checkbox"/>	1160L250B	250	250	310	12	4
	23	Int.	<input type="checkbox"/>	1160L300B	300	300	360	12	4
11.7	1	Int.	<input type="checkbox"/>	1170L040B	40	40	100	12	3
	5	Int.	<input type="checkbox"/>	1170L090B	90	90	150	12	4
	8	Int.	<input type="checkbox"/>	1170L120B	120	120	180	12	4
	10	Int.	<input type="checkbox"/>	1170L150B	150	150	210	12	4
	15	Int.	<input type="checkbox"/>	1170L200B	200	200	260	12	4
	19	Int.	<input type="checkbox"/>	1170L250B	250	250	310	12	4
	23	Int.	<input type="checkbox"/>	1170L300B	300	300	360	12	4
11.8	1	Int.	<input checked="" type="checkbox"/>	1180L040B	40	40	100	12	3
	5	Int.	<input checked="" type="checkbox"/>	1180L090B	90	90	150	12	4
	8	Int.	<input checked="" type="checkbox"/>	1180L120B	120	120	180	12	4
	10	Int.	<input checked="" type="checkbox"/>	1180L150B	150	150	210	12	4
	14	Int.	<input checked="" type="checkbox"/>	1180L200B	200	200	260	12	4
	19	Int.	<input checked="" type="checkbox"/>	1180L250B	250	250	310	12	4
	23	Int.	<input checked="" type="checkbox"/>	1180L300B	300	300	360	12	4
11.9	1	Int.	<input type="checkbox"/>	1190L040B	40	40	100	12	3
	5	Int.	<input type="checkbox"/>	1190L090B	90	90	150	12	4
	8	Int.	<input type="checkbox"/>	1190L120B	120	120	180	12	4
	10	Int.	<input type="checkbox"/>	1190L150B	150	150	210	12	4
	14	Int.	<input type="checkbox"/>	1190L200B	200	200	260	12	4
	19	Int.	<input type="checkbox"/>	1190L250B	250	250	310	12	4
	23	Int.	<input type="checkbox"/>	1190L300B	300	300	360	12	4
12.0	1	Int.	<input checked="" type="checkbox"/>	1200L040B	40	40	100	12	3
	5	Int.	<input checked="" type="checkbox"/>	1200L090B	90	90	150	12	4
	7	Int.	<input checked="" type="checkbox"/>	1200L120B	120	120	180	12	4
	10	Int.	<input checked="" type="checkbox"/>	1200L150B	150	150	210	12	4
	14	Int.	<input checked="" type="checkbox"/>	1200L200B	200	200	260	12	4
	18	Int.	<input checked="" type="checkbox"/>	1200L250B	250	250	310	12	4
	22	Int.	<input checked="" type="checkbox"/>	1200L300B	300	300	360	12	4

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

DRILLING

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

RECOMMENDED CUTTING CONDITIONS

Work Material	Mild Steel ($\leq 180\text{HB}$), Carbon steel, Alloy steel (180–280HB)				Ferritic, Precipitation hardening stainless steel ($>200\text{HB}$)			
	AISI 1010, AISI 1045, AISI 4140 etc				AISI 431, AISI 420 etc			
Dia. (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

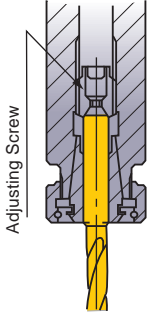
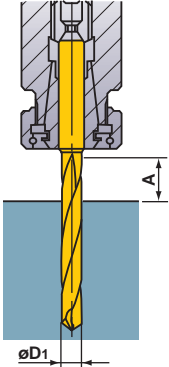
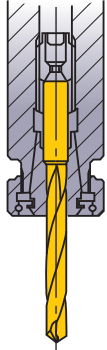
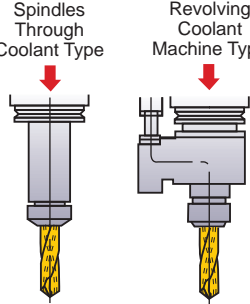
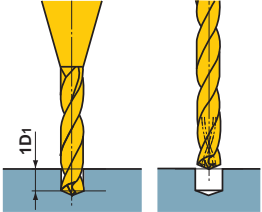
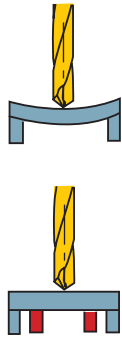
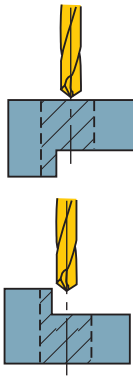
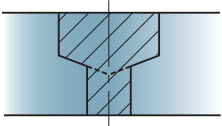
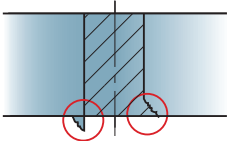
Work Material	Pre-hardened steel (35–45HRC), Alloy tool steel (≤ 350)				Hardened Steel (40–55HRC), Precipitation hardening stainless steel ($<450\text{HB}$)			
	AISI P21, AISI P20, ASTM H13, AISI L6 etc				AISI 431, AISI 420, S17400, S17700 etc			
Dia. (mm)	Cutting Speed (m/min)	Revolution (min^{-1})	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. (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.

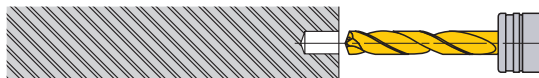
OPERATIONAL GUIDANCE

<p>Drill Holding</p>  <p>Adjusting Screw</p> <p>Thrust bearing type collet chuck holds the drill securely.</p>	<p>Drill Length</p>  <p>ϕD_1</p> <p>$A \geq D_1 \times 2$</p>	<p>Drill Installation</p>  <p>Do not clamp on the flutes.</p>	<p>Coolant Method</p>  <p>Spindles Through Coolant Type</p> <p>Revolving Coolant Machine Type</p> <p>Coolant pressure is approx. 1.5MPa-7MPa Recommended coolant pressure: $\geq 3\text{MPa}$</p>
<p>Drill Installation</p>  <p>$1D_1$</p> <ol style="list-style-type: none"> 1) Make approx. $1D_1$ (D_1: 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. 	<p>Coolant Handling</p> <ol style="list-style-type: none"> 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. 	<p>Thin Workpiece</p>  <p>If Bending Occurs</p> <p>Support the Workpiece</p>	<p>Interrupted Cutting</p>  <p>One Process</p> <p>① Lower the feed when drilling the interrupted part.</p> <p>Requires Prior Machining</p> <p>① Spot face with an end mill prior to drilling.</p>
<p>Stepped Holes</p>  <ol style="list-style-type: none"> ① Divide the two processes. ② Drill the larger hole first. <p>*A tool for machining both chamfer and spot face can be produced to order.</p>	<p>Burring and Workpiece Chipping</p>  <ol style="list-style-type: none"> ① Lower the feed rate by 50% at the end of through cutting. ② Change the point angle. 		

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

FLAT FACE DRILLING ●Drilling a blind hole

1. Drilling a pilot hole



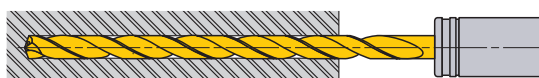
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



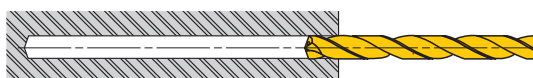
- ① Penetrate the guide hole at low revolution. (Revolution 1000min^{-1} , feed rate $0.2\text{--}0.3\text{mm/rev}$)
- ② Stop the long type drill $1\text{--}3\text{mm}$ short of the guide hole bottom.

3. Drill the deep hole



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

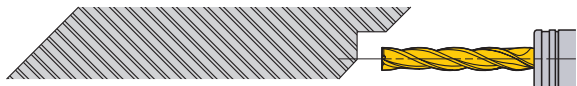
4. Drill retraction



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

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

1. Spot facing



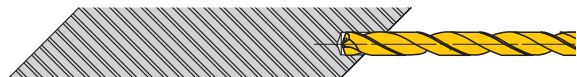
- ① Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



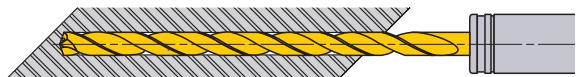
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



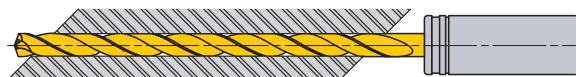
- ① Penetrate the guide hole at a low revolution. (Revolution 1000min^{-1} , feed rate $0.2\text{--}0.3\text{mm/rev}$)
- ② Stop the long type drill $0.5\text{--}1\text{mm}$ short of the guide hole bottom.

4. Drill the deep hole



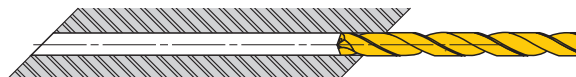
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



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

6. Drill retraction





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

DRILLING(SOLID CARBIDE)

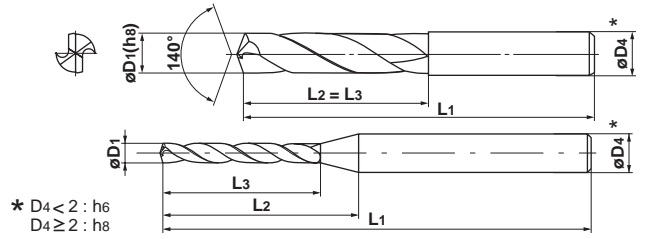
MZE/MZS

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

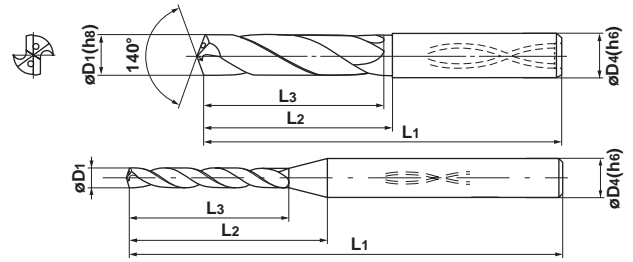
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(MZE only)	◎(MZE:○)	◎	○	○

	D1<2	2≤D1≤3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤20
 MZE	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$
 MZS	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$
	$\begin{matrix} 0 \\ -0.006 \end{matrix}$	$\begin{matrix} 0 \\ -0.008 \end{matrix}$	$\begin{matrix} 0 \\ -0.009 \end{matrix}$	$\begin{matrix} 0 \\ -0.011 \end{matrix}$	$\begin{matrix} 0 \\ -0.013 \end{matrix}$	$\begin{matrix} 0 \\ -0.013 \end{matrix}$

MZE (External coolant)



MZS (Internal coolant)



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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HT10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
1.0	2	Ext.	●		MZE0100SB	6	8	55	2.0
	5	Int.	●		MZS0100LB	11	15	55	3.0
	12	Int.	□		MZS0100XB	23	27	55	3.0
1.1	2	Ext.	●		MZE0110SB	7	9	55	2.0
	5	Int.	●		MZS0110LB	17	21	55	3.0
	12	Int.	□		MZS0110XB	23	27	55	3.0
1.2	2	Ext.	●		MZE0120SB	8	9	55	2.0
	5	Int.	●		MZS0120LB	17	20	55	3.0
	12	Int.	□		MZS0120XB	23	26	55	3.0
1.3	2	Ext.	●		MZE0130SB	8	9	55	2.0
	5	Int.	●		MZS0130LB	17	20	55	3.0
	12	Int.	□		MZS0130XB	23	26	55	3.0
1.4	2	Ext.	●		MZE0140SB	9	10	55	2.0
	5	Int.	●		MZS0140LB	17	20	55	3.0
	12	Int.	□		MZS0140XB	23	26	55	3.0
1.5	2	Ext.	●		MZE0150SB	9	10	55	2.0
	5	Int.	●		MZS0150LB	17	20	55	3.0
	12	Int.	□		MZS0150XB	23	26	55	3.0
1.6	2	Ext.	●		MZE0160SB	10	10	55	2.0
	5	Int.	●		MZS0160LB	22	25	68	3.0
	12	Int.	□		MZS0160XB	30	33	68	3.0
1.7	2	Ext.	●		MZE0170SB	10	10	55	2.0
	5	Int.	●		MZS0170LB	22	24	68	3.0
	12	Int.	□		MZS0170XB	30	32	68	3.0
1.8	2	Ext.	●		MZE0180SB	11	11	55	2.0
	5	Int.	●		MZS0180LB	22	24	68	3.0
	12	Int.	□		MZS0180XB	30	32	68	3.0
1.9	2	Ext.	●		MZE0190SB	11	11	55	2.0
	5	Int.	●		MZS0190LB	22	24	68	3.0
	12	Int.	□		MZS0190XB	30	32	68	3.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HT10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
2.0	2	Ext.	●		MZE0200SA	12	12	55	2.0
	3	Ext.	●		MZE0200MA	16	16	55	2.0
	3	Int.	●		MZS0200MB	16	18	62	3.0
	5	Int.	●		MZS0200LB	22	24	68	3.0
2.1	12	Int.	□		MZS0200XB	30	32	68	3.0
	2	Ext.	●		MZE0210SA	12	12	55	2.1
	3	Ext.	●		MZE0210MA	16	16	55	2.1
2.2	3	Int.	●		MZS0210MB	20	22	66	3.0
	5	Int.	●		MZS0210LB	28	30	74	3.0
	12	Int.	□		MZS0210XB	38	40	74	3.0
	2	Ext.	●		MZE0220SA	13	13	55	2.2
2.3	3	Ext.	●		MZE0220MA	18	18	55	2.2
	3	Int.	●		MZS0220MB	20	21	66	3.0
	5	Int.	●		MZS0220LB	28	29	74	3.0
	12	Int.	□		MZS0220XB	38	39	74	3.0
2.4	2	Ext.	●		MZE0230SA	13	13	55	2.3
	3	Ext.	●		MZE0230MA	18	18	55	2.3
	3	Int.	●		MZS0230MB	20	21	66	3.0
	5	Int.	●		MZS0230LB	28	29	74	3.0
2.5	12	Int.	□		MZS0230XB	38	39	74	3.0
	2	Ext.	●		MZE0240SA	16	16	55	2.4
	3	Ext.	●		MZE0240MA	20	20	55	2.4
	3	Int.	●		MZS0240MB	20	21	66	3.0
2.5	5	Int.	●		MZS0240LB	28	29	74	3.0
	12	Int.	□		MZS0240XB	38	39	74	3.0
	2	Ext.	●		MZE0250SA	16	16	55	2.5
	3	Ext.	●		MZE0250MA	20	20	55	2.5
2.5	3	Int.	●		MZS0250MB	20	21	66	3.0
	5	Int.	●		MZS0250LB	28	29	74	3.0
	12	Int.	□		MZS0250XB	38	39	74	3.0

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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length	Neck Length	Overall Length	Shank Dia.
						L3	L2	L1	D4
2.6	2	Ext.	●		MZE0260SA	16	16	55	2.6
	3	Ext.	●		MZE0260MA	20	20	55	2.6
	3	Int.	●		MZS0260MB	24	24	72	3.0
	5	Int.	●		MZS0260LB	33	33	81	3.0
	12	Int.	□		MZS0260XB	45	45	81	3.0
2.7	2	Ext.	●		MZE0270SA	16	16	55	2.7
	3	Ext.	●		MZE0270MA	20	20	55	2.7
	3	Int.	●		MZS0270MB	24	24	72	3.0
	5	Int.	●		MZS0270LB	33	33	81	3.0
	12	Int.	□		MZS0270XB	45	45	81	3.0
2.8	2	Ext.	●		MZE0280SA	16	16	55	2.8
	3	Ext.	●		MZE0280MA	21	21	60	2.8
	3	Int.	●		MZS0280MB	24	24	72	3.0
	5	Int.	●		MZS0280LB	33	33	81	3.0
	12	Int.	□		MZS0280XB	45	45	81	3.0
2.9	2	Ext.	●		MZE0290SA	16	16	55	2.9
	3	Ext.	●		MZE0290MA	21	21	60	2.9
	3	Int.	●		MZS0290MB	24	24	72	3.0
	5	Int.	●		MZS0290LB	33	33	81	3.0
	12	Int.	□		MZS0290XB	45	45	81	3.0
3.0	2	Ext.	●	▲	MZE0300SA	16	16	55	3.0
	3	Ext.	●	▲	MZE0300MA	21	21	60	3.0
	3	Int.	●		MZS0300MB	24	24	72	3.0
	5	Int.	●		MZS0300LB	33	33	81	3.0
3.1	2	Ext.	●	▲	MZE0310SA	18	18	55	3.1
	3	Ext.	●	▲	MZE0310MA	24	24	60	3.1
	3	Int.	●		MZS0310MB	28	28	76	4.0
	5	Int.	●		MZS0310LB	39	39	87	4.0
3.2	2	Ext.	●	▲	MZE0320SA	18	18	55	3.2
	3	Ext.	●	▲	MZE0320MA	24	24	60	3.2
	3	Int.	●		MZS0320MB	28	28	76	4.0
	5	Int.	●		MZS0320LB	39	39	87	4.0
3.3	2	Ext.	●	▲	MZE0330SA	18	18	55	3.3
	3	Ext.	●	▲	MZE0330MA	24	24	60	3.3
	3	Int.	●		MZS0330MB	28	28	76	4.0
	5	Int.	●		MZS0330LB	39	39	87	4.0
3.4	2	Ext.	●	▲	MZE0340SA	20	20	55	3.4
	3	Ext.	●	▲	MZE0340MA	24	24	60	3.4
	3	Int.	●		MZS0340MB	28	28	76	4.0
	5	Int.	●		MZS0340LB	39	39	87	4.0
3.5	2	Ext.	●	▲	MZE0350SA	20	20	55	3.5
	3	Ext.	●	▲	MZE0350MA	24	24	60	3.5
	3	Int.	●		MZS0350MB	28	28	76	4.0
	5	Int.	●		MZS0350LB	39	39	87	4.0
3.6	2	Ext.	●	▲	MZE0360SA	20	20	55	3.6
	3	Ext.	●	▲	MZE0360MA	27	27	60	3.6
	3	Int.	●		MZS0360MB	32	32	80	4.0
	5	Int.	●		MZS0360LB	44	44	92	4.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length	Neck Length	Overall Length	Shank Dia.
						L3	L2	L1	D4
3.7	2	Ext.	●	▲	MZE0370SA	20	20	55	3.7
	3	Ext.	●	▲	MZE0370MA	27	27	60	3.7
	3	Int.	●		MZS0370MB	32	32	80	4.0
	5	Int.	●		MZS0370LB	44	44	92	4.0
3.8	2	Ext.	●	▲	MZE0380SA	22	22	55	3.8
	3	Ext.	●	▲	MZE0380MA	27	27	60	3.8
	3	Int.	●		MZS0380MB	32	32	80	4.0
	5	Int.	●		MZS0380LB	44	44	92	4.0
3.9	2	Ext.	●	▲	MZE0390SA	22	22	55	3.9
	3	Ext.	●	▲	MZE0390MA	27	27	60	3.9
	3	Int.	●		MZS0390MB	32	32	80	4.0
	5	Int.	●		MZS0390LB	44	44	92	4.0
4.0	2	Ext.	●	▲	MZE0400SA	22	22	55	4.0
	3	Ext.	●	▲	MZE0400MA	27	27	60	4.0
	3	Int.	●		MZS0400MB	32	32	80	4.0
	5	Int.	●		MZS0400LB	44	44	92	4.0
4.1	2	Ext.	●	▲	MZE0410SA	22	22	55	4.1
	3	Ext.	●	▲	MZE0410MA	29	29	63	4.1
	3	Int.	●		MZS0410MB	36	36	86	5.0
	5	Int.	●		MZS0410LB	50	50	100	5.0
4.2	2	Ext.	●	▲	MZE0420SA	22	22	55	4.2
	3	Ext.	●	▲	MZE0420MA	29	29	63	4.2
	3	Int.	●		MZS0420MB	36	36	86	5.0
	5	Int.	●		MZS0420LB	50	50	100	5.0
4.3	2	Ext.	●	▲	MZE0430SA	24	24	58	4.3
	3	Ext.	●	▲	MZE0430MA	29	29	63	4.3
	3	Int.	●		MZS0430MB	36	36	86	5.0
	5	Int.	●		MZS0430LB	50	50	100	5.0
4.4	2	Ext.	●	▲	MZE0440SA	24	24	58	4.4
	3	Ext.	●	▲	MZE0440MA	29	29	63	4.4
	3	Int.	●		MZS0440MB	36	36	86	5.0
	5	Int.	●		MZS0440LB	50	50	100	5.0
4.5	2	Ext.	●	▲	MZE0450SA	24	24	58	4.5
	3	Ext.	●	▲	MZE0450MA	29	29	63	4.5
	3	Int.	●		MZS0450MB	36	36	86	5.0
	5	Int.	●		MZS0450LB	50	50	100	5.0
4.6	2	Ext.	●	▲	MZE0460SA	24	24	58	4.6
	3	Ext.	●	▲	MZE0460MA	32	32	68	4.6
	3	Int.	●		MZS0460MB	40	40	90	5.0
	5	Int.	●		MZS0460LB	55	55	105	5.0
4.7	2	Ext.	●	▲	MZE0470SA	24	24	58	4.7
	3	Ext.	●	▲	MZE0470MA	32	32	68	4.7
	3	Int.	●		MZS0470MB	40	40	90	5.0
	5	Int.	●		MZS0470LB	55	55	105	5.0
4.8	2	Ext.	●	▲	MZE0480SA	26	26	62	4.8
	3	Ext.	●	▲	MZE0480MA	32	32	68	4.8
	3	Int.	●		MZS0480MB	40	40	90	5.0
	5	Int.	●		MZS0480LB	55	55	105	5.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
4.9	2	Ext.	●	▲	MZE0490SA	26	26	62	4.9
	3	Ext.	●	▲	MZE0490MA	32	32	68	4.9
	3	Int.	●		MZS0490MB	40	40	90	5.0
	5	Int.	●		MZS0490LB	55	55	105	5.0
5.0	2	Ext.	●	▲	MZE0500SA	26	26	62	5.0
	3	Ext.	●	▲	MZE0500MA	32	32	68	5.0
	3	Int.	●		MZS0500MB	27.5	30	82	6.0
	5	Int.	●		MZS0500LB	44	48	100	6.0
5.1	2	Ext.	●	▲	MZE0510SA	26	26	62	5.1
	3	Ext.	●	▲	MZE0510MA	34	34	72	5.1
	3	Int.	●		MZS0510MB	27.5	30	82	6.0
	5	Int.	●		MZS0510LB	44	48	100	6.0
5.2	2	Ext.	●	▲	MZE0520SA	26	26	62	5.2
	3	Ext.	●	▲	MZE0520MA	34	34	72	5.2
	3	Int.	●		MZS0520MB	27.5	30	82	6.0
	5	Int.	●		MZS0520LB	44	48	100	6.0
5.3	2	Ext.	●	▲	MZE0530SA	26	26	62	5.3
	3	Ext.	●	▲	MZE0530MA	34	34	72	5.3
	3	Int.	●		MZS0530MB	27.5	30	82	6.0
	5	Int.	●		MZS0530LB	44	48	100	6.0
5.4	2	Ext.	●	▲	MZE0540SA	28	28	66	5.4
	3	Ext.	●	▲	MZE0540MA	34	34	72	5.4
	3	Int.	●		MZS0540MB	27.5	30	82	6.0
	5	Int.	●		MZS0540LB	44	48	100	6.0
5.5	2	Ext.	●	▲	MZE0550SA	28	28	66	5.5
	3	Ext.	●	▲	MZE0550MA	34	34	72	5.5
	3	Int.	●		MZS0550MB	27.5	30	82	6.0
	5	Int.	●		MZS0550LB	44	48	100	6.0
5.6	2	Ext.	●	▲	MZE0560SA	28	28	66	5.6
	3	Ext.	●	▲	MZE0560MA	36	36	74	5.6
	3	Int.	●		MZS0560MB	30	30	82	6.0
	5	Int.	●		MZS0560LB	48	48	100	6.0
5.7	2	Ext.	●	▲	MZE0570SA	28	28	66	5.7
	3	Ext.	●	▲	MZE0570MA	36	36	74	5.7
	3	Int.	●		MZS0570MB	30	30	82	6.0
	5	Int.	●		MZS0570LB	48	48	100	6.0
5.8	2	Ext.	●	▲	MZE0580SA	28	28	66	5.8
	3	Ext.	●	▲	MZE0580MA	36	36	74	5.8
	3	Int.	●		MZS0580MB	30	30	82	6.0
	5	Int.	●		MZS0580LB	48	48	100	6.0
5.9	2	Ext.	●	▲	MZE0590SA	28	28	66	5.9
	3	Ext.	●	▲	MZE0590MA	36	36	74	5.9
	3	Int.	●		MZS0590MB	30	30	82	6.0
	5	Int.	●		MZS0590LB	48	48	100	6.0
6.0	2	Ext.	●	▲	MZE0600SA	28	28	66	6.0
	3	Ext.	●	▲	MZE0600MA	41	41	81	6.0
	3	Int.	●		MZS0600MB	30	30	82	6.0
	5	Int.	●		MZS0600LB	48	48	100	6.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
6.1	2	Ext.	●	▲	MZE0610SA	31	31	70	6.1
	3	Ext.	●	▲	MZE0610MA	41	41	81	6.1
	3	Int.	●		MZS0610MB	32.5	35	88	7.0
	5	Int.	●		MZS0610LB	52	56	109	7.0
6.2	2	Ext.	●	▲	MZE0620SA	31	31	70	6.2
	3	Ext.	●	▲	MZE0620MA	41	41	81	6.2
	3	Int.	●		MZS0620MB	32.5	35	88	7.0
	5	Int.	●		MZS0620LB	52	56	109	7.0
6.3	2	Ext.	●	▲	MZE0630SA	31	31	70	6.3
	3	Ext.	●	▲	MZE0630MA	41	41	81	6.3
	3	Int.	●		MZS0630MB	32.5	35	88	7.0
	5	Int.	●		MZS0630LB	52	56	109	7.0
6.4	2	Ext.	●	▲	MZE0640SA	31	31	70	6.4
	3	Ext.	●	▲	MZE0640MA	41	41	81	6.4
	3	Int.	●		MZS0640MB	32.5	35	88	7.0
	5	Int.	●		MZS0640LB	52	56	109	7.0
6.5	2	Ext.	●	▲	MZE0650SA	31	31	70	6.5
	3	Ext.	●	▲	MZE0650MA	41	41	81	6.5
	3	Int.	●		MZS0650MB	32.5	35	88	7.0
	5	Int.	●		MZS0650LB	52	56	109	7.0
6.6	2	Ext.	●	▲	MZE0660SA	31	31	70	6.6
	3	Ext.	●	▲	MZE0660MA	43	43	83	6.6
	3	Int.	●		MZS0660MB	35	35	88	7.0
	5	Int.	●		MZS0660LB	56	56	109	7.0
6.7	2	Ext.	●	▲	MZE0670SA	31	31	70	6.7
	3	Ext.	●	▲	MZE0670MA	43	43	83	6.7
	3	Int.	●		MZS0670MB	35	35	88	7.0
	5	Int.	●		MZS0670LB	56	56	109	7.0
6.8	2	Ext.	●	▲	MZE0680SA	34	34	74	6.8
	3	Ext.	●	▲	MZE0680MA	43	43	83	6.8
	3	Int.	●		MZS0680MB	35	35	88	7.0
	5	Int.	●		MZS0680LB	56	56	109	7.0
6.9	2	Ext.	●	▲	MZE0690SA	34	34	74	6.9
	3	Ext.	●	▲	MZE0690MA	43	43	83	6.9
	3	Int.	●		MZS0690MB	35	35	88	7.0
	5	Int.	●		MZS0690LB	56	56	109	7.0
7.0	2	Ext.	●	▲	MZE0700SA	34	34	74	7.0
	3	Ext.	●	▲	MZE0700MA	43	43	83	7.0
	3	Int.	●		MZS0700MB	35	35	88	7.0
	5	Int.	●		MZS0700LB	56	56	109	7.0
7.1	2	Ext.	●	▲	MZE0710SA	34	34	74	7.1
	3	Ext.	●	▲	MZE0710MA	45	45	87	7.1
	3	Int.	●		MZS0710MB	37.5	40	94	8.0
	5	Int.	●		MZS0710LB	60	64	118	8.0
7.2	2	Ext.	●	▲	MZE0720SA	34	34	74	7.2
	3	Ext.	●	▲	MZE0720MA	45	45	87	7.2
	3	Int.	●		MZS0720MB	37.5	40	94	8.0
	5	Int.	●		MZS0720LB	60	64	118	8.0

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

● : Inventory maintained in Japan.

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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
7.3	2	Ext.	●	▲	MZE0730SA	34	34	74	7.3
	3	Ext.	●	▲	MZE0730MA	45	45	87	7.3
	3	Int.	●		MZS0730MB	37.5	40	94	8.0
	5	Int.	●		MZS0730LB	60	64	118	8.0
7.4	2	Ext.	●	▲	MZE0740SA	34	34	74	7.4
	3	Ext.	●	▲	MZE0740MA	45	45	87	7.4
	3	Int.	●		MZS0740MB	37.5	40	94	8.0
	5	Int.	●		MZS0740LB	60	64	118	8.0
7.5	2	Ext.	●	▲	MZE0750SA	34	34	74	7.5
	3	Ext.	●	▲	MZE0750MA	45	45	87	7.5
	3	Int.	●		MZS0750MB	37.5	40	94	8.0
	5	Int.	●		MZS0750LB	60	64	118	8.0
7.6	2	Ext.	●	▲	MZE0760SA	37	37	79	7.6
	3	Ext.	●	▲	MZE0760MA	48	48	90	7.6
	3	Int.	●		MZS0760MB	40	40	94	8.0
	5	Int.	●		MZS0760LB	64	64	118	8.0
7.7	2	Ext.	●	▲	MZE0770SA	37	37	79	7.7
	3	Ext.	●	▲	MZE0770MA	48	48	90	7.7
	3	Int.	●		MZS0770MB	40	40	94	8.0
	5	Int.	●		MZS0770LB	64	64	118	8.0
7.8	2	Ext.	●	▲	MZE0780SA	37	37	79	7.8
	3	Ext.	●	▲	MZE0780MA	48	48	90	7.8
	3	Int.	●		MZS0780MB	40	40	94	8.0
	5	Int.	●		MZS0780LB	64	64	118	8.0
7.9	2	Ext.	●	▲	MZE0790SA	37	37	79	7.9
	3	Ext.	●	▲	MZE0790MA	48	48	90	7.9
	3	Int.	●		MZS0790MB	40	40	94	8.0
	5	Int.	●		MZS0790LB	64	64	118	8.0
8.0	2	Ext.	●	▲	MZE0800SA	37	37	79	8.0
	3	Ext.	●	▲	MZE0800MA	48	48	90	8.0
	3	Int.	●		MZS0800MB	40	40	94	8.0
	5	Int.	●		MZS0800LB	64	64	118	8.0
8.1	2	Ext.	●	▲	MZE0810SA	37	37	79	8.1
	3	Ext.	●	▲	MZE0810MA	53	53	96	8.1
	3	Int.	●		MZS0810MB	42.5	45	100	9.0
	5	Int.	●		MZS0810LB	68	72	127	9.0
8.2	2	Ext.	●	▲	MZE0820SA	37	37	79	8.2
	3	Ext.	●	▲	MZE0820MA	53	53	96	8.2
	3	Int.	●		MZS0820MB	42.5	45	100	9.0
	5	Int.	●		MZS0820LB	68	72	127	9.0
8.3	2	Ext.	●	▲	MZE0830SA	37	37	79	8.3
	3	Ext.	●	▲	MZE0830MA	53	53	96	8.3
	3	Int.	●		MZS0830MB	42.5	45	100	9.0
	5	Int.	●		MZS0830LB	68	72	127	9.0
8.4	2	Ext.	●	▲	MZE0840SA	37	37	79	8.4
	3	Ext.	●	▲	MZE0840MA	53	53	96	8.4
	3	Int.	●		MZS0840MB	42.5	45	100	9.0
	5	Int.	●		MZS0840LB	68	72	127	9.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
8.5	2	Ext.	●	▲	MZE0850SA	37	37	79	8.5
	3	Ext.	●	▲	MZE0850MA	53	53	96	8.5
	3	Int.	●		MZS0850MB	42.5	45	100	9.0
	5	Int.	●		MZS0850LB	68	72	127	9.0
8.6	2	Ext.	●	▲	MZE0860SA	40	40	84	8.6
	3	Ext.	●	▲	MZE0860MA	55	55	98	8.6
	3	Int.	●		MZS0860MB	45	45	100	9.0
	5	Int.	●		MZS0860LB	72	72	127	9.0
8.7	2	Ext.	●	▲	MZE0870SA	40	40	84	8.7
	3	Ext.	●	▲	MZE0870MA	55	55	98	8.7
	3	Int.	●		MZS0870MB	45	45	100	9.0
	5	Int.	●		MZS0870LB	72	72	127	9.0
8.8	2	Ext.	●	▲	MZE0880SA	40	40	84	8.8
	3	Ext.	●	▲	MZE0880MA	55	55	98	8.8
	3	Int.	●		MZS0880MB	45	45	100	9.0
	5	Int.	●		MZS0880LB	72	72	127	9.0
8.9	2	Ext.	●	▲	MZE0890SA	40	40	84	8.9
	3	Ext.	●	▲	MZE0890MA	55	55	98	8.9
	3	Int.	●		MZS0890MB	45	45	100	9.0
	5	Int.	●		MZS0890LB	72	72	127	9.0
9.0	2	Ext.	●	▲	MZE0900SA	40	40	84	9.0
	3	Ext.	●	▲	MZE0900MA	55	55	98	9.0
	3	Int.	●		MZS0900MB	45	45	100	9.0
	5	Int.	●		MZS0900LB	72	72	127	9.0
9.1	2	Ext.	●	▲	MZE0910SA	40	40	84	9.1
	3	Ext.	●	▲	MZE0910MA	58	58	102	9.1
	3	Int.	●		MZS0910MB	47.5	50	106	10.0
	5	Int.	●		MZS0910LB	76	80	136	10.0
9.2	2	Ext.	●	▲	MZE0920SA	40	40	84	9.2
	3	Ext.	●	▲	MZE0920MA	58	58	102	9.2
	3	Int.	●		MZS0920MB	47.5	50	106	10.0
	5	Int.	●		MZS0920LB	76	80	136	10.0
9.3	2	Ext.	●	▲	MZE0930SA	40	40	84	9.3
	3	Ext.	●	▲	MZE0930MA	58	58	102	9.3
	3	Int.	●		MZS0930MB	47.5	50	106	10.0
	5	Int.	●		MZS0930LB	76	80	136	10.0
9.4	2	Ext.	●	▲	MZE0940SA	40	40	84	9.4
	3	Ext.	●	▲	MZE0940MA	58	58	102	9.4
	3	Int.	●		MZS0940MB	47.5	50	106	10.0
	5	Int.	●		MZS0940LB	76	80	136	10.0
9.5	2	Ext.	●	▲	MZE0950SA	40	40	84	9.5
	3	Ext.	●	▲	MZE0950MA	58	58	102	9.5
	3	Int.	●		MZS0950MB	47.5	50	106	10.0
	5	Int.	●		MZS0950LB	76	80	136	10.0
9.6	2	Ext.	●	▲	MZE0960SA	43	43	89	9.6
	3	Ext.	●	▲	MZE0960MA	60	60	105	9.6
	3	Int.	●		MZS0960MB	50	50	106	10.0
	5	Int.	●		MZS0960LB	80	80	136	10.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
9.7	2	Ext.	●	▲	MZE0970SA	43	43	89	9.7
	3	Ext.	●	▲	MZE0970MA	60	60	105	9.7
	3	Int.	●		MZS0970MB	50	50	106	10.0
	5	Int.	●		MZS0970LB	80	80	136	10.0
9.8	2	Ext.	●	▲	MZE0980SA	43	43	89	9.8
	3	Ext.	●	▲	MZE0980MA	60	60	105	9.8
	3	Int.	●		MZS0980MB	50	50	106	10.0
	5	Int.	●		MZS0980LB	80	80	136	10.0
9.9	2	Ext.	●	▲	MZE0990SA	43	43	89	9.9
	3	Ext.	●	▲	MZE0990MA	60	60	105	9.9
	3	Int.	●		MZS0990MB	50	50	106	10.0
	5	Int.	●		MZS0990LB	80	80	136	10.0
10.0	2	Ext.	●	▲	MZE1000SA	43	43	89	10.0
	3	Ext.	●	▲	MZE1000MA	60	60	105	10.0
	3	Int.	●		MZS1000MB	50	50	106	10.0
	5	Int.	●		MZS1000LB	80	80	136	10.0
10.1	2	Ext.	●	▲	MZE1010SA	43	43	89	10.1
	3	Ext.	●	▲	MZE1010MA	66	66	112	10.1
	3	Int.	●		MZS1010MB	52.5	55	116	11.0
	5	Int.	●		MZS1010LB	84	88	149	11.0
10.2	2	Ext.	●	▲	MZE1020SA	43	43	89	10.2
	3	Ext.	●	▲	MZE1020MA	66	66	112	10.2
	3	Int.	●		MZS1020MB	52.5	55	116	11.0
	5	Int.	●		MZS1020LB	84	88	149	11.0
10.3	2	Ext.	●	▲	MZE1030SA	43	43	89	10.3
	3	Ext.	●	▲	MZE1030MA	66	66	112	10.3
	3	Int.	●		MZS1030MB	52.5	55	116	11.0
	5	Int.	●		MZS1030LB	84	88	149	11.0
10.4	2	Ext.	●	▲	MZE1040SA	43	43	89	10.4
	3	Ext.	●	▲	MZE1040MA	66	66	112	10.4
	3	Int.	●		MZS1040MB	52.5	55	116	11.0
	5	Int.	●		MZS1040LB	84	88	149	11.0
10.5	2	Ext.	●	▲	MZE1050SA	43	43	89	10.5
	3	Ext.	●	▲	MZE1050MA	66	66	112	10.5
	3	Int.	●		MZS1050MB	52.5	55	116	11.0
	5	Int.	●		MZS1050LB	84	88	149	11.0
10.6	2	Ext.	●	▲	MZE1060SA	43	43	89	10.6
	3	Ext.	●	▲	MZE1060MA	68	68	114	10.6
	3	Int.	●		MZS1060MB	55	55	116	11.0
	5	Int.	●		MZS1060LB	88	88	149	11.0
10.7	2	Ext.	●	▲	MZE1070SA	47	47	95	10.7
	3	Ext.	●	▲	MZE1070MA	68	68	114	10.7
	3	Int.	●		MZS1070MB	55	55	116	11.0
	5	Int.	●		MZS1070LB	88	88	149	11.0
10.8	2	Ext.	●	▲	MZE1080SA	47	47	95	10.8
	3	Ext.	●	▲	MZE1080MA	68	68	114	10.8
	3	Int.	●		MZS1080MB	55	55	116	11.0
	5	Int.	●		MZS1080LB	88	88	149	11.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
10.9	2	Ext.	●	▲	MZE1090SA	47	47	95	10.9
	3	Ext.	●	▲	MZE1090MA	68	68	114	10.9
	3	Int.	●		MZS1090MB	55	55	116	11.0
	5	Int.	●		MZS1090LB	88	88	149	11.0
11.0	2	Ext.	●	▲	MZE1100SA	47	47	95	11.0
	3	Ext.	●	▲	MZE1100MA	68	68	114	11.0
	3	Int.	●		MZS1100MB	55	55	116	11.0
	5	Int.	●		MZS1100LB	88	88	149	11.0
11.1	2	Ext.	●	▲	MZE1110SA	47	47	95	11.1
	3	Ext.	●	▲	MZE1110MA	71	71	118	11.1
	3	Int.	●		MZS1110MB	57.5	60	122	12.0
	5	Int.	●		MZS1110LB	92	96	158	12.0
11.2	2	Ext.	●	▲	MZE1120SA	47	47	95	11.2
	3	Ext.	●	▲	MZE1120MA	71	71	118	11.2
	3	Int.	●		MZS1120MB	57.5	60	122	12.0
	5	Int.	●		MZS1120LB	92	96	158	12.0
11.3	2	Ext.	●	▲	MZE1130SA	47	47	95	11.3
	3	Ext.	●	▲	MZE1130MA	71	71	118	11.3
	3	Int.	●		MZS1130MB	57.5	60	122	12.0
	5	Int.	●		MZS1130LB	92	96	158	12.0
11.4	2	Ext.	●	▲	MZE1140SA	47	47	95	11.4
	3	Ext.	●	▲	MZE1140MA	71	71	118	11.4
	3	Int.	●		MZS1140MB	57.5	60	122	12.0
	5	Int.	●		MZS1140LB	92	96	158	12.0
11.5	2	Ext.	●	▲	MZE1150SA	47	47	95	11.5
	3	Ext.	●	▲	MZE1150MA	71	71	118	11.5
	3	Int.	●		MZS1150MB	57.5	60	122	12.0
	5	Int.	●		MZS1150LB	92	96	158	12.0
11.6	2	Ext.	●	▲	MZE1160SA	47	47	95	11.6
	3	Ext.	●	▲	MZE1160MA	73	73	121	11.6
	3	Int.	●		MZS1160MB	60	60	122	12.0
	5	Int.	●		MZS1160LB	96	96	158	12.0
11.7	2	Ext.	●	▲	MZE1170SA	47	47	95	11.7
	3	Ext.	●	▲	MZE1170MA	73	73	121	11.7
	3	Int.	●		MZS1170MB	60	60	122	12.0
	5	Int.	●		MZS1170LB	96	96	158	12.0
11.8	2	Ext.	●	▲	MZE1180SA	47	47	95	11.8
	3	Ext.	●	▲	MZE1180MA	73	73	121	11.8
	3	Int.	●		MZS1180MB	60	60	122	12.0
	5	Int.	●		MZS1180LB	96	96	158	12.0
11.9	2	Ext.	●	▲	MZE1190SA	51	51	102	11.9
	3	Ext.	●	▲	MZE1190MA	73	73	121	11.9
	3	Int.	●		MZS1190MB	60	60	122	12.0
	5	Int.	●		MZS1190LB	96	96	158	12.0
12.0	2	Ext.	●	▲	MZE1200SA	51	51	102	12.0
	3	Ext.	●	▲	MZE1200MA	73	73	121	12.0
	3	Int.	●		MZS1200MB	60	60	122	12.0
	5	Int.	●		MZS1200LB	96	96	158	12.0

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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
12.1	2	Ext.	●	▲	MZE1210SA	51	51	102	12.1
	3	Ext.	●	▲	MZE1210MA	76	76	135	12.1
	3	Int.	●		MZS1210MB	62.5	65	128	13.0
	5	Int.	●		MZS1210LB	100	104	167	13.0
12.2	2	Ext.	●	▲	MZE1220SA	51	51	102	12.2
	3	Ext.	●	▲	MZE1220MA	76	76	135	12.2
	3	Int.	●		MZS1220MB	62.5	65	128	13.0
	5	Int.	●		MZS1220LB	100	104	167	13.0
12.3	2	Ext.	●	▲	MZE1230SA	51	51	102	12.3
	3	Ext.	●	▲	MZE1230MA	76	76	135	12.3
	3	Int.	●		MZS1230MB	62.5	65	128	13.0
	5	Int.	●		MZS1230LB	100	104	167	13.0
12.4	2	Ext.	●	▲	MZE1240SA	51	51	102	12.4
	3	Ext.	●	▲	MZE1240MA	76	76	135	12.4
	3	Int.	●		MZS1240MB	62.5	65	128	13.0
	5	Int.	●		MZS1240LB	100	104	167	13.0
12.5	2	Ext.	●	▲	MZE1250SA	51	51	102	12.5
	3	Ext.	●	▲	MZE1250MA	76	76	135	12.5
	3	Int.	●		MZS1250MB	62.5	65	128	13.0
	5	Int.	●		MZS1250LB	100	104	167	13.0
12.6	2	Ext.	●	▲	MZE1260SA	51	51	102	12.6
	3	Ext.	●	▲	MZE1260MA	78	78	137	12.6
	3	Int.	●		MZS1260MB	65	65	128	13.0
	5	Int.	●		MZS1260LB	104	104	167	13.0
12.7	2	Ext.	●	▲	MZE1270SA	51	51	102	12.7
	3	Ext.	●	▲	MZE1270MA	78	78	137	12.7
	3	Int.	●		MZS1270MB	65	65	128	13.0
	5	Int.	●		MZS1270LB	104	104	167	13.0
12.8	2	Ext.	●	▲	MZE1280SA	51	51	102	12.8
	3	Ext.	●	▲	MZE1280MA	78	78	137	12.8
	3	Int.	●		MZS1280MB	65	65	128	13.0
	5	Int.	●		MZS1280LB	104	104	167	13.0
12.9	2	Ext.	●	▲	MZE1290SA	51	51	102	12.9
	3	Ext.	●	▲	MZE1290MA	78	78	137	12.9
	3	Int.	●		MZS1290MB	65	65	128	13.0
	5	Int.	●		MZS1290LB	104	104	167	13.0
13.0	2	Ext.	●	▲	MZE1300SA	51	51	102	13.0
	3	Ext.	●	▲	MZE1300MA	78	78	137	13.0
	3	Int.	●		MZS1300MB	65	65	128	13.0
	5	Int.	●		MZS1300LB	104	104	167	13.0
13.1	2	Ext.	●	▲	MZE1310SA	51	51	102	13.1
	3	Ext.	●	▲	MZE1310MA	84	84	144	13.1
	3	Int.	●		MZS1310MB	67.5	70	134	14.0
	5	Int.	●		MZS1310LB	108	112	176	14.0
13.2	2	Ext.	●	▲	MZE1320SA	51	51	102	13.2
	3	Ext.	●	▲	MZE1320MA	84	84	144	13.2
	3	Int.	●		MZS1320MB	67.5	70	134	14.0
	5	Int.	●		MZS1320LB	108	112	176	14.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
13.3	2	Ext.	●	▲	MZE1330SA	54	54	107	13.3
	3	Ext.	●	▲	MZE1330MA	84	84	144	13.3
	3	Int.	●		MZS1330MB	67.5	70	134	14.0
	5	Int.	●		MZS1330LB	108	112	176	14.0
13.4	2	Ext.	●	▲	MZE1340SA	54	54	107	13.4
	3	Ext.	●	▲	MZE1340MA	84	84	144	13.4
	3	Int.	●		MZS1340MB	67.5	70	134	14.0
	5	Int.	●		MZS1340LB	108	112	176	14.0
13.5	2	Ext.	●	▲	MZE1350SA	54	54	107	13.5
	3	Ext.	●	▲	MZE1350MA	84	84	144	13.5
	3	Int.	●		MZS1350MB	67.5	70	134	14.0
	5	Int.	●		MZS1350LB	108	112	176	14.0
13.6	2	Ext.	●	▲	MZE1360SA	54	54	107	13.6
	3	Ext.	●	▲	MZE1360MA	86	86	147	13.6
	3	Int.	●		MZS1360MB	70	70	134	14.0
	5	Int.	●		MZS1360LB	112	112	176	14.0
13.7	2	Ext.	●	▲	MZE1370SA	54	54	107	13.7
	3	Ext.	●	▲	MZE1370MA	86	86	147	13.7
	3	Int.	●		MZS1370MB	70	70	134	14.0
	5	Int.	●		MZS1370LB	112	112	176	14.0
13.8	2	Ext.	●	▲	MZE1380SA	54	54	107	13.8
	3	Ext.	●	▲	MZE1380MA	86	86	147	13.8
	3	Int.	●		MZS1380MB	70	70	134	14.0
	5	Int.	●		MZS1380LB	112	112	176	14.0
13.9	2	Ext.	●	▲	MZE1390SA	54	54	107	13.9
	3	Ext.	●	▲	MZE1390MA	86	86	147	13.9
	3	Int.	●		MZS1390MB	70	70	134	14.0
	5	Int.	●		MZS1390LB	112	112	176	14.0
14.0	2	Ext.	●	▲	MZE1400SA	54	54	107	14.0
	3	Ext.	●	▲	MZE1400MA	86	86	147	14.0
	3	Int.	●		MZS1400MB	70	70	134	14.0
	5	Int.	●		MZS1400LB	112	112	176	14.0
14.1	2	Ext.	●	▲	MZE1410SA	56	56	111	14.1
	3	Ext.	●	▲	MZE1410MA	89	89	151	14.1
	3	Int.	●		MZS1410MB	72.5	75	140	15.0
	5	Int.	●		MZS1410LB	116	120	185	15.0
14.2	2	Ext.	●	▲	MZE1420SA	56	56	111	14.2
	3	Ext.	●	▲	MZE1420MA	89	89	151	14.2
	3	Int.	●		MZS1420MB	72.5	75	140	15.0
	5	Int.	●		MZS1420LB	116	120	185	15.0
14.3	2	Ext.	□	▲	MZE1430SA	56	56	111	14.3
	3	Ext.	●	▲	MZE1430MA	89	89	151	14.3
	3	Int.	●		MZS1430MB	72.5	75	140	15.0
	5	Int.	●		MZS1430LB	116	120	185	15.0
14.4	2	Ext.	□	▲	MZE1440SA	56	56	111	14.4
	3	Ext.	●	▲	MZE1440MA	89	89	151	14.4
	3	Int.	●		MZS1440MB	72.5	75	140	15.0
	5	Int.	●		MZS1440LB	116	120	185	15.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
14.5	2	Ext.	●	▲	MZE1450SA	56	56	111	14.5
	3	Ext.	●	▲	MZE1450MA	89	89	151	14.5
	3	Int.	●		MZS1450MB	72.5	75	140	15.0
	5	Int.	●		MZS1450LB	116	120	185	15.0
14.6	2	Ext.	□	▲	MZE1460SA	56	56	111	14.6
	3	Ext.	●	▲	MZE1460MA	91	91	153	14.6
	3	Int.	●		MZS1460MB	75	75	140	15.0
	5	Int.	●		MZS1460LB	120	120	185	15.0
14.7	2	Ext.	□	▲	MZE1470SA	56	56	111	14.7
	3	Ext.	●	▲	MZE1470MA	91	91	153	14.7
	3	Int.	●		MZS1470MB	75	75	140	15.0
	5	Int.	●		MZS1470LB	120	120	185	15.0
14.8	2	Ext.	□	▲	MZE1480SA	56	56	111	14.8
	3	Ext.	●	▲	MZE1480MA	91	91	153	14.8
	3	Int.	●		MZS1480MB	75	75	140	15.0
	5	Int.	●		MZS1480LB	120	120	185	15.0
14.9	2	Ext.	□	▲	MZE1490SA	56	56	111	14.9
	3	Ext.	●	▲	MZE1490MA	91	91	153	14.9
	3	Int.	●		MZS1490MB	75	75	140	15.0
	5	Int.	●		MZS1490LB	120	120	185	15.0
15.0	2	Ext.	●	▲	MZE1500SA	56	56	111	15.0
	3	Ext.	●	▲	MZE1500MA	91	91	153	15.0
	3	Int.	●		MZS1500MB	75	75	140	15.0
	5	Int.	●		MZS1500LB	120	120	185	15.0
15.1	2	Ext.	□	▲	MZE1510SA	58	58	115	15.1
	3	Ext.	●	▲	MZE1510MA	94	94	157	15.1
	3	Int.	●		MZS1510MB	77.5	80	145	16.0
	5	Int.	●		MZS1510LB	124	128	193	16.0
15.2	2	Ext.	●	▲	MZE1520SA	58	58	115	15.2
	3	Ext.	●	▲	MZE1520MA	94	94	157	15.2
	3	Int.	●		MZS1520MB	77.5	80	145	16.0
	5	Int.	●		MZS1520LB	124	128	193	16.0
15.3	2	Ext.	□	▲	MZE1530SA	58	58	115	15.3
	3	Ext.	●	▲	MZE1530MA	94	94	157	15.3
	3	Int.	●		MZS1530MB	77.5	80	145	16.0
	5	Int.	●		MZS1530LB	124	128	193	16.0
15.4	2	Ext.	□	▲	MZE1540SA	58	58	115	15.4
	3	Ext.	●	▲	MZE1540MA	94	94	157	15.4
	3	Int.	●		MZS1540MB	77.5	80	145	16.0
	5	Int.	●		MZS1540LB	124	128	193	16.0
15.5	2	Ext.	●	▲	MZE1550SA	58	58	115	15.5
	3	Ext.	●	▲	MZE1550MA	94	94	157	15.5
	3	Int.	●		MZS1550MB	77.5	80	145	16.0
	5	Int.	●		MZS1550LB	124	128	193	16.0
15.6	2	Ext.	□	▲	MZE1560SA	58	58	115	15.6
	3	Ext.	●	▲	MZE1560MA	96	96	160	15.6
	3	Int.	●		MZS1560MB	80	80	145	16.0
	5	Int.	●		MZS1560LB	128	128	193	16.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
15.7	2	Ext.	□	▲	MZE1570SA	58	58	115	15.7
	3	Ext.	●	▲	MZE1570MA	96	96	160	15.7
	3	Int.	●		MZS1570MB	80	80	145	16.0
	5	Int.	●		MZS1570LB	128	128	193	16.0
15.8	2	Ext.	□	▲	MZE1580SA	58	58	115	15.8
	3	Ext.	●	▲	MZE1580MA	96	96	160	15.8
	3	Int.	●		MZS1580MB	80	80	145	16.0
	5	Int.	●		MZS1580LB	128	128	193	16.0
15.9	2	Ext.	□	▲	MZE1590SA	58	58	115	15.9
	3	Ext.	●	▲	MZE1590MA	96	96	160	15.9
	3	Int.	●		MZS1590MB	80	80	145	16.0
	5	Int.	●		MZS1590LB	128	128	193	16.0
16.0	2	Ext.	●	▲	MZE1600SA	58	58	115	16.0
	3	Ext.	●	▲	MZE1600MA	96	96	160	16.0
	3	Int.	●		MZS1600MB	80	80	145	16.0
	5	Int.	●		MZS1600LB	128	128	193	16.0
16.1	2	Ext.	□		MZE1610SA	60	60	119	16.1
	3	Ext.	□		MZE1610MA	102	102	167	16.1
	3	Int.	□		MZS1610MB	82.5	85	150	17.0
	5	Int.	□		MZS1610LB	132	136	201	17.0
16.2	2	Ext.	●		MZE1620SA	60	60	119	16.2
	3	Ext.	□		MZE1620MA	102	102	167	16.2
	3	Int.	□		MZS1620MB	82.5	85	150	17.0
	5	Int.	□		MZS1620LB	132	136	201	17.0
16.3	2	Ext.	●		MZE1630SA	60	60	119	16.3
	3	Ext.	□		MZE1630MA	102	102	167	16.3
	3	Int.	□		MZS1630MB	82.5	85	150	17.0
	5	Int.	□		MZS1630LB	132	136	201	17.0
16.4	2	Ext.	□		MZE1640SA	60	60	119	16.4
	3	Ext.	□		MZE1640MA	102	102	167	16.4
	3	Int.	□		MZS1640MB	82.5	85	150	17.0
	5	Int.	□		MZS1640LB	132	136	201	17.0
16.5	2	Ext.	●	▲	MZE1650SA	60	60	119	16.5
	3	Ext.	●	▲	MZE1650MA	102	102	167	16.5
	3	Int.	●		MZS1650MB	82.5	85	150	17.0
	5	Int.	●		MZS1650LB	132	136	201	17.0
16.6	2	Ext.	□		MZE1660SA	60	60	119	16.6
	3	Ext.	□		MZE1660MA	102	102	167	16.6
	3	Int.	□		MZS1660MB	85	85	150	17.0
	5	Int.	□		MZS1660LB	136	136	201	17.0
16.7	2	Ext.	□		MZE1670SA	60	60	119	16.7
	3	Ext.	□		MZE1670MA	102	102	167	16.7
	3	Int.	□		MZS1670MB	85	85	150	17.0
	5	Int.	□		MZS1670LB	136	136	201	17.0
16.8	2	Ext.	□		MZE1680SA	60	60	119	16.8
	3	Ext.	□		MZE1680MA	102	102	167	16.8
	3	Int.	□		MZS1680MB	85	85	150	17.0
	5	Int.	□		MZS1680LB	136	136	201	17.0

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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length	Neck Length	Overall Length	Shank Dia.
						L3	L2	L1	D4
16.9	2	Ext.	□		MZE1690SA	60	60	119	16.9
	3	Ext.	□		MZE1690MA	102	102	167	16.9
	3	Int.	□		MZS1690MB	85	85	150	17.0
	5	Int.	□		MZS1690LB	136	136	201	17.0
17.0	2	Ext.	●	▲	MZE1700SA	60	60	119	17.0
	3	Ext.	●	▲	MZE1700MA	102	102	167	17.0
	3	Int.	●		MZS1700MB	85	85	150	17.0
	5	Int.	●		MZS1700LB	136	136	201	17.0
17.1	2	Ext.	□		MZE1710SA	62	62	123	17.1
	3	Ext.	□		MZE1710MA	102	102	167	17.1
	3	Int.	□		MZS1710MB	87.5	90	155	18.0
	5	Int.	□		MZS1710LB	140	144	209	18.0
17.2	2	Ext.	□		MZE1720SA	62	62	123	17.2
	3	Ext.	□		MZE1720MA	102	102	167	17.2
	3	Int.	□		MZS1720MB	87.5	90	155	18.0
	5	Int.	□		MZS1720LB	140	144	209	18.0
17.3	2	Ext.	□		MZE1730SA	62	62	123	17.3
	3	Ext.	□		MZE1730MA	102	102	167	17.3
	3	Int.	□		MZS1730MB	87.5	90	155	18.0
	5	Int.	□		MZS1730LB	140	144	209	18.0
17.4	2	Ext.	□		MZE1740SA	62	62	123	17.4
	3	Ext.	□		MZE1740MA	102	102	167	17.4
	3	Int.	□		MZS1740MB	87.5	90	155	18.0
	5	Int.	□		MZS1740LB	140	144	209	18.0
17.5	2	Ext.	●	▲	MZE1750SA	62	62	123	17.5
	3	Ext.	●	▲	MZE1750MA	102	102	167	17.5
	3	Int.	●		MZS1750MB	87.5	90	155	18.0
	5	Int.	●		MZS1750LB	140	144	209	18.0
17.6	2	Ext.	□		MZE1760SA	62	62	123	17.6
	3	Ext.	□		MZE1760MA	102	102	167	17.6
	3	Int.	□		MZS1760MB	90	90	155	18.0
	5	Int.	□		MZS1760LB	144	144	209	18.0
17.7	2	Ext.	□		MZE1770SA	62	62	123	17.7
	3	Ext.	□		MZE1770MA	102	102	167	17.7
	3	Int.	□		MZS1770MB	90	90	155	18.0
	5	Int.	□		MZS1770LB	144	144	209	18.0
17.8	2	Ext.	●		MZE1780SA	62	62	123	17.8
	3	Ext.	□		MZE1780MA	102	102	167	17.8
	3	Int.	□		MZS1780MB	90	90	155	18.0
	5	Int.	□		MZS1780LB	144	144	209	18.0
17.9	2	Ext.	□		MZE1790SA	62	62	123	17.9
	3	Ext.	□		MZE1790MA	102	102	167	17.9
	3	Int.	□		MZS1790MB	90	90	155	18.0
	5	Int.	□		MZS1790LB	144	144	209	18.0
18.0	2	Ext.	●	▲	MZE1800SA	62	62	123	18.0
	3	Ext.	●	▲	MZE1800MA	102	102	167	18.0
	3	Int.	●		MZS1800MB	90	90	155	18.0
	5	Int.	●		MZS1800LB	144	144	209	18.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length	Neck Length	Overall Length	Shank Dia.
						L3	L2	L1	D4
18.1	2	Ext.	□		MZE1810SA	64	64	127	18.1
	3	Ext.	□		MZE1810MA	114	114	179	18.1
	3	Int.	□		MZS1810MB	92.5	95	160	19.0
	5	Int.	□		MZS1810LB	148	152	217	19.0
18.2	2	Ext.	□		MZE1820SA	64	64	127	18.2
	3	Ext.	□		MZE1820MA	114	114	179	18.2
	3	Int.	□		MZS1820MB	92.5	95	160	19.0
	5	Int.	□		MZS1820LB	148	152	217	19.0
18.3	2	Ext.	□		MZE1830SA	64	64	127	18.3
	3	Ext.	□		MZE1830MA	114	114	179	18.3
	3	Int.	□		MZS1830MB	92.5	95	160	19.0
	5	Int.	□		MZS1830LB	148	152	217	19.0
18.4	2	Ext.	□		MZE1840SA	64	64	127	18.4
	3	Ext.	□		MZE1840MA	114	114	179	18.4
	3	Int.	□		MZS1840MB	92.5	95	160	19.0
	5	Int.	□		MZS1840LB	148	152	217	19.0
18.5	2	Ext.	●	▲	MZE1850SA	64	64	127	18.5
	3	Ext.	●	▲	MZE1850MA	114	114	179	18.5
	3	Int.	●		MZS1850MB	92.5	95	160	19.0
	5	Int.	●		MZS1850LB	148	152	217	19.0
18.6	2	Ext.	□		MZE1860SA	64	64	127	18.6
	3	Ext.	□		MZE1860MA	114	114	179	18.6
	3	Int.	□		MZS1860MB	95	95	160	19.0
	5	Int.	□		MZS1860LB	152	152	217	19.0
18.7	2	Ext.	□		MZE1870SA	64	64	127	18.7
	3	Ext.	□		MZE1870MA	114	114	179	18.7
	3	Int.	□		MZS1870MB	95	95	160	19.0
	5	Int.	□		MZS1870LB	152	152	217	19.0
18.8	2	Ext.	□		MZE1880SA	64	64	127	18.8
	3	Ext.	□		MZE1880MA	114	114	179	18.8
	3	Int.	□		MZS1880MB	95	95	160	19.0
	5	Int.	□		MZS1880LB	152	152	217	19.0
18.9	2	Ext.	□		MZE1890SA	64	64	127	18.9
	3	Ext.	□		MZE1890MA	114	114	179	18.9
	3	Int.	□		MZS1890MB	95	95	160	19.0
	5	Int.	□		MZS1890LB	152	152	217	19.0
19.0	2	Ext.	●	▲	MZE1900SA	64	64	127	19.0
	3	Ext.	●	▲	MZE1900MA	114	114	179	19.0
	3	Int.	●		MZS1900MB	95	95	160	19.0
	5	Int.	●		MZS1900LB	152	152	217	19.0
19.1	2	Ext.	□		MZE1910SA	66	66	131	19.1
	3	Ext.	□		MZE1910MA	114	114	179	19.1
	3	Int.	□		MZS1910MB	97.5	100	165	20.0
	5	Int.	□		MZS1910LB	156	160	225	20.0
19.2	2	Ext.	□		MZE1920SA	66	66	131	19.2
	3	Ext.	□		MZE1920MA	114	114	179	19.2
	3	Int.	□		MZS1920MB	97.5	100	165	20.0
	5	Int.	□		MZS1920LB	156	160	225	20.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			VP15TF	HTi10		Flute Length	Neck Length	Overall Length	Shank Dia.
						L3	L2	L1	D4
19.3	2	Ext.	<input type="checkbox"/>		MZE1930SA	66	66	131	19.3
	3	Ext.	<input type="checkbox"/>		MZE1930MA	114	114	179	19.3
	3	Int.	<input type="checkbox"/>		MZS1930MB	97.5	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1930LB	156	160	225	20.0
19.4	2	Ext.	<input type="checkbox"/>		MZE1940SA	66	66	131	19.4
	3	Ext.	<input type="checkbox"/>		MZE1940MA	114	114	179	19.4
	3	Int.	<input type="checkbox"/>		MZS1940MB	97.5	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1940LB	156	160	225	20.0
19.5	2	Ext.	●	▲	MZE1950SA	66	66	131	19.5
	3	Ext.	●	▲	MZE1950MA	114	114	179	19.5
	3	Int.	●		MZS1950MB	97.5	100	165	20.0
	5	Int.	●		MZS1950LB	156	160	225	20.0
19.6	2	Ext.	<input type="checkbox"/>		MZE1960SA	66	66	131	19.6
	3	Ext.	<input type="checkbox"/>		MZE1960MA	114	114	179	19.6
	3	Int.	<input type="checkbox"/>		MZS1960MB	100	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1960LB	160	160	225	20.0
19.7	2	Ext.	<input type="checkbox"/>		MZE1970SA	66	66	131	19.7
	3	Ext.	<input type="checkbox"/>		MZE1970MA	114	114	179	19.7
	3	Int.	<input type="checkbox"/>		MZS1970MB	100	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1970LB	160	160	225	20.0
19.8	2	Ext.	<input type="checkbox"/>		MZE1980SA	66	66	131	19.8
	3	Ext.	<input type="checkbox"/>		MZE1980MA	114	114	179	19.8
	3	Int.	<input type="checkbox"/>		MZS1980MB	100	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1980LB	160	160	225	20.0
19.9	2	Ext.	<input type="checkbox"/>		MZE1990SA	66	66	131	19.9
	3	Ext.	<input type="checkbox"/>		MZE1990MA	114	114	179	19.9
	3	Int.	<input type="checkbox"/>		MZS1990MB	100	100	165	20.0
	5	Int.	<input type="checkbox"/>		MZS1990LB	160	160	225	20.0
20.0	2	Ext.	●	▲	MZE2000SA	66	66	131	20.0
	3	Ext.	●	▲	MZE2000MA	114	114	179	20.0
	3	Int.	●		MZS2000MB	100	100	165	20.0
	5	Int.	●		MZS2000LB	160	160	225	20.0

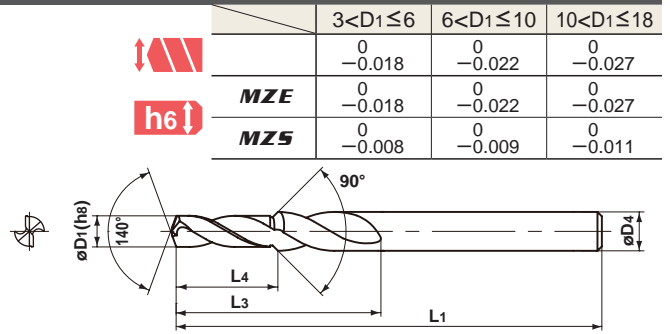
MZE/MZS

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

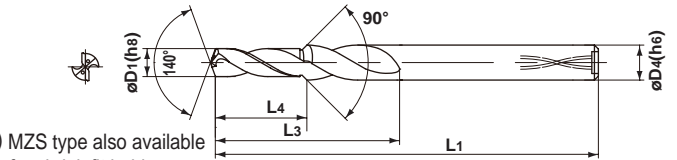
STEP DRILLS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(MZE only)	◎(MZE:○)	◎	○	○

MZE (External coolant)



MZS (Internal coolant)



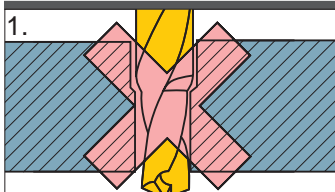
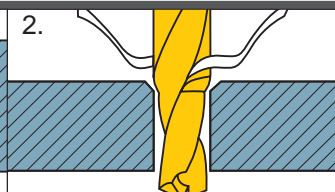
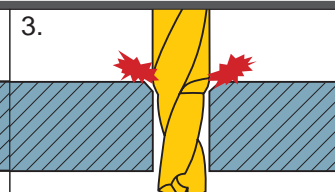
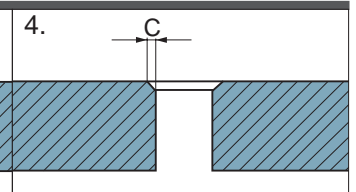
(Note 1) MZS type bigger than $\phi 5.0$ have a recess in the end face. (Note 2) Spot face drilling is not possible (chamfering only). (Note 3) For metric coarse thread. (Note 4) MZS type also available for shrink fit holder.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Order Number	Thread Size	Stock VP15TF	Dimensions (mm)			
						Step length L4	Flute Length L3	Overall Length L1	Shank Dia. D4
3.4	2	Ext.	MZE0340SM04	M4	●	8	21	73	6.0
	2	Int.	MZS0340SM04	M4	●	8	21	73	6.0
	3	Ext.	MZE0340MM04	M4	●	12	25	77	6.0
	3	Int.	MZS0340MM04	M4	●	12	25	77	6.0
4.3	2	Ext.	MZE0430SM05	M5	●	10	26	79	7.0
	2	Int.	MZS0430SM05	M5	●	10	26	79	7.0
	3	Ext.	MZE0430MM05	M5	●	15	31	84	7.0
	3	Int.	MZS0430MM05	M5	●	15	31	84	7.0
5.1	2	Ext.	MZE0510SM06	M6	●	12	30	84	8.0
	2	Int.	MZS0510SM06	M6	●	12	30	84	8.0
	3	Ext.	MZE0510MM06	M6	●	18	36	90	8.0
	3	Int.	MZS0510MM06	M6	●	18	36	90	8.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Order Number	Thread Size	Stock VP15TF	Dimensions (mm)			
						Step length L4	Flute Length L3	Overall Length L1	Shank Dia. D4
6.8	2	Ext.	MZE0680SM08	M8	●	16	40	96	10.0
	2	Int.	MZS0680SM08	M8	●	16	40	96	10.0
	3	Ext.	MZE0680MM08	M8	●	24	48	104	10.0
	3	Int.	MZS0680MM08	M8	●	24	48	104	10.0
8.5	2	Ext.	MZE0850SM10	M10	●	20	50	112	12.0
	2	Int.	MZS0850SM10	M10	●	20	50	112	12.0
	3	Ext.	MZE0850MM10	M10	●	30	60	122	12.0
	3	Int.	MZS0850MM10	M10	●	30	60	122	12.0
10.3	2	Ext.	MZE1030SM12	M12	●	24	60	124	14.0
	2	Int.	MZS1030SM12	M12	●	24	60	124	14.0
	3	Ext.	MZE1030MM12	M12	●	36	72	136	14.0
	3	Int.	MZS1030MM12	M12	●	36	72	136	14.0

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

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

Thread Size	Initial Thread Diameter Tolerance		MZE/MZS Drill Application (ϕD)	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

Thread Size	Initial Thread Diameter Tolerance		MZE/MZS Drill Application (ϕD)	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 ($\leq 180\text{HB}$)		Carbon steel, Alloy steel (180–280HB)		Carbon steel, Alloy steel (280–350HB)	
	AISI 1010 etc		AISI 1045, AISI 4140 etc		AISI 4340 etc	
Dia. (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 ($\leq 200\text{HB}$)		Gray Cast Iron ($\leq 350\text{MPa}$)		Ductile Cast Iron ($\leq 450\text{MPa}$)	
	AISI 304, AISI 316 etc		No 45 B etc		60-40-8 etc	
Dia. (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)

Work Material	Aluminium Alloy (Si<5%)		Heat Resistant Alloy Inconel718 etc		Hardened Steel (40—55HRC) AISI H13, L6 etc		
	Dia. (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. (mm)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)
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)

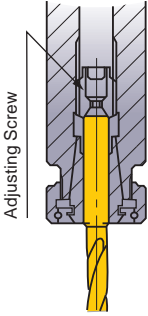
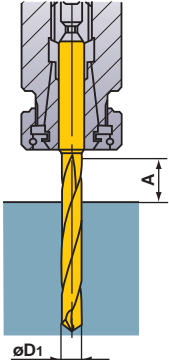
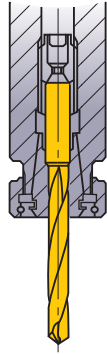
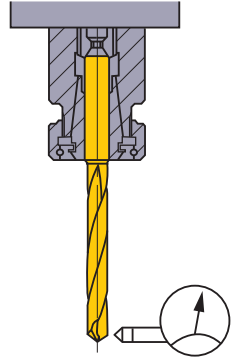
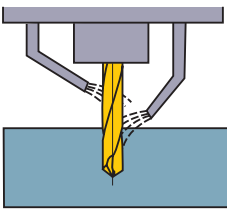
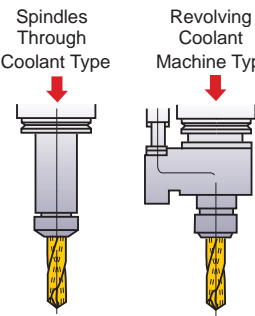
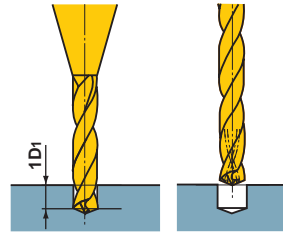
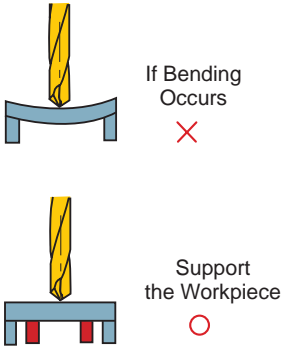
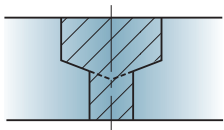
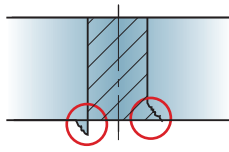
Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, AISI 316 etc		Gray Cast Iron (≤350MPa) No 45 B etc		Ductile Cast Iron (≤450MPa) 60-40-8 etc	
	Dia. (mm)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Revolution (min ⁻¹)
1.0	6300	0.03 (0.020—0.044)	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)

Work Material	Aluminium Alloy (Si<5%)		Heat Resistant Alloy	
			Inconel718 etc	
Dia. (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)

MZE/MZS STEP DRILLS

CARBIDE

OPERATIONAL GUIDANCE

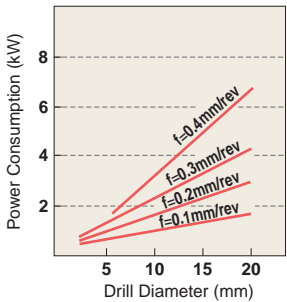
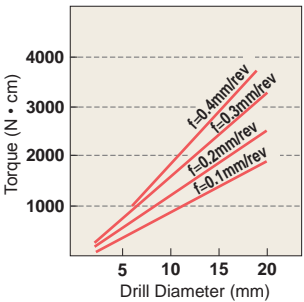
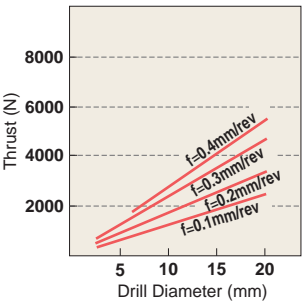
<p>Drill Holding</p>  <p>Thrust bearing type collet chuck holds the drill securely.</p>	<p>Drill Length</p>  <p>$A \geq D1 \times 1.5$</p>	<p>Drill Installation</p>  <p>Do not clamp on the flutes.</p>	<p>Installation Tolerance</p>  <p>Run-out $\leq 0.03\text{mm}$</p>
<p>Coolant Method (MZE)</p>  <p>Two coolant positions, at the end and at the center are ideal.</p>	<p>Through Coolant Type (MZS)</p>  <p>Coolant pressure is approx. 0.5–1MPa (<math>\phi 5:2\text{--}3\text{MPa}</math>). Coolant volume is 1.5–4.0l/min.</p>	<p>Drill Installation</p>  <p>①When machining a prepared hole with the MWE-SB please set the depth to 1D (D=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.</p>	<p>Coolant Handling</p> <p><MGS Type></p> <ol style="list-style-type: none"> Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure. Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.
<p>Thin Workpiece</p>  <p>If Bending Occurs \times</p> <p>Support the Workpiece \circ</p>	<p>Interrupted Cutting</p> <p>One Process \circ</p> <p>①Lower the feed when drilling the interrupted part.</p> <p>Requires Prior Machining \triangle</p> <p>①Spot face with an end mill prior to drilling.</p>	<p>Stepped Holes</p>  <p>①Divide the two processes. ②Drill the larger hole first. *A tool for machining both chamfer and spot face can be produced to order.</p>	<p>Burring and Workpiece Chipping</p>  <p>①Lower the feed rate by 50% at the end of through cutting. ②Add a 45° chamfer. ③Change the point angle.</p>

CAUTION TO USE MZS TYPE (Drill Diameter $\leq \phi 3$)

- Please use a fine mesh filter (mesh $\leq 3\mu\text{m}$) for coolant to prevent jamming in the oil hole.
- For deep drilling ($l/d > 3$), machining guiding hole is recommended. (Use **MZE** $\circ \circ \circ \circ$ SA type for guiding hole.)
- Pick drilling is also effective.

CUTTING RESISTANCE

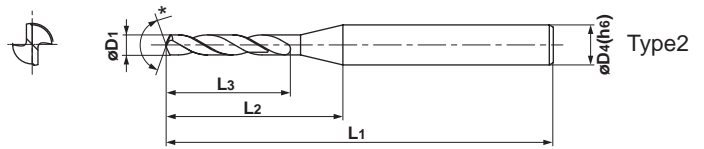
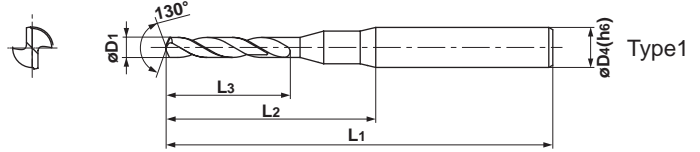
Workpiece : JIS SCM440(300HB) Cutting Speed : 50m/min

<p>Power Consumption</p>  <p>Power Consumption (kW)</p> <p>Drill Diameter (mm)</p> <p>Feed rates: $f=0.4\text{mm/rev}$, $f=0.3\text{mm/rev}$, $f=0.2\text{mm/rev}$, $f=0.1\text{mm/rev}$</p>	<p>Torque</p>  <p>Torque (N·cm)</p> <p>Drill Diameter (mm)</p> <p>Feed rates: $f=0.4\text{mm/rev}$, $f=0.3\text{mm/rev}$, $f=0.2\text{mm/rev}$, $f=0.1\text{mm/rev}$</p>	<p>Thrust</p>  <p>Thrust (N)</p> <p>Drill Diameter (mm)</p> <p>Feed rates: $f=0.4\text{mm/rev}$, $f=0.3\text{mm/rev}$, $f=0.2\text{mm/rev}$, $f=0.1\text{mm/rev}$</p>
--	--	---

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

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○	○	○	○	○	○

	$0.1 \leq D_1 \leq 3$
	$\begin{matrix} 0 \\ -0.009 \end{matrix}$
	$\begin{matrix} 0 \\ -0.006 \end{matrix}$



*Drill Dia. $\phi 0.30-1.59$: 130°
 $\phi 1.60-2.50$: 140°

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

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)				Type
		VP20MF	VP15TF		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
0.10	Ext.	●		MSE0010SB	1.2	9.7	38	3	1
0.11	Ext.	●		0011SB	1.2	9.7	38	3	1
0.12	Ext.	●		0012SB	1.4	9.7	38	3	1
0.13	Ext.	●		0013SB	1.4	9.7	38	3	1
0.14	Ext.	●		0014SB	2	9.7	38	3	1
0.15	Ext.	●		0015SB	2	9.7	38	3	1
0.16	Ext.	●		0016SB	2	9.7	38	3	1
0.17	Ext.	●		0017SB	2	9.7	38	3	1
0.18	Ext.	●		0018SB	2	9.7	38	3	1
0.19	Ext.	●		0019SB	2	9.7	38	3	1
0.20	Ext.	●		0020SB	2.5	9.7	38	3	1
0.21	Ext.	●		0021SB	2.5	9.7	38	3	1
0.22	Ext.	●		0022SB	2.5	9.7	38	3	1
0.23	Ext.	●		0023SB	2.5	9.7	38	3	1
0.24	Ext.	●		0024SB	3	9.7	38	3	1
0.25	Ext.	●		0025SB	3	9.7	38	3	1
0.26	Ext.	●		0026SB	3	9.7	38	3	1
0.27	Ext.	●		0027SB	3	9.7	38	3	1
0.28	Ext.	●		0028SB	3	9.7	38	3	1
0.29	Ext.	●		0029SB	3	9.7	38	3	1
0.30	Ext.		●	0030SB	5	10.2	38	3	2
0.31	Ext.		●	0031SB	5	10.2	38	3	2
0.32	Ext.		●	0032SB	5	10.2	38	3	2
0.33	Ext.		●	0033SB	5	10.2	38	3	2
0.34	Ext.		●	0034SB	6	11.2	38	3	2
0.35	Ext.		●	0035SB	6	11.1	38	3	2
0.36	Ext.		●	0036SB	6	11.1	38	3	2
0.37	Ext.		●	0037SB	6	11.1	38	3	2
0.38	Ext.		●	0038SB	6	11.1	38	3	2
0.39	Ext.		●	0039SB	6	11.1	38	3	2
0.40	Ext.		●	0040SB	7	12.1	38	3	2
0.41	Ext.		●	0041SB	7	12.0	38	3	2
0.42	Ext.		●	0042SB	7	12.0	38	3	2
0.43	Ext.		●	0043SB	7	12.0	38	3	2

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)				Type
		VP20MF	VP15TF		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
0.44	Ext.		●	MSE0044SB	7	12.0	38	3	2
0.45	Ext.		●	0045SB	7	12.0	38	3	2
0.46	Ext.		●	0046SB	7	11.9	38	3	2
0.47	Ext.		●	0047SB	7	11.9	38	3	2
0.48	Ext.		●	0048SB	7	11.9	38	3	2
0.49	Ext.		●	0049SB	7	11.9	38	3	2
0.50	Ext.		●	0050SB	7	11.9	38	3	2
0.51	Ext.		●	0051SB	7	11.8	38	3	2
0.52	Ext.		●	0052SB	7	11.8	38	3	2
0.53	Ext.		●	0053SB	7	11.8	38	3	2
0.54	Ext.		●	0054SB	7	11.8	38	3	2
0.55	Ext.		●	0055SB	7	11.8	38	3	2
0.56	Ext.		●	0056SB	7	11.8	38	3	2
0.57	Ext.		●	0057SB	7	11.7	38	3	2
0.58	Ext.		●	0058SB	7	11.7	38	3	2
0.59	Ext.		●	0059SB	7	11.7	38	3	2
0.60	Ext.		●	0060SB	7	11.7	38	3	2
0.61	Ext.		●	0061SB	7	11.7	38	3	2
0.62	Ext.		●	0062SB	7	11.6	38	3	2
0.63	Ext.		●	0063SB	7	11.6	38	3	2
0.64	Ext.		●	0064SB	7	11.6	38	3	2
0.65	Ext.		●	0065SB	7	11.6	38	3	2
0.66	Ext.		●	0066SB	7	11.6	38	3	2
0.67	Ext.		●	0067SB	7	11.5	38	3	2
0.68	Ext.		●	0068SB	7	11.5	38	3	2
0.69	Ext.		●	0069SB	7	11.5	38	3	2
0.70	Ext.		●	0070SB	8	12.5	38	3	2
0.71	Ext.		●	0071SB	8	12.5	38	3	2
0.72	Ext.		●	0072SB	8	12.5	38	3	2
0.73	Ext.		●	0073SB	8	12.4	38	3	2
0.74	Ext.		●	0074SB	8	12.4	38	3	2
0.75	Ext.		●	0075SB	8	12.4	38	3	2
0.76	Ext.		●	0076SB	8	12.4	38	3	2
0.77	Ext.		●	0077SB	8	12.4	38	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 > N102
 TECHNICAL DATA > Q001

DRILLING(SOLID CARBIDE)

MSE

MIRACLE MINI STAR DRILL

CARBIDE

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)				Type
		VP20MF	VP15TF		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
0.78	Ext.		●	MSE0078SB	8	12.3	38	3	2
0.79	Ext.		●	0079SB	8	12.3	38	3	2
0.80	Ext.		●	0080SB	10	14.3	38	3	2
0.81	Ext.		●	0081SB	10	14.3	38	3	2
0.82	Ext.		●	0082SB	10	14.3	38	3	2
0.83	Ext.		●	0083SB	10	14.3	38	3	2
0.84	Ext.		●	0084SB	10	14.2	38	3	2
0.85	Ext.		●	0085SB	10	14.2	38	3	2
0.86	Ext.		●	0086SB	10	14.2	38	3	2
0.87	Ext.		●	0087SB	10	14.2	38	3	2
0.88	Ext.		●	0088SB	10	14.2	38	3	2

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)				Type
		VP20MF	VP15TF		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	
0.89	Ext.		●	0089SB	10	14.1	38	3	2
0.90	Ext.		●	0090SB	10	14.1	38	3	2
0.91	Ext.		●	0091SB	10	14.1	38	3	2
0.92	Ext.		●	0092SB	10	14.1	38	3	2
0.93	Ext.		●	0093SB	10	14.1	38	3	2
0.94	Ext.		●	0094SB	10	14.0	38	3	2
0.95	Ext.		●	0095SB	10	14.0	38	3	2
0.96	Ext.		●	0096SB	10	14.0	38	3	2
0.97	Ext.		●	0097SB	10	14.0	38	3	2
0.98	Ext.		●	0098SB	10	14.0	38	3	2
0.99	Ext.		●	0099SB	10	14.0	38	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. (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. (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 $\phi 0.3$ mm, 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.

● : Inventory maintained in Japan.

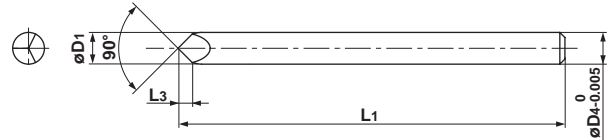
Dia. (mm)	Austenitic Stainless Steel (≤200HB)						Gray Cast Iron (≤350MPa)					
	Cutting Speed (m/min)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)		Cutting Speed (m/min)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Step (mm)	Table Feed (mm/min)	
0.1	6	20000	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	

Dia. (mm)	Aluminium Alloy (Si<5%)						Heat Resistant Alloy					
	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 $\phi 0.3\text{mm}$, 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.

DRILLING(SOLID CARBIDE)

MSP SPOT DRILL



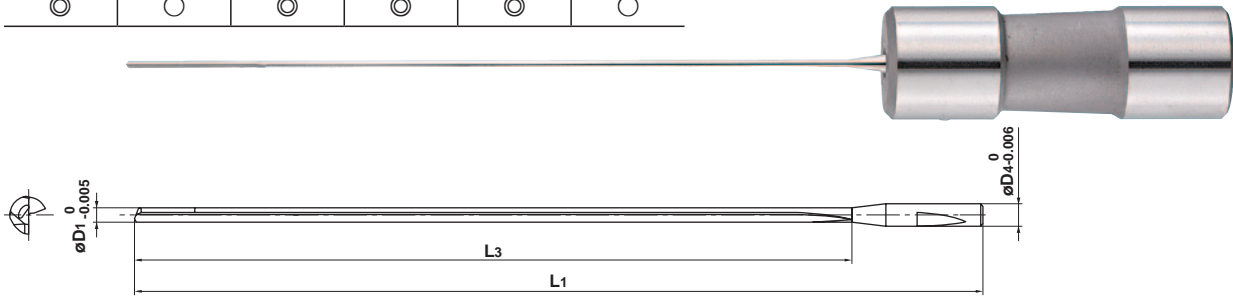
Order Number	Grade	Stock	Dimensions (mm)				Diameter Range (mm)
			Drill Dia.	Length of Cut	Overall Length	Shank Dia.	
			D1	L3	L1	D4	
MSP0300SB	VP15TF	●	3	1.5	38	3	0.1—3.0

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

- Micro deep hole drilling is possible.
- Excellent run-out accuracy ensures high precision drilling.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○	○	○	○	○	○



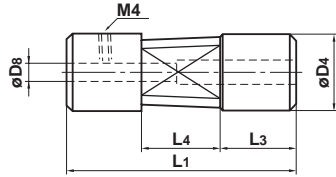
(Note) MGS drills are suitable for use with shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTT10	Order Number	Dimensions (mm)		
					Flute Length L3	Overall Length L1	Shank Dia. D4
					L3	L1	D4
0.7	50	Int	●	MGS0070L040B	40	80	3
	80	Int	●	0070L060B	60	100	3
0.8	45	Int	●	0080L040B	40	80	3
	70	Int	●	0080L060B	60	100	3
0.9	40	Int	●	0090L040B	40	80	3
	60	Int	●	0090L060B	60	100	3
1.0	35	Int	●	0100L040B	40	80	3
	55	Int	●	0100L060B	60	100	3
	75	Int	●	0100L080B	80	120	3
1.1	30	Int	●	0110L040B	40	80	3
	50	Int	●	0110L060B	60	100	3
	65	Int	●	0110L080B	80	120	3
1.2	30	Int	●	0120L040B	40	80	3
	45	Int	●	0120L060B	60	100	3
	60	Int	●	0120L080B	80	120	3
1.3	40	Int	●	0130L060B	60	100	3
	55	Int	●	0130L080B	80	120	3
	70	Int	●	0130L100B	100	140	3
1.4	35	Int	●	0140L060B	60	100	3
	50	Int	●	0140L080B	80	120	3
	65	Int	●	0140L100B	100	140	3
1.5	35	Int	●	0150L060B	60	100	3
	50	Int	●	0150L080B	80	120	3
	60	Int	●	0150L100B	100	140	3
1.6	30	Int	●	0160L060B	60	100	3
	45	Int	●	0160L080B	80	120	3
	55	Int	●	0160L100B	100	140	3
1.7	30	Int	●	0170L060B	60	100	3
	40	Int	●	0170L080B	80	120	3
	55	Int	●	0170L100B	100	140	3

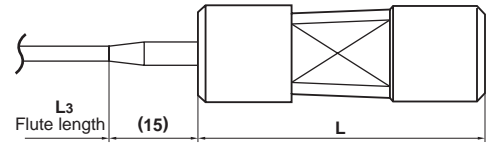
Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTT10	Order Number	Dimensions (mm)		
					Flute Length L3	Overall Length L1	Shank Dia. D4
					L3	L1	D4
1.8	30	Int	●	MGS0180L060B	60	100	3
	40	Int	●	0180L080B	80	120	3
	50	Int	●	0180L100B	100	140	3
1.9	25	Int	●	0190L060B	60	100	3
	35	Int	●	0190L080B	80	120	3
	45	Int	●	0190L100B	100	140	3
2.0	25	Int	●	0200L060B	60	100	3
	35	Int	●	0200L080B	80	120	3
	45	Int	●	0200L100B	100	140	3
2.1	35	Int	●	0210L080B	80	120	3
	40	Int	●	0210L100B	100	140	3
2.2	30	Int	●	0220L080B	80	120	3
	40	Int	●	0220L100B	100	140	3
2.3	30	Int	●	0230L080B	80	120	3
	40	Int	●	0230L100B	100	140	3
2.4	30	Int	●	0240L080B	80	120	3
	35	Int	●	0240L100B	100	140	3
2.5	25	Int	●	0250L080B	80	120	3
	35	Int	●	0250L100B	100	140	3
2.6	25	Int	●	0260L080B	80	120	3
	35	Int	●	0260L100B	100	140	3
2.7	25	Int	●	0270L080B	80	120	3
	30	Int	●	0270L100B	100	140	3
2.8	25	Int	●	0280L080B	80	120	3
	30	Int	●	0280L100B	100	140	3
2.9	20	Int	●	0290L080B	80	120	3
	30	Int	●	0290L100B	100	140	3
3.0	20	Int	●	0300L080B	80	120	3
	30	Int	●	0300L100B	100	140	3

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

DRIVER



WHEN CONNECTED WITH A DRIVER



Order Number	Stock	Dimensions (mm)					Set Screw	Wrench
		D4	D8	L1	L3	L4		
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 ($\leq 180\text{HB}$) AISI 1010 etc					Carbon steel, Alloy steel (180–280HB) AISI 1045, AISI 4140 etc				
	Dia. (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 ($\leq 200\text{HB}$) AISI 304, AISI 316 etc				
	Dia. (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 ($\leq 350\text{MPa}$) No 45 B etc					Ductile Cast Iron ($\leq 450\text{MPa}$) 60-40-8 etc				
	Dia. (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.

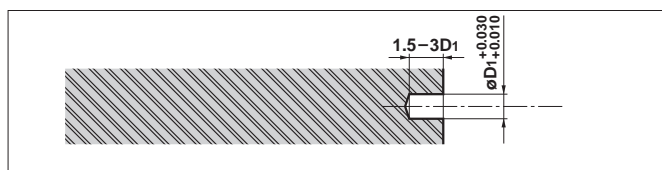
Work Material	Aluminium Alloy (Si<5%)				Copper, Copper alloy				
	Dia. (mm)	Cutting Speed (m/min)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
	0.8	50	19800	0.01 (0.008—0.016)	195	40	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.

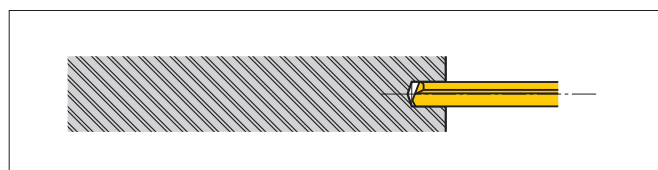
SPECIAL APPLICATION NOTES

- 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.

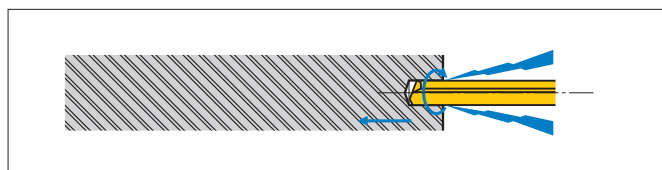
HOW TO USE



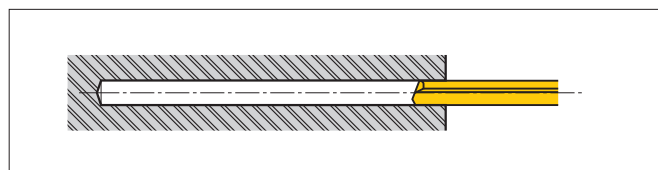
1. Pilot hole drilling.
(Mitsubishi's MZE, MZS, MWE or MWS is recommended.)



2. Drill is inserted into the pilot hole.
(Drill is not rotating.)



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.

MIRACLE DRILLS

VC-SSS

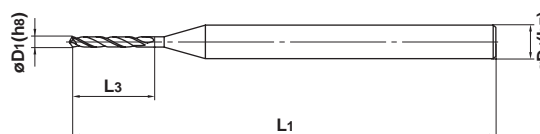
Short, For steel (3mm shank series)



Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○	◎	○	○	○	○



D1 ≤ 3
0
-0.014
0
-0.010



● First recommendation for pilot hole drilling of hardened material.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VCSSSD0030	0.3	3	38	3	●
D0040	0.4	4	38	3	●
D0050	0.5	4	38	3	●
D0060	0.6	5	38	3	●
D0070	0.7	5	38	3	●
D0080	0.8	6	38	3	●
D0090	0.9	6	38	3	●
D0100	1.0	8	38	3	●
D0110	1.1	8	38	3	●
D0120	1.2	8	38	3	●
D0130	1.3	8	38	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VCSSSD0140	1.4	8	38	3	●
D0150	1.5	10	45	3	●
D0160	1.6	10	45	3	●
D0170	1.7	10	45	3	●
D0180	1.8	10	45	3	●
D0190	1.9	10	45	3	●
D0200	2.0	12	45	3	●
D0210	2.1	12	45	3	●
D0220	2.2	12	45	3	●
D0230	2.3	12	45	3	●
D0240	2.4	12	45	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. (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)
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.

VC-HSM

Medium, For hardened material

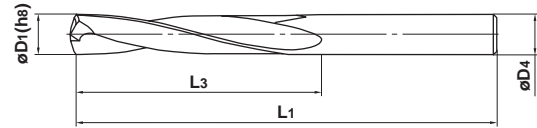


CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
	◎				○



D1 ≤ 3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 16
0 -0.014	0 -0.018	0 -0.022	0 -0.027
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	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VCHSMD0250	2.5	20	55	2.5	●
D0260	2.6	20	55	2.6	●
D0270	2.7	20	55	2.7	●
D0280	2.8	21	60	2.8	●
D0290	2.9	21	60	2.9	●
D0300	3.0	21	60	3	●
D0310	3.1	24	60	3.1	●
D0320	3.2	24	60	3.2	●
D0330	3.3	24	60	3.3	●
D0340	3.4	24	60	3.4	●
D0350	3.5	24	60	3.5	●
D0360	3.6	27	60	3.6	●
D0370	3.7	27	60	3.7	●
D0380	3.8	27	60	3.8	●
D0390	3.9	27	60	3.9	●
D0400	4.0	27	60	4	●
D0410	4.1	29	63	4.1	●
D0420	4.2	29	63	4.2	●
D0430	4.3	29	63	4.3	●
D0440	4.4	29	63	4.4	●
D0450	4.5	29	63	4.5	●
D0460	4.6	32	68	4.6	●
D0470	4.7	32	68	4.7	●
D0480	4.8	32	68	4.8	●
D0490	4.9	32	68	4.9	●
D0500	5.0	32	68	5	●
D0510	5.1	34	72	5.1	●
D0520	5.2	34	72	5.2	●
D0530	5.3	34	72	5.3	●
D0540	5.4	34	72	5.4	●
D0550	5.5	34	72	5.5	●
D0560	5.6	36	74	5.6	●
D0570	5.7	36	74	5.7	●
D0580	5.8	36	74	5.8	●
D0590	5.9	36	74	5.9	●
D0600	6.0	41	81	6	●
D0650	6.5	41	81	6.5	●
D0690	6.9	43	83	6.9	●
D0700	7.0	43	83	7	●
D0750	7.5	45	87	7.5	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VCHSMD0800	8.0	48	90	8	●
D0850	8.5	53	96	8.5	●
D0860	8.6	55	98	8.6	●
D0900	9.0	55	98	9	●
D0950	9.5	58	102	9.5	●
D1000	10.0	60	105	10	●
D1040	10.4	66	112	10.4	●
D1050	10.5	66	112	10.5	●
D1100	11.0	68	114	11	●
D1150	11.5	71	118	11.5	●
D1200	12.0	73	121	12	●
D1250	12.5	76	135	12.5	●
D1300	13.0	78	137	13	●
D1350	13.5	84	144	13.5	●
D1400	14.0	86	147	14	●
D1450	14.5	89	151	14.5	●
D1500	15.0	91	153	15	●
D1550	15.5	94	157	15.5	●
D1600	16.0	96	160	16	●

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. (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 3D (D:drill diameter) under these cutting conditions.

DRILLING

DRILLING(SOLID CARBIDE)

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).

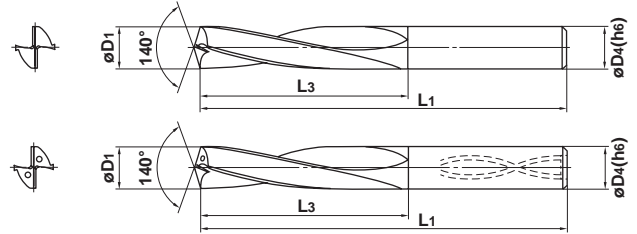
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
			○	◎	

	D1=3	3<D1≤6	6<D1≤10	10<D1≤16
	+0.005 0	+0.005 0	+0.005 0	+0.005 0
	0 -0.006	0 -0.008	0 -0.009	0 -0.011

MAE (External coolant)



MAS (Internal coolant)



(Note 1) MAS type bigger than $\phi 5.0$ have a recess in the end face.
 (Note 2) MAE/MAS drills are suitable for use with shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTI10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
3.0	3	Ext	●	MAE0300MB	21	61	3
	3	Int	□	MAS0300MB	21	61	3
	6	Int	●	MAS0300LB	30	70	3
3.1	3	Ext	●	MAE0310MB	24	64	4
	3	Int	□	MAS0310MB	24	64	4
	6	Int	●	MAS0310LB	34	74	4
3.2	3	Ext	●	MAE0320MB	24	64	4
	3	Int	□	MAS0320MB	24	64	4
	6	Int	●	MAS0320LB	34	74	4
3.3	3	Ext	●	MAE0330MB	24	64	4
	3	Int	□	MAS0330MB	24	64	4
	6	Int	●	MAS0330LB	34	74	4
3.4	3	Ext	●	MAE0340MB	24	64	4
	3	Int	□	MAS0340MB	24	64	4
	6	Int	●	MAS0340LB	34	74	4
3.5	3	Ext	●	MAE0350MB	24	64	4
	3	Int	□	MAS0350MB	24	64	4
	6	Int	●	MAS0350LB	34	74	4
3.6	3	Ext	●	MAE0360MB	28	68	4
	3	Int	□	MAS0360MB	28	68	4
	6	Int	●	MAS0360LB	40	80	4
3.65	3	Ext	●	* MAE0365MB	28	68	4
	3	Int	□	* MAS0365MB	28	68	4
	6	Int	●	* MAS0365LB	40	80	4
3.7	3	Ext	●	MAE0370MB	28	68	4
	3	Int	□	MAS0370MB	28	68	4
	6	Int	●	MAS0370LB	40	80	4
3.8	3	Ext	●	MAE0380MB	28	68	4
	3	Int	□	MAS0380MB	28	68	4
	6	Int	●	MAS0380LB	40	80	4
3.9	3	Ext	●	MAE0390MB	28	68	4
	3	Int	□	MAS0390MB	28	68	4
	6	Int	●	MAS0390LB	40	80	4
4.0	3	Ext	●	MAE0400MB	28	68	4
	3	Int	□	MAS0400MB	28	68	4
	6	Int	●	MAS0400LB	40	80	4
4.1	3	Ext	●	MAE0410MB	31	71	5
	3	Int	□	MAS0410MB	31	71	5
	6	Int	●	MAS0410LB	44	84	5

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTI10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
4.2	3	Ext	●	MAE0420MB	31	71	5
	3	Int	□	MAS0420MB	31	71	5
	6	Int	●	MAS0420LB	44	84	5
4.3	3	Ext	●	MAE0430MB	31	71	5
	3	Int	□	MAS0430MB	31	71	5
	6	Int	●	MAS0430LB	44	84	5
4.4	3	Ext	●	MAE0440MB	31	71	5
	3	Int	□	MAS0440MB	31	71	5
	6	Int	●	MAS0440LB	44	84	5
4.5	3	Ext	●	MAE0450MB	31	71	5
	3	Int	□	MAS0450MB	31	71	5
	6	Int	●	MAS0450LB	44	84	5
4.6	3	Ext	●	* MAE0460MB	33	73	5
	3	Int	□	* MAS0460MB	33	73	5
	6	Int	●	* MAS0460LB	48	88	5
4.7	3	Ext	●	MAE0470MB	33	73	5
	3	Int	□	MAS0470MB	33	73	5
	6	Int	●	MAS0470LB	48	88	5
4.8	3	Ext	●	MAE0480MB	33	73	5
	3	Int	□	MAS0480MB	33	73	5
	6	Int	●	MAS0480LB	48	88	5
4.9	3	Ext	●	MAE0490MB	33	73	5
	3	Int	□	MAS0490MB	33	73	5
	6	Int	●	MAS0490LB	48	88	5
5.0	3	Ext	●	MAE0500MB	33	73	5
	3	Int	●	MAS0500MB	33	73	5
	6	Int	●	MAS0500LB	48	88	5
5.1	3	Ext	●	MAE0510MB	36	76	6
	3	Int	□	MAS0510MB	36	76	6
	6	Int	●	MAS0510LB	52	92	6
5.2	3	Ext	●	MAE0520MB	36	76	6
	3	Int	□	MAS0520MB	36	76	6
	6	Int	●	MAS0520LB	52	92	6
5.3	3	Ext	●	MAE0530MB	36	76	6
	3	Int	□	MAS0530MB	36	76	6
	6	Int	●	MAS0530LB	52	92	6
5.4	3	Ext	●	MAE0540MB	36	76	6
	3	Int	□	MAS0540MB	36	76	6
	6	Int	●	MAS0540LB	52	92	6

* Standard hole size for rolled thread taps.

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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
5.5	3	Ext	●	* MAE0550MB	36	76	6
	3	Int	●	* MAS0550MB	36	76	6
	6	Int	●	* MAS0550LB	52	92	6
5.6	3	Ext	●	MAE0560MB	39	79	6
	3	Int	□	MAS0560MB	39	79	6
	6	Int	●	MAS0560LB	57	97	6
5.7	3	Ext	●	MAE0570MB	39	79	6
	3	Int	□	MAS0570MB	39	79	6
	6	Int	●	MAS0570LB	57	97	6
5.8	3	Ext	●	MAE0580MB	39	79	6
	3	Int	□	MAS0580MB	39	79	6
	6	Int	●	MAS0580LB	57	97	6
5.9	3	Ext	●	MAE0590MB	39	79	6
	3	Int	□	MAS0590MB	39	79	6
	6	Int	●	MAS0590LB	57	97	6
6.0	3	Ext	●	MAE0600MB	39	79	6
	3	Int	●	MAS0600MB	39	79	6
	6	Int	●	MAS0600LB	57	97	6
6.1	3	Ext	●	MAE0610MB	42	84	7
	3	Int	□	MAS0610MB	42	84	7
	6	Int	●	MAS0610LB	62	104	7
6.2	3	Ext	●	MAE0620MB	42	84	7
	3	Int	□	MAS0620MB	42	84	7
	6	Int	●	MAS0620LB	62	104	7
6.3	3	Ext	●	MAE0630MB	42	84	7
	3	Int	□	MAS0630MB	42	84	7
	6	Int	●	MAS0630LB	62	104	7
6.4	3	Ext	●	MAE0640MB	42	84	7
	3	Int	□	MAS0640MB	42	84	7
	6	Int	●	MAS0640LB	62	104	7
6.5	3	Ext	●	MAE0650MB	42	84	7
	3	Int	●	MAS0650MB	42	84	7
	6	Int	●	MAS0650LB	62	104	7
6.6	3	Ext	●	MAE0660MB	42	84	7
	3	Int	□	MAS0660MB	42	84	7
	6	Int	●	MAS0660LB	65	107	7
6.7	3	Ext	●	MAE0670MB	42	84	7
	3	Int	□	MAS0670MB	42	84	7
	6	Int	●	MAS0670LB	65	107	7
6.8	3	Ext	●	MAE0680MB	42	84	7
	3	Int	●	MAS0680MB	42	84	7
	6	Int	●	MAS0680LB	65	107	7
6.9	3	Ext	●	MAE0690MB	42	84	7
	3	Int	□	MAS0690MB	42	84	7
	6	Int	●	MAS0690LB	65	107	7
7.0	3	Ext	●	MAE0700MB	42	84	7
	3	Int	●	MAS0700MB	42	84	7
	6	Int	●	MAS0700LB	65	107	7

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
7.1	3	外部	●	MAE0710MB	48	90	8
	3	Ext	□	MAS0710MB	48	90	8
	6	Int	●	MAS0710LB	68	110	8
7.2	3	Int	●	MAE0720MB	48	90	8
	3	Ext	□	MAS0720MB	48	90	8
	6	Int	●	MAS0720LB	68	110	8
7.3	3	Int	●	MAE0730MB	48	90	8
	3	Int	□	MAS0730MB	48	90	8
	6	Int	●	MAS0730LB	68	110	8
7.35	3	Ext	●	* MAE0735MB	48	90	8
	3	Int	●	* MAS0735MB	48	90	8
	6	Int	●	* MAS0735LB	68	110	8
7.4	3	Ext	●	MAE0740MB	48	90	8
	3	Int	□	MAS0740MB	48	90	8
	6	Int	●	MAS0740LB	68	110	8
7.5	3	Ext	●	MAE0750MB	48	90	8
	3	Int	□	MAS0750MB	48	90	8
	6	Int	●	MAS0750LB	68	110	8
7.6	3	Ext	●	MAE0760MB	48	90	8
	3	Int	□	MAS0760MB	48	90	8
	6	Int	●	MAS0760LB	72	114	8
7.7	3	Ext	●	MAE0770MB	48	90	8
	3	Int	□	MAS0770MB	48	90	8
	6	Int	●	MAS0770LB	72	114	8
7.8	3	Ext	●	MAE0780MB	48	90	8
	3	Int	□	MAS0780MB	48	90	8
	6	Int	●	MAS0780LB	72	114	8
7.9	3	Ext	●	MAE0790MB	48	90	8
	3	Int	□	MAS0790MB	48	90	8
	6	Int	●	MAS0790LB	72	114	8
8.0	3	Ext	●	MAE0800MB	48	90	8
	3	Int	●	MAS0800MB	48	90	8
	6	Int	●	MAS0800LB	72	114	8
8.1	3	Ext	●	MAE0810MB	50	94	9
	3	Int	□	MAS0810MB	50	94	9
	6	Int	●	MAS0810LB	75	119	9
8.2	3	Ext	●	MAE0820MB	50	94	9
	3	Int	□	MAS0820MB	50	94	9
	6	Int	●	MAS0820LB	75	119	9
8.3	3	Ext	●	MAE0830MB	50	94	9
	3	Int	□	MAS0830MB	50	94	9
	6	Int	●	MAS0830LB	75	119	9
8.4	3	Ext	●	MAE0840MB	50	94	9
	3	Int	□	MAS0840MB	50	94	9
	6	Int	●	MAS0840LB	75	119	9
8.5	3	Ext	●	MAE0850MB	50	94	9
	3	Int	●	MAS0850MB	50	94	9
	6	Int	●	MAS0850LB	75	119	9

* Standard hole size for rolled thread taps.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
8.6	3	Ext	●	MAE0860MB	50	94	9
	3	Int	□	MAS0860MB	50	94	9
	6	Int	●	MAS0860LB	77	121	9
8.7	3	Ext	●	MAE0870MB	50	94	9
	3	Int	□	MAS0870MB	50	94	9
	6	Int	●	MAS0870LB	77	121	9
8.8	3	Ext	●	MAE0880MB	50	94	9
	3	Int	□	MAS0880MB	50	94	9
	6	Int	●	MAS0880LB	77	121	9
8.9	3	Ext	●	MAE0890MB	50	94	9
	3	Int	□	MAS0890MB	50	94	9
	6	Int	●	MAS0890LB	77	121	9
9.0	3	Ext	●	MAE0900MB	50	94	9
	3	Int	●	MAS0900MB	50	94	9
	6	Int	●	MAS0900LB	77	121	9
9.1	3	Ext	●	MAE0910MB	53	97	10
	3	Int	□	MAS0910MB	53	97	10
	6	Int	●	MAS0910LB	81	125	10
9.2	3	Ext	●	MAE0920MB	53	97	10
	3	Int	□	MAS0920MB	53	97	10
	6	Int	●	MAS0920LB	81	125	10
9.21	3	Ext	●	* MAE0921MB	53	97	10
	3	Int	●	* MAS0921MB	53	97	10
	6	Int	●	* MAS0921LB	81	125	10
9.3	3	Ext	●	MAE0930MB	53	97	10
	3	Int	□	MAS0930MB	53	97	10
	6	Int	●	MAS0930LB	81	125	10
9.4	3	Ext	●	MAE0940MB	53	97	10
	3	Int	□	MAS0940MB	53	97	10
	6	Int	●	MAS0940LB	81	125	10
9.5	3	Ext	●	MAE0950MB	53	97	10
	3	Int	●	MAS0950MB	53	97	10
	6	Int	●	MAS0950LB	81	125	10
9.6	3	Ext	●	MAE0960MB	53	97	10
	3	Int	□	MAS0960MB	53	97	10
	6	Int	●	MAS0960LB	81	125	10
9.7	3	Ext	●	MAE0970MB	53	97	10
	3	Int	□	MAS0970MB	53	97	10
	6	Int	●	MAS0970LB	81	125	10
9.8	3	Ext	●	MAE0980MB	53	97	10
	3	Int	□	MAS0980MB	53	97	10
	6	Int	●	MAS0980LB	81	125	10
9.9	3	Ext	●	MAE0990MB	53	97	10
	3	Int	□	MAS0990MB	53	97	10
	6	Int	●	MAS0990LB	81	125	10
10.0	3	Ext	●	MAE1000MB	53	97	10
	3	Int	●	MAS1000MB	53	97	10
	6	Int	●	MAS1000LB	81	125	10

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
10.1	3	Ext	□	MAE1010MB	55	101	11
	3	Int	□	MAS1010MB	55	101	11
	6	Int	□	MAS1010LB	89	135	11
10.2	3	Ext	□	MAE1020MB	55	101	11
	3	Int	□	MAS1020MB	55	101	11
	6	Int	□	MAS1020LB	89	135	11
10.3	3	Ext	●	MAE1030MB	55	101	11
	3	Int	●	MAS1030MB	55	101	11
	6	Int	●	MAS1030LB	89	135	11
10.4	3	Ext	□	MAE1040MB	55	101	11
	3	Int	□	MAS1040MB	55	101	11
	6	Int	□	MAS1040LB	89	135	11
10.5	3	Ext	●	MAE1050MB	55	101	11
	3	Int	●	MAS1050MB	55	101	11
	6	Int	●	MAS1050LB	89	135	11
10.6	3	Ext	□	MAE1060MB	55	101	11
	3	Int	□	MAS1060MB	55	101	11
	6	Int	□	MAS1060LB	89	135	11
10.7	3	Ext	□	MAE1070MB	55	101	11
	3	Int	□	MAS1070MB	55	101	11
	6	Int	□	MAS1070LB	89	135	11
10.8	3	Ext	□	MAE1080MB	55	101	11
	3	Int	□	MAS1080MB	55	101	11
	6	Int	□	MAS1080LB	89	135	11
10.9	3	Ext	□	MAE1090MB	55	101	11
	3	Int	□	MAS1090MB	55	101	11
	6	Int	□	MAS1090LB	89	135	11
11.0	3	Ext	●	MAE1100MB	55	101	11
	3	Int	●	MAS1100MB	55	101	11
	6	Int	●	MAS1100LB	89	135	11
11.08	3	Ext	●	* MAE1108MB	60	106	12
	3	Int	●	* MAS1108MB	60	106	12
	6	Int	●	* MAS1108LB	94	140	12
11.1	3	Ext	□	MAE1110MB	60	106	12
	3	Int	□	MAS1110MB	60	106	12
	6	Int	□	MAS1110LB	94	140	12
11.2	3	Ext	□	MAE1120MB	60	106	12
	3	Int	□	MAS1120MB	60	106	12
	6	Int	□	MAS1120LB	94	140	12
11.3	3	Ext	□	MAE1130MB	60	106	12
	3	Int	□	MAS1130MB	60	106	12
	6	Int	□	MAS1130LB	94	140	12
11.4	3	Ext	□	MAE1140MB	60	106	12
	3	Int	□	MAS1140MB	60	106	12
	6	Int	□	MAS1140LB	94	140	12
11.5	3	Ext	□	MAE1150MB	60	106	12
	3	Int	□	MAS1150MB	60	106	12
	6	Int	□	MAS1150LB	94	140	12

* Standard hole size for rolled thread taps.

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

Drill Dia. D ₁ (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L ₃	L ₁	D ₄
11.6	3	Ext	□	MAE1160MB	60	106	12
	3	Int	□	MAS1160MB	60	106	12
	6	Int	□	MAS1160LB	94	140	12
11.7	3	Ext	□	MAE1170MB	60	106	12
	3	Int	□	MAS1170MB	60	106	12
	6	Int	□	MAS1170LB	94	140	12
11.8	3	Ext	□	MAE1180MB	60	106	12
	3	Int	□	MAS1180MB	60	106	12
	6	Int	□	MAS1180LB	94	140	12
11.9	3	Ext	□	MAE1190MB	60	106	12
	3	Int	□	MAS1190MB	60	106	12
	6	Int	□	MAS1190LB	94	140	12
12.0	3	Ext	●	MAE1200MB	60	106	12
	3	Int	●	MAS1200MB	60	106	12
	6	Int	●	MAS1200LB	94	140	12
12.1	3	Ext	□	MAE1210MB	65	115	13
	3	Int	□	MAS1210MB	65	115	13
	6	Int	□	MAS1210LB	100	150	13
12.2	3	Ext	□	MAE1220MB	65	115	13
	3	Int	□	MAS1220MB	65	115	13
	6	Int	□	MAS1220LB	100	150	13
12.3	3	Ext	□	MAE1230MB	65	115	13
	3	Int	□	MAS1230MB	65	115	13
	6	Int	□	MAS1230LB	100	150	13
12.4	3	Ext	□	MAE1240MB	65	115	13
	3	Int	□	MAS1240MB	65	115	13
	6	Int	□	MAS1240LB	100	150	13
12.5	3	Ext	●	MAE1250MB	65	115	13
	3	Int	●	MAS1250MB	65	115	13
	6	Int	●	MAS1250LB	100	150	13
12.6	3	Ext	□	MAE1260MB	65	115	13
	3	Int	□	MAS1260MB	65	115	13
	6	Int	□	MAS1260LB	100	150	13
12.7	3	Ext	□	MAE1270MB	65	115	13
	3	Int	□	MAS1270MB	65	115	13
	6	Int	□	MAS1270LB	100	150	13
12.8	3	Ext	□	MAE1280MB	65	115	13
	3	Int	□	MAS1280MB	65	115	13
	6	Int	□	MAS1280LB	100	150	13
12.9	3	Ext	□	MAE1290MB	65	115	13
	3	Int	□	MAS1290MB	65	115	13
	6	Int	□	MAS1290LB	100	150	13
12.96	3	Ext	●	* MAE1296MB	65	115	13
	3	Int	●	* MAS1296MB	65	115	13
	6	Int	●	* MAS1296LB	100	150	13
13.0	3	Ext	●	MAE1300MB	65	115	13
	3	Int	●	MAS1300MB	65	115	13
	6	Int	●	MAS1300LB	100	150	13

* Standard hole size for rolled thread taps.

Drill Dia. D ₁ (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L ₃	L ₁	D ₄
13.1	3	Ext	□	MAE1310MB	70	120	14
	3	Int	□	MAS1310MB	70	120	14
	6	Int	□	MAS1310LB	110	160	14
13.2	3	Ext	□	MAE1320MB	70	120	14
	3	Int	□	MAS1320MB	70	120	14
	6	Int	□	MAS1320LB	110	160	14
13.3	3	Ext	□	MAE1330MB	70	120	14
	3	Int	□	MAS1330MB	70	120	14
	6	Int	□	MAS1330LB	110	160	14
13.4	3	Ext	□	MAE1340MB	70	120	14
	3	Int	□	MAS1340MB	70	120	14
	6	Int	□	MAS1340LB	110	160	14
13.5	3	Ext	●	MAE1350MB	70	120	14
	3	Int	●	MAS1350MB	70	120	14
	6	Int	●	MAS1350LB	110	160	14
13.6	3	Ext	□	MAE1360MB	70	120	14
	3	Int	□	MAS1360MB	70	120	14
	6	Int	□	MAS1360LB	110	160	14
13.7	3	Ext	□	MAE1370MB	70	120	14
	3	Int	□	MAS1370MB	70	120	14
	6	Int	□	MAS1370LB	110	160	14
13.8	3	Ext	□	MAE1380MB	70	120	14
	3	Int	□	MAS1380MB	70	120	14
	6	Int	□	MAS1380LB	110	160	14
13.9	3	Ext	□	MAE1390MB	70	120	14
	3	Int	□	MAS1390MB	70	120	14
	6	Int	□	MAS1390LB	110	160	14
14.0	3	Ext	●	MAE1400MB	70	120	14
	3	Int	●	MAS1400MB	70	120	14
	6	Int	●	MAS1400LB	110	160	14
14.1	3	Ext	□	MAE1410MB	72	130	15
	3	Int	□	MAS1410MB	72	130	15
	6	Int	□	MAS1410LB	115	173	15
14.2	3	Ext	□	MAE1420MB	72	130	15
	3	Int	□	MAS1420MB	72	130	15
	6	Int	□	MAS1420LB	115	173	15
14.3	3	Ext	□	MAE1430MB	72	130	15
	3	Int	□	MAS1430MB	72	130	15
	6	Int	□	MAS1430LB	115	173	15
14.4	3	Ext	□	MAE1440MB	72	130	15
	3	Int	□	MAS1440MB	72	130	15
	6	Int	□	MAS1440LB	115	173	15
14.5	3	Ext	□	MAE1450MB	72	130	15
	3	Int	□	MAS1450MB	72	130	15
	6	Int	□	MAS1450LB	115	173	15
14.6	3	Ext	□	MAE1460MB	72	130	15
	3	Int	□	MAS1460MB	72	130	15
	6	Int	□	MAS1460LB	115	173	15

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm)		
					Flute Length	Overall Length	Shank Dia.
					L3	L1	D4
14.7	3	Ext	<input type="checkbox"/>	MAE1470MB	72	130	15
	3	Int	<input type="checkbox"/>	MAS1470MB	72	130	15
	6	Int	<input type="checkbox"/>	MAS1470LB	115	173	15
14.8	3	Ext	<input type="checkbox"/>	MAE1480MB	72	130	15
	3	Int	<input type="checkbox"/>	MAS1480MB	72	130	15
	6	Int	<input type="checkbox"/>	MAS1480LB	115	173	15
14.9	3	Ext	<input type="checkbox"/>	MAE1490MB	72	130	15
	3	Int	<input type="checkbox"/>	MAS1490MB	72	130	15
	6	Int	<input type="checkbox"/>	MAS1490LB	115	173	15
14.96	3	Ext	●	* MAE1496MB	72	130	15
	3	Int	●	* MAS1496MB	72	130	15
	6	Int	●	* MAS1496LB	115	173	15
15.0	3	Ext	●	MAE1500MB	72	130	15
	3	Int	●	MAS1500MB	72	130	15
	6	Int	●	MAS1500LB	115	173	15
15.1	3	Ext	<input type="checkbox"/>	MAE1510MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1510MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1510LB	120	178	16
15.2	3	Ext	<input type="checkbox"/>	MAE1520MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1520MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1520LB	120	178	16
15.3	3	Ext	<input type="checkbox"/>	MAE1530MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1530MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1530LB	120	178	16
15.4	3	Ext	<input type="checkbox"/>	MAE1540MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1540MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1540LB	120	178	16
15.5	3	Ext	<input type="checkbox"/>	MAE1550MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1550MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1550LB	120	178	16
15.6	3	Ext	<input type="checkbox"/>	MAE1560MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1560MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1560LB	120	178	16
15.7	3	Ext	<input type="checkbox"/>	MAE1570MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1570MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1570LB	120	178	16
15.8	3	Ext	<input type="checkbox"/>	MAE1580MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1580MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1580LB	120	178	16
15.9	3	Ext	<input type="checkbox"/>	MAE1590MB	76	134	16
	3	Int	<input type="checkbox"/>	MAS1590MB	76	134	16
	6	Int	<input type="checkbox"/>	MAS1590LB	120	178	16
16.0	3	Ext	●	MAE1600MB	76	134	16
	3	Int	●	MAS1600MB	76	134	16
	6	Int	●	MAS1600LB	120	178	16

* Standard hole size for rolled thread taps.

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

RECOMMENDED CUTTING CONDITIONS

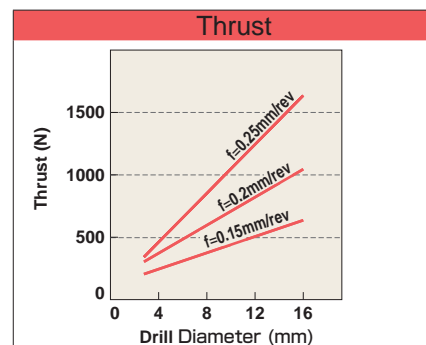
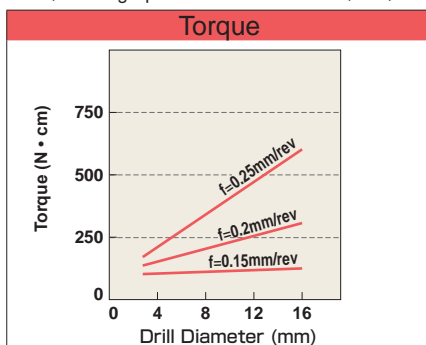
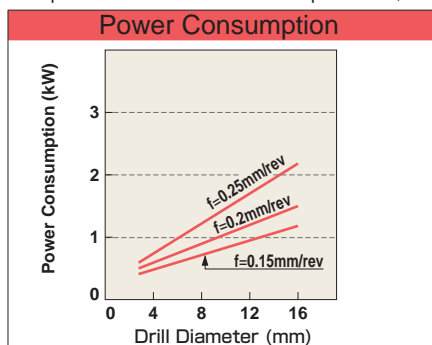
Type	Work Material	Drill Dia. $\phi 3.0 - \phi 6.0$		Drill Dia. $\phi 6.1 - \phi 10.0$		Drill Dia. $\phi 10.1 - \phi 16.0$	
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
M A E	N Aluminium Alloy Casting	90 (40-140)	0.15 (0.05-0.3)	100 (50-150)	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)
M A S	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 (ϕD_1)	Hole Diameter Tolerance		Drill Diameter (ϕD_1)	Hole Diameter Tolerance	
		max.	min.		max.	min.
M4x0.7	3.3	3.242	3.422	3.65	3.65	3.70
M5x0.8	4.2	4.134	4.334	4.60	4.59	4.66
M6x1.0	5.0	4.917	5.153	5.50	5.48	5.57
M8x1.25	6.8	6.647	6.912	7.35	7.34	7.41
M10x1.5	8.5	8.376	8.676	9.21	9.18	9.28
M12x1.75	10.3	10.106	10.441	11.08	11.05	11.15
M14x2	12.0	11.835	12.210	12.96	12.92	13.04
M16x2	14.0	13.835	14.210	14.96	14.92	15.04

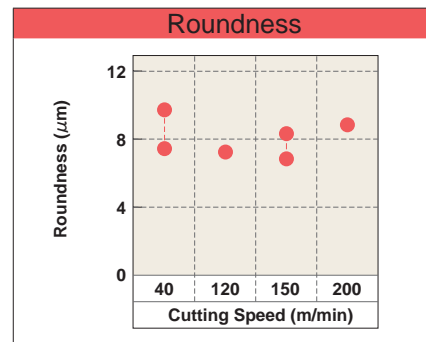
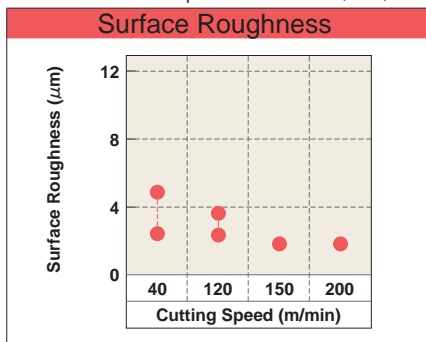
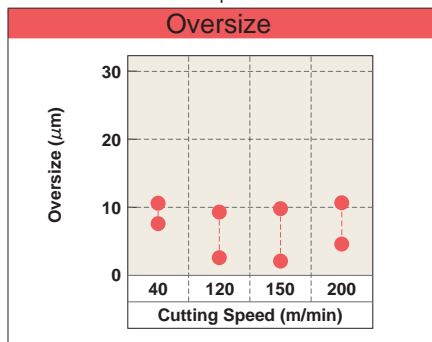
CUTTING RESISTANCE

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



MACHINED HOLE ACCURACY

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



VIOLET DRILLS

VA-PDS

Short, High precision



D₁<2

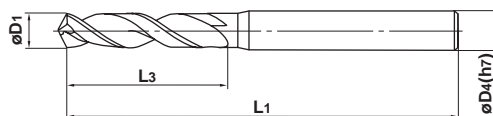
D₁≥2

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	○		○

0.5 ≤ D ₁ ≤ 3	3 < D ₁ ≤ 6	6 < D ₁ ≤ 10	10 < D ₁ ≤ 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	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
VAPDSD0050	0.50	3	50	3	●
D0051	0.51	3	50	3	●
D0052	0.52	3	50	3	●
D0053	0.53	3	50	3	●
D0054	0.54	3	50	3	●
D0055	0.55	3	50	3	●
D0056	0.56	4	50	3	●
D0057	0.57	4	50	3	●
D0058	0.58	4	50	3	●
D0059	0.59	4	50	3	●
D0060	0.60	5	50	3	●
D0061	0.61	5	50	3	●
D0062	0.62	5	50	3	●
D0063	0.63	5	50	3	●
D0064	0.64	5	50	3	●
D0065	0.65	5	50	3	●
D0066	0.66	5	50	3	●
D0067	0.67	5	50	3	●
D0068	0.68	5	50	3	●
D0069	0.69	5	50	3	●
D0070	0.70	5	50	3	●
D0071	0.71	5	50	3	●
D0072	0.72	5	50	3	●
D0073	0.73	5	50	3	●
D0074	0.74	5	50	3	●
D0075	0.75	5	50	3	●
D0076	0.76	5	50	3	●
D0077	0.77	5	50	3	●
D0078	0.78	5	50	3	●
D0079	0.79	5	50	3	●
D0080	0.80	5	50	3	●
D0081	0.81	5	50	3	●
D0082	0.82	5	50	3	●
D0083	0.83	5	50	3	●
D0084	0.84	5	50	3	●
D0085	0.85	5	50	3	●
D0086	0.86	6	50	3	●
D0087	0.87	6	50	3	●
D0088	0.88	6	50	3	●
D0089	0.89	6	50	3	●

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
VAPDSD0090	0.90	6	50	3	●
D0091	0.91	6	50	3	●
D0092	0.92	6	50	3	●
D0093	0.93	6	50	3	●
D0094	0.94	6	50	3	●
D0095	0.95	6	50	3	●
D0096	0.96	6	50	3	●
D0097	0.97	6	50	3	●
D0098	0.98	6	50	3	●
D0099	0.99	6	50	3	●
D0100	1.00	6	50	3	●
D0101	1.01	6	50	3	●
D0102	1.02	6	50	3	●
D0103	1.03	6	50	3	●
D0104	1.04	6	50	3	●
D0105	1.05	6	50	3	●
D0106	1.06	6	50	3	●
D0107	1.07	8	55	3	●
D0108	1.08	8	55	3	●
D0109	1.09	8	55	3	●
D0110	1.10	8	55	3	●
D0111	1.11	8	55	3	●
D0112	1.12	8	55	3	●
D0113	1.13	8	55	3	●
D0114	1.14	8	55	3	●
D0115	1.15	8	55	3	●
D0116	1.16	8	55	3	●
D0117	1.17	8	55	3	●
D0118	1.18	8	55	3	●
D0119	1.19	8	55	3	●
D0120	1.20	8	55	3	●
D0121	1.21	8	55	3	●
D0122	1.22	8	55	3	●
D0123	1.23	8	55	3	●
D0124	1.24	8	55	3	●
D0125	1.25	8	55	3	●
D0126	1.26	8	55	3	●
D0127	1.27	8	55	3	●
D0128	1.28	8	55	3	●
D0129	1.29	8	55	3	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD0130	1.30	9	55	3	●
D0131	1.31	9	55	3	●
D0132	1.32	9	55	3	●
D0133	1.33	9	55	3	●
D0134	1.34	9	55	3	●
D0135	1.35	9	55	3	●
D0136	1.36	9	55	3	●
D0137	1.37	9	55	3	●
D0138	1.38	9	55	3	●
D0139	1.39	9	55	3	●
D0140	1.40	9	55	3	●
D0141	1.41	9	55	3	●
D0142	1.42	9	55	3	●
D0143	1.43	9	55	3	●
D0144	1.44	9	55	3	●
D0145	1.45	9	55	3	●
D0146	1.46	9	55	3	●
D0147	1.47	9	55	3	●
D0148	1.48	9	55	3	●
D0149	1.49	9	55	3	●
D0150	1.50	9	55	3	●
D0151	1.51	11	55	3	●
D0152	1.52	11	55	3	●
D0153	1.53	11	55	3	●
D0154	1.54	11	55	3	●
D0155	1.55	11	55	3	●
D0156	1.56	11	55	3	●
D0157	1.57	11	55	3	●
D0158	1.58	11	55	3	●
D0159	1.59	11	55	3	●
D0160	1.60	11	55	3	●
D0161	1.61	11	55	3	●
D0162	1.62	11	55	3	●
D0163	1.63	11	55	3	●
D0164	1.64	11	55	3	●
D0165	1.65	11	55	3	●
D0166	1.66	11	55	3	●
D0167	1.67	11	55	3	●
D0168	1.68	11	55	3	●
D0169	1.69	11	55	3	●
D0170	1.70	11	55	3	●
D0171	1.71	11	55	3	●
D0172	1.72	11	55	3	●
D0173	1.73	11	55	3	●
D0174	1.74	11	55	3	●
D0175	1.75	11	55	3	●
D0176	1.76	11	55	3	●
D0177	1.77	11	55	3	●
D0178	1.78	11	55	3	●
D0179	1.79	11	55	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD0180	1.80	11	55	3	●
D0181	1.81	11	55	3	●
D0182	1.82	11	55	3	●
D0183	1.83	11	55	3	●
D0184	1.84	11	55	3	●
D0185	1.85	11	55	3	●
D0186	1.86	11	55	3	●
D0187	1.87	11	55	3	●
D0188	1.88	11	55	3	●
D0189	1.89	11	55	3	●
D0190	1.90	12	55	3	●
D0191	1.91	12	60	3	●
D0192	1.92	12	60	3	●
D0193	1.93	12	60	3	●
D0194	1.94	12	60	3	●
D0195	1.95	12	60	3	●
D0196	1.96	12	60	3	●
D0197	1.97	12	60	3	●
D0198	1.98	12	60	3	●
D0199	1.99	12	60	3	●
D0200	2.00	12	60	3	●
D0205	2.05	12	60	3	●
D0210	2.1	12	60	3	●
D0215	2.15	12	60	3	●
D0220	2.2	12	60	3	●
D0225	2.25	12	60	3	●
D0230	2.3	13	60	3	●
D0235	2.35	13	60	3	●
D0240	2.4	13	60	3	●
D0245	2.45	13	60	3	●
D0250	2.5	13	60	3	●
D0255	2.55	13	60	3	●
D0260	2.6	15	60	3	●
D0265	2.65	15	60	3	●
D0270	2.7	15	60	3	●
D0275	2.75	15	60	3	●
D0280	2.8	15	60	3	●
D0285	2.85	15	60	3	●
D0290	2.9	15	60	3	●
D0295	2.95	15	60	3	●
D0300	3.0	15	60	3	●
D0305	3.05	17	70	4	●
D0310	3.1	17	70	4	●
D0315	3.15	17	70	4	●
D0320	3.2	17	70	4	●
D0325	3.25	17	70	4	●
D0330	3.3	19	70	4	●
D0335	3.35	19	70	4	●
D0340	3.4	19	70	4	●
D0345	3.45	19	70	4	●

VIOLET DRILLS

VA-PDS

Short, High precision

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD0350	3.5	19	70	4	●
D0355	3.55	19	70	4	●
D0360	3.6	21	70	4	●
D0365	3.65	21	70	4	●
D0370	3.7	21	70	4	●
D0375	3.75	21	70	4	●
D0380	3.8	21	70	4	●
D0385	3.85	21	70	4	●
D0390	3.9	21	70	4	●
D0395	3.95	21	70	4	●
D0400	4.0	21	70	4	●
D0405	4.05	21	80	6	●
D0410	4.1	21	80	6	●
D0415	4.15	21	80	6	●
D0420	4.2	21	80	6	●
D0425	4.25	21	80	6	●
D0430	4.3	23	80	6	●
D0435	4.35	23	80	6	●
D0440	4.4	23	80	6	●
D0445	4.45	23	80	6	●
D0450	4.5	23	80	6	●
D0455	4.55	23	80	6	●
D0460	4.6	25	80	6	●
D0465	4.65	25	80	6	●
D0470	4.7	25	80	6	●
D0475	4.75	25	80	6	●
D0480	4.8	25	80	6	●
D0485	4.85	25	80	6	●
D0490	4.9	25	80	6	●
D0495	4.95	25	80	6	●
D0500	5.0	25	80	6	●
D0505	5.05	25	80	6	●
D0510	5.1	25	80	6	●
D0515	5.15	25	80	6	●
D0520	5.2	25	80	6	●
D0525	5.25	25	80	6	●
D0530	5.3	25	80	6	●
D0535	5.35	27	80	6	●
D0540	5.4	27	80	6	●
D0545	5.45	27	80	6	●
D0550	5.5	27	80	6	●
D0555	5.55	27	80	6	●
D0560	5.6	27	80	6	●
D0565	5.65	27	80	6	●
D0570	5.7	27	80	6	●
D0575	5.75	27	80	6	●
D0580	5.8	27	80	6	●
D0585	5.85	27	80	6	●
D0590	5.9	27	80	6	●
D0595	5.95	27	80	6	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD0600	6.0	27	80	6	●
D0605	6.05	30	80	8	●
D0610	6.1	30	80	8	●
D0615	6.15	30	80	8	●
D0620	6.2	30	80	8	●
D0625	6.25	30	80	8	●
D0630	6.3	30	80	8	●
D0635	6.35	30	80	8	●
D0640	6.4	30	80	8	●
D0645	6.45	30	80	8	●
D0650	6.5	30	80	8	●
D0655	6.55	30	80	8	●
D0660	6.6	30	80	8	●
D0665	6.65	30	80	8	●
D0670	6.7	30	80	8	●
D0675	6.75	32	80	8	●
D0680	6.8	32	80	8	●
D0685	6.85	32	80	8	●
D0690	6.9	32	80	8	●
D0695	6.95	32	80	8	●
D0700	7.0	32	80	8	●
D0705	7.05	32	80	8	●
D0710	7.1	32	80	8	●
D0715	7.15	32	80	8	●
D0720	7.2	32	80	8	●
D0725	7.25	32	80	8	●
D0730	7.3	32	80	8	●
D0735	7.35	32	80	8	●
D0740	7.4	32	80	8	●
D0745	7.45	32	80	8	●
D0750	7.5	32	80	8	●
D0755	7.55	35	85	8	●
D0760	7.6	35	85	8	●
D0765	7.65	35	85	8	●
D0770	7.7	35	85	8	●
D0775	7.75	35	85	8	●
D0780	7.8	35	85	8	●
D0785	7.85	35	85	8	●
D0790	7.9	35	85	8	●
D0795	7.95	35	85	8	●
D0800	8.0	35	85	8	●
D0805	8.05	35	90	10	●
D0810	8.1	35	90	10	●
D0815	8.15	35	90	10	●
D0820	8.2	35	90	10	●
D0825	8.25	35	90	10	●
D0830	8.3	35	90	10	●
D0835	8.35	35	90	10	●
D0840	8.4	35	90	10	●
D0845	8.45	35	90	10	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD0850	8.5	35	90	10	●
D0855	8.55	38	93	10	●
D0860	8.6	38	93	10	●
D0865	8.65	38	93	10	●
D0870	8.7	38	93	10	●
D0875	8.75	38	93	10	●
D0880	8.8	38	93	10	●
D0885	8.85	38	93	10	●
D0890	8.9	38	93	10	●
D0895	8.95	38	93	10	●
D0900	9.0	38	93	10	●
D0905	9.05	38	93	10	●
D0910	9.1	38	93	10	●
D0915	9.15	38	93	10	●
D0920	9.2	38	93	10	●
D0925	9.25	38	93	10	●
D0930	9.3	38	93	10	●
D0935	9.35	38	93	10	●
D0940	9.4	38	93	10	●
D0945	9.45	38	93	10	●
D0950	9.5	38	93	10	●
D0955	9.55	41	96	10	●
D0960	9.6	41	96	10	●
D0965	9.65	41	96	10	●
D0970	9.7	41	96	10	●
D0975	9.75	41	96	10	●
D0980	9.8	41	96	10	●
D0985	9.85	41	96	10	●
D0990	9.9	41	96	10	●
D0995	9.95	41	96	10	●
D1000	10.0	41	96	10	●
D1005	10.05	41	101	12	●
D1010	10.1	41	101	12	●
D1015	10.15	41	101	12	●
D1020	10.2	41	101	12	●
D1025	10.25	41	101	12	●
D1030	10.3	41	101	12	●
D1035	10.35	41	101	12	●
D1040	10.4	41	101	12	●
D1045	10.45	41	101	12	●
D1050	10.5	41	101	12	●
D1055	10.55	41	101	12	●
D1060	10.6	41	101	12	●
D1065	10.65	45	105	12	●
D1070	10.7	45	105	12	●
D1075	10.75	45	105	12	●
D1080	10.8	45	105	12	●
D1085	10.85	45	105	12	●
D1090	10.9	45	105	12	●
D1095	10.95	45	105	12	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSD1100	11.0	45	105	12	●
D1105	11.05	45	105	12	●
D1110	11.1	45	105	12	●
D1115	11.15	45	105	12	●
D1120	11.2	45	105	12	●
D1125	11.25	45	105	12	●
D1130	11.3	45	105	12	●
D1135	11.35	45	105	12	●
D1140	11.4	45	105	12	●
D1145	11.45	45	105	12	●
D1150	11.5	45	105	12	●
D1155	11.55	45	105	12	●
D1160	11.6	45	105	12	●
D1165	11.65	45	105	12	●
D1170	11.7	45	105	12	●
D1175	11.75	45	105	12	●
D1180	11.8	45	105	12	●
D1185	11.85	49	109	12	●
D1190	11.9	49	109	12	●
D1195	11.95	49	109	12	●
D1200	12.0	49	109	12	●
D1210	12.1	49	109	12	●
D1220	12.2	49	109	12	●
D1230	12.3	49	109	12	●
D1240	12.4	49	109	12	●
D1250	12.5	49	109	12	●
D1260	12.6	49	109	12	●
D1270	12.7	49	109	12	●
D1280	12.8	49	109	12	●
D1290	12.9	49	109	12	●
D1300	13.0	49	109	12	●

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 hardeningstainless steel ASTM 630, ASTM 631	
	Drill Dia. (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)
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) VA-PDS-SUS 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.

VA-PDM

Medium, High precision



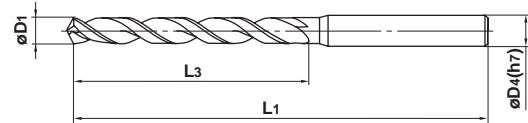
D₁<2

D₁≥2

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		○	○		○



0.5 ≤ D ₁ ≤ 3	3 < D ₁ ≤ 6	6 < D ₁ ≤ 10	10 < D ₁ ≤ 18	18 < D ₁ ≤ 30	30 < D ₁ ≤ 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	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
VAPDMD0050	0.5	6	50	3	●
D0055	0.55	6	50	3	●
D0060	0.6	8	50	3	●
D0065	0.65	8	50	3	●
D0070	0.7	10	50	3	●
D0075	0.75	10	50	3	●
D0080	0.8	10	50	3	●
D0085	0.85	10	50	3	●
D0090	0.9	12	50	3	●
D0095	0.95	12	50	3	●
D0100	1.0	12	60	3	●
D0105	1.05	12	60	3	●
D0110	1.1	16	60	3	●
D0115	1.15	16	60	3	●
D0120	1.2	16	60	3	●
D0125	1.25	16	60	3	●
D0130	1.3	16	60	3	●
D0135	1.35	18	60	3	●
D0140	1.4	18	60	3	●
D0145	1.45	18	60	3	●
D0150	1.5	18	60	3	●
D0155	1.55	20	60	3	●
D0160	1.6	20	60	3	●
D0165	1.65	20	60	3	●
D0170	1.7	20	60	3	●
D0175	1.75	20	60	3	●
D0180	1.8	22	60	3	●
D0185	1.85	22	60	3	●
D0190	1.9	22	60	3	●
D0195	1.95	23	60	3	●
D0200	2.0	23	70	3	●
D0205	2.05	23	70	3	●
D0210	2.1	23	70	3	●
D0215	2.15	23	70	3	●
D0220	2.2	26	70	3	●
D0225	2.25	26	70	3	●
D0230	2.3	26	70	3	●
D0235	2.35	26	70	3	●
D0240	2.4	29	70	3	●
D0245	2.45	29	70	3	●

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
VAPDMD0250	2.5	29	70	3	●
D0255	2.55	29	70	3	●
D0260	2.6	29	70	3	●
D0265	2.65	29	70	3	●
D0270	2.7	32	70	3	●
D0275	2.75	32	70	3	●
D0280	2.8	32	70	3	●
D0285	2.85	32	70	3	●
D0290	2.9	32	70	3	●
D0295	2.95	32	70	3	●
D0300	3.0	32	70	3	●
D0305	3.05	35	85	4	●
D0310	3.1	35	85	4	●
D0315	3.15	35	85	4	●
D0320	3.2	35	85	4	●
D0325	3.25	35	85	4	●
D0330	3.3	35	85	4	●
D0335	3.35	35	85	4	●
D0340	3.4	38	85	4	●
D0345	3.45	38	85	4	●
D0350	3.5	38	85	4	●
D0355	3.55	38	85	4	●
D0360	3.6	38	85	4	●
D0365	3.65	38	85	4	●
D0370	3.7	38	85	4	●
D0375	3.75	42	85	4	●
D0380	3.8	42	85	4	●
D0385	3.85	42	85	4	●
D0390	3.9	42	85	4	●
D0395	3.95	42	85	4	●
D0400	4.0	42	85	4	●
D0405	4.05	42	100	6	●
D0410	4.1	42	100	6	●
D0415	4.15	42	100	6	●
D0420	4.2	42	100	6	●
D0425	4.25	46	100	6	●
D0430	4.3	46	100	6	●
D0435	4.35	46	100	6	●
D0440	4.4	46	100	6	●
D0445	4.45	46	100	6	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMD0450	4.5	46	100	6	●
D0455	4.55	46	100	6	●
D0460	4.6	46	100	6	●
D0465	4.65	46	100	6	●
D0470	4.7	46	100	6	●
D0475	4.75	46	100	6	●
D0480	4.8	51	100	6	●
D0485	4.85	51	100	6	●
D0490	4.9	51	100	6	●
D0495	4.95	51	100	6	●
D0500	5.0	51	100	6	●
D0505	5.05	51	100	6	●
D0510	5.1	51	100	6	●
D0515	5.15	51	100	6	●
D0520	5.2	51	100	6	●
D0525	5.25	51	100	6	●
D0530	5.3	51	100	6	●
D0535	5.35	56	106	6	●
D0540	5.4	56	106	6	●
D0545	5.45	56	106	6	●
D0550	5.5	56	106	6	●
D0555	5.55	56	106	6	●
D0560	5.6	56	106	6	●
D0565	5.65	56	106	6	●
D0570	5.7	56	106	6	●
D0575	5.75	56	106	6	●
D0580	5.8	56	106	6	●
D0585	5.85	56	106	6	●
D0590	5.9	56	106	6	●
D0595	5.95	56	106	6	●
D0600	6.0	56	106	6	●
D0605	6.05	62	112	8	●
D0610	6.1	62	112	8	●
D0615	6.15	62	112	8	●
D0620	6.2	62	112	8	●
D0625	6.25	62	112	8	●
D0630	6.3	62	112	8	●
D0635	6.35	62	112	8	●
D0640	6.4	62	112	8	●
D0645	6.45	62	112	8	●
D0650	6.5	62	112	8	●
D0655	6.55	62	112	8	●
D0660	6.6	62	112	8	●
D0665	6.65	62	112	8	●
D0670	6.7	62	112	8	●
D0675	6.75	67	117	8	●
D0680	6.8	67	117	8	●
D0685	6.85	67	117	8	●
D0690	6.9	67	117	8	●
D0695	6.95	67	117	8	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMD0700	7.0	67	117	8	●
D0705	7.05	67	117	8	●
D0710	7.1	67	117	8	●
D0715	7.15	67	117	8	●
D0720	7.2	67	117	8	●
D0725	7.25	67	117	8	●
D0730	7.3	67	117	8	●
D0735	7.35	67	117	8	●
D0740	7.4	67	117	8	●
D0745	7.45	67	117	8	●
D0750	7.5	67	117	8	●
D0755	7.55	73	123	8	●
D0760	7.6	73	123	8	●
D0765	7.65	73	123	8	●
D0770	7.7	73	123	8	●
D0775	7.75	73	123	8	●
D0780	7.8	73	123	8	●
D0785	7.85	73	123	8	●
D0790	7.9	73	123	8	●
D0795	7.95	73	123	8	●
D0800	8.0	73	123	8	●
D0805	8.05	73	128	10	●
D0810	8.1	73	128	10	●
D0815	8.15	73	128	10	●
D0820	8.2	73	128	10	●
D0825	8.25	73	128	10	●
D0830	8.3	73	128	10	●
D0835	8.35	73	128	10	●
D0840	8.4	73	128	10	●
D0845	8.45	73	128	10	●
D0850	8.5	73	128	10	●
D0855	8.55	79	134	10	●
D0860	8.6	79	134	10	●
D0865	8.65	79	134	10	●
D0870	8.7	79	134	10	●
D0875	8.75	79	134	10	●
D0880	8.8	79	134	10	●
D0885	8.85	79	134	10	●
D0890	8.9	79	134	10	●
D0895	8.95	79	134	10	●
D0900	9.0	79	134	10	●
D0910	9.1	79	134	10	●
D0920	9.2	79	134	10	●
D0930	9.3	79	134	10	●
D0940	9.4	79	134	10	●
D0950	9.5	79	134	10	●
D0960	9.6	85	140	10	●
D0970	9.7	85	140	10	●
D0980	9.8	85	140	10	●
D0990	9.9	85	140	10	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMD1000	10.0	85	140	10	●
D1010	10.1	85	145	12	●
D1020	10.2	85	145	12	●
D1030	10.3	85	145	12	●
D1040	10.4	85	145	12	●
D1050	10.5	85	145	12	●
D1060	10.6	85	145	12	●
D1070	10.7	92	152	12	●
D1080	10.8	92	152	12	●
D1090	10.9	92	152	12	●
D1100	11.0	92	152	12	●
D1110	11.1	92	152	12	●
D1120	11.2	92	152	12	●
D1130	11.3	92	152	12	●
D1140	11.4	92	152	12	●
D1150	11.5	92	152	12	●
D1160	11.6	92	152	12	●
D1170	11.7	92	152	12	●
D1180	11.8	92	152	12	●
D1190	11.9	99	159	12	●
D1200	12.0	99	159	12	●
D1210	12.1	99	159	12	●
D1220	12.2	99	159	12	●
D1230	12.3	99	159	12	●
D1240	12.4	99	159	12	●
D1250	12.5	99	159	12	●
D1260	12.6	99	159	12	●
D1270	12.7	99	159	12	●
D1280	12.8	99	159	12	●
D1290	12.9	99	159	12	●
D1300	13.0	99	159	12	●
D1350	13.5	100	160	16	●
D1400	14.0	100	160	16	●
D1410	14.1	105	165	16	●
D1420	14.2	105	165	16	●
D1450	14.5	105	165	16	●
D1500	15.0	105	165	16	●
D1550	15.5	110	170	16	●
D1560	15.6	110	170	16	●
D1570	15.7	110	170	16	●
D1600	16.0	110	170	16	●
D1650	16.5	110	175	20	●
D1700	17.0	110	175	20	●
D1750	17.5	115	180	20	●
D1760	17.6	115	180	20	●
D1770	17.7	115	180	20	●
D1800	18.0	115	180	20	●
D1850	18.5	120	185	20	●
D1900	19.0	120	185	20	●
D1950	19.5	120	185	20	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMD1960	19.6	120	185	20	●
D1970	19.7	120	185	20	●
D2000	20.0	120	185	20	●
D2050	20.5	125	200	25	●
D2100	21.0	125	200	25	●
D2110	21.1	125	200	25	●
D2120	21.2	125	200	25	●
D2150	21.5	125	200	25	●
D2200	22.0	125	200	25	●
D2250	22.5	130	205	25	●
D2300	23.0	130	205	25	●
D2350	23.5	130	205	25	●
D2400	24.0	135	210	25	●
D2450	24.5	135	210	25	●
D2500	25.0	135	210	25	●
D2550	25.5	140	220	32	●
D2600	26.0	140	220	32	●
D2650	26.5	140	220	32	●
D2700	27.0	140	220	32	●
D2800	28.0	140	220	32	●
D2900	29.0	145	225	32	●
D3000	30.0	145	225	32	●
D3100	31.0	150	230	32	●
D3200	32.0	155	235	32	●

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 hardeningstainless steel ASTM 630, ASTM 631	
	Drill Dia. (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)
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) VA-PDM-SUS 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.

VA-PDS-SUS

Short, High precision, For stainless steel



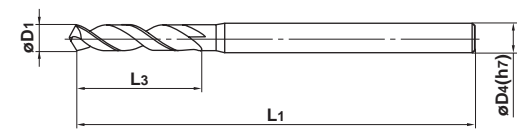
HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		◎	○	○	

$0.5 < D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 18$	$18 < D_1 \leq 20$
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	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0050	0.50	3	50	3	●
D0051	0.51	3	50	3	●
D0052	0.52	3	50	3	●
D0053	0.53	3	50	3	●
D0054	0.54	3	50	3	●
D0055	0.55	3	50	3	●
D0056	0.56	4	50	3	●
D0057	0.57	4	50	3	●
D0058	0.58	4	50	3	●
D0059	0.59	4	50	3	●
D0060	0.60	5	50	3	●
D0061	0.61	5	50	3	●
D0062	0.62	5	50	3	●
D0063	0.63	5	50	3	●
D0064	0.64	5	50	3	●
D0065	0.65	5	50	3	●
D0066	0.66	5	50	3	●
D0067	0.67	5	50	3	●
D0068	0.68	5	50	3	●
D0069	0.69	5	50	3	●
D0070	0.70	5	50	3	●
D0071	0.71	5	50	3	●
D0072	0.72	5	50	3	●
D0073	0.73	5	50	3	●
D0074	0.74	5	50	3	●
D0075	0.75	5	50	3	●
D0076	0.76	5	50	3	●
D0077	0.77	5	50	3	●
D0078	0.78	5	50	3	●
D0079	0.79	5	50	3	●
D0080	0.80	5	50	3	●
D0081	0.81	5	50	3	●
D0082	0.82	5	50	3	●
D0083	0.83	5	50	3	●
D0084	0.84	5	50	3	●
D0085	0.85	5	50	3	●
D0086	0.86	6	50	3	●
D0087	0.87	6	50	3	●
D0088	0.88	6	50	3	●
D0089	0.89	6	50	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0090	0.90	6	50	3	●
D0091	0.91	6	50	3	●
D0092	0.92	6	50	3	●
D0093	0.93	6	50	3	●
D0094	0.94	6	50	3	●
D0095	0.95	6	50	3	●
D0096	0.96	6	50	3	●
D0097	0.97	6	50	3	●
D0098	0.98	6	50	3	●
D0099	0.99	6	50	3	●
D0100	1.00	6	50	3	●
D0101	1.01	6	50	3	●
D0102	1.02	6	50	3	●
D0103	1.03	6	50	3	●
D0104	1.04	6	50	3	●
D0105	1.05	6	50	3	●
D0106	1.06	6	50	3	●
D0107	1.07	8	55	3	●
D0108	1.08	8	55	3	●
D0109	1.09	8	55	3	●
D0110	1.10	8	55	3	●
D0111	1.11	8	55	3	●
D0112	1.12	8	55	3	●
D0113	1.13	8	55	3	●
D0114	1.14	8	55	3	●
D0115	1.15	8	55	3	●
D0116	1.16	8	55	3	●
D0117	1.17	8	55	3	●
D0118	1.18	8	55	3	●
D0119	1.19	8	55	3	●
D0120	1.20	8	55	3	●
D0121	1.21	8	55	3	●
D0122	1.22	8	55	3	●
D0123	1.23	8	55	3	●
D0124	1.24	8	55	3	●
D0125	1.25	8	55	3	●
D0126	1.26	8	55	3	●
D0127	1.27	8	55	3	●
D0128	1.28	8	55	3	●
D0129	1.29	8	55	3	●

DRILLING

● : Inventory maintained in Japan.

VIOLET DRILLS

VA-PDS-SUS

Short, High precision, For stainless steel

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0130	1.30	9	55	3	●
D0131	1.31	9	55	3	●
D0132	1.32	9	55	3	●
D0133	1.33	9	55	3	●
D0134	1.34	9	55	3	●
D0135	1.35	9	55	3	●
D0136	1.36	9	55	3	●
D0137	1.37	9	55	3	●
D0138	1.38	9	55	3	●
D0139	1.39	9	55	3	●
D0140	1.40	9	55	3	●
D0141	1.41	9	55	3	●
D0142	1.42	9	55	3	●
D0143	1.43	9	55	3	●
D0144	1.44	9	55	3	●
D0145	1.45	9	55	3	●
D0146	1.46	9	55	3	●
D0147	1.47	9	55	3	●
D0148	1.48	9	55	3	●
D0149	1.49	9	55	3	●
D0150	1.50	9	55	3	●
D0151	1.51	11	55	3	●
D0152	1.52	11	55	3	●
D0153	1.53	11	55	3	●
D0154	1.54	11	55	3	●
D0155	1.55	11	55	3	●
D0156	1.56	11	55	3	●
D0157	1.57	11	55	3	●
D0158	1.58	11	55	3	●
D0159	1.59	11	55	3	●
D0160	1.60	11	55	3	●
D0161	1.61	11	55	3	●
D0162	1.62	11	55	3	●
D0163	1.63	11	55	3	●
D0164	1.64	11	55	3	●
D0165	1.65	11	55	3	●
D0166	1.66	11	55	3	●
D0167	1.67	11	55	3	●
D0168	1.68	11	55	3	●
D0169	1.69	11	55	3	●
D0170	1.70	11	55	3	●
D0171	1.71	11	55	3	●
D0172	1.72	11	55	3	●
D0173	1.73	11	55	3	●
D0174	1.74	11	55	3	●
D0175	1.75	11	55	3	●
D0176	1.76	11	55	3	●
D0177	1.77	11	55	3	●
D0178	1.78	11	55	3	●
D0179	1.79	11	55	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0180	1.80	11	55	3	●
D0181	1.81	11	55	3	●
D0182	1.82	11	55	3	●
D0183	1.83	11	55	3	●
D0184	1.84	11	55	3	●
D0185	1.85	11	55	3	●
D0186	1.86	11	55	3	●
D0187	1.87	11	55	3	●
D0188	1.88	11	55	3	●
D0189	1.89	11	55	3	●
D0190	1.90	12	55	3	●
D0191	1.91	12	60	3	●
D0192	1.92	12	60	3	●
D0193	1.93	12	60	3	●
D0194	1.94	12	60	3	●
D0195	1.95	12	60	3	●
D0196	1.96	12	60	3	●
D0197	1.97	12	60	3	●
D0198	1.98	12	60	3	●
D0199	1.99	12	60	3	●
D0200	2.00	12	60	3	●
D0201	2.01	12	60	3	●
D0202	2.02	12	60	3	●
D0203	2.03	12	60	3	●
D0204	2.04	12	60	3	●
D0205	2.05	12	60	3	●
D0206	2.06	12	60	3	●
D0207	2.07	12	60	3	●
D0208	2.08	12	60	3	●
D0209	2.09	12	60	3	●
D0210	2.10	12	60	3	●
D0211	2.11	12	60	3	●
D0212	2.12	12	60	3	●
D0213	2.13	12	60	3	●
D0214	2.14	12	60	3	●
D0215	2.15	12	60	3	●
D0216	2.16	12	60	3	●
D0217	2.17	12	60	3	●
D0218	2.18	12	60	3	●
D0219	2.19	12	60	3	●
D0220	2.20	12	60	3	●
D0221	2.21	12	60	3	●
D0222	2.22	12	60	3	●
D0223	2.23	12	60	3	●
D0224	2.24	12	60	3	●
D0225	2.25	12	60	3	●
D0226	2.26	12	60	3	●
D0227	2.27	12	60	3	●
D0228	2.28	12	60	3	●
D0229	2.29	12	60	3	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0230	2.30	13	60	3	●
D0231	2.31	13	60	3	●
D0232	2.32	13	60	3	●
D0233	2.33	13	60	3	●
D0234	2.34	13	60	3	●
D0235	2.35	13	60	3	●
D0236	2.36	13	60	3	●
D0237	2.37	13	60	3	●
D0238	2.38	13	60	3	●
D0239	2.39	13	60	3	●
D0240	2.40	13	60	3	●
D0241	2.41	13	60	3	●
D0242	2.42	13	60	3	●
D0243	2.43	13	60	3	●
D0244	2.44	13	60	3	●
D0245	2.45	13	60	3	●
D0246	2.46	13	60	3	●
D0247	2.47	13	60	3	●
D0248	2.48	13	60	3	●
D0249	2.49	13	60	3	●
D0250	2.50	13	60	3	●
D0251	2.51	13	60	3	●
D0252	2.52	13	60	3	●
D0253	2.53	13	60	3	●
D0254	2.54	13	60	3	●
D0255	2.55	13	60	3	●
D0256	2.56	13	60	3	●
D0257	2.57	13	60	3	●
D0258	2.58	13	60	3	●
D0259	2.59	13	60	3	●
D0260	2.60	15	60	3	●
D0261	2.61	15	60	3	●
D0262	2.62	15	60	3	●
D0263	2.63	15	60	3	●
D0264	2.64	15	60	3	●
D0265	2.65	15	60	3	●
D0266	2.66	15	60	3	●
D0267	2.67	15	60	3	●
D0268	2.68	15	60	3	●
D0269	2.69	15	60	3	●
D0270	2.70	15	60	3	●
D0271	2.71	15	60	3	●
D0272	2.72	15	60	3	●
D0273	2.73	15	60	3	●
D0274	2.74	15	60	3	●
D0275	2.75	15	60	3	●
D0276	2.76	15	60	3	●
D0277	2.77	15	60	3	●
D0278	2.78	15	60	3	●
D0279	2.79	15	60	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0280	2.80	15	60	3	●
D0281	2.81	15	60	3	●
D0282	2.82	15	60	3	●
D0283	2.83	15	60	3	●
D0284	2.84	15	60	3	●
D0285	2.85	15	60	3	●
D0286	2.86	15	60	3	●
D0287	2.87	15	60	3	●
D0288	2.88	15	60	3	●
D0289	2.89	15	60	3	●
D0290	2.90	15	60	3	●
D0291	2.91	15	60	3	●
D0292	2.92	15	60	3	●
D0293	2.93	15	60	3	●
D0294	2.94	15	60	3	●
D0295	2.95	15	60	3	●
D0296	2.96	15	60	3	●
D0297	2.97	15	60	3	●
D0298	2.98	15	60	3	●
D0299	2.99	15	60	3	●
D0300	3.00	15	60	3	●
D0301	3.01	17	70	4	●
D0302	3.02	17	70	4	●
D0303	3.03	17	70	4	●
D0304	3.04	17	70	4	●
D0305	3.05	17	70	4	●
D0306	3.06	17	70	4	●
D0307	3.07	17	70	4	●
D0308	3.08	17	70	4	●
D0309	3.09	17	70	4	●
D0310	3.10	17	70	4	●
D0311	3.11	17	70	4	●
D0312	3.12	17	70	4	●
D0313	3.13	17	70	4	●
D0314	3.14	17	70	4	●
D0315	3.15	17	70	4	●
D0316	3.16	17	70	4	●
D0317	3.17	17	70	4	●
D0318	3.18	17	70	4	●
D0319	3.19	17	70	4	●
D0320	3.20	17	70	4	●
D0321	3.21	17	70	4	●
D0322	3.22	17	70	4	●
D0323	3.23	17	70	4	●
D0324	3.24	17	70	4	●
D0325	3.25	17	70	4	●
D0326	3.26	17	70	4	●
D0327	3.27	17	70	4	●
D0328	3.28	17	70	4	●
D0329	3.29	17	70	4	●

VIOLET DRILLS

VA-PDS-SUS

Short, High precision, For stainless steel

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0330	3.30	19	70	4	●
D0331	3.31	19	70	4	●
D0332	3.32	19	70	4	●
D0333	3.33	19	70	4	●
D0334	3.34	19	70	4	●
D0335	3.35	19	70	4	●
D0336	3.36	19	70	4	●
D0337	3.37	19	70	4	●
D0338	3.38	19	70	4	●
D0339	3.39	19	70	4	●
D0340	3.40	19	70	4	●
D0341	3.41	19	70	4	●
D0342	3.42	19	70	4	●
D0343	3.43	19	70	4	●
D0344	3.44	19	70	4	●
D0345	3.45	19	70	4	●
D0346	3.46	19	70	4	●
D0347	3.47	19	70	4	●
D0348	3.48	19	70	4	●
D0349	3.49	19	70	4	●
D0350	3.50	19	70	4	●
D0351	3.51	19	70	4	●
D0352	3.52	19	70	4	●
D0353	3.53	19	70	4	●
D0354	3.54	19	70	4	●
D0355	3.55	19	70	4	●
D0356	3.56	19	70	4	●
D0357	3.57	19	70	4	●
D0358	3.58	19	70	4	●
D0359	3.59	19	70	4	●
D0360	3.60	21	70	4	●
D0361	3.61	21	70	4	●
D0362	3.62	21	70	4	●
D0363	3.63	21	70	4	●
D0364	3.64	21	70	4	●
D0365	3.65	21	70	4	●
D0366	3.66	21	70	4	●
D0367	3.67	21	70	4	●
D0368	3.68	21	70	4	●
D0369	3.69	21	70	4	●
D0370	3.70	21	70	4	●
D0371	3.71	21	70	4	●
D0372	3.72	21	70	4	●
D0373	3.73	21	70	4	●
D0374	3.74	21	70	4	●
D0375	3.75	21	70	4	●
D0376	3.76	21	70	4	●
D0377	3.77	21	70	4	●
D0378	3.78	21	70	4	●
D0379	3.79	21	70	4	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0380	3.80	21	70	4	●
D0381	3.81	21	70	4	●
D0382	3.82	21	70	4	●
D0383	3.83	21	70	4	●
D0384	3.84	21	70	4	●
D0385	3.85	21	70	4	●
D0386	3.86	21	70	4	●
D0387	3.87	21	70	4	●
D0388	3.88	21	70	4	●
D0389	3.89	21	70	4	●
D0390	3.90	21	70	4	●
D0391	3.91	21	70	4	●
D0392	3.92	21	70	4	●
D0393	3.93	21	70	4	●
D0394	3.94	21	70	4	●
D0395	3.95	21	70	4	●
D0396	3.96	21	70	4	●
D0397	3.97	21	70	4	●
D0398	3.98	21	70	4	●
D0399	3.99	21	70	4	●
D0400	4.00	21	70	4	●
D0405	4.05	21	80	6	●
D0410	4.1	21	80	6	●
D0415	4.15	21	80	6	●
D0420	4.2	21	80	6	●
D0425	4.25	21	80	6	●
D0430	4.3	23	80	6	●
D0435	4.35	23	80	6	●
D0440	4.4	23	80	6	●
D0445	4.45	23	80	6	●
D0450	4.5	23	80	6	●
D0455	4.55	23	80	6	●
D0460	4.6	25	80	6	●
D0465	4.65	25	80	6	●
D0470	4.7	25	80	6	●
D0475	4.75	25	80	6	●
D0480	4.8	25	80	6	●
D0485	4.85	25	80	6	●
D0490	4.9	25	80	6	●
D0495	4.95	25	80	6	●
D0500	5.0	25	80	6	●
D0505	5.05	25	80	6	●
D0510	5.1	25	80	6	●
D0515	5.15	25	80	6	●
D0520	5.2	25	80	6	●
D0525	5.25	25	80	6	●
D0530	5.3	25	80	6	●
D0535	5.35	27	80	6	●
D0540	5.4	27	80	6	●
D0545	5.45	27	80	6	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock	Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD0550	5.5	27	80	6	●	VAPDSSUSD0800	8.0	35	85	8	●
D0555	5.55	27	80	6	●	D0805	8.05	35	90	10	●
D0560	5.6	27	80	6	●	D0810	8.1	35	90	10	●
D0565	5.65	27	80	6	●	D0815	8.15	35	90	10	●
D0570	5.7	27	80	6	●	D0820	8.2	35	90	10	●
D0575	5.75	27	80	6	●	D0825	8.25	35	90	10	●
D0580	5.8	27	80	6	●	D0830	8.3	35	90	10	●
D0585	5.85	27	80	6	●	D0835	8.35	35	90	10	●
D0590	5.9	27	80	6	●	D0840	8.4	35	90	10	●
D0595	5.95	27	80	6	●	D0845	8.45	35	90	10	●
D0600	6.0	27	80	6	●	D0850	8.5	35	90	10	●
D0605	6.05	30	80	8	●	D0855	8.55	38	93	10	●
D0610	6.1	30	80	8	●	D0860	8.6	38	93	10	●
D0615	6.15	30	80	8	●	D0865	8.65	38	93	10	●
D0620	6.2	30	80	8	●	D0870	8.7	38	93	10	●
D0625	6.25	30	80	8	●	D0875	8.75	38	93	10	●
D0630	6.3	30	80	8	●	D0880	8.8	38	93	10	●
D0635	6.35	30	80	8	●	D0885	8.85	38	93	10	●
D0640	6.4	30	80	8	●	D0890	8.9	38	93	10	●
D0645	6.45	30	80	8	●	D0895	8.95	38	93	10	●
D0650	6.5	30	80	8	●	D0900	9.0	38	93	10	●
D0655	6.55	30	80	8	●	D0910	9.1	38	93	10	●
D0660	6.6	30	80	8	●	D0920	9.2	38	93	10	●
D0665	6.65	30	80	8	●	D0930	9.3	38	93	10	●
D0670	6.7	30	80	8	●	D0940	9.4	38	93	10	●
D0675	6.75	32	80	8	●	D0950	9.5	38	93	10	●
D0680	6.8	32	80	8	●	D0960	9.6	41	96	10	●
D0685	6.85	32	80	8	●	D0970	9.7	41	96	10	●
D0690	6.9	32	80	8	●	D0980	9.8	41	96	10	●
D0695	6.95	32	80	8	●	D0990	9.9	41	96	10	●
D0700	7.0	32	80	8	●	D1000	10.0	41	96	10	●
D0705	7.05	32	80	8	●	D1010	10.1	41	101	12	●
D0710	7.1	32	80	8	●	D1020	10.2	41	101	12	●
D0715	7.15	32	80	8	●	D1030	10.3	41	101	12	●
D0720	7.2	32	80	8	●	D1040	10.4	41	101	12	●
D0725	7.25	32	80	8	●	D1050	10.5	41	101	12	●
D0730	7.3	32	80	8	●	D1060	10.6	41	101	12	●
D0735	7.35	32	80	8	●	D1070	10.7	45	105	12	●
D0740	7.4	32	80	8	●	D1080	10.8	45	105	12	●
D0745	7.45	32	80	8	●	D1090	10.9	45	105	12	●
D0750	7.5	32	80	8	●	D1100	11.0	45	105	12	●
D0755	7.55	35	85	8	●	D1110	11.1	45	105	12	●
D0760	7.6	35	85	8	●	D1120	11.2	45	105	12	●
D0765	7.65	35	85	8	●	D1130	11.3	45	105	12	●
D0770	7.7	35	85	8	●	D1140	11.4	45	105	12	●
D0775	7.75	35	85	8	●	D1150	11.5	45	105	12	●
D0780	7.8	35	85	8	●	D1160	11.6	45	105	12	●
D0785	7.85	35	85	8	●	D1170	11.7	45	105	12	●
D0790	7.9	35	85	8	●	D1180	11.8	45	105	12	●
D0795	7.95	35	85	8	●	D1190	11.9	49	109	12	●

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSSUSD1200	12.0	49	109	12	●
D1210	12.1	49	109	12	●
D1220	12.2	49	109	12	●
D1230	12.3	49	109	12	●
D1240	12.4	49	109	12	●
D1250	12.5	49	109	12	●
D1260	12.6	49	109	12	●
D1270	12.7	49	109	12	●
D1280	12.8	49	109	12	●
D1290	12.9	49	109	12	●
D1300	13.0	49	109	12	●
D1350	13.5	51	111	16	●
D1400	14.0	51	111	16	●
D1410	14.1	53	113	16	●
D1420	14.2	53	113	16	●
D1450	14.5	53	113	16	●
D1500	15.0	53	113	16	●
D1550	15.5	55	115	16	●
D1560	15.6	55	115	16	●
D1570	15.7	55	115	16	●
D1600	16.0	55	115	16	●
D1650	16.5	57	122	20	●
D1700	17.0	57	122	20	●
D1750	17.5	58	123	20	●
D1760	17.6	58	123	20	●
D1770	17.7	58	123	20	●
D1800	18.0	58	123	20	●
D1850	18.5	60	125	20	●
D1900	19.0	60	125	20	●
D1950	19.5	62	127	20	●
D1960	19.6	62	127	20	●
D1970	19.7	62	127	20	●
D2000	20.0	62	127	20	●

VA-PDM-SUS

Medium, High precision, For stainless steel



HSS

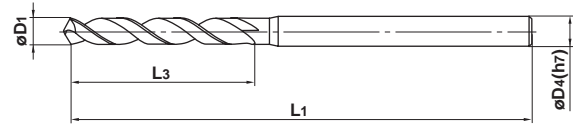
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		◎	○	○	



$0.5 < D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
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	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0050	0.50	6	50	3	●
D0051	0.51	6	50	3	●
D0052	0.52	6	50	3	●
D0053	0.53	6	50	3	●
D0054	0.54	6	50	3	●
D0055	0.55	6	50	3	●
D0056	0.56	8	50	3	●
D0057	0.57	8	50	3	●
D0058	0.58	8	50	3	●
D0059	0.59	8	50	3	●
D0060	0.60	8	50	3	●
D0061	0.61	8	50	3	●
D0062	0.62	8	50	3	●
D0063	0.63	8	50	3	●
D0064	0.64	8	50	3	●
D0065	0.65	8	50	3	●
D0066	0.66	8	50	3	●
D0067	0.67	8	50	3	●
D0068	0.68	8	50	3	●
D0069	0.69	8	50	3	●
D0070	0.70	10	50	3	●
D0071	0.71	10	50	3	●
D0072	0.72	10	50	3	●
D0073	0.73	10	50	3	●
D0074	0.74	10	50	3	●
D0075	0.75	10	50	3	●
D0076	0.76	10	50	3	●
D0077	0.77	10	50	3	●
D0078	0.78	10	50	3	●
D0079	0.79	10	50	3	●
D0080	0.80	10	50	3	●
D0081	0.81	10	50	3	●
D0082	0.82	10	50	3	●
D0083	0.83	10	50	3	●
D0084	0.84	10	50	3	●
D0085	0.85	10	50	3	●
D0086	0.86	12	50	3	●
D0087	0.87	12	50	3	●
D0088	0.88	12	50	3	●
D0089	0.89	12	50	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0090	0.90	12	50	3	●
D0091	0.91	12	50	3	●
D0092	0.92	12	50	3	●
D0093	0.93	12	50	3	●
D0094	0.94	12	50	3	●
D0095	0.95	12	50	3	●
D0096	0.96	12	50	3	●
D0097	0.97	12	50	3	●
D0098	0.98	12	50	3	●
D0099	0.99	12	50	3	●
D0100	1.00	12	60	3	●
D0101	1.01	12	60	3	●
D0102	1.02	12	60	3	●
D0103	1.03	12	60	3	●
D0104	1.04	12	60	3	●
D0105	1.05	12	60	3	●
D0106	1.06	12	60	3	●
D0107	1.07	16	60	3	●
D0108	1.08	16	60	3	●
D0109	1.09	16	60	3	●
D0110	1.10	16	60	3	●
D0111	1.11	16	60	3	●
D0112	1.12	16	60	3	●
D0113	1.13	16	60	3	●
D0114	1.14	16	60	3	●
D0115	1.15	16	60	3	●
D0116	1.16	16	60	3	●
D0117	1.17	16	60	3	●
D0118	1.18	16	60	3	●
D0119	1.19	16	60	3	●
D0120	1.20	16	60	3	●
D0121	1.21	16	60	3	●
D0122	1.22	16	60	3	●
D0123	1.23	16	60	3	●
D0124	1.24	16	60	3	●
D0125	1.25	16	60	3	●
D0126	1.26	16	60	3	●
D0127	1.27	16	60	3	●
D0128	1.28	16	60	3	●
D0129	1.29	16	60	3	●

DRILLING

VIOLET DRILLS

VA-PDM-SUS

Medium, High precision, For stainless steel

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0130	1.30	16	60	3	●
D0131	1.31	18	60	3	●
D0132	1.32	18	60	3	●
D0133	1.33	18	60	3	●
D0134	1.34	18	60	3	●
D0135	1.35	18	60	3	●
D0136	1.36	18	60	3	●
D0137	1.37	18	60	3	●
D0138	1.38	18	60	3	●
D0139	1.39	18	60	3	●
D0140	1.40	18	60	3	●
D0141	1.41	18	60	3	●
D0142	1.42	18	60	3	●
D0143	1.43	18	60	3	●
D0144	1.44	18	60	3	●
D0145	1.45	18	60	3	●
D0146	1.46	18	60	3	●
D0147	1.47	18	60	3	●
D0148	1.48	18	60	3	●
D0149	1.49	18	60	3	●
D0150	1.50	18	60	3	●
D0151	1.51	20	60	3	●
D0152	1.52	20	60	3	●
D0153	1.53	20	60	3	●
D0154	1.54	20	60	3	●
D0155	1.55	20	60	3	●
D0156	1.56	20	60	3	●
D0157	1.57	20	60	3	●
D0158	1.58	20	60	3	●
D0159	1.59	20	60	3	●
D0160	1.60	20	60	3	●
D0161	1.61	20	60	3	●
D0162	1.62	20	60	3	●
D0163	1.63	20	60	3	●
D0164	1.64	20	60	3	●
D0165	1.65	20	60	3	●
D0166	1.66	20	60	3	●
D0167	1.67	20	60	3	●
D0168	1.68	20	60	3	●
D0169	1.69	20	60	3	●
D0170	1.70	20	60	3	●
D0171	1.71	20	60	3	●
D0172	1.72	20	60	3	●
D0173	1.73	20	60	3	●
D0174	1.74	20	60	3	●
D0175	1.75	20	60	3	●
D0176	1.76	20	60	3	●
D0177	1.77	20	60	3	●
D0178	1.78	20	60	3	●
D0179	1.79	20	60	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0180	1.80	22	60	3	●
D0181	1.81	22	60	3	●
D0182	1.82	22	60	3	●
D0183	1.83	22	60	3	●
D0184	1.84	22	60	3	●
D0185	1.85	22	60	3	●
D0186	1.86	22	60	3	●
D0187	1.87	22	60	3	●
D0188	1.88	22	60	3	●
D0189	1.89	22	60	3	●
D0190	1.90	22	60	3	●
D0191	1.91	23	60	3	●
D0192	1.92	23	60	3	●
D0193	1.93	23	60	3	●
D0194	1.94	23	60	3	●
D0195	1.95	23	60	3	●
D0196	1.96	23	60	3	●
D0197	1.97	23	60	3	●
D0198	1.98	23	60	3	●
D0199	1.99	23	60	3	●
D0200	2.00	23	70	3	●
D0201	2.01	23	70	3	●
D0202	2.02	23	70	3	●
D0203	2.03	23	70	3	●
D0204	2.04	23	70	3	●
D0205	2.05	23	70	3	●
D0206	2.06	23	70	3	●
D0207	2.07	23	70	3	●
D0208	2.08	23	70	3	●
D0209	2.09	23	70	3	●
D0210	2.10	23	70	3	●
D0211	2.11	23	70	3	●
D0212	2.12	23	70	3	●
D0213	2.13	23	70	3	●
D0214	2.14	23	70	3	●
D0215	2.15	23	70	3	●
D0216	2.16	23	70	3	●
D0217	2.17	23	70	3	●
D0218	2.18	23	70	3	●
D0219	2.19	23	70	3	●
D0220	2.20	26	70	3	●
D0221	2.21	26	70	3	●
D0222	2.22	26	70	3	●
D0223	2.23	26	70	3	●
D0224	2.24	26	70	3	●
D0225	2.25	26	70	3	●
D0226	2.26	26	70	3	●
D0227	2.27	26	70	3	●
D0228	2.28	26	70	3	●
D0229	2.29	26	70	3	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0230	2.30	26	70	3	●
D0231	2.31	26	70	3	●
D0232	2.32	26	70	3	●
D0233	2.33	26	70	3	●
D0234	2.34	26	70	3	●
D0235	2.35	26	70	3	●
D0236	2.36	26	70	3	●
D0237	2.37	26	70	3	●
D0238	2.38	26	70	3	●
D0239	2.39	26	70	3	●
D0240	2.40	29	70	3	●
D0241	2.41	29	70	3	●
D0242	2.42	29	70	3	●
D0243	2.43	29	70	3	●
D0244	2.44	29	70	3	●
D0245	2.45	29	70	3	●
D0246	2.46	29	70	3	●
D0247	2.47	29	70	3	●
D0248	2.48	29	70	3	●
D0249	2.49	29	70	3	●
D0250	2.50	29	70	3	●
D0251	2.51	29	70	3	●
D0252	2.52	29	70	3	●
D0253	2.53	29	70	3	●
D0254	2.54	29	70	3	●
D0255	2.55	29	70	3	●
D0256	2.56	29	70	3	●
D0257	2.57	29	70	3	●
D0258	2.58	29	70	3	●
D0259	2.59	29	70	3	●
D0260	2.60	29	70	3	●
D0261	2.61	29	70	3	●
D0262	2.62	29	70	3	●
D0263	2.63	29	70	3	●
D0264	2.64	29	70	3	●
D0265	2.65	29	70	3	●
D0266	2.66	29	70	3	●
D0267	2.67	29	70	3	●
D0268	2.68	29	70	3	●
D0269	2.69	29	70	3	●
D0270	2.70	32	70	3	●
D0271	2.71	32	70	3	●
D0272	2.72	32	70	3	●
D0273	2.73	32	70	3	●
D0274	2.74	32	70	3	●
D0275	2.75	32	70	3	●
D0276	2.76	32	70	3	●
D0277	2.77	32	70	3	●
D0278	2.78	32	70	3	●
D0279	2.79	32	70	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0280	2.80	32	70	3	●
D0281	2.81	32	70	3	●
D0282	2.82	32	70	3	●
D0283	2.83	32	70	3	●
D0284	2.84	32	70	3	●
D0285	2.85	32	70	3	●
D0286	2.86	32	70	3	●
D0287	2.87	32	70	3	●
D0288	2.88	32	70	3	●
D0289	2.89	32	70	3	●
D0290	2.90	32	70	3	●
D0291	2.91	32	70	3	●
D0292	2.92	32	70	3	●
D0293	2.93	32	70	3	●
D0294	2.94	32	70	3	●
D0295	2.95	32	70	3	●
D0296	2.96	32	70	3	●
D0297	2.97	32	70	3	●
D0298	2.98	32	70	3	●
D0299	2.99	32	70	3	●
D0300	3.00	32	70	3	●
D0301	3.01	35	85	4	●
D0302	3.02	35	85	4	●
D0303	3.03	35	85	4	●
D0304	3.04	35	85	4	●
D0305	3.05	35	85	4	●
D0306	3.06	35	85	4	●
D0307	3.07	35	85	4	●
D0308	3.08	35	85	4	●
D0309	3.09	35	85	4	●
D0310	3.10	35	85	4	●
D0311	3.11	35	85	4	●
D0312	3.12	35	85	4	●
D0313	3.13	35	85	4	●
D0314	3.14	35	85	4	●
D0315	3.15	35	85	4	●
D0316	3.16	35	85	4	●
D0317	3.17	35	85	4	●
D0318	3.18	35	85	4	●
D0319	3.19	35	85	4	●
D0320	3.20	35	85	4	●
D0321	3.21	35	85	4	●
D0322	3.22	35	85	4	●
D0323	3.23	35	85	4	●
D0324	3.24	35	85	4	●
D0325	3.25	35	85	4	●
D0326	3.26	35	85	4	●
D0327	3.27	35	85	4	●
D0328	3.28	35	85	4	●
D0329	3.29	35	85	4	●

DRILLING

VIOLET DRILLS

VA-PDM-SUS

Medium, High precision, For stainless steel

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0330	3.30	35	85	4	●
D0331	3.31	38	85	4	●
D0332	3.32	38	85	4	●
D0333	3.33	38	85	4	●
D0334	3.34	38	85	4	●
D0335	3.35	38	85	4	●
D0336	3.36	38	85	4	●
D0337	3.37	38	85	4	●
D0338	3.38	38	85	4	●
D0339	3.39	38	85	4	●
D0340	3.40	38	85	4	●
D0341	3.41	38	85	4	●
D0342	3.42	38	85	4	●
D0343	3.43	38	85	4	●
D0344	3.44	38	85	4	●
D0345	3.45	38	85	4	●
D0346	3.46	38	85	4	●
D0347	3.47	38	85	4	●
D0348	3.48	38	85	4	●
D0349	3.49	38	85	4	●
D0350	3.50	38	85	4	●
D0351	3.51	38	85	4	●
D0352	3.52	38	85	4	●
D0353	3.53	38	85	4	●
D0354	3.54	38	85	4	●
D0355	3.55	38	85	4	●
D0356	3.56	38	85	4	●
D0357	3.57	38	85	4	●
D0358	3.58	38	85	4	●
D0359	3.59	38	85	4	●
D0360	3.60	38	85	4	●
D0361	3.61	38	85	4	●
D0362	3.62	38	85	4	●
D0363	3.63	38	85	4	●
D0364	3.64	38	85	4	●
D0365	3.65	38	85	4	●
D0366	3.66	38	85	4	●
D0367	3.67	38	85	4	●
D0368	3.68	38	85	4	●
D0369	3.69	38	85	4	●
D0370	3.70	38	85	4	●
D0371	3.71	42	85	4	●
D0372	3.72	42	85	4	●
D0373	3.73	42	85	4	●
D0374	3.74	42	85	4	●
D0375	3.75	42	85	4	●
D0376	3.76	42	85	4	●
D0377	3.77	42	85	4	●
D0378	3.78	42	85	4	●
D0379	3.79	42	85	4	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0380	3.80	42	85	4	●
D0381	3.81	42	85	4	●
D0382	3.82	42	85	4	●
D0383	3.83	42	85	4	●
D0384	3.84	42	85	4	●
D0385	3.85	42	85	4	●
D0386	3.86	42	85	4	●
D0387	3.87	42	85	4	●
D0388	3.88	42	85	4	●
D0389	3.89	42	85	4	●
D0390	3.90	42	85	4	●
D0391	3.91	42	85	4	●
D0392	3.92	42	85	4	●
D0393	3.93	42	85	4	●
D0394	3.94	42	85	4	●
D0395	3.95	42	85	4	●
D0396	3.96	42	85	4	●
D0397	3.97	42	85	4	●
D0398	3.98	42	85	4	●
D0399	3.99	42	85	4	●
D0400	4.00	42	85	4	●
D0405	4.05	42	100	6	●
D0410	4.1	42	100	6	●
D0415	4.15	42	100	6	●
D0420	4.2	42	100	6	●
D0425	4.25	46	100	6	●
D0430	4.3	46	100	6	●
D0435	4.35	46	100	6	●
D0440	4.4	46	100	6	●
D0445	4.45	46	100	6	●
D0450	4.5	46	100	6	●
D0455	4.55	46	100	6	●
D0460	4.6	46	100	6	●
D0465	4.65	46	100	6	●
D0470	4.7	46	100	6	●
D0475	4.75	46	100	6	●
D0480	4.8	51	100	6	●
D0485	4.85	51	100	6	●
D0490	4.9	51	100	6	●
D0495	4.95	51	100	6	●
D0500	5.0	51	100	6	●
D0505	5.05	51	100	6	●
D0510	5.1	51	100	6	●
D0515	5.15	51	100	6	●
D0520	5.2	51	100	6	●
D0525	5.25	51	100	6	●
D0530	5.3	51	100	6	●
D0535	5.35	56	106	6	●
D0540	5.4	56	106	6	●
D0545	5.45	56	106	6	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0550	5.5	56	106	6	●
D0555	5.55	56	106	6	●
D0560	5.6	56	106	6	●
D0565	5.65	56	106	6	●
D0570	5.7	56	106	6	●
D0575	5.75	56	106	6	●
D0580	5.8	56	106	6	●
D0585	5.85	56	106	6	●
D0590	5.9	56	106	6	●
D0595	5.95	56	106	6	●
D0600	6.0	56	106	6	●
D0605	6.05	62	112	8	●
D0610	6.1	62	112	8	●
D0615	6.15	62	112	8	●
D0620	6.2	62	112	8	●
D0625	6.25	62	112	8	●
D0630	6.3	62	112	8	●
D0635	6.35	62	112	8	●
D0640	6.4	62	112	8	●
D0645	6.45	62	112	8	●
D0650	6.5	62	112	8	●
D0655	6.55	62	112	8	●
D0660	6.6	62	112	8	●
D0665	6.65	62	112	8	●
D0670	6.7	62	112	8	●
D0675	6.75	67	117	8	●
D0680	6.8	67	117	8	●
D0685	6.85	67	117	8	●
D0690	6.9	67	117	8	●
D0695	6.95	67	117	8	●
D0700	7.0	67	117	8	●
D0705	7.05	67	117	8	●
D0710	7.1	67	117	8	●
D0715	7.15	67	117	8	●
D0720	7.2	67	117	8	●
D0725	7.25	67	117	8	●
D0730	7.3	67	117	8	●
D0735	7.35	67	117	8	●
D0740	7.4	67	117	8	●
D0745	7.45	67	117	8	●
D0750	7.5	67	117	8	●
D0755	7.55	73	123	8	●
D0760	7.6	73	123	8	●
D0765	7.65	73	123	8	●
D0770	7.7	73	123	8	●
D0775	7.75	73	123	8	●
D0780	7.8	73	123	8	●
D0785	7.85	73	123	8	●
D0790	7.9	73	123	8	●
D0795	7.95	73	123	8	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD0800	8.0	73	123	8	●
D0805	8.05	73	128	10	●
D0810	8.1	73	128	10	●
D0815	8.15	73	128	10	●
D0820	8.2	73	128	10	●
D0825	8.25	73	128	10	●
D0830	8.3	73	128	10	●
D0835	8.35	73	128	10	●
D0840	8.4	73	128	10	●
D0845	8.45	73	128	10	●
D0850	8.5	73	128	10	●
D0855	8.55	79	134	10	●
D0860	8.6	79	134	10	●
D0865	8.65	79	134	10	●
D0870	8.7	79	134	10	●
D0875	8.75	79	134	10	●
D0880	8.8	79	134	10	●
D0885	8.85	79	134	10	●
D0890	8.9	79	134	10	●
D0895	8.95	79	134	10	●
D0900	9.0	79	134	10	●
D0910	9.1	79	134	10	●
D0920	9.2	79	134	10	●
D0930	9.3	79	134	10	●
D0940	9.4	79	134	10	●
D0950	9.5	79	134	10	●
D0960	9.6	85	140	10	●
D0970	9.7	85	140	10	●
D0980	9.8	85	140	10	●
D0990	9.9	85	140	10	●
D1000	10.0	85	140	10	●
D1010	10.1	85	145	12	●
D1020	10.2	85	145	12	●
D1030	10.3	85	145	12	●
D1040	10.4	85	145	12	●
D1050	10.5	85	145	12	●
D1060	10.6	85	145	12	●
D1070	10.7	92	152	12	●
D1080	10.8	92	152	12	●
D1090	10.9	92	152	12	●
D1100	11.0	92	152	12	●
D1110	11.1	92	152	12	●
D1120	11.2	92	152	12	●
D1130	11.3	92	152	12	●
D1140	11.4	92	152	12	●
D1150	11.5	92	152	12	●
D1160	11.6	92	152	12	●
D1170	11.7	92	152	12	●
D1180	11.8	92	152	12	●
D1190	11.9	99	159	12	●

VA-PDM-SUS

Medium, High precision, For stainless steel

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDMSUSD1200	12.0	99	159	12	●
D1210	12.1	99	159	12	●
D1220	12.2	99	159	12	●
D1230	12.3	99	159	12	●
D1240	12.4	99	159	12	●
D1250	12.5	99	159	12	●
D1260	12.6	99	159	12	●
D1270	12.7	99	159	12	●
D1280	12.8	99	159	12	●
D1290	12.9	99	159	12	●
D1300	13.0	99	159	12	●

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. (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), NWE 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.

VIOLET DRILLS

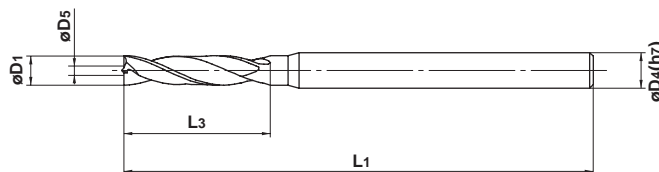
VA-PDS-CB

Short flute length, High precision, For counter boring



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	D1 ≤ 3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 18	18 < D1 ≤ 30	30 < D1 ≤ 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	Drill Dia. D1	118° Dia. D5	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock	Order Number	Drill Dia. D1	118° Dia. D5	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
NEW VAPDSCBD0200	2.0	0.7	12	60	3	●	VAPDSCBD0600	6.0	1.4	27	80	6	●
NEW D0210	2.1	0.7	12	60	3	●	D0610	6.1	1.4	30	80	8	●
NEW D0220	2.2	0.7	12	60	3	●	NEW D0620	6.2	1.4	30	80	8	●
NEW D0230	2.3	0.7	13	60	3	●	NEW D0630	6.3	1.4	30	80	8	●
NEW D0240	2.4	0.7	13	60	3	●	NEW D0640	6.4	1.4	30	80	8	●
NEW D0250	2.5	0.7	13	60	3	●	D0650	6.5	1.4	30	80	8	●
NEW D0260	2.6	0.8	15	60	3	●	D0660	6.6	1.8	30	80	8	●
NEW D0270	2.7	0.8	15	60	3	●	NEW D0670	6.7	1.8	30	80	8	●
NEW D0280	2.8	0.8	15	60	3	●	D0680	6.8	1.8	32	80	8	●
NEW D0290	2.9	0.8	15	60	3	●	D0690	6.9	1.8	32	80	8	●
D0300	3.0	0.8	15	60	3	●	D0700	7.0	1.8	32	80	8	●
NEW D0310	3.1	0.8	17	70	4	●	D0710	7.1	1.8	32	80	8	●
NEW D0320	3.2	0.8	17	70	4	●	NEW D0720	7.2	1.8	32	80	8	●
D0330	3.3	0.8	19	70	4	●	NEW D0730	7.3	1.8	32	80	8	●
D0340	3.4	0.8	19	70	4	●	NEW D0740	7.4	1.8	32	80	8	●
D0350	3.5	0.8	19	70	4	●	D0750	7.5	1.8	32	80	8	●
NEW D0360	3.6	1.0	21	70	4	●	NEW D0760	7.6	2.0	35	85	8	●
NEW D0370	3.7	1.0	21	70	4	●	NEW D0770	7.7	2.0	35	85	8	●
D0380	3.8	1.0	21	70	4	●	D0780	7.8	2.0	35	85	8	●
NEW D0390	3.9	1.0	21	70	4	●	D0790	7.9	2.0	35	85	8	●
D0400	4.0	1.0	21	70	4	●	D0800	8.0	2.0	35	85	8	●
NEW D0410	4.1	1.0	21	80	6	●	D0810	8.1	2.0	35	90	10	●
D0420	4.2	1.0	21	80	6	●	D0850	8.5	2.0	35	90	10	●
D0430	4.3	1.0	23	80	6	●	D0860	8.6	2.8	38	93	10	●
NEW D0440	4.4	1.0	23	80	6	●	D0880	8.8	2.8	38	93	10	●
D0450	4.5	1.0	23	80	6	●	D0900	9.0	2.8	38	93	10	●
NEW D0460	4.6	1.4	25	80	6	●	D0910	9.1	2.8	38	93	10	●
NEW D0470	4.7	1.4	25	80	6	●	D0950	9.5	2.8	38	93	10	●
D0480	4.8	1.4	25	80	6	●	D0960	9.6	3.2	41	96	10	●
NEW D0490	4.9	1.4	25	80	6	●	D0980	9.8	3.2	41	96	10	●
D0500	5.0	1.4	25	80	6	●	D1000	10.0	3.2	41	96	10	●
D0510	5.1	1.4	25	80	6	●	D1010	10.1	3.2	41	101	12	●
NEW D0520	5.2	1.4	25	80	6	●	D1030	10.3	3.2	41	101	12	●
NEW D0530	5.3	1.4	25	80	6	●	D1050	10.5	3.2	41	101	12	●
NEW D0540	5.4	1.4	27	80	6	●	NEW D1080	10.8	3.7	45	105	12	●
D0550	5.5	1.4	27	80	6	●	D1100	11.0	3.7	45	105	12	●
NEW D0560	5.6	1.4	27	80	6	●	D1110	11.1	3.7	45	105	12	●
NEW D0570	5.7	1.4	27	80	6	●	D1150	11.5	3.7	45	105	12	●
D0580	5.8	1.4	27	80	6	●	D1180	11.8	3.7	45	105	12	●
NEW D0590	5.9	1.4	27	80	6	●	D1200	12.0	3.7	49	109	12	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	118° Dia. D5	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
VAPDSCBD1250	12.5	3.7	49	109	12	●
D1300	13.0	4.2	49	109	12	●
D1350	13.5	4.2	51	121	16	●
D1380	13.8	4.2	51	121	16	●
D1400	14.0	4.2	51	121	16	●
D1410	14.1	5.5	58	123	16	●
NEW D1420	14.2	5.5	58	123	16	●
NEW D1450	14.5	5.5	58	123	16	●
D1480	14.8	5.5	58	123	16	●
D1500	15.0	5.5	58	123	16	●
NEW D1550	15.5	5.5	60	125	16	●
NEW D1570	15.7	5.5	60	125	16	●
D1580	15.8	5.5	60	125	16	●
D1600	16.0	5.5	60	125	16	●
D1700	17.0	5.5	62	132	20	●
D1750	17.5	5.5	63	133	20	●
D1760	17.6	6.5	63	133	20	●
NEW D1770	17.7	6.5	63	133	20	●
D1780	17.8	6.5	63	133	20	●
D1800	18.0	6.5	63	133	20	●
D1810	18.1	6.5	65	135	20	●
D1900	19.0	6.5	65	135	20	●
D1980	19.8	7.5	67	137	20	●
D2000	20.0	7.5	67	137	20	●
D2010	20.1	7.5	67	137	20	●
NEW D2100	21.0	7.5	75	165	25	●
D2200	22.0	7.5	75	165	25	●
D2300	23.0	7.5	80	170	25	●
D2400	24.0	8.5	80	170	25	●
NEW D2500	25.0	8.5	85	180	25	●
D2600	26.0	9.0	85	180	32	●
NEW D2700	27.0	9.0	95	190	32	●
D2800	28.0	10.0	95	190	32	●
D2900	29.0	10.0	100	195	32	●
D3000	30.0	11.0	100	195	32	●
NEW D3100	31.0	11.0	105	200	32	●
D3200	32.0	13.0	105	200	32	●

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 hardeningstainless steel ASTM 630, ASTM 631	
	Drill Dia. (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)
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 3xD hole depths without a pilot hole. When drilling holes smaller than 1xD 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.

V-SD

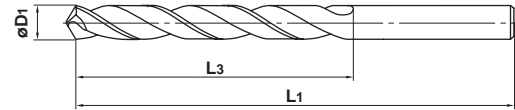
Straight shank



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	○		

$0.5 \leq D_1 < 1$	$1 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
$\begin{matrix} 0 \\ -0.010 \end{matrix}$	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
VSDD0050	0.5	6	27	●
D0060	0.6	7	30	●
D0070	0.7	9	32	●
D0080	0.8	10	34	●
D0090	0.9	11	36	●
D0100	1.0	12	40	●
D0110	1.1	14	42	●
D0120	1.2	16	42	●
D0130	1.3	16	45	●
D0140	1.4	18	48	●
D0150	1.5	18	48	●
D0160	1.6	20	50	●
D0170	1.7	20	50	●
D0180	1.8	22	52	●
D0190	1.9	22	52	●
D0200	2.0	23	55	●
D0210	2.1	23	55	●
D0220	2.2	26	58	●
D0230	2.3	26	58	●
D0240	2.4	29	61	●
D0250	2.5	29	61	●
D0260	2.6	29	64	●
D0270	2.7	32	64	●
D0280	2.8	32	67	●
D0290	2.9	32	71	●
D0300	3.0	32	71	●
D0310	3.1	35	71	●
D0320	3.2	35	71	●
D0330	3.3	35	73	●
D0340	3.4	38	73	●
D0350	3.5	38	73	●
D0360	3.6	38	76	●
D0370	3.7	38	76	●
D0380	3.8	42	76	●
D0390	3.9	42	79	●
D0400	4.0	42	83	●
D0410	4.1	42	83	●
D0420	4.2	42	83	●
D0430	4.3	46	83	●
D0440	4.4	46	86	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
VSDD0450	4.5	46	86	●
D0460	4.6	46	86	●
D0470	4.7	46	89	●
D0480	4.8	51	89	●
D0490	4.9	51	92	●
D0500	5.0	51	92	●
D0510	5.1	51	92	●
D0520	5.2	51	95	●
D0530	5.3	51	95	●
D0540	5.4	56	95	●
D0550	5.5	56	95	●
D0560	5.6	56	98	●
D0570	5.7	56	98	●
D0580	5.8	56	98	●
D0590	5.9	56	98	●
D0600	6.0	56	102	●
D0610	6.1	62	102	●
D0620	6.2	62	102	●
D0630	6.3	62	102	●
D0640	6.4	62	105	●
D0650	6.5	62	105	●
D0660	6.6	62	105	●
D0670	6.7	62	105	●
D0680	6.8	67	105	●
D0690	6.9	67	105	●
D0700	7.0	67	105	●
D0710	7.1	67	108	●
D0720	7.2	67	108	●
D0730	7.3	67	108	●
D0740	7.4	67	111	●
D0750	7.5	67	111	●
D0760	7.6	73	111	●
D0770	7.7	73	114	●
D0780	7.8	73	114	●
D0790	7.9	73	114	●
D0800	8.0	73	114	●
D0810	8.1	73	117	●
D0820	8.2	73	117	●
D0830	8.3	73	117	●
D0840	8.4	73	121	●

DRILLING

● : Inventory maintained in Japan.

VIOLET DRILLS

V-SD Straight shank

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
VSDD0850	8.5	73	121	●
D0860	8.6	79	121	●
D0870	8.7	79	121	●
D0880	8.8	79	124	●
D0890	8.9	79	124	●
D0900	9.0	79	124	●
D0910	9.1	79	124	●
D0920	9.2	79	127	●
D0930	9.3	79	127	●
D0940	9.4	79	127	●
D0950	9.5	79	127	●
D0960	9.6	85	130	●
D0970	9.7	85	130	●
D0980	9.8	85	130	●
D0990	9.9	85	130	●
D1000	10.0	85	130	●
D1010	10.1	85	133	●
D1020	10.2	85	133	●
D1030	10.3	85	133	●
D1040	10.4	85	133	●
D1050	10.5	85	137	●
D1060	10.6	85	137	●
D1070	10.7	92	137	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
VSDD1080	10.8	92	140	●
D1090	10.9	92	140	●
D1100	11.0	92	140	●
D1110	11.1	92	140	●
D1120	11.2	92	143	●
D1130	11.3	92	143	●
D1140	11.4	92	143	●
D1150	11.5	92	143	●
D1160	11.6	92	146	●
D1170	11.7	92	146	●
D1180	11.8	92	146	●
D1190	11.9	99	146	●
D1200	12.0	99	149	●
D1210	12.1	99	149	●
D1220	12.2	99	149	●
D1230	12.3	99	149	●
D1240	12.4	99	152	●
D1250	12.5	99	152	●
D1260	12.6	99	152	●
D1270	12.7	99	152	●
D1280	12.8	99	152	●
D1290	12.9	99	152	●
D1300	13.0	99	152	●

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)	
	40m/min		30m/min		20m/min		10-14m/min	
Drill Dia. (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 3D (D: 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.

● : Inventory maintained in Japan.

V-TDS

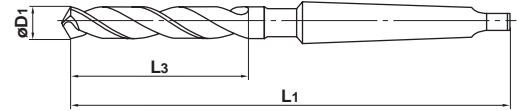
Short, Taper shank



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	○		

D1=6	6<D1≤10	10<D1≤18	18<D1≤30	30<D1≤32
0 -0.018	0 -0.022	0 -0.027	0 -0.033	0 -0.039



Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
VTDS0600M1	6.0	44	126	1	●
D0650M1	6.5	44	126	1	●
D0660M1	6.6	44	126	1	●
D0680M1	6.8	44	126	1	●
D0700M1	7.0	44	126	1	●
D0720M1	7.2	44	126	1	●
D0750M1	7.5	44	126	1	●
D0770M1	7.7	48	130	1	●
D0780M1	7.8	48	130	1	●
D0800M1	8.0	48	130	1	●
D0820M1	8.2	48	130	1	●
D0850M1	8.5	48	130	1	●
D0880M1	8.8	52	133	1	●
D0900M1	9.0	52	133	1	●
D0950M1	9.5	52	133	1	●
D0970M1	9.7	56	137	1	●
D0980M1	9.8	56	137	1	●
D1000M1	10.0	56	137	1	●
D1030M1	10.3	56	137	1	●
D1050M1	10.5	56	137	1	●
D1080M1	10.8	61	142	1	●
D1100M1	11.0	61	142	1	●
D1150M1	11.5	61	142	1	●
D1200M1	12.0	66	146	1	●
D1250M2	12.5	66	163	2	●
D1300M2	13.0	66	163	2	●
D1350M2	13.5	70	168	2	●
D1400M2	14.0	70	168	2	●
D1450M2	14.5	73	171	2	●
D1500M2	15.0	73	171	2	●
D1550M2	15.5	77	175	2	●
D1600M2	16.0	77	175	2	●
D1650M2	16.5	80	178	2	●
D1700M2	17.0	80	178	2	●
D1750M2	17.5	84	182	2	●
D1800M2	18.0	84	182	2	●
D1850M2	18.5	86	184	2	●
D1900M2	19.0	86	184	2	●
D1950M2	19.5	90	188	2	●
D2000M2	20.0	90	188	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
VTDS2050M2	20.5	93	191	2	●
D2100M2	21.0	93	191	2	●
D2150M2	21.5	96	194	2	●
D2200M2	22.0	96	194	2	●
D2250M2	22.5	100	198	2	●
D2300M2	23.0	100	198	2	●
D2350M3	23.5	102	224	3	●
D2400M3	24.0	102	224	3	●
D2450M3	24.5	102	224	3	●
D2500M3	25.0	102	224	3	●
D2550M3	25.5	105	226	3	●
D2600M3	26.0	105	226	3	●
D2650M3	26.5	105	226	3	●
D2700M3	27.0	108	230	3	●
D2750M3	27.5	108	230	3	●
D2800M3	28.0	108	230	3	●
D2850M3	28.5	111	232	3	●
D2900M3	29.0	111	232	3	●
D2950M3	29.5	111	232	3	●
D3000M3	30.0	111	232	3	●
D3050M3	30.5	114	235	3	●
D3100M3	31.0	114	235	3	●
D3150M3	31.5	114	235	3	●
D3200M3	32.0	114	235	3	●

DRILLING

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. (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.

STRAIGHT SHANK DRILLS

G-SD

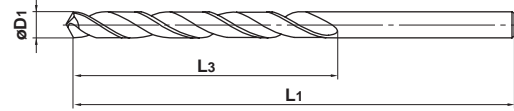
TiN, Straight shank



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	○	○	

$0.5 \leq D_1 < 1$	$1 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
$\begin{matrix} 0 \\ -0.010 \end{matrix}$	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GSDD0050	0.5	6	27	●
D0060	0.6	7	30	●
D0070	0.7	9	32	●
D0080	0.8	10	34	●
D0090	0.9	11	36	●
D0100	1.0	12	40	●
D0110	1.1	14	42	●
D0120	1.2	16	42	●
D0130	1.3	16	45	●
D0140	1.4	18	48	●
D0150	1.5	18	48	●
D0160	1.6	20	50	●
D0170	1.7	20	50	●
D0180	1.8	22	52	●
D0190	1.9	22	52	●
D0200	2.0	23	55	●
D0210	2.1	23	55	●
D0220	2.2	26	58	●
D0230	2.3	26	58	●
D0240	2.4	29	61	●
D0250	2.5	29	61	●
D0260	2.6	29	64	●
D0270	2.7	32	64	●
D0280	2.8	32	67	●
D0290	2.9	32	71	●
D0300	3.0	32	71	●
D0310	3.1	35	71	●
D0320	3.2	35	71	●
D0330	3.3	35	73	●
D0340	3.4	38	73	●
D0350	3.5	38	73	●
D0360	3.6	38	76	●
D0370	3.7	38	76	●
D0380	3.8	42	76	●
D0390	3.9	42	79	●
D0400	4.0	42	83	●
D0410	4.1	42	83	●
D0420	4.2	42	83	●
D0430	4.3	46	83	●
D0440	4.4	46	86	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GSDD0450	4.5	46	86	●
D0460	4.6	46	86	●
D0470	4.7	46	89	●
D0480	4.8	51	89	●
D0490	4.9	51	92	●
D0500	5.0	51	92	●
D0510	5.1	51	92	●
D0520	5.2	51	95	●
D0530	5.3	51	95	●
D0540	5.4	56	95	●
D0550	5.5	56	95	●
D0560	5.6	56	98	●
D0570	5.7	56	98	●
D0580	5.8	56	98	●
D0590	5.9	56	98	●
D0600	6.0	56	102	●
D0610	6.1	62	102	●
D0620	6.2	62	102	●
D0630	6.3	62	102	●
D0640	6.4	62	105	●
D0650	6.5	62	105	●
D0660	6.6	62	105	●
D0670	6.7	62	105	●
D0680	6.8	67	105	●
D0690	6.9	67	105	●
D0700	7.0	67	105	●
D0710	7.1	67	108	●
D0720	7.2	67	108	●
D0730	7.3	67	108	●
D0740	7.4	67	111	●
D0750	7.5	67	111	●
D0760	7.6	73	111	●
D0770	7.7	73	114	●
D0780	7.8	73	114	●
D0790	7.9	73	114	●
D0800	8.0	73	114	●
D0810	8.1	73	117	●
D0820	8.2	73	117	●
D0830	8.3	73	117	●
D0840	8.4	73	121	●

DRILLING

● : Inventory maintained in Japan.

STRAIGHT SHANK DRILLS

G-SD

TiN, Straight shank

HSS

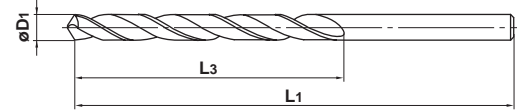
Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GSDD0850	8.5	73	121	●
D0860	8.6	79	121	●
D0870	8.7	79	121	●
D0880	8.8	79	124	●
D0890	8.9	79	124	●
D0900	9.0	79	124	●
D0910	9.1	79	124	●
D0920	9.2	79	127	●
D0930	9.3	79	127	●
D0940	9.4	79	127	●
D0950	9.5	79	127	●
D0960	9.6	85	130	●
D0970	9.7	85	130	●
D0980	9.8	85	130	●
D0990	9.9	85	130	●
D1000	10.0	85	130	●
D1010	10.1	85	133	●
D1020	10.2	85	133	●
D1030	10.3	85	133	●
D1040	10.4	85	133	●
D1050	10.5	85	137	●
D1060	10.6	85	137	●
D1070	10.7	92	137	●
D1080	10.8	92	140	●
D1090	10.9	92	140	●
D1100	11.0	92	140	●
D1110	11.1	92	140	●
D1120	11.2	92	143	●
D1130	11.3	92	143	●
D1140	11.4	92	143	●
D1150	11.5	92	143	●
D1160	11.6	92	146	●
D1170	11.7	92	146	●
D1180	11.8	92	146	●
D1190	11.9	99	146	●
D1200	12.0	99	149	●
D1210	12.1	99	149	●
D1220	12.2	99	149	●
D1230	12.3	99	149	●
D1240	12.4	99	152	●
D1250	12.5	99	152	●
D1260	12.6	99	152	●
D1270	12.7	99	152	●
D1280	12.8	99	152	●
D1290	12.9	99	152	●
D1300	13.0	99	152	●

DRILLING

● : Inventory maintained in Japan.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	$0.2 \leq D_1 < 1$	$1 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 17.5$
◎		○	○	○		$\begin{matrix} 0 \\ -0.012 \end{matrix}$	$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



● For general drilling.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD0020	0.2	2.5	19	●
D0030	0.3	3	19	●
D0040	0.4	5	20	●
D0050	0.5	6	22	●
D0060	0.6	7	24	●
D0070	0.7	10	32	●
D0080	0.8	11	34	●
D0090	0.9	13	36	●
D0100	1.0	18	40	●
D0110	1.1	20	42	●
D0120	1.2	20	42	●
D0130	1.3	22	45	●
D0140	1.4	23	48	●
D0150	1.5	23	48	●
D0160	1.6	25	50	●
D0170	1.7	25	50	●
D0180	1.8	28	52	●
D0190	1.9	28	52	●
D0200	2.0	29	55	●
D0210	2.1	29	55	●
D0220	2.2	33	58	●
D0230	2.3	33	58	●
D0240	2.4	35	61	●
D0250	2.5	35	61	●
D0260	2.6	37	64	●
D0270	2.7	37	64	●
D0280	2.8	39	67	●
D0290	2.9	42	71	●
D0300	3.0	42	71	●
D0310	3.1	42	71	●
D0320	3.2	42	71	●
D0330	3.3	45	73	●
D0340	3.4	45	73	●
D0350	3.5	45	73	●
D0360	3.6	48	76	●
D0370	3.7	48	76	●
D0380	3.8	48	76	●
D0390	3.9	51	79	●
D0400	4.0	54	83	●
D0410	4.1	54	83	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD0420	4.2	54	83	●
D0430	4.3	54	83	●
D0440	4.4	56	86	●
D0450	4.5	56	86	●
D0460	4.6	56	86	●
D0470	4.7	59	89	●
D0480	4.8	59	89	●
D0490	4.9	62	92	●
D0500	5.0	62	92	●
D0510	5.1	62	92	●
D0520	5.2	64	95	●
D0530	5.3	64	95	●
D0540	5.4	64	95	●
D0550	5.5	64	95	●
D0560	5.6	67	98	●
D0570	5.7	67	98	●
D0580	5.8	67	98	●
D0590	5.9	67	98	●
D0600	6.0	70	102	●
D0610	6.1	70	102	●
D0620	6.2	70	102	●
D0630	6.3	70	102	●
D0640	6.4	73	105	●
D0650	6.5	73	105	●
D0660	6.6	73	105	●
D0670	6.7	73	105	●
D0680	6.8	73	105	●
D0690	6.9	73	105	●
D0700	7.0	73	105	●
D0710	7.1	75	108	●
D0720	7.2	75	108	●
D0730	7.3	75	108	●
D0740	7.4	78	111	●
D0750	7.5	78	111	●
D0760	7.6	78	111	●
D0770	7.7	81	114	●
D0780	7.8	81	114	●
D0790	7.9	81	114	●
D0800	8.0	81	114	●
D0810	8.1	84	117	●

STRAIGHT SHANK DRILLS

SD

Straight shank

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD0820	8.2	84	117	●
D0830	8.3	84	117	●
D0840	8.4	87	121	●
D0850	8.5	87	121	●
D0860	8.6	87	121	●
D0870	8.7	87	121	●
D0880	8.8	89	124	●
D0890	8.9	89	124	●
D0900	9.0	89	124	●
D0910	9.1	89	124	●
D0920	9.2	92	127	●
D0930	9.3	92	127	●
D0940	9.4	92	127	●
D0950	9.5	92	127	●
D0960	9.6	95	130	●
D0970	9.7	95	130	●
D0980	9.8	95	130	●
D0990	9.9	95	130	●
D1000	10.0	95	130	●
D1010	10.1	98	133	●
D1020	10.2	98	133	●
D1030	10.3	98	133	●
D1040	10.4	98	133	●
D1050	10.5	100	137	●
D1060	10.6	100	137	●
D1070	10.7	100	137	●
D1080	10.8	103	140	●
D1090	10.9	103	140	●
D1100	11.0	103	140	●
D1110	11.1	103	140	●
D1120	11.2	106	143	●
D1130	11.3	106	143	●
D1140	11.4	106	143	●
D1150	11.5	106	143	●
D1160	11.6	109	146	●
D1170	11.7	109	146	●
D1180	11.8	109	146	●
D1190	11.9	109	146	●
D1200	12.0	111	149	●
D1210	12.1	111	149	●
D1220	12.2	111	149	●
D1230	12.3	111	149	●
D1240	12.4	114	152	●
D1250	12.5	114	152	●
D1260	12.6	114	152	●
D1270	12.7	114	152	●
D1280	12.8	114	152	●
D1290	12.9	114	152	●
D1300	13.0	114	152	●
D1350	13.5	122	168	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD1400	14.0	122	168	●
D1450	14.5	122	168	●
D1500	15.0	132	181	●
D1550	15.5	132	181	●
D1600	16.0	132	181	●
D1650	16.5	132	181	●
D1700	17.0	143	194	●
D1750	17.5	143	194	●

DRILLING

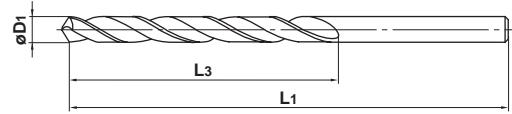
● : Inventory maintained in Japan.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		○	○	○	

0.25 ≤ D1 ≤ 5.95



$\begin{matrix} 0 \\ -0.007 \end{matrix}$



● The diameter tolerance is $\begin{matrix} 0 \\ -0.007 \end{matrix}$ mm.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD0025	0.25	3	19	●
D0035	0.35	4	19	●
D0045	0.45	5	20	●
D0055	0.55	7	24	●
D0065	0.65	8	26	●
D0075	0.75	11	34	●
D0085	0.85	13	36	●
D0095	0.95	18	40	●
D0105	1.05	20	42	●
D0115	1.15	20	42	●
D0125	1.25	22	45	●
D0135	1.35	23	48	●
D0145	1.45	23	48	●
D0155	1.55	25	50	●
D0165	1.65	25	50	●
D0175	1.75	28	52	●
D0185	1.85	28	52	●
D0195	1.95	29	55	●
D0205	2.05	29	55	●
D0215	2.15	29	55	●
D0225	2.25	33	58	●
D0235	2.35	33	58	●
D0245	2.45	35	61	●
D0255	2.55	37	64	●
D0265	2.65	37	64	●
D0275	2.75	39	67	●
D0285	2.85	39	67	●
D0295	2.95	42	71	●
D0305	3.05	42	71	●
D0315	3.15	42	71	●
D0325	3.25	42	71	●
D0335	3.35	45	73	●
D0345	3.45	45	73	●
D0355	3.55	45	73	●
D0365	3.65	48	76	●
D0375	3.75	48	76	●
D0385	3.85	51	79	●
D0395	3.95	51	79	●
D0405	4.05	54	83	●
D0415	4.15	54	83	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
SDD0425	4.25	54	83	●
D0435	4.35	54	83	●
D0445	4.45	56	86	●
D0455	4.55	56	86	●
D0465	4.65	59	89	●
D0475	4.75	59	89	●
D0485	4.85	59	89	●
D0495	4.95	62	92	●
D0505	5.05	62	92	●
D0515	5.15	62	92	●
D0525	5.25	64	95	●
D0535	5.35	64	95	●
D0545	5.45	64	95	●
D0555	5.55	64	95	●
D0565	5.65	67	98	●
D0575	5.75	67	98	●
D0585	5.85	67	98	●
D0595	5.95	67	98	●

STRAIGHT SHANK DRILLS

KSD

Cobalt HSS, For stainless steel



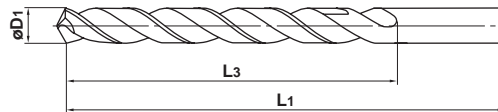
D₁<2

D₁≥2

D₁≥2

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎		○	

1 ≤ D ₁ ≤ 3	3 < D ₁ ≤ 6	6 < D ₁ ≤ 10	10 < D ₁ ≤ 13
$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



● Sharp edge geometry for stainless steels up to 200HB.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
KSDD0100	1.0	12	40	●
D0110	1.1	14	42	●
D0120	1.2	16	42	●
D0130	1.3	16	45	●
D0140	1.4	18	48	●
D0150	1.5	18	48	●
D0160	1.6	20	50	●
D0170	1.7	20	50	●
D0180	1.8	22	52	●
D0190	1.9	22	52	●
D0200	2.0	29	55	●
D0210	2.1	29	55	●
D0220	2.2	33	58	●
D0230	2.3	33	58	●
D0240	2.4	35	61	●
D0250	2.5	35	61	●
D0260	2.6	37	64	●
D0270	2.7	37	64	●
D0280	2.8	39	67	●
D0290	2.9	42	71	●
D0300	3.0	42	71	●
D0310	3.1	42	71	●
D0320	3.2	42	71	●
D0330	3.3	45	73	●
D0340	3.4	45	73	●
D0350	3.5	45	73	●
D0360	3.6	48	76	●
D0370	3.7	48	76	●
D0380	3.8	48	76	●
D0390	3.9	51	79	●
D0400	4.0	54	83	●
D0410	4.1	54	83	●
D0420	4.2	54	83	●
D0430	4.3	54	83	●
D0440	4.4	56	86	●
D0450	4.5	56	86	●
D0460	4.6	56	86	●
D0470	4.7	59	89	●
D0480	4.8	59	89	●
D0490	4.9	62	92	●

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
KSDD0500	5.0	62	92	●
D0510	5.1	62	92	●
D0520	5.2	64	95	●
D0530	5.3	64	95	●
D0540	5.4	64	95	●
D0550	5.5	64	95	●
D0560	5.6	67	98	●
D0570	5.7	67	98	●
D0580	5.8	67	98	●
D0590	5.9	67	98	●
D0600	6.0	70	102	●
D0610	6.1	70	102	●
D0620	6.2	70	102	●
D0630	6.3	70	102	●
D0640	6.4	73	105	●
D0650	6.5	73	105	●
D0660	6.6	73	105	●
D0670	6.7	73	105	●
D0680	6.8	73	105	●
D0690	6.9	73	105	●
D0700	7.0	73	105	●
D0710	7.1	75	108	●
D0720	7.2	75	108	●
D0730	7.3	75	108	●
D0740	7.4	78	111	●
D0750	7.5	78	111	●
D0760	7.6	78	111	●
D0770	7.7	81	114	●
D0780	7.8	81	114	●
D0790	7.9	81	114	●
D0800	8.0	81	114	●
D0810	8.1	84	117	●
D0820	8.2	84	117	●
D0830	8.3	84	117	●
D0840	8.4	87	121	●
D0850	8.5	87	121	●
D0860	8.6	87	121	●
D0870	8.7	87	121	●
D0880	8.8	89	124	●
D0890	8.9	89	124	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
KSDD0900	9.0	89	124	●
D0910	9.1	89	124	●
D0920	9.2	92	127	●
D0930	9.3	92	127	●
D0940	9.4	92	127	●
D0950	9.5	92	127	●
D0960	9.6	95	130	●
D0970	9.7	95	130	●
D0980	9.8	95	130	●
D0990	9.9	95	130	●
D1000	10.0	95	130	●
D1010	10.1	98	133	●
D1020	10.2	98	133	●
D1030	10.3	98	133	●
D1040	10.4	98	133	●
D1050	10.5	100	137	●
D1060	10.6	100	137	●
D1070	10.7	100	137	●
D1080	10.8	103	140	●
D1090	10.9	103	140	●
D1100	11.0	103	140	●
D1110	11.1	103	140	●
D1120	11.2	106	143	●
D1130	11.3	106	143	●
D1140	11.4	106	143	●
D1150	11.5	106	143	●
D1160	11.6	109	146	●
D1170	11.7	109	146	●
D1180	11.8	109	146	●
D1190	11.9	109	146	●
D1200	12.0	111	149	●
D1210	12.1	111	149	●
D1220	12.2	111	149	●
D1230	12.3	111	149	●
D1240	12.4	114	152	●
D1250	12.5	114	152	●
D1260	12.6	114	152	●
D1270	12.7	114	152	●
D1280	12.8	114	152	●
D1290	12.9	114	152	●
D1300	13.0	114	152	●

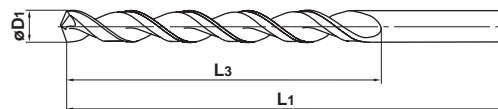
STRAIGHT SHANK DRILLS

G-WSS

TiN, For deep hole, Convolute flute



Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	$1 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
○		○	○	○		$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



● Suitable for general and deep hole drilling.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
GWSSD0100	1.0	18	40	●
D0110	1.1	20	42	●
D0120	1.2	20	42	●
D0130	1.3	22	45	●
D0140	1.4	23	48	●
D0150	1.5	23	48	●
D0160	1.6	25	50	●
D0170	1.7	25	50	●
D0180	1.8	28	52	●
D0190	1.9	28	52	●
D0200	2.0	29	55	●
D0210	2.1	29	55	●
D0220	2.2	33	58	●
D0230	2.3	33	58	●
D0240	2.4	35	61	●
D0250	2.5	35	61	●
D0260	2.6	37	64	●
D0270	2.7	37	64	●
D0280	2.8	39	67	●
D0290	2.9	42	71	●
D0300	3.0	42	71	●
D0310	3.1	42	71	●
D0320	3.2	42	71	●
D0330	3.3	45	73	●
D0340	3.4	45	73	●
D0350	3.5	45	73	●
D0360	3.6	48	76	●
D0370	3.7	48	76	●
D0380	3.8	48	76	●
D0390	3.9	51	79	●
D0400	4.0	54	83	●
D0410	4.1	54	83	●
D0420	4.2	54	83	●
D0430	4.3	54	83	●
D0440	4.4	56	86	●
D0450	4.5	56	86	●
D0460	4.6	56	86	●
D0470	4.7	59	89	●
D0480	4.8	59	89	●
D0490	4.9	62	92	●

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
GWSSD0500	5.0	62	92	●
D0510	5.1	62	92	●
D0520	5.2	64	95	●
D0530	5.3	64	95	●
D0540	5.4	64	95	●
D0550	5.5	64	95	●
D0560	5.6	67	98	●
D0570	5.7	67	98	●
D0580	5.8	67	98	●
D0590	5.9	67	98	●
D0600	6.0	70	102	●
D0610	6.1	70	102	●
D0620	6.2	70	102	●
D0630	6.3	70	102	●
D0640	6.4	73	105	●
D0650	6.5	73	105	●
D0660	6.6	73	105	●
D0670	6.7	73	105	●
D0680	6.8	73	105	●
D0690	6.9	73	105	●
D0700	7.0	73	105	●
D0710	7.1	75	108	●
D0720	7.2	75	108	●
D0730	7.3	75	108	●
D0740	7.4	78	111	●
D0750	7.5	78	111	●
D0760	7.6	78	111	●
D0770	7.7	81	114	●
D0780	7.8	81	114	●
D0790	7.9	81	114	●
D0800	8.0	81	114	●
D0810	8.1	84	117	●
D0820	8.2	84	117	●
D0830	8.3	84	117	●
D0840	8.4	87	121	●
D0850	8.5	87	121	●
D0860	8.6	87	121	●
D0870	8.7	87	121	●
D0880	8.8	89	124	●
D0890	8.9	89	124	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GWSSD0900	9.0	89	124	●
D0910	9.1	89	124	●
D0920	9.2	92	127	●
D0930	9.3	92	127	●
D0940	9.4	92	127	●
D0950	9.5	92	127	●
D0960	9.6	95	130	●
D0970	9.7	95	130	●
D0980	9.8	95	130	●
D0990	9.9	95	130	●
D1000	10.0	95	130	●
D1010	10.1	98	133	●
D1020	10.2	98	133	●
D1030	10.3	98	133	●
D1040	10.4	98	133	●
D1050	10.5	100	137	●
D1060	10.6	100	137	●
D1070	10.7	100	137	●
D1080	10.8	103	140	●
D1090	10.9	103	140	●
D1100	11.0	103	140	●
D1110	11.1	103	140	●
D1120	11.2	106	143	●
D1130	11.3	106	143	●
D1140	11.4	106	143	●
D1150	11.5	106	143	●
D1160	11.6	109	146	●
D1170	11.7	109	146	●
D1180	11.8	109	146	●
D1190	11.9	109	146	●
D1200	12.0	111	149	●
D1210	12.1	111	149	●
D1220	12.2	111	149	●
D1230	12.3	111	149	●
D1240	12.4	114	152	●
D1250	12.5	114	152	●
D1260	12.6	114	152	●
D1270	12.7	114	152	●
D1280	12.8	114	152	●
D1290	12.9	114	152	●
D1300	13.0	114	152	●

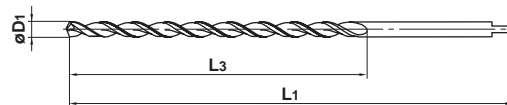
STRAIGHT SHANK DRILLS

G-WSL

TiN, Extra long



Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	$2 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
◎		○	○	○		$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



● Suitable for extra deep hole drilling.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
GWSLD0200A125	2.0	80	125	●
D0200A160	2.0	100	160	●
D0210A125	2.1	80	125	●
D0210A160	2.1	100	160	●
D0220A125	2.2	80	125	●
D0220A160	2.2	100	160	●
D0230A125	2.3	80	125	●
D0230A160	2.3	100	160	●
D0240A125	2.4	80	125	●
D0240A160	2.4	100	160	●
D0250A125	2.5	80	125	●
D0250A160	2.5	100	160	●
D0260A125	2.6	80	125	●
D0260A160	2.6	100	160	●
D0270A125	2.7	80	125	●
D0270A160	2.7	100	160	●
D0280A125	2.8	80	125	●
D0280A160	2.8	100	160	●
D0290A125	2.9	80	125	●
D0290A160	2.9	100	160	●
D0300A125	3.0	80	125	●
D0300A160	3.0	100	160	●
D0300A200	3.0	125	200	●
D0310A160	3.1	100	160	●
D0310A200	3.1	125	200	●
D0320A160	3.2	100	160	●
D0320A200	3.2	125	200	●
D0330A160	3.3	100	160	●
D0330A200	3.3	125	200	●
D0340A160	3.4	100	160	●
D0340A200	3.4	125	200	●
D0350A160	3.5	100	160	●
D0350A200	3.5	125	200	●
D0360A160	3.6	100	160	●
D0360A200	3.6	125	200	●
D0370A160	3.7	100	160	●
D0370A200	3.7	125	200	●
D0380A160	3.8	100	160	●
D0380A200	3.8	125	200	●
D0390A160	3.9	100	160	●

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
GWSLD0390A200	3.9	125	200	●
D0400A160	4.0	100	160	●
D0400A200	4.0	125	200	●
D0400A250	4.0	160	250	●
D0410A160	4.1	100	160	●
D0410A200	4.1	125	200	●
D0410A250	4.1	160	250	●
D0420A160	4.2	100	160	●
D0420A200	4.2	125	200	●
D0420A250	4.2	160	250	●
D0430A160	4.3	100	160	●
D0430A200	4.3	125	200	●
D0430A250	4.3	160	250	●
D0440A160	4.4	100	160	●
D0440A200	4.4	125	200	●
D0440A250	4.4	160	250	●
D0450A160	4.5	100	160	●
D0450A200	4.5	125	200	●
D0450A250	4.5	160	250	●
D0460A160	4.6	100	160	●
D0460A200	4.6	125	200	●
D0460A250	4.6	160	250	●
D0470A160	4.7	100	160	●
D0470A200	4.7	125	200	●
D0470A250	4.7	160	250	●
D0480A160	4.8	100	160	●
D0480A200	4.8	125	200	●
D0480A250	4.8	160	250	●
D0490A160	4.9	100	160	●
D0490A200	4.9	125	200	●
D0490A250	4.9	160	250	●
D0500A160	5.0	100	160	●
D0500A200	5.0	125	200	●
D0500A250	5.0	160	250	●
D0510A160	5.1	100	160	●
D0510A200	5.1	125	200	●
D0510A250	5.1	160	250	●
D0520A160	5.2	100	160	●
D0520A200	5.2	125	200	●
D0520A250	5.2	160	250	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GWSLD0530A160	5.3	100	160	●
D0530A200	5.3	125	200	●
D0530A250	5.3	160	250	●
D0540A160	5.4	100	160	●
D0540A200	5.4	125	200	●
D0540A250	5.4	160	250	●
D0550A160	5.5	100	160	●
D0550A200	5.5	125	200	●
D0550A250	5.5	160	250	●
D0560A160	5.6	100	160	●
D0560A200	5.6	125	200	●
D0560A250	5.6	160	250	●
D0570A160	5.7	100	160	●
D0570A200	5.7	125	200	●
D0570A250	5.7	160	250	●
D0580A160	5.8	100	160	●
D0580A200	5.8	125	200	●
D0580A250	5.8	160	250	●
D0590A160	5.9	100	160	●
D0590A200	5.9	125	200	●
D0590A250	5.9	160	250	●
D0600A160	6.0	100	160	●
D0600A200	6.0	125	200	●
D0600A250	6.0	160	250	●
D0600A315	6.0	200	315	●
D0650A160	6.5	100	160	●
D0650A200	6.5	125	200	●
D0650A250	6.5	160	250	●
D0650A315	6.5	200	315	●
D0680A160	6.8	100	160	●
D0680A200	6.8	125	200	●
D0680A250	6.8	160	250	●
D0680A315	6.8	200	315	●
D0700A160	7.0	100	160	●
D0700A200	7.0	125	200	●
D0700A250	7.0	160	250	●
D0700A315	7.0	200	315	●
D0750A200	7.5	125	200	●
D0750A250	7.5	160	250	●
D0750A315	7.5	200	315	●
D0800A200	8.0	125	200	●
D0800A250	8.0	160	250	●
D0800A315	8.0	200	315	●
D0850A200	8.5	140	200	●
D0850A250	8.5	160	250	●
D0850A315	8.5	200	315	●
D0900A200	9.0	140	200	●
D0900A250	9.0	160	250	●
D0900A315	9.0	200	315	●
D0950A200	9.5	140	200	●

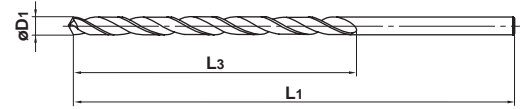
Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
GWSLD0950A250	9.5	160	250	●
D0950A315	9.5	200	315	●
D1000A200	10.0	140	200	●
D1000A250	10.0	160	250	●
D1000A315	10.0	200	315	●
D1050A250	10.5	160	250	●
D1050A315	10.5	200	315	●
D1100A250	11.0	160	250	●
D1100A315	11.0	200	315	●
D1150A250	11.5	160	250	●
D1150A315	11.5	200	315	●
D1200A250	12.0	160	250	●
D1200A315	12.0	200	315	●
D1250A250	12.5	160	250	●
D1250A315	12.5	200	315	●
D1300A250	13.0	160	250	●
D1300A315	13.0	200	315	●

STRAIGHT SHANK DRILLS

LSD
Extra long



Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy		1 ≤ D ₁ ≤ 3 0 -0.014	3 < D ₁ ≤ 6 0 -0.018	6 < D ₁ ≤ 10 0 -0.022	10 < D ₁ ≤ 13 0 -0.027
○			○	○						



● Widely used for deep hole drilling.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock	Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Stock
LSDD0100A100	1.0	25	100	●	LSDD0290A100	2.9	50	100	●
D0100A150	1.0	25	150	●	D0290A150	2.9	75	150	●
D0110A100	1.1	25	100	●	D0300A100	3.0	50	100	●
D0110A150	1.1	25	150	●	D0300A125	3.0	65	125	●
D0120A100	1.2	25	100	●	D0300A150	3.0	75	150	●
D0120A150	1.2	25	150	●	D0300A200	3.0	100	200	●
D0130A100	1.3	30	100	●	D0310A150	3.1	75	150	●
D0130A150	1.3	30	150	●	D0310A200	3.1	100	200	●
D0140A100	1.4	30	100	●	D0320A125	3.2	65	125	●
D0140A150	1.4	30	150	●	D0320A150	3.2	75	150	●
D0150A100	1.5	30	100	●	D0320A200	3.2	100	200	●
D0150A150	1.5	30	150	●	D0320A250	3.2	130	250	●
D0160A100	1.6	40	100	●	D0330A150	3.3	75	150	●
D0160A150	1.6	40	150	●	D0330A200	3.3	100	200	●
D0170A100	1.7	40	100	●	D0340A150	3.4	75	150	●
D0170A150	1.7	40	150	●	D0340A200	3.4	100	200	●
D0180A100	1.8	40	100	●	D0350A125	3.5	65	125	●
D0180A150	1.8	40	150	●	D0350A150	3.5	75	150	●
D0190A100	1.9	40	100	●	D0350A200	3.5	100	200	●
D0190A150	1.9	40	150	●	D0350A250	3.5	130	250	●
D0200A100	2.0	50	100	●	D0360A150	3.6	75	150	●
D0200A125	2.0	65	125	●	D0360A200	3.6	100	200	●
D0200A150	2.0	75	150	●	D0370A150	3.7	75	150	●
D0210A100	2.1	50	100	●	D0370A200	3.7	100	200	●
D0210A150	2.1	75	150	●	D0380A150	3.8	75	150	●
D0220A100	2.2	50	100	●	D0380A200	3.8	100	200	●
D0220A150	2.2	75	150	●	D0390A150	3.9	75	150	●
D0230A100	2.3	50	100	●	D0390A200	3.9	100	200	●
D0230A150	2.3	75	150	●	D0400A125	4.0	70	125	●
D0240A100	2.4	50	100	●	D0400A150	4.0	75	150	●
D0240A150	2.4	75	150	●	D0400A200	4.0	100	200	●
D0250A100	2.5	50	100	●	D0400A250	4.0	130	250	●
D0250A125	2.5	65	125	●	D0410A150	4.1	75	150	●
D0250A150	2.5	75	150	●	D0410A200	4.1	100	200	●
D0260A100	2.6	50	100	●	D0420A150	4.2	75	150	●
D0260A150	2.6	75	150	●	D0420A200	4.2	100	200	●
D0270A100	2.7	50	100	●	D0430A150	4.3	75	150	●
D0270A150	2.7	75	150	●	D0430A200	4.3	100	200	●
D0280A100	2.8	50	100	●	D0440A150	4.4	75	150	●
D0280A150	2.8	75	150	●	D0440A200	4.4	100	200	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock	Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
LSDD0450A125	4.5	70	125	●	LSDD0630A250	6.3	130	250	●
D0450A150	4.5	75	150	●	D0630A300	6.3	150	300	●
D0450A200	4.5	100	200	●	D0640A200	6.4	120	200	●
D0450A250	4.5	130	250	●	D0640A250	6.4	130	250	●
D0460A150	4.6	90	150	●	D0640A300	6.4	150	300	●
D0460A200	4.6	100	200	●	D0650A150	6.5	90	150	●
D0470A150	4.7	90	150	●	D0650A200	6.5	120	200	●
D0470A200	4.7	100	200	●	D0650A250	6.5	130	250	●
D0480A150	4.8	90	150	●	D0650A300	6.5	150	300	●
D0480A200	4.8	100	200	●	D0660A200	6.6	120	200	●
D0480A250	4.8	130	250	●	D0660A250	6.6	130	250	●
D0490A150	4.9	90	150	●	D0670A200	6.7	120	200	●
D0490A200	4.9	100	200	●	D0670A250	6.7	130	250	●
D0500A150	5.0	90	150	●	D0680A200	6.8	120	200	●
D0500A200	5.0	100	200	●	D0680A250	6.8	130	250	●
D0500A250	5.0	130	250	●	D0690A200	6.9	120	200	●
D0500A300	5.0	150	300	●	D0690A250	6.9	130	250	●
D0510A200	5.1	100	200	●	D0690A300	6.9	150	300	●
D0510A250	5.1	130	250	●	D0700A150	7.0	90	150	●
D0520A200	5.2	100	200	●	D0700A200	7.0	120	200	●
D0520A250	5.2	130	250	●	D0700A250	7.0	130	250	●
D0530A200	5.3	100	200	●	D0700A300	7.0	150	300	●
D0530A250	5.3	130	250	●	D0710A200	7.1	120	200	●
D0530A300	5.3	150	300	●	D0710A250	7.1	130	250	●
D0540A200	5.4	100	200	●	D0710A300	7.1	150	300	●
D0540A250	5.4	130	250	●	D0720A200	7.2	120	200	●
D0540A300	5.4	150	300	●	D0720A250	7.2	130	250	●
D0550A150	5.5	90	150	●	D0720A300	7.2	150	300	●
D0550A200	5.5	100	200	●	D0730A200	7.3	120	200	●
D0550A250	5.5	130	250	●	D0730A250	7.3	130	250	●
D0550A300	5.5	150	300	●	D0730A300	7.3	150	300	●
D0560A200	5.6	100	200	●	D0740A250	7.4	130	250	●
D0560A250	5.6	130	250	●	D0740A300	7.4	150	300	●
D0570A200	5.7	100	200	●	D0750A150	7.5	90	150	●
D0570A250	5.7	130	250	●	D0750A200	7.5	120	200	●
D0580A200	5.8	100	200	●	D0750A250	7.5	130	250	●
D0580A250	5.8	130	250	●	D0750A300	7.5	150	300	●
D0590A200	5.9	100	200	●	D0760A200	7.6	120	200	●
D0590A250	5.9	130	250	●	D0760A250	7.6	130	250	●
D0600A150	6.0	90	150	●	D0760A300	7.6	150	300	●
D0600A200	6.0	100	200	●	D0770A200	7.7	120	200	●
D0600A250	6.0	130	250	●	D0770A250	7.7	130	250	●
D0600A300	6.0	150	300	●	D0770A300	7.7	150	300	●
D0610A200	6.1	120	200	●	D0780A200	7.8	120	200	●
D0610A250	6.1	130	250	●	D0780A250	7.8	130	250	●
D0610A300	6.1	150	300	●	D0780A300	7.8	150	300	●
D0620A200	6.2	120	200	●	D0790A200	7.9	120	200	●
D0620A250	6.2	130	250	●	D0790A250	7.9	130	250	●
D0620A300	6.2	150	300	●	D0800A150	8.0	90	150	●
D0630A200	6.3	120	200	●	D0800A200	8.0	120	200	●

DRILLING

STRAIGHT SHANK DRILLS

LSD
Extra long

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
LSDD0800A250	8.0	130	250	●
D0800A300	8.0	150	300	●
D0810A250	8.1	130	250	●
D0810A300	8.1	180	300	●
D0810A350	8.1	200	350	●
D0820A250	8.2	130	250	●
D0820A300	8.2	180	300	●
D0830A250	8.3	130	250	●
D0830A300	8.3	180	300	●
D0840A200	8.4	120	200	●
D0840A250	8.4	130	250	●
D0840A300	8.4	180	300	●
D0850A200	8.5	120	200	●
D0850A250	8.5	130	250	●
D0850A300	8.5	180	300	●
D0850A350	8.5	200	350	●
D0860A250	8.6	130	250	●
D0870A250	8.7	130	250	●
D0870A300	8.7	180	300	●
D0880A200	8.8	120	200	●
D0880A250	8.8	130	250	●
D0880A300	8.8	180	300	●
D0890A200	8.9	120	200	●
D0890A250	8.9	130	250	●
D0890A300	8.9	180	300	●
D0900A200	9.0	120	200	●
D0900A250	9.0	130	250	●
D0900A300	9.0	180	300	●
D0900A350	9.0	200	350	●
D0910A250	9.1	130	250	●
D0910A300	9.1	180	300	●
D0920A250	9.2	130	250	●
D0920A300	9.2	180	300	●
D0930A250	9.3	130	250	●
D0930A300	9.3	180	300	●
D0940A250	9.4	130	250	●
D0940A300	9.4	180	300	●
D0950A200	9.5	120	200	●
D0950A250	9.5	130	250	●
D0950A300	9.5	180	300	●
D0950A350	9.5	200	350	●
D0960A250	9.6	130	250	●
D0960A300	9.6	180	300	●
D0970A250	9.7	130	250	●
D0970A300	9.7	180	300	●
D0980A250	9.8	130	250	●
D0980A300	9.8	180	300	●
D0990A250	9.9	130	250	●
D0990A300	9.9	180	300	●
D1000A200	10.0	120	200	●

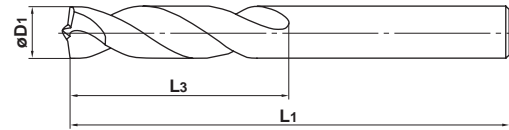
Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
LSDD1000A250	10.0	130	250	●
D1000A300	10.0	180	300	●
D1000A350	10.0	200	350	●
D1010A250	10.1	130	250	●
D1010A300	10.1	180	300	●
D1020A250	10.2	130	250	●
D1020A300	10.2	180	300	●
D1030A250	10.3	130	250	●
D1030A300	10.3	180	300	●
D1040A250	10.4	130	250	●
D1040A300	10.4	180	300	●
D1050A200	10.5	120	200	●
D1050A250	10.5	130	250	●
D1050A300	10.5	180	300	●
D1050A350	10.5	200	350	●
D1060A300	10.6	180	300	●
D1070A300	10.7	180	300	●
D1080A300	10.8	180	300	●
D1090A300	10.9	180	300	●
D1100A200	11.0	120	200	●
D1100A250	11.0	130	250	●
D1100A300	11.0	180	300	●
D1100A350	11.0	200	350	●
D1110A250	11.1	130	250	●
D1110A350	11.1	200	350	●
D1120A250	11.2	130	250	●
D1120A350	11.2	200	350	●
D1130A250	11.3	130	250	●
D1130A350	11.3	200	350	●
D1140A250	11.4	130	250	●
D1140A350	11.4	200	350	●
D1150A200	11.5	120	200	●
D1150A250	11.5	130	250	●
D1150A300	11.5	180	300	●
D1150A350	11.5	200	350	●
D1200A200	12.0	120	200	●
D1200A250	12.0	130	250	●
D1200A300	12.0	180	300	●
D1200A350	12.0	200	350	●
D1250A200	12.5	120	200	●
D1250A250	12.5	130	250	●
D1250A300	12.5	180	300	●
D1250A350	12.5	200	350	●
D1300A200	13.0	120	200	●
D1300A250	13.0	130	250	●
D1300A300	13.0	180	300	●
D1300A350	13.0	200	350	●

DRILLING

● : Inventory maintained in Japan.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		○	○	○	

$2 \leq D_1 \leq 3$	$3 < D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 13$
$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$



● Special cutting edge geometry to prevent through hole burrs.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
EPSSD0200	2.0	17	48	●
D0210	2.1	17	48	●
D0220	2.2	17	48	●
D0230	2.3	17	48	●
D0240	2.4	17	48	●
D0250	2.5	17	48	●
D0260	2.6	17	48	●
D0270	2.7	17	48	●
D0280	2.8	17	48	●
D0290	2.9	17	48	●
D0300	3.0	17	48	●
D0310	3.1	17	48	●
D0320	3.2	17	48	●
D0330	3.3	17	48	●
D0340	3.4	19	51	●
D0350	3.5	19	51	●
D0360	3.6	19	51	●
D0370	3.7	19	51	●
D0380	3.8	21	54	●
D0390	3.9	21	54	●
D0400	4.0	21	54	●
D0410	4.1	21	54	●
D0420	4.2	21	54	●
D0430	4.3	23	57	●
D0440	4.4	23	57	●
D0450	4.5	23	57	●
D0460	4.6	23	57	●
D0470	4.7	23	57	●
D0480	4.8	24	60	●
D0490	4.9	24	60	●
D0500	5.0	24	60	●
D0510	5.1	24	60	●
D0520	5.2	24	60	●
D0530	5.3	24	60	●
D0540	5.4	26	64	●
D0550	5.5	26	64	●
D0600	6.0	26	64	●
D0650	6.5	29	68	●
D0680	6.8	32	72	●
D0700	7.0	32	72	●

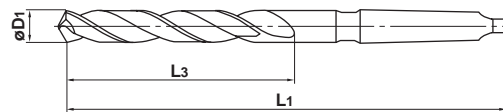
Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Stock
EPSSD0750	7.5	32	72	●
D0800	8.0	34	76	●
D0820	8.2	34	76	●
D0850	8.5	34	76	●
D0900	9.0	37	81	●
D0950	9.5	37	81	●
D1000	10.0	40	86	●
D1020	10.2	40	86	●
D1030	10.3	40	86	●
D1050	10.5	40	86	●
D1100	11.0	43	91	●
D1150	11.5	43	91	●
D1200	12.0	47	98	●
D1250	12.5	47	98	●
D1300	13.0	47	98	●

TAPER SHANK DRILLS

G-TD TiN



Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	D1=6 0 -0.018	6<D1≤10 0 -0.022	10<D1≤18 0 -0.027	18<D1≤30 0 -0.033	30<D1≤40 0 -0.039
◎		○	○	○						



● Original manufacturing and coating technology for improved performance.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
GTDD0600M1	6.0	55	148	1	●
D0650M1	6.5	61	152	1	●
D0660M1	6.6	61	155	1	●
D0680M1	6.8	67	155	1	●
D0700M1	7.0	67	155	1	●
D0720M1	7.2	67	158	1	●
D0750M1	7.5	67	158	1	●
D0770M1	7.7	72	162	1	●
D0780M1	7.8	72	162	1	●
D0800M1	8.0	72	162	1	●
D0820M1	8.2	72	168	1	●
D0850M1	8.5	72	168	1	●
D0880M1	8.8	78	172	1	●
D0900M1	9.0	78	172	1	●
D0950M1	9.5	78	175	1	●
D0970M1	9.7	84	178	1	●
D0980M1	9.8	84	178	1	●
D1000M1	10.0	84	178	1	●
D1030M1	10.3	84	182	1	●
D1050M1	10.5	84	182	1	●
D1080M1	10.8	90	185	1	●
D1100M1	11.0	90	185	1	●
D1150M1	11.5	90	188	1	●
D1200M1	12.0	97	192	1	●
D1250M1	12.5	97	195	1	●
D1300M1	13.0	97	198	1	●
D1350M1	13.5	103	202	1	●
D1400M1	14.0	103	205	1	●
D1450M2	14.5	109	222	2	●
D1500M2	15.0	109	225	2	●
D1550M2	15.5	115	228	2	●
D1600M2	16.0	115	230	2	●
D1650M2	16.5	119	232	2	●
D1700M2	17.0	119	235	2	●
D1750M2	17.5	124	240	2	●
D1800M2	18.0	124	240	2	●
D1850M2	18.5	129	245	2	●
D1900M2	19.0	129	245	2	●
D1950M2	19.5	133	250	2	●
D2000M2	20.0	133	250	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
GTDD2050M2	20.5	138	255	2	●
D2100M2	21.0	138	255	2	●
D2150M2	21.5	143	260	2	●
D2150M3	21.5	143	280	3	●
D2200M2	22.0	143	260	2	●
D2200M3	22.0	143	280	3	●
D2250M2	22.5	147	265	2	●
D2250M3	22.5	147	285	3	●
D2300M2	23.0	147	265	2	●
D2300M3	23.0	147	285	3	●
D2350M3	23.5	147	285	3	●
D2400M3	24.0	152	285	3	●
D2450M3	24.5	152	285	3	●
D2500M3	25.0	152	285	3	●
D2550M3	25.5	156	285	3	●
D2600M3	26.0	156	285	3	●
D2650M3	26.5	156	290	3	●
D2700M3	27.0	161	290	3	●
D2750M3	27.5	161	295	3	●
D2800M3	28.0	161	295	3	●
D2850M3	28.5	165	300	3	●
D2900M3	29.0	165	300	3	●
D2950M3	29.5	165	305	3	●
D3000M3	30.0	165	305	3	●
D3050M3	30.5	170	310	3	●
D3100M3	31.0	170	310	3	●
D3150M3	31.5	170	315	3	●
D3200M3	32.0	174	315	3	●
D3300M4	33.0	174	345	4	●
D3400M4	34.0	179	350	4	●
D3500M4	35.0	179	350	4	●
D3600M4	36.0	183	355	4	●
D3700M4	37.0	183	355	4	●
D3800M4	38.0	187	360	4	●
D3900M4	39.0	187	360	4	●
D4000M4	40.0	187	365	4	●

DRILLING

● : Inventory maintained in Japan.

TD

Taper shank



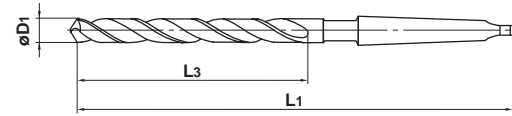
D1>40

HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		○	○	○	



D1=3	3<D1≤6	6<D1≤10	10<D1≤18	18<D1≤30	30<D1≤50	50<D1≤75
$\begin{matrix} 0 \\ -0.014 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$	$\begin{matrix} 0 \\ -0.039 \end{matrix}$	$\begin{matrix} 0 \\ -0.046 \end{matrix}$



● For general drilling.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD0300M1	3.0	38	115	1	●
D0310M1	3.1	45	122	1	●
D0320M1	3.2	45	122	1	●
D0330M1	3.3	45	122	1	●
D0340M1	3.4	45	122	1	●
D0350M1	3.5	45	122	1	●
D0360M1	3.6	50	128	1	●
D0370M1	3.7	50	128	1	●
D0380M1	3.8	50	128	1	●
D0390M1	3.9	50	128	1	●
D0400M1	4.0	50	128	1	●
D0410M1	4.1	55	135	1	●
D0420M1	4.2	55	135	1	●
D0430M1	4.3	55	135	1	●
D0440M1	4.4	55	135	1	●
D0450M1	4.5	55	135	1	●
D0460M1	4.6	60	140	1	●
D0470M1	4.7	60	140	1	●
D0480M1	4.8	60	140	1	●
D0490M1	4.9	60	140	1	●
D0500M1	5.0	60	140	1	●
D0510M1	5.1	65	145	1	●
D0520M1	5.2	65	145	1	●
D0530M1	5.3	65	145	1	●
D0540M1	5.4	65	145	1	●
D0550M1	5.5	65	145	1	●
D0560M1	5.6	68	148	1	●
D0570M1	5.7	68	148	1	●
D0580M1	5.8	68	148	1	●
D0590M1	5.9	68	148	1	●
D0600M1	6.0	68	148	1	●
D0610M1	6.1	72	152	1	●
D0620M1	6.2	72	152	1	●
D0630M1	6.3	72	152	1	●
D0640M1	6.4	72	152	1	●
D0650M1	6.5	72	152	1	●
D0660M1	6.6	75	155	1	●
D0670M1	6.7	75	155	1	●
D0680M1	6.8	75	155	1	●
D0690M1	6.9	75	155	1	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD0700M1	7.0	75	155	1	●
D0710M1	7.1	78	158	1	●
D0720M1	7.2	78	158	1	●
D0730M1	7.3	78	158	1	●
D0740M1	7.4	78	158	1	●
D0750M1	7.5	78	158	1	●
D0760M1	7.6	82	162	1	●
D0770M1	7.7	82	162	1	●
D0780M1	7.8	82	162	1	●
D0790M1	7.9	82	162	1	●
D0800M1	8.0	82	162	1	●
D0810M1	8.1	85	168	1	●
D0820M1	8.2	85	168	1	●
D0830M1	8.3	85	168	1	●
D0840M1	8.4	85	168	1	●
D0850M1	8.5	85	168	1	●
D0860M1	8.6	88	172	1	●
D0870M1	8.7	88	172	1	●
D0880M1	8.8	88	172	1	●
D0890M1	8.9	88	172	1	●
D0900M1	9.0	88	172	1	●
D0910M1	9.1	92	175	1	●
D0920M1	9.2	92	175	1	●
D0930M1	9.3	92	175	1	●
D0940M1	9.4	92	175	1	●
D0950M1	9.5	92	175	1	●
D0960M1	9.6	95	178	1	●
D0970M1	9.7	95	178	1	●
D0980M1	9.8	95	178	1	●
D0990M1	9.9	95	178	1	●
D1000M1	10.0	95	178	1	●
D1010M1	10.1	98	182	1	●
D1020M1	10.2	98	182	1	●
D1030M1	10.3	98	182	1	●
D1040M1	10.4	98	182	1	●
D1050M1	10.5	98	182	1	●
D1060M1	10.6	102	185	1	●
D1070M1	10.7	102	185	1	●
D1080M1	10.8	102	185	1	●
D1090M1	10.9	102	185	1	●

DRILLING

TAPER SHANK DRILLS

TD

Taper shank

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD1100M1	11.0	102	185	1	●
D1110M1	11.1	105	188	1	●
D1120M1	11.2	105	188	1	●
D1130M1	11.3	105	188	1	●
D1140M1	11.4	105	188	1	●
D1150M1	11.5	105	188	1	●
D1160M1	11.6	108	192	1	●
D1170M1	11.7	108	192	1	●
D1180M1	11.8	108	192	1	●
D1190M1	11.9	108	192	1	●
D1200M1	12.0	108	192	1	●
D1210M1	12.1	112	195	1	●
D1220M1	12.2	112	195	1	●
D1230M1	12.3	112	195	1	●
D1240M1	12.4	112	195	1	●
D1250M1	12.5	112	195	1	●
D1260M1	12.6	115	198	1	●
D1270M1	12.7	115	198	1	●
D1280M1	12.8	115	198	1	●
D1290M1	12.9	115	198	1	●
D1300M1	13.0	115	198	1	●
D1310M1	13.1	118	202	1	●
D1320M1	13.2	118	202	1	●
D1330M1	13.3	118	202	1	●
D1340M1	13.4	118	202	1	●
D1350M1	13.5	118	202	1	●
D1360M1	13.6	122	205	1	●
D1370M1	13.7	122	205	1	●
D1380M1	13.8	122	205	1	●
D1390M1	13.9	122	205	1	●
D1400M1	14.0	122	205	1	●
D1410M2	14.1	122	222	2	●
D1420M2	14.2	122	222	2	●
D1430M2	14.3	122	222	2	●
D1440M2	14.4	122	222	2	●
D1450M2	14.5	122	222	2	●
D1460M2	14.6	125	225	2	●
D1470M2	14.7	125	225	2	●
D1480M2	14.8	125	225	2	●
D1490M2	14.9	125	225	2	●
D1500M2	15.0	125	225	2	●
D1510M2	15.1	128	228	2	●
D1520M2	15.2	128	228	2	●
D1530M2	15.3	128	228	2	●
D1540M2	15.4	128	228	2	●
D1550M2	15.5	128	228	2	●
D1560M2	15.6	130	230	2	●
D1570M2	15.7	130	230	2	●
D1580M2	15.8	130	230	2	●
D1590M2	15.9	130	230	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD1600M2	16.0	130	230	2	●
D1610M2	16.1	132	232	2	●
D1620M2	16.2	132	232	2	●
D1630M2	16.3	132	232	2	●
D1640M2	16.4	132	232	2	●
D1650M2	16.5	132	232	2	●
D1660M2	16.6	135	235	2	●
D1670M2	16.7	135	235	2	●
D1680M2	16.8	135	235	2	●
D1690M2	16.9	135	235	2	●
D1700M2	17.0	135	235	2	●
D1710M2	17.1	140	240	2	●
D1720M2	17.2	140	240	2	●
D1730M2	17.3	140	240	2	●
D1740M2	17.4	140	240	2	●
D1750M2	17.5	140	240	2	●
D1760M2	17.6	140	240	2	●
D1770M2	17.7	140	240	2	●
D1780M2	17.8	140	240	2	●
D1790M2	17.9	140	240	2	●
D1800M2	18.0	140	240	2	●
D1810M2	18.1	145	245	2	●
D1820M2	18.2	145	245	2	●
D1830M2	18.3	145	245	2	●
D1840M2	18.4	145	245	2	●
D1850M2	18.5	145	245	2	●
D1860M2	18.6	145	245	2	●
D1870M2	18.7	145	245	2	●
D1880M2	18.8	145	245	2	●
D1890M2	18.9	145	245	2	●
D1900M2	19.0	145	245	2	●
D1910M2	19.1	150	250	2	●
D1920M2	19.2	150	250	2	●
D1930M2	19.3	150	250	2	●
D1940M2	19.4	150	250	2	●
D1950M2	19.5	150	250	2	●
D1960M2	19.6	150	250	2	●
D1970M2	19.7	150	250	2	●
D1980M2	19.8	150	250	2	●
D1990M2	19.9	150	250	2	●
D2000M2	20.0	150	250	2	●
D2010M2	20.1	155	255	2	●
D2020M2	20.2	155	255	2	●
D2030M2	20.3	155	255	2	●
D2040M2	20.4	155	255	2	●
D2050M2	20.5	155	255	2	●
D2060M2	20.6	155	255	2	●
D2070M2	20.7	155	255	2	●
D2080M2	20.8	155	255	2	●
D2090M2	20.9	155	255	2	●

DRILLING

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD2100M2	21.0	155	255	2	●
D2110M2	21.1	160	260	2	●
D2120M2	21.2	160	260	2	●
D2130M2	21.3	160	260	2	●
D2140M2	21.4	160	260	2	●
D2150M2	21.5	160	260	2	●
D2160M2	21.6	160	260	2	●
D2170M2	21.7	160	260	2	●
D2180M2	21.8	160	260	2	●
D2190M2	21.9	160	260	2	●
D2200M2	22.0	160	260	2	●
D2210M2	22.1	165	265	2	●
D2220M2	22.2	165	265	2	●
D2230M2	22.3	165	265	2	●
D2240M2	22.4	165	265	2	●
D2250M2	22.5	165	265	2	●
D2260M2	22.6	165	265	2	●
D2270M2	22.7	165	265	2	●
D2280M2	22.8	165	265	2	●
D2290M2	22.9	165	265	2	●
D2300M2	23.0	165	265	2	●
D2310M3	23.1	165	285	3	●
D2320M3	23.2	165	285	3	●
D2330M3	23.3	165	285	3	●
D2340M3	23.4	165	285	3	●
D2350M3	23.5	165	285	3	●
D2360M3	23.6	165	285	3	●
D2370M3	23.7	165	285	3	●
D2380M3	23.8	165	285	3	●
D2390M3	23.9	165	285	3	●
D2400M3	24.0	165	285	3	●
D2410M3	24.1	165	285	3	●
D2420M3	24.2	165	285	3	●
D2430M3	24.3	165	285	3	●
D2440M3	24.4	165	285	3	●
D2450M3	24.5	165	285	3	●
D2460M3	24.6	165	285	3	●
D2470M3	24.7	165	285	3	●
D2480M3	24.8	165	285	3	●
D2490M3	24.9	165	285	3	●
D2500M3	25.0	165	285	3	●
D2510M3	25.1	165	285	3	●
D2520M3	25.2	165	285	3	●
D2530M3	25.3	165	285	3	●
D2540M3	25.4	165	285	3	●
D2550M3	25.5	165	285	3	●
D2560M3	25.6	165	285	3	●
D2570M3	25.7	165	285	3	●
D2580M3	25.8	165	285	3	●
D2590M3	25.9	165	285	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD2600M3	26.0	165	285	3	●
D2610M3	26.1	170	290	3	●
D2620M3	26.2	170	290	3	●
D2630M3	26.3	170	290	3	●
D2640M3	26.4	170	290	3	●
D2650M3	26.5	170	290	3	●
D2660M3	26.6	170	290	3	●
D2670M3	26.7	170	290	3	●
D2680M3	26.8	170	290	3	●
D2690M3	26.9	170	290	3	●
D2700M3	27.0	170	290	3	●
D2710M3	27.1	175	295	3	●
D2720M3	27.2	175	295	3	●
D2730M3	27.3	175	295	3	●
D2740M3	27.4	175	295	3	●
D2750M3	27.5	175	295	3	●
D2760M3	27.6	175	295	3	●
D2770M3	27.7	175	295	3	●
D2780M3	27.8	175	295	3	●
D2790M3	27.9	175	295	3	●
D2800M3	28.0	175	295	3	●
D2810M3	28.1	180	300	3	●
D2820M3	28.2	180	300	3	●
D2830M3	28.3	180	300	3	●
D2840M3	28.4	180	300	3	●
D2850M3	28.5	180	300	3	●
D2860M3	28.6	180	300	3	●
D2870M3	28.7	180	300	3	●
D2880M3	28.8	180	300	3	●
D2890M3	28.9	180	300	3	●
D2900M3	29.0	180	300	3	●
D2910M3	29.1	185	305	3	●
D2920M3	29.2	185	305	3	●
D2930M3	29.3	185	305	3	●
D2940M3	29.4	185	305	3	●
D2950M3	29.5	185	305	3	●
D2960M3	29.6	185	305	3	●
D2970M3	29.7	185	305	3	●
D2980M3	29.8	185	305	3	●
D2990M3	29.9	185	305	3	●
D3000M3	30.0	185	305	3	●
D3010M3	30.1	190	310	3	●
D3020M3	30.2	190	310	3	●
D3030M3	30.3	190	310	3	●
D3040M3	30.4	190	310	3	●
D3050M3	30.5	190	310	3	●
D3060M3	30.6	190	310	3	●
D3070M3	30.7	190	310	3	●
D3080M3	30.8	190	310	3	●
D3090M3	30.9	190	310	3	●

DRILLING

TAPER SHANK DRILLS

TD

Taper shank

Unit : mm

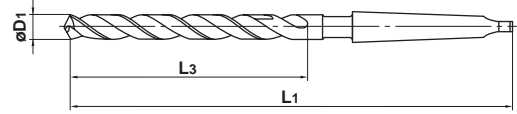
Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD3100M3	31.0	190	310	3	●
D3110M3	31.1	195	315	3	●
D3120M3	31.2	195	315	3	●
D3130M3	31.3	195	315	3	●
D3140M3	31.4	195	315	3	●
D3150M3	31.5	195	315	3	●
D3160M3	31.6	195	315	3	●
D3170M3	31.7	195	315	3	●
D3180M3	31.8	195	315	3	●
D3190M3	31.9	195	315	3	●
D3200M3	32.0	195	315	3	●
D3250M4	32.5	200	345	4	●
D3300M4	33.0	200	345	4	●
D3350M4	33.5	205	350	4	●
D3400M4	34.0	205	350	4	●
D3450M4	34.5	205	350	4	●
D3500M4	35.0	205	350	4	●
D3550M4	35.5	210	355	4	●
D3600M4	36.0	210	355	4	●
D3650M4	36.5	210	355	4	●
D3700M4	37.0	210	355	4	●
D3750M4	37.5	215	360	4	●
D3800M4	38.0	215	360	4	●
D3850M4	38.5	215	360	4	●
D3900M4	39.0	215	360	4	●
D3950M4	39.5	220	365	4	●
D4000M4	40.0	220	365	4	●
D4050M4	40.5	220	365	4	●
D4100M4	41.0	220	365	4	●
D4150M4	41.5	225	370	4	●
D4200M4	42.0	225	370	4	●
D4250M4	42.5	225	370	4	●
D4300M4	43.0	225	370	4	●
D4350M4	43.5	230	375	4	●
D4400M4	44.0	230	375	4	●
D4450M4	44.5	230	375	4	●
D4500M4	45.0	230	375	4	●
D4550M4	45.5	235	380	4	●
D4600M4	46.0	235	380	4	●
D4650M4	46.5	235	380	4	●
D4700M4	47.0	235	380	4	●
D4750M4	47.5	240	385	4	●
D4800M4	48.0	240	385	4	●
D4850M4	48.5	240	385	4	●
D4900M4	49.0	240	385	4	●
D4950M4	49.5	245	390	4	●
D5000M4	50.0	245	390	4	●
D5100M5	51.0	245	425	5	●
D5200M5	52.0	250	430	5	●
D5300M5	53.0	250	430	5	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
TDD5400M5	54.0	255	435	5	●
D5500M5	55.0	255	435	5	●
D5600M5	56.0	260	440	5	●
D5700M5	57.0	260	440	5	●
D5800M5	58.0	265	445	5	●
D5900M5	59.0	265	445	5	●
D6000M5	60.0	270	450	5	●
D6100M5	61.0	270	450	5	●
D6200M5	62.0	275	455	5	●
D6300M5	63.0	275	455	5	●
D6400M5	64.0	280	460	5	●
D6500M5	65.0	280	460	5	●
D6600M5	66.0	285	465	5	●
D6700M5	67.0	285	465	5	●
D6800M5	68.0	290	470	5	●
D6900M5	69.0	290	470	5	●
D7000M5	70.0	295	475	5	●
D7100M5	71.0	295	475	5	●
D7200M5	72.0	300	480	5	●
D7300M5	73.0	300	480	5	●
D7400M5	74.0	305	485	5	●
D7500M5	75.0	305	485	5	●

DRILLING

● : Inventory maintained in Japan.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	$5 \leq D_1 \leq 6$	$6 < D_1 \leq 10$	$10 < D_1 \leq 18$	$18 < D_1 \leq 30$	$30 < D_1 \leq 50$
○		○	○	○		$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.022 \end{matrix}$	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$	$\begin{matrix} 0 \\ -0.039 \end{matrix}$



● Suitable for drilling of difficult-to-cut materials.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
KTDD0500M1	5.0	60	140	1	●
D0550M1	5.5	65	145	1	●
D0600M1	6.0	68	148	1	●
D0650M1	6.5	72	152	1	●
D0700M1	7.0	75	155	1	●
D0750M1	7.5	78	158	1	●
D0800M1	8.0	82	162	1	●
D0850M1	8.5	85	168	1	●
D0900M1	9.0	88	172	1	●
D0950M1	9.5	92	175	1	●
D1000M1	10.0	95	178	1	●
D1010M1	10.1	98	182	1	●
D1020M1	10.2	98	182	1	●
D1030M1	10.3	98	182	1	●
D1040M1	10.4	98	182	1	●
D1050M1	10.5	98	182	1	●
D1060M1	10.6	102	185	1	●
D1070M1	10.7	102	185	1	●
D1080M1	10.8	102	185	1	●
D1090M1	10.9	102	185	1	●
D1100M1	11.0	102	185	1	●
D1150M1	11.5	105	188	1	●
D1200M1	12.0	108	192	1	●
D1210M2	12.1	112	212	2	●
D1220M2	12.2	112	212	2	●
D1250M2	12.5	112	212	2	●
D1300M2	13.0	115	215	2	●
D1310M2	13.1	118	218	2	●
D1320M2	13.2	118	218	2	●
D1350M2	13.5	118	218	2	●
D1370M2	13.7	122	222	2	●
D1380M2	13.8	122	222	2	●
D1390M2	13.9	122	222	2	●
D1400M2	14.0	122	222	2	●
D1410M2	14.1	122	222	2	●
D1420M2	14.2	122	222	2	●
D1430M2	14.3	122	222	2	●
D1440M2	14.4	122	222	2	●
D1450M2	14.5	122	222	2	●
D1470M2	14.7	125	225	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
KTDD1500M2	15.0	125	225	2	●
D1550M2	15.5	128	228	2	●
D1600M2	16.0	130	230	2	●
D1620M2	16.2	132	232	2	●
D1650M2	16.5	132	232	2	●
D1670M2	16.7	135	235	2	●
D1700M2	17.0	135	235	2	●
D1750M2	17.5	140	240	2	●
D1770M2	17.7	140	240	2	●
D1800M2	18.0	140	240	2	●
D1850M2	18.5	145	245	2	●
D1900M2	19.0	145	245	2	●
D1950M2	19.5	150	250	2	●
D2000M2	20.0	150	250	2	●
D2050M3	20.5	155	275	3	●
D2100M3	21.0	155	275	3	●
D2150M3	21.5	160	280	3	●
D2200M3	22.0	160	280	3	●
D2250M3	22.5	165	285	3	●
D2300M3	23.0	165	285	3	●
D2350M3	23.5	165	285	3	●
D2400M3	24.0	165	285	3	●
D2450M3	24.5	165	285	3	●
D2500M3	25.0	165	285	3	●
D2550M3	25.5	165	285	3	●
D2600M3	26.0	165	285	3	●
D2650M3	26.5	170	290	3	●
D2700M3	27.0	170	290	3	●
D2750M4	27.5	175	320	4	●
D2800M4	28.0	175	320	4	●
D2850M4	28.5	180	325	4	●
D2900M4	29.0	180	325	4	●
D2950M4	29.5	185	330	4	●
D3000M4	30.0	185	330	4	●
D3050M4	30.5	190	335	4	●
D3100M4	31.0	190	335	4	●
D3150M4	31.5	195	340	4	●
D3200M4	32.0	195	340	4	●
D3300M4	33.0	200	345	4	●
D3400M4	34.0	205	350	4	●

DRILLING

TAPER SHANK DRILLS

KTD
Cobalt HSS

HSS

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
KTDD3500M4	35.0	205	350	4	●
D3600M4	36.0	210	355	4	●
D3700M4	37.0	210	355	4	●
D3800M4	38.0	215	360	4	●
D3900M4	39.0	215	360	4	●
D4000M4	40.0	220	365	4	●
D4100M4	41.0	220	365	4	●
D4200M4	42.0	225	370	4	●
D4300M4	43.0	225	370	4	●
D4400M4	44.0	230	375	4	●
D4500M4	45.0	230	375	4	●
D4600M4	46.0	235	380	4	●
D4700M4	47.0	235	380	4	●
D4800M4	48.0	240	385	4	●
D4900M4	49.0	240	385	4	●
D5000M4	50.0	245	390	4	●

DRILLING

● : Inventory maintained in Japan.

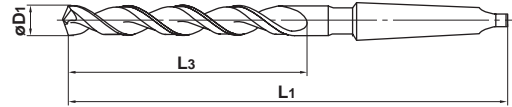
G-WTS

TiN, For deep hole, Convolute flute



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	D1=6	6<D1≤10	10<D1≤18	18<D1≤30	30<D1≤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	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
GWTS0600M1	6.0	68	148	1	●
D0620M1	6.2	72	152	1	●
D0650M1	6.5	72	152	1	●
D0680M1	6.8	75	155	1	●
D0690M1	6.9	75	155	1	●
D0700M1	7.0	75	155	1	●
D0720M1	7.2	78	158	1	●
D0750M1	7.5	78	158	1	●
D0780M1	7.8	82	162	1	●
D0800M1	8.0	82	162	1	●
D0820M1	8.2	85	168	1	●
D0850M1	8.5	85	168	1	●
D0880M1	8.8	88	172	1	●
D0900M1	9.0	88	172	1	●
D0920M1	9.2	92	175	1	●
D0950M1	9.5	92	175	1	●
D0980M1	9.8	95	178	1	●
D1000M1	10.0	95	178	1	●
D1020M1	10.2	98	182	1	●
D1030M1	10.3	98	182	1	●
D1050M1	10.5	98	182	1	●
D1100M1	11.0	102	185	1	●
D1150M1	11.5	105	188	1	●
D1200M1	12.0	108	192	1	●
D1220M2	12.2	112	212	2	●
D1230M2	12.3	112	212	2	●
D1250M2	12.5	112	212	2	●
D1300M2	13.0	115	215	2	●
D1350M2	13.5	118	218	2	●
D1400M2	14.0	122	222	2	●
D1410M2	14.1	122	222	2	●
D1420M2	14.2	122	222	2	●
D1450M2	14.5	122	222	2	●
D1500M2	15.0	125	225	2	●
D1550M2	15.5	128	228	2	●
D1600M2	16.0	130	230	2	●
D1650M2	16.5	132	232	2	●
D1700M2	17.0	135	235	2	●
D1750M2	17.5	140	240	2	●
D1800M2	18.0	140	240	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
GWTS1850M2	18.5	145	245	2	●
D1900M2	19.0	145	245	2	●
D1950M2	19.5	150	250	2	●
D2000M2	20.0	150	250	2	●
D2100M3	21.0	155	275	3	●
D2200M3	22.0	160	280	3	●
D2300M3	23.0	165	285	3	●
D2400M3	24.0	165	285	3	●
D2500M3	25.0	165	285	3	●
D2600M3	26.0	165	285	3	●
D2700M3	27.0	170	290	3	●
D2800M4	28.0	175	320	4	●
D2900M4	29.0	180	325	4	●
D3000M4	30.0	185	330	4	●
D3100M4	31.0	190	335	4	●
D3200M4	32.0	195	340	4	●

DRILLING

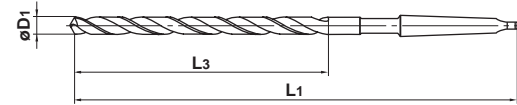
TAPER SHANK DRILLS

LTD
Extra long



D1>6

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy	D1=6 0 -0.018	6<D1≤10 0 -0.022	10<D1≤18 0 -0.027	18<D1≤30 0 -0.033	30<D1≤40 0 -0.039
○			○	○						



● For deep hole drilling.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD0600A200M1	6.0	100	200	1	●
D0600A250M1	6.0	150	250	1	●
D0600A300M1	6.0	200	300	1	●
D0600A350M1	6.0	225	350	1	●
D0650A250M1	6.5	150	250	1	●
D0650A300M1	6.5	200	300	1	●
D0650A350M1	6.5	225	350	1	●
D0700A250M1	7.0	150	250	1	●
D0700A300M1	7.0	200	300	1	●
D0700A350M1	7.0	225	350	1	●
D0750A250M1	7.5	150	250	1	●
D0750A300M1	7.5	200	300	1	●
D0750A350M1	7.5	225	350	1	●
D0800A250M1	8.0	150	250	1	●
D0800A300M1	8.0	200	300	1	●
D0800A350M1	8.0	225	350	1	●
D0850A250M1	8.5	150	250	1	●
D0850A300M1	8.5	200	300	1	●
D0850A350M1	8.5	225	350	1	●
D0900A250M1	9.0	150	250	1	●
D0900A300M1	9.0	200	300	1	●
D0900A350M1	9.0	225	350	1	●
D0950A250M1	9.5	150	250	1	●
D0950A300M1	9.5	200	300	1	●
D0950A350M1	9.5	225	350	1	●
D0950A400M1	9.5	250	400	1	●
D1000A250M1	10.0	150	250	1	●
D1000A300M1	10.0	200	300	1	●
D1000A350M1	10.0	225	350	1	●
D1000A400M1	10.0	250	400	1	●
D1050A250M1	10.5	150	250	1	●
D1050A300M1	10.5	200	300	1	●
D1050A350M1	10.5	225	350	1	●
D1050A400M1	10.5	250	400	1	●
D1100A250M1	11.0	150	250	1	●
D1100A300M1	11.0	200	300	1	●
D1100A350M1	11.0	225	350	1	●
D1100A400M1	11.0	250	400	1	●
D1150A250M1	11.5	150	250	1	●
D1150A300M1	11.5	200	300	1	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD1150A350M1	11.5	225	350	1	●
D1150A400M1	11.5	250	400	1	●
D1200A250M1	12.0	150	250	1	●
D1200A300M1	12.0	200	300	1	●
D1200A350M1	12.0	225	350	1	●
D1200A400M1	12.0	250	400	1	●
D1250A250M1	12.5	150	250	1	●
D1250A300M1	12.5	200	300	1	●
D1250A350M1	12.5	225	350	1	●
D1250A400M1	12.5	250	400	1	●
D1300A250M1	13.0	150	250	1	●
D1300A300M1	13.0	200	300	1	●
D1300A350M1	13.0	225	350	1	●
D1300A400M1	13.0	250	400	1	●
D1350A300M1	13.5	200	300	1	●
D1350A350M1	13.5	225	350	1	●
D1350A400M1	13.5	250	400	1	●
D1350A450M1	13.5	300	450	1	●
D1350A500M1	13.5	350	500	1	●
D1350A600M1	13.5	400	600	1	●
D1400A300M1	14.0	200	300	1	●
D1400A350M1	14.0	225	350	1	●
D1400A400M1	14.0	250	400	1	●
D1400A450M1	14.0	300	450	1	●
D1400A500M1	14.0	350	500	1	●
D1400A600M1	14.0	400	600	1	●
D1450A300M2	14.5	175	300	2	●
D1450A350M2	14.5	225	350	2	●
D1450A400M2	14.5	250	400	2	●
D1450A450M2	14.5	300	450	2	●
D1450A500M2	14.5	350	500	2	●
D1450A600M2	14.5	400	600	2	●
D1500A300M2	15.0	175	300	2	●
D1500A350M2	15.0	225	350	2	●
D1500A400M2	15.0	250	400	2	●
D1500A450M2	15.0	300	450	2	●
D1500A500M2	15.0	350	500	2	●
D1500A600M2	15.0	400	600	2	●
D1550A300M2	15.5	175	300	2	●
D1550A350M2	15.5	225	350	2	●

● : Inventory maintained in Japan.

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD1550A400M2	15.5	250	400	2	●
D1550A450M2	15.5	300	450	2	●
D1550A500M2	15.5	350	500	2	●
D1550A600M2	15.5	400	600	2	●
D1600A300M2	16.0	175	300	2	●
D1600A350M2	16.0	225	350	2	●
D1600A400M2	16.0	250	400	2	●
D1600A450M2	16.0	300	450	2	●
D1600A500M2	16.0	350	500	2	●
D1600A600M2	16.0	400	600	2	●
D1650A300M2	16.5	175	300	2	●
D1650A350M2	16.5	225	350	2	●
D1650A400M2	16.5	250	400	2	●
D1650A450M2	16.5	300	450	2	●
D1650A500M2	16.5	350	500	2	●
D1650A600M2	16.5	400	600	2	●
D1700A300M2	17.0	175	300	2	●
D1700A350M2	17.0	225	350	2	●
D1700A400M2	17.0	250	400	2	●
D1700A450M2	17.0	300	450	2	●
D1700A500M2	17.0	350	500	2	●
D1700A600M2	17.0	400	600	2	●
D1750A300M2	17.5	175	300	2	●
D1750A350M2	17.5	225	350	2	●
D1750A400M2	17.5	250	400	2	●
D1750A450M2	17.5	300	450	2	●
D1750A500M2	17.5	350	500	2	●
D1750A600M2	17.5	400	600	2	●
D1800A300M2	18.0	175	300	2	●
D1800A350M2	18.0	225	350	2	●
D1800A400M2	18.0	250	400	2	●
D1800A450M2	18.0	300	450	2	●
D1800A500M2	18.0	350	500	2	●
D1800A600M2	18.0	400	600	2	●
D1850A300M2	18.5	175	300	2	●
D1850A350M2	18.5	225	350	2	●
D1850A400M2	18.5	250	400	2	●
D1850A450M2	18.5	300	450	2	●
D1850A500M2	18.5	350	500	2	●
D1850A600M2	18.5	400	600	2	●
D1900A300M2	19.0	175	300	2	●
D1900A350M2	19.0	225	350	2	●
D1900A400M2	19.0	250	400	2	●
D1900A450M2	19.0	300	450	2	●
D1900A500M2	19.0	350	500	2	●
D1900A600M2	19.0	400	600	2	●
D1950A300M2	19.5	175	300	2	●
D1950A350M2	19.5	225	350	2	●
D1950A400M2	19.5	250	400	2	●
D1950A450M2	19.5	300	450	2	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD1950A500M2	19.5	350	500	2	●
D1950A600M2	19.5	400	600	2	●
D2000A300M2	20.0	175	300	2	●
D2000A350M2	20.0	225	350	2	●
D2000A400M2	20.0	250	400	2	●
D2000A450M2	20.0	300	450	2	●
D2000A500M2	20.0	350	500	2	●
D2000A600M2	20.0	400	600	2	●
D2050A350M2	20.5	225	350	2	●
D2050A400M2	20.5	250	400	2	●
D2050A450M2	20.5	300	450	2	●
D2050A500M2	20.5	350	500	2	●
D2050A600M2	20.5	400	600	2	●
D2100A350M2	21.0	225	350	2	●
D2100A400M2	21.0	250	400	2	●
D2100A450M2	21.0	300	450	2	●
D2100A500M2	21.0	350	500	2	●
D2100A600M2	21.0	400	600	2	●
D2150A350M2	21.5	225	350	2	●
D2150A400M2	21.5	250	400	2	●
D2150A450M2	21.5	300	450	2	●
D2150A500M2	21.5	350	500	2	●
D2150A600M2	21.5	400	600	2	●
D2200A350M2	22.0	225	350	2	●
D2200A400M2	22.0	250	400	2	●
D2200A450M2	22.0	300	450	2	●
D2200A500M2	22.0	350	500	2	●
D2200A600M2	22.0	400	600	2	●
D2250A350M2	22.5	225	350	2	●
D2250A400M2	22.5	250	400	2	●
D2250A450M2	22.5	300	450	2	●
D2250A500M2	22.5	350	500	2	●
D2250A600M2	22.5	400	600	2	●
D2300A350M2	23.0	225	350	2	●
D2300A400M2	23.0	250	400	2	●
D2300A450M2	23.0	300	450	2	●
D2300A500M2	23.0	350	500	2	●
D2300A600M2	23.0	400	600	2	●
D2350A350M3	23.5	200	350	3	●
D2350A400M3	23.5	250	400	3	●
D2350A450M3	23.5	300	450	3	●
D2350A500M3	23.5	350	500	3	●
D2350A600M3	23.5	400	600	3	●
D2400A350M3	24.0	200	350	3	●
D2400A400M3	24.0	250	400	3	●
D2400A450M3	24.0	300	450	3	●
D2400A500M3	24.0	350	500	3	●
D2400A600M3	24.0	400	600	3	●
D2450A350M3	24.5	200	350	3	●
D2450A400M3	24.5	250	400	3	●

DRILLING



TAPER SHANK DRILLS

LTD
Extra long

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD2450A450M3	24.5	300	450	3	●
D2450A500M3	24.5	350	500	3	●
D2450A600M3	24.5	400	600	3	●
D2500A350M3	25.0	200	350	3	●
D2500A400M3	25.0	250	400	3	●
D2500A450M3	25.0	300	450	3	●
D2500A500M3	25.0	350	500	3	●
D2500A600M3	25.0	400	600	3	●
D2550A400M3	25.5	250	400	3	●
D2550A450M3	25.5	300	450	3	●
D2550A500M3	25.5	350	500	3	●
D2550A600M3	25.5	400	600	3	●
D2600A400M3	26.0	250	400	3	●
D2600A450M3	26.0	300	450	3	●
D2600A500M3	26.0	350	500	3	●
D2600A600M3	26.0	400	600	3	●
D2650A400M3	26.5	250	400	3	●
D2650A450M3	26.5	300	450	3	●
D2650A500M3	26.5	350	500	3	●
D2650A600M3	26.5	400	600	3	●
D2700A400M3	27.0	250	400	3	●
D2700A450M3	27.0	300	450	3	●
D2700A500M3	27.0	350	500	3	●
D2700A600M3	27.0	400	600	3	●
D2750A400M3	27.5	250	400	3	●
D2750A450M3	27.5	300	450	3	●
D2750A500M3	27.5	350	500	3	●
D2750A600M3	27.5	400	600	3	●
D2800A400M3	28.0	250	400	3	●
D2800A450M3	28.0	300	450	3	●
D2800A500M3	28.0	350	500	3	●
D2800A600M3	28.0	400	600	3	●
D2850A400M3	28.5	250	400	3	●
D2850A450M3	28.5	300	450	3	●
D2850A500M3	28.5	350	500	3	●
D2850A600M3	28.5	400	600	3	●
D2900A400M3	29.0	250	400	3	●
D2900A450M3	29.0	300	450	3	●
D2900A500M3	29.0	350	500	3	●
D2900A600M3	29.0	400	600	3	●
D2950A400M3	29.5	250	400	3	●
D2950A450M3	29.5	300	450	3	●
D2950A500M3	29.5	350	500	3	●
D2950A600M3	29.5	400	600	3	●
D3000A400M3	30.0	250	400	3	●
D3000A450M3	30.0	300	450	3	●
D3000A500M3	30.0	350	500	3	●
D3000A600M3	30.0	400	600	3	●
D3050A450M3	30.5	300	450	3	●
D3050A500M3	30.5	350	500	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	M.T.No.	Stock
LTDD3050A600M3	30.5	400	600	3	●
D3100A450M3	31.0	300	450	3	●
D3100A500M3	31.0	350	500	3	●
D3100A600M3	31.0	400	600	3	●
D3150A450M3	31.5	300	450	3	●
D3150A500M3	31.5	350	500	3	●
D3150A600M3	31.5	400	600	3	●
D3200A450M3	32.0	300	450	3	●
D3200A500M3	32.0	350	500	3	●
D3200A600M3	32.0	400	600	3	●
D3300A500M4	33.0	350	500	4	●
D3300A600M4	33.0	400	600	4	●
D3400A500M4	34.0	350	500	4	●
D3400A600M4	34.0	400	600	4	●
D3500A500M4	35.0	350	500	4	●
D3500A600M4	35.0	400	600	4	●
D3600A500M4	36.0	350	500	4	●
D3600A600M4	36.0	400	600	4	●
D3700A500M4	37.0	350	500	4	●
D3700A600M4	37.0	400	600	4	●
D3800A500M4	38.0	350	500	4	●
D3800A600M4	38.0	400	600	4	●
D3900A500M4	39.0	350	500	4	●
D3900A600M4	39.0	400	600	4	●
D4000A500M4	40.0	350	500	4	●
D4000A600M4	40.0	400	600	4	●

DRILLING

● : Inventory maintained in Japan.

G-TTD

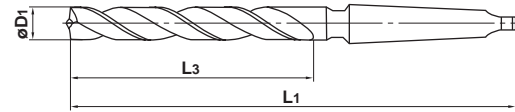
TiN, For steel frame



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
☉					

$17 \leq D_1 \leq 18$	$18 < D_1 \leq 30$	$30 < D_1 \leq 32$
0 -0.027	0 -0.033	0 -0.039



● Special point geometry for minimal through hole burrs.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	M.T.No.	Stock
GTTDD1700M3	17.0	135	255	3	●
D1750M3	17.5	140	260	3	●
D1800M3	18.0	140	260	3	●
D1900M3	19.0	145	265	3	●
D2000M3	20.0	150	270	3	●
D2150M3	21.5	160	280	3	●
D2200M3	22.0	160	280	3	●
D2250M3	22.5	165	285	3	●
D2300M3	23.0	165	285	3	●
D2350M3	23.5	165	285	3	●
D2400M3	24.0	165	285	3	●
D2450M3	24.5	165	285	3	●
D2500M3	25.0	165	285	3	●
D2600M3	26.0	165	285	3	●
D2650M3	26.5	170	290	3	●
D2800M4	28.0	175	320	4	●
D3200M4	32.0	195	340	4	●

DRILLING

TAPER SHANK DRILLS

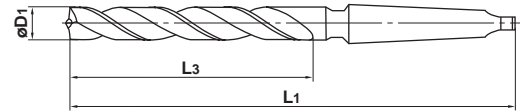
TTD
For steel frame



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○					

$17 \leq D_1 \leq 18$	$18 < D_1 \leq 30$	$30 < D_1 \leq 32$
$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$	$\begin{matrix} 0 \\ -0.039 \end{matrix}$



● Special point geometry for minimal through hole burrs.

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	M.T.No.	Stock
TTDD1700M3	17.0	135	255	3	●
D1750M3	17.5	140	260	3	●
D1800M3	18.0	140	260	3	●
D1900M3	19.0	145	265	3	●
D2000M3	20.0	150	270	3	●
D2150M3	21.5	160	280	3	●
D2200M3	22.0	160	280	3	●
D2250M3	22.5	165	285	3	●
D2300M3	23.0	165	285	3	●
D2350M3	23.5	165	285	3	●
D2400M3	24.0	165	285	3	●
D2450M3	24.5	165	285	3	●
D2500M3	25.0	165	285	3	●
D2600M3	26.0	165	285	3	●
D2650M3	26.5	170	290	3	●
D2800M4	28.0	175	320	4	●
D3200M4	32.0	195	340	4	●

DRILLING

● : Inventory maintained in Japan.

TRIANGULAR SHANK DRILLS

3KD

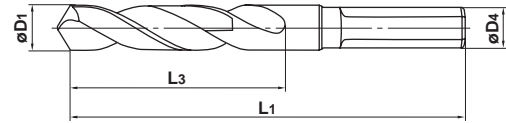
Triangular shank (Type 6.5)(Type 10)(Type 13)



HSS

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○			○	○	

	$7 \leq D_1 \leq 10$	$10 < D_1 \leq 18$	$18 < D_1 \leq 26$
	0 -0.022	0 -0.027	0 -0.033



● 3 shank types for portable power tools.

Type 6.5

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
3KD6D0700	7.0	35	75	6.5	●
6D0750	7.5	35	75	6.5	●
6D0800	8.0	35	75	6.5	●
6D0850	8.5	35	75	6.5	●
6D0900	9.0	35	75	6.5	●
6D0950	9.5	35	75	6.5	●
6D1000	10.0	50	90	6.5	●
6D1050	10.5	50	90	6.5	●
6D1100	11.0	50	90	6.5	●
6D1150	11.5	50	90	6.5	●
6D1200	12.0	50	90	6.5	●
6D1250	12.5	50	90	6.5	●
6D1300	13.0	50	90	6.5	●

Type 13

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
3KD13D1350	13.5	85	140	13	●
13D1400	14.0	85	140	13	●
13D1450	14.5	85	140	13	●
13D1500	15.0	85	140	13	●
13D1550	15.5	85	140	13	●
13D1600	16.0	85	140	13	●
13D1650	16.5	85	140	13	●
13D1700	17.0	85	140	13	●
13D1750	17.5	85	140	13	●
13D1800	18.0	85	140	13	●
13D1850	18.5	85	140	13	●
13D1900	19.0	85	140	13	●
13D1950	19.5	85	140	13	●
13D2000	20.0	85	140	13	●
13D2050	20.5	85	140	13	●
13D2100	21.0	85	140	13	●
13D2150	21.5	85	140	13	●
13D2200	22.0	85	140	13	●
13D2250	22.5	85	140	13	●
13D2300	23.0	85	140	13	●
13D2350	23.5	85	140	13	●
13D2400	24.0	85	140	13	●
13D2450	24.5	85	140	13	●
13D2500	25.0	85	140	13	●
13D2550	25.5	85	140	13	●
13D2600	26.0	85	140	13	●

Type 10

Unit : mm

Order Number	Drill Dia. D ₁	Flute Length L ₃	Overall Length L ₁	Shank Dia. D ₄	Stock
3KD10D1000	10.0	50	90	10	●
10D1050	10.5	50	90	10	●
10D1100	11.0	50	90	10	●
10D1150	11.5	50	90	10	●
10D1200	12.0	50	90	10	●
10D1250	12.5	50	90	10	●
10D1300	13.0	50	90	10	●
10D1350	13.5	85	140	10	●
10D1400	14.0	85	140	10	●
10D1450	14.5	85	140	10	●
10D1500	15.0	85	140	10	●
10D1550	15.5	85	140	10	●
10D1600	16.0	85	140	10	●

DRILLING

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. (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)
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. (mm)	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	Drilling depth	Reduction rate of cutting speed	Reduction rate of feed
4D	10%	10%	8D	30%	20%
5D	10%	15%	10D	30%	25%
6D	20%	20%	15D	40%	30%
7D	20%	20%	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. (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)
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. (mm)	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	Drilling depth	Reduction rate of cutting speed	Reduction rate of feed
4D	10%	10%	8D	30%	20%
5D	10%	15%	10D	30%	25%
6D	20%	20%	15D	40%	30%
7D	20%	20%	20D	40%	45%

D : Drill dia.


DRILLING(BRAZED TYPE)

BRS

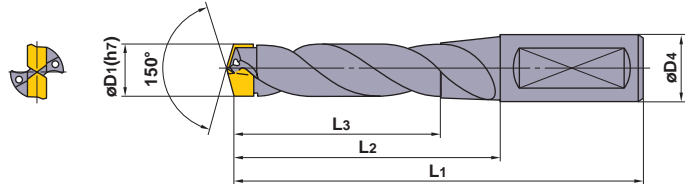
- Excellent cutting sharpness and chip discharge due to high rake type insert.
- High efficiency, high accuracy machining.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	○		

	$14 \leq D_1 \leq 18$	$18 < D_1 \leq 30$
	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.021 \end{matrix}$

(l/d=3)



Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)			
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length	Neck Length	Overall Length	Shank Dia.
		UP20M			L ₃	L ₂	L ₁	D ₄
14.0	BRS1400S16	●	14.0 < D ₁ ≤ 14.5	BRS□□□□S16	52	66	114	16
14.5	1450S16	●			52	66	114	16
15.0	1500S20	●	14.5 < D ₁ ≤ 15.5	BRS□□□□S20	61	76	126	20
15.5	1550S20	●			61	76	126	20
16.0	1600S20	●	15.5 < D ₁ ≤ 16.5		65	81	131	20
16.5	1650S20	●			65	81	131	20
17.0	1700S20	●	16.5 < D ₁ ≤ 17.5		69	86	136	20
17.5	1750S20	●			69	86	136	20
18.0	1800S20	●	17.5 < D ₁ ≤ 18.5		73	91	141	20
18.5	1850S20	●			73	91	141	20
19.0	1900S25	●	18.5 < D ₁ ≤ 19.5	BRS□□□□S25	77	101	157	25
19.5	1950S25	●			77	101	157	25
20.0	2000S25	●	19.5 < D ₁ ≤ 20.5		81	101	157	25
20.5	2050S25	●			81	101	157	25
21.0	2100S25	●	20.5 < D ₁ ≤ 21.5		80	101	157	25
21.5	2150S25	●			80	101	157	25
22.0	2200S25	●	21.5 < D ₁ ≤ 22.5		84	106	162	25
22.5	2250S25	●			84	106	162	25
23.0	2300S25	●	22.5 < D ₁ ≤ 23.5		83	106	162	25
23.5	2350S25	●			83	106	162	25
24.0	2400S32	●	23.5 < D ₁ ≤ 24.5	BRS□□□□S32	87	111	171	32
24.5	2450S32	●			87	111	171	32
25.0	2500S32	●	24.5 < D ₁ ≤ 25.5		86	111	171	32
25.5	2550S32	●			86	111	171	32
26.0	2600S32	●	25.5 < D ₁ ≤ 26.5		90	116	176	32
26.5	2650S32	●			90	116	176	32
27.0	2700S32	●	26.5 < D ₁ ≤ 27.5		89	116	176	32
27.5	2750S32	●			89	116	176	32
28.0	2800S32	●	27.5 < D ₁ ≤ 28.5		93	121	181	32
28.5	2850S32	●			93	121	181	32
29.0	2900S32	●	28.5 < D ₁ ≤ 29.5		97	126	186	32
29.5	2950S32	●			97	126	186	32
30.0	3000S32	●	29.5 < D ₁ ≤ 30.5	96	126	186	32	

For ordering an intermediate diameter, please enter the diameter (D₁) into the 4-digit space□□□□ in the nominal designation.
 (Ex. UP20M BRS2□5□3□0S32 for a diameter of φ25.30mm)

● : Inventory maintained in Japan.

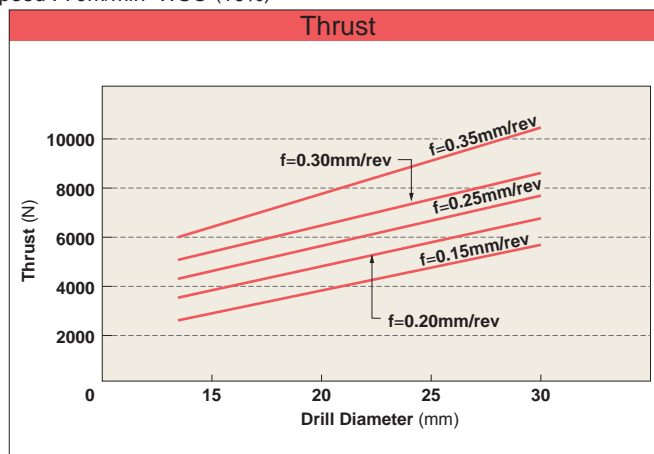
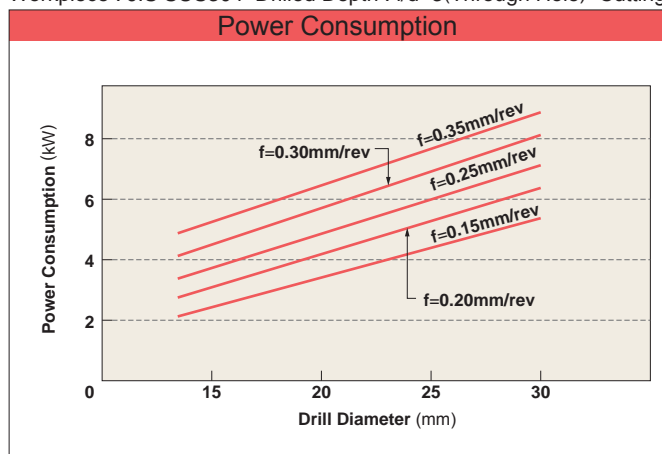
RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Drill Dia. $\phi 14.0-\phi 20.0$		Drill Dia. $\phi 20.0-\phi 30.0$	
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P Mild Steel	$\leq 180\text{HB}$	65 (50-75)	0.3 (0.20-0.40)	70 (55-85)	0.35 (0.20-0.45)
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)
	SM490 (JIS) Tensile Strength 490-610MPa	70 (60-80)	0.25 (0.20-0.30)	70 (60-80)	0.30 (0.20-0.40)
	SM570 (JIS) Tensile Strength 570-720MPa	60 (50-70)	0.25 (0.20-0.30)	60 (50-70)	0.30 (0.20-0.35)
Carbon Steel Alloy Steel	180-280HB	60 (45-70)	0.25 (0.1-0.35)	65 (45-80)	0.30 (0.15-0.35)
	280-350HB	55 (40-65)	0.20 (0.15-0.35)	60 (45-70)	0.25 (0.15-0.35)
M Stainless Steel (Austenitic)	$\leq 200\text{HB}$	70 (50-90)	0.30 (0.20-0.40)	80 (60-100)	0.3 (0.20-0.40)
K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	75 (60-110)	0.30 (0.20-0.40)	80 (60-100)	0.35 (0.25-0.50)
	Tensile Strength $\leq 450\text{MPa}$	75 (60-100)	0.30 (0.20-0.40)	80 (60-100)	0.35 (0.20-0.45)
	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%)




DRILLING(BRAZED TYPE)

BRM

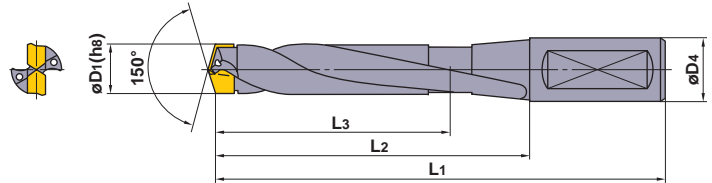
- Excellent cutting sharpness and chip discharge due to high rake type insert.
- High efficiency, high accuracy machining.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	○		

	14 ≤ D ₁ ≤ 18	18 < D ₁ ≤ 30
	$\begin{matrix} 0 \\ -0.027 \end{matrix}$	$\begin{matrix} 0 \\ -0.033 \end{matrix}$

(l/d=5)



Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)				
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length	Neck Length	Overall Length	Shank Dia.	
		UP20M			L ₃	L ₂	L ₁	D ₄	
14.0	BRM1400S16	●	14.0 < D ₁ ≤ 14.5	BRM□□□□S16	78	92	140	16	
14.5	1450S16	●			78	92	140	16	
15.0	1500S20	●	14.5 < D ₁ ≤ 15.5	BRM□□□□S20	85	100	150	20	
15.5	1550S20	●			85	100	150	20	
16.0	1600S20	●	15.5 < D ₁ ≤ 16.5		89	105	155	20	
16.5	1650S20	●			89	105	155	20	
17.0	1700S20	●	16.5 < D ₁ ≤ 17.5		98	115	165	20	
17.5	1750S20	●			98	115	165	20	
18.0	1800S20	●	17.5 < D ₁ ≤ 18.5		102	120	170	20	
18.5	1850S20	●			102	120	170	20	
19.0	1900S25	●	18.5 < D ₁ ≤ 19.5		BRM□□□□S25	105	124	180	25
19.5	1950S25	●				105	124	180	25
20.0	2000S25	●	19.5 < D ₁ ≤ 20.5	114		134	190	25	
20.5	2050S25	●		114		134	190	25	
21.0	2100S25	●	20.5 < D ₁ ≤ 21.5	118		139	195	25	
21.5	2150S25	●		118		139	195	25	
22.0	2200S25	●	21.5 < D ₁ ≤ 22.5	122		144	200	25	
22.5	2250S25	●		122		144	200	25	
23.0	2300S25	●	22.5 < D ₁ ≤ 23.5	126		149	205	25	
23.5	2350S25	●		126		149	205	25	
24.0	2400S32	●	23.5 < D ₁ ≤ 24.5	BRM□□□□S32	136	160	220	32	
24.5	2450S32	●			136	160	220	32	
25.0	2500S32	●	24.5 < D ₁ ≤ 25.5		140	165	225	32	
25.5	2550S32	●			140	165	225	32	
26.0	2600S32	●	25.5 < D ₁ ≤ 26.5		144	170	230	32	
26.5	2650S32	●			144	170	230	32	
27.0	2700S32	●	26.5 < D ₁ ≤ 27.5		148	175	235	32	
27.5	2750S32	●			148	175	235	32	
28.0	2800S32	●	27.5 < D ₁ ≤ 28.5		157	185	245	32	
28.5	2850S32	●			157	185	245	32	
29.0	2900S32	●	28.5 < D ₁ ≤ 29.5	161	190	250	32		
29.5	2950S32	●		161	190	250	32		
30.0	3000S32	●	29.5 < D ₁ ≤ 30.0	165	195	255	32		

For ordering an intermediate diameter, please enter the diameter (D₁) into the 4-digit space□□□□ in the nominal designation.
(Ex. UP20M BRM2[5]3[0]S32 for a diameter of φ25.30mm)

● : Inventory maintained in Japan.

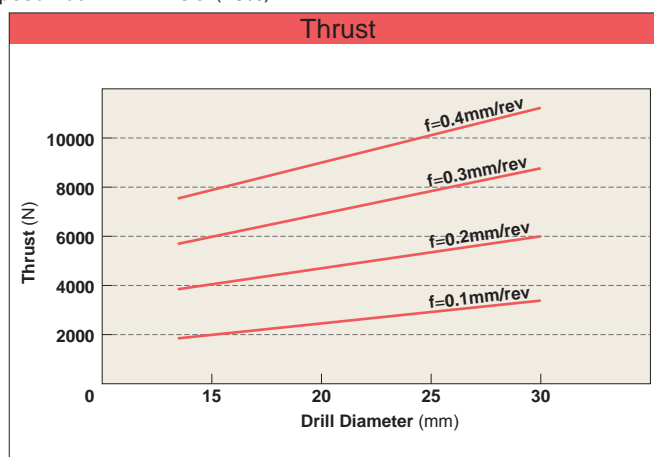
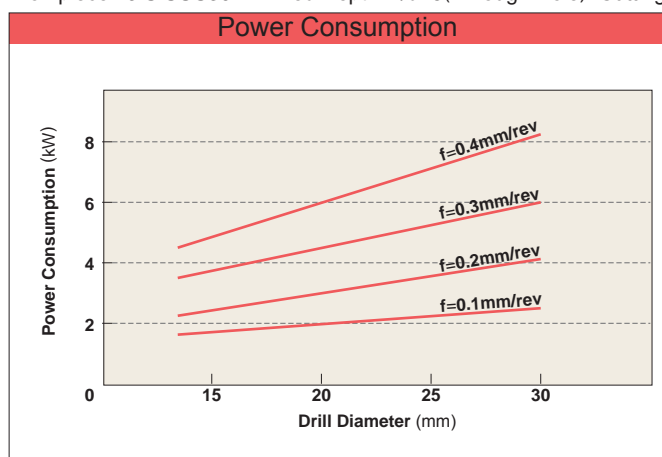
RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Drill Dia. $\phi 14.0-\phi 20.0$		Drill Dia. $\phi 20.0-\phi 30.0$	
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P Mild Steel	$\leq 180\text{HB}$	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)	$\leq 200\text{HB}$	60 (50-80)	0.25 (0.15-0.35)	65 (50-80)	0.30 (0.20-0.40)
K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	65 (50-100)	0.30 (0.20-0.40)	70 (50-100)	0.35 (0.25-0.50)
	Tensile Strength $\leq 450\text{MPa}$	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%)




DRILLING(BRAZED TYPE)

BRK

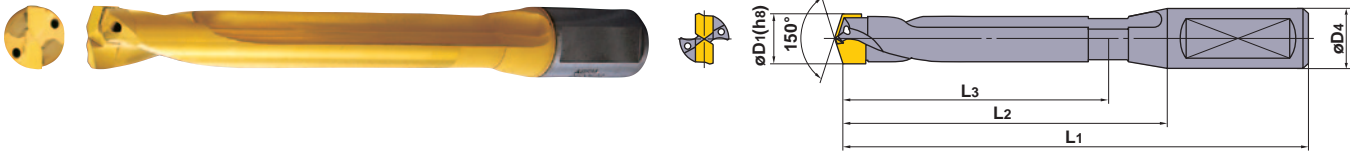
- Excellent cutting sharpness and chip discharge due to high rake type insert.
- High efficiency, high accuracy machining.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎			○		

	$14 \leq D_1 \leq 18$	$18 < D_1 \leq 30$
	0	0
	-0.027	-0.033

(l/d=7)



Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)			
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length L ₃	Neck Length L ₂	Overall Length L ₁	Shank Dia. D ₄
		UP20M						
14.0	BRK1400S16	▲	14.0 < D ₁ ≤ 14.5	BRK□□□□S16	112	126	174	16
15.0	1500S20	▲	14.5 < D ₁ ≤ 15.5	BRK□□□□S20	120	135	185	20
16.0	1600S20	▲	15.5 < D ₁ ≤ 16.5		128	144	194	20
17.0	1700S20	▲	16.5 < D ₁ ≤ 17.5		136	153	203	20
18.0	1800S20	▲	17.5 < D ₁ ≤ 18.5		144	162	212	20
19.0	1900S25	▲	18.5 < D ₁ ≤ 19.5		BRK□□□□S25	152	171	227
20.0	2000S25	▲	19.5 < D ₁ ≤ 20.5	160		180	236	25
21.0	2100S25	▲	20.5 < D ₁ ≤ 21.5	168		189	245	25
22.0	2200S25	▲	21.5 < D ₁ ≤ 22.5	176		198	254	25
23.0	2300S25	▲	22.5 < D ₁ ≤ 23.5	184		207	263	25
24.0	2400S32	▲	23.5 < D ₁ ≤ 24.5	BRK□□□□S32	192	216	276	32
25.0	2500S32	▲	24.5 < D ₁ ≤ 25.5		200	225	285	32
26.0	2600S32	▲	25.5 < D ₁ ≤ 26.5		208	234	294	32
27.0	2700S32	▲	26.5 < D ₁ ≤ 27.5		216	243	303	32
28.0	2800S32	▲	27.5 < D ₁ ≤ 28.5		224	252	312	32
29.0	2900S32	▲	28.5 < D ₁ ≤ 29.5		232	261	321	32
30.0	3000S32	▲	29.5 < D ₁ ≤ 30.5		240	270	330	32

For ordering an intermediate diameter, please enter the diameter (D₁) into the 4-digit space□□□□in the nominal designation.
(Ex. UP20M BRK2|5|3|0S32 for a diameter of φ25.30mm)

DRILLING

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

RECOMMENDED CUTTING CONDITIONS

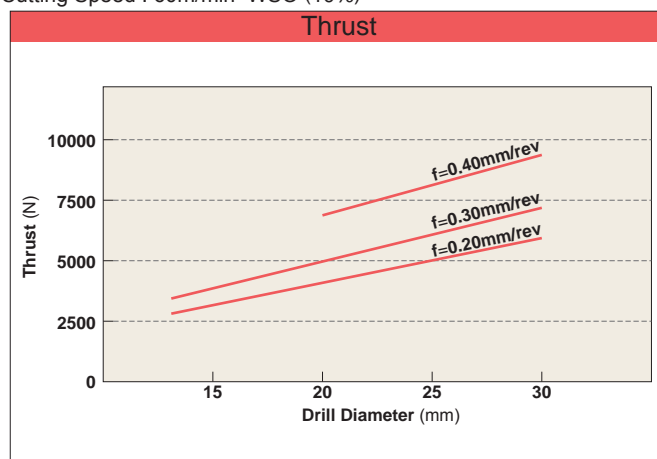
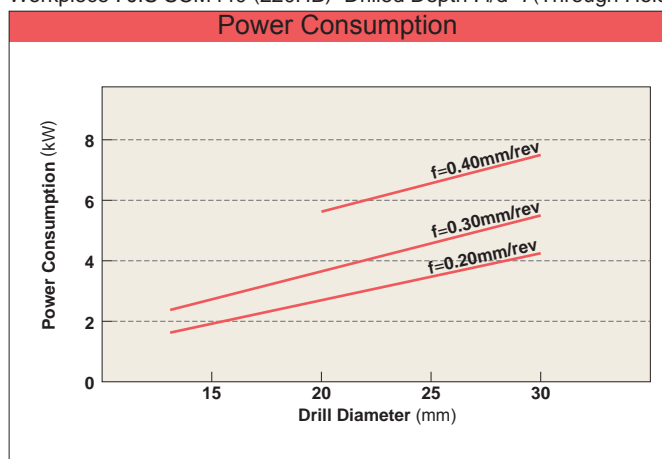
Work Material	Hardness	Drill Dia. $\phi 14.0$ — $\phi 16.0$		Drill Dia. $\phi 16.0$ — $\phi 20.0$		Drill Dia. $\phi 20.0$ — $\phi 30.0$	
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P Mild Steel	$\leq 180\text{HB}$	60 (40—75)	0.25 (0.15—0.30)	65 (40—80)	0.30 (0.20—0.35)	70 (50—85)	0.30 (0.20—0.35)
	180—280HB	55 (40—65)	0.25 (0.15—0.30)	60 (45—70)	0.30 (0.20—0.35)	65 (50—75)	0.30 (0.20—0.35)
	280—350HB	45 (30—55)	0.20 (0.10—0.25)	50 (35—60)	0.25 (0.15—0.30)	55 (40—65)	0.25 (0.15—0.30)
High Alloy Steel	200—280HB	40 (30—50)	0.20 (0.10—0.25)	45 (35—55)	0.25 (0.15—0.30)	50 (40—60)	0.25 (0.15—0.30)
K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	60 (50—70)	0.30 (0.20—0.35)	60 (50—80)	0.35 (0.25—0.40)	70 (60—90)	0.35 (0.25—0.40)
	Tensile Strength $\leq 450\text{MPa}$	45 (30—60)	0.25 (0.15—0.30)	50 (35—60)	0.30 (0.20—0.35)	55 (40—65)	0.35 (0.20—0.35)

(Note 1) The above conditions are for general cutting. The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

(Note 2) Decrease the feed rate to 1/3 of the values below, until the full drill diameter is 3 to 5mm into the workpiece.

CUTTING RESISTANCE

Workpiece : JIS SCM440 (220HB) Drilled Depth : $l/d=7$ (Through Hole) Cutting Speed : 60m/min WSO (10%)



DRILLING(BRAZED TYPE)

FOR BRIDGE CONSTRUCTION

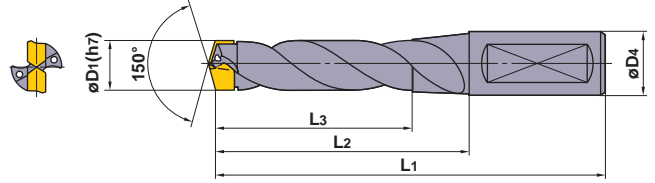
- Excellent cutting sharpness and chip discharge due to high rake type insert.
- Unique flute shape is used. (l/d=3,5)

BRSB

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎					

18<D1≤30
0
-0.021

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



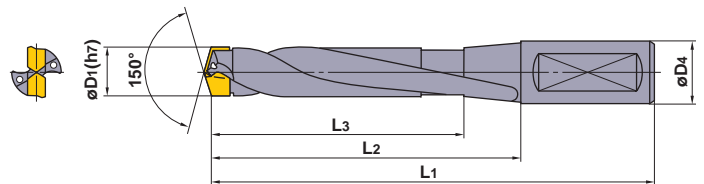
Drill Dia. D1 (mm)	Order Number	Stock UP20M	Dimensions (mm)			
			Effective flute length	Neck Length	Overall Length	Shank Dia.
			L3	L2	L1	D4
24.5	BRSB2450S32	●	87	111	171	32
24.6	2460S32	●	86	111	171	32
24.7	2470S32	●	86	111	171	32
26.5	2650S32	●	90	116	176	32
26.7	2670S32	●	89	116	176	32

BRMB

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎					

18<D1≤30
0
-0.021

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



Drill Dia. D1 (mm)	Order Number	Stock UP20M	Dimensions (mm)			
			Effective flute length	Neck Length	Overall Length	Shank Dia.
			L3	L2	L1	D4
24.5	BRMB2450S32	●	136	160	220	32
24.6	2460S32	●	140	165	225	32
24.7	2470S32	●	140	165	225	32
26.5	2650S32	●	144	170	230	32
26.7	2670S32	●	148	175	235	32

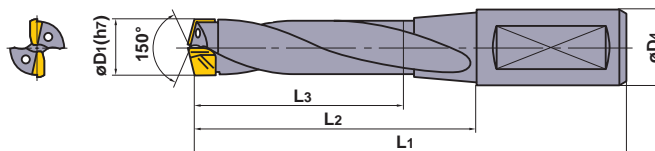
● : Inventory maintained in Japan.

BRB

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
-----------------------------	-------------------	--------------------	-----------	-------------	-------------------------

 $18 < D_1 \leq 30$
 $\begin{matrix} 0 \\ -0.021 \end{matrix}$

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



Drill Dia. D_1 (mm)	Order Number	Stock UT120T	Dimensions (mm)			
			Effective flute length L_3	Neck Length L_2	Overall Length L_1	Shank Dia. D_4
			24.5	BRB2450S32M	●	87
24.6	2460S32M	●	86	111	171	32
24.7	2470S32M	●	86	111	171	32
26.5	2650S32M	●	90	116	176	32
26.7	2670S32M	●	89	116	176	32

RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	BRB		BRSB		BRMB		
		Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	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)

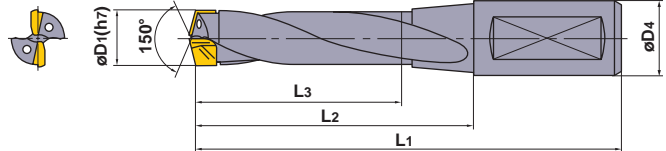
BRA

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

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy		8≤D≤10	10<D1≤18	18<D1≤30	30<D1≤40
◎		○	○				$\begin{matrix} 0 \\ -0.015 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.021 \end{matrix}$	$\begin{matrix} 0 \\ -0.025 \end{matrix}$

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



Drill Dia. D1 (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)			
	Order Number	Stock UP20M	Range of Drill Diameters (D1)	Order Number	Effective flute length	Neck Length	Overall Length	Shank Dia.
					L3	L2	L1	D4
8.0	BRA0800S16	●	8.0<D1≤8.5	BRA□□□□S16	23	35	83	16
8.5	0850S16	●			23	35	83	16
9.0	0900S16	●	8.5<D1≤9.5		28	40	88	16
9.5	0950S16	●			28	40	88	16
10.0	1000S16	●	9.5<D1≤10.5		35	45	93	16
10.5	1050S16	●			35	45	93	16
11.0	1100S16	●	10.5<D1≤11.5		40	51	99	16
11.5	1150S16	●			40	51	99	16
12.0	1200S16	●	11.5<D1≤12.5		44	56	104	16
12.5	1250S16	●			44	56	104	16
13.0	1300S16	●	12.5<D1≤13.5		48	61	109	16
13.5	1350S16	●			48	61	109	16
14.0	1400S16	●	13.5<D1≤14.5	52	66	114	16	
14.5	1450S16	●		52	66	114	16	
15.0	1500S20	●	14.5<D1≤15.5	61	76	126	20	
15.5	1550S20	●		61	76	126	20	
16.0	1600S20	●	15.5<D1≤16.5	65	81	131	20	
16.5	1650S20	●		65	81	131	20	
17.0	1700S20	●	16.5<D1≤17.5	69	86	136	20	
17.5	1750S20	●		69	86	136	20	
18.0	1800S20	●	17.5<D1≤18.5	73	91	141	20	
18.5	1850S20	●		73	91	141	20	
19.0	1900S25	●	18.5<D1≤19.5	77	101	157	25	
19.5	1950S25	●		77	101	157	25	
20.0	2000S25	●	19.5<D1≤20.5	81	101	157	25	
20.5	2050S25	●		81	101	157	25	
21.0	2100S25	●	20.5<D1≤21.5	80	101	157	25	
21.5	2150S25	●		80	101	157	25	
22.0	2200S25	●	21.5<D1≤22.5	84	106	162	25	
22.5	2250S25	●		84	106	162	25	

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

Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)				
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length L ₃	Neck Length L ₂	Overall Length L ₁	Shank Dia. D ₄	
		UP20M							
23.0	BRA2300S25	●	22.5<D ₁ ≤23.5	BRA□□□□S25	83	106	162	25	
23.5	2350S25	●			83	106	162	25	
24.0	2400S32	●	23.5<D ₁ ≤24.5	BRA□□□□S32	87	111	171	32	
24.5	2450S32	●			87	111	171	32	
25.0	2500S32	●	24.5<D ₁ ≤25.5		86	111	171	32	
25.5	2550S32	●			86	111	171	32	
26.0	2600S32	●	25.5<D ₁ ≤26.5		90	116	176	32	
26.5	2650S32	●			90	116	176	32	
27.0	2700S32	●	26.5<D ₁ ≤27.5		89	116	176	32	
27.5	2750S32	●			89	116	176	32	
28.0	2800S32	●	27.5<D ₁ ≤28.5		93	121	181	32	
28.5	2850S32	●			93	121	181	32	
29.0	2900S32	●	28.5<D ₁ ≤29.5		97	126	186	32	
29.5	2950S32	●			97	126	186	32	
30.0	3000S32	●	29.5<D ₁ ≤30.5		96	126	186	32	
30.5	3050S32	●			96	126	186	32	
31.0	3100S40	□	30.5<D ₁ ≤31.5		BRA□□□□S40	96	127	197	40
31.5	3150S40	□				96	127	197	40
32.0	3200S40	□	31.5<D ₁ ≤32.5			100	132	202	40
32.5	3250S40	□				100	132	202	40
33.0	3300S40	□	32.5<D ₁ ≤33.5			104	137	207	40
33.5	3350S40	□				104	137	207	40
34.0	3400S40	□	33.5<D ₁ ≤34.5	103		137	207	40	
34.5	3450S40	□		103		137	207	40	
35.0	3500S40	□	34.5<D ₁ ≤35.5	107		142	212	40	
35.5	3550S40	□		107		142	212	40	
36.0	3600S40	□	35.5<D ₁ ≤36.5	111		147	217	40	
36.5	3650S40	□		111		147	217	40	
37.0	3700S40	□	36.5<D ₁ ≤37.5	115		152	222	40	
37.5	3750S40	□		115		152	222	40	
38.0	3800S40	□	37.5<D ₁ ≤38.5	119		157	227	40	
38.5	3850S40	□		119		157	227	40	
39.0	3900S40	□	38.5<D ₁ ≤39.5	118		157	227	40	
39.5	3950S40	□		118		157	227	40	
40.0	4000S40	□	39.5<D ₁ ≤40.0	122		162	232	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 (D₁) into the 4-digit space□□□□in the nominal designation.
(Ex. UP20M BRA2[5]3[0]S32 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).

DRILLING(BRAZED TYPE)

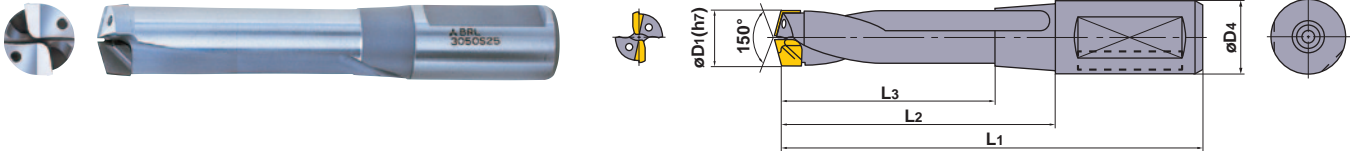
BRL

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

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy		$8 \leq D_1 \leq 10$	$10 < D_1 \leq 18$	$18 < D_1 \leq 30$	$30 < D_1 \leq 40$
◎		○	○				$\begin{matrix} 0 \\ -0.015 \end{matrix}$	$\begin{matrix} 0 \\ -0.018 \end{matrix}$	$\begin{matrix} 0 \\ -0.021 \end{matrix}$	$\begin{matrix} 0 \\ -0.025 \end{matrix}$

● For turning
($l/d=3$)



Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)			
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length L ₃	Neck Length L ₂	Overall Length L ₁	Shank Dia. D ₄
		ST140T						
8.0	BRL0800S16	●	$8.0 \leq D_1 \leq 8.5$	BRL□□□□S16	23	35	83	16
8.5	0850S16	●			23	35	83	16
9.0	0900S16	●	$8.5 < D_1 \leq 9.5$		28	40	88	16
9.5	0950S16	●			28	40	88	16
10.0	1000S16	●	$9.5 < D_1 \leq 10.5$		35	45	93	16
10.5	1050S16	●			35	45	93	16
11.0	1100S16	●	$10.5 < D_1 \leq 11.5$		40	51	99	16
11.5	1150S16	●			40	51	99	16
12.0	1200S16	●	$11.5 < D_1 \leq 12.5$		44	56	104	16
12.5	1250S16	●			44	56	104	16
13.0	1300S16	●	$12.5 < D_1 \leq 13.5$		48	61	109	16
13.5	1350S16	●			48	61	109	16
14.0	1400S16	●	$13.5 < D_1 \leq 14.5$	52	66	114	16	
14.5	1450S16	●		52	66	114	16	
15.0	1500S20	●	$14.5 < D_1 \leq 15.5$	61	76	126	20	
15.5	1550S20	●		61	76	126	20	
16.0	1600S20	●	$15.5 < D_1 \leq 16.5$	65	81	131	20	
16.5	1650S20	●		65	81	131	20	
17.0	1700S20	●	$16.5 < D_1 \leq 17.5$	69	86	136	20	
17.5	1750S20	●		69	86	136	20	
18.0	1800S20	●	$17.5 < D_1 \leq 18.5$	73	91	141	20	
18.5	1850S20	●		73	91	141	20	
19.0	1900S25	●	$18.5 < D_1 \leq 19.5$	77	101	157	25	
19.5	1950S25	●		77	101	157	25	
20.0	2000S25	●	$19.5 < D_1 \leq 20.5$	81	101	157	25	
20.5	2050S25	●		81	101	157	25	
21.0	2100S25	●	$20.5 < D_1 \leq 21.5$	80	101	157	25	
21.5	2150S25	●		80	101	157	25	
22.0	2200S25	●	$21.5 < D_1 \leq 22.5$	84	106	162	25	
22.5	2250S25	●		84	106	162	25	

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

Drill Dia. D ₁ (mm)	Standard Diameter		Intermediate Diameters		Dimensions (mm)				
	Order Number	Stock	Range of Drill Diameters (D ₁)	Order Number	Effective flute length L ₃	Neck Length L ₂	Overall Length L ₁	Shank Dia. D ₄	
		STi40T							
23.0	BRL2300S25	●	22.5<D ₁ ≤23.5	BRL□□□□S25	83	106	162	25	
23.5	2350S25	●			83	106	162	25	
24.0	2400S32	●	23.5<D ₁ ≤24.5	BRL□□□□S32	87	111	171	32	
24.5	2450S32	●			87	111	171	32	
25.0	2500S32	●	24.5<D ₁ ≤25.5		86	111	171	32	
25.5	2550S32	●			86	111	171	32	
26.0	2600S32	●	25.5<D ₁ ≤26.5		90	116	176	32	
26.5	2650S32	●			90	116	176	32	
27.0	2700S32	●	26.5<D ₁ ≤27.5		89	116	176	32	
27.5	2750S32	●			89	116	176	32	
28.0	2800S32	●	27.5<D ₁ ≤28.5		93	121	181	32	
28.5	2850S32	●			93	121	181	32	
29.0	2900S32	●	28.5<D ₁ ≤29.5		97	126	186	32	
29.5	2950S32	●			97	126	186	32	
30.0	3000S32	●	29.5<D ₁ ≤30.5		96	126	186	32	
30.5	3050S32	●			96	126	186	32	
31.0	3100S40	□	30.5<D ₁ ≤31.5		BRL□□□□S40	96	127	197	40
31.5	3150S40	□				96	127	197	40
32.0	3200S40	□	31.5<D ₁ ≤32.5			100	132	202	40
32.5	3250S40	□				100	132	202	40
33.0	3300S40	□	32.5<D ₁ ≤33.5			104	137	207	40
33.5	3350S40	□				104	137	207	40
34.0	3400S40	□	33.5<D ₁ ≤34.5	103		137	207	40	
34.5	3450S40	□		103		137	207	40	
35.0	3500S40	□	34.5<D ₁ ≤35.5	107		142	212	40	
35.5	3550S40	□		107		142	212	40	
36.0	3600S40	□	35.5<D ₁ ≤36.5	111		147	217	40	
36.5	3650S40	□		111		147	217	40	
37.0	3700S40	□	36.5<D ₁ ≤37.5	115		152	222	40	
37.5	3750S40	□		115		152	222	40	
38.0	3800S40	□	37.5<D ₁ ≤38.5	119		157	227	40	
38.5	3850S40	□		119		157	227	40	
39.0	3900S40	□	38.5<D ₁ ≤39.5	118		157	227	40	
39.5	3950S40	□		118		157	227	40	
40.0	4000S40	□	39.5<D ₁ ≤40.0	122		162	232	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 (D₁) into the 4-digit space□□□□in the nominal designation.
(Ex. STi40T BRL2|5|3|0S32 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).

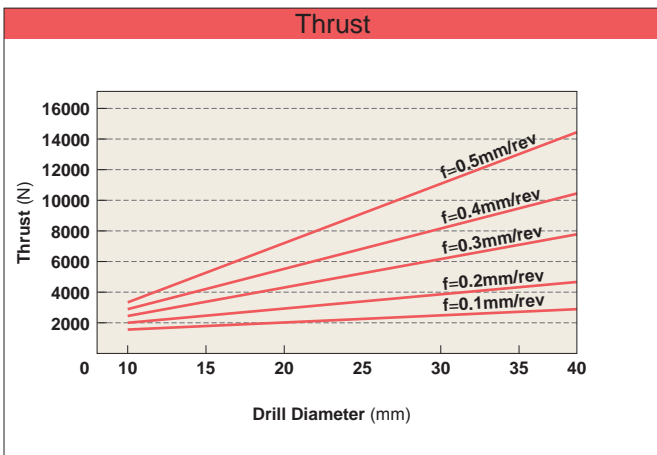
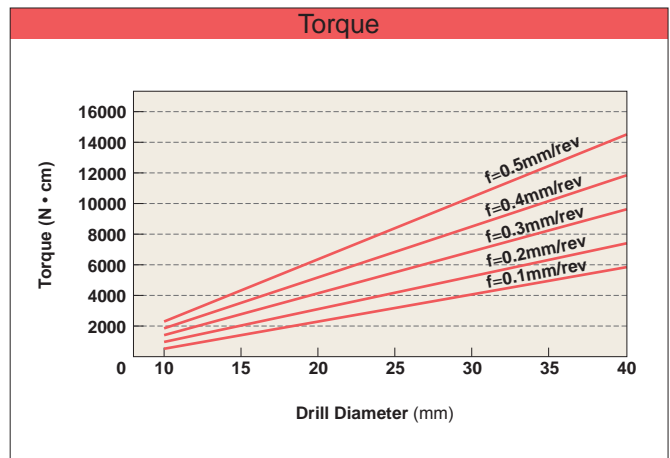
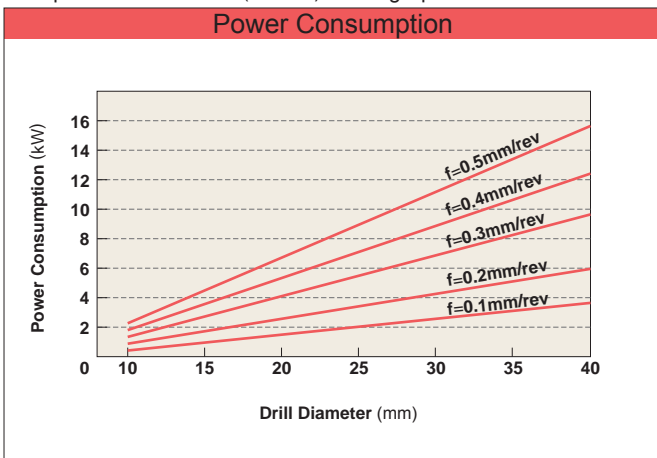
RECOMMENDED CUTTING CONDITIONS

Type	Work Material	Hardness	Drill Diameter $\phi 8.0 - \phi 13.0$		Drill Diameter $\phi 13.0 - \phi 18.0$		Drill Diameter $\geq \phi 18.0$	
			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	$\leq 180\text{HB}$	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)
		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)
	Carbon Steel Alloy Steel	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	$\leq 200\text{HB}$	30 (20-40)	0.25 (0.20-0.27)	35 (25-45)	0.27 (0.20-0.30)	40 (30-50)
	K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	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 $\leq 450\text{MPa}$	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 (1-25)	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	$\leq 180\text{HB}$	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)
		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)
	Carbon Steel Alloy Steel	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	$\leq 200\text{HB}$	30 (20-40)	0.25 (0.20-0.27)	30 (20-40)	0.27 (0.20-0.30)	35 (25-45)
	K Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	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 $\leq 450\text{MPa}$	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)

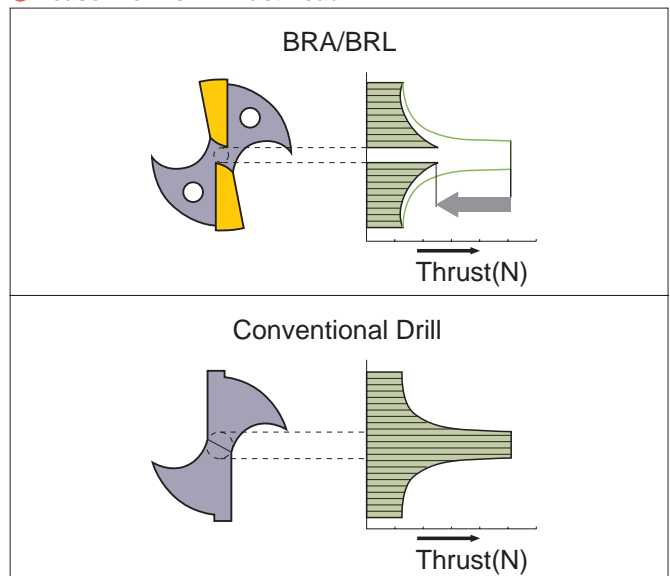
(Note) The above conditions are for general cutting. The cutting conditions need to be modified depending on power, rigidity of the machine and workpiece shape.

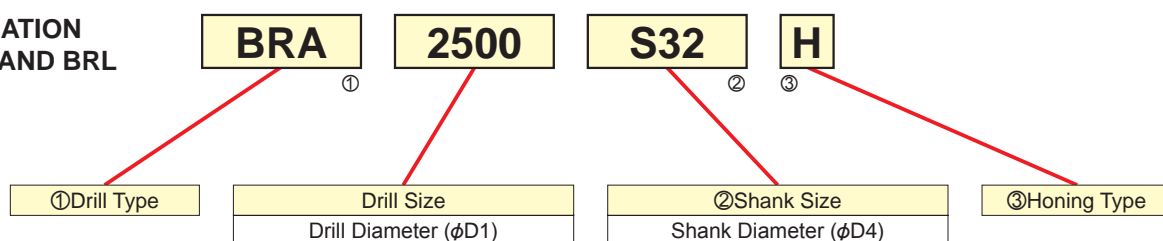
CUTTING RESISTANCE

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



Reason for Low Thrust Load



**IDENTIFICATION
FOR BRA AND BRL**

① Drill 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	φD1-0.2mm	For General Use (Carbon / Alloy / Stainless Steel)	BRA○○○○S○○
BRL	150°	l/d=3-4	10°+ Straight	10°	1.0mm/100mm	φD1-1.0mm	For Turning	BRL○○○○S○○L

② Shank Size

Type	Shank Diameter	Drill Diameter
S16	φ16 (h6)	φ8.0 ≤ D1 ≤ φ14.5
S20	φ20 (h6)	φ14.5 < D1 ≤ φ18.5
S25	φ25 (h6)	φ18.5 < D1 ≤ φ23.5
S32	φ32 (h6)	φ23.5 < D1 ≤ φ30.5
S40	φ40 (h6)	φ30.5 < D1 ≤ φ40.0

③ Honing 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

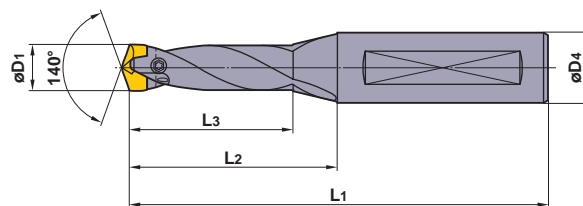
DRILLING(INDEXABLE TYPE)

S-TAW

- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.

Small Diameter Indexable Drill

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	◎	○	



HOLDERS


Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)				Wrench	Drill Dia. D1 (mm)	Insert			
		Order Number	Stock	Effective flute length L3	Neck Length L2	Overall Length L1	Shank Dia. D4			Order Number	VP15TF	VP10H	DP5010
10.0 10.4	1.5	STAWSS1000S16	●	22	32	80	16	TIP06F	10.0	STAWN1000TH	●	□	
										STAWK1000TG			●
	3	STAWSN1000S16	●	37	47	95	16	TIP06F	10.1	STAWN1010TH	●	□	
										STAWK1010TG			●
	5	STAWMN1000S16	●	57	67	115	16	TIP06F	10.2	STAWN1020TH	●	□	
										STAWK1020TG			●
	8	STAWLN1000S16	●	87	97	145	16	TIP06F	10.3	STAWN1030TH	●	□	
										STAWK1030TG			●
10.5 10.9	1.5	STAWSS1050S16	●	22	32	80	16	TIP06F	10.4	STAWN1040TH	●	□	
										STAWK1040TG			●
	3	STAWSN1050S16	●	37	47	95	16	TIP06F	10.5	STAWN1050TH	●	□	
										STAWK1050TG			●
	5	STAWMN1050S16	●	57	67	115	16	TIP06F	10.6	STAWN1060TH	●	□	
										STAWK1060TG			●
	8	STAWLN1050S16	●	87	97	145	16	TIP06F	10.7	STAWN1070TH	●	□	
										STAWK1070TG			●
11.0 11.4	1.5	STAWSS1100S16	●	25	36	84	16	TIP06F	10.8	STAWN1080TH	●	□	
										STAWK1080TG			●
	3	STAWSN1100S16	●	41	52	100	16	TIP06F	10.9	STAWN1090TH	●	□	
										STAWK1090TG			●
	5	STAWMN1100S16	●	66	77	125	16	TIP06F	11.0	STAWN1100TH	●	□	
										STAWK1100TG			●
	8	STAWLN1100S16	●	96	107	155	16	TIP06F	11.1	STAWN1110TH	●	□	
										STAWK1110TG			●
11.5 11.9	1.5	STAWSS1150S16	●	25	36	84	16	TIP06F	11.2	STAWN1120TH	●	□	
										STAWK1120TG			●
	3	STAWSN1150S16	●	41	52	100	16	TIP06F	11.3	STAWN1130TH	●	□	
										STAWK1130TG			●
	5	STAWMN1150S16	●	66	77	125	16	TIP06F	11.4	STAWN1140TH	●	□	
										STAWK1140TG			●
	8	STAWLN1150S16	●	96	107	155	16	TIP06F	11.5	STAWN1150TH	●	□	
										STAWK1150TG			●
12.0 12.4	1.5	STAWSS1200S16	●	27	39	87	16	TIP06F	11.6	STAWN1160TH	●	□	
										STAWK1160TG			●
	3	STAWSN1200S16	●	45	57	105	16	TIP06F	11.7	STAWN1170TH	●	□	
										STAWK1170TG			●
	5	STAWMN1200S16	●	70	82	130	16	TIP06F	11.8	STAWN1180TH	●	□	
										STAWK1180TG			●
	8	STAWLN1200S16	●	105	117	165	16	TIP06F	11.9	STAWN1190TH	●	□	
										STAWK1190TG			●
12.0 12.4	1.5	STAWSS1200S16	●	27	39	87	16	TIP06F	12.0	STAWN1200TH	●	□	
										STAWK1200TG			●
	3	STAWSN1200S16	●	45	57	105	16	TIP06F	12.1	STAWN1210TH	●	□	
										STAWK1210TG			●
	5	STAWMN1200S16	●	70	82	130	16	TIP06F	12.2	STAWN1220TH	●	□	
										STAWK1220TG			●
	8	STAWLN1200S16	●	105	117	165	16	TIP06F	12.3	STAWN1230TH	●	□	
										STAWK1230TG			●
									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)

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)					Insert				
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.		Drill Dia. D1 (mm)	Order Number	Stock		
				L3	L2	L1	D4	VP15TF			VP10H	DP5010	
12.5 12.9	1.5	STAWSS1250S16	●	27	39	87	16	①TIP06F	12.5	STAWN1250TH	●	□	●
										STAWK1250TG			
	3	STAWSN1250S16	●	45	57	105	16	①TIP06F	12.6	STAWN1260TH	●	□	●
										STAWK1260TG			
	5	STAWMN1250S16	●	70	82	130	16	①TIP06F	12.7	STAWN1270TH	●	□	●
										STAWK1270TG			
	8	STAWLN1250S16	●	105	117	165	16	①TIP06F	12.8	STAWN1280TH	●	□	●
										STAWK1280TG			
12.9									STAWN1290TH	●	□	●	
									STAWK1290TG				
13.0 13.4	1.5	STAWSS1300S16	●	30	43	91	16	②TIP08W	13.0	STAWN1300TH	●	□	●
										STAWK1300TG			
	3	STAWSN1300S16	●	49	62	110	16	②TIP08W	13.1	STAWN1310TH	●	□	●
										STAWK1310TG			
	5	STAWMN1300S16	●	74	87	135	16	②TIP08W	13.2	STAWN1320TH	●	□	●
										STAWK1320TG			
	8	STAWLN1300S16	●	114	127	175	16	②TIP08W	13.3	STAWN1330TH	●	□	●
										STAWK1330TG			
13.4									STAWN1340TH	●	□	●	
									STAWK1340TG				
13.5 13.9	1.5	STAWSS1350S16	●	30	43	91	16	②TIP08W	13.5	STAWN1350TH	●	□	●
										STAWK1350TG			
	3	STAWSN1350S16	●	49	62	110	16	②TIP08W	13.6	STAWN1360TH	●	□	●
										STAWK1360TG			
	5	STAWMN1350S16	●	74	87	135	16	②TIP08W	13.7	STAWN1370TH	●	□	●
										STAWK1370TG			
	8	STAWLN1350S16	●	114	127	175	16	②TIP08W	13.8	STAWN1380TH	●	□	●
										STAWK1380TG			
13.9									STAWN1390TH	●	□	●	
									STAWK1390TG				
14.0 14.4	1.5	STAWSS1400S16	●	31	45	93	16	②TIP08W	14.0	STAWN1400TH	●	□	●
										STAWK1400TG			
	3	STAWSN1400S16	●	53	67	115	16	②TIP08W	14.1	STAWN1410TH	●	□	●
										STAWK1410TG			
	5	STAWMN1400S16	●	83	97	145	16	②TIP08W	14.2	STAWN1420TH	●	□	●
										STAWK1420TG			
	8	STAWLN1400S16	●	122	137	185	16	②TIP08W	14.3	STAWN1430TH	●	□	●
										STAWK1430TG			
14.4									STAWN1440TH	●	□	●	
									STAWK1440TG				
14.5 14.9	1.5	STAWSS1450S16	●	31	45	93	16	②TIP08W	14.5	STAWN1450TH	●	□	●
										STAWK1450TG			
	3	STAWSN1450S16	●	53	67	115	16	②TIP08W	14.6	STAWN1460TH	●	□	●
										STAWK1460TG			
	5	STAWMN1450S16	●	83	97	145	16	②TIP08W	14.7	STAWN1470TH	●	□	●
										STAWK1470TG			
	8	STAWLN1450S16	●	122	137	185	16	②TIP08W	14.8	STAWN1480TH	●	□	●
										STAWK1480TG			
14.9									STAWN1490TH	●	□	●	
									STAWK1490TG				
15.0 15.4	1.5	STAWSS1500S20	●	33	48	98	20	②TIP08W	15.0	STAWN1500TH	●	□	●
										STAWK1500TG			
	3	STAWSN1500S20	●	60	75	125	20	②TIP08W	15.1	STAWN1510TH	●	□	●
										STAWK1510TG			
	5	STAWMN1500S20	●	90	105	155	20	②TIP08W	15.2	STAWN1520TH	●	□	●
										STAWK1520TG			
	8	STAWLN1500S20	●	130	148	198	20	②TIP08W	15.3	STAWN1530TH	●	□	●
										STAWK1530TG			
15.4									STAWN1540TH	●	□	●	
									STAWK1540TG				

(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).


INSERT DESCRIPTION > N193
 CUTTING CONDITIONS > N197
 USAGE NOTE > N198
 TECHNICAL DATA > Q001

DRILLING(INDEXABLE TYPE)

S-TAW

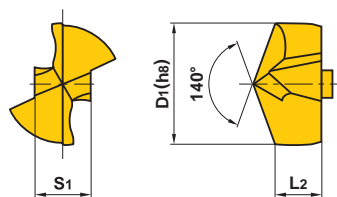
Small Diameter Indexable Drill

CARBIDE

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)				 Wrench	Insert				
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.		Drill Dia. D1 (mm)	Order Number	Stock		
				L3	L2	L1	D4				VP15TF	VP10H	DP5010
NEW 15.5 16.4	1.5	STAWSS1600S20	●	34	50	100	20	TIP10W	15.5	STAWN1550T	●		●
										STAWK1550TG			
									15.6	STAWN1560T	●		●
									15.7	STAWN1570T	●		●
										STAWK1570TG			●
	3	STAWSN1600S20	●	60	80	130	20	TIP10W	15.8	STAWN1580T	●		●
										STAWK1580TG			
									15.9	STAWN1590T	●		●
										STAWK1590TG			●
	5	STAWMN1600S20	●	90	115	165	20	TIP10W	16.0	STAWN1600T	●		●
										STAWK1600TG			
16.1									STAWN1610T	●		●	
									STAWK1610TG			●	
8	STAWLN1600S20	●	138	158	208	20	TIP10W	16.2	STAWN1620T	●		●	
									STAWK1620TG				
								16.3	STAWN1630T	●		●	
									STAWK1630TG			●	
								16.4	STAWN1640T	●		●	
									STAWK1640TG			●	
NEW 16.5 17.4	1.5	STAWSS1700S20	●	36	53	103	20	TIP10W	16.5	STAWN1650T	●		●
										STAWK1650TG			
									16.6	STAWN1660T	●		●
										STAWK1660TG			●
	3	STAWSN1700S20	●	61	85	135	20	TIP10W	16.7	STAWN1670T	●		●
										STAWK1670TG			
									16.8	STAWN1680T	●		●
										STAWK1680TG			●
	5	STAWMN1700S20	●	95	120	170	20	TIP10W	16.9	STAWN1690T	●		●
										STAWK1690TG			
									17.0	STAWN1700T	●		●
										STAWK1700TG			●
8	STAWLN1700S20	●	146	166	216	20	TIP10W	17.1	STAWN1710T	●		●	
									STAWK1710TG				
								17.2	STAWN1720T	●		●	
									STAWK1720TG			●	
								17.3	STAWN1730T	●		●	
									STAWK1730TG			●	
								17.4	STAWN1740T	●		●	
									STAWK1740TG			●	
NEW 17.5 18.4	1.5	STAWSS1800S20	●	37	55	105	20	TIP10W	17.5	STAWN1750T	●		●
										STAWK1750TG			
									17.6	STAWN1760T	●		●
										STAWK1760TG			●
	3	STAWSN1800S20	●	64	90	140	20	TIP10W	17.7	STAWN1770T	●		●
										STAWK1770TG			
									17.8	STAWN1780T	●		●
										STAWK1780TG			●
	5	STAWMN1800S20	●	100	125	175	20	TIP10W	17.9	STAWN1790T	●		●
										STAWK1790TG			
									18.0	STAWN1800T	●		●
										STAWK1800TG			●
8	STAWLN1800S20	●	154	174	224	20	TIP10W	18.1	STAWN1810T	●		●	
									STAWK1810TG				
								18.2	STAWN1820T	●		●	
									STAWK1820TG			●	
								18.3	STAWN1830T	●		●	
									STAWK1830TG			●	
								18.4	STAWN1840T	●		●	
									STAWK1840TG			●	

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

INSERTS

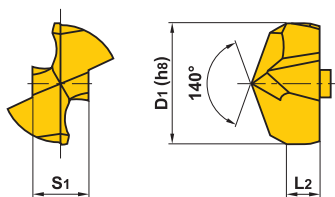
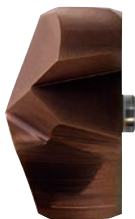


Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
STAWN1000TH	●	□	10.0	3.8	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
1010TH	●	□	10.1	3.8	4.6	
1020TH	●	□	10.2	3.8	4.6	
1030TH	●	□	10.3	3.8	4.6	
1040TH	●	□	10.4	3.8	4.6	
1050TH	●	□	10.5	4.0	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
1060TH	●	□	10.6	4.0	4.8	
1070TH	●	□	10.7	4.0	4.8	
1080TH	●	□	10.8	4.0	4.8	
1090TH	●	□	10.9	4.0	4.8	
1100TH	●	□	11.0	4.2	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
1110TH	●	□	11.1	4.2	5.1	
1120TH	●	□	11.2	4.2	5.1	
1130TH	●	□	11.3	4.2	5.1	
1140TH	●	□	11.4	4.2	5.1	
1150TH	●	□	11.5	4.4	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
1160TH	●	□	11.6	4.4	5.3	
1170TH	●	□	11.7	4.4	5.3	
1180TH	●	□	11.8	4.4	5.3	
1190TH	●	□	11.9	4.4	5.3	
1200TH	●	□	12.0	4.6	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
1210TH	●	□	12.1	4.6	5.5	
1220TH	●	□	12.2	4.6	5.5	
1230TH	●	□	12.3	4.6	5.5	
1240TH	●	□	12.4	4.6	5.5	
1250TH	●	□	12.5	4.8	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
1260TH	●	□	12.6	4.8	5.8	
1270TH	●	□	12.7	4.8	5.8	
1280TH	●	□	12.8	4.8	5.8	
1290TH	●	□	12.9	4.8	5.8	
1300TH	●	□	13.0	4.9	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
1310TH	●	□	13.1	4.9	6.0	
1320TH	●	□	13.2	4.9	6.0	
1330TH	●	□	13.3	4.9	6.0	
1340TH	●	□	13.4	4.9	6.0	
1350TH	●	□	13.5	5.1	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
1360TH	●	□	13.6	5.1	6.2	
1370TH	●	□	13.7	5.1	6.2	
1380TH	●	□	13.8	5.1	6.2	
1390TH	●	□	13.9	5.1	6.2	

Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
STAWN1400TH	●		14.0	5.3	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
1410TH	●		14.1	5.3	6.4	
1420TH	●		14.2	5.3	6.4	
1430TH	●		14.3	5.3	6.4	
1440TH	●		14.4	5.3	6.4	
1450TH	●		14.5	5.5	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
1460TH	●		14.6	5.5	6.7	
1470TH	●		14.7	5.5	6.7	
1480TH	●		14.8	5.5	6.7	
1490TH	●		14.9	5.5	6.7	
1500TH	●		15.0	5.7	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
1510TH	●		15.1	5.7	6.9	
1520TH	●		15.2	5.7	6.9	
1530TH	●		15.3	5.7	6.9	
1540TH	●		15.4	5.7	6.9	
NEW 1550T	●		15.5	5.9	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
NEW 1560T	●		15.6	5.9	7.1	
NEW 1570T	●		15.7	5.9	7.1	
NEW 1580T	●		15.8	5.9	7.1	
NEW 1590T	●		15.9	5.9	7.1	
NEW 1600T	●		16.0	5.9	7.1	
NEW 1610T	●		16.1	5.9	7.1	
NEW 1620T	●		16.2	5.9	7.1	
NEW 1630T	●		16.3	5.9	7.1	
NEW 1640T	●		16.4	5.9	7.1	
NEW 1650T	●		16.5	6.3	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
NEW 1660T	●		16.6	6.3	7.6	
NEW 1670T	●		16.7	6.3	7.6	
NEW 1680T	●		16.8	6.3	7.6	
NEW 1690T	●		16.9	6.3	7.6	
NEW 1700T	●		17.0	6.3	7.6	
NEW 1710T	●		17.1	6.3	7.6	
NEW 1720T	●		17.2	6.3	7.6	
NEW 1730T	●		17.3	6.3	7.6	
NEW 1740T	●		17.4	6.3	7.6	
NEW 1750T	●		17.5	6.7	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
NEW 1760T	●		17.6	6.7	8.1	
NEW 1770T	●		17.7	6.7	8.1	
NEW 1780T	●		17.8	6.7	8.1	
NEW 1790T	●		17.9	6.7	8.1	
NEW 1800T	●		18.0	6.7	8.1	
NEW 1810T	●		18.1	6.7	8.1	
NEW 1820T	●		18.2	6.7	8.1	
NEW 1830T	●		18.3	6.7	8.1	
NEW 1840T	●		18.4	6.7	8.1	

INSERTS

(Cast Iron)



Order Number	Stock		Dimensions (mm)			Applicable Holder
	DP5010		D1	L2	S1	
NEW STAWK1000TG	●		10.0	3.3	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
NEW 1010TG	●		10.1	3.3	4.6	
NEW 1020TG	●		10.2	3.3	4.6	
NEW 1030TG	●		10.3	3.3	4.6	
NEW 1040TG	●		10.4	3.3	4.6	
NEW 1050TG	●		10.5	3.5	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
NEW 1060TG	●		10.6	3.5	4.8	
NEW 1070TG	●		10.7	3.5	4.8	
NEW 1080TG	●		10.8	3.5	4.8	
NEW 1090TG	●		10.9	3.5	4.8	
NEW 1100TG	●		11.0	3.7	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
NEW 1110TG	●		11.1	3.7	5.1	
NEW 1120TG	●		11.2	3.7	5.1	
NEW 1130TG	●		11.3	3.7	5.1	
NEW 1140TG	●		11.4	3.7	5.1	
NEW 1150TG	●		11.5	3.9	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
NEW 1160TG	●		11.6	3.9	5.3	
NEW 1170TG	●		11.7	3.9	5.3	
NEW 1180TG	●		11.8	3.9	5.3	
NEW 1190TG	●		11.9	3.9	5.3	
NEW 1200TG	●		12.0	4.1	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
NEW 1210TG	●		12.1	4.1	5.5	
NEW 1220TG	●		12.2	4.1	5.5	
NEW 1230TG	●		12.3	4.1	5.5	
NEW 1240TG	●		12.4	4.1	5.5	
NEW 1250TG	●		12.5	4.2	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
NEW 1260TG	●		12.6	4.2	5.8	
NEW 1270TG	●		12.7	4.2	5.8	
NEW 1280TG	●		12.8	4.2	5.8	
NEW 1290TG	●		12.9	4.2	5.8	
NEW 1300TG	●		13.0	4.4	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
NEW 1310TG	●		13.1	4.4	6.0	
NEW 1320TG	●		13.2	4.4	6.0	
NEW 1330TG	●		13.3	4.4	6.0	
NEW 1340TG	●		13.4	4.4	6.0	
NEW 1350TG	●		13.5	4.6	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
NEW 1360TG	●		13.6	4.6	6.2	
NEW 1370TG	●		13.7	4.6	6.2	
NEW 1380TG	●		13.8	4.6	6.2	
NEW 1390TG	●		13.9	4.6	6.2	

DRILLING(INDEXABLE TYPE)

S-TAW

Small Diameter Indexable Drill

CARBIDE

Order Number	Stock		Dimensions (mm)			Applicable Holder
	DP5010		D1	L2	S1	
NEW STAWK1400TG	●		14.0	4.8	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
NEW 1410TG	●		14.1	4.8	6.4	
NEW 1420TG	●		14.2	4.8	6.4	
NEW 1430TG	●		14.3	4.8	6.4	
NEW 1440TG	●		14.4	4.8	6.4	
NEW 1450TG	●		14.5	5.0	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
NEW 1460TG	●		14.6	5.0	6.7	
NEW 1470TG	●		14.7	5.0	6.7	
NEW 1480TG	●		14.8	5.0	6.7	
NEW 1490TG	●		14.9	5.0	6.7	
NEW 1500TG	●		15.0	5.2	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
NEW 1510TG	●		15.1	5.2	6.9	
NEW 1520TG	●		15.2	5.2	6.9	
NEW 1530TG	●		15.3	5.2	6.9	
NEW 1540TG	●		15.4	5.2	6.9	
NEW 1550TG	●		15.5	5.3	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
NEW 1560TG	●		15.6	5.3	7.1	
NEW 1570TG	●		15.7	5.3	7.1	
NEW 1580TG	●		15.8	5.3	7.1	
NEW 1590TG	●		15.9	5.3	7.1	
NEW 1600TG	●		16.0	5.3	7.1	
NEW 1610TG	●		16.1	5.3	7.1	
NEW 1620TG	●		16.2	5.3	7.1	
NEW 1630TG	●		16.3	5.3	7.1	
NEW 1640TG	●		16.4	5.3	7.1	
NEW 1650TG	●		16.5	5.7	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
NEW 1660TG	●		16.6	5.7	7.6	
NEW 1670TG	●		16.7	5.7	7.6	
NEW 1680TG	●		16.8	5.7	7.6	
NEW 1690TG	●		16.9	5.7	7.6	
NEW 1700TG	●		17.0	5.7	7.6	
NEW 1710TG	●		17.1	5.7	7.6	
NEW 1720TG	●		17.2	5.7	7.6	
NEW 1730TG	●		17.3	5.7	7.6	
NEW 1740TG	●		17.4	5.7	7.6	
NEW 1750TG	●		17.5	6.0	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
NEW 1760TG	●		17.6	6.0	8.1	
NEW 1770TG	●		17.7	6.0	8.1	
NEW 1780TG	●		17.8	6.0	8.1	
NEW 1790TG	●		17.9	6.0	8.1	
NEW 1800TG	●		18.0	6.0	8.1	
NEW 1810TG	●		18.1	6.0	8.1	
NEW 1820TG	●		18.2	6.0	8.1	
NEW 1830TG	●		18.3	6.0	8.1	
NEW 1840TG	●		18.4	6.0	8.1	

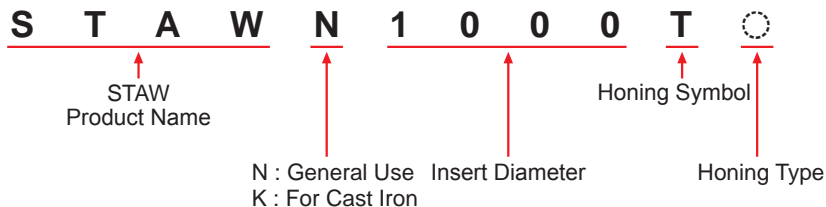
DRILLING

● : 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)



(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 Conditions Hardness	φ10.0-φ12.9		φ13.0-φ13.9		φ14.0-φ15.4		φ15.5-φ18.4	
		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)
	180-280HB	80 (60-100)	0.20 (0.15-0.25)	90 (70-110)	0.25 (0.20-0.30)	100 (80-120)	0.30 (0.25-0.35)	100 (80-120)	0.35 (0.25-0.40)
	280-350HB	70 (60-90)	0.20 (0.15-0.25)	80 (60-100)	0.25 (0.20-0.30)	90 (70-110)	0.25 (0.20-0.30)	90 (70-110)	0.30 (0.20-0.35)
M Stainless Steel	≤200HB	40 (30-50)	0.13 (0.10-0.16)	50 (40-60)	0.15 (0.12-0.18)	60 (50-70)	0.17 (0.14-0.20)	60 (50-70)	0.17 (0.14-0.20)
K Gray Cast Iron	Tensile Strength ≤350MPa	80 (60-100)	0.20 (0.15-0.25)	90 (70-110)	0.25 (0.20-0.30)	100 (80-120)	0.30 (0.25-0.35)	120 (80-140)	0.45 (0.35-0.55)
	Ductile Cast Iron Tensile Strength ≤450MPa	70 (60-90)	0.20 (0.15-0.25)	80 (60-100)	0.25 (0.20-0.30)	90 (70-110)	0.30 (0.25-0.35)	100 (80-120)	0.35 (0.25-0.40)

(Note 1) When using a drill for 1.5D depth of hole, it is possible to increase the feed rate by approx. 20%.

(Note 2) When using the 8D type holder, reduce the cutting speed by approx. 20%.

(Note 3) When using the 8D 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).

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.

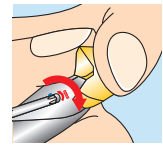
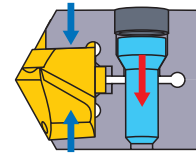
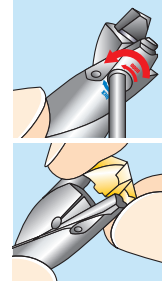
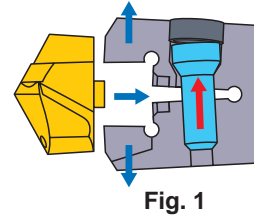
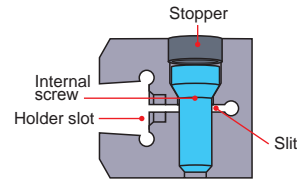
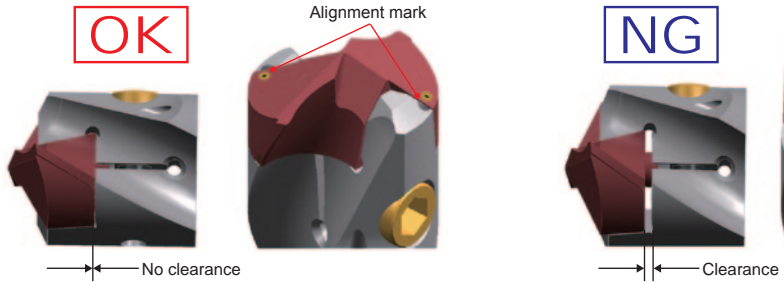


Fig. 2

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.

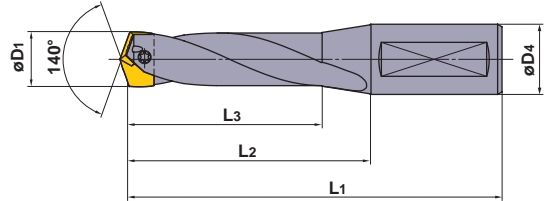
SPARE PARTS

Applicable Holder	Pack Order Number (Internal screw & stopper)		
		Stopper	Internal screw
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.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	◎		

(General Use)



HOLDERS

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)				Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Insert				
		Order Number	Stock	Effective flute length L3	Neck Length L2	Overall Length L1	Shank Dia. D4					Drill Dia. D1 (mm)	Order Number	Stock		
														VP15TF	DP5010	VP10H
14.0 14.4	3	TAWSNH1400S16	▲	51	67	115	16	WS254012T	TKY08W	WPT4405	MK1KS	14.0	TAWNH1400T	▲		
													TAWKH1400TG		▲	
												14.1	TAWNH1410T	▲		
	5	TAWMNH1400S16	▲	80	97	145	16	WS254012T	TKY08W	WPT4405	MK1KS	14.2	TAWNH1420T	▲		
													TAWKH1420TG		▲	
												14.3	TAWNH1430T	▲		
													TAWKH1430TG		▲	
												14.4	TAWNH1440T	▲		
													TAWKH1440TG		▲	
14.5 15.4	3	TAWSNH1500S20	▲	54	75	125	20	WS254013T	TKY08W	WPT4405	MK1KS	14.5	TAWNH1450T	▲		
													TAWKH1450TG		▲	
												14.6	TAWNH1460T	▲		
													TAWKH1460TG		▲	
												14.7	TAWNH1470T	▲		
													TAWKH1470TG		▲	
	5	TAWMNH1500S20	▲	85	105	155	20	WS254013T	TKY08W	WPT4405	MK1KS	14.8	TAWNH1480T	▲		
													TAWKH1480TG		▲	
												14.9	TAWNH1490T	▲		
													TAWKH1490TG		▲	
												15.0	TAWNH1500T	▲		
													TAWKH1500TG		▲	
	8	TAWLNH1500S20	▲	130	148	198	20	WS254013T	TKY08W	WPT4405	MK1KS	15.1	TAWNH1510T	▲		
													TAWKH1510TG		▲	
												15.2	TAWNH1520T	▲		
													TAWKH1520TG		▲	
												15.3	TAWNH1530T	▲		
													TAWKH1530TG		▲	
15.5 16.4	3	TAWSN1600S20	▲	58	80	130	20	WS254014T	TKY08W	WPT4405	MK1KS	15.4	TAWNH1540T	▲		
													TAWKH1540TG		▲	
												15.5	TAWNH1550T	▲		
													TAWKH1550TG		▲	
												15.6	TAWNH1560T	▲		
													TAWKH1560TG		▲	
	5	TAWMN1600S20	▲	91	115	165	20	WS254014T	TKY08W	WPT4405	MK1KS	15.7	TAWNH1570T	▲		
													TAWKH1570TG		▲	
												15.8	TAWNH1580T	▲		
													TAWKH1580TG		▲	
												15.9	TAWNH1590T	▲		
													TAWKH1590TG		▲	
8	TAWLN1600S20	▲	138	158	208	20	WS254014T	TKY08W	WPT4405	MK1KS	16.0	TAWNH1600T	▲			
												TAWKH1600TG		▲		
											16.1	TAWNH1610T	▲			
												TAWKH1610TG		▲		
											16.2	TAWNH1620T	▲			
												TAWKH1620TG		▲		
	TAWNH1630T	▲														
	TAWKH1630TG		▲													
	TAWNH1640T	▲														
	TAWKH1640TG		▲													

(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.
 To be replaced by new products.





INSERT DESCRIPTION > N205
 CUTTING CONDITIONS > N209

USAGE NOTE > N209
 TECHNICAL DATA > Q001

DRILLING(INDEXABLE TYPE)

TAW

CARBIDE





Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)								Insert								
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.					Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Drill Dia. D1 (mm)	Order Number	Stock		
																		VP15TF	DP5010	VP10H
16.5 17.4	3	TAWSN1700S20	▲	61	85	135	20	WS254015T	①TKY08W	WPT4405	MK1KS	16.5	TAWNH1650T	▲						
												TAWKH1650TG		▲						
												16.6	TAWNH1660T	▲						
												TAWKH1660TG		▲						
	5	TAWMN1700S20	▲	96	120	170	20	WS254015T	①TKY08W	WPT4405	MK1KS	16.7	TAWNH1670T	▲						
												TAWKH1670TG		▲						
												16.8	TAWNH1680T	▲						
												TAWKH1680TG		▲						
	8	TAWLN1700S20	▲	146	166	216	20	WS254015T	①TKY08W	WPT4405	MK1KS	16.9	TAWNH1690T	▲						
												TAWKH1690TG		▲						
												17.0	TAWNH1700T	▲						
												TAWKH1700TG		▲						
												17.1	TAWNH1710T	▲						
												TAWKH1710TG		▲						
												17.2	TAWNH1720T	▲						
												TAWKH1720TG		▲						
												17.3	TAWNH1730T	▲						
												TAWKH1730TG		▲						
												17.4	TAWNH1740T	▲						
												TAWKH1740TG		▲						
17.5 18.4	3	TAWSN1800S20	▲	65	90	140	20	WS254016T	①TKY08W	WPT4405	MK1KS	17.5	TAWNH1750T	▲						
												TAWKH1750TG		▲						
												17.6	TAWNH1760T	▲						
												TAWKH1760TG		▲						
	5	TAWMN1800S20	▲	102	125	175	20	WS254016T	①TKY08W	WPT4405	MK1KS	17.7	TAWNH1770T	▲						
												TAWKH1770TG		▲						
												17.8	TAWNH1780T	▲						
												TAWKH1780TG		▲						
	8	TAWLN1800S20	▲	154	174	224	20	WS254016T	①TKY08W	WPT4405	MK1KS	17.9	TAWNH1790T	▲						
												TAWKH1790TG		▲						
												18.0	TAWNH1800T	▲						
												TAWKH1800TG		▲						
												18.1	TAWNH1810T	▲						
												TAWKH1810TG		▲						
												18.2	TAWNH1820T	▲						
												TAWKH1820TG		▲						
												18.3	TAWNH1830T	▲						
												TAWKH1830TG		▲						
												18.4	TAWNH1840T	▲						
												TAWKH1840TG		▲						
18.5 19.4	3	TAWSN1900S25	●	68	99	155	25	WS304517T	②TKY10T	WPT4405	MK1KS	18.5	TAWNH1850T	●		□				
												TAWKH1850TG		●						
												18.6	TAWNH1860T	●		□				
												TAWKH1860TG		●						
	5	TAWMN1900S25	●	107	134	190	25	WS304517T	②TKY10T	WPT4405	MK1KS	18.7	TAWNH1870T	●		□				
												TAWKH1870TG		●						
												18.8	TAWNH1880T	●		□				
												TAWKH1880TG		●						
	8	TAWLN1900S25	●	162	185	241	25	WS304517T	②TKY10T	WPT4405	MK1KS	18.9	TAWNH1890T	●		□				
												TAWKH1890TG		●						
												19.0	TAWNH1900T	●		□				
												TAWKH1900TG		●						
												19.1	TAWNH1910T	●		□				
												TAWKH1910TG		●						
												19.2	TAWNH1920T	●		□				
												TAWKH1920TG		●						
												19.3	TAWNH1930T	●		□				
												TAWKH1930TG		●						
												19.4	TAWNH1940T	●		□				
												TAWKH1940TG		●						

(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.

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

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)								Insert				
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.					Drill Dia. D1 (mm)	Order Number	Stock		
														L3	L2	L1
19.5 20.4	3	TAWSN2000S25	●	72	99	155	25	WS304518T	TKY10T	WPT4405	MK1KS	19.5	TAWNH1950T	●		□
												TAWKH1950TG		●		
												19.6	TAWNH1960T	●		□
												TAWKH1960TG		●		
	5	TAWMN2000S25	●	113	139	195	25	WS304518T	TKY10T	WPT4405	MK1KS	19.7	TAWNH1970T	●		□
												TAWKH1970TG		●		
												19.8	TAWNH1980T	●		□
												TAWKH1980TG		●		
												19.9	TAWNH1990T	●		□
												TAWKH1990TG		●		
												20.0	TAWNH2000T	●		□
												TAWKH2000TG		●		
20.1	TAWNH2010T	□		□												
TAWKH2010TG			□													
8	TAWLN2000S25	●	170	193	249	25	WS304518T	TKY10T	WPT4405	MK1KS	20.2	TAWNH2020T	□		□	
											TAWKH2020TG			□		
											20.3	TAWNH2030T	□		□	
											TAWKH2030TG			□		
20.5 21.4	3	TAWSN2100S25	●	75	99	155	25	WS304518T	TKY10T	WPT4405	MK1KS	20.4	TAWNH2040T	□		□
												TAWKH2040TG			□	
												20.5	TAWNH2050T	●		□
												TAWKH2050TG		●		
	5	TAWMN2100S25	●	118	139	195	25	WS304518T	TKY10T	WPT4405	MK1KS	20.6	TAWNH2060T	□		□
												TAWKH2060TG			□	
												20.7	TAWNH2070T	□		□
												TAWKH2070TG			□	
												20.8	TAWNH2080T	□		□
												TAWKH2080TG			□	
	8	TAWLN2100S25	●	178	202	258	25	WS304518T	TKY10T	WPT4405	MK1KS	20.9	TAWNH2090T	□		□
												TAWKH2090TG			□	
21.0												TAWNH2100T	●		□	
TAWKH2100TG													●			
21.1	TAWNH2110T	□		□												
TAWKH2110TG			□													
21.2	TAWLN2100S25	●	178	202	258	25	WS304518T	TKY10T	WPT4405	MK1KS	21.2	TAWNH2120T	□		□	
											TAWKH2120TG			□		
											21.3	TAWNH2130T	□		□	
											TAWKH2130TG			□		
21.4	TAWNH2140T	□		□												
TAWKH2140TG			□													
21.5 22.4	3	TAWSN2200S25	●	79.3	104.3	160.3	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	TAWNH2150T	●		□
												TAWKH2150TG		●		
												21.6	TAWNH2160T	□		□
												TAWKH2160TG			□	
	5	TAWMN2200S25	●	124.3	144.3	200.3	25	WS355520T	TKY15T	WPT4405	MK1KS	21.7	TAWNH2170T	□		□
												TAWKH2170TG			□	
												21.8	TAWNH2180T	□		□
												TAWKH2180TG			□	
												21.9	TAWNH2190T	□		□
												TAWKH2190TG			□	
	8	TAWLN2200S25	●	186	210	266	25	WS355520T	TKY15T	WPT4405	MK1KS	22.0	TAWNH2200T	●		□
												TAWKH2200TG		●		
22.1												TAWNH2210T	□		□	
TAWKH2210TG														□		
22.2	TAWNH2220T	□		□												
TAWKH2220TG			□													
22.3	TAWLN2200S25	●	186	210	266	25	WS355520T	TKY15T	WPT4405	MK1KS	22.3	TAWNH2230T	□		□	
											TAWKH2230TG			□		
22.4	TAWNH2240T	□		□												
TAWKH2240TG			□													





DRILLING

INSERT DESCRIPTION > N205
 CUTTING CONDITIONS > N209
 USAGE NOTE > N209
 TECHNICAL DATA > Q001

DRILLING(INDEXABLE TYPE)

TAW





CARBIDE

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)								Insert								
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.					Clamp Screw	Wrench	Plate	Anti-seize Lubricant	Drill Dia. D1 (mm)	Order Number	Stock		
																		VP15TF	DP5010	VP10H
22.5 23.4	3	TAWSN2300S25	●	82.3	104.3	160.3	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	TAWNH2250T	●		□				
													TAWKH2250TG		●					
												22.6	TAWNH2260T	□		□				
													TAWKH2260TG		□					
												22.7	TAWNH2270T	□		□				
		TAWKH2270TG		□																
		22.8	TAWNH2280T	□		□														
			TAWKH2280TG		□															
		22.9	TAWNH2290T	□		□														
			TAWKH2290TG		□															
		23.0	TAWNH2300T	●		□														
			TAWKH2300TG		●															
		23.1	TAWNH2310T	□		□														
			TAWKH2310TG		□															
		23.2	TAWNH2320T	□		□														
		TAWKH2320TG		□																
	23.3	TAWNH2330T	□		□															
		TAWKH2330TG		□																
	23.4	TAWNH2340T	□		□															
		TAWKH2340TG		□																
23.5 24.4	3	TAWSN2400S32	●	86.3	110.3	170.3	32	WS355521T	TKY15T	WPT4405	MK1KS	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 25.4	3	TAWSN2500S32	●	88.6	110.6	170.6	32	WS406023T	TKY25T	WPT4405	MK1KS	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		□																

(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.

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)				 Clamp Screw	 Wrench	 Plate	 Anti-seize Lubricant	Insert					
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.					Drill Dia. D1 (mm)	Order Number	Stock			
														VP15TF	DP5010	VP10H	
L3	L2	L1	D4														
25.5 26.4	3	TAWSN2600S32	●	92.6	115.6	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.5	TAWNH2550T	●		□	
													TAWKH2550TG		●		
												25.6	TAWNH2560T	□		□	
													TAWKH2560TG		□		
		5	TAWMN2600S32	●	146.6	170.6	230.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.7	TAWNH2570T	□		□
													TAWKH2570TG		□		
	25.8												TAWNH2580T	□		□	
													TAWKH2580TG		□		
		8	TAWLN2600S32	●	218	248	308	32	WS406024T	TKY25T	WPT4405	MK1KS	25.9	TAWNH2590T	□		□
													TAWKH2590TG		□		
	26.0												TAWNH2600T	●		□	
													TAWKH2600TG		●		
	8	TAWLN2600S32	●	218	248	308	32	WS406024T	TKY25T	WPT4405	MK1KS	26.1	TAWNH2610T	□		□	
												TAWKH2610TG		□			
26.2												TAWNH2620T	□		□		
												TAWKH2620TG		□			
	8	TAWLN2600S32	●	218	248	308	32	WS406024T	TKY25T	WPT4405	MK1KS	26.3	TAWNH2630T	□		□	
												TAWKH2630TG		□			
26.4												TAWNH2640T	□		□		
												TAWKH2640TG		□			
26.5 27.4	3	TAWSN2700S32	●	94.6	115.6	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	TAWNH2650T	●		□	
													TAWKH2650TG		●		
												26.6	TAWNH2660T	□		□	
													TAWKH2660TG		□		
		5	TAWMN2700S32	●	151.6	175.6	235.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.7	TAWNH2670T	□		□
													TAWKH2670TG		□		
	26.8												TAWNH2680T	□		□	
													TAWKH2680TG		□		
		8	TAWLN2700S32	●	226	256	316	32	WS406024T	TKY25T	WPT4405	MK1KS	26.9	TAWNH2690T	□		□
													TAWKH2690TG		□		
	27.0												TAWNH2700T	●		□	
													TAWKH2700TG		●		
	8	TAWLN2700S32	●	226	256	316	32	WS406024T	TKY25T	WPT4405	MK1KS	27.1	TAWNH2710T	□		□	
												TAWKH2710TG		□			
27.2												TAWNH2720T	□		□		
												TAWKH2720TG		□			
	8	TAWLN2700S32	●	226	256	316	32	WS406024T	TKY25T	WPT4405	MK1KS	27.3	TAWNH2730T	□		□	
												TAWKH2730TG		□			
27.4												TAWNH2740T	□		□		
												TAWKH2740TG		□			
27.5 28.4	3	TAWSN2800S32	●	97.2	120.2	180.2	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	TAWNH2750T	●		□	
													TAWKH2750TG		●		
												27.6	TAWNH2760T	□		□	
													TAWKH2760TG		□		
		5	TAWMN2800S32	●	157.2	180.2	240.2	32	WS508026T	TKY27T	WPT4405	MK1KS	27.7	TAWNH2770T	□		□
													TAWKH2770TG		□		
	27.8												TAWNH2780T	□		□	
													TAWKH2780TG		□		
		8	TAWLN2800S32	●	234	264	324	32	WS508026T	TKY27T	WPT4405	MK1KS	27.9	TAWNH2790T	□		□
													TAWKH2790TG		□		
	28.0												TAWNH2800T	●		□	
													TAWKH2800TG		●		
	8	TAWLN2800S32	●	234	264	324	32	WS508026T	TKY27T	WPT4405	MK1KS	28.1	TAWNH2810T	□		□	
												TAWKH2810TG		□			
28.2												TAWNH2820T	□		□		
												TAWKH2820TG		□			
	8	TAWLN2800S32	●	234	264	324	32	WS508026T	TKY27T	WPT4405	MK1KS	28.3	TAWNH2830T	□		□	
												TAWKH2830TG		□			
28.4												TAWNH2840T	□		□		
												TAWKH2840TG		□			





DRILLING

INSERT DESCRIPTION > N205
 CUTTING CONDITIONS > N209
 USAGE NOTE > N209
 TECHNICAL DATA > Q001

DRILLING(INDEXABLE TYPE)

TAW

CARBIDE

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)								Insert					
		Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.					Drill Dia. D1 (mm)	Order Number	Stock			
														L3	L2	L1	D4
28.5 29.4	3	TAWSN2900S32	●	100.2	125.2	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	TAWNH2850T	●		□	
													TAWKH2850TG		●		
												28.6	TAWNH2860T	□		□	
													TAWKH2860TG		□		
		5	TAWMN2900S32	●	162.2	185.2	245.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.7	TAWNH2870T	□		□
													TAWKH2870TG		□		
	28.8												TAWNH2880T	□		□	
													TAWKH2880TG		□		
		8	TAWLN2900S32	●	242	272	332	32	WS508027T	TKY27T	WPT4405	MK1KS	28.9	TAWNH2890T	□		□
													TAWKH2890TG		□		
	29.0												TAWNH2900T	●		□	
													TAWKH2900TG		●		
	8	TAWLN2900S32	●	242	272	332	32	WS508027T	TKY27T	WPT4405	MK1KS	29.1	TAWNH2910T	□		□	
												TAWKH2910TG		□			
29.2												TAWNH2920T	□		□		
												TAWKH2920TG		□			
29.5 30.4	3	TAWSN3000S32	●	104.2	125.2	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.3	TAWNH2930T	□		□	
													TAWKH2930TG		□		
												29.4	TAWNH2940T	□		□	
													TAWKH2940TG		□		
		5	TAWMN3000S32	●	167.2	195.2	255.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	TAWNH2950T	●		□
													TAWKH2950TG		●		
	29.6												TAWNH2960T	□		□	
													TAWKH2960TG		□		
		8	TAWLN3000S32	●	250	285	345	32	WS508027T	TKY27T	WPT4405	MK1KS	29.7	TAWNH2970T	□		□
													TAWKH2970TG		□		
	29.8												TAWNH2980T	□		□	
													TAWKH2980TG		□		
	8	TAWLN3000S32	●	250	285	345	32	WS508027T	TKY27T	WPT4405	MK1KS	29.9	TAWNH2990T	□		□	
												TAWKH2990TG		□			
30.0												TAWNH3000T	●		□		
												TAWKH3000TG		●			
	8	TAWLN3000S32	●	250	285	345	32	WS508027T	TKY27T	WPT4405	MK1KS	30.1	TAWNH3010T	□		□	
												TAWKH3010TG		□			
30.2												TAWNH3020T	□		□		
												TAWKH3020TG		□			
	8	TAWLN3000S32	●	250	285	345	32	WS508027T	TKY27T	WPT4405	MK1KS	30.3	TAWNH3030T	□		□	
												TAWKH3030TG		□			
30.4												TAWNH3040T	□		□		
												TAWKH3040TG		□			

(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).

DRILLING

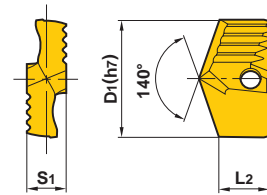
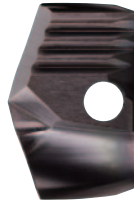
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

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

(1 insert in one case)

INSERTS

H Type



Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
TAWNH1400T	▲		14.0	7.6	5.0	TAWSNH 1400S16
1410T	▲		14.1	7.6	5.0	TAWMNH 1400S16
1420T	▲		14.2	7.6	5.0	TAWLNH 1400S16
1430T	▲		14.3	7.6	5.0	
1440T	▲		14.4	7.6	5.0	
1450T	▲		14.5	7.5	5.0	
1460T	▲		14.6	7.5	5.0	
1470T	▲		14.7	7.5	5.0	TAWSNH 1500S20
1480T	▲		14.8	7.5	5.0	
1490T	▲		14.9	7.5	5.0	TAWMNH 1500S20
1500T	▲		15.0	7.4	5.0	
1510T	▲		15.1	7.4	5.0	TAWLNH 1500S20
1520T	▲		15.2	7.4	5.0	
1530T	▲		15.3	7.4	5.0	
1540T	▲		15.4	7.4	5.0	
1550T	▲		15.5	7.9	6.0	
1560T	▲		15.6	7.9	6.0	
1570T	▲		15.7	7.9	6.0	TAWSN 1600S20
1580T	▲		15.8	7.9	6.0	
1590T	▲		15.9	7.9	6.0	TAWMN 1600S20
1600T	▲		16.0	7.8	6.0	
1610T	▲		16.1	7.8	6.0	TAWLN 1600S20
1620T	▲		16.2	7.8	6.0	
1630T	▲		16.3	7.8	6.0	
1640T	▲		16.4	7.8	6.0	
1650T	▲		16.5	7.7	6.0	
1660T	▲		16.6	7.7	6.0	
1670T	▲		16.7	7.7	6.0	TAWSN 1700S20
1680T	▲		16.8	7.7	6.0	
1690T	▲		16.9	7.7	6.0	TAWMN 1700S20
1700T	▲		17.0	7.6	6.0	
1710T	▲		17.1	7.6	6.0	TAWLN 1700S20
1720T	▲		17.2	7.6	6.0	
1730T	▲		17.3	7.6	6.0	
1740T	▲		17.4	7.6	6.0	
1750T	▲		17.5	7.5	6.0	
1760T	▲		17.6	7.5	6.0	
1770T	▲		17.7	7.5	6.0	TAWSN 1800S20
1780T	▲		17.8	7.5	6.0	
1790T	▲		17.9	7.5	6.0	TAWMN 1800S20
1800T	▲		18.0	7.4	6.0	
1810T	▲		18.1	7.4	6.0	TAWLN 1800S20
1820T	▲		18.2	7.4	6.0	
1830T	▲		18.3	7.4	6.0	
1840T	▲		18.4	7.4	6.0	

Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
TAWNH1850T	●	□	18.5	9.3	7.0	
1860T	●	□	18.6	9.3	7.0	
1870T	●	□	18.7	9.3	7.0	TAWSN 1900S25
1880T	●	□	18.8	9.3	7.0	
1890T	●	□	18.9	9.3	7.0	TAWMN 1900S25
1900T	●	□	19.0	9.2	7.0	
1910T	●	□	19.1	9.2	7.0	TAWLN 1900S25
1920T	●	□	19.2	9.2	7.0	
1930T	●	□	19.3	9.2	7.0	
1940T	●	□	19.4	9.2	7.0	
1950T	●	□	19.5	9.1	7.0	
1960T	●	□	19.6	9.1	7.0	
1970T	●	□	19.7	9.1	7.0	TAWSN 2000S25
1980T	●	□	19.8	9.1	7.0	
1990T	●	□	19.9	9.1	7.0	TAWMN 2000S25
2000T	●	□	20.0	9.0	7.0	
2010T	□	□	20.1	9.0	7.0	TAWLN 2000S25
2020T	□	□	20.2	9.0	7.0	
2030T	□	□	20.3	9.0	7.0	
2040T	□	□	20.4	9.0	7.0	
2050T	●	□	20.5	8.9	7.0	
2060T	□	□	20.6	8.9	7.0	
2070T	□	□	20.7	8.9	7.0	TAWSN 2100S25
2080T	□	□	20.8	8.9	7.0	
2090T	□	□	20.9	8.9	7.0	TAWMN 2100S25
2100T	●	□	21.0	8.8	7.0	
2110T	□	□	21.1	8.8	7.0	TAWLN 2100S25
2120T	□	□	21.2	8.8	7.0	
2130T	□	□	21.3	8.8	7.0	
2140T	□	□	21.4	8.8	7.0	
2150T	●	□	21.5	10.6	8.0	
2160T	□	□	21.6	10.6	8.0	
2170T	□	□	21.7	10.6	8.0	TAWSN 2200S25
2180T	□	□	21.8	10.6	8.0	
2190T	□	□	21.9	10.6	8.0	TAWMN 2200S25
2200T	●	□	22.0	10.5	8.0	
2210T	□	□	22.1	10.5	8.0	TAWLN 2200S25
2220T	□	□	22.2	10.5	8.0	
2230T	□	□	22.3	10.5	8.0	
2240T	□	□	22.4	10.5	8.0	
2250T	●	□	22.5	10.4	8.0	TAWSN 2300S25
2260T	□	□	22.6	10.4	8.0	TAWMN 2300S25
2270T	□	□	22.7	10.4	8.0	TAWLN 2300S25
2280T	□	□	22.8	10.4	8.0	
2290T	□	□	22.9	10.4	8.0	

DRILLING(INDEXABLE TYPE)

TAW

CARBIDE

Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
TAWNH2300T	●	□	23.0	10.3	8.0	TAWSN 2300S25
2310T	□	□	23.1	10.3	8.0	
2320T	□	□	23.2	10.3	8.0	
2330T	□	□	23.3	10.3	8.0	
2340T	□	□	23.4	10.3	8.0	
2350T	●	□	23.5	10.2	8.0	TAWSN 2400S32
2360T	□	□	23.6	10.2	8.0	
2370T	□	□	23.7	10.2	8.0	
2380T	□	□	23.8	10.2	8.0	
2390T	□	□	23.9	10.2	8.0	
2400T	●	□	24.0	10.1	8.0	TAWMN 2400S32
2410T	□	□	24.1	10.1	8.0	
2420T	□	□	24.2	10.1	8.0	
2430T	□	□	24.3	10.1	8.0	
2440T	□	□	24.4	10.1	8.0	
2450T	●	□	24.5	11.7	9.0	TAWSN 2500S32
2460T	□	□	24.6	11.7	9.0	
2470T	□	□	24.7	11.7	9.0	
2480T	□	□	24.8	11.7	9.0	
2490T	□	□	24.9	11.7	9.0	
2500T	●	□	25.0	11.6	9.0	TAWMN 2500S32
2510T	□	□	25.1	11.6	9.0	
2520T	□	□	25.2	11.6	9.0	
2530T	□	□	25.3	11.6	9.0	
2540T	□	□	25.4	11.6	9.0	
2550T	●	□	25.5	11.5	9.0	TAWLN 2500S32
2560T	□	□	25.6	11.5	9.0	
2570T	□	□	25.7	11.5	9.0	
2580T	□	□	25.8	11.5	9.0	
2590T	□	□	25.9	11.5	9.0	
2600T	●	□	26.0	11.4	9.0	TAWSN 2600S32
2610T	□	□	26.1	11.4	9.0	
2620T	□	□	26.2	11.4	9.0	
2630T	□	□	26.3	11.4	9.0	
2640T	□	□	26.4	11.4	9.0	
2650T	●	□	26.5	11.3	9.0	TAWMN 2600S32
2660T	□	□	26.6	11.3	9.0	
2670T	□	□	26.7	11.3	9.0	
2680T	□	□	26.8	11.3	9.0	
2690T	□	□	26.9	11.3	9.0	
2700T	●	□	27.0	11.2	9.0	TAWSN 2700S32
2710T	□	□	27.1	11.2	9.0	
2720T	□	□	27.2	11.2	9.0	
2730T	□	□	27.3	11.2	9.0	
2740T	□	□	27.4	11.2	9.0	

Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF	VP10H	D1	L2	S1	
TAWNH2750T	●	□	27.5	12.3	10.0	TAWSN 2800S32
2760T	□	□	27.6	12.3	10.0	
2770T	□	□	27.7	12.3	10.0	
2780T	□	□	27.8	12.3	10.0	
2790T	□	□	27.9	12.3	10.0	
2800T	●	□	28.0	12.2	10.0	TAWMN 2800S32
2810T	□	□	28.1	12.2	10.0	
2820T	□	□	28.2	12.2	10.0	
2830T	□	□	28.3	12.2	10.0	
2840T	□	□	28.4	12.2	10.0	
2850T	●	□	28.5	12.1	10.0	TAWLN 2800S32
2860T	□	□	28.6	12.1	10.0	
2870T	□	□	28.7	12.1	10.0	
2880T	□	□	28.8	12.1	10.0	
2890T	□	□	28.9	12.1	10.0	
2900T	●	□	29.0	12.0	10.0	TAWSN 2900S32
2910T	□	□	29.1	12.0	10.0	
2920T	□	□	29.2	12.0	10.0	
2930T	□	□	29.3	12.0	10.0	
2940T	□	□	29.4	12.0	10.0	
2950T	●	□	29.5	11.9	10.0	TAWMN 2900S32
2960T	□	□	29.6	11.9	10.0	
2970T	□	□	29.7	11.9	10.0	
2980T	□	□	29.8	11.9	10.0	
2990T	□	□	29.9	11.9	10.0	
3000T	●	□	30.0	11.8	10.0	TAWLN 2900S32
3010T	□	□	30.1	11.8	10.0	
3020T	□	□	30.2	11.8	10.0	
3030T	□	□	30.3	11.8	10.0	
3040T	□	□	30.4	11.8	10.0	

DRILLING

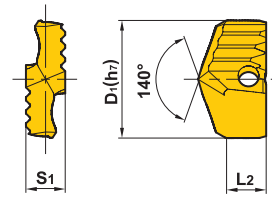
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

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

(1 insert in one case)

INSERTS

**H Type
(Cast Iron)**



Order Number	Stock	Dimensions (mm)			Applicable Holder
	DP5010	D1	L2	S1	
TAWKH1400TG	▲	14.0	7.1	5.0	TAWSNH 1400S16
1410TG	▲	14.1	7.1	5.0	TAWMNH 1400S16
1420TG	▲	14.2	7.1	5.0	TAWLNH 1400S16
1430TG	▲	14.3	7.1	5.0	TAWLNH 1400S16
1440TG	▲	14.4	7.1	5.0	TAWLNH 1400S16
1450TG	▲	14.5	7.0	5.0	
1460TG	▲	14.6	7.0	5.0	
1470TG	▲	14.7	7.0	5.0	TAWSNH 1500S20
1480TG	▲	14.8	7.0	5.0	TAWMNH 1500S20
1490TG	▲	14.9	7.0	5.0	TAWLNH 1500S20
1500TG	▲	15.0	6.9	5.0	TAWLNH 1500S20
1510TG	▲	15.1	6.9	5.0	TAWLNH 1500S20
1520TG	▲	15.2	6.9	5.0	TAWLNH 1500S20
1530TG	▲	15.3	6.9	5.0	TAWLNH 1500S20
1540TG	▲	15.4	6.9	5.0	TAWLNH 1500S20
1550TG	▲	15.5	7.3	6.0	
1560TG	▲	15.6	7.3	6.0	
1570TG	▲	15.7	7.3	6.0	TAWSN 1600S20
1580TG	▲	15.8	7.3	6.0	TAWMN 1600S20
1590TG	▲	15.9	7.3	6.0	TAWMN 1600S20
1600TG	▲	16.0	7.2	6.0	TAWLN 1600S20
1610TG	▲	16.1	7.2	6.0	TAWLN 1600S20
1620TG	▲	16.2	7.2	6.0	TAWLN 1600S20
1630TG	▲	16.3	7.2	6.0	TAWLN 1600S20
1640TG	▲	16.4	7.2	6.0	TAWLN 1600S20
1650TG	▲	16.5	7.1	6.0	
1660TG	▲	16.6	7.1	6.0	
1670TG	▲	16.7	7.1	6.0	TAWSN 1700S20
1680TG	▲	16.8	7.1	6.0	TAWMN 1700S20
1690TG	▲	16.9	7.1	6.0	TAWMN 1700S20
1700TG	▲	17.0	7.0	6.0	TAWLN 1700S20
1710TG	▲	17.1	7.0	6.0	TAWLN 1700S20
1720TG	▲	17.2	7.0	6.0	TAWLN 1700S20
1730TG	▲	17.3	7.0	6.0	TAWLN 1700S20
1740TG	▲	17.4	7.0	6.0	TAWLN 1700S20
1750TG	▲	17.5	6.8	6.0	
1760TG	▲	17.6	6.8	6.0	
1770TG	▲	17.7	6.8	6.0	TAWSN 1800S20
1780TG	▲	17.8	6.8	6.0	TAWMN 1800S20
1790TG	▲	17.9	6.8	6.0	TAWMN 1800S20
1800TG	▲	18.0	6.8	6.0	TAWLN 1800S20
1810TG	▲	18.1	6.8	6.0	TAWLN 1800S20
1820TG	▲	18.2	6.8	6.0	TAWLN 1800S20
1830TG	▲	18.3	6.8	6.0	TAWLN 1800S20
1840TG	▲	18.4	6.8	6.0	TAWLN 1800S20

Order Number	Stock	Dimensions (mm)			Applicable Holder
	DP5010	D1	L2	S1	
TAWKH1850TG	●	18.5	8.6	7.0	
1860TG	●	18.6	8.6	7.0	
1870TG	●	18.7	8.6	7.0	TAWSN 1900S25
1880TG	●	18.8	8.6	7.0	TAWMN 1900S25
1890TG	●	18.9	8.6	7.0	TAWLN 1900S25
1900TG	●	19.0	8.5	7.0	TAWLN 1900S25
1910TG	●	19.1	8.5	7.0	TAWLN 1900S25
1920TG	●	19.2	8.5	7.0	TAWLN 1900S25
1930TG	●	19.3	8.5	7.0	TAWLN 1900S25
1940TG	●	19.4	8.5	7.0	TAWLN 1900S25
1950TG	●	19.5	8.4	7.0	
1960TG	●	19.6	8.4	7.0	
1970TG	●	19.7	8.4	7.0	TAWSN 2000S25
1980TG	●	19.8	8.4	7.0	TAWMN 2000S25
1990TG	●	19.9	8.4	7.0	TAWLN 2000S25
2000TG	●	20.0	8.3	7.0	TAWLN 2000S25
2010TG	□	20.1	8.3	7.0	TAWLN 2000S25
2020TG	□	20.2	8.3	7.0	TAWLN 2000S25
2030TG	□	20.3	8.3	7.0	TAWLN 2000S25
2040TG	□	20.4	8.3	7.0	TAWLN 2000S25
2050TG	●	20.5	8.2	7.0	
2060TG	□	20.6	8.2	7.0	
2070TG	□	20.7	8.2	7.0	TAWSN 2100S25
2080TG	□	20.8	8.2	7.0	TAWMN 2100S25
2090TG	□	20.9	8.2	7.0	TAWLN 2100S25
2100TG	●	21.0	8.1	7.0	TAWLN 2100S25
2110TG	□	21.1	8.1	7.0	TAWLN 2100S25
2120TG	□	21.2	8.1	7.0	TAWLN 2100S25
2130TG	□	21.3	8.1	7.0	TAWLN 2100S25
2140TG	□	21.4	8.1	7.0	TAWLN 2100S25
2150TG	●	21.5	9.8	8.0	
2160TG	□	21.6	9.8	8.0	
2170TG	□	21.7	9.8	8.0	TAWSN 2200S25
2180TG	□	21.8	9.8	8.0	TAWMN 2200S25
2190TG	□	21.9	9.8	8.0	TAWLN 2200S25
2200TG	●	22.0	9.7	8.0	TAWLN 2200S25
2210TG	□	22.1	9.7	8.0	TAWLN 2200S25
2220TG	□	22.2	9.7	8.0	TAWLN 2200S25
2230TG	□	22.3	9.7	8.0	TAWLN 2200S25
2240TG	□	22.4	9.7	8.0	TAWLN 2200S25
2250TG	●	22.5	9.6	8.0	TAWSN 2300S25
2260TG	□	22.6	9.6	8.0	TAWMN 2300S25
2270TG	□	22.7	9.6	8.0	TAWLN 2300S25
2280TG	□	22.8	9.6	8.0	TAWLN 2300S25
2290TG	□	22.9	9.6	8.0	TAWLN 2300S25

DRILLING

DRILLING(INDEXABLE TYPE)

TAW

CARBIDE

Order Number	Stock	Dimensions (mm)			Applicable Holder
	DP5010	D1	L2	S1	
TAWKH2300TG	●	23.0	9.5	8.0	TAWSN 2300S25
2310TG	□	23.1	9.5	8.0	
2320TG	□	23.2	9.5	8.0	
2330TG	□	23.3	9.5	8.0	
2340TG	□	23.4	9.5	8.0	
2350TG	●	23.5	9.4	8.0	TAWMN 2300S25
2360TG	□	23.6	9.4	8.0	
2370TG	□	23.7	9.4	8.0	
2380TG	□	23.8	9.4	8.0	
2390TG	□	23.9	9.4	8.0	
2400TG	●	24.0	9.3	8.0	TAWLN 2300S25
2410TG	□	24.1	9.3	8.0	
2420TG	□	24.2	9.3	8.0	
2430TG	□	24.3	9.3	8.0	
2440TG	□	24.4	9.3	8.0	
2450TG	●	24.5	10.8	9.0	TAWSN 2400S32
2460TG	□	24.6	10.8	9.0	
2470TG	□	24.7	10.8	9.0	
2480TG	□	24.8	10.8	9.0	
2490TG	□	24.9	10.8	9.0	
2500TG	●	25.0	10.7	9.0	TAWMN 2400S32
2510TG	□	25.1	10.7	9.0	
2520TG	□	25.2	10.7	9.0	
2530TG	□	25.3	10.7	9.0	
2540TG	□	25.4	10.7	9.0	
2550TG	●	25.5	10.6	9.0	TAWLN 2500S32
2560TG	□	25.6	10.6	9.0	
2570TG	□	25.7	10.6	9.0	
2580TG	□	25.8	10.6	9.0	
2590TG	□	25.9	10.6	9.0	
2600TG	●	26.0	10.5	9.0	TAWSN 2600S32
2610TG	□	26.1	10.5	9.0	
2620TG	□	26.2	10.5	9.0	
2630TG	□	26.3	10.5	9.0	
2640TG	□	26.4	10.5	9.0	
2650TG	●	26.5	10.4	9.0	TAWMN 2600S32
2660TG	□	26.6	10.4	9.0	
2670TG	□	26.7	10.4	9.0	
2680TG	□	26.8	10.4	9.0	
2690TG	□	26.9	10.4	9.0	
2700TG	●	27.0	10.3	9.0	TAWLN 2700S32
2710TG	□	27.1	10.3	9.0	
2720TG	□	27.2	10.3	9.0	
2730TG	□	27.3	10.3	9.0	
2740TG	□	27.4	10.3	9.0	

Order Number	Stock	Dimensions (mm)			Applicable Holder
	DP5010	D1	L2	S1	
TAWKH2750TG	●	27.5	11.3	10.0	TAWSN 2800S32
2760TG	□	27.6	11.3	10.0	
2770TG	□	27.7	11.3	10.0	
2780TG	□	27.8	11.3	10.0	
2790TG	□	27.9	11.3	10.0	
2800TG	●	28.0	11.2	10.0	TAWMN 2800S32
2810TG	□	28.1	11.2	10.0	
2820TG	□	28.2	11.2	10.0	
2830TG	□	28.3	11.2	10.0	
2840TG	□	28.4	11.2	10.0	
2850TG	●	28.5	11.1	10.0	TAWLN 2800S32
2860TG	□	28.6	11.1	10.0	
2870TG	□	28.7	11.1	10.0	
2880TG	□	28.8	11.1	10.0	
2890TG	□	28.9	11.1	10.0	
2900TG	●	29.0	11.0	10.0	TAWSN 2900S32
2910TG	□	29.1	11.0	10.0	
2920TG	□	29.2	11.0	10.0	
2930TG	□	29.3	11.0	10.0	
2940TG	□	29.4	11.0	10.0	
2950TG	●	29.5	10.9	10.0	TAWMN 2900S32
2960TG	□	29.6	10.9	10.0	
2970TG	□	29.7	10.9	10.0	
2980TG	□	29.8	10.9	10.0	
2990TG	□	29.9	10.9	10.0	
3000TG	●	30.0	10.8	10.0	TAWLN 3000S32
3010TG	□	30.1	10.8	10.0	
3020TG	□	30.2	10.8	10.0	
3030TG	□	30.3	10.8	10.0	
3040TG	□	30.4	10.8	10.0	

DRILLING

● : 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)

RECOMMENDED CUTTING CONDITIONS

Work Material	Drill Diameter Conditions Hardness	φ14.0—φ15.4		φ15.5—φ18.4		φ18.5—φ21.4	
		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	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)
	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)
	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)
	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		φ24.5—φ27.4		φ27.5—φ30.4	
		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	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)
	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)
	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)
	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 8D type holder, reduce the cutting speed by approx. 20%.

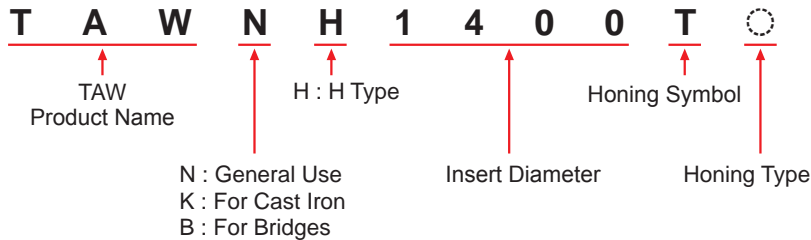
(Note 2) When using the 8D type holder, it is recommended to drill a pilot guide hole.

(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)



(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)

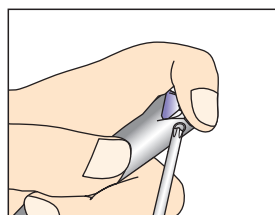


Fig. 1

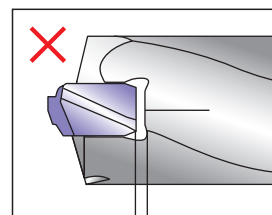
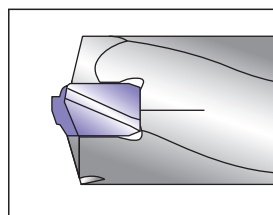


Fig. 2

INSERT REPLACEMENT

- Thoroughly clean the serrations of the holder before installing a new insert.
Remove heavy dirt in the holder serrations by using the cleaning plate provided.

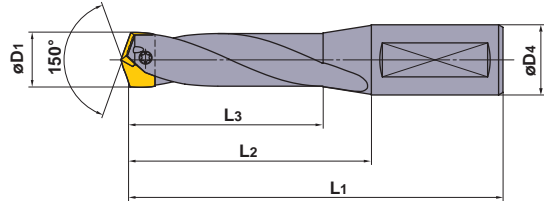
DRILLING(INDEXABLE TYPE)

TAW

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎					

(For Bridge Construction)



HOLDERS

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder		Insert			Dimensions (mm)				Clamp Screw	Wrench	Plate	Anti-seize Lubricant
		Order Number	Stock	Drill Dia. D1 (mm)	Order Number	Stock	Effective flute length	Neck Length	Overall Length	Shank Dia.				
24.5	3	TAWSB2500S32	●	24.5	TAWBH2450T	●	88.6	110.6	170.6	32	WS406023T	TKY25T	WPT4405	MK1KS
24.6	5	TAWMB2500S32	□	24.6	TAWBH2460T	□	140.6	165.6	225.6	32	WS406023T	TKY25T	WPT4405	MK1KS
24.7				24.7	TAWBH2470T	●								
26.5	3	TAWSB2700S32	●	26.5	TAWBH2650T	□	94.6	115.6	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS
26.7	5	TAWMB2700S32	□	26.7	TAWB2670T	●	151.6	175.6	235.6	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	Dimensions (mm)			Applicable Holder	Hone Width (mm)	Geometry
			D1	L2	S1			
	TAWBH2450T	●	24.5	11.7	9.0	TAWSB2500S32 TAWMB2500S32	0.20-0.25	
	2460T	□	24.6	11.7	9.0			
	2470T	●	24.7	11.7	9.0			
	2650T	□	26.5	11.3	9.0	TAWSB2700S32 TAWMB2700S32		
	2670T	●	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	φ24.5, φ24.6, φ24.7		φ26.5, φ26.7		
		Conditions	Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P Structural Steel	Hardness	Tensile Strength ≦400-500MPa	70 (60-80)	0.30 (0.25-0.35)	70 (60-80)	0.30 (0.25-0.35)
		Tensile Strength ≦490-610MPa	65 (55-75)	0.30 (0.25-0.35)	65 (55-75)	0.30 (0.25-0.35)
		Tensile Strength ≦570-720MPa	60 (50-70)	0.30 (0.25-0.35)	60 (50-70)	0.30 (0.25-0.35)

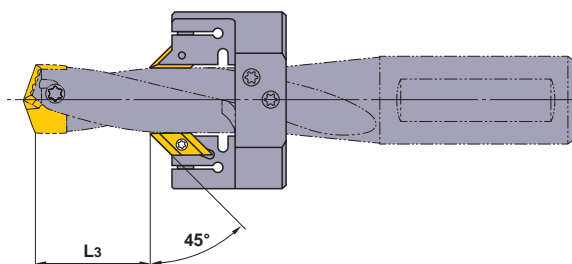
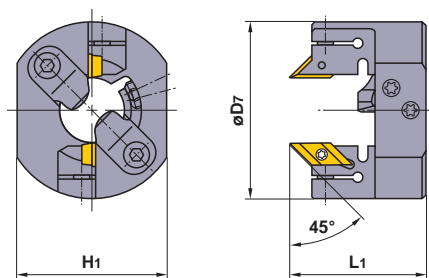
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

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

CHAMFER RING

- Drilling and chamfering can be done at the same time.
- Chamfering position can be changed according to the machining depth.
- Maximum chamfer width: 4mm







CARBIDE



Tool Holder Number	Stock	Dimensions (mm)			Maximum chamfer width	Drilled Depth L3 (min.—max.)			Suitable TAW Type Drill
		L1	D7	H1		TAWS	TAWM	TAWL	
TAW200R-90	▲	40	53	44	4	12—29	29—70	70—127	TAWS/M/L/N2000S25
210R-90	▲	40	54	46	4	12—32	32—75	75—135	TAWS/M/L/N2100S25
220R-90	▲	40	55	46	4	14—36	36—81	81—143	TAWS/M/L/N2200S25
230R-90	▲	40	56	48	4	14—39	39—86	86—151	TAWS/M/L/N2300S25
240R-90	▲	40	57	48	4	14—43	43—92	92—159	TAWS/M/L/N2400S32
250R-90	▲	42	58	50	4	15—43	43—95	95—165	TAWS/M/L/N2500S32
260R-90	▲	42	59	50	4	15—47	47—101	101—173	TAWS/M/L/N2600S32
270R-90	▲	42	60	52	4	15—49	49—106	106—181	TAWS/M/L/N2700S32
280R-90	▲	42	61	52	4	15—52	52—112	112—189	TAWS/M/L/N2800S32
290R-90	▲	45	62	54	4	15—52	52—114	114—194	TAWS/M/L/N2900S32
300R-90	▲	45	63	54	4	15—56	56—119	119—202	TAWS/M/L/N3000S32

(Note) For cutting conditions, refer to the recommended cutting conditions for the TAW drill on N211.
If tears or vibrations occur, reduce the feed or cutting speed.

SPARE PARTS


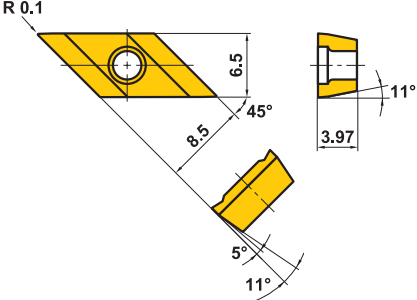
Tool Holder Number							Insert
	Clamp Screw (Insert)	Guide Plate	Screw (Guide Plate)	Set screw (Chamfer Ring)	Run-out adjust Screw	Wrench	
TAW200R-90	TS254	TAWP20-21	HSC04008	TSR06011S	TSR05008S		TAWC12T301-45GM
210R-90	TS254	TAWP20-21	HSC04008	TSR06011S	TSR05008S		
220R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S		
230R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S		
240R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S	①TKY20R	
250R-90	TS254	TAWP25-26	HSC04008	TSR06011S	TSR05008S	①TKY10R	
260R-90	TS254	TAWP25-26	HSC04008	TSR06011S	TSR05008S	②TKY08F	
270R-90	TS254	TAWP27-28	HSC04008	TSR06011S	TSR05008S		
280R-90	TS254	TAWP27-28	HSC04008	TSR06011S	TSR05008S		
290R-90	TS254	TAWP29-30	HSC04008	TSR06011S	TSR05008S		
300R-90	TS254	TAWP29-30	HSC04008	TSR06011S	TSR05008S		

(Note) The above parts are provided with the chamfer ring except insert.

CHAMFER RING

CARBIDE

INSERTS

Shape	Order Number	Stock	Geometry
		VP15TF	
	TAWC12T301-45GM	●	

CHAMFER RING INSTALLATION

- 1 Loosen the set screws (A) and clearance adjust screw (B) on the chamfer ring.
- 2 Install the chamfering insert on the chamfer ring.
- 3 Put the chamfer ring on from the front of the drill. Remove the TAW drill insert or clamp screw beforehand.
- 4 Ensure that the TAW drill insert is securely located using the clamp screw.
- 5 Fasten the 2 set screws (A) on the chamfer ring to attach it to the drill as shown in fig. 1.
 - Note : The guide plate of the chamfer ring should be fixed on the back (left) side of the TAW drill flute.
- 6 Tighten the adjust screw (B) until the chamfering insert comes into contact with the TAW drill as shown in fig. 2.
 - Note : Stop when the chamfering insert contacts the TAW drill.
 - If the screw is overtightened, the chamfering insert may be damaged.
 - (Clamp Torque (Guide) : 3.0–3.5N • m)

Fig. 1

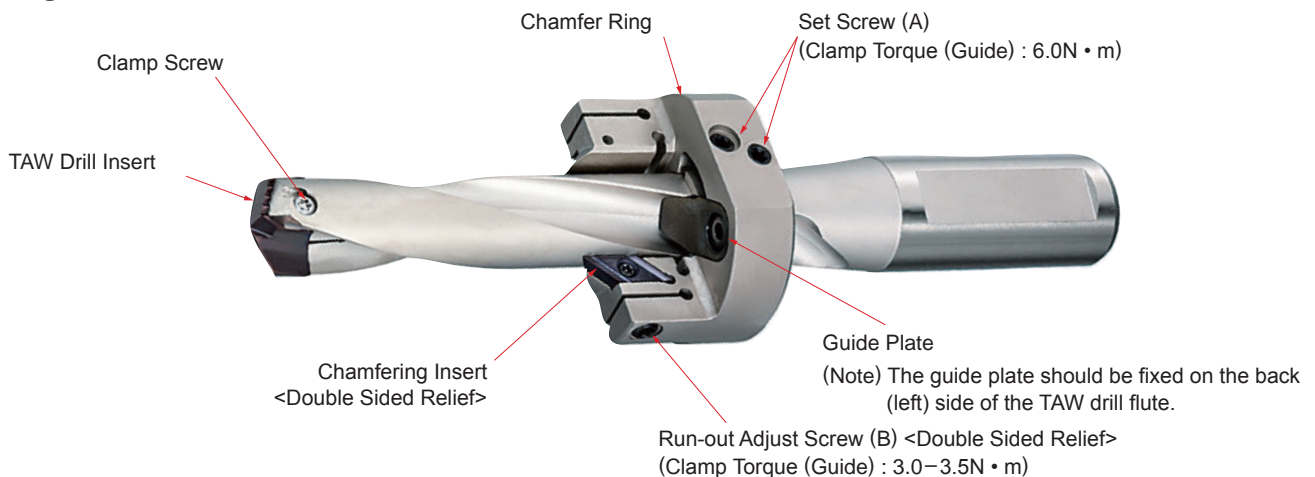
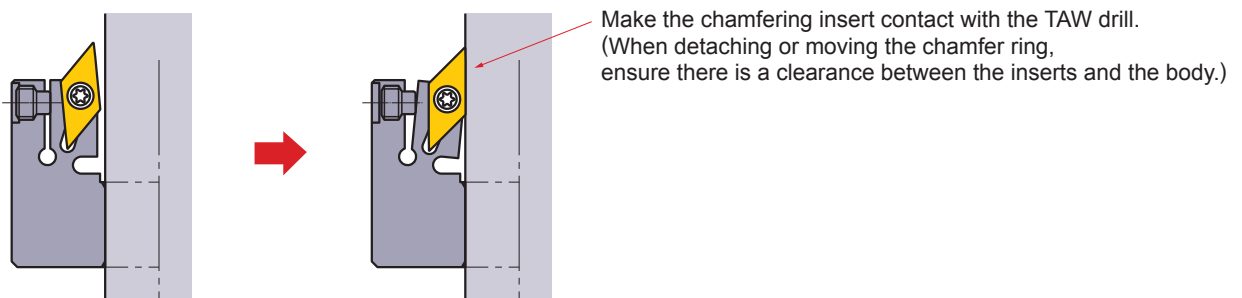


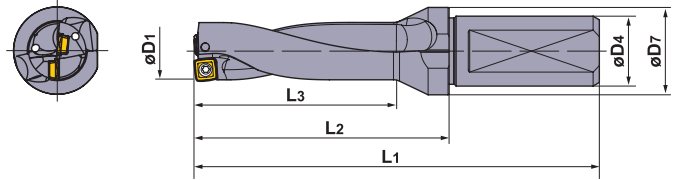
Fig. 2



● : Inventory maintained in Japan.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	◎		

	Machining tolerance (guide)(mm)
I/d=2-3	+ 0.25 0.00
I/d=4-5	+ 0.35 0.00
I/d=6	+ 0.45 0.00



Drill Dia. D1 (mm)	Hole Depth (I/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)					Amount of radial adjustment (max)	Insert Number		
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter				
					L3	L2	L1	D4	D7			Clamp Screw	Wrench
17.0	2	MVX1700X2F20	●	2	41	56	99	20	25	0.5	SOMX063005-UM	TPS25	TIP07F
	3	1700X3F20	●	2	58	73	116	20	25	0.5	063005-UM	TPS25	TIP07F
	4	1700X4F20	●	2	75	90	133	20	25	0.5	063005-UM	TPS25	TIP07F
	5	1700X5F20	●	2	92	107	150	20	25	0.5	063005-UM	TPS25	TIP07F
	6	1700X6F20	●	2	109	124	167	20	25	0.5	063005-UM	TPS25	TIP07F
17.5	2	1750X2F25	●	2	42	62	112	25	32	0.45	063005-UM	TPS25	TIP07F
	3	1750X3F25	●	2	59.5	79.5	129.5	25	32	0.45	063005-UM	TPS25	TIP07F
	4	1750X4F25	●	2	77	97	147	25	32	0.45	063005-UM	TPS25	TIP07F
	5	1750X5F25	●	2	94.5	114.5	164.5	25	32	0.45	063005-UM	TPS25	TIP07F
	6	1750X6F25	●	2	112	132	182	25	32	0.45	063005-UM	TPS25	TIP07F
18.0	2	1800X2F25	●	2	43	63	113	25	32	0.4	063005-UM	TPS25	TIP07F
	3	1800X3F25	●	2	61	81	131	25	32	0.4	063005-UM	TPS25	TIP07F
	4	1800X4F25	●	2	79	99	149	25	32	0.4	063005-UM	TPS25	TIP07F
	5	1800X5F25	●	2	97	117	167	25	32	0.4	063005-UM	TPS25	TIP07F
	6	1800X6F25	●	2	115	135	185	25	32	0.4	063005-UM	TPS25	TIP07F
18.5	2	1850X2F25	●	2	44	64	114	25	32	0.35	063005-UM	TPS25	TIP07F
	3	1850X3F25	●	2	62.5	82.5	132.5	25	32	0.35	063005-UM	TPS25	TIP07F
	4	1850X4F25	●	2	81	101	151	25	32	0.35	063005-UM	TPS25	TIP07F
	5	1850X5F25	●	2	99.5	119.5	169.5	25	32	0.35	063005-UM	TPS25	TIP07F
	6	1850X6F25	●	2	118	138	188	25	32	0.35	063005-UM	TPS25	TIP07F
19.0	2	1900X2F25	●	2	45	65	115	25	32	0.3	063005-UM	TPS25	TIP07F
	3	1900X3F25	●	2	64	84	134	25	32	0.3	063005-UM	TPS25	TIP07F
	4	1900X4F25	●	2	83	103	153	25	32	0.3	063005-UM	TPS25	TIP07F
	5	1900X5F25	●	2	102	122	172	25	32	0.3	063005-UM	TPS25	TIP07F
	6	1900X6F25	●	2	121	141	191	25	32	0.3	063005-UM	TPS25	TIP07F
19.5	2	1950X2F25	●	2	46	66	116	25	32	0.25	063005-UM	TPS25	TIP07F
	3	1950X3F25	●	2	65.5	85.5	135.5	25	32	0.25	063005-UM	TPS25	TIP07F
	4	1950X4F25	●	2	85	105	155	25	32	0.25	063005-UM	TPS25	TIP07F
	5	1950X5F25	●	2	104.5	124.5	174.5	25	32	0.25	063005-UM	TPS25	TIP07F
	6	1950X6F25	●	2	124	144	194	25	32	0.25	063005-UM	TPS25	TIP07F
20.0	2	2000X2F25	●	2	47	67	117	25	32	0.6	073505-UM	TPS3	TIP10F
	3	2000X3F25	●	2	67	87	137	25	32	0.6	073505-UM	TPS3	TIP10F
	4	2000X4F25	●	2	87	107	157	25	32	0.6	073505-UM	TPS3	TIP10F
	5	2000X5F25	●	2	107	127	177	25	32	0.6	073505-UM	TPS3	TIP10F
	6	2000X6F25	●	2	127	147	197	25	32	0.6	073505-UM	TPS3	TIP10F

INSERT DESCRIPTION > N215

CUTTING CONDITIONS > N216

USAGE NOTE

> N224



TECHNICAL DATA

> Q001

DRILLING(INDEXABLE TYPE)



MVX NEW

CARBIDE


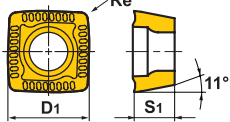
Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)					Amount of radial adjustment (max)	Insert Number		
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter				
					L3	L2	L1	D4	D7				
20.5	2	MVX2050X2F25	●	2	48	68	118	25	32	0.55	SOMX073505-UM	TPS3	TIP10F
	3	2050X3F25	●	2	68.5	88.5	138.5	25	32	0.55	073505-UM	TPS3	TIP10F
21.0	2	2100X2F25	●	2	49	69	119	25	32	0.5	073505-UM	TPS3	TIP10F
	3	2100X3F25	●	2	70	90	140	25	32	0.5	073505-UM	TPS3	TIP10F
	4	2100X4F25	●	2	91	111	161	25	32	0.5	073505-UM	TPS3	TIP10F
	5	2100X5F25	●	2	112	132	182	25	32	0.5	073505-UM	TPS3	TIP10F
	6	2100X6F25	●	2	133	153	203	25	32	0.5	073505-UM	TPS3	TIP10F
21.5	2	2150X2F25	●	2	50	70	120	25	32	0.45	073505-UM	TPS3	TIP10F
	3	2150X3F25	●	2	71.5	91.5	141.5	25	32	0.45	073505-UM	TPS3	TIP10F
22.0	2	2200X2F25	●	2	51	71	121	25	32	0.4	073505-UM	TPS3	TIP10F
	3	2200X3F25	●	2	73	93	143	25	32	0.4	073505-UM	TPS3	TIP10F
	4	2200X4F25	●	2	95	115	165	25	32	0.4	073505-UM	TPS3	TIP10F
	5	2200X5F25	●	2	117	137	187	25	32	0.4	073505-UM	TPS3	TIP10F
	6	2200X6F25	●	2	139	159	209	25	32	0.4	073505-UM	TPS3	TIP10F
22.5	2	2250X2F25	●	2	52	72	122	25	32	0.35	073505-UM	TPS3	TIP10F
	3	2250X3F25	●	2	74.5	94.5	144.5	25	32	0.35	073505-UM	TPS3	TIP10F
23.0	2	2300X2F25	●	2	53	73	123	25	32	0.8	084005-UM	TPS351	TIP10F
	3	2300X3F25	●	2	76	96	146	25	32	0.8	084005-UM	TPS351	TIP10F
	4	2300X4F25	●	2	99	119	169	25	32	0.8	084005-UM	TPS351	TIP10F
	5	2300X5F25	●	2	122	142	192	25	32	0.8	084005-UM	TPS351	TIP10F
	6	2300X6F25	●	2	145	165	215	25	32	0.8	084005-UM	TPS351	TIP10F
23.5	2	2350X2F25	●	2	54	74	124	25	32	0.75	084005-UM	TPS351	TIP10F
	3	2350X3F25	●	2	77.5	97.5	147.5	25	32	0.75	084005-UM	TPS351	TIP10F
24.0	2	2400X2F25	●	2	55	75	125	25	32	0.7	084005-UM	TPS351	TIP10F
	3	2400X3F25	●	2	79	99	149	25	32	0.7	084005-UM	TPS351	TIP10F
	4	2400X4F25	●	2	103	123	173	25	32	0.7	084005-UM	TPS351	TIP10F
	5	2400X5F25	●	2	127	147	197	25	32	0.7	084005-UM	TPS351	TIP10F
	6	2400X6F25	●	2	151	171	221	25	32	0.7	084005-UM	TPS351	TIP10F
24.5	2	2450X2F25	●	2	56	76	126	25	32	0.65	084005-UM	TPS351	TIP10F
	3	2450X3F25	●	2	80.5	100.5	150.5	25	32	0.65	084005-UM	TPS351	TIP10F
25.0	2	2500X2F25	●	2	57	77	127	25	32	0.6	084005-UM	TPS351	TIP10F
	3	2500X3F25	●	2	82	102	152	25	32	0.6	084005-UM	TPS351	TIP10F
	4	2500X4F25	●	2	107	127	177	25	32	0.6	084005-UM	TPS351	TIP10F
	5	2500X5F25	●	2	132	152	202	25	32	0.6	084005-UM	TPS351	TIP10F
	6	2500X6F25	●	2	157	177	227	25	32	0.6	084005-UM	TPS351	TIP10F
25.5	2	2550X2F25	●	2	58	78	128	25	32	0.6	084005-UM	TPS351	TIP10F
	3	2550X3F25	●	2	83.5	103.5	153.5	25	32	0.6	084005-UM	TPS351	TIP10F
26.0	2	2600X2F32	●	2	59	79	134	32	42	0.5	084005-UM	TPS351	TIP10F
	3	2600X3F32	●	2	85	105	160	32	42	0.5	084005-UM	TPS351	TIP10F
	4	2600X4F32	●	2	111	131	186	32	42	0.5	084005-UM	TPS351	TIP10F
	5	2600X5F32	●	2	137	157	212	32	42	0.5	084005-UM	TPS351	TIP10F
	6	2600X6F32	●	2	163	183	238	32	42	0.5	084005-UM	TPS351	TIP10F
26.5	2	2650X2F32	●	2	60	80	135	32	42	0.5	084005-UM	TPS351	TIP10F
	3	2650X3F32	●	2	86.5	106.5	161.5	32	42	0.5	084005-UM	TPS351	TIP10F
27.0	2	2700X2F32	●	2	61	81	136	32	42	0.45	084005-UM	TPS351	TIP10F
	3	2700X3F32	●	2	88	108	163	32	42	0.45	084005-UM	TPS351	TIP10F
	4	2700X4F32	●	2	115	135	190	32	42	0.45	084005-UM	TPS351	TIP10F
	5	2700X5F32	●	2	142	162	217	32	42	0.45	084005-UM	TPS351	TIP10F
	6	2700X6F32	●	2	169	189	244	32	42	0.45	084005-UM	TPS351	TIP10F

DRILLING

● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)					Amount of radial adjustment (max)	Insert Number		
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter				
					L3	L2	L1	D4	D7				
27.5	2	MVX2750X2F32	●	2	62	82	137	32	42	0.4	SOMX084005-UM	TPS351	TIP10F
	3	2750X3F32	●	2	89.5	109.5	164.5	32	42	0.4	084005-UM	TPS351	TIP10F
28.0	2	2800X2F32	●	2	63	83	138	32	42	0.85	094506-UM	TPS4	TIP15W
	3	2800X3F32	●	2	91	111	166	32	42	0.85	094506-UM	TPS4	TIP15W
	4	2800X4F32	●	2	119	139	194	32	42	0.85	094506-UM	TPS4	TIP15W
	5	2800X5F32	●	2	147	167	222	32	42	0.85	094506-UM	TPS4	TIP15W
	6	2800X6F32	●	2	175	195	250	32	42	0.85	094506-UM	TPS4	TIP15W
28.5	2	2850X2F32	●	2	64	84	139	32	42	0.8	094506-UM	TPS4	TIP15W
	3	2850X3F32	●	2	92.5	112.5	167.5	32	42	0.8	094506-UM	TPS4	TIP15W
29.0	2	2900X2F32	●	2	65	85	140	32	42	0.75	094506-UM	TPS4	TIP15W
	3	2900X3F32	●	2	94	114	169	32	42	0.75	094506-UM	TPS4	TIP15W
	4	2900X4F32	●	2	123	143	198	32	42	0.75	094506-UM	TPS4	TIP15W
	5	2900X5F32	●	2	152	172	227	32	42	0.75	094506-UM	TPS4	TIP15W
	6	2900X6F32	●	2	181	201	256	32	42	0.75	094506-UM	TPS4	TIP15W
29.5	2	2950X2F32	●	2	66	86	141	32	42	0.7	094506-UM	TPS4	TIP15W
	3	2950X3F32	●	2	95.5	115.5	170.5	32	42	0.7	094506-UM	TPS4	TIP15W
30.0	2	3000X2F32	●	2	67	87	142	32	42	0.65	094506-UM	TPS4	TIP15W
	3	3000X3F32	●	2	97	117	172	32	42	0.65	094506-UM	TPS4	TIP15W
	4	3000X4F32	●	2	127	147	202	32	42	0.65	094506-UM	TPS4	TIP15W
	5	3000X5F32	●	2	157	177	232	32	42	0.65	094506-UM	TPS4	TIP15W
	6	3000X6F32	●	2	187	207	262	32	42	0.65	094506-UM	TPS4	TIP15W
30.5	3	3050X3F32	●	2	98.5	118.5	173.5	32	42	0.6	094506-UM	TPS4	TIP15W
31.0	2	3100X2F40	●	2	69	89	154	40	50	0.55	094506-UM	TPS4	TIP15W
	3	3100X3F40	●	2	100	120	185	40	50	0.55	094506-UM	TPS4	TIP15W
	4	3100X4F40	●	2	131	151	216	40	50	0.55	094506-UM	TPS4	TIP15W
	5	3100X5F40	●	2	162	182	247	40	50	0.55	094506-UM	TPS4	TIP15W
	6	3100X6F40	●	2	193	213	278	40	50	0.55	094506-UM	TPS4	TIP15W
31.5	3	3150X3F40	●	2	101.5	121.5	186.5	40	50	0.55	094506-UM	TPS4	TIP15W
32.0	2	3200X2F40	●	2	71	91	156	40	50	0.45	094506-UM	TPS4	TIP15W
	3	3200X3F40	●	2	103	123	188	40	50	0.45	094506-UM	TPS4	TIP15W
	4	3200X4F40	●	2	135	155	220	40	50	0.45	094506-UM	TPS4	TIP15W
	5	3200X5F40	●	2	167	187	252	40	50	0.45	094506-UM	TPS4	TIP15W
	6	3200X6F40	●	2	199	219	284	40	50	0.45	094506-UM	TPS4	TIP15W
32.5	3	3250X3F40	●	2	104.5	124.5	189.5	40	50	0.45	094506-UM	TPS4	TIP15W
33.0	2	3300X2F40	●	2	73	93	158	40	50	0.4	094506-UM	TPS4	TIP15W
	3	3300X3F40	●	2	106	126	191	40	50	0.4	094506-UM	TPS4	TIP15W
	4	3300X4F40	●	2	139	159	224	40	50	0.4	094506-UM	TPS4	TIP15W
	5	3300X5F40	●	2	172	192	257	40	50	0.4	094506-UM	TPS4	TIP15W
	6	3300X6F40	●	2	205	225	290	40	50	0.4	094506-UM	TPS4	TIP15W

INSERTS

Shape	Drill Dia.	Insert Number	Dimensions (mm)			Stock			Geometry
			D1	S1	Re	VP15TF	MC1020	MC5020	
	ø17-ø19.5	SOMX063005-UM	6	3	0.5	●	●	●	
	ø20-ø22.5	073505-UM	7	3.5	0.5	●	●	●	
	ø23-ø27.5	084005-UM	8.3	4	0.5	●	●	●	
	ø28-ø33	094506-UM	9.7	4.5	0.6	●	●	●	

*MC1020 and MC5020 are for the outer insert only.

CUTTING CONDITIONS > N216
 USAGE NOTE > N224
 TECHNICAL DATA > Q001

DRILLING(INDEXABLE TYPE)



CARBIDE

RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Recommended grade		φ17-φ19.5				φ20-φ23.5				
				Cutting Speed (m/min)	Feed (mm/rev)			Cutting Speed (m/min)	Feed (mm/rev)			
					Outer	Inner	l/d=2-6		l/d=2, 3	l/d=4, 5	l/d=6	l/d=2-6
P Mild Steel	≤180HB	MC1020	VP15TF	200 (180-235)	0.05 (0.04-0.06)	0.05 (0.04-0.06)	0.04 (0.04-0.05)	200 (180-235)	0.06 (0.04-0.08)	0.06 (0.04-0.07)	0.04 (0.04-0.05)	
	Carbon Steel Alloy Steel	180-280HB	MC1020	VP15TF	140 (115-180)	0.08 (0.06-0.14)	0.08 (0.06-0.09)	0.05 (0.04-0.06)	140 (115-180)	0.10 (0.06-0.18)	0.09 (0.06-0.12)	0.07 (0.06-0.08)
	Carbon Steel Alloy Steel	280-350HB	MC1020	VP15TF	100 (75-140)	0.08 (0.06-0.14)	0.08 (0.06-0.09)	0.05 (0.04-0.06)	100 (75-140)	0.10 (0.06-0.18)	0.09 (0.06-0.12)	0.07 (0.06-0.08)
	Alloy tool steel	≤350HB	MC1020	VP15TF	135 (100-170)	0.08 (0.06-0.14)	0.08 (0.06-0.09)	0.05 (0.04-0.06)	135 (100-170)	0.10 (0.06-0.18)	0.09 (0.06-0.12)	0.07 (0.06-0.08)
M Austenitic Stainless Steel	≤200HB	MC1020	VP15TF	140 (115-180)	0.06 (0.04-0.08)	0.05 (0.04-0.06)	0.04 (0.04-0.05)	140 (115-180)	0.08 (0.06-0.12)	0.07 (0.06-0.08)	0.06 (0.06-0.07)	
	Austenitic Stainless Steel	>200HB	MC1020	VP15TF	140 (115-180)	0.06 (0.04-0.08)	0.05 (0.04-0.06)	0.04 (0.04-0.05)	140 (115-180)	0.08 (0.06-0.12)	0.07 (0.06-0.08)	0.06 (0.06-0.07)
	Ferritic, Precipitation hardening stainless steel	≤200HB	MC1020	VP15TF	140 (115-165)	0.06 (0.04-0.08)	0.05 (0.04-0.06)	0.04 (0.04-0.05)	140 (115-165)	0.09 (0.06-0.14)	0.07 (0.06-0.09)	0.06 (0.06-0.07)
	Ferritic, Precipitation hardening stainless steel	>200HB	MC1020	VP15TF	140 (115-165)	0.06 (0.04-0.08)	0.05 (0.04-0.06)	0.04 (0.04-0.05)	140 (115-165)	0.09 (0.06-0.14)	0.07 (0.06-0.09)	0.06 (0.06-0.07)
K Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	VP15TF	160 (130-195)	0.11 (0.08-0.14)	0.09 (0.08-0.10)	0.05 (0.04-0.06)	160 (130-195)	0.14 (0.10-0.18)	0.10 (0.10-0.12)	0.07 (0.06-0.08)	
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	VP15TF	100 (80-135)	0.11 (0.08-0.14)	0.09 (0.08-0.10)	0.05 (0.04-0.06)	100 (80-135)	0.13 (0.10-0.16)	0.10 (0.10-0.11)	0.07 (0.06-0.08)
	Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020	VP15TF	100 (70-125)	0.11 (0.08-0.14)	0.09 (0.08-0.10)	0.05 (0.04-0.06)	100 (70-125)	0.13 (0.10-0.16)	0.10 (0.10-0.11)	0.07 (0.06-0.08)
Work Material	Hardness	Recommended grade		φ24-φ29.5				φ30-φ33				
				Cutting Speed (m/min)	Feed (mm/rev)			Cutting Speed (m/min)	Feed (mm/rev)			
					Outer	Inner	l/d=2-6		l/d=2, 3	l/d=4, 5	l/d=6	l/d=2-6
P Mild Steel	≤180HB	MC1020	VP15TF	200 (180-235)	0.07 (0.04-0.08)	0.06 (0.04-0.07)	0.05 (0.04-0.06)	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	180-280HB	MC1020	VP15TF	140 (115-180)	0.12 (0.08-0.18)	0.10 (0.08-0.12)	0.09 (0.08-0.10)	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	280-350HB	MC1020	VP15TF	100 (75-140)	0.12 (0.08-0.18)	0.10 (0.08-0.12)	0.09 (0.08-0.10)	100 (75-140)	0.14 (0.08-0.24)	0.12 (0.08-0.16)	0.11 (0.10-0.12)
	Alloy tool steel	≤350HB	MC1020	VP15TF	135 (100-170)	0.12 (0.08-0.18)	0.10 (0.08-0.12)	0.09 (0.08-0.10)	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	≤200HB	MC1020	VP15TF	140 (115-180)	0.09 (0.06-0.12)	0.08 (0.06-0.09)	0.07 (0.06-0.08)	140 (115-180)	0.11 (0.06-0.16)	0.08 (0.06-0.11)	0.07 (0.06-0.10)	
	Austenitic Stainless Steel	>200HB	MC1020	VP15TF	140 (115-180)	0.09 (0.06-0.12)	0.08 (0.06-0.09)	0.07 (0.06-0.08)	140 (115-180)	0.11 (0.06-0.16)	0.08 (0.06-0.11)	0.07 (0.06-0.10)
	Ferritic, Precipitation hardening stainless steel	≤200HB	MC1020	VP15TF	140 (115-165)	0.10 (0.06-0.14)	0.08 (0.06-0.09)	0.07 (0.06-0.08)	140 (115-165)	0.11 (0.06-0.16)	0.09 (0.06-0.11)	0.08 (0.06-0.10)
	Ferritic, Precipitation hardening stainless steel	>200HB	MC1020	VP15TF	140 (115-165)	0.10 (0.06-0.14)	0.08 (0.06-0.09)	0.07 (0.06-0.08)	140 (115-165)	0.11 (0.06-0.16)	0.09 (0.06-0.11)	0.08 (0.06-0.10)
K Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	VP15TF	160 (130-195)	0.15 (0.10-0.20)	0.11 (0.10-0.13)	0.09 (0.08-0.10)	160 (130-195)	0.15 (0.10-0.20)	0.12 (0.10-0.13)	0.11 (0.10-0.12)	
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	VP15TF	100 (80-135)	0.14 (0.10-0.18)	0.11 (0.10-0.12)	0.09 (0.08-0.10)	100 (80-135)	0.15 (0.10-0.20)	0.12 (0.10-0.13)	0.11 (0.10-0.12)
	Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020	VP15TF	100 (70-125)	0.14 (0.10-0.18)	0.11 (0.10-0.12)	0.09 (0.08-0.10)	100 (70-125)	0.15 (0.10-0.20)	0.12 (0.10-0.13)	0.11 (0.10-0.12)

1) When using VP15TF for outer insert, lower the cutting speed to approx. 70%.

2) When using external coolant the maximum machining depth should be L/D=3. Machining deeper is not recommended.

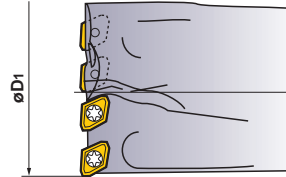
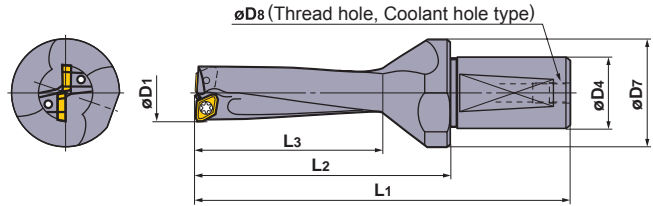
3) For stainless steel machining, internal coolant must be used.

TAFS/TAFM/TAFL

- High rigidity holder.
- 4 corner use insert.
- Various grades and chip breakers.

CARBIDE

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○		○	○		



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

Number of Teeth = 4 ($\phi D1 \geq 49$)

Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)						Insert Number	Clamp Screw	Wrench
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter	Through coolant hole			
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.

INSERT DESCRIPTION > N221
CUTTING CONDITIONS > N222



USAGE NOTE > N225
TECHNICAL DATA > Q001

N217



DRILLING



TAFS/TAFM/TAFL

CARBIDE

Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)						Insert Number	 Clamp Screw	 Wrench
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter	Through coolant hole			
					L3	L2	L1	D4	D7	D8			
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

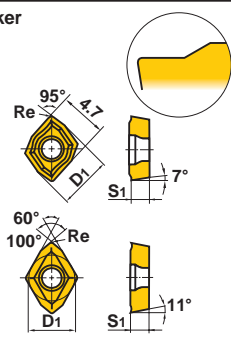
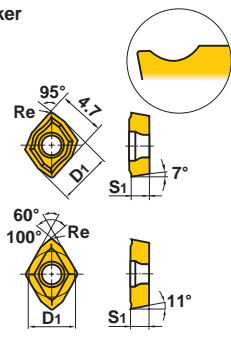
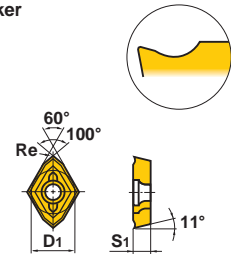
● : Inventory maintained in Japan.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)						Insert Number		
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter	Through coolant hole			
					L3	L2	L1	D4	D7	D8			
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	TAFM2900F32	●	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	TAFM3000F40	●	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	TAFM3100F40	●	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	TAFM3200F40	●	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	TAFM3300F40	●	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	TAFM3400F40	●	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

Drill Dia. D1 (mm)	Hole Depth (l/d)	Order Number	Stock	Number of Teeth	Dimensions (mm)						Insert Number		
					Effective flute length	Neck Length	Overall Length	Shank Dia.	Flange diameter	Through coolant hole			
					L3	L2	L1	D4	D7	D8			
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

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

INSERTS

Geometry	Drill Dia.	Insert Number	Dimensions (mm)			Stock				
			D ₁	S ₁	Re	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	P						M		K			
	Mild Steel		Carbon Steel		Alloy Steel		Stainless Steel		Gray Cast Iron		Ductile Cast Iron	
	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT	GCMT	GPMT
U1	◎	◎	○	○	○	○	○	○	○	○	○	○
U2	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
U3		○			○	○		○		○		○

INSERT GRADE RECOMMENDATION

◎ : 1st Recommendation ○ : 2nd Recommendation

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

CUTTING CONDITIONS > N222
 USAGE NOTE > N225
 TECHNICAL DATA > Q001

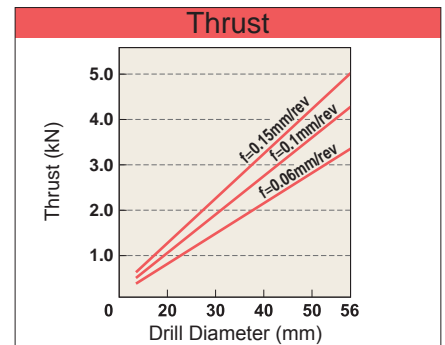
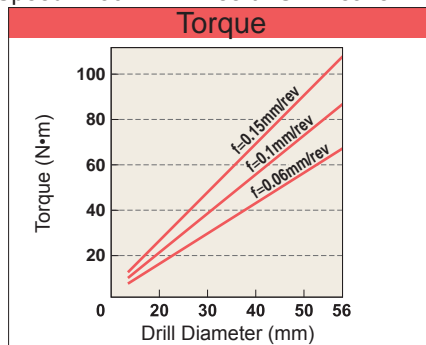
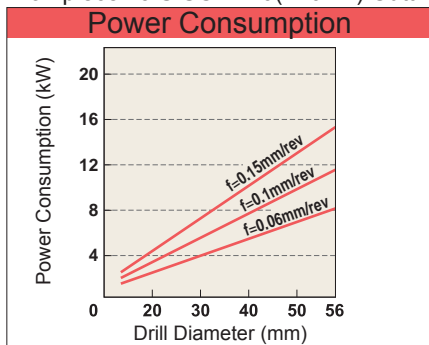
RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Speed (m/min)			Breaker	Feed (mm/rev)					
		For l/d=2,3		For l/d=4		Drill Diameter (mm)					
		(φ12-φ14.5)	(φ15-)	(φ16-)		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

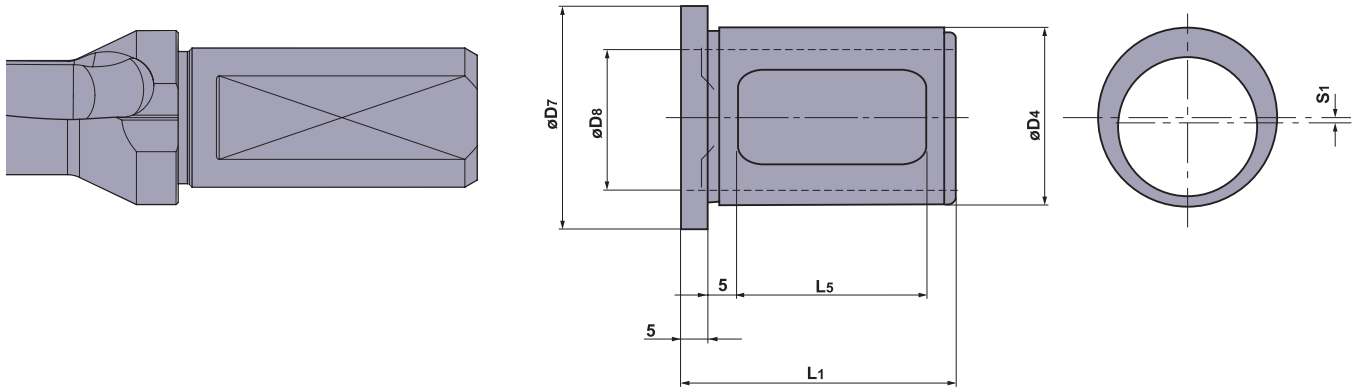
Workpiece : JIS SCM440(220HB) Cutting Speed : 150m/min Insert : U2 Breaker



JUST FIT SLEEVE [JFS]

CARBIDE

- A sleeve designed to improve the performance of TAF drills, allowing the cutting diameter to be increased in increments of 0.1mm
- When installing 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 (S1x2)	Suitable MVX Type Drill TAF Type Drill
			D7	D4	D8	L1	L5		
JFS-1	JFS2520-10	●	33	25	20	43	30	0.10	MVX1700 X \varnothing F20 TAFS/M/L1200F20 TAFS/M/L1550F20
	2520-20	●	33	25	20	43	30	0.20	
	2520-30	●	33	25	20	43	30	0.30	
	2520-40	●	33	25	20	43	30	0.40	
	2520-50	●	33	25	20	43	30	0.50	
JFS-2	JFS3225-10	●	40	32	25	50	34	0.10	MVX1750 X \varnothing F25 MVX2550 X \varnothing F25 TAFS/M/L1600F25 TAFS/M/L2450F25
	3225-20	●	40	32	25	50	34	0.20	
	3225-30	●	40	32	25	50	34	0.30	
	3225-40	●	40	32	25	50	34	0.40	
	3225-50	●	40	32	25	50	34	0.50	
JFS-3	JFS4032-10	●	48	40	32	55	40	0.10	TMVX2600 X \varnothing F32 MVX3000 X \varnothing F32 TAFS/M/L2500F32 TAFS/M/L2950F32
	4032-20	●	48	40	32	55	40	0.20	
	4032-30	●	48	40	32	55	40	0.30	
	4032-40	●	48	40	32	55	40	0.40	
	4032-50	●	48	40	32	55	40	0.50	

(Note) Cannot be used for shank diameter \varnothing 40.

GUIDELINE FOR SELECTING A JUST FIT SLEEVE

Desired = (Drill \varnothing + Increase of JFS) + 0.1mm

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

$$\varnothing 20.3 = (\text{MVX2000 X } \varnothing \text{F25} + \text{JFS3225-20}) + 0.1$$

20mm Drill

Using JFS an Increase of 0.2mm.

Oversize

<Tool Selected>
MVX Drill : MVX2000 X \varnothing F25
JUST FIT SLEEVE [JFS]
: JFS3225-20

DRILLING

(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.

JUST FIT SLEEVE [JFS]

CARBIDE

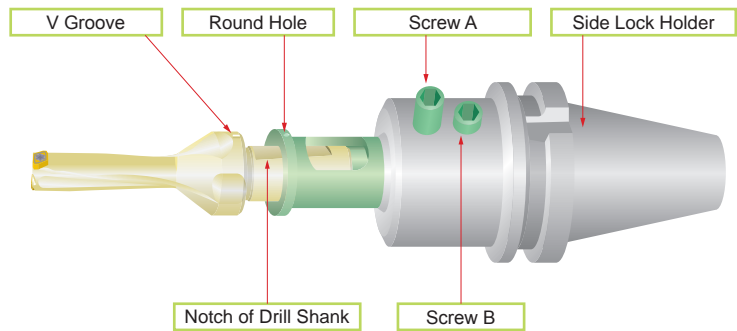
APPLICATION OF JUST FIT SLEEVE

1 When inserting the drill into the side lock holder, align 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)

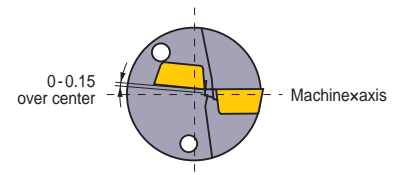
- Fine adjustments cannot be made for the diameter
- Cannot be used with collect chuck type holders.



APPLICATION OF MVX TYPE DRILL

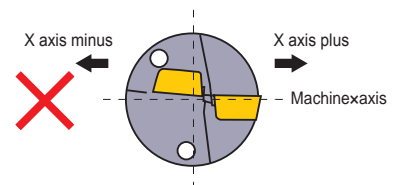
●Use on a Lathe

(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.

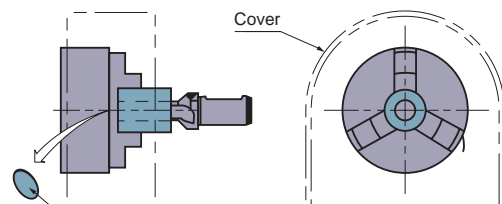
(2)By off setting it is possible to adjust the hole diameter. To do this adjust in the positive X axis direction (hole oversize direction). For the amount of possible adjustment please refer to the dimensions list.



*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.

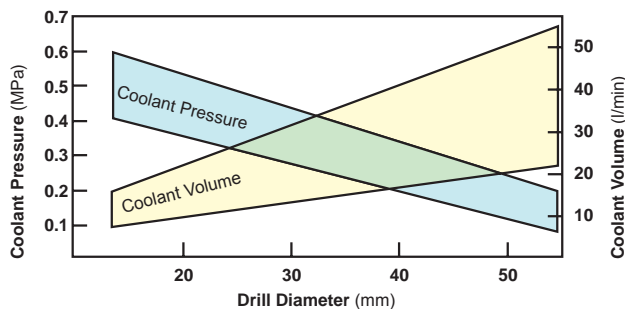
To reduce the danger of injury or damage a cover guard is highly recommended.



DRILLING

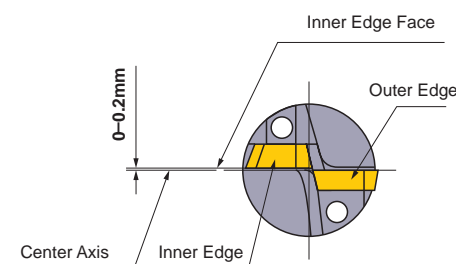
APPLICATION OF MVX TYPE DRILL

- Please ensure the highest rigidity possible exists in both machine set up and workholding.
- Refer to the following graph 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.

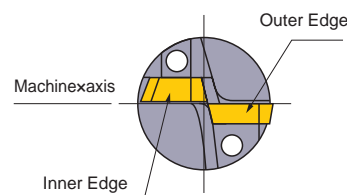


● Use on a Lathe

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



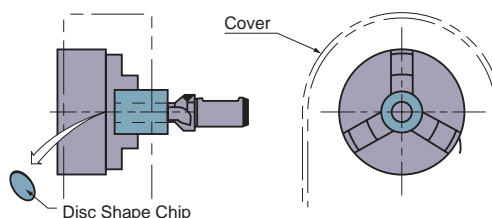
(2) To adjust the hole diameter by off-setting the drill, the outer cutting edge and machine axis must be set parallel.



(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.

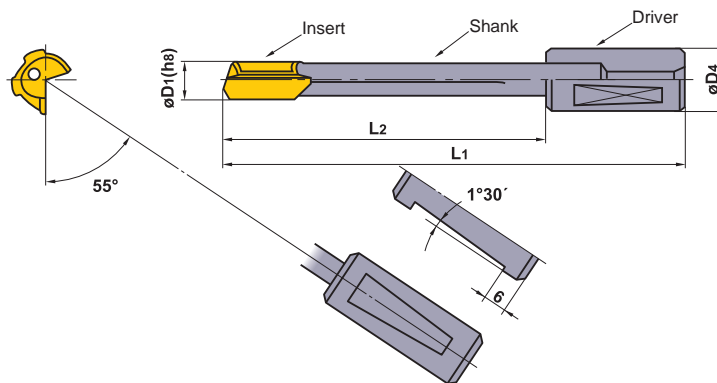


GUN DRILL

CARBIDE

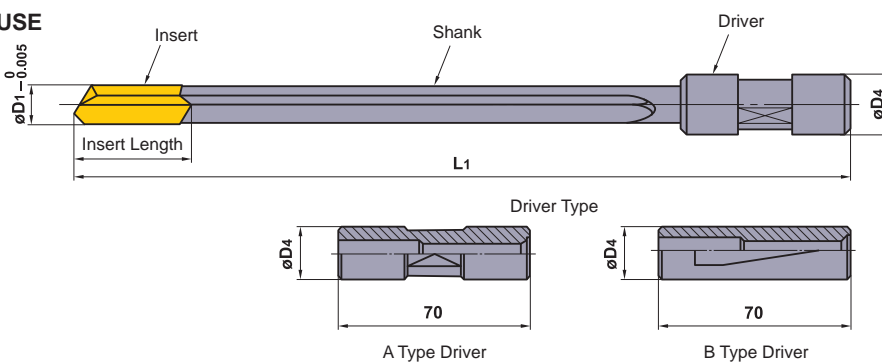
● GUN DRILL FOR MACHINING CENTER

- Suitable for deep hole drilling on Machining Center.
- Drill Diameter : $\phi 6.0 - \phi 20.0$



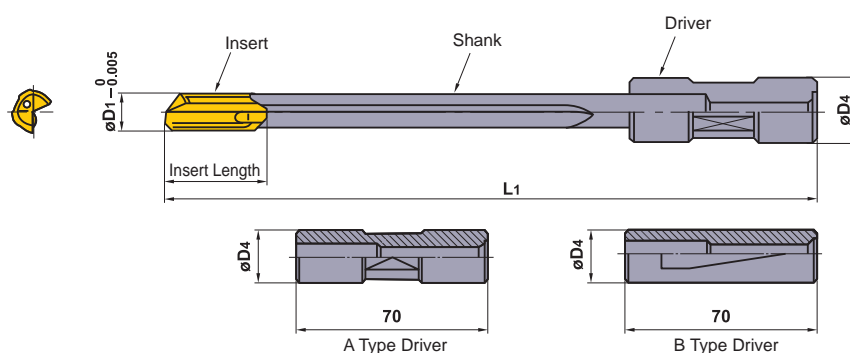
● GUN DRILL FOR GENERAL USE

- Suitable for deep hole drilling.
- Drill Diameter : $\phi 2.0 - \phi 30.3$



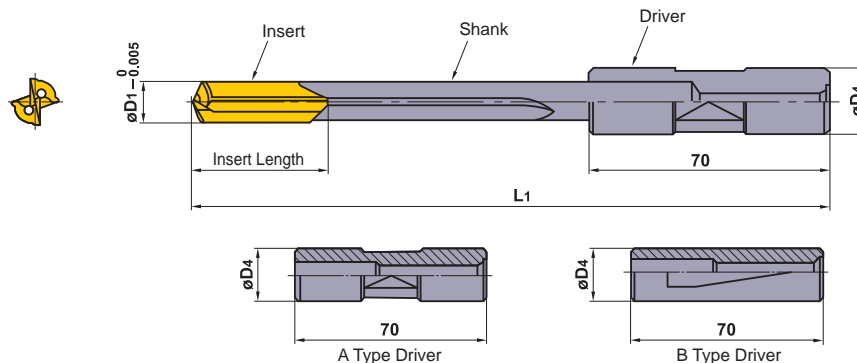
● SAMMIKA GUN DRILL

- The unique uneven cutting edge shape displays excellent chip dividing and enables high feed machining.
- Drill Diameter : $\phi 5.0 - \phi 30.3$



● ARROW JET GUN DRILL

- Excellent chip discharge due to the double-tooth design and chip breaker.
- Drill Diameter : $\phi 6.0 - \phi 30.0$



■ ORDERING METHOD

Please specify the following when ordering.

① Drill Name ② Diameter of Drill (ϕD_1) ③ Length of Drill (L_1) ④ Outside Diameter of Driver (ϕD_4) and Type ⑤ Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)

e.g.) General Gun Drill $\phi 8 \times 500 \times \phi 19.5$ A type Driver, SCM440(250HB) $\times \phi 8^{+0.020} 300 \times$ Through Hole

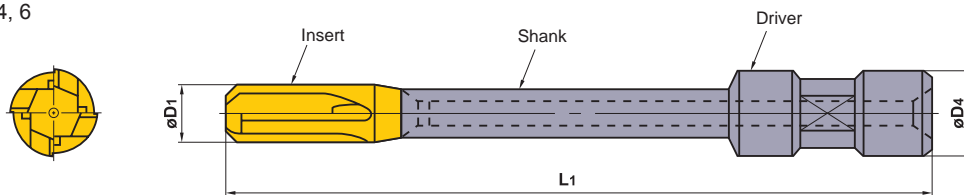
DRILLING

GUN REAMER

CARBIDE

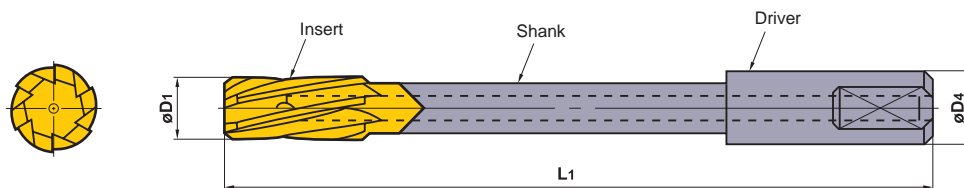
● Straight Reamer Type

- Reamer Diameter : $\phi 6.0 - \phi 30.0$
- Number of teeth : 1, 2, 3, 4, 6



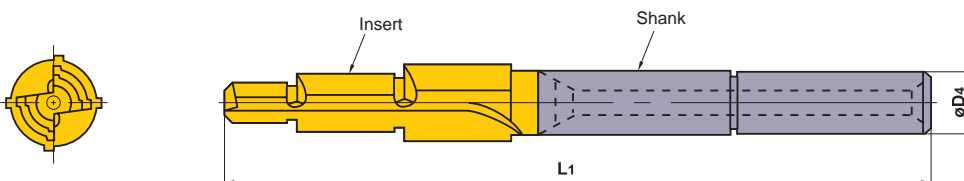
● Spiral Reamer Type

- Reamer Diameter : $\phi 6.0 - \phi 30.0$
- Number of teeth : 4, 6



● Line Reamer Type

- Reamer Diameter : $\phi 6.0 - \phi 30.0$
- Number of teeth : 1, 2, 4



■ ORDERING METHOD

Please specify the following when ordering.

① Reamer Name ② Diameter of Reamer ($\phi D1$) ③ Length of Reamer ($L1$) ④ Outside Diameter of Driver ($\phi D4$) and Type
⑤ Number of Teeth ⑥ Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)
e.g.) General Gun Reamer $\phi 12 \times 450 \times \phi 19.5$ A type Driver, 4-Teeth, FC250 (180HB) $\times \phi 12^{+0.020} \times 100 \times$ Through Hole

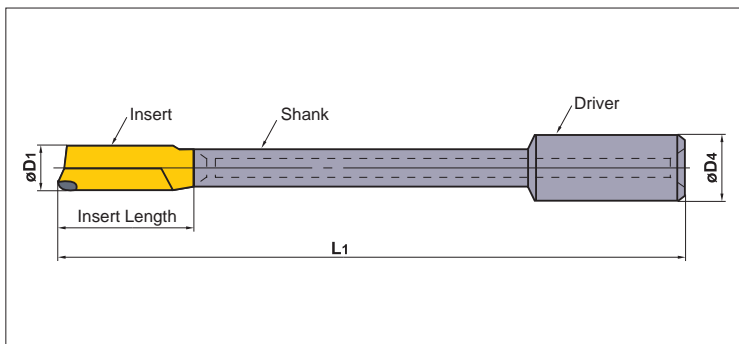
DRILLING

DRILLING(BRAZED TYPE)

WITH DIAMOND COMPOUND

GUN REAMER

CARBIDE



STANDARD

Reamer Diameter	Insert Length	Overall Length L_1	Number of Teeth	Shape of Teeth
$\phi 6 - \phi 30.3$	*	*	*	Straight

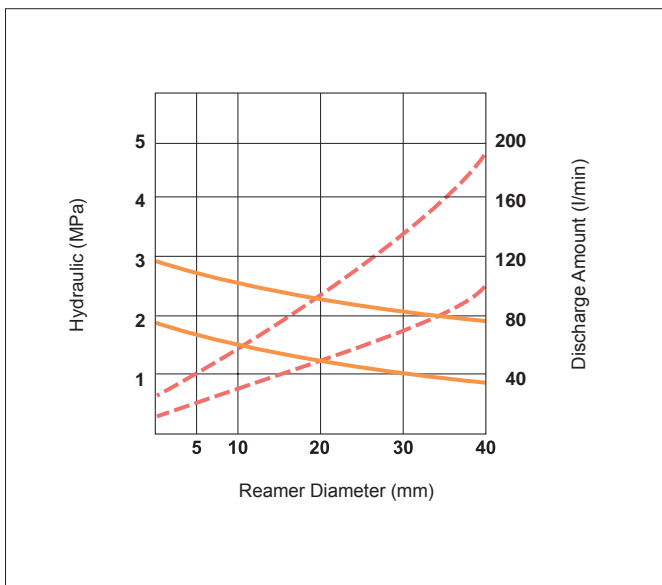
*Please contact us for any geometry (different diameter of reamer, insert length, tool length, number of teeth) that is not in this list.

Reamer Diameter D_1	Internal Diameter of Driver D_8	External Diameter of Driver D_4
$6.0 \leq D_1 \leq 7.0$	3.5	12.70
$7.0 < D_1 \leq 13.3$	4.8	19.05
$13.3 < D_1 \leq 20.8$	6.4	25.40
$20.8 < D_1 \leq 25.3$	8.0	31.75
$25.3 < D_1 \leq 30.3$	8.0	38.10

RECOMMENDED CUTTING CONDITIONS

Work Material	Cutting Speed (m/min)	Feed (mm/rev)		
		$\phi 5 - \phi 10$	$\phi 10 - \phi 20$	$\phi 25 - \phi 30$
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



DRILLING

ORDERING METHOD

Please specify the following when ordering.

- ① Reamer Name ② Diameter of Reamer (ϕD_1) ③ Length of Reamer (L_1) ④ Number of Teeth ⑤ Outside Diameter of Driver (ϕD_4) and Type
 - ⑥ Workpiece Material, Drilling Accuracy, Drilling Depth and Drilling Mode (Through Hole, Blind Hole)
- e.g.) Gun Reamer with Diamond Compound $\phi 10 \times 300$ 1-Tooth $\times \phi 19.05$ A Type Driver, AC4B $\times \phi 10^{+0.01}_0 \times 200$ x Through Hole

CVD DIAMOND COATED DRILLS


MCS

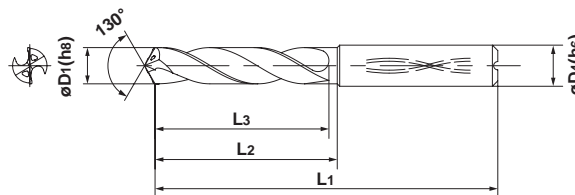
For CFRP

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

CARBIDE

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

	3<D≤6	6<D≤10	10<D≤18	18<D≤20
	0 -0.018	0 -0.022	0 -0.027	0 -0.033
	0 -0.008	0 -0.009	0 -0.011	0 -0.013



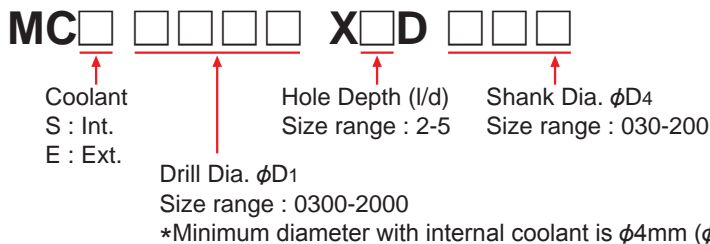
(Note) MCS drills are suitable for use with shrink fit holders.

Drill Dia. D1		Hole Depth (l/d)	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)			
				DD2010		Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4
(inch)	(mm)								
.1719	4.366	3	Int.	●	MCS01719X3DB	23	28	65	6
.1915	4.864	3	Int.	●	01915X3DB	27	28	65	6
.2510	6.375	3	Int.	●	02510X3DB	33	41	78	8
.3125	7.938	3	Int.	●	03125X3DB	40	41	78	8
.3760	9.550	3	Int.	●	03760X3DB	45	46	87	10
.3765	9.563	3	Int.	●	03765X3DB	45	46	87	10
.4380	11.125	3	Int.	●	04380X3DB	53	54	100	12
.5010	12.725	3	Int.	●	05010X3DB	58	59	105	14

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

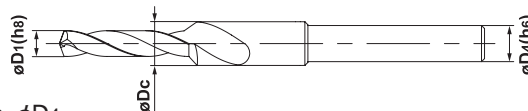
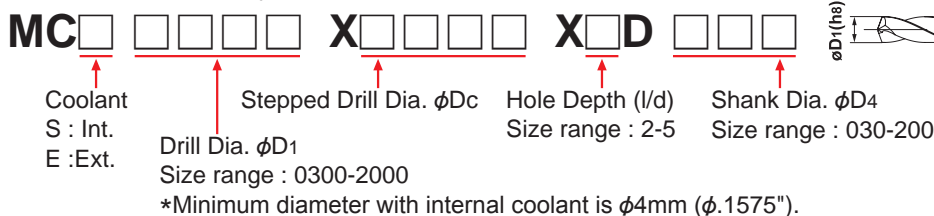
For non stocked sizes please enter details into the below.
Please contact us for details of any geometry that is not mentioned.
*Recommended carbide grade TF15 for CFRP/titanium stacks.

Order number of straight type



Size range of drill dia. : ø3mm-ø20mm
Size range of shank dia. : ø3mm -ø20mm
For cutting dia D1 - Please indicate with 4 digits
E.g. ø3mm - 0300
For shank dia D4 - Please use 3 digits
E.g. ø12mm - 120
*For inch sizes please convert to metric (1"= 25.4mm)
ex. : ø.3760" → ø9.550mm → 0955

Order number of stepped type



DRILLING

● : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

DD2010

Work material		CFRP				CFRP with Aluminium stack			
Dia. (inch)	Dia. (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. (inch)	Dia. (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

DC-SSS

Short, For non-ferrous material

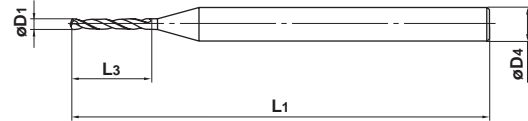


CARBIDE

$$0.2 \leq D_1 \leq 2$$

$$\begin{matrix} 0 \\ -0.014 \end{matrix}$$

$$\begin{matrix} 0 \\ -0.010 \end{matrix}$$



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

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
DCSSSD0020	0.2	2	38	3	●
D0030	0.3	3	38	3	●
D0040	0.4	4	38	3	●
D0050	0.5	4	38	3	●
D0060	0.6	5	38	3	●
D0070	0.7	5	38	3	●
D0080	0.8	6	38	3	●
D0090	0.9	6	38	3	●
D0100	1.0	8	38	3	●
D0110	1.1	8	38	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
DCSSSD0120	1.2	8	38	3	●
D0130	1.3	8	38	3	●
D0140	1.4	8	38	3	●
D0150	1.5	10	45	3	●
D0160	1.6	10	45	3	●
D0170	1.7	10	45	3	●
D0180	1.8	10	45	3	●
D0190	1.9	10	45	3	●
D0200	2.0	12	45	3	●

CUTTING CONDITIONS > N235

DC-SSM

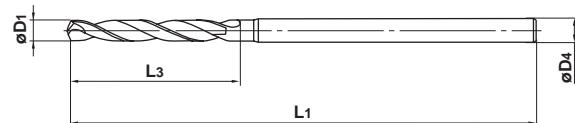
Medium, For non-ferrous material



$$2.1 \leq D_1 \leq 3$$

$$\begin{matrix} 0 \\ -0.014 \end{matrix}$$

$$\begin{matrix} 0 \\ -0.010 \end{matrix}$$



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

Unit : mm

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
DCSSMD0210	2.1	17	60	3	●
D0220	2.2	17	60	3	●
D0230	2.3	17	60	3	●
D0240	2.4	17	60	3	●
D0250	2.5	21	60	3	●

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock
DCSSMD0260	2.6	21	60	3	●
D0270	2.7	21	60	3	●
D0280	2.8	21	60	3	●
D0290	2.9	21	60	3	●
D0300	3.0	21	60	3	●

DRILLING

● : Inventory maintained in Japan.

CUTTING CONDITIONS > N235

N231

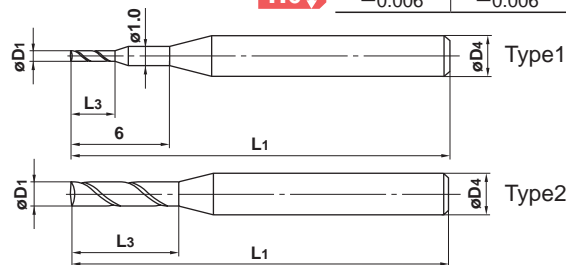
CVD DIAMOND COATED DRILLS

DC-BSS

Drill for hard brittle materials



	$0.05 \leq D_1 < 0.2$	$0.2 \leq D_1 \leq 3$
\uparrow \downarrow	0	0
\downarrow \uparrow	-0.009	-0.014
h6 \updownarrow	0	0
	-0.006	-0.006



Unit : mm

● Drill for machining hard brittle materials such as sintered ceramics and quartz glass that cannot be machined with conventional drills.

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock	Type	Short Delivery
—	0.05	0.5	38	3	<input type="checkbox"/>		
—	0.06	0.6	38	3	<input type="checkbox"/>		
—	0.07	0.7	38	3	<input type="checkbox"/>		
—	0.08	0.8	38	3	<input type="checkbox"/>		
—	0.09	0.9	38	3	<input type="checkbox"/>		
—	0.1	1	38	3	<input type="checkbox"/>	1	◎
—	0.11	1.2	38	3	<input type="checkbox"/>	1	◎
—	0.12	1.4	38	3	<input type="checkbox"/>	1	
—	0.13	1.5	38	3	<input type="checkbox"/>	1	◎
—	0.14	1.5	38	3	<input type="checkbox"/>	1	◎
—	0.15	1.5	38	3	<input type="checkbox"/>	1	◎
—	0.16	1.5	38	3	<input type="checkbox"/>	1	
—	0.17	1.5	38	3	<input type="checkbox"/>	1	◎
—	0.18	1.5	38	3	<input type="checkbox"/>	1	◎
—	0.19	1.5	38	3	<input type="checkbox"/>	1	
—	0.2	2	38	3	<input type="checkbox"/>	2	◎
—	0.25	2.5	38	3	<input type="checkbox"/>	2	◎
—	0.3	3	38	3	<input type="checkbox"/>	2	◎
—	0.35	3.5	38	3	<input type="checkbox"/>	2	◎
—	0.4	4	38	3	<input type="checkbox"/>	2	◎
—	0.5	4	38	3	<input type="checkbox"/>	2	◎
—	0.6	5	38	3	<input type="checkbox"/>	2	◎
—	0.7	5	38	3	<input type="checkbox"/>	2	◎
—	0.8	6	38	3	<input type="checkbox"/>	2	◎
—	0.9	6	38	3	<input type="checkbox"/>	2	◎
—	1	8	38	3	<input type="checkbox"/>	2	◎

Order Number	Drill Dia. D1	Flute Length L3	Overall Length L1	Shank Dia. D4	Stock	Type	Short Delivery
—	1.1	8	38	3	<input type="checkbox"/>	2	◎
—	1.2	8	38	3	<input type="checkbox"/>	2	◎
—	1.3	8	38	3	<input type="checkbox"/>	2	◎
—	1.4	8	38	3	<input type="checkbox"/>	2	
—	1.5	10	38	3	<input type="checkbox"/>	2	◎
—	1.6	10	38	3	<input type="checkbox"/>	2	◎
—	1.7	10	38	3	<input type="checkbox"/>	2	◎
—	1.8	10	38	3	<input type="checkbox"/>	2	◎
—	1.9	10	38	3	<input type="checkbox"/>	2	
—	2	12	38	3	<input type="checkbox"/>	2	◎
—	2.1	12	38	3	<input type="checkbox"/>	2	
—	2.2	12	38	3	<input type="checkbox"/>	2	
—	2.3	12	38	3	<input type="checkbox"/>	2	
—	2.4	12	38	3	<input type="checkbox"/>	2	◎
—	2.5	12	38	3	<input type="checkbox"/>	2	◎
—	2.6	12	38	3	<input type="checkbox"/>	2	
—	2.7	12	38	3	<input type="checkbox"/>	2	
—	2.8	12	38	3	<input type="checkbox"/>	2	
—	2.9	12	38	3	<input type="checkbox"/>	2	
—	3	12	38	3	<input type="checkbox"/>	2	◎

(Note 1) The dimensions shown in the above table are basic sizes. Contact Mitsubishi Materials if different diameters and flute lengths are required.

(Note 2) Drills with ◎ mark can be delivered in shorter time (1—2 weeks). For the delivery of other drills, contact Mitsubishi Materials.

(Note 3) Drills with D1 0.05—0.09mm are designed with a special geometry.

DRILLING

: Non stock, produced to order only.

RECOMMENDED CUTTING CONDITIONS

■ DC-SSS, DC-SSM

Work Material	Aluminium alloy		Aluminium alloy		Copper Copper alloy		Graphite Machineable Ceramics		MMC FRP	
	Dia. (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)
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 material, reduce the feed.
- 2) When drilling deep holes, moderate the cutting conditions.
- 3) The revolution can be increased by using a high speed spindle.

■ DC-BSS

Work Material	Aluminium nitride		Alumina		Zirconia		Silicon carbide Silicon nitride		Quartz glass	
	Step	0.01mm	0.005mm	0.003mm	0.002mm	0.05mm				
Dia. (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)
0.1	20000	0.0002	20000	0.0001	20000	0.0001	20000	0.00005	20000	0.0002
0.2	15000	0.0002	15000	0.0001	15000	0.0001	15000	0.00005	15000	0.0002
0.5	12000	0.0002	12000	0.0001	12000	0.0001	12000	0.00005	12000	0.0003
1.0	10000	0.0002	10000	0.0001	10000	0.0001	10000	0.00005	10000	0.0003
1.5	7500	0.0003	7500	0.0002	7500	0.0002	7500	0.0001	7500	0.0004
2.0	6000	0.0003	6000	0.0002	6000	0.0002	6000	0.0001	6000	0.0004
2.5	5000	0.0003	5000	0.0003	5000	0.0002	5000	0.0001	5000	0.0005
3.0	5000	0.0003	5000	0.0003	5000	0.0002	5000	0.0001	5000	0.0005

- 1) Depending on the type of machine, it is possible to apply cutting speeds over 20000min⁻¹.
- 2) Please use the water soluble coolant or grinding fluid.

Memo

A series of horizontal dashed lines for writing, spanning the width of the page.