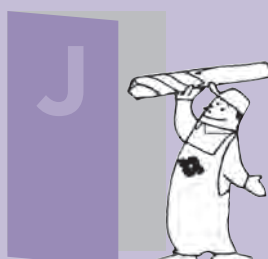


Drills

J1 to J200

J



Drill Selection Guide	J2-1
Effective Length List by Diameter	J3-1
Application Range of Major Drills	J4
Drill Coatings	J6

Solid Carbide Drill	General-purpose	MULTIDRILL NeXEO MDE series	J8
	For Flat Bottom Hole	Flat MULTIDRILL MDF series	J26
	For High-efficiency Drilling of Steel and Cast Iron <i>New</i>	MULTIDRILL MDH series	J38
	For High Efficiency	Super MULTIDRILL GS series / HGS series ...	J48
	For Thin Plates	Super MULTIDRILL WGS series	J60
	For Stainless Steel	MULTIDRILL MDM series	J62
	For Cast Iron	Strong MULTIDRILL HX series	J72
	For High-efficiency Steel and Cast Iron	Strong MULTIDRILL HY series	J80
	For High-efficiency, Deep Holes	Super MULTIDRILL XHGS series / PHT series ...	J82
	For Non-Ferrous Metals	MULTIDRILL MDA series	J90
	For Non-Ferrous Metals	Super MULTIDRILL NHGS series	J98
	For CFRP	SUMIDIA Coat Drills SDC series	J103
	For Aluminum Alloy	SUMIDIA Drills DAL series / DDL series	J104
	For Small Diameter Deep Holes	Micro Long Drill MLDH-L type / MLDH-P type ...	J105
Indexable Head type Drill	For Very Small Holes	Micro MULTIDRILL MDUS series / MDUP series /	
	For Very Small Holes	MINI-MULTIDRILL MDSS series	J108
		MULTIDRILL Made-to-Order Design Request Sheet ...	J110
Indexable Head type Drill	Indexable Head type Drills	SEC-MULTIDRILL SMD series	J112
		Heads for General Steel / Cast Iron / Exotic Alloys: MTL type / MSL type / MEL type ...	J113
		Heads for Flat Bottom Hole: MFS type ...	J126
		Heads for Rolled Steel for Welded Structures (for Bridge): MB type ...	J134
Indexable Insert type Drill		SEC-MULTIDRILL Made-to-Order Design Request Sheet ...	J136
	General-purpose <i>New</i>	SumiDrill GDX series	J138
	General-purpose <i>Expansion</i>	SumiDrill WDX series	J158
	For Deep Drilling / Pocketing	SEC-Plunge Drill PDL series/SEC-Plunge Mill PCT series ...	J172
Solid Reamer	For Medium to Large Sized Holes	SEC-COREMILL TCS series	J178
Indexable Insert type Reamer	For High-efficiency, High-precision Reaming	SumiReamer SSR series	J180
	For High-efficiency Reaming	SumiReamer SR series	J190

Stock Markings and Symbols

- mark: Standard stocked item
- mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

- * mark: Semi-standard stock (please confirm stock availability)
- mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- mark: Not available

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

Drill Selection Guide

Applications	Work Material	Series	Cat. No.	Diameter (mm)	Appearance	Ref. Page
General-purpose	P M K S	MULTIDRILL NeXEO MDE-E type	MDE0000S00E02	ø1.0 to 20.0		J8
			MDE0000S00E04	ø1.0 to 20.0		
	P M K N S	MULTIDRILL NeXEO MDE-H type	MDE0000S00H03	ø1.0 to 20.0		J8
			MDE0000S00H05	ø1.0 to 20.0		
High Efficiency	P K	MULTIDRILL MDH series	MDH0000S00H03	ø3.0 to 14.0		J38
			MDH0000S00H05	ø3.0 to 14.0		
			MDH0000S00H08	ø3.0 to 14.0		
	P K	Super MULTIDRILL GS series	MDW0000GS2	ø1.0 to 20.0		J48
			MDW0000GS4	ø1.0 to 20.0		
	P M K S	Super MULTIDRILL HGS series	MDW0000HGS3	ø1.5 to 20.0		J48
			MDW0000HGS5	ø1.5 to 20.0		
			MDW0000HGS8	ø1.5 to 16.0		
	P K	Strong MULTIDRILL HY series	MDW0000HY3	ø5.0 to 16.0		J80
			MDW0000HY5	ø5.0 to 16.0		
			MDW0000HY8	ø5.0 to 16.0		
Flat Bottom Hole	P M K N	Flat MULTIDRILL MDF series	MDF0000S2D	ø0.3 to 20.0		J26
			MDF0000L2D	ø3.0 to 20.0		
			MDF0000H3D	ø3.0 to 16.0		
			MDF0000H5D	ø3.0 to 16.0		
Deep Hole	P M K	Super MULTIDRILL XHGS series	MDW0000XHGS10	ø2.1 to 16.0		J82
			MDW0000XHGS12	ø2.5 to 16.0		
			MDW0000XHGS15	ø2.1 to 16.0		
			MDW0000XHGS20	ø2.1 to 14.0		
			MDW0000XHGS25	ø2.1 to 12.0		
			MDW0000XHGS30	ø2.1 to 10.0		
Thin Plates	P M K S	MULTIDRILL NeXEO type for Hub Drilling MDE-E	MDE0000S00E02H	ø8.8 to ø13.97		J8
Stainless Steel	M S	MULTIDRILL MDM series	MDM0000S00H03	ø3.0 to ø16.0		J62
			MDM0000S00H05	ø3.0 to ø16.0		
Cast Iron	K	Strong MULTIDRILL HX series	MDW0000HX3	ø3.0 to 20.0		J72
			MDW0000HX5	ø3.0 to 20.0		
			MDW0000HX8	ø3.0 to 18.0		
Non-Ferrous Metal	N	MULTIDRILL MDA series	MDA0000S00H03	ø1.0 to 12.0		J90
			MDA0000S00H05	ø1.0 to 12.0		
			MDA0000S00H10	ø1.0 to 12.0		
			MDA0000S00H15	ø1.0 to 3.0		
			MDA0000S00H20	ø1.0 to 3.0		
		Super MULTIDRILL NHGS series	MDW0000NHGS3	ø3.0 to 16.0		J98
			MDW0000NHGS5	ø3.0 to 16.0		
			MDW0000NHGS10	ø3.0 to 16.0		
		SUMIDIA Drills DAL series	DAL0000H	ø5.0 to 12.0		J104
		SUMIDIA Drills DDL series	DDL0000H	ø5.0 to 12.0		

Drill Selection Guide

Series	Drilling Depth (L/D)	Coated Carbide	Coolant Supply	P			H		M	S		K		N			Ref. Page		
				Carbon Steel Alloy Steel up to 35HRC			Tempered Steel		Hardened Steel	Stainless Steel	Titanium Alloy		Heat-resistant Alloy	Cast Iron	Ductile Cast Iron	Aluminum Alloy		Copper Alloy	Composite
				C 0.28% or below	C 0.29%	SKD SKS	45HRC or less	46HRC and above	SUS	Ti	Inconel	FC	FCD	Al	Cu	CFRP			
MDE-E type	2D 4D		External	○	◎	◎	○			○	○	○	◎	◎				J8	
MDE-H type	3D 5D 8D		Internal	◎	◎	◎	○			◎	○	○	◎	◎	○	○		J8	
MDH series	3D 5D 8D		Internal	◎	◎	◎							◎	◎				J38	
GS series	2D 4D		External	○	◎	◎	○	○	○	○	○	○	◎					J48	
HGS series	3D 5D 8D		Internal	◎	◎	◎	○	○	◎	◎	○	○	◎		○			J48	
HY series	3D 5D 8D		Internal	◎	◎								◎	◎				J80	
MDF series	2D 3D 5D		External S2D	◎	◎	◎	○		○	○	○	○	○	○	○			J26	
			External L2D	◎	◎	◎	○		○			○	○	○					
			Internal	◎	◎	◎	○		○			○	○	○					
XHGS series	10D 12D 15D 20D 25D		Internal	○	◎	◎	○		○			○	◎				J82		
	30D																		
PHT series	Pilot 3D		Internal	○	◎	◎	○		○			○	◎					J82	
MDE-E type For Hub Drilling	2D		External	○	◎	◎	○		○	○	○	◎	◎					J8	
WGS series	2D		External	○	◎	◎	○		○			○	○					J60	
MDM series	3D 5D		Internal	○	○				◎	◎	○	○	○					J62	
HX series	3D 5D 8D		Internal										◎	◎				J72	
MDA series	3D 5D 10D 15D 20D		Internal												◎	◎		J90	
NHGS series	3D 5D 10D		Internal												◎	◎		J98	
DAL series	3D	—	External												◎		○	J104	
DDL series	3D	—	External												◎		○	J104	

Drilling

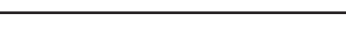
Solid

Indexable
Head type

Indexable
Insert type

Reamers

Drill Selection Guide

Applications/ Specifications	Work Material	Series	Cat. No.	Diameter (mm)	Appearance	Ref. Page
CFRP	CFRP	SUMIDIA Coat Drill SDC series	MDS000000 SDC3	ø2.0 to 10.0		J103
Small Diameter Deep Hole	P M K	Micro Long Drill MLDH-L type	MLDH 0000 L5	ø0.8 to 2.0		J105
			MLDH 0000 L12	ø0.8 to 2.0		
			MLDH 0000 L20	ø0.8 to 2.0		
			MLDH 0000 L30	ø0.8 to 2.0		
Very Small Diameters	P M K H	Guide Drill for MLDH series MLDH-P type	MLDH 0000 P	ø0.8 to 2.0		J105
Indexable Head type	P M K H	MINI-MULTIDRILL MDSS series	MDSS 0000	ø0.2 to 1.0		J108
		Micro MULTIDRILL MDUS series	MDUS 0000-30C	ø0.03 to 0.19		J108
		Micro Multi Pointing Drill MDUP series	MDUP 0000-30C	ø0.03 to 0.18		J108
Indexable Head type Emphasis on Edge Sharpness	P M K	SEC-MULTIDRILL SMD-MSL type Head	SMDH 0000-1.5D/-1.5DF	ø12.0 to 30.8 D: ø13.5 to 30.8		J113
			SMDH 0000M/-3D/-3DF			
			SMDH 0000L/-5D/-5DF			
			SMDH 0000D/-8D/-8DF			
Indexable Head type High-efficiency	P K	SEC-MULTIDRILL SMD-MTL type Head	SMDH 0000-1.5D/-1.5DF	ø12.0 to 30.8 M, L: ø12.0 to 42.5 D: ø13.5 to 42.5		J113
			SMDH 0000M/-3D/-3DF			
			SMDH 0000L/-5D/-5DF			
			SMDH 0000D/-8D/-8DF			
Indexable Head type Low Resistance	P M K	SEC-MULTIDRILL SMD-MEL type Head	SMDH 0000-1.5D/-1.5DF	ø12.0 to 30.8 D: ø13.5 to 30.8		J113
			SMDH 0000M/-3D/-3DF			
			SMDH 0000L/-5D/-5DF			
			SMDH 0000D/-8D/-8DF			
Indexable Head type For Flat Bottom Hole	P M K N	SEC-MULTIDRILL SMD-MFS type Head	SMDH 0000-1.5D/1.5DF/S	ø12.0 to 30.0		J126
Indexable Head type For Bridge	P	SEC-MULTIDRILL SMD-MB type Head	SMDH 0000B3	ø24.5 to 26.7		J134
Indexable Insert type	P M K	SumiDrill GDX series	GDXH 0000D2S/D3S/D4S00-00	ø15.5 to 27.0		J138
			GDXH 0000D5S/D6S/D7S00-00	ø15.5 to 27.0		
	P M K N	SumiDrill WDX series	WDX 0000D2S00	ø13.0 to 68.0		J158
			WDX 0000D3S00	ø13.0 to 68.0		
			WDX 0000D4S00	ø13.0 to 63.0		
			WDX 0000D5S00	ø13.0 to 55.0		
	P K S N	SEC-Plunge Drill PDL series	PDL 0000D2S00	ø16.0 to 40.0		J172
			PDL 0000D3S00	ø16.0 to 40.0		
	P K S N	SEC-Plunge Mill PCT series	PCT 0000D3S00	ø16.0 to 40.0		J172
			PCT 0000D5S00	ø16.0 to 40.0		
Solid Reamer	P K	SumiReamer SSR series	SSR 0000H7T	ø2.97 to 12.0		J180
			SSR 0000H7S			
			SSR 0000JT			
			SSR 0000JS			
Indexable Insert type Reamer	P M K N	SumiReamer SR series	SRG 00.0H7-000-00012R1	ø11.9 to 140.6		J190
			SR 00.0H7-000-00012R1	ø11.9 to 140.6		

Drill Selection Guide

Series	Drilling Depth (L/D)	Coated Carbide	Coolant Supply	P		Tempered Steel	H		M	S		K		N			Ref. Page
				Alloy Steel Carbon Steel up to 35HRC			Hardened Steel		Stainless Steel	Titanium Alloy	Heat-resistant Alloy	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite	
				C 0.28% or below	C 0.29%	SKD SKS	45HRC or less	46HRC and above	SUS	Ti	Inconel	FC	FCD	Al	Cu	CFRP	
SDC series	3D	SUMIDIA Coat	Dry														J103
MLDH-L type	5D 12D 20D 30D	PVD Coat	Internal	⊙	⊙	○	○		⊙	○	○	⊙	⊙	○			J105
MLDH-P type	Pilot 2D	PVD Coat	Internal	⊙	⊙	○	○		⊙	○	○	⊙	⊙	○			J105
MDSS series	10D	FB Coat	External	⊙	⊙	⊙	⊙	○	⊙		○	⊙	⊙	○			J108
MDUS series	10D	PVD Coat	External	⊙	⊙				⊙					○	⊙		J108
MDUP series	Pilot 1D	PVD Coat	External	⊙	⊙				⊙					○	⊙		J108
SMD -MSL type Head	1.5D 3D 5D 8D 12D	NX Coat		⊙	○				⊙	○	○	⊙	⊙				J113
SMD -MTL type Head	1.5D 3D 5D 12D	DEX Coat	Internal	⊙	⊙	○	○					⊙	⊙				J113
SMD -MEL type Head	1.5D 3D 5D 8D 12D	DEX Coat	Internal	⊙	○		○		⊙	○	○	⊙	⊙	○			J113
SMD -MFS type Head	1.5D 3D 5D 8D 12D	DEX Coat	Internal	⊙	⊙		○		○			○	○	○			J126
SMD -MB type Head	3D	DEX Coat	Internal	⊙	⊙												J134
GDX series	2D 3D 4D 5D 6D 7D	PVD Coat CVD Coat	Internal	⊙	⊙		○		⊙			⊙	⊙				J138
WDX series	2D 3D 4D 5D	PVD Coat AURORA Coat DLC CVD Coat	Internal	⊙	⊙		○		⊙			⊙	⊙	⊙			J158
PDL series	2D 3D	PVD Coat AURORA Coat DLC CVD Coat	Internal	⊙	⊙		○		○	⊙		⊙	⊙	⊙	○		J172
PCT series	3D 5D	PVD Coat AURORA Coat DLC CVD Coat	Internal	⊙	⊙		○		○	⊙		⊙	⊙	⊙	○		J172
SSR series		PVD Coat	Internal	⊙	⊙	⊙	○					⊙	⊙				J180
SR series		PVD Coat AURORA Coat DLC	Internal	⊙	⊙	⊙	○		⊙	○	○	⊙	⊙	○	○		J190

Drilling

J

Solid

Indexable
Head type

Indexable
Insert type

Reamers

Effective Length List by Diameter

● Diameter $\varnothing 0.03$ to $\varnothing 0.78\text{mm}$

Dia.	Effective Length	Overall Length	Cat. No.	Page
DC	LU	OAL		
0.03	0.02	38.2	MDUP 0030-30C	J108
	0.26	38.0	MDUS 0030-30C	J109
0.04	0.04	38.2	MDUP 0040-30C	J108
	0.34	38.0	MDUS 0040-30C	J109
0.05	0.05	38.2	MDUP 0050-30C	J108
	0.45	38.0	MDUS 0050-30C	J109
0.08	0.06	38.2	MDUP 0080-30C	J108
	0.72	38.0	MDUS 0080-30C	J109
0.1	0.1	38.2	MDUP 0100-30C	J108
	0.9	38.0	MDUS 0100-30C	J109
0.12	0.08	38.2	MDUP 0120-30C	J108
	1.08	38.0	MDUS 0120-30C	J109
0.15	0.08	38.2	MDUP 0150-30C	J108
	1.35	38.0	MDUS 0150-30C	J109
0.18	0.17	38.2	MDUP 0180-30C	J108
	1.62	38.0	MDUS 0180-30C	J109
0.2	2.25	38.0	MDSS 0020	J109
0.21	2.24	38.0	MDSS 0021	J109
0.22	2.23	38.0	MDSS 0022	J109
0.23	2.21	38.0	MDSS 0023	J109
0.24	2.2	38.0	MDSS 0024	J109
0.25	2.19	38.0	MDSS 0025	J109
0.26	2.18	38.0	MDSS 0026	J109
0.27	2.16	38.0	MDSS 0027	J109
0.28	2.15	38.0	MDSS 0028	J109
0.29	2.14	38.0	MDSS 0029	J109
0.3	0.7	40.0	MDF 0030S2D	J28
	2.6	38.0	MDSS 0030	J109
0.31	2.6	38.0	MDSS 0031	J109
0.32	2.6	38.0	MDSS 0032	J109
0.33	2.6	38.0	MDSS 0033	J109
0.34	2.6	38.0	MDSS 0034	J109
0.35	3.6	38.0	MDSS 0035	J109
0.36	3.6	38.0	MDSS 0036	J109
0.37	3.5	38.0	MDSS 0037	J109
0.38	3.5	38.0	MDSS 0038	J109
0.39	3.5	38.0	MDSS 0039	J109
0.4	0.8	40.0	MDF 0040S2D	J28
	4.5	38.0	MDSS 0040	J109
0.41	4.5	38.0	MDSS 0041	J109
0.42	4.5	38.0	MDSS 0042	J109
0.43	4.5	38.0	MDSS 0043	J109
0.44	4.5	38.0	MDSS 0044	J109
0.45	4.4	38.0	MDSS 0045	J109
0.46	4.4	38.0	MDSS 0046	J109
0.47	4.4	38.0	MDSS 0047	J109
0.48	4.4	38.0	MDSS 0048	J109
0.49	4.4	38.0	MDSS 0049	J109
0.5	1.3	40.0	MDF 0050S2D	J28
	5.4	38.0	MDSS 0050	J109
0.51	5.4	38.0	MDSS 0051	J109
0.52	5.4	38.0	MDSS 0052	J109
0.53	5.3	38.0	MDSS 0053	J109
0.54	5.3	38.0	MDSS 0054	J109
0.55	5.3	38.0	MDSS 0055	J109
0.56	5.3	38.0	MDSS 0056	J109
0.57	5.3	38.0	MDSS 0057	J109
0.58	5.3	38.0	MDSS 0058	J109
0.59	5.3	38.0	MDSS 0059	J109
0.6	1.5	40.0	MDF 0060S2D	J28
	6.3	38.0	MDSS 0060	J109
0.61	6.2	38.0	MDSS 0061	J109
0.62	6.2	38.0	MDSS 0062	J109
0.63	6.2	38.0	MDSS 0063	J109
0.64	6.2	38.0	MDSS 0064	J109
0.65	6.2	38.0	MDSS 0065	J109
0.66	6.2	38.0	MDSS 0066	J109
0.67	6.2	38.0	MDSS 0067	J109
0.68	6.2	38.0	MDSS 0068	J109
0.69	6.1	38.0	MDSS 0069	J109
0.7	1.8	40.0	MDF 0070S2D	J28
	8.1	38.0	MDSS 0070	J109
0.71	8.1	38.0	MDSS 0071	J109
0.72	8.1	38.0	MDSS 0072	J109
0.73	8.1	38.0	MDSS 0073	J109
0.74	8.1	38.0	MDSS 0074	J109
0.75	8.1	38.0	MDSS 0075	J109
0.76	8.1	38.0	MDSS 0076	J109
0.77	8.0	38.0	MDSS 0077	J109
0.78	8.0	38.0	MDSS 0078	J109

● Diameter $\varnothing 0.79$ to $\varnothing 0.92\text{mm}$

Dia.	Effective Length	Overall Length	Cat. No.	Page
DC	LU	OAL		
0.79	8.0	38.0	MDSS 0079	J109
	2.0	40.0	MDF 0080S2D	J28
0.8	2.0	45.0	MLDH 0800P	J106
	6.8	50.0	MLDH 0800L5	J106
	9.0	38.0	MDSS 0080	J109
	12.8	55.0	MLDH 0800L12	J106
	17.8	60.0	MLDH 0800L20	J106
	26.8	70.0	MLDH 0800L30	J106
0.81	2.0	45.0	MLDH 0810P	J106
	7.8	50.0	MLDH 0810L5	J106
	9.0	38.0	MDSS 0081	J109
	12.8	55.0	MLDH 0810L12	J106
0.82	17.8	60.0	MLDH 0810L20	J106
	26.8	70.0	MLDH 0810L30	J106
	2.1	45.0	MLDH 0820P	J106
	7.8	50.0	MLDH 0820L5	J106
	9.0	38.0	MDSS 0082	J109
	12.8	55.0	MLDH 0820L12	J106
0.83	18.8	60.0	MLDH 0820L20	J106
	26.8	70.0	MLDH 0820L30	J106
	2.1	45.0	MLDH 0830P	J106
	7.8	50.0	MLDH 0830L5	J106
	9.0	38.0	MDSS 0083	J109
	12.8	55.0	MLDH 0830L12	J106
0.84	18.8	60.0	MLDH 0830L20	J106
	26.8	70.0	MLDH 0830L30	J106
	2.1	45.0	MLDH 0840P	J106
	7.7	50.0	MLDH 0840L5	J106
	9.0	38.0	MDSS 0084	J109
	12.7	55.0	MLDH 0840L12	J106
0.85	18.7	60.0	MLDH 0840L20	J106
	27.7	70.0	MLDH 0840L30	J106
	2.1	45.0	MLDH 0850P	J106
	7.7	50.0	MLDH 0850L5	J106
	8.9	38.0	MDSS 0085	J109
	12.7	55.0	MLDH 0850L12	J106
0.86	18.7	60.0	MLDH 0850L20	J106
	27.7	70.0	MLDH 0850L30	J106
	2.1	45.0	MLDH 0860P	J106
	7.7	50.0	MLDH 0860L5	J106
	8.9	38.0	MDSS 0086	J109
	13.7	55.0	MLDH 0860L12	J106
0.87	19.7	65.0	MLDH 0860L20	J106
	27.7	70.0	MLDH 0860L30	J106
	2.2	45.0	MLDH 0870P	J106
	7.7	50.0	MLDH 0870L5	J106
	8.9	38.0	MDSS 0087	J109
	13.7	55.0	MLDH 0870L12	J106
0.88	19.7	65.0	MLDH 0870L20	J106
	28.7	70.0	MLDH 0870L30	J106
	2.2	45.0	MLDH 0880P	J106
	7.7	50.0	MLDH 0880L5	J106
	8.9	38.0	MDSS 0088	J109
	13.7	55.0	MLDH 0880L12	J106
0.89	19.7	65.0	MLDH 0880L20	J106
	28.7	70.0	MLDH 0880L30	J106
	2.3	45.0	MLDH 0890P	J106
	7.7	50.0	MLDH 0890L5	J106
	8.9	38.0	MDSS 0089	J109
	13.7	55.0	MLDH 0890L12	J106
0.9	19.7	65.0	MLDH 0890L20	J106
	28.7	70.0	MLDH 0890L30	J106
	2.3	40.0	MDF 0090S2D	J28
	2.3	45.0	MLDH 0900P	J106
	7.7	50.0	MLDH 0900L5	J106
	9.9	38.0	MDSS 0090	J109
0.91	13.7	55.0	MLDH 0900L12	J106
	20.7	65.0	MLDH 0900L20	J106
	29.7	75.0	MLDH 0900L30	J106
	2.2	45.0	MLDH 0910P	J106
	8.6	50.0	MLDH 0910L5	J106
	9.9	38.0	MDSS 0091	J109
0.92	13.6	55.0	MLDH 0910L12	J106
	20.6	65.0	MLDH 0910L20	J106
	29.6	75.0	MLDH 0910L30	J106
	2.3	45.0	MLDH 0920P	J106
	8.6	50.0	MLDH 0920L5	J106
	9.9	38.0	MDSS 0092	J109
0.92	14.6	60.0	MLDH 0920L12	J106
	20.6	65.0	MLDH 0920L20	J106

● Diameter $\varnothing 0.92$ to $\varnothing 1.1\text{mm}$

Dia.	Effective Length	Overall Length	Cat. No.	Page
DC	LU	OAL		
0.92	29.6	75.0	MLDH 0920L30	J106
	2.3	45.0	MLDH 0930P	J106
	8.6	50.0	MLDH 0930L5	J106
0.93	9.8	38.0	MDSS 0093	J109
	14.6	60.0	MLDH 0930L12	J106
	20.6	65.0	MLDH 0930L20	J106
	30.6	75.0	MLDH 0930L30	J106
	2.4	45.0	MLDH 0940P	J106
0.94	8.6	50.0	MLDH 0940L5	J106
	9.8	38.0	MDSS 0094	J109
	14.6	60.0	MLDH 0940L12	J106
	21.6	65.0	MLDH 0940L20	J106
	30.6	75.0	MLDH 0940L30	J106
	2.4	45.0	MLDH 0950P	J106
0.95	8.6	50.0	MLDH 0950L5	J106
	9.8	38.0	MDSS 0095	J109
	14.6	60.0	MLDH 0950L12	J106
	21.6	65.0	MLDH 0950L20	J106
	30.6	75.0	MLDH 0950L30	J106
0.96	2.4	45.0	MLDH 0960P	J106
	8.6	50.0	MLDH 0960L5	J106
	9.8	38.0	MDSS 0096	J109
	14.6	60.0	MLDH 0960L12	J106
	21.6	65.0	MLDH 0960L20	J106
0.97	31.6	75.0	MLDH 0960L30	J106
	2.4	45.0	MLDH 0970P	J106
	8.5	50.0	MLDH 0970L5	J106
	9.8	38.0	MDSS 0097	J109
	14.5	60.0	MLDH 0970L12	J106
0.98	21.5	65.0	MLDH 0970L20	J106
	31.5	75.0	MLDH 0970L30	J106
	2.4	45.0	MLDH 0980P	J106
	8.5	50.0	MLDH 0980L5	J106
	9.8	38.0	MDSS 0098	J109
0.99	15.5	60.0	MLDH 0980L12	J106
	22.5	65.0	MLDH 0980L20	J106
	31.5	75.0	MLDH 0980L30	J106
	2.5	45.0	MLDH 0990P	J106
	8.5	50.0	MLDH 0990L5	J106
1.0	9.8	38.0	MDSS 0099	J109
	15.5	60.0	MLDH 0990L12	J106
	22.5	65.0	MLDH 0990L20	J106
	32.5	75.0	MLDH 0990L30	J106
	2.5	45.0	MDF 0100S2D	J28
1.0	2.5	45.0	MLDH 1000P	J106
	4.5	45.0	MDA 0100S03H03	J92
	4.7	45.2	MDW 0100GS2	J50
	5.7	45.2	MDE 0100S03E02	J13
	6.7	57.2	MDE 0100S03H03	J19
	7.7	49.2	MDE 0100S03E04	J13
	8.5	50.0	MDA 0100S03H05	J92
	8.5	50.0	MLDH 1000L5	J106
	8.7	59.2	MDE 0100S03H05	J19
	10.7	49.2	MDW 0100GS4	J50
	10.8	38.0	MDSS 0100	J109
1.05	11.7	62.2	MDE 0100S03H08	J19
	12.5	55.0	MDA 0100S03H10	J92
	15.5	60.0	MLDH 1000L12	J106
	17.5	60.0	MDA 0100S03H15	J92
	22.5	65.0	MDA 0100S03H20	J92
	22.5	65.0	MLDH 1000L20	J106
	32.5	75.0	MLDH 1000L30	J106
	2.6	45.0	MLDH 1050P	J106
	10.4	55.0	MLDH 1050L5	J106
	16.4	60.0	MLDH 1050L12	J106
	23.4	65.0	MLDH 1050L20	J106
1.1	34.4	80.0	MLDH 1050L30	J106
	2.8	45.0	MDF 0110S2D	J28
	2.8	45.0	MLDH 1100P	J107
	4.6	45.2	MDW 0110GS2	J50
	5.6	45.2	MDE 0110S03E02	J13
	6.4	45.0	MDA 0110S03H03	J92
	6.6	57.2	MDE 0110S03H03	J19
	7.6	49.2	MDE 0110S03E04	J13
	8.6	59.2	MDE 0110S03H05	J19
	10.4	50.0	MDA 0110S03H05	J92
	10.4	55.0	MLDH 1100L5	J107
1.1	10.6	49.2	MDW 0110GS4	J50
	12.6	62.2	MDE 0110S03H08	J19
	16.4	55.0	MDA 0110S03H10	J92

Effective Length List by Diameter

● Diameter ø1.1 to ø1.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.1	17.4	60.0	MLDH 1100L12	J107
	19.4	65.0	MDA 0110S03H15	J92
	24.4	70.0	MDA 0110S03H20	J92
	24.4	70.0	MLDH 1100L20	J107
	35.4	80.0	MLDH 1100L30	J107
1.15	2.9	45.0	MLDH 1150P	J107
	10.3	55.0	MLDH 1150L5	J107
	18.3	60.0	MLDH 1150L12	J107
	26.3	70.0	MLDH 1150L20	J107
	37.3	80.0	MLDH 1150L30	J107
1.2	3.0	45.0	MDF 0120S2D	J28
	3.0	45.0	MLDH 1200P	J107
	4.4	45.2	MDW 0120GS2	J50
	6.2	48.0	MDA 0120S03H03	J92
	6.4	45.2	MDE 0120S03E02	J13
	7.4	57.2	MDE 0120S03H03	J19
	8.4	49.2	MDE 0120S03E04	J13
	9.4	59.2	MDE 0120S03H05	J19
	10.2	55.0	MDA 0120S03H05	J92
	10.2	55.0	MLDH 1200L5	J107
	10.4	49.2	MDW 0120GS4	J50
	13.4	62.2	MDE 0120S03H08	J19
	16.2	60.0	MDA 0120S03H10	J92
	18.2	60.0	MLDH 1200L12	J107
	21.2	65.0	MDA 0120S03H15	J92
1.25	27.2	70.0	MDA 0120S03H20	J92
	27.2	70.0	MLDH 1200L20	J107
	39.2	85.0	MLDH 1200L30	J107
	3.1	45.0	MLDH 1250P	J107
	12.1	55.0	MLDH 1250L5	J107
	19.1	65.0	MLDH 1250L12	J107
	28.1	70.0	MLDH 1250L20	J107
	41.1	85.0	MLDH 1250L30	J107
	3.3	45.0	MDF 0130S2D	J28
	3.3	45.0	MLDH 1300P	J107
	4.4	45.3	MDW 0130GS2	J50
	6.1	48.0	MDA 0130S03H03	J92
	6.3	45.2	MDE 0130S03E02	J13
	7.3	57.2	MDE 0130S03H03	J19
	9.3	49.2	MDE 0130S03E04	J13
1.3	10.3	59.2	MDE 0130S03H05	J19
	10.4	49.3	MDW 0130GS4	J50
	12.1	55.0	MDA 0130S03H05	J92
	12.1	55.0	MLDH 1300L5	J107
	14.3	62.2	MDE 0130S03H08	J19
	18.1	60.0	MDA 0130S03H10	J92
	20.1	65.0	MLDH 1300L12	J107
	23.1	65.0	MDA 0130S03H15	J92
	29.1	75.0	MDA 0130S03H20	J92
	29.1	75.0	MLDH 1300L20	J107
	42.1	85.0	MLDH 1300L30	J107
	3.4	45.0	MLDH 1350P	J107
	12.0	55.0	MLDH 1350L5	J107
	21.0	65.0	MLDH 1350L12	J107
	30.0	75.0	MLDH 1350L20	J107
1.35	44.0	90.0	MLDH 1350L30	J107
	3.5	45.0	MDF 0140S2D	J28
	3.5	45.0	MLDH 1400P	J107
	4.2	45.3	MDW 0140GS2	J50
	5.9	48.0	MDA 0140S03H03	J92
	7.2	45.3	MDE 0140S03E02	J13
	8.2	57.3	MDE 0140S03H03	J19
	9.2	49.3	MDE 0140S03E04	J13
	10.2	49.3	MDW 0140GS4	J50
	11.2	59.3	MDE 0140S03H05	J19
	11.9	55.0	MDA 0140S03H05	J92
	11.9	55.0	MLDH 1400L5	J107
	15.2	62.3	MDE 0140S03H08	J19
	17.9	60.0	MDA 0140S03H10	J92
1.4	21.9	65.0	MLDH 1400L12	J107
	25.9	70.0	MDA 0140S03H15	J92
	31.9	75.0	MDA 0140S03H20	J92
	31.9	75.0	MLDH 1400L20	J107
	45.9	90.0	MLDH 1400L30	J107
	3.6	45.0	MLDH 1450P	J107
	13.8	55.0	MLDH 1450L5	J107
	22.8	65.0	MLDH 1450L12	J107
	32.8	75.0	MLDH 1450L20	J107
	46.8	90.0	MLDH 1450L30	J107
	3.8	45.0	MDF 0150S2D	J28

(Blue text: Flat head Indexable head type)

● Diameter ø1.5 to ø1.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.5	3.8	45.0	MLDH 1500P	J107
	4.1	45.3	MDW 0150GS2	J50
	5.8	48.0	MDA 0150S03H03	J92
	7.1	45.3	MDE 0150S03E02	J13
	8.1	63.3	MDW 0150HGS3	J54
	9.1	57.3	MDE 0150S03H03	J19
	10.1	49.3	MDE 0150S03E04	J13
	10.1	49.3	MDW 0150GS4	J50
	12.1	59.3	MDE 0150S03H05	J19
	12.1	70.3	MDW 0150HGS5	J54
	13.8	55.0	MDA 0150S03H05	J92
	13.8	55.0	MLDH 1500L5	J107
	16.1	62.3	MDE 0150S03H08	J19
	16.6	76.3	MDW 0150HGS8	J54
	20.8	65.0	MDA 0150S03H10	J92
1.55	23.8	65.0	MLDH 1500L12	J107
	25.8	70.0	MDA 0150S03H15	J92
	33.8	75.0	MDA 0150S03H20	J92
	33.8	75.0	MLDH 1500L20	J107
	48.8	90.0	MLDH 1500L30	J107
	3.9	45.0	MLDH 1550P	J107
	13.7	55.0	MLDH 1550L5	J107
	23.7	65.0	MLDH 1550L12	J107
	34.7	80.0	MLDH 1550L20	J107
	50.7	95.0	MLDH 1550L30	J107
	4.0	45.0	MDF 0160S2D	J28
	4.0	45.0	MLDH 1600P	J107
	5.9	45.3	MDW 0160GS2	J50
	7.6	50.0	MDA 0160S03H03	J92
1.6	7.9	45.3	MDE 0160S03E02	J13
	8.9	59.3	MDE 0160S03H03	J19
	10.4	63.3	MDW 0160HGS3	J54
	10.9	49.3	MDE 0160S03E04	J13
	11.9	62.3	MDE 0160S03H05	J19
	12.9	49.3	MDW 0160GS4	J50
	13.6	55.0	MDA 0160S03H05	J92
	13.6	55.0	MLDH 1600L5	J107
	16.9	67.3	MDE 0160S03H08	J19
	16.9	70.3	MDW 0160HGS5	J54
	21.9	76.3	MDW 0160HGS8	J54
	22.6	65.0	MDA 0160S03H10	J92
	24.6	70.0	MLDH 1600L12	J107
	29.6	75.0	MDA 0160S03H15	J92
1.65	35.6	80.0	MDA 0160S03H20	J92
	35.6	80.0	MLDH 1600L20	J107
	51.6	95.0	MLDH 1600L30	J107
	4.1	50.0	MLDH 1650P	J107
	15.5	60.0	MLDH 1650L5	J107
	25.5	70.0	MLDH 1650L12	J107
	37.5	80.0	MLDH 1650L20	J107
	53.5	95.0	MLDH 1650L30	J107
	4.3	45.0	MDF 0170S2D	J28
	4.3	50.0	MLDH 1700P	J107
	5.9	45.4	MDW 0170GS2	J50
	7.5	50.0	MDA 0170S03H03	J92
	7.8	45.3	MDE 0170S03E02	J13
	9.8	59.3	MDE 0170S03H03	J19
	10.4	63.4	MDW 0170HGS3	J54
1.7	10.8	49.3	MDE 0170S03E04	J13
	12.8	62.3	MDE 0170S03H05	J19
	12.9	49.4	MDW 0170GS4	J50
	15.5	60.0	MDA 0170S03H05	J92
	15.5	60.0	MLDH 1700L5	J107
	16.9	70.4	MDW 0170HGS5	J54
	17.8	67.3	MDE 0170S03H08	J19
	21.9	76.4	MDW 0170HGS8	J54
	22.5	65.0	MDA 0170S03H10	J92
	26.5	70.0	MLDH 1700L12	J107
	29.5	75.0	MDA 0170S03H15	J92
	38.5	80.0	MDA 0170S03H20	J92
	38.5	80.0	MLDH 1700L20	J107
	55.5	100.0	MLDH 1700L30	J107
1.75	4.4	50.0	MLDH 1750P	J107
	15.4	60.0	MLDH 1750L5	J107
	27.4	70.0	MLDH 1750L12	J107
	39.4	85.0	MLDH 1750L20	J107
	57.4	100.0	MLDH 1750L30	J107
	4.5	45.0	MDF 0180S2D	J28
	4.5	50.0	MLDH 1800P	J107
	5.7	45.4	MDW 0180GS2	J50

(Blue text: Flat head Indexable head type)

● Diameter ø1.8 to ø2.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.8	7.3	50.0	MDA 0180S03H03	J92
	8.6	45.3	MDE 0180S03E02	J13
	9.6	59.3	MDE 0180S03H03	J19
	10.2	63.4	MDW 0180HGS3	J54
	11.6	49.3	MDE 0180S03E04	J13
	12.7	49.4	MDW 0180GS4	J50
	13.6	62.3	MDE 0180S03H05	J19
	15.3	60.0	MDA 0180S03H05	J92
	15.3	60.0	MLDH 1800L5	J107
	16.7	70.4	MDW 0180HGS5	J54
	18.6	67.3	MDE 0180S03H08	J19
	21.7	76.4	MDW 0180HGS8	J54
	25.3	70.0	MDA 0180S03H10	J92
	28.3	70.0	MLDH 1800L12	J107
	32.3	75.0	MDA 0180S03H15	J92
	40.3	85.0	MDA 0180S03H20	J92
	40.3	85.0	MLDH 1800L20	J107
	58.3	100.0	MLDH 1800L30	J107
1.85	4.6	50.0	MLDH 1850P	J107
	17.2	60.0	MLDH 1850L5	J107
	28.2	70.0	MLDH 1850L12	J107
	41.2	85.0	MLDH 1850L20	J107
	59.2	103.0	MLDH 1850L30	J107
1.9	4.8	45.0	MDF 0190S2D	J28
	4.8	50.0	MLDH 1900P	J107
	5.6	45.4	MDW 0190GS2	J50
	7.2	50.0	MDA 0190S03H03	J92
	8.5	45.3	MDE 0190S03E02	J13
	10.1	63.4	MDW 0190HGS3	J54
	10.5	59.3	MDE 0190S03H03	J19
	12.5	49.3	MDE 0190S03E04	J13
	12.6	49.4	MDW 0190GS4	J50
	14.5	62.3	MDE 0190S03H05	J19
	16.6	70.4	MDW 0190HGS5	J54
	17.2	60.0	MDA 0190S03H05	J92
	17.2	60.0	MLDH 1900L5	J107
	19.5	70.3	MDE 0190S03H08	J19
	21.6	76.4	MDW 0190HGS8	J54
	25.2	70.0	MDA 0190S03H10	J92
	29.2	75.0	MLDH 1900L12	J107
	32.2	75.0	MDA 0190S03H15	J92
43.2	85.0	MDA 0190S03H20	J92	
43.2	85.0	MLDH 1900L20	J107	
60.2	103.0	MLDH 1900L30	J107	
1.95	4.9	50.0	MLDH 1950P	J107
	17.1	60.0	MLDH 1950L5	J107
	30.1	75.0	MLDH 1950L12	J107
	44.1	85.0	MLDH 1950L20	J107
	61.1	103.0	MLDH 1950L30	J107
2.0	5.0	50.0	MDF 0200S2D	J28
	5.0	50.0	MLDH 2000P	J107
	5.4	45.4	MDW 0200GS2	J50
	7.0	50.0	MDA 0200S03H03	J92
	9.4	45.4	MDE 0200S03E02	J13
	9.9	63.4	MDW 0200HGS3	J54
	10.5	50.0	MDS 0200SDC3	J103
	11.4	59.4	MDE 0200S03H03	J19
	12.4	49.4	MDW 0200GS4	J50
	13.4	49.4	MDE 0200S03E04	J13
	15.4	62.4	MDE 0200S03H05	J19
	16.4	70.4	MDW 0200HGS5	J54
	17.0	60.0	MDA 0200S03H05	J92
	17.0	60.0	MLDH 2000L5	J107
	21.4	70.4	MDE 0200S03H08	J19
	21.4	76.4	MDW 0200HGS8	J54
	27.0	70.0	MDA 0200S03H10	J92
	31.0	75.0	MLDH 2000L12	J107
37.0	80.0	MDA 0200S03H15	J92	
45.0	90.0	MDA 0200S03H20	J92	
45.0	90.0	MLDH 2000L20	J107	
63.0	103.0	MLDH 2000L30	J107	
2.1	5.3	50.0	MDF 0210S2D	J28
	7.3	45.4	MDW 0210GS2	J50
	9.3	45.4	MDE 0210S03E02	J13
	9.9	55.0	MDA 0210S03H03	J92
	11.3	59.4	MDE 0210S03H03	J19
	12.2	68.3	MDW 0210PHT	J84
	12.3	68.4	MDW 0210HGS3	J54
	13.3	49.4	MDE 0210S03E04	J13
	14.3	49.4	MDW 0210GS4	J50

Effective Length List by Diameter

● Diameter $\phi 2.1$ to $\phi 2.489\text{mm}$

	Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.1		15.3	62.4	MDE 0210S03H05	J19
		18.9	65.0	MDA 0210S03H05	J92
		21.3	78.4	MDW 0210HGS5	J54
		22.3	70.4	MDE 0210S03H08	J19
		24.8	81.4	MDW 0210HGS8	J54
		26.9	70.0	MDA 0210S03H10	J92
		35.3	88.4	MDW 0210XHGS10	J84
		36.9	80.0	MDA 0210S03H15	J92
		45.3	98.4	MDW 0210XHGS15	J84
		46.9	95.0	MDA 0210S03H20	J92
		58.3	111.4	MDW 0210XHGS20	J84
		70.3	123.4	MDW 0210XHGS25	J84
		83.3	136.4	MDW 0210XHGS30	J84
		5.5	50.0	MDF 0220S2D	J28
2.2		7.2	45.5	MDW 0220GS2	J50
		9.7	55.0	MDA 0220S03H03	J92
		10.1	45.4	MDE 0220S03E02	J13
		12.0	68.3	MDW 0220PHT	J84
		12.1	59.4	MDA 0220S03H03	J19
		12.2	68.5	MDW 0220HGS3	J54
		14.1	49.4	MDE 0220S03E04	J13
		14.2	49.5	MDW 0220GS4	J50
		16.1	62.4	MDE 0220S03H05	J19
		18.7	65.0	MDA 0220S03H05	J92
		21.2	78.5	MDW 0220HGS5	J54
		23.1	70.4	MDA 0220S03H08	J19
		24.7	81.5	MDW 0220HGS8	J54
		28.7	75.0	MDA 0220S03H10	J92
2.3		35.1	88.4	MDW 0220XHGS10	J84
		38.7	85.0	MDA 0220S03H15	J92
		45.1	98.4	MDW 0220XHGS15	J84
		47.7	95.0	MDA 0220S03H20	J92
		58.1	111.4	MDW 0220XHGS20	J84
		70.1	123.4	MDW 0220XHGS25	J84
		83.1	136.4	MDW 0220XHGS30	J84
		5.8	50.0	MDF 0230S2D	J28
		7.1	45.5	MDW 0230GS2	J50
		9.6	55.0	MDA 0230S03H03	J92
		10.0	45.4	MDE 0230S03E02	J13
		11.9	68.3	MDW 0230PHT	J84
		12.0	63.4	MDE 0230S03H03	J19
		12.1	68.5	MDW 0230HGS3	J54
2.4		14.0	49.4	MDE 0230S03E04	J13
		14.1	49.5	MDW 0230GS4	J50
		17.0	68.4	MDE 0230S03H05	J19
		20.6	65.0	MDA 0230S03H05	J92
		21.1	78.5	MDW 0230HGS5	J54
		24.0	75.4	MDE 0230S03H08	J19
		24.6	81.5	MDW 0230HGS8	J54
		28.6	75.0	MDA 0230S03H10	J92
		35.0	88.4	MDW 0230XHGS10	J84
		41.6	85.0	MDA 0230S03H15	J92
		45.0	98.4	MDW 0230XHGS15	J84
		49.6	100.0	MDA 0230S03H20	J92
		58.0	111.4	MDW 0230XHGS20	J84
		70.0	123.4	MDW 0230XHGS25	J84
2.489		83.0	136.4	MDW 0230XHGS30	J84
		6.0	50.0	MDF 0240S2D	J28
		6.9	45.5	MDW 0240GS2	J50
		9.4	55.0	MDA 0240S03H03	J92
		10.8	45.4	MDE 0240S03E02	J13
		11.7	68.3	MDW 0240PHT	J84
		11.9	68.5	MDW 0240HGS3	J54
		12.8	63.4	MDE 0240S03H03	J19
		13.9	49.5	MDW 0240GS4	J50
		14.8	49.4	MDE 0240S03E04	J13
		17.8	68.4	MDE 0240S03H05	J19
		20.4	65.0	MDA 0240S03H05	J92
		20.9	78.5	MDW 0240HGS5	J54
		24.4	81.5	MDW 0240HGS8	J54
		24.8	75.4	MDE 0240S03H08	J19
		31.4	75.0	MDA 0240S03H10	J92
		34.8	88.4	MDW 0240XHGS10	J84
		41.4	85.0	MDA 0240S03H15	J92
		44.8	98.4	MDW 0240XHGS15	J84
		52.4	100.0	MDA 0240S03H20	J92
		57.8	111.4	MDW 0240XHGS20	J84
		69.8	123.4	MDW 0240XHGS25	J84
		82.8	136.4	MDW 0240XHGS30	J84

● Diameter $\phi 2.5$ to $\phi 2.8\text{mm}$

	Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.5		6.3	50.0	MDF 0250S2D	J28
		6.8	45.5	MDW 0250GS2	J50
		9.3	55.0	MDA 0250S03H03	J92
		10.8	45.5	MDE 0250S03E02	J13
		11.6	68.3	MDW 0250PHT	J84
		11.8	68.5	MDW 0250HGS3	J54
		13.8	49.5	MDW 0250GS4	J50
		13.8	63.5	MDE 0250S03H03	J19
		14.8	49.5	MDE 0250S03E04	J13
		18.8	68.5	MDE 0250S03H05	J19
		20.8	78.5	MDW 0250HGS5	J54
		22.3	65.0	MDA 0250S03H05	J92
		24.3	81.5	MDW 0250HGS8	J54
		25.8	75.5	MDE 0250S03H08	J19
2.6		31.3	75.0	MDA 0250S03H10	J92
		34.8	88.5	MDW 0250XHGS10	J84
		37.8	91.5	MDW 0250XHGS12	J84
		41.3	85.0	MDA 0250S03H15	J92
		44.8	98.5	MDW 0250XHGS15	J84
		56.3	105.0	MDA 0250S03H20	J92
		57.8	111.5	MDW 0250XHGS20	J84
		69.8	123.5	MDW 0250XHGS25	J84
		82.8	136.5	MDW 0250XHGS30	J84
		6.5	50.0	MDF 0260S2D	J28
		9.6	45.5	MDW 0260GS2	J50
		11.1	60.0	MDA 0260S03H03	J92
		11.6	45.5	MDE 0260S03E02	J13
		13.6	63.5	MDE 0260S03H03	J19
2.7		13.9	68.3	MDW 0260PHT	J84
		14.1	68.5	MDW 0260HGS3	J54
		15.6	49.5	MDE 0260S03E04	J13
		15.6	49.5	MDW 0260GS4	J50
		18.6	68.5	MDE 0260S03H05	J19
		22.1	70.0	MDA 0260S03H05	J92
		24.6	78.5	MDW 0260HGS5	J54
		26.6	75.5	MDE 0260S03H08	J19
		29.6	81.5	MDW 0260HGS8	J54
		34.1	80.0	MDA 0260S03H10	J92
		41.6	93.5	MDW 0260XHGS10	J84
		46.1	90.0	MDA 0260S03H15	J92
		56.6	108.5	MDW 0260XHGS15	J84
		57.1	105.0	MDA 0260S03H20	J92
2.76		71.6	123.5	MDW 0260XHGS20	J84
		86.6	138.5	MDW 0260XHGS25	J84
		101.6	153.5	MDW 0260XHGS30	J84
		6.8	50.0	MDF 0270S2D	J28
		9.6	45.6	MDW 0270GS2	J50
		11.0	60.0	MDA 0270S03H03	J92
		11.5	45.5	MDE 0270S03E02	J13
		13.9	68.4	MDW 0270PHT	J84
		14.1	68.6	MDW 0270HGS3	J54
		14.5	68.5	MDE 0270S03H03	J19
		15.5	49.5	MDE 0270S03E04	J13
		15.6	49.6	MDW 0270GS4	J50
		19.5	78.5	MDE 0270S03H05	J19
		24.0	70.0	MDA 0270S03H05	J92
2.78		24.6	78.6	MDW 0270HGS5	J54
		27.5	81.5	MDE 0270S03H08	J19
		29.6	81.6	MDW 0270HGS8	J54
		34.0	80.0	MDA 0270S03H10	J92
		41.5	93.5	MDW 0270XHGS10	J84
		46.0	90.0	MDA 0270S03H15	J92
		56.5	108.5	MDW 0270XHGS15	J84
		59.0	105.0	MDA 0270S03H20	J92
		71.5	123.5	MDW 0270XHGS20	J84
		86.5	138.5	MDW 0270XHGS25	J84
		101.5	153.5	MDW 0270XHGS30	J84
		6.9	50.0	MDF 0276S2D	J28
		11.3	45.5	MDE 0276S03E02	J13
		20.3	78.5	MDE 0276S03H05	J19
2.8		6.9	50.0	MDF 0278S2D	J28
		11.3	45.5	MDE 0278S03E02	J13
		20.3	78.5	MDE 0278S03H05	J19
		7.0	50.0	MDF 0280S2D	J28
		9.4	45.6	MDW 0280GS2	J50
		10.8	60.0	MDA 0280S03H03	J92
		11.3	45.5	MDE 0280S03E02	J13
		13.7	68.4	MDW 0280PHT	J84
		13.9	68.6	MDW 0280HGS3	J54
		14.3	68.5	MDE 0280S03H03	J19

● Diameter $\phi 2.8$ to $\phi 3.1\text{mm}$

	Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.8		15.3	49.5	MDE 0280S03E04	J13
		15.4	49.6	MDW 0280GS4	J50
		20.3	78.5	MDE 0280S03H05	J19
		23.8	70.0	MDA 0280S03H05	J92
		24.4	78.6	MDW 0280HGS5	J54
		28.3	81.5	MDE 0280S03H08	J19
		29.4	81.6	MDW 0280HGS8	J54
		35.8	80.0	MDA 0280S03H10	J92
		41.3	93.5	MDW 0280XHGS10	J84
		50.8	95.0	MDA 0280S03H15	J92
		56.3	108.5	MDW 0280XHGS15	J84
		60.8	110.0	MDA 0280S03H20	J92
		71.3	123.5	MDW 0280XHGS20	J84
		86.3	138.5	MDW 0280XHGS25	J84
2.9		101.3	153.5	MDW 0280XHGS30	J84
		7.3	50.0	MDF 0290S2D	J28
		9.3	45.6	MDW 0290GS2	J50
		10.7	60.0	MDA 0290S03H03	J92
		11.2	45.5	MDE 0290S03E02	J13
		13.6	68.4	MDW 0290PHT	J84
		13.8	68.6	MDW 0290HGS3	J54
		15.2	49.5	MDE 0290S03E04	J13
		15.2	68.5	MDE 0290S03H03	J19
		15.3	49.6	MDW 0290GS4	J50
		21.2	78.5	MDE 0290S03H05	J19
		24.3	78.6	MDW 0290HGS5	J54
		25.7	70.0	MDA 0290S03H05	J92
		29.2	81.5	MDE 0290S03H08	J19
3.0		29.3	81.6	MDW 0290HGS8	J54
		35.7	80.0	MDA 0290S03H10	J92
		41.2	93.5	MDW 0290XHGS10	J84
		50.7	95.0	MDA 0290S03H15	J92
		56.2	108.5	MDW 0290XHGS15	J84
		62.7	110.0	MDA 0290S03H20	J92
		71.2	123.5	MDW 0290XHGS20	J84
		86.2	138.5	MDW 0290XHGS25	J84
		101.2	153.5	MDW 0290XHGS30	J84
		7.5	50.0	MDF 0300S2D	J28
		9.0	45.5	MDE 0300S03E02	J13
		9.0	68.0	MDF 0300H3D	J34
		9.0	100.0	MDF 0300L2D	J32
		9.1	45.6	MDW 0300GS2	J50
3.1		10.5	60.0	MDA 0300S03H03	J92
		13.4	68.4	MDW 0300PHT	J84
		13.5	68.5	MDW 0300HGX3	J74
		13.6	68.6	MDW 0300HGS3	J54

Effective Length List by Diameter

● Diameter ø3.1 to ø3.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.1	15.8	72.4	MDA 0310S04H03	J93
	15.8	72.4	MDW 0310PHT	J84
	16.0	72.6	MDE 0310S04H03	J19
	16.0	72.6	MDH 0310S04H03	J42
	16.0	72.6	MDM 0310S04H03	J66
	16.0	72.6	MDW 0310HGS3	J54
	16.0	72.6	MDW 0310HX3	J74
	16.2	86.0	MDF 0310H5D	J34
	20.0	60.6	MDE 0310S04E04	J13
	20.0	60.6	MDW 0310GS4	J50
	27.8	86.4	MDA 0310S04H05	J93
	28.0	86.6	MDH 0310S04H05	J42
	28.0	86.6	MDE 0310S04H05	J19
	28.0	86.6	MDM 0310S04H05	J66
	28.0	86.6	MDW 0310HGS5	J54
	28.0	86.6	MDW 0310HX5	J74
	28.0	86.6	MDW 0310NHGS5	J99
	31.0	92.6	MDH 0310S04H08	J42
	34.5	92.6	MDE 0310S04H08	J19
	34.5	92.6	MDW 0310HGS8	J54
	44.9	106.6	MDA 0310S04H10	J93
	49.0	103.6	MDW 0310XHGS10	J84
	64.0	118.6	MDW 0310XHGS15	J84
	82.0	136.6	MDW 0310XHGS20	J84
	99.0	153.6	MDW 0310XHGS25	J84
	117.0	171.6	MDW 0310XHGS30	J84
3.2	8.0	50.0	MDF 0320S2D	J28
	9.6	72.0	MDF 0320H3D	J34
	9.6	100.0	MDF 0320L2D	J32
	14.8	54.6	MDE 0320S04E02	J13
	14.9	54.7	MDW 0320GS2	J50
	15.6	72.4	MDA 0320S04H03	J93
	15.6	72.4	MDW 0320PHT	J84
	15.8	72.6	MDE 0320S04H03	J19
	15.8	72.6	MDH 0320S04H03	J42
	15.8	72.6	MDM 0320S04H03	J66
	15.8	72.6	MDW 0320HX3	J74
	15.9	72.7	MDW 0320HGS3	J54
	15.9	72.7	MDW 0320NHGS3	J99
	16.6	86.0	MDF 0320H5D	J34
	19.8	60.6	MDE 0320S04E04	J13
	19.9	60.7	MDW 0320GS4	J50
	27.6	86.4	MDA 0320S04H05	J93
	27.8	86.6	MDH 0320S04H05	J42
	27.8	86.6	MDE 0320S04H05	J19
	27.8	86.6	MDM 0320S04H05	J66
	27.8	86.6	MDW 0320HX5	J74
	27.9	86.7	MDW 0320HGS5	J54
	27.9	86.7	MDW 0320NHGS5	J99
	30.8	92.6	MDH 0320S04H08	J42
	34.3	92.6	MDE 0320S04H08	J19
	34.4	92.7	MDW 0320HGS8	J54
	44.8	106.6	MDA 0320S04H10	J93
	44.9	106.7	MDW 0320NHGS10	J99
	48.8	103.6	MDW 0320XHGS10	J84
	63.8	118.6	MDW 0320XHGS15	J84
	81.8	136.6	MDW 0320XHGS20	J84
	98.8	153.6	MDW 0320XHGS25	J84
	116.8	171.6	MDW 0320XHGS30	J84
3.3	8.3	50.0	MDF 0330S2D	J28
	10.0	72.0	MDF 0330H3D	J34
	10.0	100.0	MDF 0330L2D	J32
	14.7	54.6	MDE 0330S04E02	J13
	14.8	54.7	MDW 0330GS2	J50
	15.5	72.4	MDA 0330S04H03	J93
	15.5	72.4	MDW 0330PHT	J84
	15.7	72.6	MDE 0330S04H03	J19
	15.7	72.6	MDH 0330S04H03	J42
	15.7	72.6	MDM 0330S04H03	J66
	15.7	72.6	MDW 0330HX3	J74
	15.8	72.7	MDW 0330HGS3	J54
	15.8	72.7	MDW 0330NHGS3	J99
	16.8	61.7	MDS 0330SDC3	J103
	17.2	86.0	MDF 0330H5D	J34
	19.7	60.6	MDE 0330S04E04	J13
	19.8	60.7	MDW 0330GS4	J50
	27.5	86.4	MDA 0330S04H05	J93
	27.7	86.6	MDH 0330S04H05	J42
	27.7	86.6	MDE 0330S04H05	J19
	27.7	86.6	MDM 0330S04H05	J66

(Blue text: Flat head Indexable head type)

● Diameter ø3.3 to ø3.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.3	27.7	86.6	MDW 0330HX5	J74
	27.8	86.7	MDW 0330HGS5	J54
	27.8	86.7	MDW 0330NHGS5	J99
	30.7	92.6	MDH 0330S04H08	J42
	34.2	92.6	MDE 0330S04H08	J19
	34.3	92.7	MDW 0330HGS8	J54
	48.7	103.6	MDW 0330XHGS10	J84
	63.7	118.6	MDW 0330XHGS15	J84
	81.7	136.6	MDW 0330XHGS20	J84
	98.7	153.6	MDW 0330XHGS25	J84
	116.7	171.6	MDW 0330XHGS30	J84
3.4	8.5	50.0	MDF 0340S2D	J28
	10.2	72.0	MDF 0340H3D	J34
	10.2	100.0	MDF 0340L2D	J32
	14.5	54.6	MDE 0340S04E02	J13
	14.6	54.7	MDW 0340GS2	J50
	15.4	72.5	MDW 0340PHT	J84
	15.5	72.6	MDE 0340S04H03	J19
	15.5	72.6	MDH 0340S04H03	J42
	15.5	72.6	MDM 0340S04H03	J66
	15.5	72.6	MDW 0340HX3	J74
	15.6	72.7	MDW 0340HGS3	J54
	17.7	86.0	MDF 0340H5D	J34
	19.5	60.6	MDE 0340S04E04	J13
	19.6	60.7	MDW 0340GS4	J50
	27.4	86.5	MDA 0340S04H05	J93
	27.5	86.6	MDH 0340S04H05	J42
	27.5	86.6	MDE 0340S04H05	J19
	27.5	86.6	MDM 0340S04H05	J66
	27.6	86.7	MDW 0340HX5	J74
	27.6	86.7	MDW 0340HGS5	J54
	27.6	86.7	MDW 0340NHGS5	J99
	30.5	92.6	MDH 0340S04H08	J42
	34.0	92.6	MDE 0340S04H08	J19
	34.1	92.7	MDW 0340HGS8	J54
	44.5	106.6	MDA 0340S04H10	J93
	44.6	106.7	MDW 0340NHGS10	J99
	48.5	103.6	MDW 0340XHGS10	J84
	63.5	118.6	MDW 0340XHGS15	J84
	81.5	136.6	MDW 0340XHGS20	J84
	98.5	153.6	MDW 0340XHGS25	J84
	116.5	171.6	MDW 0340XHGS30	J84
3.5	8.8	50.0	MDF 0350S2D	J28
	10.6	72.0	MDF 0350H3D	J34
	10.6	100.0	MDF 0350L2D	J32
	14.4	54.6	MDE 0350S04E02	J13
	14.5	54.7	MDW 0350GS2	J50
	15.2	72.5	MDA 0350S04H03	J93
	15.3	72.5	MDW 0350PHT	J84
	15.4	72.6	MDE 0350S04H03	J19
	15.4	72.6	MDH 0350S04H03	J42
	15.4	72.6	MDM 0350S04H03	J66
	15.4	72.6	MDW 0350HX3	J74
	15.5	72.7	MDW 0350HGS3	J54
	15.5	72.7	MDW 0350NHGS3	J99
	18.3	86.0	MDF 0350H5D	J34
	19.4	60.6	MDE 0350S04E04	J13
	19.5	60.7	MDW 0350GS4	J50
	27.2	86.5	MDA 0350S04H05	J93
	27.4	86.6	MDH 0350S04H05	J42
	27.4	86.6	MDE 0350S04H05	J19
	27.4	86.6	MDM 0350S04H05	J66
	27.4	86.6	MDW 0350HX5	J74
	27.5	86.7	MDW 0350HGS5	J54
	27.5	86.7	MDW 0350NHGS5	J99
	30.4	92.6	MDH 0350S04H08	J42
	33.9	92.6	MDE 0350S04H08	J19
	33.9	92.6	MDW 0350HX8	J74
	34.0	92.7	MDW 0350HGS8	J54
	44.4	106.6	MDA 0350S04H10	J93
	44.5	106.7	MDW 0350NHGS10	J99
	48.4	103.6	MDW 0350XHGS10	J84
	53.4	108.6	MDW 0350XHGS12	J84
	63.4	118.6	MDW 0350XHGS15	J84
	81.4	136.6	MDW 0350XHGS20	J84
	98.4	153.6	MDW 0350XHGS25	J84
	116.4	171.6	MDW 0350XHGS30	J84
3.6	9.0	50.0	MDF 0360S2D	J28
	10.8	72.0	MDF 0360H3D	J34
	10.8	100.0	MDF 0360L2D	J32

(Blue text: Flat head Indexable head type)

● Diameter ø3.6 to ø3.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page	
3.6	16.3	54.7	MDE 0360S04E02	J13	
	16.3	54.7	MDW 0360GS2	J50	
	17.6	72.5	MDW 0360PHT	J84	
	17.8	72.7	MDE 0360S04H03	J19	
	17.8	72.7	MDH 0360S04H03	J42	
	17.8	72.7	MDM 0360S04H03	J66	
	17.8	72.7	MDW 0360HGS3	J54	
	17.8	72.7	MDW 0360HX3	J74	
	18.7	86.0	MDF 0360H5D	J34	
	22.3	60.7	MDE 0360S04E04	J13	
	22.3	60.7	MDW 0360GS4	J50	
	31.1	86.5	MDA 0360S04H05	J93	
	31.3	86.7	MDH 0360S04H05	J42	
	31.3	86.7	MDE 0360S04H05	J19	
	31.3	86.7	MDM 0360S04H05	J66	
	31.3	86.7	MDW 0360HGS5	J54	
	31.3	86.7	MDW 0360HX5	J74	
	31.3	86.7	MDW 0360NHGS5	J99	
	37.3	92.7	MDH 0360S04H08	J42	
	39.3	92.7	MDE 0360S04H08	J19	
	39.3	92.7	MDW 0360HGS8	J54	
	51.3	106.7	MDA 0360S04H10	J93	
	51.3	106.7	MDW 0360NHGS10	J99	
	55.3	108.7	MDW 0360XHGS10	J84	
	75.3	128.7	MDW 0360XHGS15	J84	
	95.3	148.7	MDW 0360XHGS20	J84	
	115.3	168.7	MDW 0360XHGS25	J84	
	135.3	188.7	MDW 0360XHGS30	J84	
	3.65	17.4	72.5	MDA 0365S04H03	J93
		17.8	72.8	MDW 0365NHGS3	J99
		30.9	86.5	MDA 0365S04H05	J93
		31.3	86.8	MDW 0365NHGS5	J99
3.66	9.1	50.0	MDF 0366S2D	J28	
	16.2	54.7	MDE 0366S04E02	J13	
	30.9	86.5	MDA 0366S04H05	J93	
	31.2	86.7	MDE 0366S04H05	J19	
3.68	31.3	86.8	MDW 0366NHGS5	J99	
	9.2	50.0	MDF 0368S2D	J28	
	16.2	54.7	MDE 0368S04E02	J13	
	31.2	86.7	MDE 0368S04H05	J19	
3.7	9.3	50.0	MDF 0370S2D	J28	
	11.2	72.0	MDF 0370H3D	J34	
	11.2	100.0	MDF 0370L2D	J32	
	16.2	54.7	MDE 0370S04E02	J13	
	16.3	54.8	MDW 0370GS2	J50	
	17.5	72.5	MDW 0370PHT	J85	
	17.7	72.7	MDE 0370S04H03	J19	
	17.7	72.7	MDH 0370S04H03	J42	
	17.7	72.7	MDM 0370S04H03	J66	
	17.7	72.7	MDW 0370HX3	J74	
	17.8	72.8	MDW 0370HGS3	J54	
	19.3	86.0	MDF 0370H5D	J34	
	22.2	60.7	MDE 0370S04E04	J13	
	22.3	60.8	MDW 0370GS4	J50	
	30.9	86.5	MDA 0370S04H05	J93	
	31.2	86.7	MDH 0370S04H05	J42	
	31.2	86.7	MDE 0370S04H05	J19	
	31.2	86.7	MDM 0370S04H05	J66	
	31.2	86.7	MDW 0370HX5	J74	
	31.3	86.8	MDW 0370HGS5	J54	
31.3	86.8	MDW 0370NHGS5	J99		
37.2	92.7	MDH 0370S04H08	J42		
39.2	92.7	MDE 0370S04H08	J19		
39.3	92.8	MDW 0370HGS8	J54		
55.2	108.7	MDW 0370XHGS10	J85		
75.2	128.7	MDW 0370XHGS15	J85		
95.2	148.7	MDW 0370XHGS20	J85		
115.2	168.7	MDW 0370XHGS25	J85		
135.2	188.7	MDW 0370XHGS30	J85		
3.8	9.5	50.0	MDF 0380S2D	J28	
	11.4	72.0	MDF 0380H3D	J34	
	11.4	100.0	MDF 0380L2D	J32	
	16.0	54.7	MDE 0380S04E02	J13	
	16.1	54.8	MDW 0380GS2	J50	
	17.3	72.5	MDW 0380PHT	J85	
	17.5	72.7	MDE 0380S04H03	J20	
	17.5	72.7	MDH 0380S04H03	J42	
	17.5	72.7	MDM 0380S04H03	J66	
	17.5	72.7	MDW 0380HX3	J74	
17.6	72.8	MDW 0380HGS3	J54		

Effective Length List by Diameter

● Diameter $\phi 3.8$ to $\phi 4.0$ mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.8	19.8	86.0	MDF 0380H5D	J34
	22.0	60.7	MDE 0380S04E04	J13
	22.1	60.8	MDW 0380GS4	J50
	30.8	86.5	MDA 0380S04H05	J93
	31.0	86.7	MDH 0380S04H05	J42
	31.0	86.7	MDE 0380S04H05	J20
	31.0	86.7	MDM 0380S04H05	J66
	31.0	86.7	MDW 0380HX5	J74
	31.1	86.8	MDW 0380HGS5	J54
	31.1	86.8	MDW 0380NHGS5	J99
	37.0	92.7	MDH 0380S04H08	J42
	39.0	92.7	MDE 0380S04H08	J20
	39.1	92.8	MDW 0380HGS8	J54
	55.0	108.7	MDW 0380XHGS10	J85
	75.0	128.7	MDW 0380XHGS15	J85
	95.0	148.7	MDW 0380XHGS20	J85
	115.0	168.7	MDW 0380XHGS25	J85
	135.0	188.7	MDW 0380XHGS30	J85
3.9	9.8	50.0	MDF 0390S2D	J28
	11.8	72.0	MDF 0390H3D	J34
	11.8	100.0	MDF 0390L2D	J32
	15.9	54.7	MDE 0390S04E02	J13
	16.0	54.8	MDW 0390GS2	J50
	17.2	72.5	MDW 0390PHT	J85
	17.4	72.7	MDE 0390S04H03	J20
	17.4	72.7	MDH 0390S04H03	J42
	17.4	72.7	MDM 0390S04H03	J66
	17.4	72.7	MDW 0390HX3	J74
	17.5	72.8	MDW 0390HGS3	J54
	20.3	86.0	MDF 0390H5D	J34
	21.9	60.7	MDE 0390S04E04	J13
	22.0	60.8	MDW 0390GS4	J50
	30.7	86.5	MDA 0390S04H05	J93
	30.9	86.7	MDH 0390S04H05	J42
	30.9	86.7	MDE 0390S04H05	J20
	30.9	86.7	MDM 0390S04H05	J66
4.0	30.9	86.7	MDW 0390HX5	J74
	31.0	86.8	MDW 0390HGS5	J54
	31.0	86.8	MDW 0390NHGS5	J99
	36.9	92.7	MDH 0390S04H08	J42
	38.9	92.7	MDE 0390S04H08	J20
	39.0	92.8	MDW 0390HGS8	J54
	51.0	106.8	MDW 0390NHGS10	J99
	54.9	108.7	MDW 0390XHGS10	J85
	74.9	128.7	MDW 0390XHGS15	J85
	94.9	148.7	MDW 0390XHGS20	J85
	114.9	168.7	MDW 0390XHGS25	J85
	134.9	188.7	MDW 0390XHGS30	J85
	10.0	50.0	MDF 0400S2D	J28
	12.0	72.0	MDF 0400H3D	J34
	12.0	100.0	MDF 0400L2D	J32
	15.7	54.7	MDE 0400S04E02	J13
	15.8	54.8	MDW 0400GS2	J50
	17.0	72.5	MDA 0400S04H03	J93
	17.0	72.5	MDW 0400PHT	J85
4.0	17.2	72.7	MDE 0400S04H03	J20
	17.2	72.7	MDH 0400S04H03	J42
	17.2	72.7	MDM 0400S04H03	J66
	17.2	72.7	MDW 0400HX3	J74
	17.3	72.8	MDW 0400HGS3	J54
	17.3	72.8	MDW 0400NHGS3	J99
	18.5	62.0	MDS 0400SDC3	J103
	20.8	86.0	MDF 0400H5D	J34
	21.7	60.7	MDE 0400S04E04	J13
	21.8	60.8	MDW 0400GS4	J50
	30.5	86.5	MDA 0400S04H05	J93
	30.7	86.7	MDH 0400S04H05	J42
	30.7	86.7	MDE 0400S04H05	J20
	30.7	86.7	MDM 0400S04H05	J66
	30.7	86.7	MDW 0400HX5	J74
	30.8	86.8	MDW 0400HGS5	J54
	30.8	86.8	MDW 0400NHGS5	J99
	36.7	92.7	MDH 0400S04H08	J42
	38.7	92.7	MDE 0400S04H08	J20
	38.7	92.7	MDW 0400HX8	J74
	38.8	92.8	MDW 0400HGS8	J54
	50.7	106.7	MDA 0400S04H10	J93
	50.8	106.8	MDW 0400NHGS10	J99
	54.7	108.7	MDW 0400XHGS10	J85
	62.7	116.7	MDW 0400XHGS12	J85

(Blue text: Flat head Indexable head type)

● Diameter $\phi 4.0$ to $\phi 4.3$ mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.0	74.7	128.7	MDW 0400XHGS15	J85
	94.7	148.7	MDW 0400XHGS20	J85
	114.7	168.7	MDW 0400XHGS25	J85
	134.7	188.7	MDW 0400XHGS30	J85
	10.3	60.0	MDF 0410S2D	J28
	12.4	80.0	MDF 0410H3D	J34
	12.4	100.0	MDF 0410L2D	J32
	17.6	61.7	MDE 0410S05E02	J13
	17.7	61.8	MDW 0410GS2	J50
	19.4	80.5	MDA 0410S06H03	J93
4.1	19.4	80.5	MDW 0410PHT	J85
	19.6	80.7	MDE 0410S05H03	J20
	19.6	80.7	MDM 0410S05H03	J66
	19.6	80.7	MDW 0410HX3	J74
	19.7	80.8	MDH 0410S06H03	J42
	19.7	80.8	MDW 0410HGS3	J54
	19.7	80.8	MDW 0410NHGS3	J99
	21.4	98.0	MDF 0410H5D	J34
	25.6	76.7	MDE 0410S05E04	J13
	25.7	76.8	MDW 0410GS4	J50
4.2	34.4	98.5	MDA 0410S06H05	J93
	34.6	98.7	MDE 0410S05H05	J20
	34.6	98.7	MDM 0410S05H05	J66
	34.6	98.7	MDW 0410HX5	J74
	34.7	98.8	MDH 0410S06H05	J42
	34.7	98.8	MDW 0410HGS5	J54
	34.7	98.8	MDW 0410NHGS5	J99
	41.7	105.8	MDH 0410S06H08	J42
	44.1	105.7	MDE 0410S05H08	J20
	44.2	105.8	MDW 0410HGS8	J54
4.3	62.6	120.7	MDW 0410XHGS10	J85
	82.6	140.7	MDW 0410XHGS15	J85
	105.6	163.7	MDW 0410XHGS20	J85
	127.6	185.7	MDW 0410XHGS25	J85
	150.6	208.7	MDW 0410XHGS30	J85
	10.5	60.0	MDF 0420S2D	J28
	12.6	80.0	MDF 0420H3D	J34
	12.6	100.0	MDF 0420L2D	J32
	17.5	61.8	MDE 0420S05E02	J13
	17.6	61.9	MDW 0420GS2	J50
4.3	19.3	80.6	MDA 0420S06H03	J93
	19.3	80.6	MDW 0420PHT	J85
	19.5	80.8	MDE 0420S05H03	J20
	19.5	80.8	MDH 0420S06H03	J42
	19.5	80.8	MDM 0420S05H03	J66
	19.5	80.8	MDW 0420HX3	J74
	19.6	80.9	MDW 0420HGS3	J54
	19.6	80.9	MDW 0420NHGS3	J99
	21.8	98.0	MDF 0420H5D	J34
	25.5	76.8	MDE 0420S05E04	J13
4.4	25.6	76.9	MDW 0420GS4	J50
	34.3	98.6	MDA 0420S06H05	J93
	34.5	98.8	MDH 0420S06H05	J42
	34.5	98.8	MDE 0420S05H05	J20
	34.5	98.8	MDM 0420S05H05	J66
	34.5	98.8	MDW 0420HX5	J74
	34.6	98.9	MDW 0420HGS5	J54
	34.6	98.9	MDW 0420NHGS5	J99
	41.5	105.8	MDH 0420S06H08	J42
	44.0	105.8	MDE 0420S05H08	J20
4.5	44.1	105.9	MDW 0420HGS8	J54
	62.5	120.8	MDW 0420XHGS10	J85
	82.5	140.8	MDW 0420XHGS15	J85
	105.5	163.8	MDW 0420XHGS20	J85
	127.5	185.8	MDW 0420XHGS25	J85
	150.5	208.8	MDW 0420XHGS30	J85
	10.8	60.0	MDF 0430S2D	J28
	13.0	80.0	MDF 0430H3D	J34
	13.0	100.0	MDF 0430L2D	J32
	17.4	61.8	MDE 0430S05E02	J13
4.6	17.5	61.9	MDW 0430GS2	J50
	19.2	80.6	MDW 0430PHT	J85
	19.4	80.8	MDE 0430S05H03	J20
	19.4	80.8	MDH 0430S06H03	J42
	19.4	80.8	MDM 0430S05H03	J66
	19.4	80.8	MDW 0430HX3	J74
	19.5	80.9	MDW 0430HGS3	J54
	22.4	98.0	MDF 0430H5D	J34
	25.4	76.8	MDE 0430S05E04	J13
	25.5	76.9	MDW 0430GS4	J50

(Blue text: Flat head Indexable head type)

● Diameter $\phi 4.3$ to $\phi 4.6$ mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.3	34.1	98.6	MDA 0430S06H05	J93
	34.4	98.8	MDH 0430S06H05	J42
	34.4	98.8	MDE 0430S05H05	J20
	34.4	98.8	MDM 0430S05H05	J66
	34.4	98.8	MDW 0430HX5	J74
	34.5	98.9	MDW 0430HGS5	J54
	34.5	98.9	MDW 0430NHGS5	J99
	41.4	105.8	MDH 0430S06H08	J42
	43.9	105.8	MDE 0430S05H08	J20
	44.0	105.9	MDW 0430HGS8	J54
	62.4	120.8	MDW 0430XHGS10	J85
	82.4	140.8	MDW 0430XHGS15	J85
	105.4	163.8	MDW 0430XHGS20	J85
4.4	11.0	60.0	MDF 0440S2D	J28
	13.2	80.0	MDF 0440H3D	J34
	13.2	100.0	MDF 0440L2D	J32
	17.2	61.8	MDE 0440S05E02	J13
	17.3	61.9	MDW 0440GS2	J50
	19.0	80.6	MDW 0440PHT	J85
	19.2	80.8	MDE 0440S05H03	J20
	19.2	80.8	MDH 0440S06H03	J42
	19.2	80.8	MDM 0440S05H03	J66
	19.2	80.8	MDW 0440HX3	J74
	19.3	80.9	MDW 0440HGS3	J54
	22.9	98.0	MDF 0440H5D	J34
	25.2	76.8	MDE 0440S05E04	J13
4.5	25.3	76.9	MDW 0440GS4	J50
	34.0	98.6	MDA 0440S06H05	J93
	34.2	98.8	MDH 0440S06H05	J42
	34.2	98.8	MDE 0440S05H05	J20
	34.2	98.8	MDM 0440S05H05	J66
	34.2	98.8	MDW 0440HX5	J74
	34.3	98.9	MDW 0440HGS5	J54
	34.3	98.9	MDW 0440NHGS5	J99
	41.2	105.8	MDH 0440S06H08	J42
	43.7	105.8	MDE 0440S05H08	J20
	43.8	105.9	MDW 0440HGS8	J54
	62.2	120.8	MDW 0440XHGS10	J85
	82.2	140.8	MDW 0440XHGS15	J85
4.6	105.2	163.8	MDW 0440XHGS20	J85
	127.2	185.8	MDW 0440XHGS25	J85
	150.2	208.8	MDW 0440XHGS30	J85
	11.3	60.0	MDF 0450S2D	J28
	13.6	80.0	MDF 0450H3D	J34
	13.6	100.0	MDF 0450L2D	J32
	17.1	61.8	MDE 0450S05E02	J13
	17.2	61.9	MDW 0450GS2	J50
	18.9	80.6	MDA 0450S06H03	J93
	18.9	80.6	MDW 0450PHT	J85
	19.1	80.8	MDE 0450S05H03	J20
	19.1	80.8	MDH 0450S06H03	J42
	19.1	80.8	MDM 0450S05H03	J66
19.1	80.8	MDW 0450HX3	J74	
19.2	80.9	MDW 0450HGS3	J54	
19.2	80.9	MDW 0450NHGS3	J99	
23.5	98.0	MDF 0450H5D	J34	
25.1	76.8	MDE 0450S05E04	J13	
25.2	76.9	MDW 0450GS4	J50	
33.9	98.6	MDA 0450S06H05	J93	
34.1	98.8	MDH 0450S06H05	J42	
34.1	98.8	MDE 0450S05H05	J20	
34.1	98.8	MDM 0450S05H05	J66	
34.1	98.8	MDW 0450HX5	J74	
34.2	98.9	MDW 0450HGS5	J54	
34.2	98.9	MDW 0450NHGS5	J99	
41.1	105.8	MDH 0450S06H08	J42	
43.6	105.8	MDE 0450S05H08	J20	
43.6	105.8	MDW 0450HX8	J74	
43.7	105.9	MDW 0450HGS8	J54	
57.1	121.8	MDA 0450S06H10	J93	
57.2	121.9	MDW 0450NHGS10	J99	
62.1	120.8	MDW 0450XHGS10	J85	
69.1	127.8	MDW 0450XHGS12	J85	
82.1	140.8	MDW 0450XHGS15	J85	
105.1	163.8	MDW 0450XHGS20	J85	
127.1	185.8	MDW 0450XHGS25	J85	
150.1	208.8	MDW 0450XHGS30	J85	
4.6	11.5	60.0	MDF 0460S2D	J28

Effective Length List by Diameter

● Diameter ø4.6 to ø4.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.6	13.8	80.0	MDF 0460H3D	J34
	13.8	100.0	MDF 0460L2D	J32
	18.9	61.8	MDE 0460S05E02	J13
	19.1	62.0	MDW 0460GS2	J50
	20.7	80.6	MDA 0460S06H03	J93
	21.0	80.9	MDH 0460S06H03	J42
	21.2	80.6	MDW 0460PHT	J85
	21.4	80.8	MDE 0460S05H03	J20
	21.4	80.8	MDM 0460S05H03	J66
	21.4	80.8	MDW 0460HX3	J74
	21.6	81.0	MDW 0460HGS3	J54
	21.6	81.0	MDW 0460NHGS3	J99
	23.9	98.0	MDF 0460H5D	J34
	31.9	76.8	MDE 0460S05E04	J13
	32.1	77.0	MDW 0460GS4	J50
	37.7	98.6	MDA 0460S06H05	J93
	37.9	98.8	MDE 0460S05H05	J20
	37.9	98.8	MDM 0460S05H05	J66
	37.9	98.8	MDW 0460HX5	J74
	38.0	98.9	MDH 0460S06H05	J42
	38.1	99.0	MDW 0460HGS5	J54
	38.1	99.0	MDW 0460NHGS5	J99
	46.0	105.9	MDH 0460S06H08	J42
	48.9	105.8	MDE 0460S05H08	J20
	49.1	106.0	MDW 0460HGS8	J54
	68.9	125.8	MDW 0460XHGS10	J85
	93.9	150.8	MDW 0460XHGS15	J85
	118.9	175.8	MDW 0460XHGS20	J85
	143.9	200.8	MDW 0460XHGS25	J85
	168.9	225.8	MDW 0460XHGS30	J85
4.62	11.6	60.0	MDF 0462S2D	J28
	18.9	61.8	MDE 0462S05E02	J13
	37.9	98.8	MDE 0462S05H05	J20
4.64	11.6	60.0	MDF 0464S2D	J28
	18.9	61.8	MDE 0464S05E02	J13
	37.9	98.8	MDE 0464S05H05	J20
4.7	11.8	60.0	MDF 0470S2D	J28
	14.2	80.0	MDF 0470H3D	J34
	14.2	100.0	MDF 0470L2D	J32
	18.9	61.9	MDE 0470S05E02	J13
	19.0	62.0	MDW 0470GS2	J50
	20.9	80.9	MDH 0470S06H03	J42
	21.1	80.6	MDW 0470PHT	J85
	21.4	80.9	MDE 0470S05H03	J20
	21.4	80.9	MDM 0470S05H03	J66
	21.4	80.9	MDW 0470HX3	J74
	21.5	81.0	MDW 0470HGS3	J54
	24.5	98.0	MDF 0470H5D	J34
	31.9	76.9	MDE 0470S05E04	J13
	32.0	77.0	MDW 0470GS4	J50
	37.6	98.6	MDA 0470S06H05	J93
	37.9	98.9	MDH 0470S06H05	J42
	37.9	98.9	MDE 0470S05H05	J20
	37.9	98.9	MDM 0470S05H05	J66
	37.9	98.9	MDW 0470HX5	J74
	38.0	99.0	MDW 0470HGS5	J54
	38.0	99.0	MDW 0470NHGS5	J99
	45.9	105.9	MDH 0470S06H08	J42
	48.9	105.9	MDE 0470S05H08	J20
	49.0	106.0	MDW 0470HGS8	J54
	68.9	125.9	MDW 0470XHGS10	J85
	93.9	150.9	MDW 0470XHGS15	J85
	118.9	175.9	MDW 0470XHGS20	J85
	143.9	200.9	MDW 0470XHGS25	J85
	168.9	225.9	MDW 0470XHGS30	J85
4.8	12.0	60.0	MDF 0480S2D	J28
	14.4	80.0	MDF 0480H3D	J34
	14.4	100.0	MDF 0480L2D	J32
	18.7	61.9	MDE 0480S05E02	J13
	18.8	62.0	MDW 0480GS2	J50
	20.7	80.9	MDH 0480S06H03	J42
	20.9	80.6	MDW 0480PHT	J85
	21.2	80.9	MDE 0480S05H03	J20
	21.2	80.9	MDM 0480S05H03	J66
	21.2	80.9	MDW 0480HX3	J74
	21.3	81.0	MDW 0480HGS3	J54
	25.0	98.0	MDF 0480H5D	J34
	31.7	76.9	MDE 0480S05E04	J13
	31.8	77.0	MDW 0480GS4	J50
	37.4	98.6	MDA 0480S06H05	J93
	37.7	98.9	MDH 0480S06H05	J42
	37.7	98.9	MDE 0480S05H05	J20
	37.7	98.9	MDM 0480S05H05	J66
	37.7	98.9	MDW 0480HX5	J74
37.8	99.0	MDW 0480HGS5	J54	
37.8	99.0	MDW 0480NHGS5	J99	
45.7	105.9	MDH 0480S06H08	J42	
48.7	105.9	MDE 0480S05H08	J20	
48.8	106.0	MDW 0480HGS8	J54	
61.7	121.9	MDA 0480S06H10	J93	
63.7	122.0	MDW 0480NHGS10	J99	
68.7	125.9	MDW 0480XHGS10	J85	
93.7	150.9	MDW 0480XHGS15	J85	
118.7	175.9	MDW 0480XHGS20	J85	
143.7	200.9	MDW 0480XHGS25	J85	
168.7	225.9	MDW 0480XHGS30	J85	
4.9	12.3	60.0	MDF 0490S2D	J28
	15.0	80.0	MDF 0490H3D	J34
	15.0	100.0	MDF 0490L2D	J32
	18.4	61.9	MDE 0490S05E02	J13
	18.5	62.0	MDW 0490GS2	J50
	20.2	80.9	MDH 0490S06H03	J42
	20.4	80.7	MDW 0490PHT	J85
	20.7	80.9	MDE 0490S05H03	J20
	20.7	80.9	MDM 0490S05H03	J66
	20.7	80.9	MDW 0490HX3	J74
	20.8	81.0	MDW 0490HGS3	J54
	25.0	98.0	MDF 0490H5D	J34
	31.4	76.9	MDE 0490S05E04	J13
	31.5	77.0	MDW 0490GS4	J50
	37.2	98.7	MDA 0490S06H05	J93
	37.4	98.9	MDH 0490S06H05	J42
	37.4	98.9	MDE 0490S05H05	J20
	37.4	98.9	MDM 0490S05H05	J66
	37.4	98.9	MDW 0490HX5	J74
37.5	99.0	MDW 0490HGS5	J54	
37.5	99.0	MDW 0490HY5	J81	
37.5	99.0	MDW 0490NHGS5	J99	
52.4	119.0	MDH 0490S06H08	J42	
53.8	118.9	MDE 0490S06H08	J20	
53.8	118.9	MDW 0490HX8	J74	
54.0	119.1	MDW 0490HGS8	J54	
70.3	136.9	MDA 0490S06H10	J93	
70.5	137.1	MDW 0490NHGS10	J99	
76.3	137.9	MDW 0490XHGS10	J85	
101.3	162.9	MDW 0490XHGS15	J85	
131.3	192.9	MDW 0490XHGS20	J85	
156.3	217.9	MDW 0490XHGS25	J85	
184.3	245.9	MDW 0490XHGS30	J85	
5.0	13.0	60.0	MDF 0500S2D	J28
	15.6	82.0	MDF 0500H3D	J34
	15.6	110.0	MDF 0500L2D	J32
	18.1	65.9	MDE 0500S06E02	J14
	18.3	66.1	MDW 0500GS2	J50
	20.6	82.7	MDA 0500S06H03	J93
	20.8	82.9	MDH 0500S06H03	J42
	20.8	82.9	MDW 0500PHT	J85
	20.9	83.0	MDE 0500S06H03	J20
	20.9	83.0	MDM 0500S06H03	J66
	20.9	83.0	MDW 0500HX3	J74
	21.0	83.1	MDW 0500HGS3	J54
	21.0	83.1	MDW 0500HY3	J81
	21.0	83.1	MDW 0500NHGS3	J99
	26.6	100.0	MDF 0500H5D	J34
	32.3	81.9	MDE 0500S06E04	J14
	32.5	82.1	MDW 0500GS4	J50
	37.0	100.7	MDA 0500S06H05	J93
	37.3	100.9	MDE 0500S06H05	J20
37.3	100.9	MDM 0500S06H05	J66	
37.3	100.9	MDW 0500HX5	J74	
37.4	101.0	MDH 0500S06H05	J42	
37.5	101.1	MDW 0500HGS5	J54	
37.5	101.1	MDW 0500HY5	J81	
37.5	101.1	MDW 0500NHGS5	J99	
52.4	119.0	MDH 0500S06H08	J42	
53.8	118.9	MDE 0500S06H08	J20	
53.8	118.9	MDW 0500HX8	J74	
54.0	119.1	MDW 0500HGS8	J54	
70.3	136.9	MDA 0500S06H10	J93	
70.5	137.1	MDW 0500NHGS10	J99	
76.3	137.9	MDW 0500XHGS10	J85	
101.3	162.9	MDW 0500XHGS15	J85	
131.3	192.9	MDW 0500XHGS20	J85	
156.3	217.9	MDW 0500XHGS25	J85	
184.3	245.9	MDW 0500XHGS30	J85	
5.1	13.2	60.0	MDF 0510S2D	J28
	15.8	82.0	MDF 0510H3D	J34
	15.8	110.0	MDF 0510L2D	J32
	18.3	65.9	MDE 0510S06E02	J14
	18.5	66.1	MDW 0510GS2	J50
	20.4	82.7	MDA 0510S06H03	J93
	20.6	82.9	MDH 0510S06H03	J42
	20.6	82.9	MDW 0510PHT	J85
	20.7	83.0	MDE 0510S06H03	J20
	20.7	83.0	MDM 0510S06H03	J66
	20.7	83.0	MDW 0510HX3	J74
	20.8	83.1	MDW 0510HGS3	J54
	20.8	83.1	MDW 0510HY3	J81
	20.8	83.1	MDW 0510NHGS3	J99
	26.8	100.0	MDF 0510H5D	J34
	32.5	81.9	MDE 0510S06E04	J14
	32.7	82.1	MDW 0510GS4	J50
	37.2	100.7	MDA 0510S06H05	J93
	37.5	100.9	MDE 0510S06H05	J20
37.5	100.9	MDM 0510S06H05	J66	
37.5	100.9	MDW 0510HX5	J74	
37.6	101.0	MDH 0510S06H05	J42	
37.7	101.1	MDW 0510HGS5	J54	
37.7	101.1	MDW 0510HY5	J81	
37.7	101.1	MDW 0510NHGS5	J99	
52.6	119.0	MDH 0510S06H08	J42	
54.0	118.9	MDE 0510S06H08	J20	
54.0	118.9	MDW 0510HX8	J74	
54.2	119.1	MDW 0510HGS8	J54	
70.5	136.9	MDA 0510S06H10	J93	
70.7	137.1	MDW 0510NHGS10	J99	
76.5	137.9	MDW 0510XHGS10	J85	
101.5	162.9	MDW 0510XHGS15	J85	
131.5	192.9	MDW 0510XHGS20	J85	
156.5	217.9	MDW 0510XHGS25	J85	
184.5	245.9	MDW 0510XHGS30	J85	
5.2	13.4	60.0	MDF 0520S2D	J28
	16.0	82.0	MDF 0520H3D	J34
	16.0	110.0	MDF 0520L2D	J32
	18.5	65.9	MDE 0520S06E02	J14
	18.7	66.1	MDW 0520GS2	J50
	20.6	82.7	MDA 0520S06H03	J93
	20.8	82.9	MDH 0520S06H03	J42
	20.8	82.9	MDW 0520PHT	J85
	20.9	83.0	MDE 0520S06H03	J20
	20.9	83.0	MDM 0520S06H03	J66
	20.9	83.0	MDW 0520HX3	J74
	21.0	83.1	MDW 0520HGS3	J54
	21.0	83.1	MDW 0520HY3	J81
	21.0	83.1	MDW 0520NHGS3	J99
	27.0	100.0	MDF 0520H5D	J34
	32.7	81.9	MDE 0520S06E04	J14
	32.9	82.1	MDW 0520GS4	J50
	37.4	100.7	MDA 0520S06H05	J93
	37.7	100.9	MDE 0520S06H05	J20
37.7	100.9	MDM 0520S06H05	J66	
37.7	100.9	MDW 0520HX5	J74	
37.8	101.0	MDH 0520S06H05	J42	
37.9	101.1	MDW 0520HGS5	J54	
37.9	101.1	MDW 0520HY5	J81	
37.9	101.1	MDW 0520NHGS5	J99	
53.0	119.0	MDH 0520S06H08	J42	
54.4	118.9	MDE 0520S06H08	J20	
54.4	118.9	MDW 0520HX8	J74	
54.6	119.1	MDW 0520HGS8	J54	
70.7	136.9	MDA 0520S06H10	J93	
70.9	137.1	MDW 0520NHGS10	J99	
76.7	137.9	MDW 0520XHGS10	J85	
101.7	162.9	MDW 0520XHGS15	J85	
131.7	192.9	MDW 0520XHGS20	J85	
156.7	217.9	MDW 0520XHGS25	J85	
184.7	245.9	MDW 0520XHGS30	J85	
5.3	13.6	60.0	MDF 0530S2D	J28
	16.2	82.0	MDF 0530H3D	J34
	16.2	110.0	MDF 0530L2D	J32
	18.7	65.9	MDE 0530S06E02	J14
	18.9	66.1	MDW 0530GS2	J50
	20.8	82.7	MDA 0530S06H03	J93
	21.0	82.9	MDH 0530S06H03	J42
	21.0	82.9	MDW 0530PHT	J85
	21.1	83.0	MDE 0530S06H03	J20
	21.1	83.0	MDM 0530S06H03	J66
	21.1	83.0	MDW 0530HX3	J74
	21.2	83.1	MDW 0530HGS3	J54
	21.2	83.1	MDW 0530HY3	J81
	21.2	83.1	MDW 0530NHGS3	J99
	27.2	100.0	MDF 0530H5D	J34
	32.9	81.9	MDE 0530S06E04	J14
	33.1	82.1	MDW 0530GS4	J50
	37.6	100.7	MDA 0530S06H05	J93
	37.9	100.9	MDE 0530S06H05	J20
37.9	100.9	MDM 0530S06H05	J66	
37.9	100.9	MDW 0530HX5	J74	
38.0	101.0	MDH 0530S06H05	J42	
38.1	101.1	MDW 0530HGS5	J54	
38.1	101.1	MDW 0530HY5	J81	
38.1	101.1	MDW 0530NHGS5	J99	
53.4	119.0	MDH 0530S06H08	J42	
54.8	118.9	MDE 0530S06H08	J20	
54.8	118.9	MDW 0530HX8	J74	
55.0	119.1	MDW 0530HGS8	J54	
70.9	136.9	MDA 0530S06H10	J93	
71.1	137.1	MDW 0530NHGS10	J99	
76.9	137.9	MDW 0530XHGS10	J85	
101.9				

Effective Length List by Diameter

● Diameter $\phi 5.3$ to $\phi 5.5\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.3	20.6	83.0	MDM 0530S06H03	J66
	20.6	83.0	MDW 0530HX3	J74
	20.7	83.1	MDW 0530HGS3	J55
	20.7	83.1	MDW 0530NHGS3	J99
	27.6	100.0	MDF 0530H5D	J34
	32.1	82.0	MDE 0530S06E04	J14
	32.2	82.1	MDW 0530GS4	J50
	36.8	100.7	MDA 0530S06H05	J93
	37.1	101.0	MDH 0530S06H05	J42
	37.1	101.0	MDE 0530S06H05	J20
	37.1	101.0	MDM 0530S06H05	J66
	37.1	101.0	MDW 0530HX5	J74
	37.2	101.1	MDW 0530HGS5	J55
	37.2	101.1	MDW 0530NHGS5	J99
	52.1	119.0	MDH 0530S06H08	J42
	53.6	119.0	MDE 0530S06H08	J20
	53.7	119.1	MDW 0530HGS8	J55
	76.1	138.0	MDW 0530XHGS10	J86
	101.1	163.0	MDW 0530XHGS15	J86
	131.1	193.0	MDW 0530XHGS20	J86
5.4	156.1	218.0	MDW 0530XHGS25	J86
	184.1	246.0	MDW 0530XHGS30	J86
	13.5	60.0	MDF 0540S2D	J28
	16.2	82.0	MDF 0540H3D	J34
	16.2	110.0	MDF 0540L2D	J32
	17.9	66.0	MDE 0540S06E02	J14
	18.0	66.1	MDW 0540GS2	J50
	20.1	82.7	MDW 0540PHT	J86
	20.4	83.0	MDE 0540S06H03	J20
	20.4	83.0	MDH 0540S06H03	J42
	20.4	83.0	MDM 0540S06H03	J66
	20.4	83.0	MDW 0540HX3	J74
	20.5	83.1	MDW 0540HGS3	J55
	28.1	100.0	MDF 0540H5D	J34
	31.9	82.0	MDE 0540S06E04	J14
	32.0	82.1	MDW 0540GS4	J50
	36.6	100.7	MDA 0540S06H05	J93
	36.9	101.0	MDH 0540S06H05	J42
	36.9	101.0	MDE 0540S06H05	J20
	36.9	101.0	MDM 0540S06H05	J66
5.5	36.9	101.0	MDW 0540HX5	J74
	37.0	101.1	MDW 0540HGS5	J55
	37.0	101.1	MDW 0540NHGS5	J99
	51.9	119.0	MDH 0540S06H08	J42
	53.4	119.0	MDE 0540S06H08	J20
	53.5	119.1	MDW 0540HGS8	J55
	75.9	138.0	MDW 0540XHGS10	J86
	100.9	163.0	MDW 0540XHGS15	J86
	130.9	193.0	MDW 0540XHGS20	J86
	155.9	218.0	MDW 0540XHGS25	J86
	183.9	246.0	MDW 0540XHGS30	J86
	13.8	60.0	MDF 0550S2D	J28
	16.6	82.0	MDF 0550H3D	J34
	16.6	110.0	MDF 0550L2D	J32
	17.8	66.0	MDE 0550S06E02	J14
	17.9	66.1	MDW 0550GS2	J50
	20.0	82.7	MDA 0550S06H03	J93
	20.0	82.7	MDW 0550PHT	J86
	20.3	83.0	MDE 0550S06H03	J20
	20.3	83.0	MDH 0550S06H03	J42
	20.3	83.0	MDM 0550S06H03	J66
	20.3	83.0	MDW 0550HX3	J74
	20.4	83.1	MDW 0550HGS3	J55
	20.4	83.1	MDW 0550NHGS3	J99
	28.7	100.0	MDF 0550H5D	J34
	31.8	82.0	MDE 0550S06E04	J14
	31.9	82.1	MDW 0550GS4	J50
	36.5	100.7	MDA 0550S06H05	J93
	36.8	101.0	MDH 0550S06H05	J42
	36.8	101.0	MDE 0550S06H05	J20
	36.8	101.0	MDM 0550S06H05	J66
	36.8	101.0	MDW 0550HX5	J74
	36.9	101.1	MDW 0550HGS5	J55
	36.9	101.1	MDW 0550NHGS5	J99
	51.8	119.0	MDH 0550S06H08	J42
	53.3	119.0	MDE 0550S06H08	J20
	53.3	119.0	MDW 0550HX8	J74
	53.4	119.1	MDW 0550HGS8	J55
	69.8	137.0	MDA 0550S06H10	J93
	69.9	137.1	MDW 0550NHGS10	J99

● Diameter $\phi 5.5$ to $\phi 5.8\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.5	75.8	138.0	MDW 0550XHGS10	J86
	84.8	147.0	MDW 0550XHGS12	J86
	100.8	163.0	MDW 0550XHGS15	J86
	130.8	193.0	MDW 0550XHGS20	J86
	155.8	218.0	MDW 0550XHGS25	J86
	183.8	246.0	MDW 0550XHGS30	J86
5.52	13.8	60.0	MDF 0552S2D	J28
	19.6	66.0	MDE 0552S06E02	J14
	40.6	101.0	MDE 0552S06H05	J20
5.54	13.9	60.0	MDF 0554S2D	J28
	19.6	66.0	MDE 0554S06E02	J14
	40.6	101.0	MDE 0554S06H05	J20
5.6	14.0	60.0	MDF 0560S2D	J28
	16.8	82.0	MDF 0560H3D	J34
	16.8	110.0	MDF 0560L2D	J32
	19.6	66.0	MDE 0560S06E02	J14
	19.8	66.2	MDW 0560GS2	J50
	22.4	82.8	MDW 0560PHT	J86
	22.6	83.0	MDE 0560S06H03	J20
	22.6	83.0	MDM 0560S06H03	J66
	22.6	83.0	MDW 0560HX3	J74
	22.7	83.1	MDH 0560S06H03	J42
	22.8	83.2	MDW 0560HGS3	J55
	22.9	82.3	MDS 05600SDC3	J103
			MDF 0560H5D	J34
	33.6	82.0	MDE 0560S06E04	J14
	33.8	82.2	MDW 0560GS4	J50
	40.3	100.7	MDA 0560S06H05	J93
	40.6	101.0	MDE 0560S06H05	J20
	40.6	101.0	MDM 0560S06H05	J66
	40.6	101.0	MDW 0560HX5	J74
	40.7	101.1	MDH 0560S06H05	J42
	40.8	101.2	MDW 0560HGS5	J55
	40.8	101.2	MDW 0560NHGS5	J99
	58.6	119.0	MDE 0560S06H08	J20
	58.7	119.1	MDH 0560S06H08	J42
	58.8	119.2	MDW 0560HGS8	J55
	76.6	137.0	MDA 0560S06H10	J93
	82.6	143.0	MDW 0560XHGS10	J86
	112.6	173.0	MDW 0560XHGS15	J86
	142.6	203.0	MDW 0560XHGS20	J86
	172.6	233.0	MDW 0560XHGS25	J86
202.6	263.0	MDW 0560XHGS30	J86	
5.7	14.3	60.0	MDF 0570S2D	J28
	17.2	82.0	MDF 0570H3D	J34
	17.2	110.0	MDF 0570L2D	J32
	19.5	66.0	MDE 0570S06E02	J14
	19.7	66.2	MDW 0570GS2	J50
	22.3	82.8	MDW 0570PHT	J86
	22.5	83.0	MDE 0570S06H03	J20
	22.5	83.0	MDM 0570S06H03	J66
	22.5	83.0	MDW 0570HX3	J74
	22.6	83.1	MDH 0570S06H03	J42
	22.7	83.2	MDW 0570HGS3	J55
	29.7	100.0	MDF 0570H5D	J34
	33.5	82.0	MDE 0570S06E04	J14
	33.7	82.2	MDW 0570GS4	J50
	40.2	100.8	MDA 0570S06H05	J93
	40.5	101.0	MDE 0570S06H05	J20
	40.5	101.0	MDM 0570S06H05	J66
	40.5	101.0	MDW 0570HX5	J74
	40.6	101.1	MDH 0570S06H05	J42
	40.7	101.2	MDW 0570HGS5	J55
	40.7	101.2	MDW 0570NHGS5	J99
	58.5	119.0	MDE 0570S06H08	J20
	58.6	119.1	MDH 0570S06H08	J42
	58.7	119.2	MDW 0570HGS8	J55
	82.5	143.0	MDW 0570XHGS10	J86
	112.5	173.0	MDW 0570XHGS15	J86
	142.5	203.0	MDW 0570XHGS20	J86
	172.5	233.0	MDW 0570XHGS25	J86
	202.5	263.0	MDW 0570XHGS30	J86
	5.8	14.5	60.0	MDF 0580S2D
17.4		82.0	MDF 0580H3D	J34
17.4		110.0	MDF 0580L2D	J32
19.4		66.1	MDE 0580S06E02	J14
19.5		66.2	MDW 0580GS2	J50
22.1		82.8	MDW 0580PHT	J86
22.4		83.1	MDE 0580S06H03	J20
22.4		83.1	MDH 0580S06H03	J42
22.4		83.1	MDW 0580HX5	J74
22.4		83.1	MDW 0580HGS5	J55

Effective Length List by Diameter

● Diameter $\phi 6.0$ to $\phi 6.3\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.0	40.2	101.2	MDW 0600HGS5	J55
	40.2	101.2	MDW 0600HY5	J81
	40.2	101.2	MDW 0600NHGS5	J99
	58.1	119.1	MDH 0600S08H08	J43
	58.1	119.1	MDE 0600S06H08	J20
	58.1	119.1	MDW 0600HX8	J74
	58.2	119.2	MDW 0600HGS8	J55
	58.2	119.2	MDW 0600HY8	J81
	76.1	137.1	MDA 0600S06H10	J93
	76.2	137.2	MDW 0600NHGS10	J99
	82.1	143.1	MDW 0600XHGS10	J86
	94.1	155.1	MDW 0600XHGS12	J86
	112.1	173.1	MDW 0600XHGS15	J86
	142.1	203.1	MDW 0600XHGS20	J86
	172.1	233.1	MDW 0600XHGS25	J86
	202.1	263.1	MDW 0600XHGS30	J86
6.1	15.3	70.0	MDF 0610S2D	J28
	18.4	88.0	MDF 0610H3D	J34
	18.4	120.0	MDF 0610L2D	J32
	23.0	74.1	MDE 0610S07E02	J14
	23.2	74.3	MDW 0610GS2	J50
	24.2	88.8	MDW 0610PHT	J86
	24.5	89.1	MDE 0610S07H03	J20
	24.5	89.1	MDM 0610S07H03	J66
	24.5	89.1	MDW 0610HX3	J74
	24.6	89.2	MDH 0610S08H03	J43
	24.7	89.3	MDW 0610HGS3	J55
	31.8	109.0	MDF 0610H5D	J34
	34.0	84.1	MDE 0610S07E04	J14
	34.2	84.3	MDW 0610GS4	J50
	43.7	109.8	MDA 0610S08H05	J94
	44.0	110.1	MDE 0610S07H05	J20
	44.0	110.1	MDM 0610S07H05	J66
	44.0	110.1	MDW 0610HX5	J74
	44.1	110.2	MDH 0610S08H05	J43
	44.2	110.3	MDW 0610HGS5	J55
	44.2	110.3	MDW 0610NHGS5	J99
	62.1	131.2	MDH 0610S08H08	J43
	63.5	131.1	MDE 0610S07H08	J20
	63.7	131.3	MDW 0610HGS8	J55
6.2	83.0	152.1	MDA 0610S08H10	J94
	83.2	152.3	MDW 0610NHGS10	J99
	90.0	154.1	MDW 0610XHGS10	J86
	120.0	184.1	MDW 0610XHGS15	J86
	153.0	217.1	MDW 0610XHGS20	J86
	185.0	249.1	MDW 0610XHGS25	J86
	218.0	282.1	MDW 0610XHGS30	J86
	15.5	70.0	MDF 0620S2D	J28
	18.6	88.0	MDF 0620H3D	J34
	18.6	120.0	MDF 0620L2D	J32
	22.8	74.1	MDE 0620S07E02	J14
	23.0	74.3	MDW 0620GS2	J50
	24.0	88.8	MDW 0620PHT	J86
	24.3	89.1	MDE 0620S07H03	J20
	24.3	89.1	MDM 0620S07H03	J66
	24.3	89.1	MDW 0620HX3	J74
	24.4	89.2	MDH 0620S08H03	J43
	24.5	89.3	MDW 0620HGS3	J55
	32.2	109.0	MDF 0620H5D	J34
	33.8	84.1	MDE 0620S07E04	J14
	34.0	84.3	MDW 0620GS4	J50
	43.5	109.8	MDA 0620S08H05	J94
	43.8	110.1	MDE 0620S07H05	J20
	43.8	110.1	MDM 0620S07H05	J66
	43.8	110.1	MDW 0620HX5	J74
	43.9	110.2	MDH 0620S08H05	J43
	44.0	110.3	MDW 0620HGS5	J55
	44.0	110.3	MDW 0620NHGS5	J99
6.3	61.9	131.2	MDH 0620S08H08	J43
	63.3	131.1	MDE 0620S07H08	J20
	63.5	131.3	MDW 0620HGS8	J55
	89.8	154.1	MDW 0620XHGS10	J86
	119.8	184.1	MDW 0620XHGS15	J86
	152.8	217.1	MDW 0620XHGS20	J86
	184.8	249.1	MDW 0620XHGS25	J86
	217.8	282.1	MDW 0620XHGS30	J86
	15.8	70.0	MDF 0630S2D	J28
	19.0	88.0	MDF 0630H3D	J34
	19.0	120.0	MDF 0630L2D	J32
	22.7	74.1	MDE 0630S07E02	J14

(Blue text: Flat head Indexable head type)

● Diameter $\phi 6.3$ to $\phi 6.5\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.3	22.9	74.3	MDW 0630GS2	J50
	23.9	88.8	MDW 0630PHT	J86
	24.2	89.1	MDE 0630S07H03	J20
	24.2	89.1	MDM 0630S07H03	J66
	24.2	89.1	MDW 0630HX3	J74
	24.3	89.2	MDH 0630S08H03	J43
	24.4	89.3	MDW 0630HGS3	J55
	32.8	109.0	MDF 0630H5D	J34
	33.7	84.1	MDE 0630S07E04	J14
	33.9	84.3	MDW 0630GS4	J50
	43.4	109.8	MDA 0630S08H05	J94
	43.7	110.1	MDE 0630S07H05	J20
	43.7	110.1	MDM 0630S07H05	J66
	43.7	110.1	MDW 0630HX5	J74
	43.8	110.2	MDH 0630S08H05	J43
	43.9	110.3	MDW 0630HGS5	J55
	43.9	110.3	MDW 0630NHGS5	J99
	61.8	131.2	MDH 0630S08H08	J43
6.375	63.2	131.1	MDE 0630S07H08	J20
	63.4	131.3	MDW 0630HGS8	J55
	89.7	154.1	MDW 0630XHGS10	J86
	119.7	184.1	MDW 0630XHGS15	J86
	152.7	217.1	MDW 0630XHGS20	J86
	184.7	249.1	MDW 0630XHGS25	J86
	217.7	282.1	MDW 0630XHGS30	J86
	24.4	84.5	MDS 06375SDC3	J103
	16.0	70.0	MDF 0640S2D	J28
	19.2	88.0	MDF 0640H3D	J34
	19.2	120.0	MDF 0640L2D	J32
	22.6	74.2	MDE 0640S07E02	J14
	22.7	74.3	MDW 0640GS2	J50
	23.8	88.9	MDW 0640PHT	J86
	24.1	89.2	MDE 0640S07H03	J20
	24.1	89.2	MDH 0640S08H03	J43
	24.1	89.2	MDM 0640S07H03	J66
6.4	24.1	89.2	MDW 0640HX3	J74
	24.2	89.3	MDW 0640HGS3	J55
	33.3	109.0	MDF 0640H5D	J34
	33.6	84.2	MDE 0640S07E04	J14
	33.7	84.3	MDW 0640GS4	J50
	43.3	109.9	MDA 0640S08H05	J94
	43.6	110.2	MDH 0640S08H05	J43
	43.6	110.2	MDE 0640S07H05	J20
	43.6	110.2	MDM 0640S07H05	J66
	43.6	110.2	MDW 0640HX5	J74
	43.7	110.3	MDW 0640HGS5	J55
	43.7	110.3	MDW 0640NHGS5	J100
	61.6	131.2	MDH 0640S08H08	J43
	63.1	131.2	MDE 0640S07H08	J20
	63.2	131.3	MDW 0640HGS8	J55
	89.6	154.2	MDW 0640XHGS10	J86
	119.6	184.2	MDW 0640XHGS15	J86
	152.6	217.2	MDW 0640XHGS20	J86
6.5	184.6	249.2	MDW 0640XHGS25	J86
	217.6	282.2	MDW 0640XHGS30	J86
	16.3	70.0	MDF 0650S2D	J28
	19.6	88.0	MDF 0650H3D	J34
	19.6	120.0	MDF 0650L2D	J32
	22.5	74.2	MDE 0650S07E02	J14
	22.6	74.3	MDW 0650GS2	J50
	23.6	88.9	MDA 0650S08H03	J94
	23.7	88.9	MDW 0650PHT	J86
	24.0	89.2	MDE 0650S07H03	J20
	24.0	89.2	MDH 0650S08H03	J43
	24.0	89.2	MDM 0650S07H03	J66
	24.0	89.2	MDW 0650HX3	J74
	24.1	89.3	MDW 0650HGS3	J55
	24.1	89.3	MDW 0650HY3	J81
	24.1	89.3	MDW 0650NHGS3	J100
	33.5	84.2	MDE 0650S07E04	J14
	33.6	84.3	MDW 0650GS4	J50
6.5	33.9	109.0	MDF 0650H5D	J34
	43.1	109.9	MDA 0650S08H05	J94
	43.5	110.2	MDH 0650S08H05	J43
	43.5	110.2	MDE 0650S07H05	J20
	43.5	110.2	MDM 0650S07H05	J66
	43.5	110.2	MDW 0650HX5	J74
	43.6	110.3	MDW 0650HGS5	J55
	43.6	110.3	MDW 0650HY5	J81
	43.6	110.3	MDW 0650NHGS5	J100

(Blue text: Flat head Indexable head type)

● Diameter $\phi 6.5$ to $\phi 6.8\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.5	61.5	131.2	MDH 0650S08H08	J43
	63.0	131.2	MDE 0650S07H08	J20
	63.0	131.2	MDW 0650HX8	J74
	63.1	131.3	MDW 0650HGS8	J55
	82.4	152.2	MDA 0650S08H10	J94
	82.6	152.3	MDW 0650NHGS10	J100
	89.5	154.2	MDW 0650XHGS10	J86
	100.5	165.2	MDW 0650XHGS12	J86
	119.5	184.2	MDW 0650XHGS15	J86
	152.5	217.2	MDW 0650XHGS20	J86
	184.5	249.2	MDW 0650XHGS25	J86
	217.5	282.2	MDW 0650XHGS30	J86
6.6	16.5	70.0	MDF 0660S2D	J28
	19.8	88.0	MDF 0660H3D	J34
	19.8	120.0	MDF 0660L2D	J32
	24.3	74.2	MDE 0660S07E02	J14
	24.4	89.3	MDH 0660S08H03	J43
	24.5	74.4	MDW 0660GS2	J51
	26.0	88.9	MDW 0660PHT	J86
	26.3	89.2	MDE 0660S07H03	J21
	26.3	89.2	MDM 0660S07H03	J66
	26.3	89.2	MDW 0660HX3	J75
	26.5	89.4	MDW 0660HGS3	J55
	34.3	84.2	MDE 0660S07E04	J14
	34.3	109.0	MDF 0660H5D	J34
	34.5	84.4	MDW 0660GS4	J51
	45.0	109.9	MDA 0660S08H05	J94
	45.4	110.3	MDH 0660S08H05	J43
	47.3	110.2	MDE 0660S07H05	J21
	47.3	110.2	MDM 0660S07H05	J66
	47.3	110.2	MDW 0660HX5	J75
	47.5	110.4	MDW 0660HGS5	J55
	47.5	110.4	MDW 0660NHGS5	J100
	66.4	131.3	MDH 0660S08H08	J43
	68.3	131.2	MDE 0660S07H08	J21
	68.5	131.4	MDW 0660HGS8	J55
96.3	159.2	MDW 0660XHGS10	J86	
131.3	194.2	MDW 0660XHGS15	J86	
166.3	229.2	MDW 0660XHGS20	J86	
201.3	264.2	MDW 0660XHGS25	J86	
236.3	299.2	MDW 0660XHGS30	J86	
6.7	16.8	70.0	MDF 0670S2D	J28
	20.2	88.0	MDF 0670H3D	J34
	20.2	120.0	MDF 0670L2D	J32
	24.0	88.9	MDA 0670S08H03	J94
	24.2	74.2	MDE 0670S07E02	J14
	24.3	89.3	MDH 0670S08H03	J43
	24.4	74.4	MDW 0670GS2	J51
	25.9	88.9	MDW 0670PHT	J87
	26.2	89.2	MDE 0670S07H03	J21
	26.2	89.2	MDM 0670S07H03	J66
	26.2	89.2	MDW 0670HX3	J75
	26.4	89.4	MDW 0670HGS3	J55
	26.4	89.4	MDW 0670NHGS3	J100
	34.2	84.2	MDE 0670S07E04	J14
	34.4	84.4	MDW 0670GS4	J51
	34.9	109.0	MDF 0670H5D	J34
	45.0	109.9	MDA 0670S08H05	J94
	45.3	110.3	MDH 0670S08H05	J43
	47.2	110.2	MDE 0670S07H05	J21
	47.2	110.2	MDM 0670S07H05	J66
	47.2	110.2	MDW 0670HX5	J75
	47.4	110.4	MDW 0670HGS5	J55
	47.4	110.4	MDW 0670NHGS5	J100
	66.3	131.3	MDH 0670S08H08	J43
	68.2	131.2	MDE 0670S07H08	J21
	68.2	131.2	MDW 0670HX8	J75
	68.4	131.4	MDW 0670HGS8	J55
	89.4	152.4	MDW 0670NHGS10	J100
	96.2	159.2	MDW 0670XHGS10	J87
	131.2	194.2	MDW 0670XHGS15	J87
166.2	229.2	MDW 0670XHGS20	J87	
201.2	264.2	MDW 0670XHGS25	J87	
236.2	299.2	MDW 0670XHGS30	J87	
6.8	17.0	70.0	MDF 0680S2D	J28
	20.4	88.0	MDF 0680H3D	J34
	20.4	120.0	MDF 0680L2D	J32
	23.7	88.9	MDA 0680S08H03	J94
	24.0	74.2	MDE 0680S07E02	J14
	24.1	89.3	MDH 0680S08H03	J43

Effective Length List by Diameter

● Diameter $\phi 6.8$ to $\phi 7.0$ mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.8	24.2	74.4	MDW 0680GS2	J51
	25.7	88.9	MDW 0680PHT	J87
	26.0	89.2	MDE 0680S07H03	J21
	26.0	89.2	MDM 0680S07H03	J66
	26.0	89.2	MDW 0680HX3	J75
	26.2	89.4	MDW 0680HGS3	J55
	26.2	89.4	MDW 0680HY3	J81
	26.2	89.4	MDW 0680NHGS3	J100
	34.0	84.2	MDE 0680S07E04	J14
	34.2	84.4	MDW 0680GS4	J51
	35.4	109.0	MDF 0680H5D	J34
	44.7	109.9	MDA 0680S08H05	J94
	45.1	110.3	MDH 0680S08H05	J43
	47.0	110.2	MDE 0680S07H05	J21
	47.0	110.2	MDM 0680S07H05	J66
	47.0	110.2	MDW 0680HX5	J75
	47.2	110.4	MDW 0680HGS5	J55
	47.2	110.4	MDW 0680HY5	J81
	47.2	110.4	MDW 0680NHGS5	J100
	66.1	131.3	MDH 0680S08H08	J43
	68.0	131.2	MDE 0680S07H08	J21
	68.0	131.2	MDW 0680HX8	J75
	68.2	131.4	MDW 0680HGS8	J55
	68.2	131.4	MDW 0680HY8	J81
	87.0	152.2	MDA 0680S08H10	J94
	89.2	152.4	MDW 0680NHGS10	J100
	96.0	159.2	MDW 0680XHGS10	J87
	131.0	194.2	MDW 0680XHGS15	J87
	166.0	229.2	MDW 0680XHGS20	J87
	201.0	264.2	MDW 0680XHGS25	J87
	236.0	299.2	MDW 0680XHGS30	J87
6.9	17.3	70.0	MDF 0690S2D	J28
	20.8	88.0	MDF 0690H3D	J34
	20.8	120.0	MDF 0690L2D	J32
	24.0	74.3	MDE 0690S07E02	J14
	24.0	89.3	MDH 0690S08H03	J43
	24.1	74.4	MDW 0690GS2	J51
	25.6	88.9	MDW 0690PHT	J87
	26.0	89.3	MDE 0690S07H03	J21
	26.0	89.3	MDM 0690S07H03	J66
	26.0	89.3	MDW 0690HX3	J75
	26.1	89.4	MDW 0690HGS3	J55
	34.0	84.3	MDE 0690S07E04	J14
	34.1	84.4	MDW 0690GS4	J51
	35.9	109.0	MDF 0690H5D	J34
	45.0	110.3	MDH 0690S08H05	J43
	47.0	110.3	MDE 0690S07H05	J21
	47.0	110.3	MDM 0690S07H05	J66
	47.0	110.3	MDW 0690HX5	J75
	47.1	110.4	MDW 0690HGS5	J55
	47.1	110.4	MDW 0690NHGS5	J100
	66.0	131.3	MDH 0690S08H08	J43
	68.0	131.3	MDE 0690S07H08	J21
	68.0	131.3	MDW 0690HX8	J75
	68.1	131.4	MDW 0690HGS8	J55
	96.0	159.3	MDW 0690XHGS10	J87
	131.0	194.3	MDW 0690XHGS15	J87
	166.0	229.3	MDW 0690XHGS20	J87
	201.0	264.3	MDW 0690XHGS25	J87
	236.0	299.3	MDW 0690XHGS30	J87
7.0	17.5	70.0	MDF 0700S2D	J28
	21.0	88.0	MDF 0700H3D	J34
	21.0	120.0	MDF 0700L2D	J32
	23.4	88.9	MDA 0700S08H03	J94
	23.8	74.3	MDE 0700S07E02	J14
	23.8	89.3	MDH 0700S08H03	J43
	23.9	74.4	MDW 0700GS2	J51
	25.4	88.9	MDW 0700PHT	J87
	25.8	89.3	MDE 0700S07H03	J21
	25.8	89.3	MDM 0700S07H03	J67
	25.8	89.3	MDW 0700HX3	J75
	25.9	89.4	MDW 0700HGS3	J55
	25.9	89.4	MDW 0700HY3	J81
	25.9	89.4	MDW 0700NHGS3	J100
	26.1	84.6	MDS 0700S0DC3	J103
	33.8	84.3	MDE 0700S07E04	J14
	33.9	84.4	MDW 0700GS4	J51
	36.4	109.0	MDF 0700H5D	J34
	44.0	109.9	MDA 0700S08H05	J94
	44.8	110.3	MDH 0700S08H05	J43

● Diameter $\phi 7.0$ to $\phi 7.3$ mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.0	46.8	110.3	MDE 0700S07H05	J21
	46.8	110.3	MDM 0700S07H05	J67
	46.8	110.3	MDW 0700HX5	J75
	46.9	110.4	MDW 0700HGS5	J55
	46.9	110.4	MDW 0700HY5	J81
	46.9	110.4	MDW 0700NHGS5	J100
	65.8	131.3	MDH 0700S08H08	J43
	67.8	131.3	MDE 0700S07H08	J21
	67.8	131.3	MDW 0700HX8	J75
	67.9	131.4	MDW 0700HGS8	J55
	86.8	152.3	MDA 0700S08H10	J94
	88.9	152.4	MDW 0700NHGS10	J100
	95.8	159.3	MDW 0700XHGS10	J87
	109.8	173.3	MDW 0700XHGS12	J87
	130.8	194.3	MDW 0700XHGS15	J87
	165.8	229.3	MDW 0700XHGS20	J87
	200.8	264.3	MDW 0700XHGS25	J87
	235.8	299.3	MDW 0700XHGS30	J87
	7.1	17.8	70.0	MDF 0710S2D
21.4		94.0	MDF 0710H3D	J34
21.4		130.0	MDF 0710L2D	J32
23.7		79.3	MDE 0710S08E02	J14
23.9		79.5	MDW 0710GS2	J51
27.9		95.0	MDW 0710PHT	J87
28.2		95.3	MDE 0710S08H03	J21
28.2		95.3	MDM 0710S08H03	J67
28.2		95.3	MDW 0710HX3	J75
28.3		95.4	MDH 0710S08H03	J43
28.4		95.5	MDW 0710HGS3	J55
35.7		91.3	MDE 0710S08E04	J14
35.9		91.5	MDW 0710GS4	J51
37.0		118.0	MDF 0710H5D	J34
50.3		118.9	MDA 0710S08H05	J94
50.7		119.3	MDE 0710S08H05	J21
50.7		119.3	MDM 0710S08H05	J67
50.7		119.3	MDW 0710HX5	J75
50.8		119.4	MDH 0710S08H05	J43
50.9		119.5	MDW 0710HGS5	J55
50.9		119.5	MDW 0710NHGS5	J100
71.8		143.4	MDH 0710S08H08	J43
73.2		143.3	MDE 0710S08H08	J21
73.4		143.5	MDW 0710HGS8	J55
103.7		170.3	MDW 0710XHGS10	J87
138.7		205.3	MDW 0710XHGS15	J87
176.7		243.3	MDW 0710XHGS20	J87
213.7		280.3	MDW 0710XHGS25	J87
251.7		318.3	MDW 0710XHGS30	J87
7.2	18.0	70.0	MDF 0720S2D	J28
	21.6	94.0	MDF 0720H3D	J34
	21.6	130.0	MDF 0720L2D	J32
	23.5	79.3	MDE 0720S08E02	J14
	23.7	79.5	MDW 0720GS2	J51
	27.7	95.0	MDW 0720PHT	J87
	28.0	95.3	MDE 0720S08H03	J21
	28.0	95.3	MDM 0720S08H03	J67
	28.0	95.3	MDW 0720HX3	J75
	28.1	95.4	MDH 0720S08H03	J43
	28.2	95.5	MDW 0720HGS3	J55
	35.5	91.3	MDE 0720S08E04	J14
	35.7	91.5	MDW 0720GS4	J51
	37.4	118.0	MDF 0720H5D	J34
	50.2	119.0	MDA 0720S08H05	J94
	50.5	119.3	MDE 0720S08H05	J21
	50.5	119.3	MDM 0720S08H05	J67
	50.5	119.3	MDW 0720HX5	J75
	50.6	119.4	MDH 0720S08H05	J43
	50.7	119.5	MDW 0720HGS5	J55
	50.7	119.5	MDW 0720NHGS5	J100
	71.6	143.4	MDH 0720S08H08	J43
	73.0	143.3	MDE 0720S08H08	J21
	73.2	143.5	MDW 0720HGS8	J55
	95.7	167.5	MDW 0720NHGS10	J100
	103.5	170.3	MDW 0720XHGS10	J87
	138.5	205.3	MDW 0720XHGS15	J87
	176.5	243.3	MDW 0720XHGS20	J87
	213.5	280.3	MDW 0720XHGS25	J87
251.5	318.3	MDW 0720XHGS30	J87	
7.3	18.3	70.0	MDF 0730S2D	J28
	22.0	94.0	MDF 0730H3D	J34
	22.0	130.0	MDF 0730L2D	J32

Effective Length List by Diameter

● Diameter ø7.5 to ø7.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.5	35.2	91.4	MDE 0750S08E04	J14
	35.4	91.6	MDW 0750GS4	J51
	39.1	118.0	MDF 0750H5D	J34
	49.8	119.0	MDA 0750S08H05	J94
	50.2	119.4	MDH 0750S08H05	J43
	50.2	119.4	MDE 0750S08H05	J21
	50.2	119.4	MDM 0750S08H05	J67
	50.2	119.4	MDW 0750HX5	J75
	50.4	119.6	MDW 0750HGS5	J55
	50.4	119.6	MDW 0750NHGS5	J100
	71.2	143.4	MDH 0750S08H08	J43
	72.7	143.4	MDE 0750S08H08	J21
	72.7	143.4	MDW 0750HX8	J75
	72.9	143.6	MDW 0750HGS8	J55
	95.1	167.4	MDA 0750S08H10	J94
	95.4	167.6	MDW 0750NHGS10	J100
	103.2	170.4	MDW 0750XHGS10	J87
	116.2	183.4	MDW 0750XHGS12	J87
	138.2	205.4	MDW 0750XHGS15	J87
	176.2	243.4	MDW 0750XHGS20	J87
	213.2	280.4	MDW 0750XHGS25	J87
	251.2	318.4	MDW 0750XHGS30	J87
7.52	18.8	70.0	MDF 0752S2D	J28
	26.0	79.4	MDE 0752S08E02	J14
7.54	54.0	119.4	MDE 0752S08H05	J21
	18.9	70.0	MDF 0754S2D	J28
7.54	26.0	79.4	MDE 0754S08E02	J14
	54.0	119.4	MDE 0754S08H05	J21
7.6	19.0	70.0	MDF 0760S2D	J28
	22.8	94.0	MDF 0760H3D	J34
	22.8	130.0	MDF 0760L2D	J32
	26.0	79.4	MDE 0760S08E02	J14
	26.2	79.6	MDW 0760GS2	J51
	29.6	95.0	MDW 0760PHT	J87
	30.0	95.4	MDE 0760S08H03	J21
	30.0	95.4	MDM 0760S08H03	J67
	30.0	95.4	MDW 0760HX3	J75
	30.1	95.5	MDH 0760S08H03	J43
	30.2	95.6	MDW 0760HGS3	J55
	38.0	91.4	MDE 0760S08E04	J14
	38.2	91.6	MDW 0760GS4	J51
	39.5	118.0	MDF 0760H5D	J34
	53.6	119.0	MDA 0760S08H05	J94
	54.0	119.4	MDE 0760S08H05	J21
	54.0	119.4	MDM 0760S08H05	J67
	54.0	119.4	MDW 0760HX5	J75
	54.1	119.5	MDH 0760S08H05	J43
	54.2	119.6	MDW 0760HGS5	J55
	54.2	119.6	MDW 0760NHGS5	J100
	78.0	143.4	MDE 0760S08H08	J21
	78.1	143.5	MDH 0760S08H08	J43
	78.2	143.6	MDW 0760HGS8	J55
	110.0	175.4	MDW 0760XHGS10	J87
7.7	150.0	215.4	MDW 0760XHGS15	J87
	190.0	255.4	MDW 0760XHGS20	J87
	230.0	295.4	MDW 0760XHGS25	J87
	270.0	335.4	MDW 0760XHGS30	J87
	19.3	70.0	MDF 0770S2D	J28
	23.2	94.0	MDF 0770H3D	J34
	23.2	130.0	MDF 0770L2D	J32
	25.9	79.4	MDE 0770S08E02	J14
	26.1	79.6	MDW 0770GS2	J51
	29.5	95.0	MDW 0770PHT	J87
	29.9	95.4	MDE 0770S08H03	J21
	29.9	95.4	MDM 0770S08H03	J67
	29.9	95.4	MDW 0770HX3	J75
	30.0	95.5	MDH 0770S08H03	J43
	30.1	95.6	MDW 0770HGS3	J55
	37.9	91.4	MDE 0770S08E04	J14
	38.1	91.6	MDW 0770GS4	J51
	40.1	118.0	MDF 0770H5D	J34
	53.5	119.0	MDA 0770S08H05	J94
	53.9	119.4	MDE 0770S08H05	J21
	53.9	119.4	MDM 0770S08H05	J67
	53.9	119.4	MDW 0770HX5	J75
	54.0	119.5	MDH 0770S08H05	J43
	54.1	119.6	MDW 0770HGS5	J55
	54.1	119.6	MDW 0770NHGS5	J100
	77.9	143.4	MDE 0770S08H08	J21
	78.0	143.5	MDH 0770S08H08	J43

(Blue text: Flat head Indexable head type)

● Diameter ø7.7 to ø8.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.7	78.1	143.6	MDW 0770HGS8	J55
	109.9	175.4	MDW 0770XHGS10	J87
	149.9	215.4	MDW 0770XHGS15	J87
	189.9	255.4	MDW 0770XHGS20	J87
	229.9	295.4	MDW 0770XHGS25	J87
	269.9	335.4	MDW 0770XHGS30	J87
	19.5	70.0	MDF 0780S2D	J28
	23.4	94.0	MDF 0780H3D	J34
	23.4	130.0	MDF 0780L2D	J32
	25.7	79.4	MDE 0780S08E02	J14
	25.9	79.6	MDW 0780GS2	J51
	29.3	95.0	MDA 0780S08H03	J94
	29.3	95.0	MDW 0780PHT	J87
	29.7	95.4	MDE 0780S08H03	J21
	29.7	95.4	MDM 0780S08H03	J67
7.8	29.7	95.4	MDW 0780HX3	J75
	29.8	95.5	MDH 0780S08H03	J43
	29.9	95.6	MDW 0780HGS3	J55
	29.9	95.6	MDW 0780NHGS3	J100
	37.7	91.4	MDE 0780S08E04	J14
	37.9	91.6	MDW 0780GS4	J51
	40.6	118.0	MDF 0780H5D	J34
	53.3	119.0	MDA 0780S08H05	J94
	53.7	119.4	MDE 0780S08H05	J21
	53.7	119.4	MDM 0780S08H05	J67
	53.7	119.4	MDW 0780HX5	J75
	53.8	119.5	MDH 0780S08H05	J43
	53.9	119.6	MDW 0780HGS5	J55
	53.9	119.6	MDW 0780NHGS5	J100
	77.7	143.4	MDE 0780S08H08	J21
7.9	77.8	143.5	MDH 0780S08H08	J43
	77.9	143.6	MDW 0780HGS8	J55
	101.7	167.4	MDA 0780S08H10	J94
	101.9	167.6	MDW 0780NHGS10	J100
	109.7	175.4	MDW 0780XHGS10	J87
	149.7	215.4	MDW 0780XHGS15	J87
	189.7	255.4	MDW 0780XHGS20	J87
	229.7	295.4	MDW 0780XHGS25	J87
	269.7	335.4	MDW 0780XHGS30	J87
	19.8	70.0	MDF 0790S2D	J28
	23.8	94.0	MDF 0790H3D	J34
	23.8	130.0	MDF 0790L2D	J32
	25.6	79.4	MDE 0790S08E02	J14
	25.8	79.6	MDW 0790GS2	J51
	29.3	95.1	MDW 0790PHT	J87
7.938	29.6	95.4	MDE 0790S08H03	J21
	29.6	95.4	MDM 0790S08H03	J67
	29.6	95.4	MDW 0790HX3	J75
	29.7	95.5	MDH 0790S08H03	J43
	29.8	95.6	MDW 0790HGS3	J55
	37.6	91.4	MDE 0790S08E04	J14
	37.8	91.6	MDW 0790GS4	J51
	41.1	118.0	MDF 0790H5D	J34
	53.2	119.1	MDA 0790S08H05	J94
	53.6	119.4	MDE 0790S08H05	J21
	53.6	119.4	MDM 0790S08H05	J67
	53.6	119.4	MDW 0790HX5	J75
	53.7	119.5	MDH 0790S08H05	J43
	53.8	119.6	MDW 0790HGS5	J55
	53.8	119.6	MDW 0790NHGS5	J100
8.0	77.6	143.4	MDE 0790S08H08	J21
	77.7	143.5	MDH 0790S08H08	J43
	77.8	143.6	MDW 0790HGS8	J55
	109.6	175.4	MDW 0790XHGS10	J87
	149.6	215.4	MDW 0790XHGS15	J87
	189.6	255.4	MDW 0790XHGS20	J87
	229.6	295.4	MDW 0790XHGS25	J87
	269.6	335.4	MDW 0790XHGS30	J87
	30.0	91.9	MDS 07738SDC3	J103
	20.0	70.0	MDF 0800S2D	J28
	24.0	94.0	MDF 0800H3D	J34
	24.0	130.0	MDF 0800L2D	J32
	24.0	130.0	MDF 0800L2D-S6	J32
	25.5	79.5	MDE 0800S08E02	J14
	25.7	79.7	MDW 0800GS2	J51
	29.1	95.1	MDA 0800S08H03	J94
8.0	29.1	95.1	MDW 0800PHT	J87
	29.5	95.5	MDE 0800S08H03	J21
	29.5	95.5	MDH 0800S08H03	J43
	29.5	95.5	MDM 0800S08H03	J67

(Blue text: Flat head Indexable head type)

● Diameter ø8.0 to ø8.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page	
8.0	29.5	95.5	MDW 0800HX3	J75	
	29.7	95.7	MDW 0800HGS3	J55	
	29.7	95.7	MDW 0800HY3	J81	
	29.7	95.7	MDW 0800NHGS3	J100	
	29.9	91.9	MDS 0800SDC3	J103	
	37.5	91.5	MDE 0800S08E04	J14	
	37.7	91.7	MDW 0800GS4	J51	
	41.6	118.0	MDF 0800H5D	J34	
	53.1	119.1	MDA 0800S08H05	J94	
	53.5	119.5	MDH 0800S08H05	J43	
	53.5	119.5	MDE 0800S08H05	J21	
	53.5	119.5	MDM 0800S08H05	J67	
	53.5	119.5	MDW 0800HX5	J75	
	53.7	119.7	MDW 0800HGS5	J55	
	53.7	119.7	MDW 0800HY5	J81	
	53.7	119.7	MDW 0800NHGS5	J100	
	77.5	143.5	MDH 0800S08H08	J43	
	77.5	143.5	MDE 0800S08H08	J21	
	77.5	143.5	MDW 0800HX8	J75	
	77.7	143.7	MDW 0800HGS8	J55	
	101.5	167.5	MDA 0800S08H10	J94	
	101.7	167.7	MDW 0800NHGS10	J100	
	109.5	175.5	MDW 0800XHGS10	J87	
	125.5	191.5	MDW 0800XHGS12	J87	
	149.5	215.5	MDW 0800XHGS15	J87	
	189.5	255.5	MDW 0800XHGS20	J87	
	229.5	295.5	MDW 0800XHGS25	J87	
	269.5	335.5	MDW 0800XHGS30	J87	
8.1	20.3	80.0	MDF 0810S2D	J28	
	24.4	100.0	MDF 0810H3D	J34	
	24.4	140.0	MDF 0810L2D	J32	
	25.4	83.5	MDE 0810S09E02	J14	
	25.6	83.7	MDW 0810GS2	J51	
	31.9	101.5	MDE 0810S09H03	J21	
	31.9	101.5	MDH 0810S10H03	J43	
	31.9	101.5	MDM 0810S09H03	J67	
	31.9	101.5	MDW 0810HX3	J75	
	32.1	101.7	MDW 0810HGS3	J55	
	42.2	127.0	MDF 0810H5D	J34	
	42.4	99.5	MDE 0810S09E04	J14	
	42.6	99.7	MDW 0810GS4	J51	
	56.9	128.1	MDA 0810S10H05	J94	
	57.4	128.5	MDH 0810S10H05	J43	
	57.4	128.5	MDE 0810S09H05	J21	
	57.4	128.5	MDM 0810S09H05	J67	
	57.4	128.5	MDW 0810HX5	J75	
	57.6	128.7	MDW 0810HGS5	J55	
	57.6	128.7	MDW 0810NHGS5	J100	
	81.4	155.5	MDH 0810S10H08	J43	
	82.9	155.5	MDE 0810S09H08	J21	
	83.1	155.7	MDW 0810HGS8	J55	
	108.3	182.5	MDA 0810S10H10	J94	
	8.2	20.5	80.0	MDF 0820S2D	J28
		24.6	100.0	MDF 0820H3D	J34
		24.6	140.0	MDF 0820L2D	J32
		25.2	83.5	MDE 0820S09E02	J14
25.4		83.7	MDW 0820GS2	J51	
31.7		101.5	MDE 0820S09H03	J21	
31.7		101.5	MDH 0820S10H03	J43	
31.7		101.5	MDM 0820S09H03	J67	
31.7		101.5	MDW 0820HX3	J75	
31.9		101.7	MDW 0820HGS3	J55	
42.2		99.5	MDE 0820S09E04	J14	
42.4		99.7	MDW 0820GS4	J51	
42.6		127.0	MDF 0820H5D	J34	
56.8		128.1	MDA 0820S10H05	J94	
57.2		128.5	MDH 0820S10H05	J43	
57.2		128.5	MDE 0820S09H05	J21	
57.2		128.5	MDM 0820S09H05	J67	
57.2		128.5	MDW 0820HX5	J75	
57.4		128.7	MDW 0820HGS5	J55	
57.4		128.7	MDW 0820NHGS5	J100	
81.2		155.5	MDH 0820S10H08	J43	
82.7		155.5	MDE 0820S09H08	J21	
82.9		155.7	MDW 0820HGS8	J55	
108.2		182.5	MDA 0820S10H10	J94	
8.3		20.8	80.0	MDF 0830S2D	J28
		25.0	100.0	MDF 0830H3D	J34
		25.0	140.0	MDF 0830L2D	J32
		25.1	83.5	MDE 0830S09E02	J14

Effective Length List by Diameter

● Diameter ø8.3 to ø8.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.3	25.3	83.7	MDW 0830GS2	J51
	31.6	101.5	MDE 0830S09H03	J21
	31.6	101.5	MDH 0830S10H03	J43
	31.6	101.5	MDM 0830S09H03	J67
	31.6	101.5	MDW 0830HX3	J75
	31.8	101.7	MDW 0830HGS3	J55
	42.1	99.5	MDE 0830S09E04	J14
	42.3	99.7	MDW 0830GS4	J51
	43.2	127.0	MDF 0830H5D	J34
	56.7	128.1	MDA 0830S10H05	J94
	57.1	128.5	MDH 0830S10H05	J43
	57.1	128.5	MDM 0830S09H05	J67
	57.1	128.5	MDW 0830HX5	J75
	57.3	128.7	MDW 0830HGS5	J55
	57.3	128.7	MDW 0830NHGS5	J100
	81.1	155.5	MDH 0830S10H08	J43
	82.6	155.5	MDE 0830S09H08	J21
	82.8	155.7	MDW 0830HGS8	J55
8.4	21.0	80.0	MDF 0840S2D	J28
	24.9	83.5	MDE 0840S09E02	J14
	25.1	83.7	MDW 0840GS2	J51
	25.2	100.0	MDF 0840H3D	J34
	25.2	140.0	MDF 0840L2D	J32
	31.4	101.5	MDE 0840S09H03	J21
	31.4	101.5	MDH 0840S10H03	J43
	31.4	101.5	MDM 0840S09H03	J67
	31.4	101.5	MDW 0840HX3	J75
	31.6	101.7	MDW 0840HGS3	J55
	41.9	99.5	MDE 0840S09E04	J14
	42.1	99.7	MDW 0840GS4	J51
	43.7	127.0	MDF 0840H5D	J34
	56.5	128.1	MDA 0840S10H05	J94
	56.9	128.5	MDH 0840S10H05	J43
	56.9	128.5	MDE 0840S09H05	J21
	56.9	128.5	MDM 0840S09H05	J67
	56.9	128.5	MDW 0840HX5	J75
8.5	57.1	128.7	MDW 0840HGS5	J55
	57.1	128.7	MDW 0840NHGS5	J100
	80.9	155.5	MDH 0840S10H08	J43
	82.4	155.5	MDE 0840S09H08	J21
	82.6	155.7	MDW 0840HGS8	J55
	21.3	80.0	MDF 0850S2D	J28
	24.8	83.5	MDE 0850S09E02	J14
	25.1	83.8	MDW 0850GS2	J51
	25.6	100.0	MDF 0850H3D	J34
	25.6	140.0	MDF 0850L2D	J32
	30.9	101.1	MDW 0850PHT	J88
	31.0	101.1	MDA 0850S10H03	J94
	31.3	101.5	MDE 0850S09H03	J21
	31.3	101.5	MDH 0850S10H03	J43
	31.3	101.5	MDM 0850S09H03	J67
	31.3	101.5	MDW 0850HX3	J75
	31.6	101.8	MDW 0850HGS3	J55
	31.6	101.8	MDW 0850HY3	J81
	31.6	101.8	MDW 0850NHGS3	J100
8.6	41.8	99.5	MDE 0850S09E04	J14
	42.1	99.8	MDW 0850GS4	J51
	44.3	127.0	MDF 0850H5D	J34
	56.5	128.1	MDA 0850S10H05	J94
	56.8	128.5	MDH 0850S10H05	J43
	56.8	128.5	MDE 0850S09H05	J21
	56.8	128.5	MDM 0850S09H05	J67
	56.8	128.5	MDW 0850HX5	J75
	57.1	128.8	MDW 0850HGS5	J55
	57.1	128.8	MDW 0850HY5	J81
	57.1	128.8	MDW 0850NHGS5	J100
	80.8	155.5	MDH 0850S10H08	J43
	82.3	155.5	MDE 0850S09H08	J21
	82.3	155.5	MDW 0850HX8	J75
	82.6	155.8	MDW 0850HGS8	J55
	82.6	155.8	MDW 0850HY8	J81
	107.9	182.5	MDA 0850S10H10	J94
	108.1	182.8	MDW 0850NHGS10	J100
8.7	116.8	186.5	MDW 0850XHGS10	J88
	131.8	201.5	MDW 0850XHGS12	J88
	156.8	226.5	MDW 0850XHGS15	J88
	199.8	269.5	MDW 0850XHGS20	J88
	241.8	311.5	MDW 0850XHGS25	J88
	284.8	354.5	MDW 0850XHGS30	J88

● Diameter ø8.6 to ø8.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.6	21.5	80.0	MDF 0860S2D	J28
	25.8	100.0	MDF 0860H3D	J35
	25.8	140.0	MDF 0860L2D	J32
	26.7	83.6	MDE 0860S09E02	J14
	26.9	83.8	MDW 0860GS2	J51
	31.2	101.1	MDA 0860S10H03	J94
	31.7	101.6	MDH 0860S10H03	J44
	33.7	101.6	MDE 0860S09H03	J21
	33.7	101.6	MDM 0860S09H03	J67
	33.7	101.6	MDW 0860HX3	J75
	33.9	101.8	MDW 0860HGS3	J55
	33.9	101.8	MDW 0860HY3	J81
	33.9	101.8	MDW 0860NHGS3	J100
	43.7	99.6	MDE 0860S09E04	J14
	43.9	99.8	MDW 0860GS4	J51
	44.7	127.0	MDF 0860H5D	J35
	58.2	128.1	MDA 0860S10H05	J94
	58.7	128.6	MDH 0860S10H05	J44
	60.7	128.6	MDE 0860S09H05	J21
8.7	60.7	128.6	MDM 0860S09H05	J67
	60.7	128.6	MDW 0860HX5	J75
	60.9	128.8	MDW 0860HGS5	J55
	60.9	128.8	MDW 0860HY5	J81
	60.9	128.8	MDW 0860NHGS5	J100
	85.7	155.6	MDH 0860S10H08	J44
	87.7	155.6	MDE 0860S09H08	J21
	87.9	155.8	MDW 0860HGS8	J55
	21.8	80.0	MDF 0870S2D	J28
	26.2	100.0	MDF 0870H3D	J35
	26.2	140.0	MDF 0870L2D	J32
	26.6	83.6	MDE 0870S09E02	J14
	26.8	83.8	MDW 0870GS2	J51
	31.6	101.6	MDH 0870S10H03	J44
	33.6	101.6	MDE 0870S09H03	J21
	33.6	101.6	MDM 0870S09H03	J67
	33.6	101.6	MDW 0870HX3	J75
	33.8	101.8	MDW 0870HGS3	J56
	43.6	99.6	MDE 0870S09E04	J14
8.8	43.8	99.8	MDW 0870GS4	J51
	45.3	127.0	MDF 0870H5D	J35
	58.1	128.2	MDA 0870S10H05	J94
	58.6	128.6	MDH 0870S10H05	J44
	60.6	128.6	MDE 0870S09H05	J21
	60.6	128.6	MDM 0870S09H05	J67
	60.6	128.6	MDW 0870HX5	J75
	60.8	128.8	MDW 0870HGS5	J56
	60.8	128.8	MDW 0870NHGS5	J100
	85.6	155.6	MDH 0870S10H08	J44
	87.6	155.6	MDE 0870S09H08	J21
	87.8	155.8	MDW 0870HGS8	J56
	22.0	80.0	MDF 0880S2D	J28
	26.4	83.6	MDE 0880S09E02	J14
	26.4	83.6	MDE 0880S09E02H	J17
	26.4	100.0	MDF 0880H3D	J35
	26.4	140.0	MDF 0880L2D	J32
	26.6	83.8	MDW 0880GS2	J51
	31.0	101.2	MDA 0880S10H03	J94
	31.4	101.6	MDH 0880S10H03	J44
8.9	33.4	101.6	MDE 0880S09H03	J21
	33.4	101.6	MDM 0880S09H03	J67
	33.4	101.6	MDW 0880HX3	J75
	33.6	101.8	MDW 0880HGS3	J56
	33.6	101.8	MDW 0880HY3	J81
	33.6	101.8	MDW 0880NHGS3	J100
	43.4	99.6	MDE 0880S09E04	J14
	43.6	99.8	MDW 0880GS4	J51
	45.8	127.0	MDF 0880H5D	J35
	58.0	128.2	MDA 0880S10H05	J94
	58.4	128.6	MDH 0880S10H05	J44
	60.4	128.6	MDE 0880S09H05	J21
	60.4	128.6	MDM 0880S09H05	J67
	60.4	128.6	MDW 0880HX5	J75
	60.6	128.8	MDW 0880HGS5	J56
	60.6	128.8	MDW 0880HY5	J81
	60.6	128.8	MDW 0880NHGS5	J100
	85.4	155.6	MDH 0880S10H08	J44
8.9	87.4	155.6	MDE 0880S09H08	J21
	87.4	155.6	MDW 0880HX8	J75
	87.6	155.8	MDW 0880HGS8	J56
	22.3	80.0	MDF 0890S2D	J28

● Diameter ø8.9 to ø9.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.9	26.3	83.6	MDE 0890S09E02	J14
	26.5	83.8	MDW 0890GS2	J51
	26.8	100.0	MDF 0890H3D	J35
	26.8	140.0	MDF 0890L2D	J32
	31.3	101.6	MDH 0890S10H03	J44
	33.3	101.6	MDE 0890S09H03	J21
	33.3	101.6	MDM 0890S09H03	J67
	33.3	101.6	MDW 0890HX3	J75
	33.5	101.8	MDW 0890HGS3	J56
	43.3	99.6	MDE 0890S09E04	J14
	43.5	99.8	MDW 0890GS4	J51
	46.3	127.0	MDF 0890H5D	J35
	57.8	128.2	MDA 0890S10H05	J94
	58.3	128.6	MDH 0890S10H05	J44
	60.3	128.6	MDE 0890S09H05	J21
	60.3	128.6	MDM 0890S09H05	J67
	60.3	128.6	MDW 0890HX5	J75
	60.5	128.8	MDW 0890HGS5	J56
	60.5	128.8	MDW 0890NHGS5	J100
	85.3	155.6	MDH 0890S10H08	J44
87.3	155.6	MDE 0890S09H08	J21	
87.5	155.8	MDW 0890HGS8	J56	
9.0	22.5	80.0	MDF 0900S2D	J28
	26.1	83.6	MDE 0900S09E02	J14
	26.4	83.9	MDW 0900GS2	J51
	27.0	100.0	MDF 0900H3D	J35
	27.0	140.0	MDF 0900L2D	J32
	30.7	101.2	MDA 0900S10H03	J94
	31.1	101.6	MDH 0900S10H03	J44
	32.7	101.2	MDW 0900PHT	J88
	33.1	101.6	MDE 0900S09H03	J21
	33.1	101.6	MDM 0900S09H03	J67
	33.1	101.6	MDW 0900HX3	J75
	33.4	101.9	MDW 0900HGS3	J56
	33.4	101.9	MDW 0900HY3	J81
	33.4	101.9	MDW 0900NHGS3	J100
	33.6	100.1	MDS 0900SDC3	J103
	43.1	99.6	MDE 0900S09E04	J14
	43.4	99.9	MDW 0900GS4	J51
	46.8	127.0	MDF 0900H5D	J35
	57.7	128.2	MDA 0900S10H05	J94
	58.1	128.6	MDH 0900S10H05	J44
	60.1	128.6	MDE 0900S09H05	J21
	60.1	128.6	MDM 0900S09H05	J67
	60.1	128.6	MDW 0900HX5	J75
	60.4	128.9	MDW 0900HGS5	J56
	60.4	128.9	MDW 0900HY5	J81
	60.4	128.9	MDW 0900NHGS5	J100
	85.1	155.6	MDH 0900S10H08	J44
	87.1	155.6	MDE 0900S09H08	J21
	87.1	155.6	MDW 0900HX8	J75
	87.4	155.9	MDW 0900HGS8	J56
112.1	182.6	MDA 0900S10H10	J94	
114.4	182.9	MDW 0900NHGS10	J100	
123.1	191.6	MDW 0900XHGS10	J88	
141.1	209.6	MDW 0900XHGS12	J88	
168.1	236.6	MDW 0900XHGS15	J88	
213.1	281.6	MDW 0900XHGS20	J88	
258.1	326.6	MDW 0900XHGS25	J88	
303.1	371.6	MDW 0900XHGS30	J88	
9.1	22.8	80.0	MDF 0910S2D	J28
	26.1	88.7	MDE 0910S10E02	J14
	26.3	88.9	MDW 0910GS2	J51
	27.4	106.0	MDF 0910H3D	J35
	27.4	150.0	MDF 0910L2D	J32
	35.6	107.7	MDE 0910S10H03	J21
	35.6	107.7	MDH 0910S10H03	J44
	35.6	107.7	MDM 0910S10H03	J67
	35.6	107.7	MDW 0910HX3	J75
	35.8	107.9	MDW 0910HGS3	J56
	46.1	106.7	MDE 0910S10E04	J14
	46.3	106.9	MDW 0910GS4	J51
	47.4	136.0	MDF 0910H5D	J35
	63.6	137.2	MDA 0910S10H05	J95
	64.1	137.7	MDH 0910S10H05	J44
	64.1	137.7	MDE 0910S10H05	J21
	64.1	137.7	MDM 0910S10H05	J67
	64.1	137.7	MDW 0910HX5	J75
	64.3	137.9	MDW 0910HGS5	J56
	64.3	137.9	MDW 0910NHGS5	J100

Effective Length List by Diameter

● Diameter ø9.1 to ø9.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.1	91.1	167.7	MDH 0910S10H08	J44
	92.6	167.7	MDE 0910S10H08	J21
	92.8	167.9	MDW 0910HGS8	J56
	23.0	80.0	MDF 0920S2D	J28
	25.9	88.7	MDE 0920S10E02	J15
	26.1	88.9	MDW 0920GS2	J51
	27.6	106.0	MDF 0920H3D	J35
	27.6	150.0	MDF 0920L2D	J32
	35.4	107.7	MDE 0920S10H03	J21
	35.4	107.7	MDH 0920S10H03	J44
9.2	35.4	107.7	MDM 0920S10H03	J67
	35.4	107.7	MDW 0920HX3	J75
	35.6	107.9	MDW 0920HGS3	J56
	45.9	106.7	MDE 0920S10E04	J15
	46.1	106.9	MDW 0920GS4	J51
	47.8	136.0	MDF 0920H5D	J35
	63.4	137.2	MDA 0920S10H05	J95
	63.9	137.7	MDH 0920S10H05	J44
	63.9	137.7	MDE 0920S10H05	J21
	63.9	137.7	MDM 0920S10H05	J67
9.21	63.9	137.7	MDW 0920HX5	J75
	64.1	137.9	MDW 0920HGS5	J56
	64.1	137.9	MDW 0920NHGS5	J100
	90.9	167.7	MDH 0920S10H08	J44
	92.4	167.7	MDE 0920S10H08	J21
	92.6	167.9	MDW 0920HGS8	J56
	35.6	107.9	MDW 0921NHGS3	J100
	63.3	137.2	MDA 0921S10H05	J95
	64.1	137.9	MDW 0921NHGS5	J100
	23.1	80.0	MDF 0924S2D	J28
9.24	25.8	88.7	MDE 0924S10E02	J15
	63.8	137.7	MDE 0924S10H05	J22
	23.1	80.0	MDF 0926S2D	J28
9.26	25.8	88.7	MDE 0926S10E02	J15
	63.8	137.7	MDE 0926S10H05	J22
	23.3	80.0	MDF 0930S2D	J28
	25.8	88.7	MDE 0930S10E02	J15
	26.0	88.9	MDW 0930GS2	J51
	28.0	106.0	MDF 0930H3D	J35
	28.0	150.0	MDF 0930L2D	J32
	35.3	107.7	MDE 0930S10H03	J22
	35.3	107.7	MDH 0930S10H03	J44
	35.3	107.7	MDM 0930S10H03	J67
9.3	35.3	107.7	MDW 0930HX3	J75
	35.5	107.9	MDW 0930HGS3	J56
	45.8	106.7	MDE 0930S10E04	J15
	46.0	106.9	MDW 0930GS4	J51
	48.4	136.0	MDF 0930H5D	J35
	63.3	137.2	MDA 0930S10H05	J95
	63.8	137.7	MDH 0930S10H05	J44
	63.8	137.7	MDE 0930S10H05	J22
	63.8	137.7	MDM 0930S10H05	J67
	63.8	137.7	MDW 0930HX5	J75
9.36	64.0	137.9	MDW 0930HGS5	J56
	64.0	137.9	MDW 0930NHGS5	J100
	90.8	167.7	MDH 0930S10H08	J44
	92.3	167.7	MDE 0930S10H08	J22
	92.5	167.9	MDW 0930HGS8	J56
	120.7	197.7	MDA 0930S10H10	J95
	23.4	80.0	MDF 0936S2D	J28
	25.6	88.7	MDE 0936S10E02	J15
	63.6	137.7	MDE 0936S10H05	J22
	23.4	80.0	MDF 0938S2D	J28
9.38	25.6	88.7	MDE 0938S10E02	J15
	63.6	137.7	MDE 0938S10H05	J22
	23.5	80.0	MDF 0940S2D	J28
	25.6	88.7	MDE 0940S10E02	J15
	25.8	88.9	MDW 0940GS2	J51
	28.2	106.0	MDF 0940H3D	J35
	28.2	150.0	MDF 0940L2D	J32
	34.7	107.3	MDA 0940S10H03	J95
	35.1	107.7	MDE 0940S10H03	J22
	35.1	107.7	MDH 0940S10H03	J44
9.4	35.1	107.7	MDM 0940S10H03	J67
	35.1	107.7	MDW 0940HX3	J75
	35.3	107.9	MDW 0940HGS3	J56
	35.3	107.9	MDW 0940NHGS3	J100
	45.6	106.7	MDE 0940S10E04	J15
	45.8	106.9	MDW 0940GS4	J51
	48.9	136.0	MDF 0940H5D	J35

(Blue text: Flat head Indexable head type)

● Diameter ø9.4 to ø9.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.4	63.2	137.3	MDA 0940S10H05	J95
	63.6	137.7	MDH 0940S10H05	J44
	63.6	137.7	MDE 0940S10H05	J22
	63.6	137.7	MDM 0940S10H05	J67
	63.6	137.7	MDW 0940HX5	J75
	63.8	137.9	MDW 0940HGS5	J56
	63.8	137.9	MDW 0940NHGS5	J100
	90.6	167.7	MDH 0940S10H08	J44
	92.1	167.7	MDE 0940S10H08	J22
	92.3	167.9	MDW 0940HGS8	J56
9.5	25.8	80.0	MDF 0950S2D	J28
	25.8	88.7	MDE 0950S10E02	J15
	25.8	89.0	MDW 0950GS2	J51
	28.6	106.0	MDF 0950H3D	J35
	28.6	150.0	MDF 0950L2D	J32
	34.5	107.3	MDA 0950S10H03	J95
	34.6	107.3	MDW 0950PHT	J88
	35.0	107.7	MDE 0950S10H03	J22
	35.0	107.7	MDH 0950S10H03	J44
	35.0	107.7	MDM 0950S10H03	J67
9.52	35.0	107.7	MDW 0950HX3	J75
	35.3	108.0	MDW 0950HGS3	J56
	35.3	108.0	MDW 0950HY3	J81
	35.3	108.0	MDW 0950NHGS3	J100
	45.5	106.7	MDE 0950S10E04	J15
	45.8	107.0	MDW 0950GS4	J51
	49.5	136.0	MDF 0950H5D	J35
	63.0	137.3	MDA 0950S10H05	J95
	63.5	137.7	MDH 0950S10H05	J44
	63.5	137.7	MDE 0950S10H05	J22
9.54	63.5	137.7	MDM 0950S10H05	J67
	63.5	137.7	MDW 0950HX5	J75
	63.8	138.0	MDW 0950HGS5	J56
	63.8	138.0	MDW 0950HY5	J81
	63.8	138.0	MDW 0950NHGS5	J100
	90.5	167.7	MDH 0950S10H08	J44
	92.0	167.7	MDE 0950S10H08	J22
	92.0	167.7	MDW 0950HX8	J75
	92.3	168.0	MDW 0950HGS8	J56
	120.5	197.7	MDA 0950S10H10	J95
9.55	120.8	198.0	MDW 0950NHGS10	J100
	130.5	202.7	MDW 0950XHGS10	J88
	147.5	219.7	MDW 0950XHGS12	J88
	175.5	247.7	MDW 0950XHGS15	J88
	220.5	295.7	MDW 0950XHGS20	J88
	270.5	342.7	MDW 0950XHGS25	J88
	318.5	390.7	MDW 0950XHGS30	J88
	23.8	80.0	MDF 0952S2D	J28
	28.3	88.7	MDE 0952S10E02	J15
	67.3	137.7	MDE 0952S10H05	J22
9.6	23.9	80.0	MDF 0954S2D	J29
	28.3	88.7	MDE 0954S10E02	J15
	67.3	137.7	MDE 0954S10H05	J22
	37.9	107.2	MDS 09550SDC3	J103
	24.0	80.0	MDF 0960S2D	J29
	28.3	88.7	MDE 0960S10E02	J15
	28.6	89.0	MDW 0960GS2	J51
	28.8	106.0	MDF 0960H3D	J35
	28.8	150.0	MDF 0960L2D	J32
	36.9	107.3	MDA 0960S10H03	J95
9.6	37.3	107.7	MDE 0960S10H03	J22
	37.3	107.7	MDM 0960S10H03	J67
	37.3	107.7	MDW 0960HX3	J75
	37.4	107.8	MDH 0960S10H03	J44
	37.6	108.0	MDW 0960HGS3	J56
	47.3	106.7	MDE 0960S10E04	J15
	47.6	107.0	MDW 0960GS4	J51
	49.9	136.0	MDF 0960H5D	J35
	66.9	137.3	MDA 0960S10H05	J95
	67.3	137.7	MDE 0960S10H05	J22
9.7	67.3	137.7	MDM 0960S10H05	J67
	67.3	137.7	MDW 0960HX5	J75
	67.4	137.8	MDH 0960S10H05	J44
	67.6	138.0	MDW 0960HGS5	J56
	67.6	138.0	MDW 0960NHGS5	J100
	97.3	167.7	MDE 0960S10H08	J22
	97.4	167.8	MDH 0960S10H08	J44
	97.6	168.0	MDW 0960HGS8	J56
	24.3	80.0	MDF 0970S2D	J29
	28.3	88.8	MDE 0970S10E02	J15

(Blue text: Flat head Indexable head type)

● Diameter ø9.7 to ø10.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.7	28.5	89.0	MDW 0970GS2	J51
	29.2	106.0	MDF 0970H3D	J35
	29.2	150.0	MDF 0970L2D	J32
	37.3	107.8	MDE 0970S10H03	J22
	37.3	107.8	MDH 0970S10H03	J44
	37.3	107.8	MDM 0970S10H03	J67
	37.3	107.8	MDW 0970HX3	J75
	37.5	108.0	MDW 0970HGS3	J56
	47.3	106.8	MDE 0970S10E04	J15
	47.5	107.0	MDW 0970GS4	J51
	50.5	136.0	MDF 0970H5D	J35
	67.3	137.8	MDH 0970S10H05	J44
	67.3	137.8	MDE 0970S10H05	J22
	67.3	137.8	MDM 0970S10H05	J67
	67.3	137.8	MDW 0970HX5	J75
	67.5	138.0	MDW 0970HGS5	J56
	67.5	138.0	MDW 0970NHGS5	J100
	97.3	167.8	MDH 0970S10H08	J44
	97.3	167.8	MDE 0970S10H08	J22
	97.5	168.0	MDW 0970HGS8	J56
9.8	24.5	80.0	MDF 0980S2D	J29
	28.1	88.8	MDE 0980S10E02	J15
	28.3	89.0	MDW 0980GS2	J51
	29.4	106.0	MDF 0980H3D	J35
	29.4	150.0	MDF 0980L2D	J32
	37.1	107.8	MDE 0980S10H03	J22
	37.1	107.8	MDH 0980S10H03	J44
	37.1	107.8	MDM 0980S10H03	J67
	37.1	107.8	MDW 0980HX3	J75
	37.3	108.0	MDW 0980HGS3	J56
	47.1	106.8	MDE 0980S10E04	J15
	47.3	107.0	MDW 0980GS4	J51
	51.0	136.0	MDF 0980H5D	J35
	66.6	137.3	MDA 0980S10H05	J95
	67.1	137.8	MDH 0980S10H05	J44
	67.1	137.8	MDE 0980S10H05	J22
	67.1	137.8	MDM 0980S10H05	J67
	67.1	137.8	MDW 0980HX5	J75
	67.3	138.0	MDW 0980HGS5	J56
	67.3	138.0	MDW 0980NHGS5	J101
9.9	97.1	167.8	MDH 0980S10H08	J44
	97.1	167.8	MDE 0980S10H08	J22
	97.3	168.0	MDW 0980HGS8	J56
	127.1	197.8	MDA 0980S10H10	J95
	127.3	198.0	MDW 0980NHGS10	J101
	24.8	80.0	MDF 0990S2D	J29
	28.0	88.8	MDE 0990S10E02	J15
	28.2	89.0	MDW 0990GS2	J51
	29.8	106.0	MDF 0990H3D	J35
	29.8	150.0	MDF 0990L2D	J32
	37.0	107.8	MDE 0990S10H03	J22
	37.0	107.8	MDH 0990S10H03	J44
	37.0	107.8	MDM 0990S10H03	J67
	37.0	107.8	MDW 0990HX3	J75
	37.2	108.0	MDW 0990HGS3	J56
	47.0	106.8	MDE 0990S10E04	J15
	47.2	107.0	MDW 0990GS4	J51
	51.5	136.0	MDF 0990H5D	J35
	67.0	137.8	MDH 0990S10H05	J44
	67.0	137.8	MDE 0990S10H05	J22
10.0	67.0	137.8	MDM 0990S10H05	J67
	67.0	137.8	MDW 0990HX5	J75
	67.2	138.0	MDW 0990HGS5	J56
	67.2	138.0	MDW 0990NHGS5	J101
	97.0	167.8	MDH 0990S10H08	J44
	97.0	167.8	MDE 0990S10H08	J22
	97.2	168.0	MDW 0990HGS8	J56
	25.0	80.0	MDF 1000S2D	J29
	27.8	88.8	MDE 1000S10E02	J15
	27.8	88.8	MDE 1000S10E02H	J17
	28.1	89.1	MDW 1000GS2	J51
	30.0	106.0	MDF 1000H3D	J35
	30.0	150.0	MDF 1000L2D	J32
	30.0	150.0	MDF 1000L2D-S8	J32
	36.3	107.3	MDA 1000S10H03	J95
	36.3	107.3	MDW 1000PHT	J88
	36.8	107.8	MDE 1000S10H03	J22
	36.8	107.8	MDH 1000S10H03	J44
	36.8	107.8	MDM 1000S10H03	J67
	36.8	107.8	MDW 1000HX3	J75

Effective Length List by Diameter

● Diameter $\phi 10.0$ to $\phi 10.3\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.0	37.1	108.1	MDW 1000HGS3	J56
	37.1	108.1	MDW 1000HY3	J81
	37.1	108.1	MDW 1000NHGS3	J101
	37.3	107.3	MDS 1000SDC3	J103
	46.8	106.8	MDE 1000S1E04	J15
	47.1	107.1	MDW 1000GS4	J51
	52.0	136.0	MDF 1000H5D	J35
	66.3	137.3	MDA 1000S10H05	J95
	66.8	137.8	MDH 1000S10H05	J44
	66.8	137.8	MDE 1000S10H05	J22
	66.8	137.8	MDW 1000S10H05	J67
	66.8	137.8	MDW 1000HX5	J75
	67.1	138.1	MDW 1000HGS5	J56
	67.1	138.1	MDW 1000HY5	J81
	67.1	138.1	MDW 1000NHGS5	J101
	96.8	167.8	MDH 1000S10H08	J44
	96.8	167.8	MDE 1000S10H08	J22
	96.8	167.8	MDW 1000HX8	J75
	97.1	168.1	MDW 1000HGS8	J56
	126.8	197.8	MDA 1000S10H10	J95
	127.1	198.1	MDW 1000NHGS10	J101
	136.8	207.8	MDW 1000XHGS10	J88
	156.8	227.8	MDW 1000XHGS12	J88
	186.8	257.8	MDW 1000XHGS15	J88
	236.8	307.8	MDW 1000XHGS20	J88
	286.8	357.8	MDW 1000XHGS25	J88
	336.8	407.8	MDW 1000XHGS30	J88
10.1	25.3	90.0	MDF 1010S2D	J29
	27.7	94.8	MDE 1010S11E02	J15
	28.0	95.1	MDW 1010GS2	J51
	30.4	116.0	MDF 1010H3D	J35
	30.4	160.0	MDF 1010L2D	J32
	38.7	117.3	MDA 1010S12H03	J95
	39.2	117.8	MDE 1010S11H03	J22
	39.2	117.8	MDM 1010S11H03	J67
	39.2	117.8	MDW 1010HX3	J75
	39.3	117.9	MDH 1010S12H03	J44
	39.5	118.1	MDW 1010HGS3	J56
	39.5	118.1	MDW 1010NHGS3	J101
	52.6	149.0	MDF 1010H5D	J35
	52.7	115.8	MDE 1010S11E04	J15
	53.0	116.1	MDW 1010GS4	J51
	70.2	150.3	MDA 1010S12H05	J95
	70.7	150.8	MDE 1010S11H05	J22
	70.7	150.8	MDM 1010S11H05	J67
10.2	70.7	150.8	MDW 1010HX5	J75
	70.8	150.9	MDH 1010S12H05	J44
	71.0	151.1	MDW 1010HGS5	J56
	100.8	183.9	MDH 1010S12H08	J44
	102.2	183.8	MDE 1010S11H08	J22
	102.5	184.1	MDW 1010HGS8	J56
	25.5	90.0	MDF 1020S2D	J29
	27.6	94.9	MDE 1020S11E02	J15
	27.8	95.1	MDW 1020GS2	J51
	30.6	116.0	MDF 1020H3D	J35
	30.6	160.0	MDF 1020L2D	J32
	39.1	117.9	MDE 1020S11H03	J22
	39.1	117.9	MDH 1020S12H03	J44
	39.1	117.9	MDM 1020S11H03	J67
	39.1	117.9	MDW 1020HX3	J76
	39.3	118.1	MDW 1020HGS3	J56
	39.3	118.1	MDW 1020HY3	J81
10.3	52.8	115.9	MDE 1020S11E04	J15
	52.8	116.1	MDW 1020GS4	J51
	53.0	149.0	MDF 1020H5D	J35
	70.6	150.9	MDH 1020S12H05	J44
	70.6	150.9	MDE 1020S11H05	J22
	70.6	150.9	MDM 1020S11H05	J67
	70.6	150.9	MDW 1020HX5	J76
	70.8	151.1	MDW 1020HGS5	J56
	70.8	151.1	MDW 1020HY5	J81
	100.6	183.9	MDH 1020S12H08	J44
	102.1	183.9	MDE 1020S11H08	J22
	102.3	184.1	MDW 1020HGS8	J56
	25.8	90.0	MDF 1030S2D	J29
	27.5	94.9	MDE 1030S11E02	J15
	27.7	95.1	MDW 1030GS2	J51
	31.0	116.0	MDF 1030H3D	J35
	31.0	160.0	MDF 1030L2D	J32
	38.6	117.4	MDA 1030S12H03	J95

● Diameter $\phi 10.3$ to $\phi 10.5\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.3	39.0	117.9	MDE 1030S11H03	J22
	39.0	117.9	MDH 1030S12H03	J44
	39.0	117.9	MDM 1030S11H03	J67
	39.0	117.9	MDW 1030HX3	J76
	39.2	118.1	MDW 1030HGS3	J56
	39.2	118.1	MDW 1030HY3	J81
	39.2	118.1	MDW 1030NHGS3	J101
	52.5	115.9	MDE 1030S11E04	J15
	52.7	116.1	MDW 1030GS4	J51
	53.6	149.0	MDF 1030H5D	J35
	70.1	150.4	MDA 1030S12H05	J95
	70.5	150.9	MDH 1030S12H05	J44
	70.5	150.9	MDE 1030S11H05	J22
	70.5	150.9	MDM 1030S11H05	J67
	70.5	150.9	MDW 1030HX5	J76
	70.7	151.1	MDW 1030HGS5	J56
	70.7	151.1	MDW 1030HY5	J81
	70.7	151.1	MDW 1030NHGS5	J101
	100.5	183.9	MDH 1030S12H08	J44
	102.0	183.9	MDE 1030S11H08	J22
	102.0	183.9	MDW 1030HX8	J76
	102.2	184.1	MDW 1030HGS8	J56
	102.2	184.1	MDW 1030HY8	J81
10.4	26.0	90.0	MDF 1040S2D	J29
	27.3	94.9	MDE 1040S11E02	J15
	27.6	95.2	MDW 1040GS2	J51
	31.2	116.0	MDF 1040H3D	J35
	31.2	160.0	MDF 1040L2D	J32
	38.3	117.4	MDA 1040S12H03	J95
	38.8	117.9	MDE 1040S11H03	J22
	38.8	117.9	MDH 1040S12H03	J44
	38.8	117.9	MDM 1040S11H03	J67
	38.8	117.9	MDW 1040HX3	J76
	39.1	118.2	MDW 1040HGS3	J56
	52.3	115.9	MDE 1040S11E04	J15
	52.6	116.2	MDW 1040GS4	J51
	54.1	149.0	MDF 1040H5D	J35
	69.8	150.4	MDA 1040S12H05	J95
	70.3	150.9	MDH 1040S12H05	J44
	70.3	150.9	MDE 1040S11H05	J22
	70.3	150.9	MDM 1040S11H05	J67
10.5	70.3	150.9	MDW 1040HX5	J76
	70.6	151.2	MDW 1040HGS5	J56
	70.6	151.2	MDW 1040NHGS5	J101
	100.3	183.9	MDH 1040S12H08	J44
	101.8	183.9	MDE 1040S11H08	J22
	102.1	184.2	MDW 1040HGS8	J56
	26.3	90.0	MDF 1050S2D	J29
	27.2	94.9	MDE 1050S11E02	J15
	27.5	95.2	MDW 1050GS2	J51
	31.6	116.0	MDF 1050H3D	J35
	31.6	160.0	MDF 1050L2D	J32
	38.2	117.4	MDA 1050S12H03	J95
	38.2	117.4	MDW 1050PHT	J88
	38.7	117.9	MDE 1050S11H03	J22
	38.7	117.9	MDH 1050S12H03	J44
	38.7	117.9	MDM 1050S11H03	J67
	38.7	117.9	MDW 1050HX3	J76
	39.0	118.2	MDW 1050HGS3	J56
	39.0	118.2	MDW 1050NHGS3	J101
10.6	52.2	115.9	MDE 1050S11E04	J15
	52.5	116.2	MDW 1050GS4	J51
	54.7	149.0	MDF 1050H5D	J35
	69.7	150.4	MDA 1050S12H05	J95
	70.2	150.9	MDH 1050S12H05	J44
	70.2	150.9	MDE 1050S11H05	J22
	70.2	150.9	MDM 1050S11H05	J67
	70.2	150.9	MDW 1050HX5	J76
	70.5	151.2	MDW 1050HGS5	J56
	70.5	151.2	MDW 1050NHGS5	J101
	100.2	183.9	MDH 1050S12H08	J44
	101.7	183.9	MDE 1050S11H08	J22
	101.7	183.9	MDW 1050HX8	J76
	102.0	184.2	MDW 1050HGS8	J56
	133.2	216.9	MDA 1050S12H10	J95
	133.5	217.2	MDW 1050NHGS10	J101
	144.2	222.9	MDW 1050XHGS10	J88
	163.2	241.9	MDW 1050XHGS12	J88
10.7	194.2	272.9	MDW 1050XHGS15	J88
	247.2	325.9	MDW 1050XHGS20	J88

● Diameter $\phi 10.5$ to $\phi 10.9\text{mm}$

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.5	299.2	377.9	MDW 1050XHGS25	J88
	26.5	90.0	MDF 1060S2D	J29
	31.0	94.9	MDE 1060S11E02	J15
	31.3	95.2	MDW 1060GS2	J51
	31.8	116.0	MDF 1060H3D	J35
	31.8	160.0	MDF 1060L2D	J32
	38.5	117.4	MDA 1060S12H03	J95
	39.1	118.0	MDH 1060S12H03	J44
	41.0	117.9	MDE 1060S11H03	J22
	41.0	117.9	MDM 1060S11H03	J67
	41.0	117.9	MDW 1060HX3	J76
	41.3	118.2	MDW 1060HGS3	J56
	41.3	118.2	MDW 1060NHGS3	J101
10.6	54.0	115.9	MDE 1060S11E04	J15
	54.3	116.2	MDW 1060GS4	J51
	55.1	149.0	MDF 1060H5D	J35
	71.5	150.4	MDA 1060S12H05	J95
	72.1	151.0	MDH 1060S12H05	J44
	74.0	150.9	MDE 1060S11H05	J22
	74.0	150.9	MDM 1060S11H05	J67
	74.0	150.9	MDW 1060HX5	J76
	74.3	151.2	MDW 1060HGS5	J56
	74.3	151.2	MDW 1060NHGS5	J101
	105.1	184.0	MDH 1060S12H08	J44
	107.0	183.9	MDE 1060S11H08	J22
	107.3	184.2	MDW 1060HGS8	J56
10.7	26.8	90.0	MDF 1070S2D	J29
	30.9	94.9	MDE 1070S11E02	J15
	31.2	95.2	MDW 1070GS2	J51
	32.2	116.0	MDF 1070H3D	J35
	32.2	160.0	MDF 1070L2D	J32
	39.0	118.0	MDH 1070S12H03	J44
	40.9	117.9	MDE 1070S11H03	J22
	40.9	117.9	MDM 1070S11H03	J67
	40.9	117.9	MDW 1070HX3	J76
	41.2	118.2	MDW 1070HGS3	J56
	53.9	115.9	MDE 1070S11E04	J15
	54.2	116.2	MDW 1070GS4	J51
	55.7	149.0	MDF 1070H5D	J35
10.8	72.0	151.0	MDH 1070S12H05	J44
	73.9	150.9	MDE 1070S11H05	J22
	73.9	150.9	MDM 1070S11H05	J67
	73.9	150.9	MDW 1070HX5	J76
	74.2	151.2	MDW 1070HGS5	J56
	105.0	184.0	MDH 1070S12H08	J44
	106.9	183.9	MDE 1070S11H08	J22
	107.2	184.2	MDW 1070HGS8	J56
	27.0	90.0	MDF 1080S2D	J29
	30.8	95.0	MDE 1080S11E02	J15
	30.8	95.0	MDE 1080S11E02H	J17
	31.0	95.2	MDW 1080GS2	J51
	32.4	116.0	MDF 1080H3D	J35
32.4	160.0	MDF 1080L2D	J32	
10.9	38.8	118.0	MDH 1080S12H03	J44
	40.8	118.0	MDE 1080S11H03	J22
	40.8	118.0	MDM 1080S11H03	J67
	40.8	118.0	MDW 1080HX3	J76
	41.0	118.2	MDW 1080HGS3	J56
	53.8	116.0	MDE 1080S11E04	J15
	54.0	116.2	MDW 1080GS4	J51
	56.2	149.0	MDF 1080H5D	J35
	71.2	150.4	MDA 1080S12H05	J95
	71.8	151.0	MDH 1080S12H05	J44
	73.8	151.0	MDE 1080S11H05	J22
	73.8	151.0	MDM 1080S11H05	J67
	73.8	151.0	MDW 1080HX5	J76
10.10	74.0	151.2	MDW 1080HGS5	J56
	104.8	184.0	MDH 1080S12H08	J44
	106.8	184.0	MDE 1080S11H08	J22
	107.0	184.2	MDW 1080HGS8	J56
	137.8	217.0	MDA 1080S12H10	J95
	27.3	90.0	MDF 1090S2D	J29
	30.7	95.0	MDE 1090S11E02	J15
	31.0	95.3	MDW 1090GS2	J51
	32.8	116.0	MDF 1090H3D	J35
	32.8	160.0	MDF 1090L2D	J32
	38.7	118.0	MDH 1090S12H03	J44
	40.7	118.0	MDE 1090S11H03	J22
	40.7	118.0	MDM 1090S11H03	J67
40.7	118.0	MDW 1090HX3	J76	

Effective Length List by Diameter

● Diameter ø10.9 to ø11.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.9	41.0	118.3	MDW 1090HGS3	J56
	53.7	116.0	MDE 1090S11E04	J15
	54.0	116.3	MDW 1090GS4	J51
	56.7	149.0	MDF 1090H5D	J35
	71.7	151.0	MDH 1090S12H05	J44
	73.7	151.0	MDE 1090S11H05	J22
	73.7	151.0	MDM 1090S11H05	J67
	73.7	151.0	MDW 1090HX5	J76
	74.0	151.3	MDW 1090HGS5	J56
	104.7	184.0	MDH 1090S12H08	J44
	106.7	184.0	MDE 1090S11H08	J22
	107.0	184.3	MDW 1090HGS8	J56
11.0	27.5	90.0	MDF 1100S2D	J29
	30.5	95.0	MDE 1100S11E02	J15
	30.8	95.3	MDW 1100GS2	J51
	33.0	116.0	MDF 1100H3D	J35
	33.0	160.0	MDF 1100L2D	J32
	38.0	117.5	MDA 1100S12H03	J95
	38.5	118.0	MDH 1100S12H03	J44
	40.0	117.5	MDW 1100PHT	J88
	40.5	118.0	MDE 1100S11H03	J22
	40.5	118.0	MDM 1100S11H03	J68
	40.5	118.0	MDW 1100HX3	J76
	40.8	118.3	MDW 1100HGS3	J56
	40.8	118.3	MDW 1100HY3	J81
	40.8	118.3	MDW 1100NHGS3	J101
	53.5	116.0	MDE 1100S11E04	J15
	53.8	116.3	MDW 1100GS4	J51
	57.2	149.0	MDF 1100H5D	J35
	71.0	150.5	MDA 1100S12H05	J95
	71.5	151.0	MDH 1100S12H05	J44
	73.5	151.0	MDE 1100S11H05	J22
	73.5	151.0	MDM 1100S11H05	J68
	73.5	151.0	MDW 1100HX5	J76
	73.8	151.3	MDW 1100HGS5	J56
	73.8	151.3	MDW 1100HY5	J81
	73.8	151.3	MDW 1100NHGS5	J101
	104.5	184.0	MDH 1100S12H08	J44
	106.5	184.0	MDE 1100S11H08	J22
	106.5	184.0	MDW 1100HX8	J76
	106.8	184.3	MDW 1100HGS8	J56
	137.5	217.0	MDA 1100S12H10	J95
	139.8	217.3	MDW 1100NHGS10	J101
	150.5	228.0	MDW 1100XHGS10	J88
	172.5	250.0	MDW 1100XHGS12	J88
	205.5	283.0	MDW 1100XHGS15	J88
	260.5	338.0	MDW 1100XHGS20	J88
	315.5	393.0	MDW 1100XHGS25	J88
11.08	43.2	124.3	MDW 1108NHGS3	J101
	77.7	160.3	MDW 1108NHGS5	J101
11.1	27.8	90.0	MDF 1110S2D	J29
	30.4	102.0	MDE 1110S12E02	J15
	30.7	102.3	MDW 1110GS2	J51
	33.4	122.0	MDF 1110H3D	J35
	33.4	170.0	MDF 1110L2D	J32
	42.3	123.5	MDA 1110S12H03	J95
	42.9	124.0	MDE 1110S12H03	J22
	42.9	124.0	MDM 1110S12H03	J68
	42.9	124.0	MDW 1110HX3	J76
	43.0	124.1	MDH 1110S12H03	J44
	43.2	124.3	MDW 1110HGS3	J56
	43.2	124.3	MDW 1110NHGS3	J101
	56.4	123.0	MDE 1110S12E04	J15
	56.7	123.3	MDW 1110GS4	J51
	57.8	158.0	MDF 1110H5D	J35
	76.8	159.5	MDA 1110S12H05	J95
	77.4	160.0	MDE 1110S12H05	J22
	77.4	160.0	MDM 1110S12H05	J68
	77.4	160.0	MDW 1110HX5	J76
	77.5	160.1	MDH 1110S12H05	J44
	77.7	160.3	MDW 1110HGS5	J56
	77.7	160.3	MDW 1110NHGS5	J101
	110.5	196.1	MDH 1110S12H08	J44
	111.9	196.0	MDE 1110S12H08	J22
	112.2	196.3	MDW 1110HGS8	J56
11.2	28.0	90.0	MDF 1120S2D	J29
	30.2	102.0	MDE 1120S12E02	J15
	30.5	102.3	MDW 1120GS2	J51
	33.6	122.0	MDF 1120H3D	J35
	33.6	160.0	MDF 1120L2D	J32

(Blue text: Flat head Indexable head type)

● Diameter ø11.2 to ø11.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.2	42.7	124.0	MDE 1120S12H03	J22
	42.7	124.0	MDM 1120S12H03	J68
	42.7	124.0	MDW 1120HX3	J76
	42.8	124.1	MDH 1120S12H03	J44
	43.0	124.3	MDW 1120HGS3	J56
	43.0	124.3	MDW 1120NHGS3	J101
	56.2	123.0	MDE 1120S12E04	J15
	56.5	123.3	MDW 1120GS4	J51
	58.2	158.0	MDF 1120H5D	J35
	76.7	159.5	MDA 1120S12H05	J95
	77.2	160.0	MDE 1120S12H05	J22
	77.2	160.0	MDM 1120S12H05	J68
	77.2	160.0	MDW 1120HX5	J76
	77.3	160.1	MDH 1120S12H05	J44
	77.5	160.3	MDW 1120HGS5	J56
	77.5	160.3	MDW 1120NHGS5	J101
	110.3	196.1	MDH 1120S12H08	J44
	111.7	196.0	MDE 1120S12H08	J22
	112.0	196.3	MDW 1120HGS8	J56
11.22	28.1	90.0	MDF 1122S2D	J29
	30.2	102.0	MDE 1122S12E02	J15
11.24	77.2	160.0	MDE 1122S12H05	J22
	28.1	90.0	MDF 1124S2D	J29
11.24	30.2	102.0	MDE 1124S12E02	J15
	77.2	160.0	MDE 1124S12H05	J22
11.3	28.3	90.0	MDF 1130S2D	J29
	30.2	102.1	MDE 1130S12E02	J15
	30.4	102.3	MDW 1130GS2	J51
	34.0	122.0	MDF 1130H3D	J35
	34.0	160.0	MDF 1130L2D	J32
	42.7	124.1	MDE 1130S12H03	J22
	42.7	124.1	MDH 1130S12H03	J44
	42.7	124.1	MDM 1130S12H03	J68
	42.7	124.1	MDW 1130HX3	J76
	42.9	124.3	MDW 1130HGS3	J56
	56.2	123.1	MDE 1130S12E04	J15
	56.4	123.3	MDW 1130GS4	J51
	58.8	158.0	MDF 1130H5D	J35
	77.2	160.1	MDH 1130S12H05	J44
	77.2	160.1	MDE 1130S12H05	J22
	77.2	160.1	MDM 1130S12H05	J68
	77.2	160.1	MDW 1130HX5	J76
	77.4	160.3	MDW 1130HGS5	J56
	110.2	196.1	MDH 1130S12H08	J44
	111.7	196.1	MDE 1130S12H08	J22
	111.9	196.3	MDW 1130HGS8	J56
11.36	28.4	90.0	MDF 1136S2D	J29
	30.0	102.1	MDE 1136S12E02	J15
11.38	27.8	160.1	MDE 1136S12H05	J22
	28.4	90.0	MDF 1138S2D	J29
11.38	30.0	102.1	MDE 1138S12E02	J15
	77.0	160.1	MDE 1138S12H05	J22
11.4	28.5	90.0	MDF 1140S2D	J29
	30.0	102.1	MDE 1140S12E02	J15
	30.3	102.4	MDW 1140GS2	J51
	34.2	122.0	MDF 1140H3D	J35
	34.2	160.0	MDF 1140L2D	J32
	42.5	124.1	MDE 1140S12H03	J22
	42.5	124.1	MDH 1140S12H03	J45
	42.5	124.1	MDM 1140S12H03	J68
	42.5	124.1	MDW 1140HX3	J76
	42.8	124.4	MDW 1140HGS3	J56
	42.8	124.4	MDW 1140HY3	J81
	42.8	124.4	MDW 1140NHGS3	J101
	56.0	123.1	MDE 1140S12E04	J15
	56.3	123.4	MDW 1140GS4	J51
	59.3	158.0	MDF 1140H5D	J35
	76.4	159.5	MDA 1140S12H05	J95
	77.0	160.1	MDH 1140S12H05	J45
	77.0	160.1	MDE 1140S12H05	J22
	77.0	160.1	MDM 1140S12H05	J68
	77.0	160.1	MDW 1140HX5	J76
	77.3	160.4	MDW 1140HGS5	J56
	77.3	160.4	MDW 1140HY5	J81
	77.3	160.4	MDW 1140NHGS5	J101
	110.0	196.1	MDH 1140S12H08	J45
	111.5	196.1	MDE 1140S12H08	J22
	111.8	196.4	MDW 1140HGS8	J56
11.5	28.8	90.0	MDF 1150S2D	J29
	29.9	102.1	MDE 1150S12E02	J15

(Blue text: Flat head Indexable head type)

● Diameter ø11.5 to ø11.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.5	30.2	102.4	MDW 1150GS2	J51
	34.6	122.0	MDF 1150H3D	J35
	34.6	160.0	MDF 1150L2D	J32
	41.8	123.5	MDA 1150S12H03	J95
	41.8	123.5	MDW 1150PHT	J88
	42.4	124.1	MDE 1150S12H03	J22
	42.4	124.1	MDH 1150S12H03	J45
	42.4	124.1	MDM 1150S12H03	J68
	42.4	124.1	MDW 1150HX3	J76
	42.7	124.4	MDW 1150HGS3	J56
	42.7	124.4	MDW 1150HY3	J81
	42.7	124.4	MDW 1150NHGS3	J101
	55.9	123.1	MDE 1150S12E04	J15
	56.2	123.4	MDW 1150GS4	J51
	59.9	158.0	MDF 1150H5D	J35
	76.3	159.5	MDA 1150S12H05	J95
	76.9	160.1	MDH 1150S12H05	J45
	76.9	160.1	MDE 1150S12H05	J22
	76.9	160.1	MDM 1150S12H05	J68
	76.9	160.1	MDW 1150HX5	J76
	77.2	160.4	MDW 1150HGS5	J56
	77.2	160.4	MDW 1150HY5	J81
	77.2	160.4	MDW 1150NHGS5	J101
	109.9	196.1	MDH 1150S12H08	J45
	111.4	196.1	MDE 1150S12H08	J22
	111.4	196.1	MDW 1150HX8	J76
	111.7	196.4	MDW 1150HGS8	J56
	145.8	232.1	MDA 1150S12H10	J95
	146.2	232.4	MDW 1150NHGS10	J101
	157.9	239.1	MDW 1150XHGS10	J88
	178.9	260.1	MDW 1150XHGS12	J88
	212.9	294.1	MDW 1150XHGS15	J88
	270.9	352.1	MDW 1150XHGS20	J88
	327.9	409.1	MDW 1150XHGS25	J88
11.6	29.0	90.0	MDF 1160S2D	J29
	31.7	102.1	MDE 1160S12E02	J15
	32.0	102.4	MDW 1160GS2	J51
	34.8	122.0	MDF 1160H3D	J35
	34.8	160.0	MDF 1160L2D	J32
	44.7	124.1	MDE 1160S12H03	J22
	44.7	124.1	MDM 1160S12H03	J68
	44.7	124.1	MDW 1160HX3	J76
	44.8	124.2	MDH 1160S12H03	J45
	45.0	124.4	MDW 1160HGS3	J56
	57.7	123.1	MDE 1160S12E04	J15
	58.0	123.4	MDW 1160GS4	J51
	60.3	158.0	MDF 1160H5D	J35
	80.7	160.1	MDE 1160S12H05	J22
	80.7	160.1	MDM 1160S12H05	J68
	80.7	160.1	MDW 1160HX5	J76
	80.8	160.2	MDH 1160S12H05	J45
81.0	160.4	MDW 1160HGS5	J56	
116.7	196.1	MDE 1160S12H08	J22	
116.8	196.2	MDH 1160S12H08	J45	
117.0	196.4	MDW 1160HGS8	J56	
11.7	29.3	90.0	MDF 1170S2D	J29
	31.6	102.1	MDE 1170S12E02	J15
	31.9	102.4	MDW 1170GS2	J51
	35.2	122.0	MDF 1170H3D	J35
	35.2	160.0	MDF 1170L2D	J32
	44.6	124.1	MDE 1170S12H03	J22
	44.6	124.1	MDM 1170S12H03	J68
	44.6	124.1	MDW 1170HX3	J76
	44.7	124.2	MDH 1170S12H03	J45
	44.9	124.4	MDW 1170HGS3	J56
	57.6	123.1	MDE 1170S12E04	J15
	57.9	123.4	MDW 1170GS4	J51
	60.9	158.0	MDF 1170H5D	J35
	80.6	160.1	MDE 1170S12H05	J22
	80.6	160.1	MDM 1170S12H05	J68
	80.6	160.1	MDW 1170HX5	J76
	80.7	160.2	MDH 1170S12H05	J45
80.9	160.4	MDW 1170HGS5	J56	
116.6	196.1	MDE 1170S12H08	J22	
116.7	196.2	MDH 1170S12H08	J45	
116.9	196.4	MDW 1170HGS8	J56	
11.8	29.5	90.0	MDF 1180S2D	J29
	31.4	102.1	MDE 1180S12E02	J15
	31.7	102.4	MDW 1180GS2	J51
	35.4	122.0	MDF 1180H3D	J35

Effective Length List by Diameter

● Diameter ø11.8 to ø12.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.8	35.4	160.0	MDF 1180L2D	J32
	44.4	124.1	MDE 1180S12H03	J23
	44.4	124.1	MDM 1180S12H03	J68
	44.4	124.1	MDW 1180HX3	J76
	44.5	124.2	MDH 1180S12H03	J45
	44.7	124.4	MDW 1180HGS3	J56
	57.4	123.1	MDE 1180S12E04	J15
	57.7	123.4	MDW 1180GS4	J51
	61.4	158.0	MDF 1180H5D	J35
	79.9	159.6	MDA 1180S12H05	J95
	80.4	160.1	MDE 1180S12H05	J23
	80.4	160.1	MDM 1180S12H05	J68
	80.4	160.1	MDW 1180HX5	J76
	80.5	160.2	MDH 1180S12H05	J45
	80.7	160.4	MDW 1180HGS5	J56
	116.4	196.1	MDE 1180S12H08	J23
	116.5	196.2	MDH 1180S12H08	J45
	116.7	196.4	MDW 1180HGS8	J56
11.9	29.8	90.0	MDF 1190S2D	J29
	31.4	102.2	MDE 1190S12E02	J15
	31.7	102.5	MDW 1190GS2	J51
	35.8	122.0	MDF 1190H3D	J35
	35.8	160.0	MDF 1190L2D	J32
	44.4	124.2	MDE 1190S12H03	J23
	44.4	124.2	MDH 1190S12H03	J45
	44.4	124.2	MDM 1190S12H03	J68
	44.4	124.2	MDW 1190HX3	J76
	44.7	124.5	MDW 1190HGS3	J56
	57.4	123.2	MDE 1190S12E04	J15
	57.7	123.5	MDW 1190GS4	J51
	61.9	158.0	MDF 1190H5D	J35
	80.4	160.2	MDH 1190S12H05	J45
	80.4	160.2	MDE 1190S12H05	J23
	80.4	160.2	MDM 1190S12H05	J68
	80.4	160.2	MDW 1190HX5	J76
12.0	80.7	160.5	MDW 1190HGS5	J56
	116.4	196.2	MDH 1190S12H08	J45
	116.4	196.2	MDE 1190S12H08	J23
	116.7	196.5	MDW 1190HGS8	J56
	21.0	88.5	SMDT 1200 MFS+SMDH 120-1.5D	J132
	21.0	88.5	SMDT 1200 MFS+SMDH 120-1.5DF	J130
	23.0	90.5	SMDT 1200 MTL/MSL/MEL+SMDH 120-1.5D	J124
	23.0	90.5	SMDT 1200 MTL/MSL/MEL+SMDH 120-1.5DF	J122
	30.0	90.0	MDF 1200S2D	J29
	31.2	102.2	MDE 1200S12E02	J15
	31.5	102.5	MDW 1200GS2	J51
	36.0	122.0	MDF 1200H3D	J35
	36.0	160.0	MDF 1200L2D-S10	J32
	36.0	170.0	MDF 1200L2D	J32
	40.0	105.2	SMDT 1200 MFS+SMDH 120-3D	J132
	40.0	105.2	SMDT 1200 MFS+SMDH 120-3DF	J130
	40.0	105.2	SMDT 1200 MFS+SMDH 120M	J128
	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-3D	J124
12.0	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-3DF	J122
	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120M	J120
	43.6	123.6	MDA 1200S12H03	J95
	43.6	123.6	MDW 1200PHT	J88
	44.2	124.2	MDE 1200S12H03	J23
	44.2	124.2	MDH 1200S12H03	J45
	44.2	124.2	MDM 1200S12H03	J68
	44.2	124.2	MDW 1200HX3	J76
	44.5	124.5	MDW 1200HGS3	J56
	44.5	124.5	MDW 1200HY3	J81
	44.5	124.5	MDW 1200NHGS3	J101
	57.2	123.2	MDE 1200S12E04	J15
	57.5	123.5	MDW 1200GS4	J51
	62.4	158.0	MDF 1200H5D	J35
	65.0	130.2	SMDT 1200 MFS+SMDH 120-5D	J132
	65.0	130.2	SMDT 1200 MFS+SMDH 120-5DF	J130
	65.0	130.2	SMDT 1200 MFS+SMDH 120L	J128
12.0	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-5D	J124
	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-5DF	J122
	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120L	J120
	79.6	159.6	MDA 1200S12H05	J95
	80.2	160.2	MDH 1200S12H05	J45
	80.2	160.2	MDE 1200S12H05	J23
	80.2	160.2	MDM 1200S12H05	J68
	80.2	160.2	MDW 1200HX5	J76
	80.5	160.5	MDW 1200HGS5	J56
	80.5	160.5	MDW 1200HY5	J81

(Blue text: Flat head Indexable head type)

● Diameter ø12.0 to ø12.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.0	80.5	160.5	MDW 1200NHGS5	J101
	96.0	162.4	SMDT 1200 MFS+SMDH 120-8D	J132
	96.0	162.4	SMDT 1200 MFS+SMDH 120-8DF	J130
	98.0	164.4	SMDT 1200 MTL/MSL/MEL+SMDH 120-8D	J124
	98.0	164.4	SMDT 1200 MTL/MSL/MEL+SMDH 120-8DF	J122
	116.2	196.2	MDH 1200S12H08	J45
	116.2	196.2	MDE 1200S12H08	J23
	116.2	196.2	MDW 1200HX8	J76
	116.5	196.5	MDW 1200HGS8	J56
	144.0	211.3	SMDT 1200 MFS+SMDH 120-12D	J132
	146.0	213.3	SMDT 1200 MTL/MSL/MEL+SMDH 120-12D	J124
	152.2	232.2	MDA 1200S12H10	J95
	152.5	232.5	MDW 1200NHGS10	J101
	164.2	244.2	MDW 1200XHGS10	J88
	188.2	268.2	MDW 1200XHGS12	J88
	224.2	304.2	MDW 1200XHGS15	J88
	284.2	364.2	MDW 1200XHGS20	J88
	344.2	424.2	MDW 1200XHGS25	J88
12.04	31.1	102.2	MDE 1204S13E02H	J17
	23.0	90.5	SMDT 1210 MTL/MSL/MEL+SMDH 120-1.5D	J124
	23.0	90.5	SMDT 1210 MTL/MSL/MEL+SMDH 120-1.5DF	J122
	30.3	100.0	MDF 1210S2D	J29
	31.1	102.2	MDE 1210S13E02	J15
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-3D	J124
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-3DF	J122
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120M	J120
	46.6	130.2	MDE 1210S13H03	J23
	46.6	130.2	MDM 1210S13H03	J68
	46.7	130.3	MDH 1210S14H03	J45
	46.9	130.5	MDW 1210HGS3	J56
	46.9	130.5	MDW 1210NHGS3	J101
	60.1	139.2	MDE 1210S13E04	J15
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-5D	J124
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-5DF	J122
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120L	J120
	84.1	169.2	MDE 1210S13H05	J23
12.1	84.1	169.2	MDM 1210S13H05	J68
	84.2	169.3	MDH 1210S14H05	J45
	84.4	169.5	MDW 1210HGS5	J56
	84.4	169.5	MDW 1210NHGS5	J101
	98.0	164.4	SMDT 1210 MTL/MSL/MEL+SMDH 120-8D	J124
	98.0	164.4	SMDT 1210 MTL/MSL/MEL+SMDH 120-8DF	J122
	121.6	208.2	MDE 1210S13H08	J23
	146.0	213.3	SMDT 1210 MTL/MSL/MEL+SMDH 120-12D	J124
	23.0	90.5	SMDT 1220 MTL/MSL/MEL+SMDH 120-1.5D	J124
	23.0	90.5	SMDT 1220 MTL/MSL/MEL+SMDH 120-1.5DF	J122
	30.5	100.0	MDF 1220S2D	J29
	30.9	102.2	MDE 1220S13E02	J15
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-3D	J124
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-3DF	J122
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120M	J120
	46.4	130.2	MDE 1220S13H03	J23
	46.4	130.2	MDM 1220S13H03	J68
	46.5	130.3	MDH 1220S14H03	J45
12.2	46.7	130.5	MDW 1220HGS3	J56
	59.9	139.2	MDE 1220S13E04	J15
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-5D	J124
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-5DF	J122
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120L	J120
	83.9	169.2	MDE 1220S13H05	J23
	83.9	169.2	MDM 1220S13H05	J68
	84.0	169.3	MDH 1220S14H05	J45
	84.2	169.5	MDW 1220HGS5	J56
	98.0	164.4	SMDT 1220 MTL/MSL/MEL+SMDH 120-8D	J124
	98.0	164.4	SMDT 1220 MTL/MSL/MEL+SMDH 120-8DF	J122
	121.4	208.2	MDE 1220S13H08	J23
	126.0	213.3	SMDT 1220 MTL/MSL/MEL+SMDH 120-12D	J124
	23.0	90.5	SMDT 1230 MTL/MSL/MEL+SMDH 120-1.5D	J124
	23.0	90.5	SMDT 1230 MTL/MSL/MEL+SMDH 120-1.5DF	J122
	30.8	100.0	MDF 1230S2D	J29
	30.8	102.2	MDE 1230S13E02	J15
	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-3D	J124
12.3	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-3DF	J122
	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120M	J120
	46.3	130.2	MDE 1230S13H03	J23
	46.3	130.2	MDM 1230S13H03	J68
	46.4	130.3	MDH 1230S14H03	J45
	46.6	130.5	MDW 1230HGS3	J57
	46.6	130.5	MDW 1230NHGS3	J101
	59.8	139.2	MDE 1230S13E04	J15

(Blue text: Flat head Indexable head type)

● Diameter ø12.3 to ø12.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.3	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-5D	J124
	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-5DF	J122
	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120L	J120
	83.8	169.2	MDE 1230S13H05	J23
	83.8	169.2	MDM 1230S13H05	J68
	83.9	169.3	MDH 1230S14H05	J45
	84.1	169.5	MDW 1230HGS5	J57
	84.1	169.5	MDW 1230NHGS5	J101
	98.0	164.4	SMDT 1230 MTL/MSL/MEL+SMDH 120-8D	J124
	98.0	164.4	SMDT 1230 MTL/MSL/MEL+SMDH 120-8DF	J122
	121.3	208.2	MDE 1230S13H08	J23
	146.0	213.3	SMDT 1230 MTL/MSL/MEL+SMDH 120-12D	J124
12.4	23.0	90.5	SMDT 1240 MTL/MSL/MEL+SMDH 120-1.5D	J124
	23.0	90.5	SMDT 1240 MTL/MSL/MEL+SMDH 120-1.5DF	J122
	30.7	102.3	MDE 1240S13E02	J15
	31.0	100.0	MDF 1240S2D	J29
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-3D	J124
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-3DF	J122
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120M	J120
	46.2	130.3	MDE 1240S13H03	J23
	46.2	130.3	MDH 1240S14H03	J45
	46.2	130.3	MDM 1240S13H03	J68
	46.5	130.6	MDW 1240HGS3	J57
	59.7	139.3	MDE 1240S13E04	J15
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-5D	J124
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-5DF	J122
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120L	J120
	83.7	169.3	MDH 1240S14H05	J45
	83.7	169.3	MDE 1240S13H05	J23
	83.7	169.3	MDM 1240S13H05	J68
	84.0	169.6	MDW 1240HGS5	J57
	98.0	164.4	SMDT 1240 MTL/MSL/MEL+SMDH 120-8D	J124
	98.0	164.4	SMDT 1240 MTL/MSL/MEL+SMDH 120-8DF	J122
	121.2	208.3	MDE 1240S13H08	J23
	146.0	213.3	SMDT 1240 MTL/MSL/MEL+SMDH 120-12D	J124
	12.5	22.0	88.8	SMDT 1250 MFS+SMDH 125-1.5D
22.0		88.8	SMDT 1250 MFS+SMDH 125-1.5DF	J130
24.0		91.0	SMDT 1250 MTL/MSL/MEL+SMDH 125-1.5D	J124
24.0		91.0	SMDT 1250 MTL/MSL/MEL+SMDH 125-1.5DF	J122
30.6		102.3	MDE 1250S13E02	J15
31.3		100.0	MDF 1250S2D	J29
37.6		128.0	MDF 1250H3D	J35
37.6		180.0	MDF 1250L2D	J32
41.0		105.1	SMDT 1250 MFS+SMDH 125-3D	J132
41.0		105.1	SMDT 1250 MFS+SMDH 125-3DF	J130
41.0		105.1	SMDT 1250 MFS+SMDH 125M	J128
44.0		107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-3D	J124
44.0		107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-3DF	J122
44.0		107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125M	J120
45.5		129.7	MDW 1250PHT	J88
46.1		130.3	MDE 1250S13H03	J23
46.1		130.3	MDH 1250S14H03	J45
46.1		130.3	MDM 1250S13H03	J68
46.1		130.3	MDW 1250HX3	J76
46.4		130.6	MDW 1250HGS3	J57
46.4		130.6	MDW 1250HY3	J81
46.4		130.6	MDW 1250NHGS3	J101
59.6		139.3	MDE 1250S13E04	J15
65.1		167.0	MDF 1250H5D	J35
67.0		130.1	SMDT 1250 MFS+SMDH 125-5D	J132
67.0		130.1	SMDT 1250 MFS+SMDH 125-5DF	J130
67.0		130.1	SMDT 1250 MFS+SMDH 125L	J128
69.0		132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-5D	J124
69.0		132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-5DF	J122
69.0		132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125L	J120
83.6		169.3	MDH 1250S14H05	J45
83.6		169.3	MDE 1250S13H05	J23
83.6		169.3	MDM 1250S13H05	J68
83.6		169.3	MDW 1250HX5	J76
83.9		169.6	MDW 1250HGS5	J57
83.9		169.6	MDW 1250HY5	J81
83.9	169.6	MDW 1250NHGS5	J101	
100.0	167.9	SMDT 1250 MFS+SMDH 125-8D	J132	
100.0	167.9	SMDT 1250 MFS+SMDH 125-8DF	J130	
102.0	170.1	SMDT 1250 MTL/MSL/MEL+SMDH 125-8D	J124	
102.0	170.1	SMDT 1250 MTL/MSL/MEL+SMDH 125-8DF	J122	
119.6	208.3	MDE 1250S14H08	J45	
121.1	208.3	MDE 1250S13H08	J23	
121.1	208.3	MDW 1250HX8	J76	
121.4	208.6	MDW 1250HGS8	J57	

Effective Length List by Diameter

● Diameter ø12.5 to ø12.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.5	121.4	208.6	MDW 1250HY8	J81
	150.0	217.3	SMDT 1250 MFS+SMDH 125-12D	J132
	152.0	219.5	SMDT 1250 MTL/MSL/MEL+SMDH 125-12D	J124
	158.9	247.6	MDW 1250NHGS10	J101
	171.6	255.3	MDW 1250XHGS10	J88
	194.6	278.3	MDW 1250XHGS12	J88
	231.6	315.3	MDW 1250XHGS15	J88
	294.6	378.3	MDW 1250XHGS20	J88
	32.4	102.3	MDE 1252S13E02H	J17
	24.0	91.0	SMDT 1260 MTL/MSL/MEL+SMDH 125-1.5D	J124
12.52	24.0	91.0	SMDT 1260 MTL/MSL/MEL+SMDH 125-1.5DF	J122
	31.5	100.0	MDF 1260S2D	J29
	32.4	102.3	MDE 1260S13E02	J15
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-3D	J124
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-3DF	J122
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125M	J120
	46.5	130.4	MDH 1260S14H03	J45
	48.4	130.3	MDE 1260S13H03	J23
	48.4	130.3	MDM 1260S13H03	J68
	48.7	130.6	MDW 1260HGS3	J57
12.6	61.4	139.3	MDE 1260S13E04	J15
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-5D	J124
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-5DF	J122
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125L	J120
	85.5	169.4	MDH 1260S14H05	J45
	87.4	169.3	MDE 1260S13H05	J23
	87.4	169.3	MDM 1260S13H05	J68
	87.7	169.6	MDW 1260HGS5	J57
	102.0	170.1	SMDT 1260 MTL/MSL/MEL+SMDH 125-8D	J124
	102.0	170.1	SMDT 1260 MTL/MSL/MEL+SMDH 125-8DF	J122
12.6	126.4	208.3	MDE 1260S13H08	J23
	152.0	219.5	SMDT 1260 MTL/MSL/MEL+SMDH 125-12D	J124
	24.0	91.0	SMDT 1270 MTL/MSL/MEL+SMDH 125-1.5D	J124
	24.0	91.0	SMDT 1270 MTL/MSL/MEL+SMDH 125-1.5DF	J122
	31.8	100.0	MDF 1270S2D	J29
	32.3	102.3	MDE 1270S13E02	J15
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-3D	J124
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-3DF	J122
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125M	J120
	46.4	130.4	MDH 1270S14H03	J45
12.7	48.3	130.3	MDE 1270S13H03	J23
	48.3	130.3	MDM 1270S13H03	J68
	48.6	130.6	MDW 1270HGS3	J57
	61.3	139.3	MDE 1270S13E04	J15
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-5D	J124
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-5DF	J122
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125L	J120
	85.4	169.4	MDH 1270S14H05	J45
	87.3	169.3	MDE 1270S13H05	J23
	87.3	169.3	MDM 1270S13H05	J68
12.7	87.6	169.6	MDW 1270HGS5	J57
	102.0	170.1	SMDT 1270 MTL/MSL/MEL+SMDH 125-8D	J124
	102.0	170.1	SMDT 1270 MTL/MSL/MEL+SMDH 125-8DF	J122
	126.3	208.3	MDE 1270S13H08	J23
	152.0	219.5	SMDT 1270 MTL/MSL/MEL+SMDH 125-12D	J124
	24.0	91.0	SMDT 1280 MTL/MSL/MEL+SMDH 125-1.5D	J124
	24.0	91.0	SMDT 1280 MTL/MSL/MEL+SMDH 125-1.5DF	J122
	32.0	100.0	MDF 1280S2D	J29
	32.1	102.3	MDE 1280S13E02	J15
	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-3D	J124
12.8	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-3DF	J122
	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125M	J120
	46.2	130.4	MDH 1280S14H03	J45
	48.1	130.3	MDE 1280S13H03	J23
	48.1	130.3	MDM 1280S13H03	J68
	48.4	130.6	MDW 1280HGS3	J57
	61.1	139.3	MDE 1280S13E04	J15
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-5D	J124
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-5DF	J122
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125L	J120
12.8	85.2	169.4	MDH 1280S14H05	J45
	87.1	169.3	MDE 1280S13H05	J23
	87.1	169.3	MDM 1280S13H05	J68
	87.4	169.6	MDW 1280HGS5	J57
	102.0	170.1	SMDT 1280 MTL/MSL/MEL+SMDH 125-8D	J124
	102.0	170.1	SMDT 1280 MTL/MSL/MEL+SMDH 125-8DF	J122
	126.1	208.3	MDE 1280S13H08	J23
	152.0	219.5	SMDT 1280 MTL/MSL/MEL+SMDH 125-12D	J124
	24.0	91.0	SMDT 1290 MTL/MSL/MEL+SMDH 125-1.5D	J124
	24.0	91.0	SMDT 1290 MTL/MSL/MEL+SMDH 125-1.5DF	J122

(Blue text: Flat head Indexable head type)

● Diameter ø12.9 to ø13.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.9	32.0	102.3	MDE 1290S13E02	J15
	32.3	100.0	MDF 1290S2D	J29
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-3D	J124
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-3DF	J122
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125M	J120
	46.1	130.4	MDH 1290S14H03	J45
	48.0	130.3	MDE 1290S13H03	J23
	48.0	130.3	MDM 1290S13H03	J68
	48.4	130.7	MDW 1290HGS3	J57
	61.0	139.3	MDE 1290S13E04	J15
12.9	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-5D	J124
	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-5DF	J122
	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125L	J120
	85.1	169.4	MDH 1290S14H05	J45
	87.0	169.3	MDE 1290S13H05	J23
	87.0	169.3	MDM 1290S13H05	J68
	87.4	169.7	MDW 1290HGS5	J57
	102.0	170.1	SMDT 1290 MTL/MSL/MEL+SMDH 125-8D	J124
	102.0	170.1	SMDT 1290 MTL/MSL/MEL+SMDH 125-8DF	J122
	126.0	208.3	MDE 1290S13H08	J23
12.96	152.0	219.5	SMDT 1290 MTL/MSL/MEL+SMDH 125-12D	J124
	48.3	130.7	MDW 1296NHGS3	J101
	87.3	169.7	MDW 1296NHGS5	J101
	23.0	90.0	SMDT 1300 MFS+SMDH 130-1.5D	J132
	23.0	90.0	SMDT 1300 MFS+SMDH 130-1.5DF	J130
	25.0	92.2	SMDT 1300 MTL/MSL/MEL+SMDH 130-1.5D	J124
	25.0	92.2	SMDT 1300 MTL/MSL/MEL+SMDH 130-1.5DF	J122
	31.9	102.4	MDE 1300S13E02	J15
	32.5	100.0	MDF 1300S2D	J29
	39.0	128.0	MDF 1300H3D	J35
12.96	39.0	180.0	MDF 1300L2D	J32
	43.0	110.2	SMDT 1300 MFS+SMDH 130-3D	J132
	43.0	110.2	SMDT 1300 MFS+SMDH 130-3DF	J130
	43.0	110.2	SMDT 1300 MFS+SMDH 130M	J128
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-3D	J124
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-3DF	J122
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130M	J120
	45.9	130.4	MDH 1300S14H03	J45
	47.2	129.7	MDW 1300PHT	J88
	47.9	130.4	MDE 1300S13H03	J23
13.0	47.9	130.4	MDM 1300S13H03	J68
	47.9	130.4	MDW 1300HX3	J76
	48.2	130.7	MDW 1300HGS3	J57
	48.2	130.7	MDW 1300HY3	J81
	48.2	130.7	MDW 1300NHGS3	J101
	60.9	139.4	MDE 1300S13E04	J15
	67.6	167.0	MDF 1300H5D	J35
	70.0	140.2	SMDT 1300 MFS+SMDH 130-5D	J132
	70.0	140.2	SMDT 1300 MFS+SMDH 130-5DF	J130
	70.0	140.2	SMDT 1300 MFS+SMDH 130L	J128
13.0	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-5D	J124
	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-5DF	J122
	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130L	J120
	84.9	169.4	MDH 1300S14H05	J45
	86.9	169.4	MDE 1300S13H05	J23
	86.9	169.4	MDM 1300S13H05	J68
	86.9	169.4	MDW 1300HX5	J76
	87.2	169.7	MDW 1300HGS5	J57
	87.2	169.7	MDW 1300HY5	J81
	87.2	169.7	MDW 1300NHGS5	J101
13.0	104.0	176.2	SMDT 1300 MFS+SMDH 130-8D	J132
	104.0	176.2	SMDT 1300 MFS+SMDH 130-8DF	J130
	106.0	178.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-8D	J124
	106.0	178.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-8DF	J122
	123.9	208.4	MDH 1300S14H08	J45
	125.9	208.4	MDE 1300S13H08	J23
	125.9	208.4	MDW 1300HX8	J76
	126.2	208.7	MDW 1300HGS8	J57
	156.0	223.5	SMDT 1300 MFS+SMDH 130-12D	J132
	158.0	225.7	SMDT 1300 MTL/MSL/MEL+SMDH 130-12D	J124
13.0	165.2	247.7	MDW 1300NHGS10	J101
	177.9	260.4	MDW 1300XHGS10	J88
	203.9	286.4	MDW 1300XHGS12	J88
	242.9	325.4	MDW 1300XHGS15	J88
	307.9	390.4	MDW 1300XHGS20	J88
	25.0	92.2	SMDT 1310 MTL/MSL/MEL+SMDH 130-1.5D	J124
	25.0	92.2	SMDT 1310 MTL/MSL/MEL+SMDH 130-1.5DF	J122
	32.8	107.4	MDE 1310S14E02	J16
	32.8	110.0	MDF 1310S2D	J29
	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-3D	J124

(Blue text: Flat head Indexable head type)

● Diameter ø13.1 to ø13.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.1	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-3D	J122
	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130M	J120
	50.3	136.4	MDE 1310S14H03	J23
	50.3	136.4	MDM 1310S14H03	J68
	50.4	136.5	MDH 1310S14H03	J45
	50.6	136.7	MDW 1310HGS3	J57
	66.8	149.4	MDE 1310S14E04	J16
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-5D	J124
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-5DF	J122
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130L	J120
13.1	90.8	178.4	MDE 1310S14H05	J23
	90.8	178.4	MDM 1310S14H05	J68
	90.9	178.5	MDH 1310S14H05	J45
	91.1	178.7	MDW 1310HGS5	J57
	106.0	178.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-8D	J124
	106.0	178.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-8DF	J122
	131.3	220.4	MDE 1310S14H08	J23
	158.0	225.7	SMDT 1310 MTL/MSL/MEL+SMDH 130-12D	J124
	25.0	92.2	SMDT 1320 MTL/MSL/MEL+SMDH 130-1.5D	J124
	25.0	92.2	SMDT 1320 MTL/MSL/MEL+SMDH 130-1.5DF	J122
13.2	32.6	107.4	MDE 1320S14E02	J16
	33.0	110.0	MDF 1320S2D	J29
	45.0	112.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-3D	J124
	45.0	112.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-3DF	J122
	50.1	136.4	MDE 1320S14H03	J23
	50.1	136.4	MDM 1320S14H03	J68

Effective Length List by Diameter

● Diameter ø13.4 to ø13.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.4	90.3	178.4	MDM 1340S14H05	J68
	90.4	178.5	MDH 1340S14H05	J45
	90.7	178.8	MDW 1340HGS5	J57
	106.0	178.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-8D	J124
	106.0	178.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-8DF	J122
	130.8	220.4	MDE 1340S14H08	J23
	158.0	225.7	SMDT 1340 MTL/MSL/MEL+SMDH 130-12D	J124
	26.0	93.9	SMDT 1350 MFS+SMDH 140-1.5D	J132
	26.0	93.9	SMDT 1350 MFS+SMDH 140-1.5DF	J130
	29.0	96.3	SMDT 1350 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1350 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	32.3	107.5	MDE 1350S14E02	J16
	33.8	110.0	MDF 1350S2D	J29
	40.6	134.0	MDF 1350H3D	J35
	40.6	190.0	MDF 1350L2D	J32
13.5	48.0	116.6	SMDT 1350 MFS+SMDH 140-3D	J132
	48.0	116.6	SMDT 1350 MFS+SMDH 140-3DF	J130
	48.0	116.6	SMDT 1350 MFS+SMDH 140M	J128
	49.1	135.8	MDW 1350PHT	J88
	49.8	136.5	MDE 1350S14H03	J23
	49.8	136.5	MDH 1350S14H03	J45
	49.8	136.5	MDM 1350S14H03	J68
	49.8	136.5	MDW 1350HX3	J76
	50.1	136.8	MDW 1350HGS3	J57
	50.1	136.8	MDW 1350NHGS3	J102
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140M	J120
	66.3	149.5	MDE 1350S14E04	J16
	70.3	176.0	MDF 1350H5D	J35
13.6	77.0	146.6	SMDT 1350 MFS+SMDH 140-5D	J132
	77.0	146.6	SMDT 1350 MFS+SMDH 140-5DF	J130
	77.0	146.6	SMDT 1350 MFS+SMDH 140L	J128
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140L	J120
	90.3	178.5	MDH 1350S14H05	J45
	90.3	178.5	MDE 1350S14H05	J23
	90.3	178.5	MDM 1350S14H05	J68
	90.3	178.5	MDW 1350HX5	J76
	90.6	178.8	MDW 1350HGS5	J57
	90.6	178.8	MDW 1350NHGS5	J102
	121.0	191.6	SMDT 1350 MFS+SMDH 140-8D	J132
	121.0	191.6	SMDT 1350 MFS+SMDH 140-8DF	J130
	121.0	191.6	SMDT 1350 MFS+SMDH 140D	J128
13.8	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140D	J120
	129.3	220.5	MDH 1350S14H08	J45
	130.8	220.5	MDE 1350S14H08	J23
	130.8	220.5	MDW 1350HX8	J76
	131.1	220.8	MDW 1350HGS8	J57
	168.0	236.1	SMDT 1350 MFS+SMDH 140-12D	J132
	170.0	238.5	SMDT 1350 MTL/MSL/MEL+SMDH 140-12D	J124
	185.3	271.5	MDW 1350XHGS10	J88
	210.3	296.5	MDW 1350XHGS12	J88
	250.3	336.5	MDW 1350XHGS15	J88
	318.3	404.5	MDW 1350XHGS20	J88
	29.0	96.3	SMDT 1360 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1360 MTL/MSL/MEL+SMDH 140-1.5DF	J122
13.9	34.0	107.5	MDE 1360S14E02	J16
	34.1	107.5	MDF 1360S2D	J29
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140M	J120
	52.1	136.5	MDE 1360S14H03	J23
	52.1	136.5	MDH 1360S14H03	J45
	52.1	136.5	MDM 1360S14H03	J68
	52.4	136.8	MDW 1360HGS3	J57
	68.1	149.5	MDE 1360S14E04	J16
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140L	J120
	94.1	178.5	MDH 1360S14H05	J45
	94.1	178.5	MDE 1360S14H05	J23
14.0	94.1	178.8	MDM 1360S14H05	J68
	94.4	178.8	MDW 1360HGS5	J57
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140D	J120
	135.7	220.5	MDE 1390S14H08	J23
	170.0	238.5	SMDT 1390 MTL/MSL/MEL+SMDH 140-12D	J124
	33.5	107.5	MDE 1392S14E02H	J17
	33.5	107.5	MDE 1397S14E02H	J17
	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5D	J132
	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5DF	J130
	29.0	96.3	SMDT 1400 MTL/MSL/MEL+SMDH 140-1.5D	J124

● Diameter ø13.6 to ø14.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.6	136.1	220.5	MDE 1360S14H08	J23
	170.0	238.5	SMDT 1360 MTL/MSL/MEL+SMDH 140-12D	J124
	29.0	96.3	SMDT 1370 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1370 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	34.0	107.5	MDE 1370S14E02	J16
	34.3	110.0	MDF 1370S2D	J29
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140M	J120
	52.0	136.5	MDE 1370S14H03	J23
	52.0	136.5	MDH 1370S14H03	J45
	52.0	136.5	MDW 1370S14H03	J68
	52.3	136.8	MDW 1370HGS3	J57
	68.0	149.5	MDE 1370S14E04	J16
	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-5D	J124
13.7	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140L	J120
	94.0	178.5	MDH 1370S14H05	J45
	94.0	178.5	MDE 1370S14H05	J23
	94.0	178.5	MDM 1370S14H05	J68
	94.3	178.8	MDW 1370HGS5	J57
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140D	J120
	136.0	220.5	MDE 1370S14H08	J23
	170.0	238.5	SMDT 1370 MTL/MSL/MEL+SMDH 140-12D	J124
	29.0	96.3	SMDT 1380 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1380 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.8	107.5	MDE 1380S14E02	J16
	34.5	110.0	MDF 1380S2D	J29
13.8	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140M	J120
	51.8	136.5	MDE 1380S14H03	J23
	51.8	136.5	MDH 1380S14H03	J45
	51.8	136.5	MDM 1380S14H03	J68
	52.2	136.9	MDW 1380HGS3	J57
	67.8	149.5	MDE 1380S14E04	J16
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140L	J120
	93.8	178.5	MDH 1380S14H05	J45
	93.8	178.5	MDE 1380S14H05	J23
	93.8	178.5	MDM 1380S14H05	J68
	94.2	178.9	MDW 1380HGS5	J57
13.85	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140D	J120
	135.8	220.5	MDE 1380S14H08	J23
	170.0	238.5	SMDT 1380 MTL/MSL/MEL+SMDH 140-12D	J124
	33.7	107.5	MDE 1385S14E02H	J17
	29.0	96.3	SMDT 1390 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1390 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.7	107.5	MDE 1390S14E02	J16
	34.8	110.0	MDF 1390S2D	J29
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140M	J120
	51.7	136.5	MDE 1390S14H03	J23
	51.7	136.5	MDH 1390S14H03	J45
13.9	51.7	136.5	MDM 1390S14H03	J68
	52.1	136.9	MDW 1390HGS3	J57
	67.7	149.5	MDE 1390S14E04	J16
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140L	J120
	93.7	178.5	MDH 1390S14H05	J45
	93.7	178.5	MDE 1390S14H05	J23
	93.7	178.5	MDM 1390S14H05	J68
	94.1	178.9	MDW 1390HGS5	J57
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140D	J120
	135.7	220.5	MDE 1390S14H08	J23
	170.0	238.5	SMDT 1390 MTL/MSL/MEL+SMDH 140-12D	J124
14.0	33.5	107.5	MDE 1392S14E02H	J17
	33.5	107.5	MDE 1397S14E02H	J17
	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5D	J132
	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5DF	J130
	29.0	96.3	SMDT 1400 MTL/MSL/MEL+SMDH 140-1.5D	J124

● Diameter ø14.0 to ø14.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.0	29.0	96.3	SMDT 1400 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.5	107.5	MDE 1400S14E02	J16
	35.0	110.0	MDF 1400S2D	J29
	42.0	134.0	MDF 1400H3D	J35
	42.0	190.0	MDF 1400L2D	J32
	42.0	190.0	MDF 1400L2D-S12	J32
	48.0	116.6	SMDT 1400 MFS+SMDH 140-3D	J132
	48.0	116.6	SMDT 1400 MFS+SMDH 140-3DF	J130
	48.0	116.6	SMDT 1400 MFS+SMDH 140M	J128
	50.9	135.9	MDW 1400PHT	J88
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140M	J120
	51.5	136.5	MDE 1400S14H03	J23
	51.5	136.5	MDH 1400S14H03	J45
	51.5	136.5	MDM 1400S14H03	J68
	51.5	136.5	MDW 1400HX3	J77
	51.9	136.9	MDW 1400HGS3	J57
	51.9	136.9	MDW 1400HY3	J81
	51.9	136.9	MDW 1400NHGS3	J102
	67.5	149.5	MDE 1400S14E04	J16
	72.8	176.0	MDF 1400H5D	J35
	77.0	146.6	SMDT 1400 MFS+SMDH 140-5D	J132
	77.0	146.6	SMDT 1400 MFS+SMDH 140-5DF	J130
	77.0	146.6	SMDT 1400 MFS+SMDH 140L	J128
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140L	J120
	93.5	178.5	MDH 1400S14H05	J45
	93.5	178.5	MDE 1400S14H05	J23
	93.5	178.5	MDM 1400S14H05	J68
	93.5	178.5	MDW 1400HX5	J77
	93.9	178.9	MDW 1400HGS5	J57
	93.9	178.9	MDW 1400HY5	J81
	93.9	178.9	MDW 1400NHGS5	J102
	121.0	191.6	SMDT 1400 MFS+SMDH 140-8D	J132
	121.0	191.6	SMDT 1400 MFS+SMDH 140-8DF	J130
	121.0	191.6	SMDT 1400 MFS+SMDH 140D	J128
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140D	J120
	135.5	220.5	MDH 1400S14H08	J45
	135.5	220.5	MDE 1400S14H08	J23
	135.9	220.9	MDW 1400HGS8	J57
	168.0	236.1	SMDT 1400 MFS+SMDH 140-12D	J132
	170.0	238.5	SMDT 1400 MTL/MSL/MEL+SMDH 140-12D	J124
	191.5	276.5	MDW 1400XHGS10	J88
	219.5	304.5	MDW 1400XHGS12	J88
	261.5	346.5	MDW 1400XHGS15	J88
	331.5	416.5	MDW 1400XHGS20	J88
14.1	29.0	96.3	SMDT 1410 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1410 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.5	110.6	MDE 1410S15E02	J16
	35.3	110.0	MDF 1410S2D	J29
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140M	J120
	54.0	142.6	MDE 1410S15H03	J23
	54.0	142.6	MDM 1410S15H03	J68
	54.3	142.9	MDW 1410HGS3	J57
	54.3	142.9	MDW 1410NHGS3	J102
	70.5	155.6	MDE 1410S15E04	J16
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140L	J120
	97.5	187.6	MDE 1410S15H05	J23
	97.5	187.6	MDM 1410S15H05	J68
	97.8	187.9	MDW 1410HGS5	J57
	97.8	187.9	MDW 1410NHGS5	J102
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140D	J120
	141.0	232.6	MDE 1410S15H08	J23
	170.0	238.5	SMDT 1410 MTL/MSL/MEL+SMDH 140-12D	J124
	14.2	29.0	96.3	SMDT 1420 MTL/MSL/MEL+SMDH 140-1.5D
29.0		96.3	SMDT 1420 MTL/MSL/MEL+SMDH 140-1.5DF	J122
33.3		110.6	MDE 1420S15E02	J16
35.5		110.0	MDF 1420S2D	J29
51.0		119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-3D	J124
51.0	119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-3DF	J122	

Effective Length List by Diameter

● Diameter ø14.2 to ø14.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.2	51.0	119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140M	J120
	53.8	142.6	MDE 1420S15H03	J23
	53.8	142.6	MDM 1420S15H03	J68
	54.1	142.9	MDW 1420HGS3	J57
	70.3	155.6	MDE 1420S15E04	J16
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140L	J120
	97.3	187.6	MDE 1420S15H05	J23
	97.3	187.6	MDM 1420S15H05	J68
	97.6	187.9	MDW 1420HGS5	J57
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140D	J120
	140.8	232.6	MDE 1420S15H08	J23
14.3	170.0	238.5	SMDT 1430 MTL/MSL/MEL+SMDH 140-12D	J124
	29.0	96.3	SMDT 1430 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1430 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.2	110.6	MDE 1430S15E02	J16
	35.8	110.0	MDF 1430S2D	J29
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140M	J120
	53.7	142.6	MDE 1430S15H03	J23
	53.7	142.6	MDM 1430S15H03	J68
	54.1	143.0	MDW 1430HGS3	J57
	70.2	155.6	MDE 1430S15E04	J16
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140L	J120
14.4	97.2	187.6	MDE 1430S15H05	J23
	97.2	187.6	MDM 1430S15H05	J68
	97.6	188.0	MDW 1430HGS5	J57
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140D	J120
	140.7	232.6	MDE 1430S15H08	J23
	170.0	238.5	SMDT 1430 MTL/MSL/MEL+SMDH 140-12D	J124
	29.0	96.3	SMDT 1440 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1440 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	33.0	110.6	MDE 1440S15E02	J16
	36.0	110.0	MDF 1440S2D	J29
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140M	J120
14.5	53.5	142.6	MDE 1440S15H03	J23
	53.5	142.6	MDM 1440S15H03	J68
	53.9	143.0	MDW 1440HGS3	J57
	70.0	155.6	MDE 1440S15E04	J16
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140L	J120
	97.0	187.6	MDE 1440S15H05	J23
	97.0	187.6	MDM 1440S15H05	J68
	97.4	188.0	MDW 1440HGS5	J57
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140D	J120
	140.5	232.6	MDE 1440S15H08	J23
	170.0	238.5	SMDT 1440 MTL/MSL/MEL+SMDH 140-12D	J124
14.5	26.0	93.9	SMDT 1450 MFS+SMDH 140-1.5D	J132
	26.0	93.9	SMDT 1450 MFS+SMDH 140-1.5DF	J130
	29.0	96.3	SMDT 1450 MTL/MSL/MEL+SMDH 140-1.5D	J124
	29.0	96.3	SMDT 1450 MTL/MSL/MEL+SMDH 140-1.5DF	J122
	32.9	110.6	MDE 1450S15E02	J16
	36.3	110.0	MDF 1450S2D	J29
	43.6	140.0	MDF 1450H3D	J35
	43.6	200.0	MDF 1450L2D	J32
	48.0	116.6	SMDT 1450 MFS+SMDH 140-3D	J132
	48.0	116.6	SMDT 1450 MFS+SMDH 140-3DF	J130
	48.0	116.6	SMDT 1450 MFS+SMDH 140M	J128
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-3D	J124
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-3DF	J122
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140M	J120
	52.7	141.9	MDW 1450PHT	J88
	53.4	142.6	MDE 1450S15H03	J23
14.5	53.4	142.6	MDM 1450S15H03	J68
	53.4	142.6	MDW 1450HX3	J77
	53.8	143.0	MDW 1450HGS3	J57
	53.8	143.0	MDW 1450NHGS3	J102

(Blue text: Flat head Indexable head type)

● Diameter ø14.5 to ø14.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.5	69.9	155.6	MDE 1450S15E04	J16
	75.5	185.0	MDF 1450H5D	J35
	77.0	146.6	SMDT 1450 MFS+SMDH 140-5D	J132
	77.0	146.6	SMDT 1450 MFS+SMDH 140-5DF	J130
	77.0	146.6	SMDT 1450 MFS+SMDH 140L	J128
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-5D	J124
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-5DF	J122
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140L	J120
	96.9	187.6	MDE 1450S15H05	J23
	96.9	187.6	MDM 1450S15H05	J68
	96.9	187.6	MDW 1450HX5	J77
	97.3	188.0	MDW 1450HGS5	J57
	97.3	188.0	MDW 1450NHGS5	J102
	121.0	191.6	SMDT 1450 MFS+SMDH 140-8D	J132
	121.0	191.6	SMDT 1450 MFS+SMDH 140-8DF	J130
	121.0	191.6	SMDT 1450 MFS+SMDH 140D	J128
14.6	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-8D	J124
	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-8DF	J122
	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140D	J120
	140.4	232.6	MDE 1450S15H08	J23
	140.8	233.0	MDW 1450HGS8	J57
	168.0	236.1	SMDT 1450 MFS+SMDH 140-12D	J132
	170.0	238.5	SMDT 1450 MTL/MSL/MEL+SMDH 140-12D	J124
	198.9	287.6	MDW 1450XHGS10	J88
	225.9	314.6	MDW 1450XHGS12	J88
	268.9	357.6	MDW 1450XHGS15	J88
	31.0	100.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.8	110.7	MDE 1460S15E02	J16
	36.5	110.0	MDF 1460S2D	J29
	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-3DF	J122
14.6	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150M	J120
	55.8	142.7	MDE 1460S15H03	J24
	55.8	142.7	MDM 1460S15H03	J68
	56.1	143.0	MDW 1460HGS3	J57
	71.8	155.7	MDE 1460S15E04	J16
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150L	J120
	100.8	187.7	MDE 1460S15H05	J24
	100.8	187.7	MDM 1460S15H05	J68
	101.1	188.0	MDW 1460HGS5	J57
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150D	J120
	145.8	232.7	MDE 1460S15H08	J24
	182.0	253.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-12D	J124
14.7	31.0	100.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.7	110.7	MDE 1470S15E02	J16
	36.8	110.0	MDF 1470S2D	J29
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150M	J120
	55.7	142.7	MDE 1470S15H03	J24
	55.7	142.7	MDM 1470S15H03	J68
	56.0	143.0	MDW 1470HGS3	J57
	71.7	155.7	MDE 1470S15E04	J16
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150L	J120
	100.7	187.7	MDE 1470S15H05	J24
	100.7	187.7	MDM 1470S15H05	J68
	101.0	188.0	MDW 1470HGS5	J57
14.8	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150D	J120
	145.7	232.7	MDE 1470S15H08	J24
	182.0	253.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-12D	J124
	31.0	100.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.5	110.7	MDE 1480S15E02	J16
	37.0	110.0	MDF 1480S2D	J29
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150M	J120
	55.5	142.7	MDE 1480S15H03	J24
	55.5	142.7	MDM 1480S15H03	J68
	55.9	143.1	MDW 1480HGS3	J57
	55.9	143.1	MDW 1480NHGS3	J102

(Blue text: Flat head Indexable head type)

● Diameter ø14.8 to ø15.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.8	71.5	155.7	MDE 1480S15E04	J16
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150L	J120
	100.5	187.7	MDE 1480S15H05	J24
	100.5	187.7	MDM 1480S15H05	J68
	100.9	188.1	MDW 1480HGS5	J57
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150D	J120
	145.5	232.7	MDE 1480S15H08	J24
	182.0	253.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-12D	J124
	31.0	100.0	SMDT 1490 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1490 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.4	110.7	MDE 1490S15E02	J16
	37.3	110.0	MDF 1490S2D	J29
14.9	54.0	129.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-3D	J124

Effective Length List by Diameter

● Diameter ø15.0 to ø15.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.0	180.0	250.4	SMDT 1500 MFS+SMDH 150-12D	J132
	182.0	253.0	SMDT 1500 MTL/MSL/MEL+SMDH 150-12D	J124
	205.2	292.7	MDW 1500XHGS10	J88
	235.2	322.7	MDW 1500XHGS12	J88
	280.2	367.7	MDW 1500XHGS15	J88
15.1	31.0	100.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.1	114.7	MDE 1510S16E02	J16
	37.8	115.0	MDF 1510S2D	J29
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150M	J120
	57.6	148.7	MDE 1510S16H03	J24
	57.6	148.7	MDM 1510S16H03	J69
	58.0	149.1	MDW 1510HGS3	J57
	74.1	162.7	MDE 1510S16E04	J16
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150L	J120
	104.1	196.7	MDE 1510S16H05	J24
15.2	104.1	196.7	MDM 1510S16H05	J69
	104.5	197.1	MDW 1510HGS5	J57
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150D	J120
	150.6	244.7	MDE 1510S16H08	J24
	182.0	253.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-12D	J124
	31.0	100.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	33.0	114.8	MDE 1520S16E02	J16
	38.0	115.0	MDF 1520S2D	J29
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150M	J120
	57.5	148.8	MDE 1520S16H03	J24
15.3	57.5	148.8	MDM 1520S16H03	J69
	57.8	149.1	MDW 1520HGS3	J57
	74.0	162.8	MDE 1520S16E04	J16
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150L	J120
	104.0	196.8	MDE 1520S16H05	J24
	104.0	196.8	MDM 1520S16H05	J69
	104.3	197.1	MDW 1520HGS5	J57
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150D	J120
	150.5	244.8	MDE 1520S16H08	J24
	182.0	253.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-12D	J124
	31.0	100.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-1.5D	J124
15.4	31.0	100.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	32.9	114.8	MDE 1530S16E02	J16
	38.3	115.0	MDF 1530S2D	J29
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150M	J120
	57.4	148.8	MDE 1530S16H03	J24
	57.4	148.8	MDM 1530S16H03	J69
	57.8	149.1	MDW 1530HGS3	J57
	73.9	162.8	MDE 1530S16E04	J16
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150L	J120
	103.9	196.8	MDE 1530S16H05	J24
	103.9	196.8	MDM 1530S16H05	J69
	104.3	197.2	MDW 1530HGS5	J57
15.4	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150D	J120
	150.4	244.8	MDE 1530S16H08	J24
	182.0	253.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-12D	J124
	31.0	100.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	32.7	114.8	MDE 1540S16E02	J16
	38.5	115.0	MDF 1540S2D	J29
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150M	J120
	57.2	148.8	MDE 1540S16H03	J24
	57.2	148.8	MDM 1540S16H03	J69

● Diameter ø15.4 to ø15.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.4	57.6	149.2	MDW 1540HGS3	J57
	73.7	162.8	MDE 1540S16E04	J16
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150L	J120
15.5	103.7	196.8	MDE 1540S16H05	J24
	103.7	196.8	MDM 1540S16H05	J69
	104.1	197.2	MDW 1540HGS5	J57
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150D	J120
	150.2	244.8	MDE 1540S16H08	J24
	182.0	253.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-12D	J124
	28.0	97.3	SMDT 1550 MFS+SMDH 150-1.5D	J132
	28.0	97.3	SMDT 1550 MFS+SMDH 150-1.5DF	J130
	31.0	100.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-1.5D	J124
	31.0	100.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-1.5DF	J122
	32.6	114.8	MDE 1550S16E02	J16
	38.8	115.0	MDF 1550S2D	J29
	46.6	146.0	MDF 1550H3D	J35
	46.6	210.0	MDF 1550L2D	J32
15.5	51.0	126.6	SMDT 1550 MFS+SMDH 150-3D	J132
	51.0	126.6	SMDT 1550 MFS+SMDH 150-3DF	J130
	51.0	126.6	SMDT 1550 MFS+SMDH 150M	J128
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-3D	J124
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-3DF	J122
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150M	J120
	56.4	148.1	MDW 1550PHT	J88
	57.1	148.8	MDE 1550S16H03	J24
	57.1	148.8	MDM 1550S16H03	J69
	57.1	148.8	MDW 1550HX3	J77
	57.5	149.2	MDW 1550HGS3	J57
	57.5	149.2	MDW 1550NHGS3	J102
	73.6	162.8	MDE 1550S16E04	J16
	80.7	194.0	MDF 1550H5D	J35
	82.0	156.6	SMDT 1550 MFS+SMDH 150-5D	J132
15.6	82.0	156.6	SMDT 1550 MFS+SMDH 150-5DF	J130
	82.0	156.6	SMDT 1550 MFS+SMDH 150L	J128
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-5D	J124
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-5DF	J122
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150L	J120
	103.6	196.8	MDE 1550S16H05	J24
	103.6	196.8	MDM 1550S16H05	J69
	103.6	196.8	MDW 1550HX5	J77
	104.0	197.2	MDW 1550HGS5	J57
	104.0	197.2	MDW 1550NHGS5	J102
	129.0	201.6	SMDT 1550 MFS+SMDH 150-8D	J132
	129.0	201.6	SMDT 1550 MFS+SMDH 150-8DF	J130
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-8D	J124
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-8DF	J122
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150D	J120
15.6	150.1	244.8	MDE 1560S16H08	J24
	150.5	245.2	MDW 1550HGS8	J57
	180.0	250.4	SMDT 1550 MFS+SMDH 150-12D	J132
	182.0	253.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-12D	J124
	212.6	303.8	MDW 1550XHGS10	J88
	241.6	332.8	MDW 1550XHGS12	J88
	287.6	378.8	MDW 1550XHGS15	J88
	32.0	102.7	SMDT 1560 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1560 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	34.4	114.8	MDE 1560S16E02	J16
	39.0	115.0	MDF 1560S2D	J29
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160M	J120
	59.4	148.8	MDE 1560S16H03	J24
	59.4	148.8	MDM 1560S16H03	J69
15.6	59.8	149.2	MDW 1560HGS3	J57
	75.4	162.8	MDE 1560S16E04	J16
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160L	J120
	107.4	196.8	MDE 1560S16H05	J24
	107.4	196.8	MDM 1560S16H05	J69
	107.8	197.2	MDW 1560HGS5	J57
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160D	J120
	155.4	244.8	MDE 1560S16H08	J24

● Diameter ø15.6 to ø16.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.6	194.0	265.5	SMDT 1560 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1570 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1570 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	34.4	114.9	MDE 1570S16E02	J16
	39.3	115.0	MDF 1570S2D	J29
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160M	J120
	59.4	148.9	MDE 1570S16H03	J24
	59.4	148.9	MDM 1570S16H03	J69
15.7	59.7	149.2	MDW 1570HGS3	J57
	75.4	162.9	MDE 1570S16E04	J16
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160L	J120
	107.4	196.9	MDE 1570S16H05	J24
	107.4	196.9	MDM 1570S16H05	J69
	107.7	197.2	MDW 1570HGS5	J57
	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-8DF	J122
15.8	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160D	J120
	155.4	244.9	MDE 1570S16H08	J24
	194.0	265.5	SMDT 1570 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1580 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1580 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	34.2	114.9	MDE 1580S16E02	J16
	39.5	115.0	MDF 1580S2D	J29
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160M	J120
15.9	59.2	148.9	MDE 1580S16H03	J24
	59.2	148.9	MDM 1580S16H03	J69
	59.6	149.3	MDW 1580HGS3	J57
	75.2	162.9	MDE 1580S16E04	J16
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160L	J120
	107.2	196.9	MDE 1580S16H05	J24
	107.2	196.9	MDM 1580S16H05	J69
	107.6	197.3	MDW 1580HGS5	J57
15.9	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160D	J120
	155.2	244.9	MDE 1580S16H08	J24
	194.0	265.5	SMDT 1580 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1590 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1590 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	34.1	114.9	MDE 1590S16E02	J16
	39.8	115.0	MDF 1590S2D	J29
	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-3D	J124
15.9	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160M	J120
	59.1	148.9	MDE 1590S16H03	J24
	59.1	148.9	MDM 1590S16H03	J69
	59.5	149.3	MDW 1590HGS3	J58
	75.1	162.9	MDE 1590S16E04	J16
	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160L	J120
	107.1	196.9	MDE 1590S16H05	J24
16.0	107.1	196.9	MDM 1590S16H05	J69
	107.5	197.3	MDW 1590HGS5	J58
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160D	J120
	155.1	244.9	MDE 1590S16H08	J24
	194.0	265.5	SMDT 1590 MTL/MSL/MEL+SMDH 160-12D	J124
	29.0	99.9	SMDT 1600 MFS+SMDH 160-1.5D	J132
	29.0	99.9	SMDT 1600 MFS+SMDH 160-1.5DF	J130
	32.0	94.0	PDL 160D2S20	J174
16.0	32.0	102.7	SMDT 1600 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1600 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	33.9	114.9	MDE 1600S16E02	J16
	40.0	115.0	MDF 1600S2D	J29
	48.0	110.0	PDL 160D3S20	J174
	48.0	146.0	MDF 1600H3D	J35
	48.0	210.0	MDF 1600L2D	J32
	48.0	210.0	MDF 1600L2D-S14	J32
	54.0	131.6	SMDT 1600 MFS+SMDH 160-3D	J132
	54.0	131.6	SMDT 1600 MFS+SMDH 160-3DF	J130

Effective Length List by Diameter

● Diameter ø16.0 to ø16.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
16.0	54.0	131.6	SMDT 1600 MFS+SMDH 160M	J128
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160M	J120
	58.1	148.1	MDW 1600PHT	J88
	58.9	148.9	MDE 1600S16H03	J24
	58.9	148.9	MDM 1600S16H03	J69
	58.9	148.9	MDW 1600HX3	J77
	59.3	149.3	MDW 1600HGS3	J58
	59.3	149.3	MDW 1600HY3	J81
	59.3	149.3	MDW 1600NHGS3	J102
	74.9	162.9	MDE 1600S16E04	J16
	83.2	194.0	MDF 1600H5D	J35
	87.0	166.6	SMDT 1600 MFS+SMDH 160-5D	J132
	87.0	166.6	SMDT 1600 MFS+SMDH 160-5DF	J130
	87.0	166.6	SMDT 1600 MFS+SMDH 160L	J128
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160L	J120
	106.9	196.9	MDE 1600S16H05	J24
	106.9	196.9	MDM 1600S16H05	J69
	106.9	196.9	MDW 1600HX5	J77
	107.3	197.3	MDW 1600HGS5	J58
	107.3	197.3	MDW 1600HY5	J81
	107.3	197.3	MDW 1600NHGS5	J102
	137.0	211.6	SMDT 1600 MFS+SMDH 160-8D	J132
	137.0	211.6	SMDT 1600 MFS+SMDH 160-8DF	J130
	137.0	211.6	SMDT 1600 MFS+SMDH 160D	J128
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160D	J120
	154.9	244.9	MDE 1600S16H08	J24
	155.3	245.3	MDW 1600HGS8	J58
	192.0	262.7	SMDT 1600 MFS+SMDH 160-12D	J132
	194.0	265.5	SMDT 1600 MTL/MSL/MEL+SMDH 160-12D	J124
	218.9	308.9	MDW 1600XHGS10	J88
	248.9	340.9	MDW 1600XHGS12	J88
	298.9	388.9	MDW 1600XHGS15	J88
16.1	32.0	102.7	SMDT 1610 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1610 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160M	J120
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160L	J120
	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-8DF	J122
16.2	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160D	J120
	194.0	265.5	SMDT 1610 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1620 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1620 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160M	J120
	90.0	169.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1620 MTL/MSL/MEL+SMDH 160L	J120
16.3	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160D	J120
	194.0	265.5	SMDT 1620 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1630 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1630 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160M	J120
	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-5D	J124
16.4	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160L	J120
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160D	J120
	194.0	265.5	SMDT 1630 MTL/MSL/MEL+SMDH 160-12D	J124
	32.0	102.7	SMDT 1640 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1640 MTL/MSL/MEL+SMDH 160-1.5DF	J122
	57.0	134.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-3DF	J122

(Blue text: Flat head Indexable head type)

● Diameter ø16.4 to ø16.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
16.4	90.0	169.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1640 MTL/MSL/MEL+SMDH 160L	J120
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160D	J120
	194.0	265.5	SMDT 1640 MTL/MSL/MEL+SMDH 160-12D	J124
	29.0	99.9	SMDT 1650 MFS+SMDH 160-1.5D	J132
	29.0	99.9	SMDT 1650 MFS+SMDH 160-1.5DF	J130
	32.0	102.7	SMDT 1650 MTL/MSL/MEL+SMDH 160-1.5D	J124
	32.0	102.7	SMDT 1650 MTL/MSL/MEL+SMDH 160-1.5DF	J122
16.5	34.3	119.0	MDE 1650S17E02	J16
	41.3	125.0	MDF 1650S2D	J29
	49.6	220.0	MDF 1650L2D	J32
	54.0	131.6	SMDT 1650 MFS+SMDH 160-3D	J132
	54.0	131.6	SMDT 1650 MFS+SMDH 160-3DF	J130
	54.0	131.6	SMDT 1650 MFS+SMDH 160M	J128
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-3D	J124
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-3DF	J122
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160M	J120
	60.8	155.0	MDE 1650S17H03	J24
16.6	60.8	155.0	MDW 1650HX3	J77
	61.2	155.4	MDW 1650HGS3	J58
	76.3	170.0	MDE 1650S17E04	J16
	87.0	166.6	SMDT 1650 MFS+SMDH 160-5D	J132
	87.0	166.6	SMDT 1650 MFS+SMDH 160-5DF	J130
	87.0	166.6	SMDT 1650 MFS+SMDH 160L	J128
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-5D	J124
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-5DF	J122
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160L	J120
	110.3	206.0	MDE 1650S17H05	J24
16.7	110.3	206.0	MDW 1650HX5	J77
	110.7	206.4	MDW 1650HGS5	J58
	137.0	211.6	SMDT 1650 MFS+SMDH 160-8D	J132
	137.0	211.6	SMDT 1650 MFS+SMDH 160-8DF	J130
	137.0	211.6	SMDT 1650 MFS+SMDH 160D	J128
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-8D	J124
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-8DF	J122
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160D	J120
	192.0	262.7	SMDT 1650 MFS+SMDH 160-12D	J132
	194.0	265.5	SMDT 1650 MTL/MSL/MEL+SMDH 160-12D	J124
16.8	34.0	104.4	SMDT 1660 MTL/MSL/MEL+SMDH 170-1.5D	J124
	34.0	104.4	SMDT 1660 MTL/MSL/MEL+SMDH 170-1.5DF	J122
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-3D	J124
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-3DF	J122
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170M	J120
	95.0	174.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-5D	J124
	95.0	174.6	SMDT 1660 MTL/MSL/MEL+SMDH 170L	J120
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-8D	J124
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-8DF	J122
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170D	J120
16.9	207.0	278.1	SMDT 1660 MTL/MSL/MEL+SMDH 170-12D	J124
	34.0	104.4	SMDT 1670 MTL/MSL/MEL+SMDH 170-1.5D	J124
	34.0	104.4	SMDT 1670 MTL/MSL/MEL+SMDH 170-1.5DF	J122
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-3D	J124
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-3DF	J122
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170M	J120
	95.0	174.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-5D	J124
	95.0	174.6	SMDT 1670 MTL/MSL/MEL+SMDH 170L	J120
	148.0	224.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-8D	J124
	148.0	224.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-8DF	J122

(Blue text: Flat head Indexable head type)

● Diameter ø16.9 to ø17.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
16.9	60.0	139.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-3DF	J122
	60.0	139.6	SMDT 1690 MTL/MSL/MEL+SMDH 170M	J120
	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-5D	J124
	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-5DF	J122
	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170L	J120
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-8D	J124
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-8DF	J122
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170D	J120
	207.0	278.1	SMDT 1690 MTL/MSL/MEL+SMDH 170-12D	J124
	31.0	101.4	SMDT 1700 MFS+SMDH 170-1.5D	J132
31.0	101.4	SMDT 1700 MFS+SMDH 170-1.5DF	J130	
34.0	104.4	SMDT 1700 MTL/MSL/MEL+SMDH 170-1.5D	J124	
34.0	104.4	SMDT 1700 MTL/MSL/MEL+SMDH 170-1.5DF	J122	
34.6	119.1	MDE 1700S17E02	J16	
42.5	125.0	MDF 1700S2D	J29	
51.0	220.0	MDF 1700L2D	J32	
57.0	136.6	SMDT 1700 MFS+SMDH 170-3D	J132	
57.0	136.6	SMDT 1700 MFS+SMDH 170-3DF	J130	
57.0	136.6	SMDT 1700 MFS+SMDH 170M	J128	
60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-3D	J124	
60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-3DF	J122	
60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170M	J120	
62.6	155.1	MDE 1700S17H03	J24	
62.6	155.1	MDW 1700HX3	J77	
63.0	155.5	MDW 1700HGS3	J58	
75.7	170.2	MDE 1700S17E04	J16	
92.0	171.6	SMDT 1700 MFS+SMDH 170-5D	J132	
92.0	171.6	SMDT 1700 MFS+SMDH 170-5DF	J130	
92.0	171.6	SMDT 1700 MFS+SMDH 170L	J128	
95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-5D	J124	
95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-5DF	J122	
95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170L	J120	
113.6	206.1	MDE 1700S17H05	J24	
113.6	206.1	MDW 1700HX5	J77	
114.0	206.5	MDW 1700HGS5	J58	
145.0	221.6	SMDT 1700 MFS+SMDH 170-8D	J132	
145.0	221.6	SMDT 1700 MFS+SMDH 170-8DF	J130	
145.0	221.6	SMDT 1700 MFS+SMDH 170D	J128	
148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-8D	J124	
148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-8DF	J122	
148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170D	J120	
204.0	275.1	SMDT 1700 MFS+SMDH 170-12D	J132	
207.0	278.1	SMDT 1700 MTL/MSL/MEL+SMDH 170-12D	J124	
34.0	104.4	SMDT 1710 MTL/MSL/MEL+SMDH 170-1.5D	J124	
34.0	104.4	SMDT 1710 MTL/MSL/MEL+SMDH 170-1.5DF	J122	
60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-3D	J124	
60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-3DF	J122	
60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170M	J120	
65.0	161.1	MDW 1710HX3	J77	
95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-5D	J124	
95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-5DF	J122	
95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170L	J120	
117.5	217.1	MDW 1710HX5	J77	
148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-8D	J124	
148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-8DF	J122	
148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170D	J120	
170.0	269.1	MDW 1710HX8	J77	
207.0	278.1	SMDT 1710 MTL/MSL/MEL+SMDH 170-12D	J124	
34.0	104.4	SMDT 1720 MTL/MSL/MEL+SMDH 170-1.5D	J124	
34.0	104.4	SMDT 1720 MTL/MSL/MEL+SMDH 170-1.5DF	J122	
60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-3D	J124	
60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-3DF	J122	
60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170M	J120	
95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-5D	J124	
95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-5DF	J122	
95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170L	J120	
148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-8D	J124	
148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-8DF	J122	
148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170D	J120	
207.0	278.1	SMDT 1720 MTL/MSL/MEL+SMDH 170-12D	J124	
34.0	104.4	SMDT 1730 MTL/MSL/MEL+SMDH 170-1.5D	J124	
34.0	104.4	SMDT 1730 MTL/MSL/MEL+SMDH 170-1.5DF	J122	
60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-3D	J124	
60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-3DF	J122	
60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170M	J120	
95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-5D	J124	
95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-5DF	J122	
95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170L	J120	
148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-8D	J124	
148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-8DF	J122	

Effective Length List by Diameter

● Diameter ø17.3 to ø17.8mm

Dia.	Effective Length	Overall Length	Cat. No.	Page
DC	LU	OAL		
17.3	148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170D	J120
	207.0	278.1	SMDT 1730 MTL/MSL/MEL+SMDH 170-12D	J124
17.4	34.0	104.4	SMDT 1740 MTL/MSL/MEL+SMDH 170-1.5D	J124
	34.0	104.4	SMDT 1740 MTL/MSL/MEL+SMDH 170-1.5DF	J122
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-3D	J124
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-3DF	J122
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170M	J120
	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-5D	J124
	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-5DF	J122
	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170L	J120
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-8D	J124
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-8DF	J122
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170D	J120
	207.0	278.1	SMDT 1740 MTL/MSL/MEL+SMDH 170-12D	J124
	31.0	101.4	SMDT 1750 MFS+SMDH 170-1.5D	J132
	31.0	101.4	SMDT 1750 MFS+SMDH 170-1.5DF	J130
	34.0	104.4	SMDT 1750 MTL/MSL/MEL+SMDH 170-1.5D	J124
	34.0	104.4	SMDT 1750 MTL/MSL/MEL+SMDH 170-1.5DF	J122
	35.0	123.2	MDE 1750S18E02	J16
	43.8	130.0	MDF 1750S2D	J29
	52.6	230.0	MDF 1750L2D	J32
	57.0	136.6	SMDT 1750 MFS+SMDH 170-3D	J132
57.0	136.6	SMDT 1750 MFS+SMDH 170-3DF	J130	
57.0	136.6	SMDT 1750 MFS+SMDH 170M	J128	
60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-3D	J124	
60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-3DF	J122	
60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170M	J120	
17.5	64.5	161.2	MDE 1750S18H03	J24
	64.5	161.2	MDW 1750HX3	J78
	64.9	161.6	MDW 1750HGS3	J58
	77.0	170.2	MDE 1750S18E04	J16
	92.0	171.6	SMDT 1750 MFS+SMDH 170-5D	J132
	92.0	171.6	SMDT 1750 MFS+SMDH 170-5DF	J130
	92.0	171.6	SMDT 1750 MFS+SMDH 170L	J128
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-5D	J124
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-5DF	J122
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170L	J120
	116.9	217.3	MDE 1750S18H05	J24
	117.0	217.2	MDW 1750HX5	J78
	117.4	217.6	MDW 1750HGS5	J58
	145.0	221.6	SMDT 1750 MFS+SMDH 170-8D	J132
	145.0	221.6	SMDT 1750 MFS+SMDH 170-8DF	J130
	145.0	221.6	SMDT 1750 MFS+SMDH 170D	J128
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-8D	J124
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-8DF	J122
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170D	J120
	204.0	275.1	SMDT 1750 MFS+SMDH 170-12D	J132
207.0	278.1	SMDT 1750 MTL/MSL/MEL+SMDH 170-12D	J124	
17.6	36.0	107.1	SMDT 1760 MTL/MSL/MEL+SMDH 180-1.5D	J124
	36.0	107.1	SMDT 1760 MTL/MSL/MEL+SMDH 180-1.5DF	J122
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-3D	J124
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-3DF	J122
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180M	J120
	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-5D	J124
	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-5DF	J122
	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180L	J120
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-8D	J124
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-8DF	J122
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180D	J120
	219.0	290.5	SMDT 1760 MTL/MSL/MEL+SMDH 180-12D	J124
	36.0	107.1	SMDT 1770 MTL/MSL/MEL+SMDH 180-1.5D	J124
	36.0	107.1	SMDT 1770 MTL/MSL/MEL+SMDH 180-1.5DF	J122
	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-3D	J124
	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-3DF	J122
17.7	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180M	J120
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-5D	J124
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-5DF	J122
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180L	J120
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-8D	J124
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-8DF	J122
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180D	J120
	219.0	290.5	SMDT 1770 MTL/MSL/MEL+SMDH 180-12D	J124
	36.0	107.1	SMDT 1780 MTL/MSL/MEL+SMDH 180-1.5D	J124
	36.0	107.1	SMDT 1780 MTL/MSL/MEL+SMDH 180-1.5DF	J122
17.8	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-3D	J124
	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-3DF	J122
	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180M	J120
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-5D	J124
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-5DF	J122
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180L	J120

Effective Length List by Diameter

● Diameter ø18.8 to ø19.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
18.8	67.0	160.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-3DF	J122
	67.0	160.0	SMDT 1880 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1880 MTL/MSL/MEL+SMDH 190-12D	J124
	37.0	114.8	SMDT 1890 MTL/MSL/MEL+SMDH 190-1.5D	J124
18.9	37.0	114.8	SMDT 1890 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1890 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1890 MTL/MSL/MEL+SMDH 190-12D	J124
19.0	34.0	111.4	SMDT 1900 MFS+SMDH 190-1.5D	J132
	34.0	111.4	SMDT 1900 MFS+SMDH 190-1.5DF	J130
	35.0	126.5	MDE 1900S19E02	J16
	37.0	114.8	SMDT 1900 MTL/MSL/MEL+SMDH 190-1.5D	J124
	37.0	114.8	SMDT 1900 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	47.5	140.0	MDF 1900S2D	J29
	57.0	240.0	MDF 1900L2D	J32
	63.0	156.6	SMDT 1900 MFS+SMDH 190-3D	J132
	63.0	156.6	SMDT 1900 MFS+SMDH 190-3DF	J130
	63.0	156.6	SMDT 1900 MFS+SMDH 190M	J128
19.1	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-3DF	J122
	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190M	J120
	70.0	167.5	MDE 1900S19H03	J24
	70.0	167.5	MDW 1900HX3	J78
	70.4	167.9	MDW 1900HGS3	J58
	80.9	182.4	MDE 1900S19E04	J16
	102.0	191.6	SMDT 1900 MFS+SMDH 190-5D	J132
	102.0	191.6	SMDT 1900 MFS+SMDH 190-5DF	J130
	102.0	191.6	SMDT 1900 MFS+SMDH 190L	J128
19.2	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190L	J120
	127.0	224.5	MDE 1900S19H05	J24
	127.0	224.5	MDW 1900HX5	J78
	127.4	224.9	MDW 1900HGS5	J58
	161.0	251.6	SMDT 1900 MFS+SMDH 190-8D	J132
	161.0	251.6	SMDT 1900 MFS+SMDH 190-8DF	J130
	161.0	251.6	SMDT 1900 MFS+SMDH 190D	J128
	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-8D	J124
19.3	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190L	J120
	228.0	305.7	SMDT 1900 MFS+SMDH 190-12D	J132
	231.0	309.1	SMDT 1900 MTL/MSL/MEL+SMDH 190-12D	J124
	37.0	114.8	SMDT 1910 MTL/MSL/MEL+SMDH 190-1.5D	J124
	37.0	114.8	SMDT 1910 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-3DF	J122
	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-5D	J124
19.4	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1910 MTL/MSL/MEL+SMDH 190-12D	J124
	37.0	114.8	SMDT 1920 MTL/MSL/MEL+SMDH 190-1.5D	J124
	37.0	114.8	SMDT 1920 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1920 MTL/MSL/MEL+SMDH 190M	J120
19.5	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1920 MTL/MSL/MEL+SMDH 190-12D	J124
	37.0	114.8	SMDT 1930 MTL/MSL/MEL+SMDH 190-1.5D	J124
	37.0	114.8	SMDT 1930 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-3D	J124
19.6	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-3DF	J122
	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1930 MTL/MSL/MEL+SMDH 190-12D	J124
	37.0	114.8	SMDT 1940 MTL/MSL/MEL+SMDH 190-1.5D	J124
19.7	37.0	114.8	SMDT 1940 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1940 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1940 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 1950 MTL/MSL/MEL+SMDH 190-1.5D	J124	
19.8	37.0	114.8	SMDT 1950 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1950 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1950 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 1960 MTL/MSL/MEL+SMDH 190-1.5D	J124	
19.9	37.0	114.8	SMDT 1960 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1960 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1960 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1960 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1960 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1960 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1960 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1960 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1960 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1960 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 1970 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.0	37.0	114.8	SMDT 1970 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1970 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1970 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1970 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1970 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1970 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1970 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1970 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1970 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1970 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 1980 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.1	37.0	114.8	SMDT 1980 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1980 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1980 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1980 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1980 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1980 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1980 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1980 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1980 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1980 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 1990 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.2	37.0	114.8	SMDT 1990 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 1990 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 1990 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 1990 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 1990 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 1990 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 1990 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 1990 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 1990 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 1990 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 2000 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.3	37.0	114.8	SMDT 2000 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 2000 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 2000 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 2000 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 2000 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 2000 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 2000 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 2000 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 2000 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 2000 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 2010 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.4	37.0	114.8	SMDT 2010 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 2010 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 2010 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 2010 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 2010 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 2010 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 2010 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 2010 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 2010 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 2010 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 2020 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.5	37.0	114.8	SMDT 2020 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 2020 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 2020 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 2020 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 2020 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 2020 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 2020 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 2020 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 2020 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 2020 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 2030 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.6	37.0	114.8	SMDT 2030 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 2030 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 2030 MTL/MSL/MEL+SMDH 190M	J120
	106.0	195.0	SMDT 2030 MTL/MSL/MEL+SMDH 190-5D	J124
	106.0	195.0	SMDT 2030 MTL/MSL/MEL+SMDH 190-5DF	J122
	106.0	195.0	SMDT 2030 MTL/MSL/MEL+SMDH 190L	J120
	164.0	255.0	SMDT 2030 MTL/MSL/MEL+SMDH 190-8D	J124
	164.0	255.0	SMDT 2030 MTL/MSL/MEL+SMDH 190-8DF	J122
	164.0	255.0	SMDT 2030 MTL/MSL/MEL+SMDH 190D	J120
	231.0	309.1	SMDT 2030 MTL/MSL/MEL+SMDH 190-12D	J124
37.0	114.8	SMDT 2040 MTL/MSL/MEL+SMDH 190-1.5D	J124	
20.7	37.0	114.8	SMDT 2040 MTL/MSL/MEL+SMDH 190-1.5DF	J122
	67.0	160.0	SMDT 2040 MTL/MSL/MEL+SMDH 190-3D	J124
	67.0	160.0	SMDT 2040 MTL/MSL/MEL+SMDH 190M	J120</

Drilling

Solid

Indexable
Head typeIndexable
insert type

Reamers

● Diameter ø21.3 to ø21.9mm

Dia.	Effective Length	Overall Length	Cat. No.	Page
DC	LU	OAL		
21.3	180.0	270.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-8DF	J122
	180.0	270.3	SMDT 2130 MTL/MSL/MEL+SMDH 210D	J120
	255.0	333.9	SMDT 2130 MTL/MSL/MEL+SMDH 210-12D	J124
	41.0	119.1	SMDT 2140 MTL/MSL/MEL+SMDH 210-1.5D	J122
	41.0	119.1	SMDT 2140 MTL/MSL/MEL+SMDH 210-1.5DF	J124
21.4	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-3D	J124
	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-3DF	J122
	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210M	J120
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-5D	J120
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-5DF	J122
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210L	J120
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-8D	J120
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-8DF	J122
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210D	J120
	255.0	333.9	SMDT 2140 MTL/MSL/MEL+SMDH 210-12D	J124
21.5	37.0	115.5	SMDT 2150 MFS+SMDH 210-1.5D	J132
	37.0	115.5	SMDT 2150 MFS+SMDH 210-1.5DF	J130
	41.0	119.1	SMDT 2150 MTL/MSL/MEL+SMDH 210-1.5D	J122
	41.0	119.1	SMDT 2150 MTL/MSL/MEL+SMDH 210-1.5DF	J124
	69.0	156.7	SMDT 2150 MFS+SMDH 210-3D	J132
	69.0	156.7	SMDT 2150 MFS+SMDH 210-3DF	J130
	69.0	156.7	SMDT 2150 MFS+SMDH 210M	J128
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-3D	J124
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-3DF	J122
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210M	J120
	112.0	196.7	SMDT 2150 MFS+SMDH 210-5D	J132
	112.0	196.7	SMDT 2150 MFS+SMDH 210-5DF	J130
	112.0	196.7	SMDT 2150 MFS+SMDH 210L	J128
	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-5D	J120
	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-5DF	J122
21.6	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210L	J120
	177.0	266.7	SMDT 2150 MFS+SMDH 210-8D	J132
	177.0	266.7	SMDT 2150 MFS+SMDH 210-8DF	J130
	177.0	266.7	SMDT 2150 MFS+SMDH 210D	J128
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-8D	J124
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-8DF	J122
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210D	J120
	252.0	330.3	SMDT 2150 MFS+SMDH 210-12D	J134
	255.0	333.9	SMDT 2150 MTL/MSL/MEL+SMDH 210-12D	J124
	43.0	120.9	SMDT 2160 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2160 MTL/MSL/MEL+SMDH 220-1.5DF	J123
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-3DF	J123
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220M	J120
	21.7	123.0	205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-5D
123.0		205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-5DF	J123
123.0		205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220L	J120
191.0		275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-8D	J125
191.0		275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-8DF	J123
191.0		275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220D	J120
268.0		347.0	SMDT 2160 MTL/MSL/MEL+SMDH 220-12D	J125
43.0		120.9	SMDT 2170 MTL/MSL/MEL+SMDH 220-1.5D	J125
43.0		120.9	SMDT 2170 MTL/MSL/MEL+SMDH 220-1.5DF	J123
77.0		165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-3D	J125
21.8	77.0	165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-3DF	J123
	77.0	165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-5DF	J123
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-8DF	J123
	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2170 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2180 MTL/MSL/MEL+SMDH 220-1.5D	J125
21.9	43.0	120.9	SMDT 2180 MTL/MSL/MEL+SMDH 220-1.5DF	J123
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-3DF	J123
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-5DF	J123
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-8DF	J123
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220D	J120
21.9	268.0	347.0	SMDT 2180 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2190 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2190 MTL/MSL/MEL+SMDH 220-1.5DF	J123
	77.0	165.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-3DF	J123

(Blue text: Flat head ■ Indexable head type)

The effective length (LU) is a guideline for the usable length. When drilling, use the flute length (LCF), taking into consideration the extra length for chip evacuation.

Effective Length List by Diameter

● Diameter ø21.9 to ø22.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
21.9	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2190 MTL/MSL/MEL+SMDH 220-12D	J125
	39.0	117.1	SMDT 2200 MFS+SMDH 220-1.5D	J133
	39.0	117.1	SMDT 2200 MFS+SMDH 220-1.5DF	J130
	43.0	120.9	SMDT 2200 MTL/MSL/MEL+SMDH 220-1.5D	J125
22.0	43.0	120.9	SMDT 2200 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	73.0	161.3	SMDT 2200 MFS+SMDH 220-3D	J133
	73.0	161.3	SMDT 2200 MFS+SMDH 220M	J128
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220M	J120
	119.0	201.3	SMDT 2200 MFS+SMDH 220-5D	J133
	119.0	201.3	SMDT 2200 MFS+SMDH 220-5DF	J130
	119.0	201.3	SMDT 2200 MFS+SMDH 220L	J128
	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-5D	J125
22.1	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220L	J120
	187.0	271.3	SMDT 2200 MFS+SMDH 220-8D	J133
	187.0	271.3	SMDT 2200 MFS+SMDH 220-8DF	J130
	187.0	271.3	SMDT 2200 MFS+SMDH 220D	J128
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220D	J120
	264.0	343.2	SMDT 2200 MFS+SMDH 220-12D	J133
	268.0	347.0	SMDT 2200 MTL/MSL/MEL+SMDH 220-12D	J125
22.2	43.0	120.9	SMDT 2210 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2210 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-8DF	J122
22.3	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2210 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2220 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2220 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220L	J120
22.4	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2220 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2230 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2230 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-5D	J125
22.5	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2230 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2240 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2240 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-3DF	J122

(Blue text: Flat head Indexable head type)

● Diameter ø22.5 to ø23.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
22.5	39.0	117.1	SMDT 2250 MFS+SMDH 220-1.5DF	J130
	43.0	120.9	SMDT 2250 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2250 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	73.0	161.3	SMDT 2250 MFS+SMDH 220-3D	J133
	73.0	161.3	SMDT 2250 MFS+SMDH 220-3DF	J130
	73.0	161.3	SMDT 2250 MFS+SMDH 220M	J128
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220M	J120
	119.0	201.3	SMDT 2250 MFS+SMDH 220-5D	J133
22.6	119.0	201.3	SMDT 2250 MFS+SMDH 220-5DF	J130
	119.0	201.3	SMDT 2250 MFS+SMDH 220L	J128
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220L	J120
	187.0	271.3	SMDT 2250 MFS+SMDH 220-8D	J133
	187.0	271.3	SMDT 2250 MFS+SMDH 220-8DF	J130
	187.0	271.3	SMDT 2250 MFS+SMDH 220D	J128
	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-8DF	J122
22.7	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2250 MFS+SMDH 220-12D	J133
	43.0	120.9	SMDT 2260 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2260 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-5D	J125
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220L	J120
22.8	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2260 MTL/MSL/MEL+SMDH 220-12D	J125
	43.0	120.9	SMDT 2270 MTL/MSL/MEL+SMDH 220-1.5D	J125
	43.0	120.9	SMDT 2270 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-3D	J125
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-3DF	J122
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220M	J120
	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-5D	J125
22.9	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-5DF	J122
	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220L	J120
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-8D	J125
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-8DF	J122
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220D	J120
	268.0	347.0	SMDT 2270 MTL/MSL/MEL+SMDH 220-12D	J125
	45.0	122.0	SMDT 2280 MTL/MSL/MEL+SMDH 220-1.5D	J125
	45.0	122.0	SMDT 2280 MTL/MSL/MEL+SMDH 220-1.5DF	J122
	80.0	164.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-3D	J125
	80.0	164.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-3DF	J122
23.0	80.0	164.7	SMDT 2280 MTL/MSL/MEL+SMDH 220M	J120
	128.0	214.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-5D	J125
	128.0	214.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-5DF	J122
	128.0	214.7	SMDT 2280 MTL/MSL/MEL+SMDH 220L	J120
	199.0	284.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-8D	J125
	199.0	284.7	SMDT 2280 MTL/MSL/MEL+SMDH 220-8DF	J122
	199.0	284.7	SMDT 2280 MTL/MSL/MEL+SMDH 220D	J120
	280.0	359.0	SMDT 2280 MTL/MSL/MEL+SMDH 220-12D	J125
	40.0	118.0	SMDT 2300 MFS+SMDH 230-1.5D	J133
	40.0	118.0	SMDT 2300 MFS+SMDH 230-1.5DF	J130

(Blue text: Flat head Indexable head type)

● Diameter ø23.0 to ø23.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page	
23.0	80.0	164.7	SMDT 2300 MTL/MSL/MEL+SMDH 230M	J120	
	124.0	210.7	SMDT 2300 MFS+SMDH 230-5D	J133	
	124.0	210.7	SMDT 2300 MFS+SMDH 230-5DF	J130	
	124.0	210.7	SMDT 2300 MFS+SMDH 230L	J128	
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-5D	J125	
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-5DF	J122	
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230L	J120	
	195.0	280.7	SMDT 2300 MFS+SMDH 230-8D	J133	
	195.0	280.7	SMDT 2300 MFS+SMDH 230-8DF	J130	
	195.0	280.7	SMDT 2300 MFS+SMDH 230D	J128	
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-8D	J125	
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-8DF	J122	
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230D	J120	
	276.0	355.0	SMDT 2300 MFS+SMDH 230-12D	J133	
	280.0	359.0	SMDT 2300 MTL/MSL/MEL+SMDH 230-12D	J125	
	23.1	45.0	122.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-1.5D	J125
45.0		122.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-1.5DF	J122	
80.0		164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-3D	J125	
80.0		164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-3DF	J122	
80.0		164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230M	J120	
128.0		214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-5D	J125	
128.0		214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-5DF	J122	
128.0		214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230L	J120	
199.0		284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-8D	J125	
199.0		284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-8DF	J122	
199.0		284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230D	J120	
280.0		359.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-12D	J125	
23.2		45.0	122.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-1.5D	J125
		45.0	122.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-1.5DF	J122
		80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-3D	J125
		80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-3DF	J122
	80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230M	J120	
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-5D	J125	
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-5DF	J122	
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230L	J120	
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-8D	J125	
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-8DF	J122	
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230D	J120	
	280.0	359.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-12D	J125	
	23.3	45.0	122.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-1.5D	J125
		45.0	122.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-1.5DF	J122
		80.0	164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-3D	J125
		80.0	164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-3DF	J122
80.0		164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230M	J120	
128.0		214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-5D	J125	
128.0		214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-5DF	J122	
128.0		214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230L	J120	
199.0		284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-8D	J125	
199.0		284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-8DF	J122	
199.0		284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230D	J120	
280.0		359.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-12D	J125	
23.4		45.0	122.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-1.5D	J125
		45.0	122.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-1.5DF	J122
		80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-3D	J125
		80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-3DF	J122
	80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230M	J120	
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-5D	J125	
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-5DF	J122	
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230L	J120	
	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-8D	J125	
	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-8DF	J122	
	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230D	J120	
	280.0	359.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-12D	J125	
	23.5	40.0	118.0	SMDT 2350 MFS+SMDH 230-1.5D	J133
		40.0	118.0	SMDT 2350 MFS+SMDH 230-1.5DF	J130
		45.0	122.0	SMDT 2350 MTL/MSL/MEL+SMDH 230-1.5D	J125
		45.0	122.0	SMDT 2350 MTL/MSL/MEL+SMDH 230-1.5DF	J122
76.0		160.7	SMDT 2350 MFS+SMDH 230-3D	J133	
76.0		160.7	SMDT 2350 MFS+SMDH 230-3DF	J130	
76.0		160.7	SMDT 2350 MFS+SMDH 230M	J128	
80.0		164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-3D	J125	
80.0		164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-3DF	J122	
80.0		164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230M	J120	
124.0		210.7	SMDT 2350 MFS+SMDH 230-5D	J133	
124.0		210.7	SMDT 2350 MFS+SMDH 230-5DF	J130	
124.0		210.7	SMDT 2350 MFS+SMDH 230L	J128	
128.0		214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-5D	J125	
128.0		214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-5DF	J122	
128.0		214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230L	J120	
195.0	280.7	SMDT 2350 MFS+SMDH 230-8D	J133		

Drilling

Solid

Indexable
Head type

Indexable

Reamers

● Diameter ø24.6 to ø25.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
24.6	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-8D	J125
	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-8DF	J122
	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240D	J120
	292.0	376.1	SMDT 2460 MTL/MSL/MEL+SMDH 240-12D	J125
	46.0	128.4	SMDT 2470 MTL/MSL/MEL+SMDH 240-1.5D	J125
	46.0	128.4	SMDT 2470 MTL/MSL/MEL+SMDH 240-1.5DF	J122
24.7	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-3D	J125
	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-3DF	J122
	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240M	J120
	90.3	173.3	SMDT 2470 MB+SMDH 240B3	J135
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-5D	J125
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-5DF	J122
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240L	J120
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-8D	J125
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-8DF	J122
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240D	J120
24.8	292.0	376.1	SMDT 2470 MTL/MSL/MEL+SMDH 240-12D	J125
	46.0	128.4	SMDT 2480 MTL/MSL/MEL+SMDH 240-1.5D	J125
	46.0	128.4	SMDT 2480 MTL/MSL/MEL+SMDH 240-1.5DF	J122
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-3D	J125
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-3DF	J122
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240M	J120
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-5D	J125
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-5DF	J122
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240L	J120
	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-8D	J125
24.9	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-8DF	J122
	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240D	J120
	292.0	376.1	SMDT 2480 MTL/MSL/MEL+SMDH 240-12D	J125
	48.0	128.8	SMDT 2490 MTL/MSL/MEL+SMDH 250-1.5D	J125
	48.0	128.8	SMDT 2490 MTL/MSL/MEL+SMDH 250-1.5DF	J123
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-3D	J125
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-3DF	J123
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250M	J120
	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-5D	J125
	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-5DF	J123
25.0	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250L	J120
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-8D	J125
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-8DF	J123
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250D	J120
	304.0	388.3	SMDT 2490 MTL/MSL/MEL+SMDH 250-12D	J125
	43.0	124.7	SMDT 2500 MFS+SMDH 250-1.5D	J133
	43.0	124.7	SMDT 2500 MFS+SMDH 250-1.5DF	J131
	48.0	128.8	SMDT 2500 MTL/MSL/MEL+SMDH 250-1.5D	J125
	48.0	128.8	SMDT 2500 MTL/MSL/MEL+SMDH 250-1.5DF	J123
	50.0	127.0	PDL 250D2S25	J174
25.1	75.0	152.0	PDL 250D3S25	J174
	82.0	170.4	SMDT 2500 MFS+SMDH 250-3D	J133
	82.0	170.4	SMDT 2500 MFS+SMDH 250-3DF	J131
	82.0	170.4	SMDT 2500 MFS+SMDH 250M	J128
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-3D	J125
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-3DF	J123
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250M	J120
	134.0	225.4	SMDT 2500 MFS+SMDH 250-5D	J133
	134.0	225.4	SMDT 2500 MFS+SMDH 250-5DF	J131
	134.0	225.4	SMDT 2500 MFS+SMDH 250L	J128
25.2	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-5D	J125
	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-5DF	J123
	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250L	J120
	211.0	300.4	SMDT 2500 MFS+SMDH 250-8D	J133
	211.0	300.4	SMDT 2500 MFS+SMDH 250-8DF	J131
	211.0	300.4	SMDT 2500 MFS+SMDH 250D	J128
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-8D	J125
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-8DF	J123
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250D	J120
	300.0	384.2	SMDT 2500 MFS+SMDH 250-12D	J133
25.3	304.0	388.3	SMDT 2500 MTL/MSL/MEL+SMDH 250-12D	J125
	48.0	128.8	SMDT 2510 MTL/MSL/MEL+SMDH 250-1.5D	J125
	48.0	128.8	SMDT 2510 MTL/MSL/MEL+SMDH 250-1.5DF	J123
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-3D	J125
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-3DF	J123
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250M	J120
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-5D	J125
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-5DF	J123
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250L	J120
	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-8D	J125
25.4	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-8DF	J123
	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250D	J120
	304.0	388.3	SMDT 2510 MTL/MSL/MEL+SMDH 250-12D	J125
	48.0	128.8	SMDT 2520 MTL/MSL/MEL+SMDH 250-1.5D	J125
	48.0	128.8	SMDT 2520 MTL/MSL/MEL+SMDH 250-1.5DF	J123
	87.0	174.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-3D	J125

(Blue text: Flat head ■ Indexable head type)

J3-25

Effective Length List by Diameter

● Diameter ø26.8 to ø27.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
26.8	316.0	400.8	SMDT 2680 MTL/MSL/MEL+SMDH 260-12D	J125
	51.0	132.2	SMDT 2690 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2690 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-8D	J125
26.9	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270L	J120
	328.0	413.3	SMDT 2690 MTL/MSL/MEL+SMDH 270-12D	J125
	46.0	127.8	SMDT 2700 MFS+SMDH 270-1.5D	J133
	46.0	127.8	SMDT 2700 MFS+SMDH 270-1.5DF	J131
	51.0	132.2	SMDT 2700 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2700 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	88.0	175.5	SMDT 2700 MFS+SMDH 270-3D	J133
	88.0	175.5	SMDT 2700 MFS+SMDH 270-3DF	J131
	88.0	175.5	SMDT 2700 MFS+SMDH 270M	J128
27.0	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270M	J120
	144.0	235.5	SMDT 2700 MFS+SMDH 270-5D	J133
	144.0	235.5	SMDT 2700 MFS+SMDH 270-5DF	J131
	144.0	235.5	SMDT 2700 MFS+SMDH 270L	J128
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270L	J120
	227.0	320.5	SMDT 2700 MFS+SMDH 270-8D	J133
27.1	227.0	320.5	SMDT 2700 MFS+SMDH 270-8DF	J131
	227.0	320.5	SMDT 2700 MFS+SMDH 270M	J128
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270M	J120
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270L	J128
	328.0	413.3	SMDT 2700 MTL/MSL/MEL+SMDH 270-12D	J125
	51.0	132.2	SMDT 2710 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2710 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-3D	J125
27.2	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2710 MTL/MSL/MEL+SMDH 270-12D	J125
	51.0	132.2	SMDT 2720 MTL/MSL/MEL+SMDH 270-1.5D	J125
27.3	51.0	132.2	SMDT 2720 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270M	J120
27.4	328.0	413.3	SMDT 2720 MTL/MSL/MEL+SMDH 270-12D	J125
	51.0	132.2	SMDT 2730 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2730 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-8D	J125

(Blue text: Flat head Indexable head type)

● Diameter ø27.4 to ø28.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
27.4	149.0	239.9	SMDT 2740 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2740 MTL/MSL/MEL+SMDH 270-12D	J125
	46.0	127.8	SMDT 2750 MFS+SMDH 270-1.5D	J133
	46.0	127.8	SMDT 2750 MFS+SMDH 270-1.5DF	J131
	51.0	132.2	SMDT 2750 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2750 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	88.0	175.5	SMDT 2750 MFS+SMDH 270-3D	J133
27.5	88.0	175.5	SMDT 2750 MFS+SMDH 270-3DF	J131
	88.0	175.5	SMDT 2750 MFS+SMDH 270M	J128
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270M	J120
	144.0	235.5	SMDT 2750 MFS+SMDH 270-5D	J133
	144.0	235.5	SMDT 2750 MFS+SMDH 270-5DF	J131
	144.0	235.5	SMDT 2750 MFS+SMDH 270L	J128
	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-5DF	J123
27.6	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270M	J120
	227.0	320.5	SMDT 2750 MFS+SMDH 270-8D	J133
	227.0	320.5	SMDT 2750 MFS+SMDH 270-8DF	J131
	227.0	320.5	SMDT 2750 MFS+SMDH 270M	J128
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2750 MTL/MSL/MEL+SMDH 270-12D	J125
	51.0	132.2	SMDT 2760 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2760 MTL/MSL/MEL+SMDH 270-1.5DF	J123
27.7	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2760 MTL/MSL/MEL+SMDH 270-12D	J125
27.8	51.0	132.2	SMDT 2770 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2770 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270L	J120
	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-8DF	J123
27.9	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2770 MTL/MSL/MEL+SMDH 270-12D	J125
	51.0	132.2	SMDT 2780 MTL/MSL/MEL+SMDH 270-1.5D	J125
	51.0	132.2	SMDT 2780 MTL/MSL/MEL+SMDH 270-1.5DF	J123
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-3D	J125
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-3DF	J123
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270M	J120
	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-5D	J125
	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-5DF	J123
	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270L	J120
28.0	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-8D	J125
	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-8DF	J123
	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270M	J120
	328.0	413.3	SMDT 2780 MTL/MSL/MEL+SMDH 270-12D	J125
	53.0	133.9	SMDT 2790 MTL/MSL/MEL+SMDH 280-1.5D	J125
	53.0	133.9	SMDT 2790 MTL/MSL/MEL+SMDH 280-1.5DF	J123
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-3D	J125
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-3DF	J123
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280M	J120
	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-5D	J125
28.1	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-5DF	J123
	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280L	J120
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-8D	J125
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-8DF	J123
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280M	J120
	341.0	425.8	SMDT 2790 MTL/MSL/MEL+SMDH 280-12D	J125
	48.0	129.4	SMDT 2800 MFS+SMDH 280-1.5D	J133
	48.0	129.4	SMDT 2800 MFS+SMDH 280-1.5DF	J131
	48.0	129.4	SMDT 2800 MFS+SMDH 280L	J128
	53.0	133.9	SMDT 2800 MTL/MSL/MEL+SMDH 280-1.5D	J125

(Blue text: Flat head Indexable head type)

● Diameter ø28.0 to ø28.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page	
28.0	53.0	133.9	SMDT 2800 MTL/MSL/MEL+SMDH 280-1.5DF	J123	
	91.0	180.6	SMDT 2800 MFS+SMDH 280-3D	J133	
	91.0	180.6	SMDT 2800 MFS+SMDH 280-3DF	J131	
	91.0	180.6	SMDT 2800 MFS+SMDH 280M	J128	
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-3D	J125	
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-3DF	J123	
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280M	J120	
	149.0	240.6	SMDT 2800 MFS+SMDH 280-5D	J133	
	149.0	240.6	SMDT 2800 MFS+SMDH 280-5DF	J131	
	149.0	240.6	SMDT 2800 MFS+SMDH 280L	J128	
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-5D	J125	
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-5DF	J123	
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280L	J120	
	235.0	325.6	SMDT 2800 MFS+SMDH 280-8D	J133	
	235.0	325.6	SMDT 2800 MFS+SMDH 280-8DF	J131	
	235.0	325.6	SMDT 2800 MFS+SMDH 280D	J128	
	240.0	330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-8D	J125	
	28.1	240.0	330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-8DF	J123
240.0		330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280D	J120	
336.0		421.3	SMDT 2800 MFS+SMDH 280-12D	J133	
341.0		425.8	SMDT 2800 MTL/MSL/MEL+SMDH 280-12D	J125	
53.0		133.9	SMDT 2810 MTL/MSL/MEL+SMDH 280-1.5D	J125	
53.0		133.9	SMDT 2810 MTL/MSL/MEL+SMDH 280-1.5DF	J123	
96.0		185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-3D	J125	
96.0		185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-3DF	J123	
96.0		185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280M	J120	
154.0		245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-5D	J125	
154.0		245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-5DF	J123	
154.0		245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280L	J120	
240.0		330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-8D	J125	
240.0		330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-8DF	J123	
240.0		330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280D	J120	
341.0		425.8	SMDT 2810 MTL/MSL/MEL+SMDH 280-12D	J125	
28.2		53.0	133.9	SMDT 2820 MTL/MSL/MEL+SMDH 280-1.5D	J125
		53.0	133.9	SMDT 2820 MTL/MSL/MEL+SMDH 280-1.5DF	J123
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-3D	J125	
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-3DF	J123	
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280M	J120	
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-5D	J125	
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-5DF	J123	
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280L	J120	
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-8D	J125	
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-8DF	J123	
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280D	J120	
	341.0	425.8	SMDT 2820 MTL/MSL/MEL+SMDH 280-12D	J125	
	53.0	133.9	SMDT 2830 MTL/MSL/MEL+SMDH 280-1.5D	J125	
	53.0	133.9	SMDT 2830 MTL/MSL/MEL+SMDH 280-1.5DF	J123	
	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-3D	J125	
	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-3DF	J123	
	28.3	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280M	J120
		154.0	245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-5D	J125
154.0		245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-5DF	J123	
154.0		245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280L	J120	
240.0		330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-8D	J125	
240.0		330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-8DF	J123	
240.0		330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280D	J120	
341.0		425.8	SMDT 2830 MTL/MSL/MEL+SMDH 280-12D	J125	
53.0		133.9	SMDT 2840 MTL/MSL/MEL+SMDH 280-1.5D	J125	
53.0		133.9	SMDT 2840 MTL/MSL/MEL+SMDH 280-1.5DF	J123	
96.0		185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-3D	J125	
96.0		185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-3DF	J123	
96.0		185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280M	J120	
154.0		245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-5D	J125	
154.0		245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-5DF	J123	
154.0		245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280L	J120	
28.4		240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-8D	J125
		240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-8DF	J123
	240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280D	J120	
	341.0	425.8	SMDT 2840 MTL/MSL/MEL+SMDH 280-12D	J125	
	48.0	129.4	SMDT 2850 MFS+SMDH 280-1.5D	J133	
	48.0	129.4	SMDT 2850 MFS+SMDH 280-1.5DF	J131	
	53.0	133.9	SMDT 2850 MTL/MSL/MEL+SMDH 280-1.5D	J125	
	53.0	133.9	SMDT 2850 MTL/MSL/MEL+SMDH 280-1.5DF	J123	
	91.0	180.6	SMDT 2850 MFS+SMDH 280-3D	J133	
	91.0	180.6	SMDT 2850 MFS+SMDH 280-3DF	J131	
	91.0	180.6	SMDT 2850 MFS+SMDH 280M	J128	
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-3D	J125	
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-3DF	J123	
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280M	J120	
	149.0	240.6	SMDT 2850 MFS+SMDH 280-5D	J133	
	149.0	240.6	SMDT 2850 MFS+SMDH 280-5DF	J131	
	149.0	240.6	SMDT 2850 MFS+SMDH 280L	J128	

Reamers

Effective Length List by Diameter

● Diameter ø30.1 to ø30.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.1	365.0	450.8	SMDT 3010 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3020 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3020 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3020 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-5DF	J123
	164.0	260.5	SMDT 3020 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-8D	J125
30.2	257.0	350.5	SMDT 3020 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3020 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3020 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3030 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3030 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3030 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-5DF	J123
30.3	164.0	260.5	SMDT 3030 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-8D	J125
	257.0	350.5	SMDT 3030 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3030 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3030 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3040 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3040 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3040 MTL/MSL/MEL+SMDH 300M	J121
30.4	164.0	260.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-5DF	J123
	164.0	260.5	SMDT 3040 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-8D	J125
	257.0	350.5	SMDT 3040 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3040 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3040 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3050 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3050 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-3D	J125
30.5	103.0	190.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3050 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-5DF	J123
	164.0	260.5	SMDT 3050 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-8D	J125
	257.0	350.5	SMDT 3050 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3050 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3050 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3060 MTL/MSL/MEL+SMDH 300-1.5D	J125
30.6	56.0	138.3	SMDT 3060 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3060 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-5DF	J123
	164.0	260.5	SMDT 3060 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-8D	J125
	257.0	350.5	SMDT 3060 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3060 MTL/MSL/MEL+SMDH 300D	J121
30.7	365.0	450.8	SMDT 3060 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3070 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3070 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3070 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-5DF	J123
	164.0	260.5	SMDT 3070 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-8D	J125
30.8	257.0	350.5	SMDT 3070 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3070 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3070 MTL/MSL/MEL+SMDH 300-12D	J125
	56.0	138.3	SMDT 3080 MTL/MSL/MEL+SMDH 300-1.5D	J125
	56.0	138.3	SMDT 3080 MTL/MSL/MEL+SMDH 300-1.5DF	J123
	103.0	190.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-3D	J125
	103.0	190.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-3DF	J123
	103.0	190.5	SMDT 3080 MTL/MSL/MEL+SMDH 300M	J121
	164.0	260.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-5D	J125
	164.0	260.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-5DF	J123

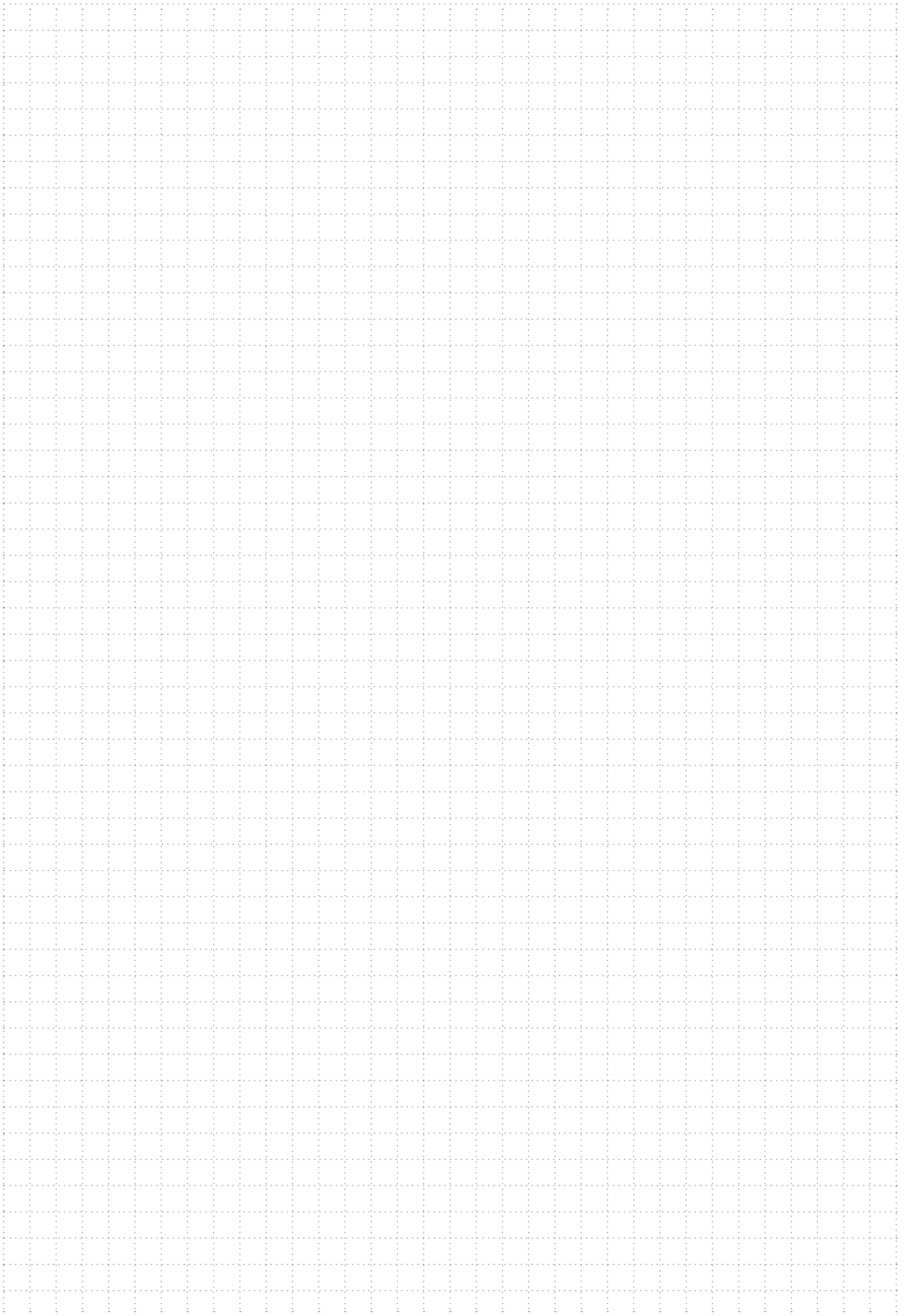
● Diameter ø30.8 to ø42.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.8	164.0	260.5	SMDT 3080 MTL/MSL/MEL+SMDH 300L	J121
	257.0	350.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-8D	J125
	257.0	350.5	SMDT 3080 MTL/MSL/MEL+SMDH 300-8DF	J123
	257.0	350.5	SMDT 3080 MTL/MSL/MEL+SMDH 300D	J121
	365.0	450.8	SMDT 3080 MTL/MSL/MEL+SMDH 300-12D	J125
31.0	106.0	200.7	SMDT 3100 MTL+SMDH 320M	J121
	170.0	265.8	SMDT 3100 MTL+SMDH 320L	J121
	266.0	360.8	SMDT 3100 MTL+SMDH 320D	J121
	64.0	162.0	PDL 320D2S40	J174
	96.0	194.0	PDL 320D3S40	J174
32.0	106.0	200.7	SMDT 3200 MTL+SMDH 320M	J121
	170.0	265.8	SMDT 3200 MTL+SMDH 320L	J121
	266.0	360.8	SMDT 3200 MTL+SMDH 320D	J121
	111.0	205.9	SMDT 3300 MTL+SMDH 335M	J121
	178.0	274.1	SMDT 3300 MTL+SMDH 335L	J121
33.0	279.0	376.1	SMDT 3300 MTL+SMDH 335D	J121
	116.0	221.2	SMDT 3400 MTL+SMDH 350M	J121
	186.0	296.4	SMDT 3400 MTL+SMDH 350L	J121
	291.0	401.4	SMDT 3400 MTL+SMDH 350D	J121
	116.0	221.2	SMDT 3500 MTL+SMDH 350M	J121
34.0	186.0	296.4	SMDT 3500 MTL+SMDH 350L	J121
	291.0	401.4	SMDT 3500 MTL+SMDH 350D	J121
	121.0	226.4	SMDT 3600 MTL+SMDH 365M	J121
	194.0	301.6	SMDT 3600 MTL+SMDH 365L	J121
	303.0	411.6	SMDT 3600 MTL+SMDH 365D	J121
35.0	125.0	231.7	SMDT 3700 MTL+SMDH 380M	J121
	201.0	311.9	SMDT 3700 MTL+SMDH 380L	J121
	315.0	426.9	SMDT 3700 MTL+SMDH 380D	J121
	125.0	231.7	SMDT 3750 MTL+SMDH 380M	J121
	201.0	311.9	SMDT 3750 MTL+SMDH 380L	J121
36.0	315.0	426.9	SMDT 3750 MTL+SMDH 380D	J121
	125.0	231.7	SMDT 3800 MTL+SMDH 380M	J121
	201.0	311.9	SMDT 3800 MTL+SMDH 380L	J121
	315.0	426.9	SMDT 3800 MTL+SMDH 380D	J121
	130.0	237.0	SMDT 3900 MTL+SMDH 395M	J121
37.0	209.0	322.2	SMDT 3900 MTL+SMDH 395L	J121
	328.0	437.2	SMDT 3900 MTL+SMDH 395D	J121
	80.0	185.0	PDL 400D2S40	J174
	120.0	225.0	PDL 400D3S40	J174
	135.0	252.2	SMDT 4000 MTL+SMDH 410M	J121
38.0	217.0	332.5	SMDT 4000 MTL+SMDH 410L	J121
	340.0	457.5	SMDT 4000 MTL+SMDH 410D	J121
	135.0	252.2	SMDT 4050 MTL+SMDH 410M	J121
	217.0	332.5	SMDT 4050 MTL+SMDH 410L	J121
	340.0	457.5	SMDT 4050 MTL+SMDH 410D	J121
39.0	135.0	252.2	SMDT 4100 MTL+SMDH 410M	J121
	217.0	332.5	SMDT 4100 MTL+SMDH 410L	J121
	340.0	457.5	SMDT 4100 MTL+SMDH 410D	J121
	140.0	257.5	SMDT 4200 MTL+SMDH 425M	J121
	225.0	342.7	SMDT 4200 MTL+SMDH 425L	J121
40.0	352.0	467.7	SMDT 4200 MTL+SMDH 425D	J121

(Blue text: Flat head Indexable head type)

The effective length (LU) is a guideline for the usable length. When drilling, use the flute length (LCF), taking into consideration the extra length for chip evacuation.

MEMO



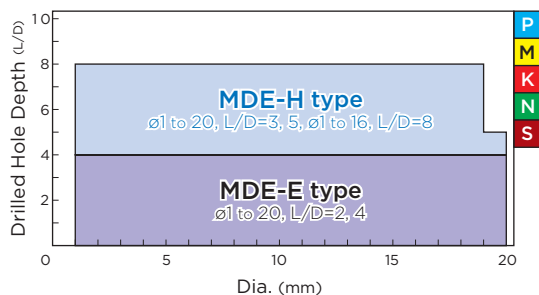
Application Range of Major Drills

Coolant: External supply / Internal supply

■ Solid Carbide Drills

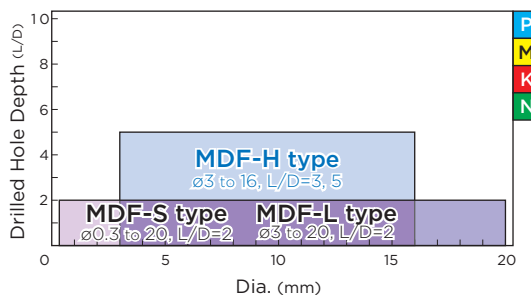
General-purpose MULTIDRILL NeXEO MDE series

ISO J8



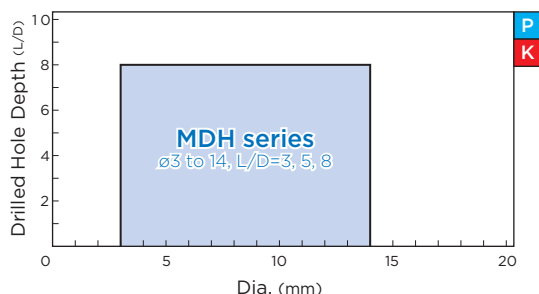
Flat MULTIDRILL MDF series

ISO J26



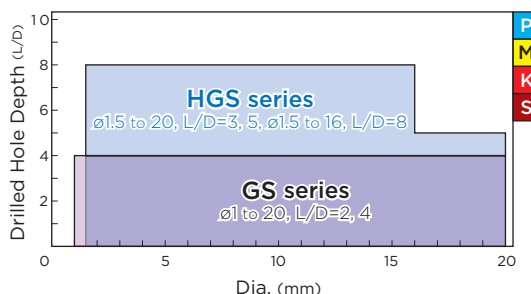
High-efficiency MULTIDRILL MDH series

ISO J38



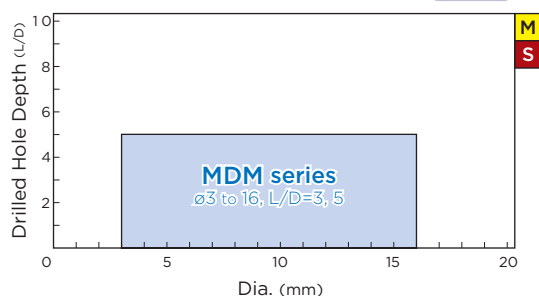
High-efficiency Super MULTIDRILL GS/HGS series

ISO J48



For Stainless Steel MULTIDRILL MDM series

ISO J62

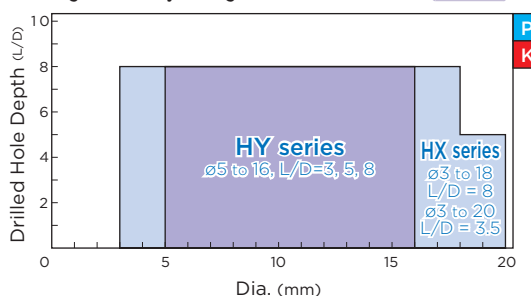


For Cast Iron Strong MULTIDRILL HX series

ISO J72

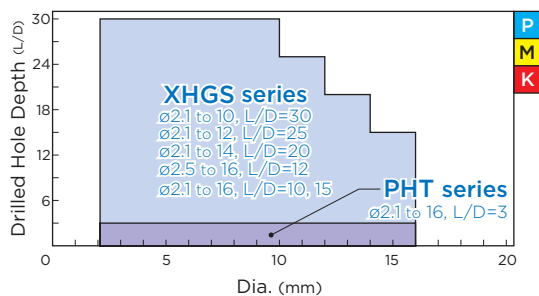
High-efficiency Strong MULTIDRILL HY series

ISO J80



For Deep Holes Super MULTIDRILL XHGS/PHT series

ISO J82

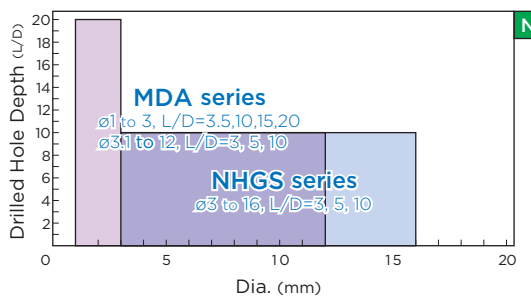


For Non-Ferrous Metal MULTIDRILL MDA series

ISO J90

Aluminum Alloy Super MULTIDRILL NHGS series

ISO J98

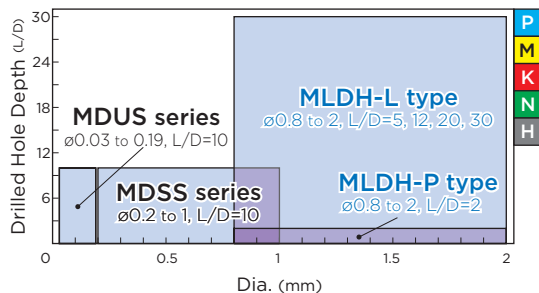


Small Diameter Micro Long Drill MLDH-L/MLDH-P types

ISO J105

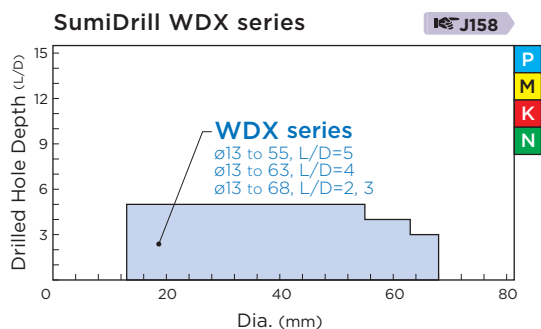
Very Small Diameter MULTIDRILL MDUS/MDSS series

ISO J108

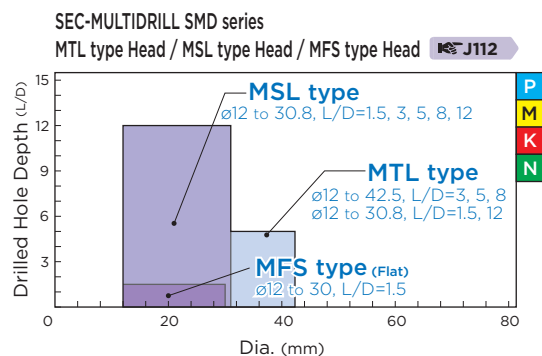


Application Range of Major Drills

■ Indexable Insert type Drills



■ Indexable Head type Drills



Drill Coatings

New Grade

ACH70

HF Coat

HF
Coat

- TiAlCrSi-based super multi-layered coating realises excellent wear resistance and thermal resistance
- Tough TiAlB-based coating is utilised on the carbide substrate to improve coating strength and fracture resistance

Super multi-layered TiAlCrSi

Hardness HV: 46GPa

Starting Temperature for Oxidisation: 1,100°C

TiAlB-based toughness layer

Balances wear and fracture resistance

General-purpose Grade

ACT100 ACT70

NX Coat

NX
Coat

- Sumitomo Electric Hardmetal's proprietary nano-coating technology provides stable tool life across a wide range of cutting conditions over a variety of work materials.
- Coating Structure

Super multi-layered TiAlCrSi coating

Hardness (HV): 46GPa

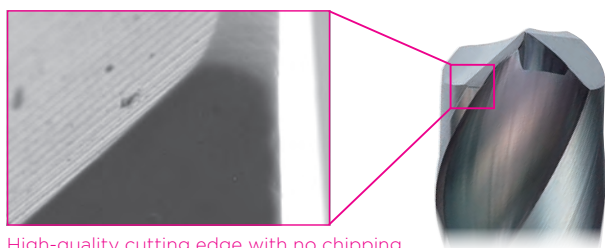
Oxidisation Starting Temperature: 1,100°C

Highly Adhesive Layer

■ Features

- High-quality, high-hardness, high-strength coating based on ABSOTECH™ technology achieves excellent wear and thermal resistance.
- Resistant to peripheral edge chipping
- High-quality edge provides stable tool life

MULTIDRILL
NeXEO MDE series



High-quality cutting edge with no chipping

Competitor's Product A



Chipping in edge coating

DEX Coat

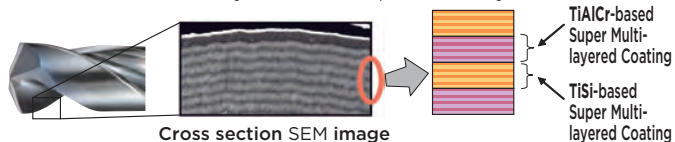
DEX
Coat

Sumitomo Electric Hardmetal's dedicated coating for drills utilises nano-coating technology to provide long tool life.

■ Features

● Coating Structure

World's first compound super multi-layered coating made from alternate layers of two super multi-layered substrates.



Cross section SEM image

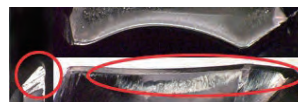
- Silicon and chrome improve wear, thermal and adhesion resistance.
- Super multi-layered structure offers improved chipping resistance

■ DEX Coat Application Examples

MULTIDRILL GS series with DEX Coat (after drilling 100 holes)



Competitor's Product A (after 70m of machining)



Tool : MDW 0800GS4
Work Material : S50C (200HB)
Cutting Conditions : $vc = 70\text{m/min}$, $f = 0.25\text{mm/rev}$, $H = 32\text{mm}$,
External Coolant Supply (Water-soluble)

Drilling

Solid

Indexable
Head type

Indexable
Insert type

Reamers

Drill Coatings



■ Features

- Thin, ultra-smooth DLC coating
Significantly improved adhesion resistance in drilling of aluminum alloy and non-ferrous metals
Significantly reduced cutting force, contributing to long and stable tool life

AURORA Coat X

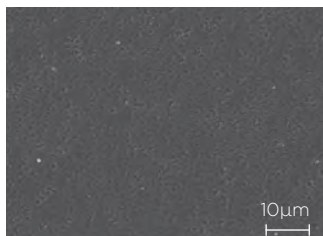


DLX1700

■ General Features

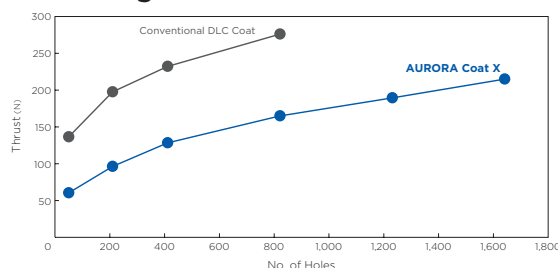
AURORA Coat X, which has ultra-enhanced smoothness through our proprietary new coating technology, low coefficient of friction and high-hardness thin DLC (Diamond Like Carbon) layer, improves wear and adhesion resistance, to realise long and stable tool life in drilling of aluminum alloys and non-ferrous metals.

● Coating Surface Properties



(SEM image)

● Cutting Force



Work Material: ADC12 Machine: Vertical Machining Centre BT30 Tool: MDA0600S06H05 (ø6mm x 5D)
Cutting Conditions: $v_c = 180\text{m/min}$ $f = 0.2\text{mm/rev}$ Internal Coolant Supply (Water-soluble)



■ Features

- Thin, smooth DLC coating with a low coefficient of friction
Suppresses adhesion to the cutting edge and reduces cutting force during drilling of aluminum alloy and non-ferrous metals
- High adhesion strength withstands violent cutting conditions
The world's first coating applicable to cutting tools, with our proprietary coating technique improving adhesion strength

AURORA Coat



DL1300 DL1500

■ General Features

High-hardness, low-friction coefficient AURORA Coat has excellent adhesion resistance in drilling of aluminum alloy and non-ferrous metals, and works in combination with a special cutting edge shape to achieve stable tool life.

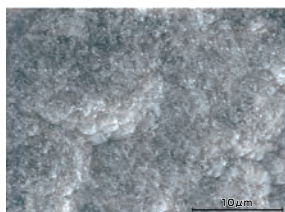
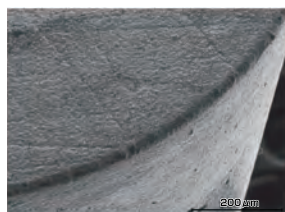
■ AURORA Coat Application Examples

AURORA Coat Super MULTIDRILL NHGS series (after drilling 100 holes)	 Clean cutting edge with no adhesion
Competitor's Product B (after drilling 20 holes)	 Severe adhesion
Tool : MDW 0800NHGS5 Work Material : ADC12 Cutting Conditions: $v_c = 200\text{m/min}$, $f = 1.0\text{mm/rev}$, $H = 32\text{mm}$, Internal Coolant Supply	



■ Features

- Creating a fine-grained diamond coating with both high strength and high wear resistance on the smooth surface required for drilling CFRP



SUMIDIA Coat



■ General Features

Our original polycrystalline diamond coating technology achieves over 10 times the wear resistance of uncoated carbide. Excellent diamond layer adhesion is achieved with a combination of a dedicated substrate for diamond coating and a proprietary coating pre-treatment technique.

■ SUMIDIA Coat Application Examples

SUMIDIA Coat  No. of Workpieces: 600 holes Able to continue	Competitor's Diamond Coating  No. of Workpieces: 50 holes Coating peels and burrs are formed
Tool : SUMIDIA Coat Drill ø6.35mm Work Material : CFRP Cutting Conditions: $v_c = 130\text{m/min}$, $f = 0.075\text{mm/rev}$, $H = 15\text{mm}$, Through Hole Dry	



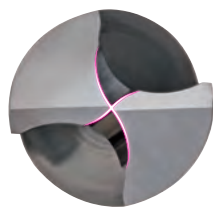
General Features

- Innovative new general purpose drill. Utilising the ACT100 grade.
- Applicable to a wide range of materials from high carbon steel and die steel to stainless steel. Enables stable drilling even on small machining centres and small lathes.
- NX Coat made with ABSOTECH™ technology for excellent wear resistance and thermal resistance.
- Low resistance chip breaking.

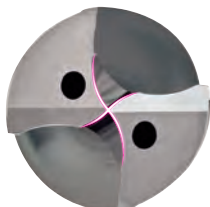
Features and Applications

- RX THINNING reduces thrust. Also ideal for small machining centres and small lathes.
 - Further reduces cutting force with overlap thinning, suppressing wear in hub drilling. Excellent for shallow holes.
- *L/D=2 sizes only

RX THINNING + Arc Shaped Cutting Lip

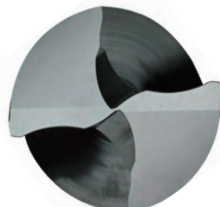


External Coolant Supply

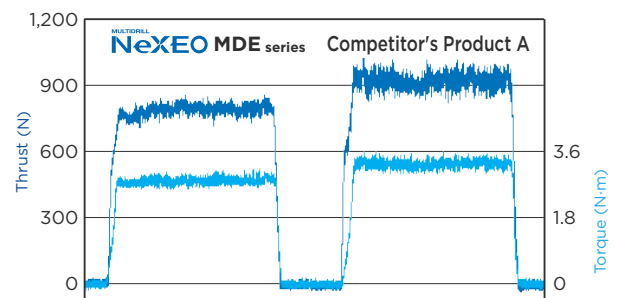


Internal Coolant Supply

Overlap Thinning



For Hub Drilling



Work Material : S50C
 Diameter : ø8mm
 Hole Depth : 5D
 Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.15\text{mm/rev}$, $H = 38\text{mm}$ (Through),
 Internal Coolant Supply (Water-soluble)

General-purpose drill suitable for a wide range of work materials and cutting conditions

General-purpose grade

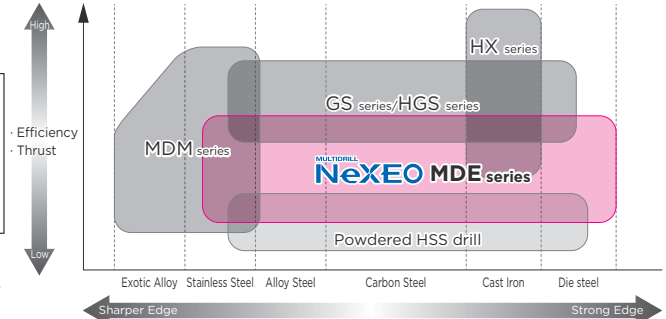
ACT100

- Micro-grained carbide substrate
Achieves both wear and fracture resistance
- NX Coat
High-quality, high-hardness, high-strength coating based on ABSOTECH™ technology achieves excellent wear and thermal resistance.

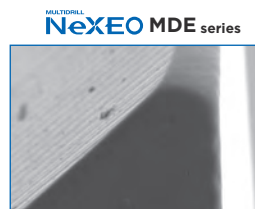


Super multi-layered TiAlCrSi
 Coated Carbide
 Hardness (HV): 46GPa
 Oxidisation Starting
 Temperature: 1,100°C

Highly Adhesive Layer



- High-quality edge provides stable tool life



High-quality cutting edge with no chipping

Competitor's Product B



Chipping in edge coating

- Strong arc-shaped cutting edge design for good chip evacuation

NeXEO MDE series



Chips are broken into small pieces

Competitor's Product C



Elongated chips

Work Material : S50C
 Diameter : ø9mm
 Hole Depth : 5D
 Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.15\text{mm/rev}$
 Internal Coolant Supply (Water-soluble)

- Drills holes with good precision and high quality

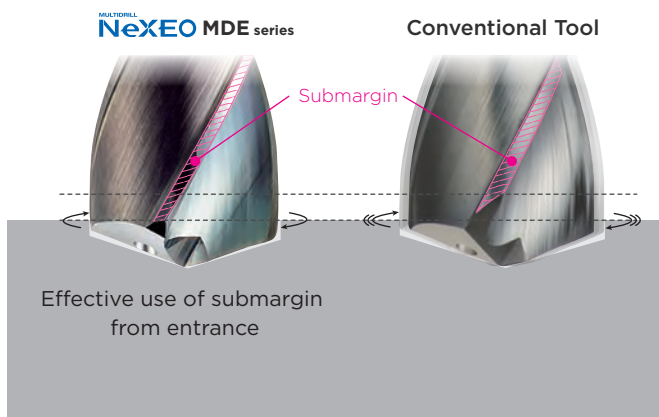


Internal Coolant Supply: Double margin

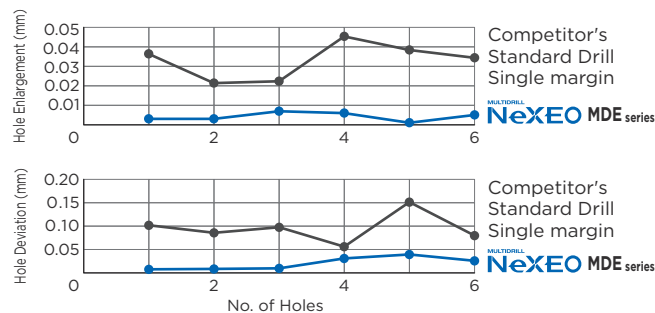


External Coolant Supply: Single margin

- Special double margin for good hole precision (internal coolant supply)

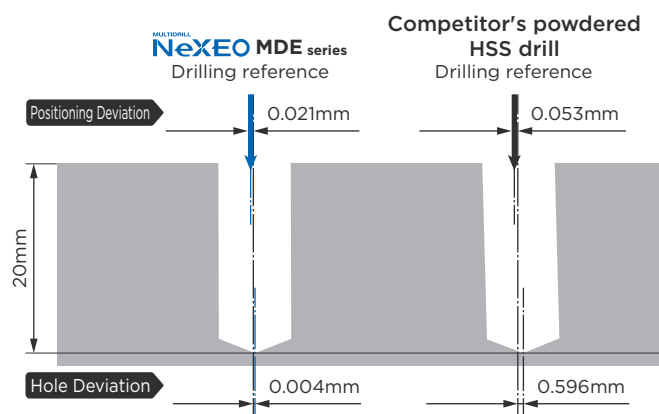


- Comparison of hole precision (die steel drilling)



Work Material : DH31S (49HRC)
 Tool : MDE 0800S08H05 (ø8mmx5D)
 Cutting Conditions: $v_c = 17\text{m/min}$, $f = 0.07\text{mm/rev}$
 Internal Coolant Supply (Water-soluble)

- Compared to powdered HSS drill, good hole precision (die steel drilling)

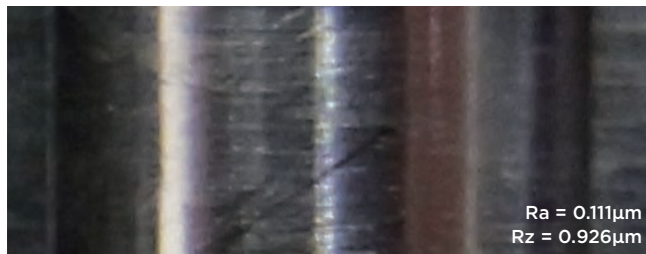


Good hole position accuracy Minimal hole deviation

Work Material : NAK55
 Tool : MDE 0680S07E04 (ø6.8mmx4D)
 Cutting Conditions: $v_c = 50\text{m/min}$, $f = 0.1\text{mm/rev}$, $H = 20\text{mm}$,
 External Coolant Supply (Water-soluble)

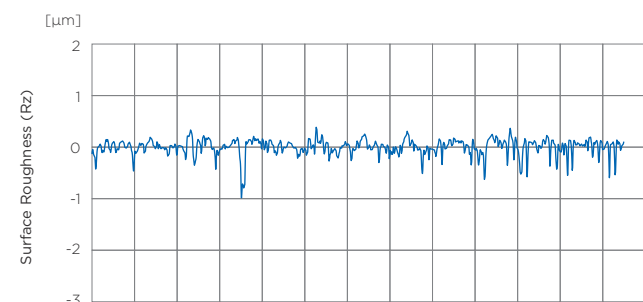
- Comparison of hole wall

NeXEO MDE series

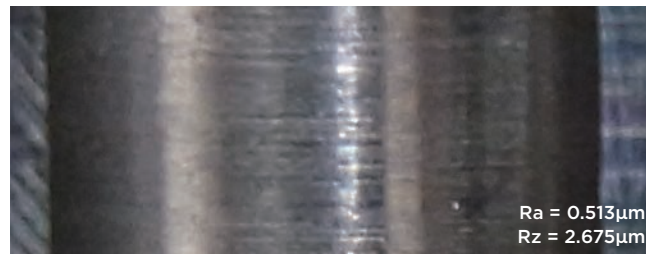


Shiny and good

$R_a = 0.111\mu\text{m}$
 $R_z = 0.926\mu\text{m}$

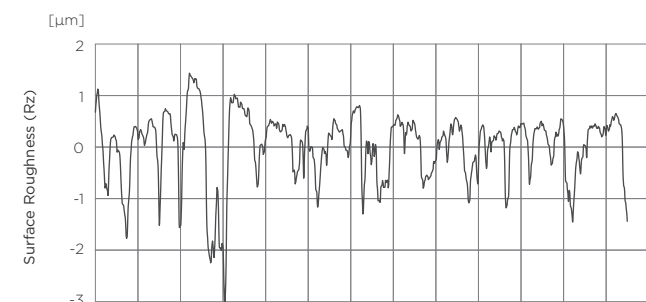


Competitor's powdered HSS drill



Cloudiness due to blemishes

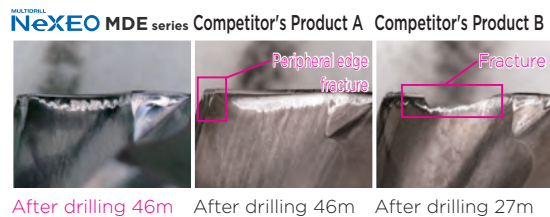
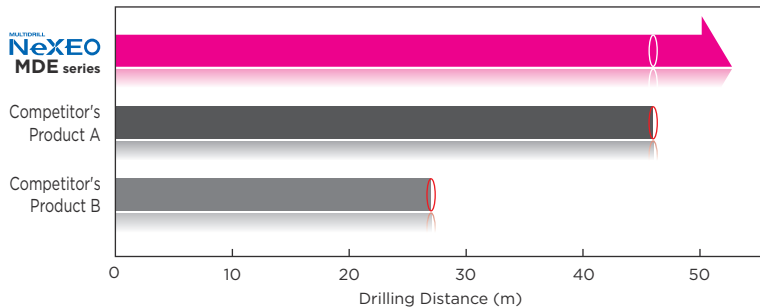
$R_a = 0.513\mu\text{m}$
 $R_z = 2.675\mu\text{m}$



■ Application Examples

High Carbon Steel

ACT100 grade achieves high wear resistance and peripheral edge fracture resistance



Work Material: S50C, Machine: BT30 Vertical Machining Centre, Tool: MDE 0800S08H05 (ø8mmx5D)
 Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.15\text{mm/rev}$, $H = 38\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Low Carbon Steel

Good chip control in low carbon steel drilling



Chips are broken into small pieces

Conventional Drill A

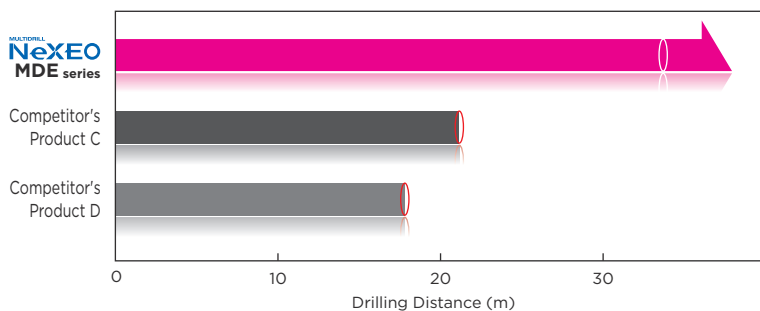


Elongated chips

Work Material: SM material (machine tool frame), Machine: Large double column machining centre, Tool: MDE 1150S12H05 (ø11.5mmx5D)
 Cutting Conditions: $vc = 100\text{m/min}$, $f = 0.25\text{mm/rev}$, Internal Coolant Supply (Water-soluble), Cutting Distance: Approx. 20m per 30 min

Ultra-hard Alloy Steel

ACT100 grade and new edge design prevent workpiece adhesion fracture



Work Material: SCM440H (30HRC), Machine: BT30 vertical machining centre, Tool: MDE 0800S08H05 (ø8mmx5D)
 Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.15\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Stainless Steel

Stable drilling of stainless steel on a lathe



Conventional Drill B



Work Material: SUS310, Machine: NC lathe (workpiece rotates), Tool: MDE 0350S04H05 (ø3.5mmx5D)
 Cutting Conditions: $vc = 40\text{m/min}$, $f = 0.05\text{mm/rev}$, $H = 14\text{mm}$, Internal Coolant Supply (Non-water-soluble), No. of Workpieces: 5,000

Ductile Cast Iron

NX coat reduces margin damage and rake face wear

NeXEO MDE series



Competitor's Product E



Work Material: FCD450, Machine: HSK63 machining centre, Tool: MDE 079S08H05 ($\phi 7.9\text{mm} \times 5\text{D}$), with hole
 Cutting Conditions: $vc = 70\text{m/min}$, $f = 0.1\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble) Cutting Distance: 64m

Frequency of Replacement Compared to Powdered HSS drill

Long tool life approx. 10 times longer than powdered HSS drill

NeXEO MDE series

No. of Workpieces: 12,000 holes



Competitor's Product F: Powdered HSS drill

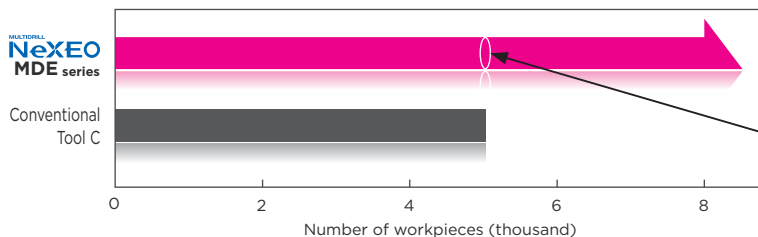
No. of Workpieces: 1,200 holes



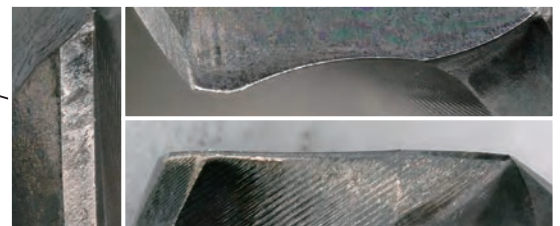
Work Material: S15C (automotive parts), Machine: BT30 small machining centre
 Tool: MDE 0680S07E04 ($\phi 6.8\text{mm} \times 4\text{D}$)
 Cutting Conditions: $vc = 60\text{m/min}$, $f = 0.15\text{mm/rev}$ External Coolant Supply (Non-water-soluble)
 Tool: Competitor's Product F Powdered HSS drill ($\phi 6.8\text{mm} \times 4\text{D}$)
 Cutting Conditions: $vc = 40\text{m/min}$, $f = 0.15\text{mm/rev}$ External Coolant Supply (Non-water-soluble)

Stainless Steel, Small Lathe

Low resistance, good chip control and long, stable tool life



NeXEO MDE series

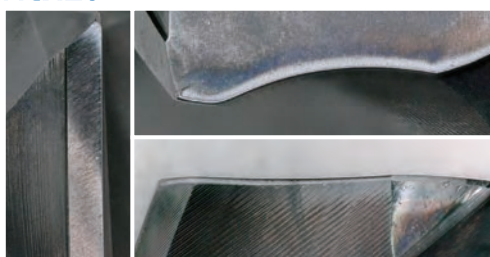


Work Material: SUS316L (95 to 100HRB) (plugs), Machine: Automatic CNC lathe (workpiece rotates), Tool: MDE 0680S07E2 ($\phi 6.8\text{mm} \times 2\text{D}$)
 Cutting Conditions: $vc = 50\text{m/min}$, $f = 0.09\text{mm/rev}$, External Coolant Supply (Non-water-soluble)

High Carbon Steel, Small Machining Centre

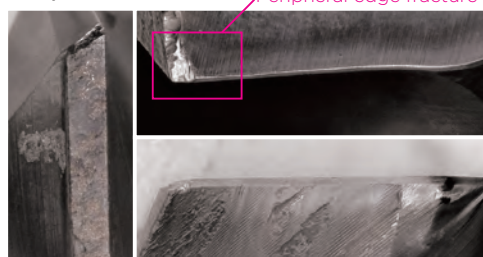
Achieves long and stable tool life even in low feed drilling of high carbon steel

NeXEO MDE series



Competitor's Product G

Peripheral edge fracture



Work Material: S48C, Machine: BT30 small machining centre, Tool: MDE 0830S07E4 ($\phi 8.3\text{mm} \times 4\text{D}$)
 Cutting Conditions: $vc = 30\text{m/min}$, $f = 0.08\text{mm/rev}$, External Coolant Supply (Non-water soluble), No. of Workpieces: 150

● Series expansion of small diameter drills from $\varnothing 1.0\text{mm}$ to 2.9mm

■ Application Examples

Low Carbon Steel

MULTIDRILL
NeXEO MDE series



After drilling 900 holes



Competitor's Product H



After drilling 900 holes



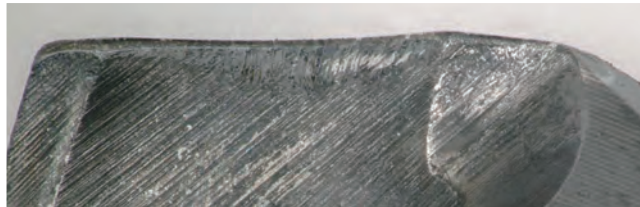
Work Material: SCM415, Machine: BT30 vertical machining centre, Tool: MDE 0100S03H05 ($\varnothing 1.0\text{mm} \times 5\text{D}$), with hole
Cutting Conditions: $vc = 40\text{m/min}$, $f = 0.04\text{mm/rev}$, $H = 5\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Stainless Steel

MULTIDRILL
NeXEO MDE series



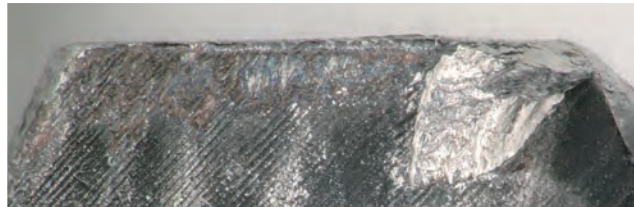
After drilling 3,840 holes



Conventional Drill D



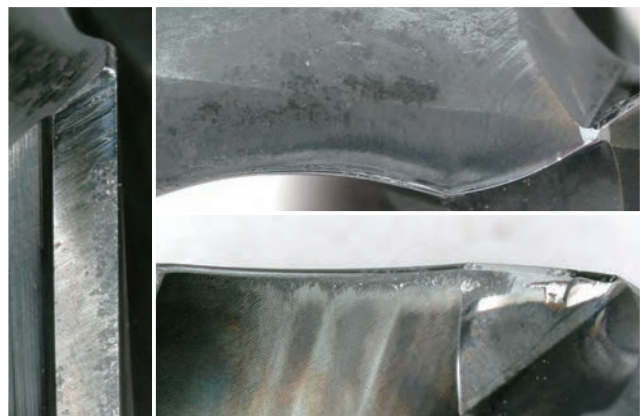
After drilling 3,840 holes



Work Material: SUS304, Machine: BT30 vertical machining centre, Tool: MDE 0200S03H05 ($\varnothing 2.0\text{mm} \times 5\text{D}$), with hole
Cutting Conditions: $vc = 40\text{m/min}$, $f = 0.04\text{mm/rev}$, $H = 10\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

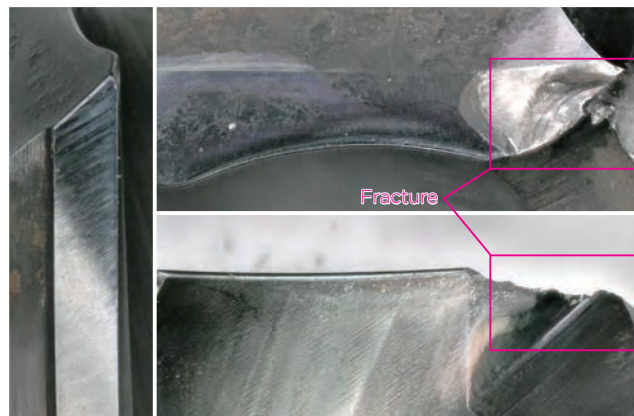
Hole for Press-fitting Bolt in Inner Shaft of Hub

MULTIDRILL
NeXEO MDE series



After drilling 2,500 workpieces (5 holes per workpiece)

Conventional Drill E



After drilling 1,000 workpieces (5 holes per workpiece)

Work Material: S55C equivalent, Machine: Vertical machining centre, Tool: MDE 1397S14E02H ($\varnothing 13.97\text{mm} \times 2\text{D}$)
Cutting Conditions: $vc = 75\text{m/min}$, $f = 0.2\text{mm/rev}$, $H = 15\text{mm}$ (through), External Coolant Supply (Water-soluble)



*For tolerances, refer to Chapter N - References.

Fig 1 (Single margin)

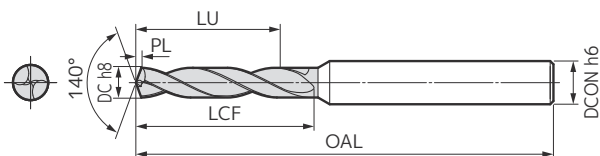
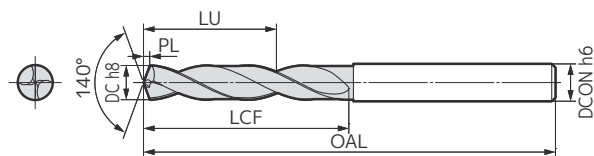


Fig 2 (Single margin)

Diameter $\varnothing 1.0$ to 3.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	2	●	MDE 0100S03E02	5.7	7.2	45.2	0.2	3.0	1
	4	●	0100S03E04	7.7	9.2	49.2	0.2	3.0	1
1.1	2	●	MDE 0110S03E02	5.6	7.2	45.2	0.2	3.0	1
	4	●	0110S03E04	7.6	9.2	49.2	0.2	3.0	1
1.2	2	●	MDE 0120S03E02	6.4	8.2	45.2	0.2	3.0	1
	4	●	0120S03E04	8.4	10.2	49.2	0.2	3.0	1
1.3	2	●	MDE 0130S03E02	6.3	8.2	45.2	0.2	3.0	1
	4	●	0130S03E04	9.3	11.2	49.2	0.2	3.0	1
1.4	2	●	MDE 0140S03E02	7.2	9.3	45.3	0.3	3.0	1
	4	●	0140S03E04	9.2	11.3	49.3	0.3	3.0	1
1.5	2	●	MDE 0150S03E02	7.1	9.3	45.3	0.3	3.0	1
	4	●	0150S03E04	10.1	12.3	49.3	0.3	3.0	1
1.6	2	●	MDE 0160S03E02	7.9	10.3	45.3	0.3	3.0	1
	4	●	0160S03E04	10.9	13.3	49.3	0.3	3.0	1
1.7	2	●	MDE 0170S03E02	7.8	10.3	45.3	0.3	3.0	1
	4	●	0170S03E04	10.8	13.3	49.3	0.3	3.0	1
1.8	2	●	MDE 0180S03E02	8.6	11.3	45.3	0.3	3.0	1
	4	●	0180S03E04	11.6	14.3	49.3	0.3	3.0	1
1.9	2	●	MDE 0190S03E02	8.5	11.3	45.3	0.3	3.0	1
	4	●	0190S03E04	12.5	15.3	49.3	0.3	3.0	1
2.0	2	●	MDE 0200S03E02	9.4	12.4	45.4	0.4	3.0	1
	4	●	0200S03E04	13.4	16.4	49.4	0.4	3.0	1
2.1	2	●	MDE 0210S03E02	9.3	12.4	45.4	0.4	3.0	1
	4	●	0210S03E04	13.3	16.4	49.4	0.4	3.0	1
2.2	2	●	MDE 0220S03E02	10.1	13.4	45.4	0.4	3.0	1
	4	●	0220S03E04	14.1	17.4	49.4	0.4	3.0	1
2.3	2	●	MDE 0230S03E02	10.0	13.4	45.4	0.4	3.0	1
	4	●	0230S03E04	14.0	17.4	49.4	0.4	3.0	1
2.4	2	●	MDE 0240S03E02	10.8	14.4	45.4	0.4	3.0	2
	4	●	0240S03E04	14.8	18.4	49.4	0.4	3.0	2
2.5	2	●	MDE 0250S03E02	10.8	14.5	45.5	0.5	3.0	2
	4	●	0250S03E04	14.8	18.5	49.5	0.5	3.0	2
2.6	2	●	MDE 0260S03E02	11.6	15.5	45.5	0.5	3.0	2
	4	●	0260S03E04	15.6	19.5	49.5	0.5	3.0	2
2.7	2	●	MDE 0270S03E02	11.5	15.5	45.5	0.5	3.0	2
	4	●	0270S03E04	15.5	19.5	49.5	0.5	3.0	2
2.76	2	●	MDE 0276S03E02	11.3	15.5	45.5	0.5	3.0	2
	2	●	0278S03E02	11.3	15.5	45.5	0.5	3.0	2
2.8	2	●	MDE 0280S03E02	11.3	15.5	45.5	0.5	3.0	2
	4	●	0280S03E04	15.3	19.5	49.5	0.5	3.0	2
2.9	2	●	MDE 0290S03E02	11.2	15.5	45.5	0.5	3.0	2
	4	●	0290S03E04	15.2	19.5	49.5	0.5	3.0	2
3.0	2	●	MDE 0300S03E02	9.0	13.5	45.5	0.5	3.0	2
	4	●	0300S03E04	15.0	19.5	49.5	0.5	3.0	2

Grade: ACT100

Diameter $\varnothing 3.1$ to 5.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.1	2	●	MDE 0310S04E02	15.0	19.6	54.6	0.6	4.0	2
	4	●	0310S04E04	20.0	24.6	60.6	0.6	4.0	2
3.2	2	●	MDE 0320S04E02	14.8	19.6	54.6	0.6	4.0	2
	4	●	0320S04E04	19.8	24.6	60.6	0.6	4.0	2
3.3	2	●	MDE 0330S04E02	14.7	19.6	54.6	0.6	4.0	2
	4	●	0330S04E04	19.7	24.6	60.6	0.6	4.0	2
3.4	2	●	MDE 0340S04E02	14.5	19.6	54.6	0.6	4.0	2
	4	●	0340S04E04	19.5	24.6	60.6	0.6	4.0	2
3.5	2	●	MDE 0350S04E02	14.4	19.6	54.6	0.6	4.0	2
	4	●	0350S04E04	19.4	24.6	60.6	0.6	4.0	2
3.6	2	●	MDE 0360S04E02	16.3	21.7	54.7	0.7	4.0	2
	4	●	0360S04E04	22.3	27.7	60.7	0.7	4.0	2
3.66	2	●	MDE 0366S04E02	16.2	21.7	54.7	0.7	4.0	2
	2	●	0368S04E02	16.2	21.7	54.7	0.7	4.0	2
3.7	2	●	MDE 0370S04E02	16.2	21.7	54.7	0.7	4.0	2
	4	●	0370S04E04	22.2	27.7	60.7	0.7	4.0	2
3.8	2	●	MDE 0380S04E02	16.0	21.7	54.7	0.7	4.0	2
	4	●	0380S04E04	22.0	27.7	60.7	0.7	4.0	2
3.9	2	●	MDE 0390S04E02	15.9	21.7	54.7	0.7	4.0	2
	4	●	0390S04E04	21.9	27.7	60.7	0.7	4.0	2
4.0	2	●	MDE 0400S04E02	15.7	21.7	54.7	0.7	4.0	2
	4	●	0400S04E04	21.7	27.7	60.7	0.7	4.0	2
4.1	2	●	MDE 0410S05E02	17.6	23.7	61.7	0.7	5.0	2
	4	●	0410S05E04	25.6	31.7	76.7	0.7	5.0	2
4.2	2	●	MDE 0420S05E02	17.5	23.8	61.8	0.8	5.0	2
	4	●	0420S05E04	25.5	31.8	76.8	0.8	5.0	2
4.3	2	●	MDE 0430S05E02	17.4	23.8	61.8	0.8	5.0	2
	4	●	0430S05E04	25.4	31.8	76.8	0.8	5.0	2
4.4	2	●	MDE 0440S05E02	17.2	23.8	61.8	0.8	5.0	2
	4	●	0440S05E04	25.2	31.8	76.8	0.8	5.0	2
4.5	2	●	MDE 0450S05E02	17.1	23.8	61.8	0.8	5.0	2
	4	●	0450S05E04	25.1	31.8	76.8	0.8	5.0	2
4.6	2	●	MDE 0460S05E02	18.9	25.8	61.8	0.8	5.0	2
	4	●	0460S05E04	31.9	38.8	76.8	0.8	5.0	2
4.62	2	●	MDE 0462S05E02	18.9	25.8	61.8	0.8	5.0	2
	2	●	0464S05E02	18.9	25.8	61.8	0.8	5.0	2
4.7	2	●	MDE 0470S05E02	18.9	25.9	61.9	0.9	5.0	2
	4	●	0470S05E04	31.9	38.9	76.9	0.9	5.0	2
4.8	2	●	MDE 0480S05E02	18.7	25.9	61.9	0.9	5.0	2
	4	●	0480S05E04	31.7	38.9	76.9	0.9	5.0	2
4.9	2	●	MDE 0490S05E02	18.6	25.9	61.9	0.9	5.0	2
	4	●	0490S05E04	31.6	38.9	76.9	0.9	5.0	2
5.0	2	●	MDE 0500S05E02	18.4	25.9	61.9	0.9	5.0	2
	4	●	0500S05E04	31.4	38.9	76.9	0.9	5.0	2

Grade: ACT100

NeXEO MDE-E type (External Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

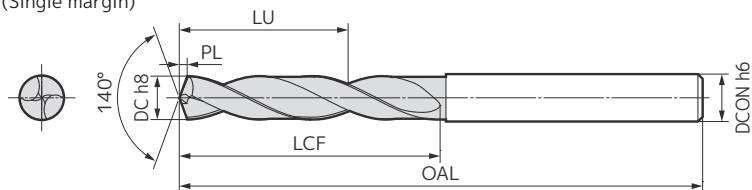
Heat Resistant
Alloy

Cast Iron

Ductile
Cast Iron

*For tolerances, refer to Chapter N - References.

Fig 2 (Single margin)



Diameter ø5.1 to 7.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.1	2	●	MDE 0510S06E02	18.3	25.9	65.9	0.9	6.0	2
	4	●	0510S06E04	32.3	39.9	81.9	0.9	6.0	2
5.2	2	●	MDE 0520S06E02	18.1	25.9	65.9	0.9	6.0	2
	4	●	0520S06E04	32.1	39.9	81.9	0.9	6.0	2
5.3	2	●	MDE 0530S06E02	18.1	26.0	66.0	1.0	6.0	2
	4	●	0530S06E04	32.1	40.0	82.0	1.0	6.0	2
5.4	2	●	MDE 0540S06E02	17.9	26.0	66.0	1.0	6.0	2
	4	●	0540S06E04	31.9	40.0	82.0	1.0	6.0	2
5.5	2	●	MDE 0550S06E02	17.8	26.0	66.0	1.0	6.0	2
	4	●	0550S06E04	31.8	40.0	82.0	1.0	6.0	2
5.52	2	●	MDE 0552S06E02	19.6	28.0	66.0	1.0	6.0	2
	4	●	0554S06E02	19.6	28.0	66.0	1.0	6.0	2
5.6	2	●	MDE 0560S06E02	19.6	28.0	66.0	1.0	6.0	2
	4	●	0560S06E04	33.6	42.0	82.0	1.0	6.0	2
5.7	2	●	MDE 0570S06E02	19.5	28.0	66.0	1.0	6.0	2
	4	●	0570S06E04	33.5	42.0	82.0	1.0	6.0	2
5.8	2	●	MDE 0580S06E02	19.4	28.1	66.1	1.1	6.0	2
	4	●	0580S06E04	33.4	42.1	82.1	1.1	6.0	2
5.9	2	●	MDE 0590S06E02	19.3	28.1	66.1	1.1	6.0	2
	4	●	0590S06E04	33.3	42.1	82.1	1.1	6.0	2
6.0	2	●	MDE 0600S06E02	19.1	28.1	66.1	1.1	6.0	2
	4	●	0600S06E04	33.1	42.1	82.1	1.1	6.0	2
6.1	2	●	MDE 0610S07E02	23.0	32.1	74.1	1.1	7.0	2
	4	●	0610S07E04	34.0	43.1	84.1	1.1	7.0	2
6.2	2	●	MDE 0620S07E02	22.8	32.1	74.1	1.1	7.0	2
	4	●	0620S07E04	33.8	43.1	84.1	1.1	7.0	2
6.3	2	●	MDE 0630S07E02	22.7	32.1	74.1	1.1	7.0	2
	4	●	0630S07E04	33.7	43.1	84.1	1.1	7.0	2
6.4	2	●	MDE 0640S07E02	22.6	32.2	74.2	1.2	7.0	2
	4	●	0640S07E04	33.6	43.2	84.2	1.2	7.0	2
6.5	2	●	MDE 0650S07E02	22.5	32.2	74.2	1.2	7.0	2
	4	●	0650S07E04	33.5	43.2	84.2	1.2	7.0	2
6.6	2	●	MDE 0660S07E02	24.3	34.2	74.2	1.2	7.0	2
	4	●	0660S07E04	34.3	44.2	84.2	1.2	7.0	2
6.7	2	●	MDE 0670S07E02	24.2	34.2	74.2	1.2	7.0	2
	4	●	0670S07E04	34.2	44.2	84.2	1.2	7.0	2
6.8	2	●	MDE 0680S07E02	24.0	34.2	74.2	1.2	7.0	2
	4	●	0680S07E04	34.0	44.2	84.2	1.2	7.0	2
6.9	2	●	MDE 0690S07E02	24.0	34.3	74.3	1.3	7.0	2
	4	●	0690S07E04	34.0	44.3	84.3	1.3	7.0	2
7.0	2	●	MDE 0700S07E02	23.8	34.3	74.3	1.3	7.0	2
	4	●	0700S07E04	33.8	44.3	84.3	1.3	7.0	2
7.1	2	●	MDE 0710S08E02	23.7	34.3	79.3	1.3	8.0	2
	4	●	0710S08E04	35.7	46.3	91.3	1.3	8.0	2

Grade: ACT100

Diameter ø7.2 to 9.1mm

Dimensions (mm)

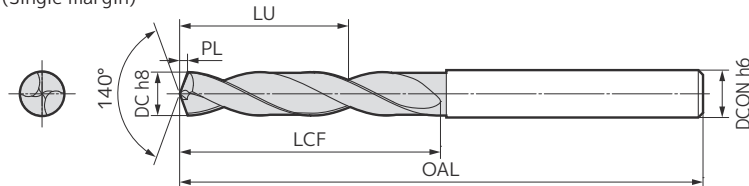
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.2	2	●	MDE 0720S08E02	23.5	34.3	79.3	1.3	8.0	2
	4	●	0720S08E04	35.5	46.3	91.3	1.3	8.0	2
7.3	2	●	MDE 0730S08E02	23.4	34.3	79.3	1.3	8.0	2
	4	●	0730S08E04	35.4	46.3	91.3	1.3	8.0	2
7.36	2	●	MDE 0736S08E02	23.2	34.3	79.3	1.3	8.0	2
	4	●	0738S08E02	23.2	34.3	79.3	1.3	8.0	2
7.4	2	●	MDE 0740S08E02	23.2	34.3	79.3	1.3	8.0	2
	4	●	0740S08E04	35.2	46.3	91.3	1.3	8.0	2
7.5	2	●	MDE 0750S08E02	23.2	34.4	79.4	1.4	8.0	2
	4	●	0750S08E04	35.2	46.4	91.4	1.4	8.0	2
7.52	2	●	MDE 0752S08E02	26.0	37.4	79.4	1.4	8.0	2
	4	●	0754S08E02	26.0	37.4	79.4	1.4	8.0	2
7.6	2	●	MDE 0760S08E02	26.0	37.4	79.4	1.4	8.0	2
	4	●	0760S08E04	38.0	49.4	91.4	1.4	8.0	2
7.7	2	●	MDE 0770S08E02	25.9	37.4	79.4	1.4	8.0	2
	4	●	0770S08E04	37.9	49.4	91.4	1.4	8.0	2
7.8	2	●	MDE 0780S08E02	25.7	37.4	79.4	1.4	8.0	2
	4	●	0780S08E04	37.7	49.4	91.4	1.4	8.0	2
7.9	2	●	MDE 0790S08E02	25.6	37.4	79.4	1.4	8.0	2
	4	●	0790S08E04	37.6	49.4	91.4	1.4	8.0	2
8.0	2	●	MDE 0800S08E02	25.5	37.5	79.5	1.5	8.0	2
	4	●	0800S08E04	37.5	49.5	91.5	1.5	8.0	2
8.1	2	●	MDE 0810S09E02	25.4	37.5	83.5	1.5	9.0	2
	4	●	0810S09E04	42.4	54.5	99.5	1.5	9.0	2
8.2	2	●	MDE 0820S09E02	25.2	37.5	83.5	1.5	9.0	2
	4	●	0820S09E04	42.2	54.5	99.5	1.5	9.0	2
8.3	2	●	MDE 0830S09E02	25.1	37.5	83.5	1.5	9.0	2
	4	●	0830S09E04	42.1	54.5	99.5	1.5	9.0	2
8.4	2	●	MDE 0840S09E02	24.9	37.5	83.5	1.5	9.0	2
	4	●	0840S09E04	41.9	54.5	99.5	1.5	9.0	2
8.5	2	●	MDE 0850S09E02	24.8	37.5	83.5	1.5	9.0	2
	4	●	0850S09E04	41.8	54.5	99.5	1.5	9.0	2
8.6	2	●	MDE 0860S09E02	26.7	39.6	83.6	1.6	9.0	2
	4	●	0860S09E04	43.7	56.6	99.6	1.6	9.0	2
8.7	2	●	MDE 0870S09E02	26.6	39.6	83.6	1.6	9.0	2
	4	●	0870S09E04	43.6	56.6	99.6	1.6	9.0	2
8.8	2	●	MDE 0880S09E02	26.4	39.6	83.6	1.6	9.0	2
	4	●	0880S09E04	43.4	56.6	99.6	1.6	9.0	2
8.9	2	●	MDE 0890S09E02	26.3	39.6	83.6	1.6	9.0	2
	4	●	0890S09E04	43.3	56.6	99.6	1.6	9.0	2
9.0	2	●	MDE 0900S09E02	26.1	39.6	83.6	1.6	9.0	2
	4	●	0900S09E04	43.1	56.6	99.6	1.6	9.0	2
9.1	2	●	MDE 0910S10E02	26.1	39.7	88.7	1.7	10.0	2
	4	●	0910S10E04	46.1	59.7	106.7	1.7	10.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 2 (Single margin)

Diameter $\varnothing 9.2$ to 11.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.2	2	●	MDE 0920S10E02	25.9	39.7	88.7	1.7	10.0	2
	4	●	0920S10E04	45.9	59.7	106.7	1.7	10.0	2
9.24	2	●	MDE 0924S10E02	25.8	39.7	88.7	1.7	10.0	2
9.26	2	●	0926S10E02	25.8	39.7	88.7	1.7	10.0	2
9.3	2	●	MDE 0930S10E02	25.8	39.7	88.7	1.7	10.0	2
	4	●	0930S10E04	45.8	59.7	106.7	1.7	10.0	2
9.36	2	●	MDE 0936S10E02	25.6	39.7	88.7	1.7	10.0	2
9.38	2	●	0938S10E02	25.6	39.7	88.7	1.7	10.0	2
9.4	2	●	MDE 0940S10E02	25.6	39.7	88.7	1.7	10.0	2
	4	●	0940S10E04	45.6	59.7	106.7	1.7	10.0	2
9.5	2	●	MDE 0950S10E02	25.5	39.7	88.7	1.7	10.0	2
	4	●	0950S10E04	45.5	59.7	106.7	1.7	10.0	2
9.52	2	●	MDE 0952S10E02	28.3	42.7	88.7	1.7	10.0	2
9.54	2	●	0954S10E02	28.3	42.7	88.7	1.7	10.0	2
9.6	2	●	MDE 0960S10E02	28.3	42.7	88.7	1.7	10.0	2
	4	●	0960S10E04	47.3	61.7	106.7	1.7	10.0	2
9.7	2	●	MDE 0970S10E02	28.3	42.8	88.8	1.8	10.0	2
	4	●	0970S10E04	47.3	61.8	106.8	1.8	10.0	2
9.8	2	●	MDE 0980S10E02	28.1	42.8	88.8	1.8	10.0	2
	4	●	0980S10E04	47.1	61.8	106.8	1.8	10.0	2
9.9	2	●	MDE 0990S10E02	28.0	42.8	88.8	1.8	10.0	2
	4	●	0990S10E04	47.0	61.8	106.8	1.8	10.0	2
10.0	2	●	MDE 1000S10E02	27.8	42.8	88.8	1.8	10.0	2
	4	●	1000S10E04	46.8	61.8	106.8	1.8	10.0	2
10.1	2	●	MDE 1010S11E02	27.7	42.8	94.8	1.8	11.0	2
	4	●	1010S11E04	52.7	67.8	115.8	1.8	11.0	2
10.2	2	●	MDE 1020S11E02	27.6	42.9	94.9	1.9	11.0	2
	4	●	1020S11E04	52.6	67.9	115.9	1.9	11.0	2
10.3	2	●	MDE 1030S11E02	27.5	42.9	94.9	1.9	11.0	2
	4	●	1030S11E04	52.5	67.9	115.9	1.9	11.0	2
10.4	2	●	MDE 1040S11E02	27.3	42.9	94.9	1.9	11.0	2
	4	●	1040S11E04	52.3	67.9	115.9	1.9	11.0	2
10.5	2	●	MDE 1050S11E02	27.2	42.9	94.9	1.9	11.0	2
	4	●	1050S11E04	52.2	67.9	115.9	1.9	11.0	2
10.6	2	●	MDE 1060S11E02	31.0	46.9	94.9	1.9	11.0	2
	4	●	1060S11E04	54.0	69.9	115.9	1.9	11.0	2
10.7	2	●	MDE 1070S11E02	30.9	46.9	94.9	1.9	11.0	2
	4	●	1070S11E04	53.9	69.9	115.9	1.9	11.0	2
10.8	2	●	MDE 1080S11E02	30.8	47.0	95.0	2.0	11.0	2
	4	●	1080S11E04	53.8	70.0	116.0	2.0	11.0	2
10.9	2	●	MDE 1090S11E02	30.7	47.0	95.0	2.0	11.0	2
	4	●	1090S11E04	53.7	70.0	116.0	2.0	11.0	2
11.0	2	●	MDE 1100S11E02	30.5	47.0	95.0	2.0	11.0	2
	4	●	1100S11E04	53.5	70.0	116.0	2.0	11.0	2

Grade: ACT100

Diameter $\varnothing 11.1$ to 13.0mm

Dimensions (mm)

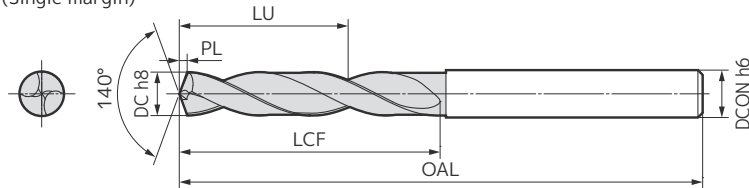
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.1	2	●	MDE 1110S12E02	30.4	47.0	102.0	2.0	12.0	2
	4	●	1110S12E04	56.4	73.0	123.0	2.0	12.0	2
11.2	2	●	MDE 1120S12E02	30.2	47.0	102.0	2.0	12.0	2
	4	●	1120S12E04	56.2	73.0	123.0	2.0	12.0	2
11.22	2	●	MDE 1122S12E02	30.2	47.0	102.0	2.0	12.0	2
11.24	2	●	1124S12E02	30.2	47.0	102.0	2.0	12.0	2
11.3	2	●	MDE 1130S12E02	30.2	47.1	102.1	2.1	12.0	2
	4	●	1130S12E04	56.2	73.1	123.1	2.1	12.0	2
11.36	2	●	MDE 1136S12E02	30.0	47.1	102.1	2.1	12.0	2
11.38	2	●	1138S12E02	30.0	47.1	102.1	2.1	12.0	2
11.4	2	●	MDE 1140S12E02	30.0	47.1	102.1	2.1	12.0	2
	4	●	1140S12E04	56.0	73.1	123.1	2.1	12.0	2
11.5	2	●	MDE 1150S12E02	29.9	47.1	102.1	2.1	12.0	2
	4	●	1150S12E04	55.9	73.1	123.1	2.1	12.0	2
11.6	2	●	MDE 1160S12E02	31.7	49.1	102.1	2.1	12.0	2
	4	●	1160S12E04	57.7	75.1	123.1	2.1	12.0	2
11.7	2	●	MDE 1170S12E02	31.6	49.1	102.1	2.1	12.0	2
	4	●	1170S12E04	57.6	75.1	123.1	2.1	12.0	2
11.8	2	●	MDE 1180S12E02	31.4	49.1	102.1	2.1	12.0	2
	4	●	1180S12E04	57.4	75.1	123.1	2.1	12.0	2
11.9	2	●	MDE 1190S12E02	31.4	49.2	102.2	2.2	12.0	2
	4	●	1190S12E04	57.4	75.2	123.2	2.2	12.0	2
12.0	2	●	MDE 1200S12E02	31.2	49.2	102.2	2.2	12.0	2
	4	●	1200S12E04	57.2	75.2	123.2	2.2	12.0	2
12.1	2	●	MDE 1210S13E02	31.1	49.2	102.2	2.2	13.0	2
	4	●	1210S13E04	60.1	78.2	139.2	2.2	13.0	2
12.2	2	●	MDE 1220S13E02	30.9	49.2	102.2	2.2	13.0	2
	4	●	1220S13E04	59.9	78.2	139.2	2.2	13.0	2
12.3	2	●	MDE 1230S13E02	30.8	49.2	102.2	2.2	13.0	2
	4	●	1230S13E04	59.8	78.2	139.2	2.2	13.0	2
12.4	2	●	MDE 1240S13E02	30.7	49.3	102.3	2.3	13.0	2
	4	●	1240S13E04	59.7	78.3	139.3	2.3	13.0	2
12.5	2	●	MDE 1250S13E02	30.6	49.3	102.3	2.3	13.0	2
	4	●	1250S13E04	59.6	78.3	139.3	2.3	13.0	2
12.6	2	●	MDE 1260S13E02	32.4	51.3	102.3	2.3	13.0	2
	4	●	1260S13E04	61.4	80.3	139.3	2.3	13.0	2
12.7	2	●	MDE 1270S13E02	32.3	51.3	102.3	2.3	13.0	2
	4	●	1270S13E04	61.3	80.3	139.3	2.3	13.0	2
12.8	2	●	MDE 1280S13E02	32.1	51.3	102.3	2.3	13.0	2
	4	●	1280S13E04	61.1	80.3	139.3	2.3	13.0	2
12.9	2	●	MDE 1290S13E02	32.0	51.3	102.3	2.3	13.0	2
	4	●	1290S13E04	61.0	80.3	139.3	2.3	13.0	2
13.0	2	●	MDE 1300S13E02	31.9	51.4	102.4	2.4	13.0	2
	4	●	1300S13E04	60.9	80.4	139.4	2.4	13.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 2 (Single margin)



Diameter ø13.1 to 15.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.1	2	●	MDE 1310S14E02	32.8	52.4	107.4	2.4	14.0	2
	4	●	1310S14E04	66.8	86.4	149.4	2.4	14.0	2
13.2	2	●	MDE 1320S14E02	32.6	52.4	107.4	2.4	14.0	2
	4	●	1320S14E04	66.6	86.4	149.4	2.4	14.0	2
13.3	2	●	MDE 1330S14E02	32.5	52.4	107.4	2.4	14.0	2
	4	●	1330S14E04	66.5	86.4	149.4	2.4	14.0	2
13.4	2	●	MDE 1340S14E02	32.3	52.4	107.4	2.4	14.0	2
	4	●	1340S14E04	66.3	86.4	149.4	2.4	14.0	2
13.5	2	●	MDE 1350S14E02	32.3	52.5	107.5	2.5	14.0	2
	4	●	1350S14E04	66.3	86.5	149.5	2.5	14.0	2
13.6	2	●	MDE 1360S14E02	34.1	54.5	107.5	2.5	14.0	2
	4	●	1360S14E04	68.1	88.5	149.5	2.5	14.0	2
13.7	2	●	MDE 1370S14E02	34.0	54.5	107.5	2.5	14.0	2
	4	●	1370S14E04	68.0	88.5	149.5	2.5	14.0	2
13.8	2	●	MDE 1380S14E02	33.8	54.5	107.5	2.5	14.0	2
	4	●	1380S14E04	67.8	88.5	149.5	2.5	14.0	2
13.9	2	●	MDE 1390S14E02	33.7	54.5	107.5	2.5	14.0	2
	4	●	1390S14E04	67.7	88.5	149.5	2.5	14.0	2
14.0	2	●	MDE 1400S14E02	33.5	54.5	107.5	2.5	14.0	2
	4	●	1400S14E04	67.5	88.5	149.5	2.5	14.0	2
14.1	2	●	MDE 1410S15E02	33.5	54.6	110.6	2.6	15.0	2
	4	●	1410S15E04	70.5	91.6	155.6	2.6	15.0	2
14.2	2	●	MDE 1420S15E02	33.3	54.6	110.6	2.6	15.0	2
	4	●	1420S15E04	70.3	91.6	155.6	2.6	15.0	2
14.3	2	●	MDE 1430S15E02	33.2	54.6	110.6	2.6	15.0	2
	4	●	1430S15E04	70.2	91.6	155.6	2.6	15.0	2
14.4	2	●	MDE 1440S15E02	33.0	54.6	110.6	2.6	15.0	2
	4	●	1440S15E04	70.0	91.6	155.6	2.6	15.0	2
14.5	2	●	MDE 1450S15E02	32.9	54.6	110.6	2.6	15.0	2
	4	●	1450S15E04	69.9	91.6	155.6	2.6	15.0	2
14.6	2	●	MDE 1460S15E02	33.8	55.7	110.7	2.7	15.0	2
	4	●	1460S15E04	71.8	93.7	155.7	2.7	15.0	2
14.7	2	●	MDE 1470S15E02	33.7	55.7	110.7	2.7	15.0	2
	4	●	1470S15E04	71.7	93.7	155.7	2.7	15.0	2
14.8	2	●	MDE 1480S15E02	33.5	55.7	110.7	2.7	15.0	2
	4	●	1480S15E04	71.5	93.7	155.7	2.7	15.0	2
14.9	2	●	MDE 1490S15E02	33.4	55.7	110.7	2.7	15.0	2
	4	●	1490S15E04	71.4	93.7	155.7	2.7	15.0	2
15.0	2	●	MDE 1500S15E02	33.2	55.7	110.7	2.7	15.0	2
	4	●	1500S15E04	71.2	93.7	155.7	2.7	15.0	2
15.1	2	●	MDE 1510S16E02	33.1	55.7	114.7	2.7	16.0	2
	4	●	1510S16E04	74.1	96.7	162.7	2.7	16.0	2
15.2	2	●	MDE 1520S16E02	33.0	55.8	114.8	2.8	16.0	2
	4	●	1520S16E04	74.0	96.8	162.8	2.8	16.0	2

Grade: ACT100

Diameter ø15.3 to 20.0mm

Dimensions (mm)

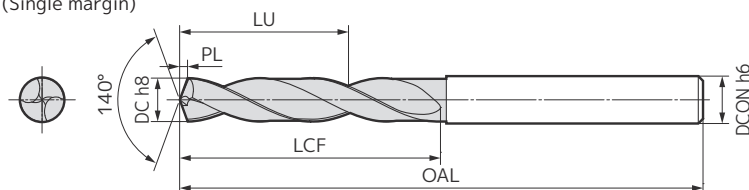
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.3	2	●	MDE 1530S16E02	32.9	55.8	114.8	2.8	16.0	2
	4	●	1530S16E04	73.9	96.8	162.8	2.8	16.0	2
15.4	2	●	MDE 1540S16E02	32.7	55.8	114.8	2.8	16.0	2
	4	●	1540S16E04	73.7	96.8	162.8	2.8	16.0	2
15.5	2	●	MDE 1550S16E02	32.6	55.8	114.8	2.8	16.0	2
	4	●	1550S16E04	73.6	96.8	162.8	2.8	16.0	2
15.6	2	●	MDE 1560S16E02	34.4	57.8	114.8	2.8	16.0	2
	4	●	1560S16E04	75.4	98.8	162.8	2.8	16.0	2
15.7	2	●	MDE 1570S16E02	34.4	57.9	114.9	2.9	16.0	2
	4	●	1570S16E04	75.4	98.9	162.9	2.9	16.0	2
15.8	2	●	MDE 1580S16E02	34.2	57.9	114.9	2.9	16.0	2
	4	●	1580S16E04	75.2	98.9	162.9	2.9	16.0	2
15.9	2	●	MDE 1590S16E02	34.1	57.9	114.9	2.9	16.0	2
	4	●	1590S16E04	75.1	98.9	162.9	2.9	16.0	2
16.0	2	●	MDE 1600S16E02	33.9	57.9	114.9	2.9	16.0	2
	4	●	1600S16E04	74.9	98.9	162.9	2.9	16.0	2
16.5	2	●	MDE 1650S17E02	34.3	59.0	119.0	3.0	17.0	2
	4	●	1650S17E04	76.3	101.0	170.0	3.0	17.0	2
16.8	2	●	MDE 1680S17E04	75.9	101.1	170.1	3.1	17.0	2
	4	●	1700S17E04	75.7	101.2	170.2	3.2	17.0	2
17.0	2	●	MDE 1700S17E02	34.6	60.1	119.1	3.1	17.0	2
	4	●	1700S17E04	75.7	101.2	170.2	3.2	17.0	2
17.5	2	●	MDE 1750S18E02	35.0	61.2	123.2	3.2	18.0	2
	4	●	1750S18E04	77.0	103.2	170.2	3.2	18.0	2
18.0	2	●	MDE 1800S18E02	35.3	62.3	123.3	3.3	18.0	2
	4	●	1800S18E04	78.3	105.3	170.3	3.3	18.0	2
18.5	2	●	MDE 1850S19E02	34.7	62.4	126.4	3.4	19.0	2
	4	●	1850S19E04	79.7	107.4	182.4	3.4	19.0	2
19.0	2	●	MDE 1900S19E02	35.0	63.5	126.5	3.5	19.0	2
	4	●	1900S19E04	80.9	109.4	182.4	3.4	19.0	2
19.5	2	●	MDE 1950S20E02	35.3	64.5	130.5	3.5	20.0	2
	4	●	1950S20E04	84.3	113.5	182.5	3.5	20.0	2
19.7	2	●	MDE 1970S20E04	88.1	117.6	182.6	3.6	20.0	2
	4	●	2000S20E02	35.6	65.6	130.6	3.6	20.0	2
20.0	2	●	MDE 2000S20E02	35.6	65.6	130.6	3.6	20.0	2
	4	●	2000S20E04	87.6	117.6	182.6	3.6	20.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 1 (Single margin)

Diameter $\varnothing 8.8$ to 13.97mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.80	2	●	MDE 0880S09E02H	26.4	39.6	83.6	1.6	9.0	1
10.00	2	●	1000S10E02H	27.8	42.8	88.8	1.8	10.0	1
10.80	2	●	1080S11E02H	30.8	47.0	95.0	2.0	11.0	1
12.04	2	●	1204S13E02H	31.1	49.2	102.2	2.2	13.0	1
12.52	2	●	1252S13E02H	32.4	51.3	102.3	2.3	13.0	1
13.85	2	●	1385S14E02H	33.7	54.5	107.5	2.5	14.0	1
13.92	2	●	1392S14E02H	33.5	54.5	107.5	2.5	14.0	1
13.97	2	●	1397S14E02H	33.5	54.5	107.5	2.5	14.0	1

Grade: ACT100

NeXEO MDE-E type (External Coolant Supply)

Recommended Cutting Conditions (MDE-E type, External Coolant Supply, 2D/4D) Including hub drilling

- The recommended cutting conditions below are for cases where a water soluble coolant is used (excluding drilling of stainless steel).
- Supply sufficient water soluble coolant to the cutting edge.
- If using non-water-soluble coolant, reduce the cutting speed by 20-30% and ensure that sufficient coolant is supplied.
- When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
- Make sure the flute does not enter the collet.
- If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
*If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
- When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material		Mild Steel/Low Carbon Steel SS400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. ≥ ø3	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06
ø2.0		9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08
ø2.5		9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08
ø3.0		8,500	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12
ø4.0		6,400	0.07 to 0.17	6,400	0.07 to 0.17	5,600	0.07 to 0.17	4,800	0.07 to 0.17
ø5.0		5,100	0.08 to 0.20	5,100	0.08 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20
ø6.0		4,300	0.10 to 0.20	4,300	0.10 to 0.20	3,800	0.10 to 0.20	3,200	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.12 to 0.23
ø8.0		3,200	0.15 to 0.25	3,200	0.15 to 0.25	2,800	0.15 to 0.25	2,400	0.15 to 0.25
ø9.0		2,900	0.17 to 0.25	2,900	0.17 to 0.25	2,500	0.17 to 0.25	2,200	0.17 to 0.25
ø10.0		2,600	0.18 to 0.28	2,600	0.18 to 0.28	2,300	0.18 to 0.28	2,000	0.18 to 0.28
ø11.0		2,400	0.20 to 0.30	2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,800	0.20 to 0.30
ø12.0		2,200	0.20 to 0.30	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30
ø14.0		1,900	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30
ø16.0		1,600	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30
ø18.0		1,500	0.20 to 0.30	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30
ø20.0		1,300	0.20 to 0.30	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30
High-efficiency Product		GS series		GS series		GS series		GS series	

Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 up to 270HB		Stainless Steel (oil-based drilling) SUS304/SUS410 up to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		20 to 50m/min		30 to 60m/min	
	Dia. ≥ ø3	60 to 100m/min		50 to 100m/min		20 to 50m/min		30 to 60m/min	
Diameter DC (mm)		Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04
ø2.0		8,000	0.04 to 0.08	8,000	0.04 to 0.08	6,300	0.03 to 0.06	7,100	0.03 to 0.06
ø2.5		9,000	0.04 to 0.08	8,500	0.04 to 0.08	5,100	0.03 to 0.07	5,700	0.03 to 0.06
ø3.0		8,500	0.06 to 0.15	7,500	0.05 to 0.12	4,300	0.05 to 0.10	5,400	0.05 to 0.12
ø4.0		6,400	0.08 to 0.18	5,600	0.07 to 0.17	3,200	0.05 to 0.10	4,000	0.07 to 0.17
ø5.0		5,100	0.10 to 0.20	4,500	0.08 to 0.20	2,600	0.06 to 0.15	3,200	0.08 to 0.20
ø6.0		4,300	0.12 to 0.23	3,800	0.10 to 0.20	2,200	0.06 to 0.15	2,700	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,200	0.12 to 0.23	1,900	0.06 to 0.18	2,300	0.10 to 0.20
ø8.0		3,200	0.18 to 0.25	2,800	0.15 to 0.25	1,600	0.06 to 0.20	2,000	0.12 to 0.25
ø9.0		2,900	0.17 to 0.25	2,500	0.17 to 0.25	1,500	0.08 to 0.20	1,800	0.12 to 0.25
ø10.0		2,600	0.18 to 0.28	2,300	0.18 to 0.28	1,300	0.08 to 0.20	1,600	0.12 to 0.25
ø11.0		2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,200	0.08 to 0.20	1,500	0.15 to 0.30
ø12.0		2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,100	0.10 to 0.25	1,400	0.15 to 0.30
ø14.0		1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,000	0.10 to 0.25	1,200	0.15 to 0.30
ø16.0		1,600	0.20 to 0.30	1,400	0.20 to 0.30	800	0.10 to 0.25	1,000	0.15 to 0.30
ø18.0		1,500	0.20 to 0.30	1,300	0.20 to 0.30	800	0.10 to 0.25	900	0.15 to 0.30
ø20.0		1,300	0.20 to 0.30	1,200	0.20 to 0.30	700	0.10 to 0.25	800	0.15 to 0.30
High-efficiency Product		GS series		GS series		GS series		GS series	



*For tolerances, refer to Chapter N - References.

Fig 1 (Double margin)

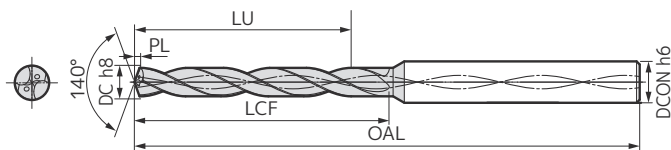
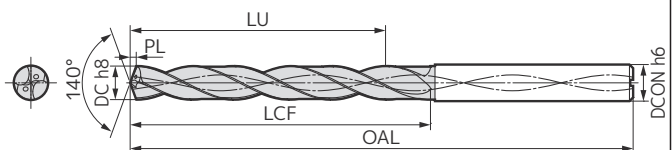


Fig 2 (Double margin)

Diameter $\phi 1.0$ to 2.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	3	●	MDE 0100S03H03	6.7	8.2	57.2	0.2	3.0	1
	5	●	0100S03H05	8.7	10.2	59.2	0.2	3.0	1
	8	●	0100S03H08	11.7	13.2	62.2	0.2	3.0	1
1.1	3	●	MDE 0110S03H03	6.6	8.2	57.2	0.2	3.0	1
	5	●	0110S03H05	8.6	10.2	59.2	0.2	3.0	1
	8	●	0110S03H08	12.6	14.2	62.2	0.2	3.0	1
1.2	3	●	MDE 0120S03H03	7.4	9.2	57.2	0.2	3.0	1
	5	●	0120S03H05	9.4	11.2	59.2	0.2	3.0	1
	8	●	0120S03H08	13.4	15.2	62.2	0.2	3.0	1
1.3	3	●	MDE 0130S03H03	7.3	9.2	57.2	0.2	3.0	1
	5	●	0130S03H05	10.3	12.2	59.2	0.2	3.0	1
	8	●	0130S03H08	14.3	16.2	62.2	0.2	3.0	1
1.4	3	●	MDE 0140S03H03	8.2	10.3	57.3	0.3	3.0	1
	5	●	0140S03H05	11.2	13.3	59.3	0.3	3.0	1
	8	●	0140S03H08	15.2	17.3	62.3	0.3	3.0	1
1.5	3	●	MDE 0150S03H03	9.1	11.3	57.3	0.3	3.0	1
	5	●	0150S03H05	12.1	14.3	59.3	0.3	3.0	1
	8	●	0150S03H08	16.1	18.3	62.3	0.3	3.0	1
1.6	3	●	MDE 0160S03H03	8.9	11.3	59.3	0.3	3.0	1
	5	●	0160S03H05	11.9	14.3	62.3	0.3	3.0	1
	8	●	0160S03H08	16.9	19.3	67.3	0.3	3.0	1
1.7	3	●	MDE 0170S03H03	9.8	12.3	59.3	0.3	3.0	1
	5	●	0170S03H05	12.8	15.3	62.3	0.3	3.0	1
	8	●	0170S03H08	17.8	20.3	67.3	0.3	3.0	1
1.8	3	●	MDE 0180S03H03	9.6	12.3	59.3	0.3	3.0	1
	5	●	0180S03H05	13.6	16.3	62.3	0.3	3.0	1
	8	●	0180S03H08	18.6	21.3	67.3	0.3	3.0	1
1.9	3	●	MDE 0190S03H03	10.5	13.3	59.3	0.3	3.0	1
	5	●	0190S03H05	14.5	17.3	62.3	0.3	3.0	1
	8	●	0190S03H08	19.5	22.3	70.3	0.3	3.0	1
2.0	3	●	MDE 0200S03H03	11.4	14.4	59.4	0.4	3.0	1
	5	●	0200S03H05	15.4	18.4	62.4	0.4	3.0	1
	8	●	0200S03H08	21.4	24.4	70.4	0.4	3.0	1
2.1	3	●	MDE 0210S03H03	11.3	14.4	59.4	0.4	3.0	1
	5	●	0210S03H05	15.3	18.4	62.4	0.4	3.0	1
	8	●	0210S03H08	22.3	25.4	70.4	0.4	3.0	1
2.2	3	●	MDE 0220S03H03	12.1	15.4	59.4	0.4	3.0	1
	5	●	0220S03H05	16.1	19.4	62.4	0.4	3.0	1
	8	●	0220S03H08	23.1	26.4	70.4	0.4	3.0	1
2.3	3	●	MDE 0230S03H03	12.0	15.4	63.4	0.4	3.0	1
	5	●	0230S03H05	17.0	20.4	68.4	0.4	3.0	1
	8	●	0230S03H08	24.0	27.4	75.4	0.4	3.0	1
2.4	3	●	MDE 0240S03H03	12.8	16.4	63.4	0.4	3.0	2
	5	●	0240S03H05	17.8	21.4	68.4	0.4	3.0	2
	8	●	0240S03H08	24.8	28.4	75.4	0.4	3.0	2

Grade: ACT100

Diameter $\phi 2.5$ to 3.7mm

Dimensions (mm)

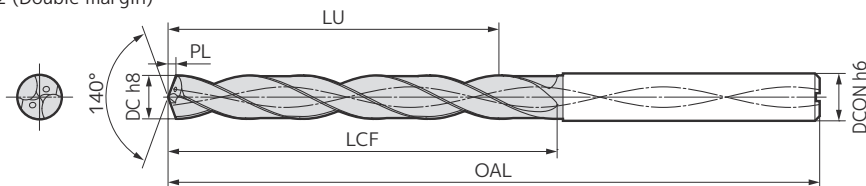
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.5	3	●	MDE 0250S03H03	13.8	17.5	63.5	0.5	3.0	2
	5	●	0250S03H05	18.8	22.5	68.5	0.5	3.0	2
	8	●	0250S03H08	25.8	29.5	75.5	0.5	3.0	2
2.6	3	●	MDE 0260S03H03	13.6	17.5	63.5	0.5	3.0	2
	5	●	0260S03H05	18.6	22.5	68.5	0.5	3.0	2
	8	●	0260S03H08	26.6	30.5	75.5	0.5	3.0	2
2.7	3	●	MDE 0270S03H03	14.5	18.5	68.5	0.5	3.0	2
	5	●	0270S03H05	19.5	23.5	78.5	0.5	3.0	2
	8	●	0270S03H08	27.5	31.5	81.5	0.5	3.0	2
2.76	5	●	MDE 0276S03H05	20.3	24.5	78.5	0.5	3.0	2
	8	●	0278S03H05	20.3	24.5	78.5	0.5	3.0	2
2.8	3	●	MDE 0280S03H03	14.3	18.5	68.5	0.5	3.0	2
	5	●	0280S03H05	20.3	24.5	78.5	0.5	3.0	2
	8	●	0280S03H08	28.3	32.5	81.5	0.5	3.0	2
2.9	3	●	MDE 0290S03H03	15.2	19.5	68.5	0.5	3.0	2
	5	●	0290S03H05	21.2	25.5	78.5	0.5	3.0	2
	8	●	0290S03H08	29.2	33.5	81.5	0.5	3.0	2
3.0	3	●	MDE 0300S03H03	14.0	18.5	68.5	0.5	3.0	2
	5	●	0300S03H05	24.0	28.5	78.5	0.5	3.0	2
	8	●	0300S03H08	29.0	33.5	81.5	0.5	3.0	2
3.1	3	●	MDE 0310S04H03	16.0	20.6	72.6	0.6	4.0	2
	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	2
	8	●	0310S04H08	34.5	39.1	92.6	0.6	4.0	2
3.2	3	●	MDE 0320S04H03	15.8	20.6	72.6	0.6	4.0	2
	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	2
	8	●	0320S04H08	34.3	39.1	92.6	0.6	4.0	2
3.3	3	●	MDE 0330S04H03	15.7	20.6	72.6	0.6	4.0	2
	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	2
	8	●	0330S04H08	34.2	39.1	92.6	0.6	4.0	2
3.4	3	●	MDE 0340S04H03	15.5	20.6	72.6	0.6	4.0	2
	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	2
	8	●	0340S04H08	34.0	39.1	92.6	0.6	4.0	2
3.5	3	●	MDE 0350S04H03	15.4	20.6	72.6	0.6	4.0	2
	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	2
	8	●	0350S04H08	33.9	39.1	92.6	0.6	4.0	2
3.6	3	●	MDE 0360S04H03	17.8	23.2	72.7	0.7	4.0	2
	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	2
	8	●	0360S04H08	39.3	44.7	92.7	0.7	4.0	2
3.66	5	●	MDE 0366S04H05	31.2	36.7	86.7	0.7	4.0	2
	8	●	0368S04H05	31.2	36.7	86.7	0.7	4.0	2
3.7	3	●	MDE 0370S04H03	17.7	23.2	72.7	0.7	4.0	2
	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	2
	8	●	0370S04H08	39.2	44.7	92.7	0.7	4.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 2 (Double margin)

Diameter $\varnothing 3.8$ to 5.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.8	3	●	MDE 0380S04H03	17.5	23.2	72.7	0.7	4.0	2
	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	2
	8	●	0380S04H08	39.0	44.7	92.7	0.7	4.0	2
3.9	3	●	MDE 0390S04H03	17.4	23.2	72.7	0.7	4.0	2
	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	2
	8	●	0390S04H08	38.9	44.7	92.7	0.7	4.0	2
4.0	3	●	MDE 0400S04H03	17.2	23.2	72.7	0.7	4.0	2
	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	2
	8	●	0400S04H08	38.7	44.7	92.7	0.7	4.0	2
4.1	3	●	MDE 0410S05H03	19.6	25.7	80.7	0.7	5.0	2
	5	●	0410S05H05	34.6	40.7	98.7	0.7	5.0	2
	8	●	0410S05H08	44.1	50.2	105.7	0.7	5.0	2
4.2	3	●	MDE 0420S05H03	19.5	25.8	80.8	0.8	5.0	2
	5	●	0420S05H05	34.5	40.8	98.8	0.8	5.0	2
	8	●	0420S05H08	44.0	50.3	105.8	0.8	5.0	2
4.3	3	●	MDE 0430S05H03	19.4	25.8	80.8	0.8	5.0	2
	5	●	0430S05H05	34.4	40.8	98.8	0.8	5.0	2
	8	●	0430S05H08	43.9	50.3	105.8	0.8	5.0	2
4.4	3	●	MDE 0440S05H03	19.2	25.8	80.8	0.8	5.0	2
	5	●	0440S05H05	34.2	40.8	98.8	0.8	5.0	2
	8	●	0440S05H08	43.7	50.3	105.8	0.8	5.0	2
4.5	3	●	MDE 0450S05H03	19.1	25.8	80.8	0.8	5.0	2
	5	●	0450S05H05	34.1	40.8	98.8	0.8	5.0	2
	8	●	0450S05H08	43.6	50.3	105.8	0.8	5.0	2
4.6	3	●	MDE 0460S05H03	21.4	28.3	80.8	0.8	5.0	2
	5	●	0460S05H05	37.9	44.8	98.8	0.8	5.0	2
	8	●	0460S05H08	48.9	55.8	105.8	0.8	5.0	2
4.62	5	●	MDE 0462S05H05	37.9	44.8	98.8	0.8	5.0	2
4.64	5	●	0464S05H05	37.9	44.8	98.8	0.8	5.0	2
4.7	3	●	MDE 0470S05H03	21.4	28.4	80.9	0.9	5.0	2
	5	●	0470S05H05	37.9	44.9	98.9	0.9	5.0	2
	8	●	0470S05H08	48.9	55.9	105.9	0.9	5.0	2
4.8	3	●	MDE 0480S05H03	21.2	28.4	80.9	0.9	5.0	2
	5	●	0480S05H05	37.7	44.9	98.9	0.9	5.0	2
	8	●	0480S05H08	48.7	55.9	105.9	0.9	5.0	2
4.9	3	●	MDE 0490S05H03	21.1	28.4	80.9	0.9	5.0	2
	5	●	0490S05H05	37.6	44.9	98.9	0.9	5.0	2
	8	●	0490S05H08	48.6	55.9	105.9	0.9	5.0	2
5.0	3	●	MDE 0500S05H03	20.9	28.4	80.9	0.9	5.0	2
	5	●	0500S05H05	37.4	44.9	98.9	0.9	5.0	2
	8	●	0500S05H08	48.4	55.9	105.9	0.9	5.0	2
5.1	3	●	MDE 0510S06H03	20.8	28.4	82.9	0.9	6.0	2
	5	●	0510S06H05	37.3	44.9	100.9	0.9	6.0	2
	8	●	0510S06H08	53.8	61.4	118.9	0.9	6.0	2

Grade: ACT100

Diameter $\varnothing 5.2$ to 6.5mm

Dimensions (mm)

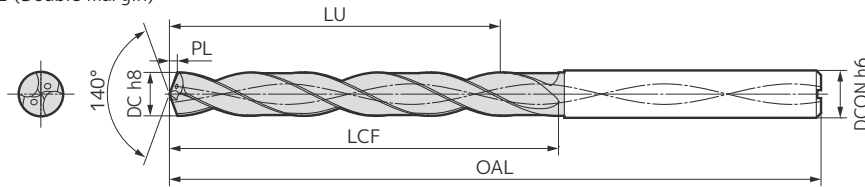
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.2	3	●	MDE 0520S06H03	20.6	28.4	82.9	0.9	6.0	2
	5	●	0520S06H05	37.1	44.9	100.9	0.9	6.0	2
	8	●	0520S06H08	53.6	61.4	118.9	0.9	6.0	2
5.3	3	●	MDE 0530S06H03	20.6	28.5	83.0	1.0	6.0	2
	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	2
	8	●	0530S06H08	53.6	61.5	119.0	1.0	6.0	2
5.4	3	●	MDE 0540S06H03	20.4	28.5	83.0	1.0	6.0	2
	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	2
	8	●	0540S06H08	53.4	61.5	119.0	1.0	6.0	2
5.5	3	●	MDE 0550S06H03	20.3	28.5	83.0	1.0	6.0	2
	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	2
	8	●	0550S06H08	53.3	61.5	119.0	1.0	6.0	2
5.52	5	●	MDE 0552S06H05	40.6	49.0	101.0	1.0	6.0	2
5.54	5	●	0554S06H05	40.6	49.0	101.0	1.0	6.0	2
5.6	3	●	MDE 0560S06H03	22.6	31.0	83.0	1.0	6.0	2
	5	●	0560S06H05	40.6	49.0	101.0	1.0	6.0	2
	8	●	0560S06H08	58.6	67.0	119.0	1.0	6.0	2
5.7	3	●	MDE 0570S06H03	22.5	31.0	83.0	1.0	6.0	2
	5	●	0570S06H05	40.5	49.0	101.0	1.0	6.0	2
	8	●	0570S06H08	58.5	67.0	119.0	1.0	6.0	2
5.8	3	●	MDE 0580S06H03	22.4	31.1	83.1	1.1	6.0	2
	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	2
	8	●	0580S06H08	58.4	67.1	119.1	1.1	6.0	2
5.9	3	●	MDE 0590S06H03	22.3	31.1	83.1	1.1	6.0	2
	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	2
	8	●	0590S06H08	58.3	67.1	119.1	1.1	6.0	2
6.0	3	●	MDE 0600S06H03	22.1	31.1	83.1	1.1	6.0	2
	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	2
	8	●	0600S06H08	58.1	67.1	119.1	1.1	6.0	2
6.1	3	●	MDE 0610S07H03	24.5	33.6	89.1	1.1	7.0	2
	5	●	0610S07H05	44.0	53.1	110.1	1.1	7.0	2
	8	●	0610S07H08	63.5	72.6	131.1	1.1	7.0	2
6.2	3	●	MDE 0620S07H03	24.3	33.6	89.1	1.1	7.0	2
	5	●	0620S07H05	43.8	53.1	110.1	1.1	7.0	2
	8	●	0620S07H08	63.3	72.6	131.1	1.1	7.0	2
6.3	3	●	MDE 0630S07H03	24.2	33.6	89.1	1.1	7.0	2
	5	●	0630S07H05	43.7	53.1	110.1	1.1	7.0	2
	8	●	0630S07H08	63.2	72.6	131.1	1.1	7.0	2
6.4	3	●	MDE 0640S07H03	24.1	33.7	89.2	1.2	7.0	2
	5	●	0640S07H05	43.6	53.2	110.2	1.2	7.0	2
	8	●	0640S07H08	63.1	72.7	131.2	1.2	7.0	2
6.5	3	●	MDE 0650S07H03	24.0	33.7	89.2	1.2	7.0	2
	5	●	0650S07H05	43.5	53.2	110.2	1.2	7.0	2
	8	●	0650S07H08	63.0	72.7	131.2	1.2	7.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 2 (Double margin)

Diameter $\phi 6.6$ to 7.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	3	●	MDE 0660S07H03	26.3	36.2	89.2	1.2	7.0	2
	5	●	0660S07H05	47.3	57.2	110.2	1.2	7.0	2
	8	●	0660S07H08	68.3	78.2	131.2	1.2	7.0	2
6.7	3	●	MDE 0670S07H03	26.2	36.2	89.2	1.2	7.0	2
	5	●	0670S07H05	47.2	57.2	110.2	1.2	7.0	2
	8	●	0670S07H08	68.2	78.2	131.2	1.2	7.0	2
6.8	3	●	MDE 0680S07H03	26.0	36.2	89.2	1.2	7.0	2
	5	●	0680S07H05	47.0	57.2	110.2	1.2	7.0	2
	8	●	0680S07H08	68.0	78.2	131.2	1.2	7.0	2
6.9	3	●	MDE 0690S07H03	26.0	36.3	89.3	1.3	7.0	2
	5	●	0690S07H05	47.0	57.3	110.3	1.3	7.0	2
	8	●	0690S07H08	68.0	78.3	131.3	1.3	7.0	2
7.0	3	●	MDE 0700S07H03	25.8	36.3	89.3	1.3	7.0	2
	5	●	0700S07H05	46.8	57.3	110.3	1.3	7.0	2
	8	●	0700S07H08	67.8	78.3	131.3	1.3	7.0	2
7.1	3	●	MDE 0710S08H03	28.2	38.8	95.3	1.3	8.0	2
	5	●	0710S08H05	50.7	61.3	119.3	1.3	8.0	2
	8	●	0710S08H08	73.2	83.8	143.3	1.3	8.0	2
7.2	3	●	MDE 0720S08H03	28.0	38.8	95.3	1.3	8.0	2
	5	●	0720S08H05	50.5	61.3	119.3	1.3	8.0	2
	8	●	0720S08H08	73.0	83.8	143.3	1.3	8.0	2
7.3	3	●	MDE 0730S08H03	27.9	38.8	95.3	1.3	8.0	2
	5	●	0730S08H05	50.4	61.3	119.3	1.3	8.0	2
	8	●	0730S08H08	72.9	83.8	143.3	1.3	8.0	2
7.36	5	●	MDE 0736S08H05	50.2	61.3	119.3	1.3	8.0	2
7.38	5	●	0738S08H05	50.2	61.3	119.3	1.3	8.0	2
7.4	3	●	MDE 0740S08H03	27.7	38.8	95.3	1.3	8.0	2
	5	●	0740S08H05	50.2	61.3	119.3	1.3	8.0	2
	8	●	0740S08H08	72.7	83.8	143.3	1.3	8.0	2
7.5	3	●	MDE 0750S08H03	27.7	38.9	95.4	1.4	8.0	2
	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	2
	8	●	0750S08H08	72.7	83.9	143.4	1.4	8.0	2
7.52	5	●	MDE 0752S08H05	54.0	65.4	119.4	1.4	8.0	2
7.54	5	●	0754S08H05	54.0	65.4	119.4	1.4	8.0	2
7.6	3	●	MDE 0760S08H03	30.0	41.4	95.4	1.4	8.0	2
	5	●	0760S08H05	54.0	65.4	119.4	1.4	8.0	2
	8	●	0760S08H08	78.0	89.4	143.4	1.4	8.0	2
7.7	3	●	MDE 0770S08H03	29.9	41.4	95.4	1.4	8.0	2
	5	●	0770S08H05	53.9	65.4	119.4	1.4	8.0	2
	8	●	0770S08H08	77.9	89.4	143.4	1.4	8.0	2
7.8	3	●	MDE 0780S08H03	29.7	41.4	95.4	1.4	8.0	2
	5	●	0780S08H05	53.7	65.4	119.4	1.4	8.0	2
	8	●	0780S08H08	77.7	89.4	143.4	1.4	8.0	2

Grade: ACT100

Diameter $\phi 7.9$ to 9.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.9	3	●	MDE 0790S08H03	29.6	41.4	95.4	1.4	8.0	2
	5	●	0790S08H05	53.6	65.4	119.4	1.4	8.0	2
	8	●	0790S08H08	77.6	89.4	143.4	1.4	8.0	2
8.0	3	●	MDE 0800S08H03	29.5	41.5	95.5	1.5	8.0	2
	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	2
	8	●	0800S08H08	77.5	89.5	143.5	1.5	8.0	2
8.1	3	●	MDE 0810S09H03	31.9	44.0	101.5	1.5	9.0	2
	5	●	0810S09H05	57.4	69.5	128.5	1.5	9.0	2
	8	●	0810S09H08	82.9	95.0	155.5	1.5	9.0	2
8.2	3	●	MDE 0820S09H03	31.7	44.0	101.5	1.5	9.0	2
	5	●	0820S09H05	57.2	69.5	128.5	1.5	9.0	2
	8	●	0820S09H08	82.7	95.0	155.5	1.5	9.0	2
8.3	3	●	MDE 0830S09H03	31.6	44.0	101.5	1.5	9.0	2
	5	●	0830S09H05	57.1	69.5	128.5	1.5	9.0	2
	8	●	0830S09H08	82.6	95.0	155.5	1.5	9.0	2
8.4	3	●	MDE 0840S09H03	31.4	44.0	101.5	1.5	9.0	2
	5	●	0840S09H05	56.9	69.5	128.5	1.5	9.0	2
	8	●	0840S09H08	82.4	95.0	155.5	1.5	9.0	2
8.5	3	●	MDE 0850S09H03	31.3	44.0	101.5	1.5	9.0	2
	5	●	0850S09H05	56.8	69.5	128.5	1.5	9.0	2
	8	●	0850S09H08	82.3	95.0	155.5	1.5	9.0	2
8.6	3	●	MDE 0860S09H03	33.7	46.6	101.6	1.6	9.0	2
	5	●	0860S09H05	60.7	73.6	128.6	1.6	9.0	2
	8	●	0860S09H08	87.7	100.6	155.6	1.6	9.0	2
8.7	3	●	MDE 0870S09H03	33.6	46.6	101.6	1.6	9.0	2
	5	●	0870S09H05	60.6	73.6	128.6	1.6	9.0	2
	8	●	0870S09H08	87.6	100.6	155.6	1.6	9.0	2
8.8	3	●	MDE 0880S09H03	33.4	46.6	101.6	1.6	9.0	2
	5	●	0880S09H05	60.4	73.6	128.6	1.6	9.0	2
	8	●	0880S09H08	87.4	100.6	155.6	1.6	9.0	2
8.9	3	●	MDE 0890S09H03	33.3	46.6	101.6	1.6	9.0	2
	5	●	0890S09H05	60.3	73.6	128.6	1.6	9.0	2
	8	●	0890S09H08	87.3	100.6	155.6	1.6	9.0	2
9.0	3	●	MDE 0900S09H03	33.1	46.6	101.6	1.6	9.0	2
	5	●	0900S09H05	60.1	73.6	128.6	1.6	9.0	2
	8	●	0900S09H08	87.1	100.6	155.6	1.6	9.0	2
9.1	3	●	MDE 0910S10H03	35.6	49.2	107.7	1.7	10.0	2
	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	2
	8	●	0910S10H08	92.6	106.2	167.7	1.7	10.0	2
9.2	3	●	MDE 0920S10H03	35.4	49.2	107.7	1.7	10.0	2
	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	2
	8	●	0920S10H08	92.4	106.2	167.7	1.7	10.0	2

Grade: ACT100

NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

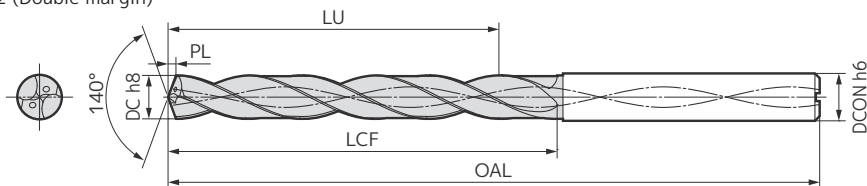
Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
AlloyCopper
Alloy

*For tolerances, refer to Chapter N - References.

Fig 2 (Double margin)



Diameter ø9.24 to 10.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.24	5	●	MDE 0924S10H05	63.8	77.7	137.7	1.7	10.0	2
9.26	5	●	0926S10H05	63.8	77.7	137.7	1.7	10.0	2
9.3	3	●	MDE 0930S10H03	35.3	49.2	107.7	1.7	10.0	2
	5	●	0930S10H05	63.8	77.7	137.7	1.7	10.0	2
	8	●	0930S10H08	92.3	106.2	167.7	1.7	10.0	2
9.36	5	●	MDE 0936S10H05	63.6	77.7	137.7	1.7	10.0	2
9.38	5	●	0938S10H05	63.6	77.7	137.7	1.7	10.0	2
9.4	3	●	MDE 0940S10H03	35.1	49.2	107.7	1.7	10.0	2
	5	●	0940S10H05	63.6	77.7	137.7	1.7	10.0	2
	8	●	0940S10H08	92.1	106.2	167.7	1.7	10.0	2
9.5	3	●	MDE 0950S10H03	35.0	49.2	107.7	1.7	10.0	2
	5	●	0950S10H05	63.5	77.7	137.7	1.7	10.0	2
	8	●	0950S10H08	92.0	106.2	167.7	1.7	10.0	2
9.52	5	●	MDE 0952S10H05	67.3	81.7	137.7	1.7	10.0	2
9.54	5	●	0954S10H05	67.3	81.7	137.7	1.7	10.0	2
9.6	3	●	MDE 0960S10H03	37.3	51.7	107.7	1.7	10.0	2
	5	●	0960S10H05	67.3	81.7	137.7	1.7	10.0	2
	8	●	0960S10H08	97.3	111.7	167.7	1.7	10.0	2
9.7	3	●	MDE 0970S10H03	37.3	51.8	107.8	1.8	10.0	2
	5	●	0970S10H05	67.3	81.8	137.8	1.8	10.0	2
	8	●	0970S10H08	97.3	111.8	167.8	1.8	10.0	2
9.8	3	●	MDE 0980S10H03	37.1	51.8	107.8	1.8	10.0	2
	5	●	0980S10H05	67.1	81.8	137.8	1.8	10.0	2
	8	●	0980S10H08	97.1	111.8	167.8	1.8	10.0	2
9.9	3	●	MDE 0990S10H03	37.0	51.8	107.8	1.8	10.0	2
	5	●	0990S10H05	67.0	81.8	137.8	1.8	10.0	2
	8	●	0990S10H08	97.0	111.8	167.8	1.8	10.0	2
10.0	3	●	MDE 1000S10H03	36.8	51.8	107.8	1.8	10.0	2
	5	●	1000S10H05	66.8	81.8	137.8	1.8	10.0	2
	8	●	1000S10H08	96.8	111.8	167.8	1.8	10.0	2
10.1	3	●	MDE 1010S11H03	39.2	54.3	117.8	1.8	11.0	2
	5	●	1010S11H05	70.7	85.8	150.8	1.8	11.0	2
	8	●	1010S11H08	102.2	117.3	183.8	1.8	11.0	2
10.2	3	●	MDE 1020S11H03	39.1	54.4	117.9	1.9	11.0	2
	5	●	1020S11H05	70.6	85.9	150.9	1.9	11.0	2
	8	●	1020S11H08	102.1	117.4	183.9	1.9	11.0	2
10.3	3	●	MDE 1030S11H03	39.0	54.4	117.9	1.9	11.0	2
	5	●	1030S11H05	70.5	85.9	150.9	1.9	11.0	2
	8	●	1030S11H08	102.0	117.4	183.9	1.9	11.0	2
10.4	3	●	MDE 1040S11H03	38.8	54.4	117.9	1.9	11.0	2
	5	●	1040S11H05	70.3	85.9	150.9	1.9	11.0	2
	8	●	1040S11H08	101.8	117.4	183.9	1.9	11.0	2

Grade: ACT100

Diameter ø10.5 to 11.7mm

Dimensions (mm)

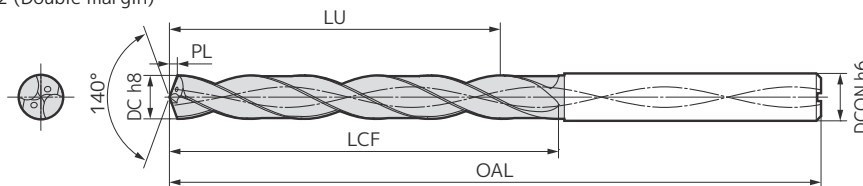
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.5	3	●	MDE 1050S11H03	38.7	54.4	117.9	1.9	11.0	2
	5	●	1050S11H05	70.2	85.9	150.9	1.9	11.0	2
	8	●	1050S11H08	101.7	117.4	183.9	1.9	11.0	2
10.6	3	●	MDE 1060S11H03	41.0	56.9	117.9	1.9	11.0	2
	5	●	1060S11H05	74.0	89.9	150.9	1.9	11.0	2
	8	●	1060S11H08	107.0	122.9	183.9	1.9	11.0	2
10.7	3	●	MDE 1070S11H03	40.9	56.9	117.9	1.9	11.0	2
	5	●	1070S11H05	73.9	89.9	150.9	1.9	11.0	2
	8	●	1070S11H08	106.9	122.9	183.9	1.9	11.0	2
10.8	3	●	MDE 1080S11H03	40.8	57.0	118.0	2.0	11.0	2
	5	●	1080S11H05	73.8	90.0	151.0	2.0	11.0	2
	8	●	1080S11H08	106.8	123.0	184.0	2.0	11.0	2
10.9	3	●	MDE 1090S11H03	40.7	57.0	118.0	2.0	11.0	2
	5	●	1090S11H05	73.7	90.0	151.0	2.0	11.0	2
	8	●	1090S11H08	106.7	123.0	184.0	2.0	11.0	2
11.0	3	●	MDE 1100S11H03	40.5	57.0	118.0	2.0	11.0	2
	5	●	1100S11H05	73.5	90.0	151.0	2.0	11.0	2
	8	●	1100S11H08	106.5	123.0	184.0	2.0	11.0	2
11.1	3	●	MDE 1110S12H03	42.9	59.5	124.0	2.0	12.0	2
	5	●	1110S12H05	77.4	94.0	160.0	2.0	12.0	2
	8	●	1110S12H08	111.9	128.5	196.0	2.0	12.0	2
11.2	3	●	MDE 1120S12H03	42.7	59.5	124.0	2.0	12.0	2
	5	●	1120S12H05	77.2	94.0	160.0	2.0	12.0	2
	8	●	1120S12H08	111.7	128.5	196.0	2.0	12.0	2
11.22	5	●	MDE 1122S12H05	77.2	94.0	160.0	2.0	12.0	2
11.24	5	●	1124S12H05	77.2	94.0	160.0	2.0	12.0	2
11.3	3	●	MDE 1130S12H03	42.7	59.6	124.1	2.1	12.0	2
	5	●	1130S12H05	77.2	94.1	160.1	2.1	12.0	2
	8	●	1130S12H08	111.7	128.6	196.1	2.1	12.0	2
11.36	5	●	MDE 1136S12H05	77.0	94.1	160.1	2.1	12.0	2
11.38	5	●	1138S12H05	77.0	94.1	160.1	2.1	12.0	2
11.4	3	●	MDE 1140S12H03	42.5	59.6	124.1	2.1	12.0	2
	5	●	1140S12H05	77.0	94.1	160.1	2.1	12.0	2
	8	●	1140S12H08	111.5	128.6	196.1	2.1	12.0	2
11.5	3	●	MDE 1150S12H03	42.4	59.6	124.1	2.1	12.0	2
	5	●	1150S12H05	76.9	94.1	160.1	2.1	12.0	2
	8	●	1150S12H08	111.4	128.6	196.1	2.1	12.0	2
11.6	3	●	MDE 1160S12H03	44.7	62.1	124.1	2.1	12.0	2
	5	●	1160S12H05	80.7	98.1	160.1	2.1	12.0	2
	8	●	1160S12H08	116.7	134.1	196.1	2.1	12.0	2
11.7	3	●	MDE 1170S12H03	44.6	62.1	124.1	2.1	12.0	2
	5	●	1170S12H05	80.6	98.1	160.1	2.1	12.0	2
	8	●	1170S12H08	116.6	134.1	196.1	2.1	12.0	2

Grade: ACT100



*For tolerances, refer to Chapter N - References.

Fig 2 (Double margin)

Diameter $\phi 11.8$ to 13.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.8	3	●	MDE 1180S12H03	44.4	62.1	124.1	2.1	12.0	2
	5	●	1180S12H05	80.4	98.1	160.1	2.1	12.0	2
	8	●	1180S12H08	116.4	134.1	196.1	2.1	12.0	2
11.9	3	●	MDE 1190S12H03	44.4	62.2	124.2	2.2	12.0	2
	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	2
	8	●	1190S12H08	116.4	134.2	196.2	2.2	12.0	2
12.0	3	●	MDE 1200S12H03	44.2	62.2	124.2	2.2	12.0	2
	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	2
	8	●	1200S12H08	116.2	134.2	196.2	2.2	12.0	2
12.1	3	●	MDE 1210S13H03	46.6	64.7	130.2	2.2	13.0	2
	5	●	1210S13H05	84.1	102.2	169.2	2.2	13.0	2
	8	●	1210S13H08	121.6	139.7	208.2	2.2	13.0	2
12.2	3	●	MDE 1220S13H03	46.4	64.7	130.2	2.2	13.0	2
	5	●	1220S13H05	83.9	102.2	169.2	2.2	13.0	2
	8	●	1220S13H08	121.4	139.7	208.2	2.2	13.0	2
12.3	3	●	MDE 1230S13H03	46.3	64.7	130.2	2.2	13.0	2
	5	●	1230S13H05	83.8	102.2	169.2	2.2	13.0	2
	8	●	1230S13H08	121.3	139.7	208.2	2.2	13.0	2
12.4	3	●	MDE 1240S13H03	46.2	64.8	130.3	2.3	13.0	2
	5	●	1240S13H05	83.7	102.3	169.3	2.3	13.0	2
	8	●	1240S13H08	121.2	139.8	208.3	2.3	13.0	2
12.5	3	●	MDE 1250S13H03	46.1	64.8	130.3	2.3	13.0	2
	5	●	1250S13H05	83.6	102.3	169.3	2.3	13.0	2
	8	●	1250S13H08	121.1	139.8	208.3	2.3	13.0	2
12.6	3	●	MDE 1260S13H03	48.4	67.3	130.3	2.3	13.0	2
	5	●	1260S13H05	87.4	106.3	169.3	2.3	13.0	2
	8	●	1260S13H08	126.4	145.3	208.3	2.3	13.0	2
12.7	3	●	MDE 1270S13H03	48.3	67.3	130.3	2.3	13.0	2
	5	●	1270S13H05	87.3	106.3	169.3	2.3	13.0	2
	8	●	1270S13H08	126.3	145.3	208.3	2.3	13.0	2
12.8	3	●	MDE 1280S13H03	48.1	67.3	130.3	2.3	13.0	2
	5	●	1280S13H05	87.1	106.3	169.3	2.3	13.0	2
	8	●	1280S13H08	126.1	145.3	208.3	2.3	13.0	2
12.9	3	●	MDE 1290S13H03	48.0	67.3	130.3	2.3	13.0	2
	5	●	1290S13H05	87.0	106.3	169.3	2.3	13.0	2
	8	●	1290S13H08	126.0	145.3	208.3	2.3	13.0	2
13.0	3	●	MDE 1300S13H03	47.9	67.4	130.4	2.4	13.0	2
	5	●	1300S13H05	86.9	106.4	169.4	2.4	13.0	2
	8	●	1300S13H08	125.9	145.4	208.4	2.4	13.0	2
13.1	3	●	MDE 1310S14H03	50.3	69.9	136.4	2.4	14.0	2
	5	●	1310S14H05	90.8	110.4	178.4	2.4	14.0	2
	8	●	1310S14H08	131.3	150.9	220.4	2.4	14.0	2

Grade: ACT100

Diameter $\phi 13.2$ to 14.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.2	3	●	MDE 1320S14H03	50.1	69.9	136.4	2.4	14.0	2
	5	●	1320S14H05	90.6	110.4	178.4	2.4	14.0	2
	8	●	1320S14H08	131.1	150.9	220.4	2.4	14.0	2
13.3	3	●	MDE 1330S14H03	50.0	69.9	136.4	2.4	14.0	2
	5	●	1330S14H05	90.5	110.4	178.4	2.4	14.0	2
	8	●	1330S14H08	131.0	150.9	220.4	2.4	14.0	2
13.4	3	●	MDE 1340S14H03	49.8	69.9	136.4	2.4	14.0	2
	5	●	1340S14H05	90.3	110.4	178.4	2.4	14.0	2
	8	●	1340S14H08	130.8	150.9	220.4	2.4	14.0	2
13.5	3	●	MDE 1350S14H03	49.8	70.0	136.5	2.5	14.0	2
	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	2
	8	●	1350S14H08	130.8	151.0	220.5	2.5	14.0	2
13.6	3	●	MDE 1360S14H03	52.1	72.5	136.5	2.5	14.0	2
	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	2
	8	●	1360S14H08	136.1	156.5	220.5	2.5	14.0	2
13.7	3	●	MDE 1370S14H03	52.0	72.5	136.5	2.5	14.0	2
	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	2
	8	●	1370S14H08	136.0	156.5	220.5	2.5	14.0	2
13.8	3	●	MDE 1380S14H03	51.8	72.5	136.5	2.5	14.0	2
	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	2
	8	●	1380S14H08	135.8	156.5	220.5	2.5	14.0	2
13.9	3	●	MDE 1390S14H03	51.7	72.5	136.5	2.5	14.0	2
	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	2
	8	●	1390S14H08	135.7	156.5	220.5	2.5	14.0	2
14.0	3	●	MDE 1400S14H03	51.5	72.5	136.5	2.5	14.0	2
	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	2
	8	●	1400S14H08	135.5	156.5	220.5	2.5	14.0	2
14.1	3	●	MDE 1410S15H03	54.0	75.1	142.6	2.6	15.0	2
	5	●	1410S15H05	97.5	118.6	187.6	2.6	15.0	2
	8	●	1410S15H08	141.0	162.1	232.6	2.6	15.0	2
14.2	3	●	MDE 1420S15H03	53.8	75.1	142.6	2.6	15.0	2
	5	●	1420S15H05	97.3	118.6	187.6	2.6	15.0	2
	8	●	1420S15H08	140.8	162.1	232.6	2.6	15.0	2
14.3	3	●	MDE 1430S15H03	53.7	75.1	142.6	2.6	15.0	2
	5	●	1430S15H05	97.2	118.6	187.6	2.6	15.0	2
	8	●	1430S15H08	140.7	162.1	232.6	2.6	15.0	2
14.4	3	●	MDE 1440S15H03	53.5	75.1	142.6	2.6	15.0	2
	5	●	1440S15H05	97.0	118.6	187.6	2.6	15.0	2
	8	●	1440S15H08	140.5	162.1	232.6	2.6	15.0	2
14.5	3	●	MDE 1450S15H03	53.4	75.1	142.6	2.6	15.0	2
	5	●	1450S15H05	96.9	118.6	187.6	2.6	15.0	2
	8	●	1450S15H08	140.4	162.1	232.6	2.6	15.0	2

Grade: ACT100

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

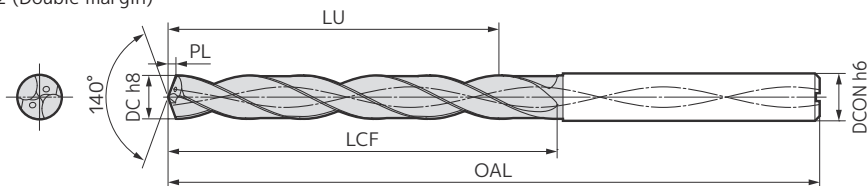
Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
AlloyCopper
Alloy

*For tolerances, refer to Chapter N - References.

Fig 2 (Double margin)



Diameter ø14.6 to 15.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
14.6	3	●	MDE 1460S15H03	55.8	77.7	142.7	2.7	15.0	2
	5	●	1460S15H05	100.8	122.7	187.7	2.7	15.0	2
	8	●	1460S15H08	145.8	167.7	232.7	2.7	15.0	2
14.7	3	●	MDE 1470S15H03	55.7	77.7	142.7	2.7	15.0	2
	5	●	1470S15H05	100.7	122.7	187.7	2.7	15.0	2
	8	●	1470S15H08	145.7	167.7	232.7	2.7	15.0	2
14.8	3	●	MDE 1480S15H03	55.5	77.7	142.7	2.7	15.0	2
	5	●	1480S15H05	100.5	122.7	187.7	2.7	15.0	2
	8	●	1480S15H08	145.5	167.7	232.7	2.7	15.0	2
14.9	3	●	MDE 1490S15H03	55.4	77.7	142.7	2.7	15.0	2
	5	●	1490S15H05	100.4	122.7	187.7	2.7	15.0	2
	8	●	1490S15H08	145.4	167.7	232.7	2.7	15.0	2
15.0	3	●	MDE 1500S15H03	55.2	77.7	142.7	2.7	15.0	2
	5	●	1500S15H05	100.2	122.7	187.7	2.7	15.0	2
	8	●	1500S15H08	145.2	167.7	232.7	2.7	15.0	2
15.1	3	●	MDE 1510S16H03	57.6	80.2	148.7	2.7	16.0	2
	5	●	1510S16H05	104.1	126.7	196.7	2.7	16.0	2
	8	●	1510S16H08	150.6	173.2	244.7	2.7	16.0	2
15.2	3	●	MDE 1520S16H03	57.5	80.3	148.8	2.8	16.0	2
	5	●	1520S16H05	104.0	126.8	196.8	2.8	16.0	2
	8	●	1520S16H08	150.5	173.3	244.8	2.8	16.0	2
15.3	3	●	MDE 1530S16H03	57.4	80.3	148.8	2.8	16.0	2
	5	●	1530S16H05	103.9	126.8	196.8	2.8	16.0	2
	8	●	1530S16H08	150.4	173.3	244.8	2.8	16.0	2
15.4	3	●	MDE 1540S16H03	57.2	80.3	148.8	2.8	16.0	2
	5	●	1540S16H05	103.7	126.8	196.8	2.8	16.0	2
	8	●	1540S16H08	150.2	173.3	244.8	2.8	16.0	2
15.5	3	●	MDE 1550S16H03	57.1	80.3	148.8	2.8	16.0	2
	5	●	1550S16H05	103.6	126.8	196.8	2.8	16.0	2
	8	●	1550S16H08	150.1	173.3	244.8	2.8	16.0	2
15.6	3	●	MDE 1560S16H03	59.4	82.8	148.8	2.8	16.0	2
	5	●	1560S16H05	107.4	130.8	196.8	2.8	16.0	2
	8	●	1560S16H08	155.4	178.8	244.8	2.8	16.0	2
15.7	3	●	MDE 1570S16H03	59.4	82.9	148.9	2.9	16.0	2
	5	●	1570S16H05	107.4	130.9	196.9	2.9	16.0	2
	8	●	1570S16H08	155.4	178.9	244.9	2.9	16.0	2
15.8	3	●	MDE 1580S16H03	59.2	82.9	148.9	2.9	16.0	2
	5	●	1580S16H05	107.2	130.9	196.9	2.9	16.0	2
	8	●	1580S16H08	155.2	178.9	244.9	2.9	16.0	2
15.9	3	●	MDE 1590S16H03	59.1	82.9	148.9	2.9	16.0	2
	5	●	1590S16H05	107.1	130.9	196.9	2.9	16.0	2
	8	●	1590S16H08	155.1	178.9	244.9	2.9	16.0	2

Grade: ACT100

Diameter ø16.0 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
16.0	3	●	MDE 1600S16H03	58.9	82.9	148.9	2.9	16.0	2
	5	●	1600S16H05	106.9	130.9	196.9	2.9	16.0	2
	8	●	1600S16H08	154.9	178.9	244.9	2.9	16.0	2
16.5	3	●	MDE 1650S17H03	60.8	85.5	155.0	3.0	17.0	2
	5	●	1650S17H05	110.3	135.0	206.0	3.0	17.0	2
	8	●	1650S17H08	160.3	185.0	256.0	3.0	17.0	2
17.0	3	●	MDE 1700S17H03	62.6	88.1	155.1	3.1	17.0	2
	5	●	1700S17H05	113.6	139.1	206.1	3.1	17.0	2
	8	●	1700S17H08	163.6	189.1	256.1	3.1	17.0	2
17.5	3	●	MDE 1750S18H03	64.5	90.7	161.2	3.2	18.0	2
	5	●	1750S18H05	116.9	143.2	217.3	3.2	18.0	2
	8	●	1750S18H08	166.9	193.2	267.3	3.2	18.0	2
18.0	3	●	MDE 1800S18H03	66.3	93.3	161.3	3.3	18.0	2
	5	●	1800S18H05	120.3	147.3	217.3	3.3	18.0	2
	8	●	1800S18H08	170.3	197.3	267.3	3.3	18.0	2
18.5	3	●	MDE 1850S19H03	68.2	95.9	167.4	3.4	19.0	2
	5	●	1850S19H05	123.6	151.4	224.4	3.4	19.0	2
	8	●	1850S19H08	173.6	201.4	274.4	3.4	19.0	2
19.0	3	●	MDE 1900S19H03	70.0	98.5	167.5	3.5	19.0	2
	5	●	1900S19H05	127.0	155.5	224.5	3.5	19.0	2
	8	●	1900S19H08	177.0	205.5	274.5	3.5	19.0	2
19.5	3	●	MDE 1950S20H03	71.8	101.0	173.5	3.5	20.0	2
	5	●	1950S20H05	130.3	159.5	233.5	3.5	20.0	2
	8	●	1950S20H08	180.3	209.5	283.5	3.5	20.0	2
20.0	3	●	MDE 2000S20H03	73.6	103.6	173.6	3.6	20.0	2
	5	●	2000S20H05	133.6	163.6	233.6	3.6	20.0	2
	8	●	2000S20H08	183.6	213.6	283.6	3.6	20.0	2

Grade: ACT100

NeXEO MDE-H type (Internal Coolant Supply)

Recommended Cutting Conditions (MDE-H type, internal coolant supply, 3D/5D/8D)

- The recommended cutting conditions below are for cases where a water soluble coolant is used.
- MQL coolant is also usable. Note that external mixing MQL equipment may not generate MQL with a shank diameter (DCON) of $\phi 16\text{mm}$ or more.
- When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
- Make sure the flute does not enter the collet.
- If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
*If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
- When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material		Mild Steel/Low Carbon Steel S4400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	Dia. < $\phi 3$	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. $\geq \phi 3$	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)
$\phi 1.0$	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500
$\phi 1.5$	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500
$\phi 2.0$	9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000
$\phi 2.5$	9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08	7,600
$\phi 3.0$	9,600	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12	6,400
$\phi 4.0$	7,200	0.07 to 0.17	6,400	0.07 to 0.17	5,600	0.07 to 0.17	4,800	0.07 to 0.17	4,800
$\phi 5.0$	5,800	0.08 to 0.20	5,100	0.08 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20	3,900
$\phi 6.0$	4,800	0.10 to 0.20	4,300	0.10 to 0.20	3,800	0.10 to 0.20	3,200	0.10 to 0.20	3,200
$\phi 7.0$	4,100	0.12 to 0.23	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.12 to 0.23	2,800
$\phi 8.0$	3,600	0.12 to 0.25	3,200	0.12 to 0.25	2,800	0.12 to 0.25	2,400	0.12 to 0.25	2,400
$\phi 9.0$	3,200	0.14 to 0.25	2,900	0.14 to 0.25	2,500	0.14 to 0.25	2,200	0.14 to 0.25	2,200
$\phi 10.0$	2,900	0.16 to 0.28	2,600	0.16 to 0.28	2,300	0.16 to 0.28	2,000	0.16 to 0.28	2,000
$\phi 11.0$	2,700	0.18 to 0.30	2,400	0.18 to 0.30	2,100	0.18 to 0.30	1,800	0.18 to 0.30	1,800
$\phi 12.0$	2,400	0.20 to 0.30	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,600
$\phi 14.0$	2,100	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,400
$\phi 16.0$	1,800	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30	1,200
$\phi 18.0$	1,600	0.20 to 0.30	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30	1,100
$\phi 20.0$	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30	1,000
High-efficiency Product		HGS series		HGS series		HGS series		HGS series	

Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 up to 270HB		Stainless Steel SUS304/SUS410 up to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38HRC	
Cutting Speed	Dia. < $\phi 3$	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 60m/min	
	Dia. $\geq \phi 3$	60 to 100m/min		50 to 100m/min		40 to 80m/min		30 to 60m/min	
Diameter DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)
$\phi 1.0$	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03	9,500
$\phi 1.5$	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04	8,500
$\phi 2.0$	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.03 to 0.06	7,100	0.03 to 0.06	7,100
$\phi 2.5$	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.03 to 0.07	5,700	0.03 to 0.06	5,700
$\phi 3.0$	8,500	0.06 to 0.15	7,500	0.05 to 0.12	6,400	0.05 to 0.12	4,800	0.05 to 0.10	4,800
$\phi 4.0$	6,400	0.08 to 0.18	5,600	0.07 to 0.17	4,800	0.07 to 0.17	3,600	0.06 to 0.13	3,600
$\phi 5.0$	5,100	0.10 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20	2,900	0.07 to 0.15	2,900
$\phi 6.0$	4,300	0.12 to 0.23	3,800	0.10 to 0.20	3,200	0.10 to 0.20	2,400	0.08 to 0.18	2,400
$\phi 7.0$	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.10 to 0.23	2,100	0.10 to 0.20	2,100
$\phi 8.0$	3,200	0.18 to 0.25	2,800	0.12 to 0.25	2,400	0.10 to 0.20	1,800	0.12 to 0.22	1,800
$\phi 9.0$	2,900	0.17 to 0.25	2,500	0.14 to 0.25	2,200	0.12 to 0.23	1,600	0.14 to 0.22	1,600
$\phi 10.0$	2,600	0.18 to 0.28	2,300	0.16 to 0.28	2,000	0.12 to 0.23	1,500	0.16 to 0.25	1,500
$\phi 11.0$	2,400	0.20 to 0.30	2,100	0.18 to 0.30	1,800	0.15 to 0.25	1,400	0.18 to 0.28	1,400
$\phi 12.0$	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.15 to 0.25	1,200	0.18 to 0.28	1,200
$\phi 14.0$	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.15 to 0.25	1,100	0.18 to 0.30	1,100
$\phi 16.0$	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.15 to 0.25	900	0.18 to 0.30	900
$\phi 18.0$	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.15 to 0.25	800	0.18 to 0.30	800
$\phi 20.0$	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.15 to 0.25	720	0.18 to 0.30	720
High-efficiency Product		HX series (HY series)		HX series (HY series)		MDM series		HGS series	

*Non-ferrous metal machining is possible with conditions similar to P-class, but we recommend the use of a dedicated drill (MDA series).

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers



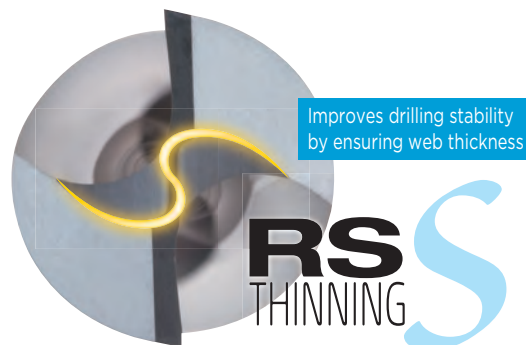
General Features

The flat MULTIDRILL MDF series is a solid carbide drill that can be used for a variety of applications, including high-efficiency flat bottom drilling and drilling in inclined and curved surfaces.

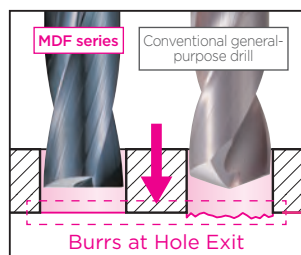


Features and Applications

- **180° point angle design supports a variety of drilling applications**
Suitable for high-efficiency flat bottom drilling, drilling on non-flat surfaces such as inclined and cylindrical surfaces, and interrupted drilling. Also reduces burrs at the hole exit.
- **Improves drilling stability**
Achieves high rigidity by employing RS THINNING, which has a thick web.
- **Excellent chip evacuation**
Achieves excellent chip evacuation thanks to the wide chip pocket and high-quality rake face shape.
- **Excellent cutting edge strength**
Achieves excellent cutting edge strength through optimised cutting edge design.
- **Coolant can now be supplied internally**
This enables deeper drilling.



Reduction of Burrs at Hole Exit

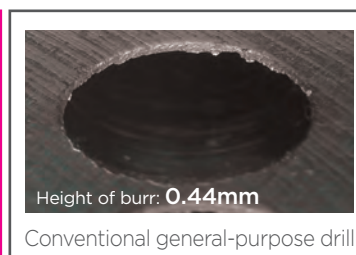


Work Material: SCM415
Machine: BT40 Vertical Machining Centre
Tool: MDF 0500S2D (ø5.0mm x 2D)
Cutting Conditions: VC = 65m/min,
f = 0.12mm/rev,
H = 10mm,
150 holes, Wet

Reduces exit burrs to **half or less** compared with general-purpose drills

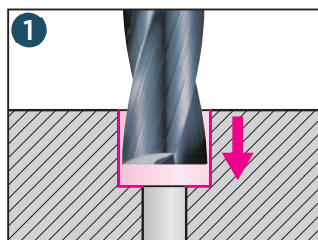


Flat MULTIDRILL MDF series

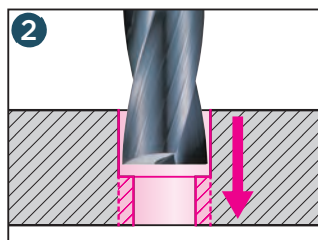


Conventional general-purpose drill

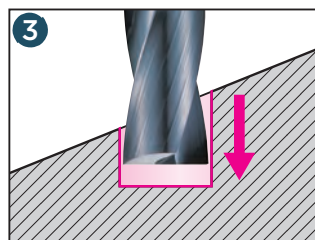
Drilling Applications



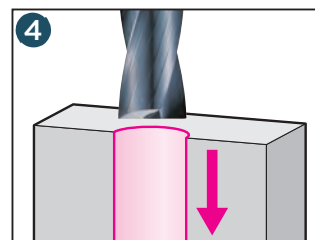
High-efficiency flat bottom drilling



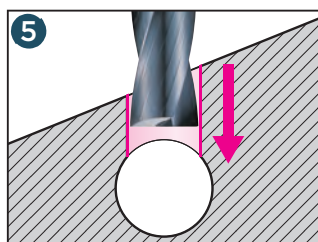
Hole expansion drilling



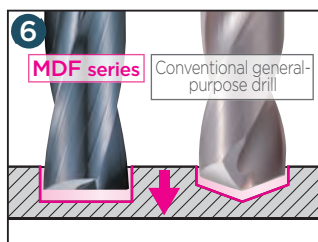
Drilling in non-horizontal surface
(inclined surface, cylindrical surface, etc.)



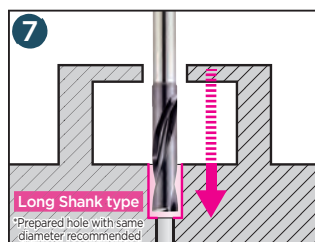
Interrupted drilling



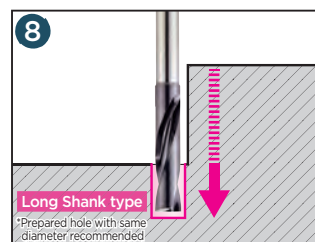
Cross drilling



Pre-tap hole drilling in thin plates



Deep reach flat bottom drilling



Avoids interference with work material

Long shanked type (MDF-L type 2D) for flat bottom drilling, hole expansion and burr control in long overhang conditions

- For deep reach flat bottom drilling and to avoid interference with the work material.

*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed for drilling with the long shank type.

DC < 6mm, stepped shank



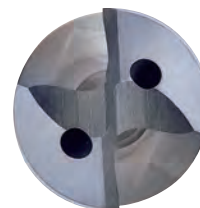
DC ≥ 6mm, relief shank



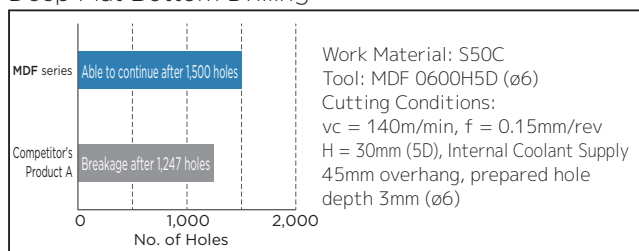
With Oil Hole (MDF-H type 3D/5D) for up to 5D deep hole applications

- Internal coolant supply enables deep flat bottom hole drilling.

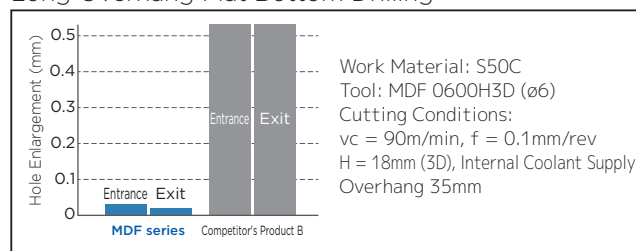
*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed for drilling with an L/D=5 oil hole.



Deep Flat Bottom Drilling



Long Overhang Flat Bottom Drilling



Drilling on slanted surfaces



Prevents burrs and conical remnants on tool withdrawal



■ Distinguishing Flat Drills, General-purpose Drills and Endmills

Tool	Flat Drill MDF series	General-purpose Drill GS/HGS series	Endmill for Flat Bottom Drilling GSXMILL Slot
Shape of hole base			
Drilling in flat surfaces	Approx. 1/2 the feed of a general-purpose drill	Best	Only for low feed 1D or smaller ≤1/5 the feed of a general-purpose drill
Drilling non-flat surfaces	Ideal (2D or smaller recommended)	Not Applicable	Only for low feed 1D or smaller ≤1/2 the feed of a flat drill
Traverse Cutting	Not Applicable	Not Applicable	Best

■ Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Description
External	MDF□□□□S2D	ø0.3 to 20.0	up to 2	188 items in stock
	MDF□□□□L2D	ø3.0 to 20.0	up to 2	115 items in stock
Internal	MDF□□□□H3D	ø3.0 to 16.0	up to 3	99 items in stock
	MDF□□□□H5D	ø3.0 to 16.0	up to 5	99 items in stock

MDF-S type (External Coolant Supply)

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

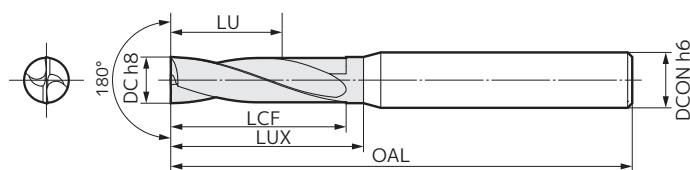
Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

Fig 1

Diameter $\varnothing 0.3$ to 5.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
0.3*	2	●	MDF 0030S2D*	0.7	1.1	1.4	40	3.0	1
0.4*		●	0040S2D*	0.8	1.4	1.7	40	3.0	1
0.5		●	0050S2D	1.3	2.0	2.3	40	3.0	1
0.6		●	0060S2D	1.5	2.4	2.7	40	3.0	1
0.7		●	0070S2D	1.8	2.8	3.1	40	3.0	1
0.8	2	●	0080S2D	2.0	3.2	3.5	40	3.0	1
0.9		●	0090S2D	2.3	3.6	3.9	40	3.0	1
1.0		●	MDF 0100S2D	2.5	4.0	4.3	45	3.0	1
1.1		●	0110S2D	2.8	4.4	4.7	45	3.0	1
1.2		●	0120S2D	3.0	4.8	5.1	45	3.0	1
1.3	2	●	0130S2D	3.3	5.2	5.5	45	3.0	1
1.4		●	0140S2D	3.5	5.6	5.9	45	3.0	1
1.5		●	0150S2D	3.8	6.0	6.3	45	3.0	1
1.6		●	0160S2D	4.0	6.4	6.7	45	3.0	1
1.7		●	0170S2D	4.3	6.8	7.1	45	3.0	1
1.8	2	●	0180S2D	4.5	7.2	7.5	45	3.0	1
1.9		●	0190S2D	4.8	7.6	7.9	45	3.0	1
2.0		●	MDF 0200S2D	5.0	8.0	8.3	50	4.0	1
2.1		●	0210S2D	5.3	8.4	8.7	50	4.0	1
2.2		●	0220S2D	5.5	8.8	9.1	50	4.0	1
2.3	2	●	0230S2D	5.8	9.2	9.5	50	4.0	1
2.4		●	0240S2D	6.0	9.6	9.9	50	4.0	1
2.5		●	0250S2D	6.3	10.0	10.3	50	4.0	1
2.6		●	0260S2D	6.5	10.4	10.7	50	4.0	1
2.7		●	0270S2D	6.8	10.8	11.1	50	4.0	1
2.76	2	●	0276S2D	6.9	11.0	11.3	50	4.0	1
2.78		●	0278S2D	6.9	11.1	11.4	50	4.0	1
2.8		●	0280S2D	7.0	11.2	11.5	50	4.0	1
2.9		●	0290S2D	7.3	11.6	11.9	50	4.0	1
3.0		●	0300S2D	7.5	12.0	12.3	50	6.0	1
3.1	2	●	0310S2D	7.8	12.4	12.7	50	6.0	1
3.2		●	0320S2D	8.0	12.8	13.1	50	6.0	1
3.3		●	0330S2D	8.3	13.2	13.5	50	6.0	1
3.4		●	0340S2D	8.5	13.6	13.9	50	6.0	1
3.5		●	0350S2D	8.8	14.0	14.3	50	6.0	1
3.6	2	●	0360S2D	9.0	14.4	14.7	50	6.0	1
3.66		●	0366S2D	9.1	14.6	14.9	50	6.0	1
3.68		●	0368S2D	9.2	14.7	15.0	50	6.0	1
3.7		●	0370S2D	9.3	14.8	15.1	50	6.0	1
3.8		●	0380S2D	9.5	15.2	15.5	50	6.0	1
3.9	2	●	0390S2D	9.8	15.6	15.9	50	6.0	1
4.0		●	0400S2D	10.0	16.0	16.3	50	6.0	1
4.1		●	MDF 0410S2D	10.3	16.4	16.7	60	6.0	1
4.2		●	0420S2D	10.5	16.8	17.1	60	6.0	1
4.3		●	0430S2D	10.8	17.2	17.5	60	6.0	1
4.4	2	●	0440S2D	11.0	17.6	17.9	60	6.0	1
4.5		●	0450S2D	11.3	18.0	18.3	60	6.0	1
4.6		●	0460S2D	11.5	18.4	18.7	60	6.0	1
4.62		●	0462S2D	11.6	18.5	18.8	60	6.0	1
4.64		●	0464S2D	11.6	18.6	18.9	60	6.0	1
4.7	2	●	0470S2D	11.8	18.8	19.1	60	6.0	1
4.8		●	0480S2D	12.0	19.2	19.5	60	6.0	1
4.9		●	0490S2D	12.3	19.6	19.9	60	6.0	1
5.0		●	0500S2D	12.5	20.0	20.3	60	6.0	1
5.1		●	0510S2D	12.8	20.4	20.7	60	6.0	1

*RS thinning is used for $\varnothing 0.5$ mm and larger sizes.

Grade: ACF75

Diameter $\varnothing 5.2$ to 9.52mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
5.2	2	●	MDF 0520S2D	13.0	20.8	24.2	60	6.0	1
5.3		●	0530S2D	13.3	21.2	24.7	60	6.0	1
5.4		●	0540S2D	13.5	21.6	25.3	60	6.0	1
5.5		●	0550S2D	13.8	22.0	25.9	60	6.0	1
5.52		●	0552S2D	13.8	22.1	26.1	60	6.0	1
5.54	2	●	0554S2D	13.9	22.2	26.2	60	6.0	1
5.6		●	0560S2D	14.0	22.4	26.5	60	6.0	1
5.7		●	0570S2D	14.3	22.8	27.1	60	6.0	1
5.8		●	0580S2D	14.5	23.2	27.6	60	6.0	1
5.9		●	0590S2D	14.8	23.6	28.2	60	6.0	1
6.0	2	●	MDF 0600S2D	15.0	24.0	28.8	60	6.0	1
6.1		●	0610S2D	15.3	24.4	29.4	70	8.0	1
6.2		●	0620S2D	15.5	24.8	29.0	70	8.0	1
6.3		●	0630S2D	15.8	25.2	29.5	70	8.0	1
6.4		●	0640S2D	16.0	25.6	29.1	70	8.0	1
6.5	2	●	0650S2D	16.3	26.0	29.7	70	8.0	1
6.6		●	0660S2D	16.5	26.4	30.3	70	8.0	1
6.7		●	0670S2D	16.8	26.8	30.9	70	8.0	1
6.8		●	0680S2D	17.0	27.2	31.4	70	8.0	1
6.9		●	0690S2D	17.3	27.6	32.0	70	8.0	1
7.0	2	●	0700S2D	17.5	28.0	32.6	70	8.0	1
7.1		●	0710S2D	17.8	28.4	33.2	70	8.0	1
7.2		●	0720S2D	18.0	28.8	33.8	70	8.0	1
7.3		●	0730S2D	18.3	29.2	34.3	70	8.0	1
7.36		●	0736S2D	18.4	29.4	34.7	70	8.0	1
7.38	2	●	0738S2D	18.4	29.5	34.8	70	8.0	1
7.4		●	0740S2D	18.5	29.6	34.9	70	8.0	1
7.5		●	0750S2D	18.8	30.0	35.5	70	8.0	1
7.52		●	0752S2D	18.8	30.1	35.7	70	8.0	1
7.54		●	0754S2D	18.9	30.2	35.8	70	8.0	1
7.6	2	●	0760S2D	19.0	30.4	36.1	70	8.0	1
7.7		●	0770S2D	19.3	30.8	36.7	70	8.0	1
7.8		●	0780S2D	19.5	31.2	37.2	70	8.0	1
7.9		●	0790S2D	19.8	31.6	37.8	70	8.0	1
8.0		●	0800S2D	20.0	32.0	38.4	70	8.0	1
8.1	2	●	MDF 0810S2D	20.3	32.4	37.0	80	10.0	1
8.2		●	0820S2D	20.5	32.8	37.6	80	10.0	1
8.3		●	0830S2D	20.8	33.2	38.1	80	10.0	1
8.4		●	0840S2D	21.0	33.6	38.7	80	10.0	1
8.5		●	0850S2D	21.3	34.0	39.3	80	10.0	1
8.6	2	●	0860S2D	21.5	34.4	39.9	80	10.0	1
8.7		●	0870S2D	21.8	34.8	40.5	80	10.0	1
8.8		●	0880S2D	22.0	35.2	41.0	80	10.0	1
8.9		●	0890S2D	22.3	35.6	41.6	80	10.0	1
9.0		●	0900S2D	22.5	36.0	42.2	80	10.0	1
9.1	2	●	0910S2D	22.8	36.4	42.8	80	10.0	1
9.2		●	0920S2D	23.0	36.8	43.4	80	10.0	1
9.24		●	0924S2D	23.1	37.0	43.6	80	10.0	1
9.26		●	0926S2D	23.1	37.0	43.7	80	10.0	1
9.3		●	0930S2D	23.3	37.2	43.9	80	10.0	1
9.36	2	●	0936S2D	23.4	37.4	44.3	80	10.0	1
9.38		●	0938S2D	23.4	37.5	44.4	80	10.0	1
9.4		●	0940S2D	23.5	37.6	44.5	80	10.0	1
9.5		●	0950S2D	23.8	38.0	45.1	80	10.0	1
9.52		●	0952S2D	23.8	38.1	45.3	80	10.0	1

Grade: ACF75

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

MDF-S type (External Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

Heat Resistant
Alloy

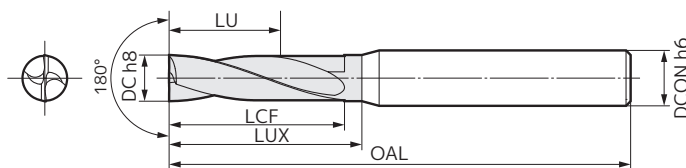
Cast Iron

Ductile
Cast IronAluminum
AlloyPVD
Coat

2D

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø9.54 to 14.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
9.54	2	●	MDF 0954S2D	23.9	38.2	45.4	80	10.0	1
9.6		●	0960S2D	24.0	38.4	45.7	80	10.0	1
9.7		●	0970S2D	24.3	38.8	46.3	80	10.0	1
9.8		●	0980S2D	24.5	39.2	46.8	80	10.0	1
9.9		●	0990S2D	24.8	39.6	47.4	80	10.0	1
10.0		●	1000S2D	25.0	40.0	48.0	80	10.0	1
10.1	2	●	MDF 1010S2D	25.3	40.4	46.6	90	12.0	1
10.2		●	1020S2D	25.5	40.8	47.2	90	12.0	1
10.3		●	1030S2D	25.8	41.2	47.7	90	12.0	1
10.4		●	1040S2D	26.0	41.6	48.3	90	12.0	1
10.5		●	1050S2D	26.3	42.0	48.9	90	12.0	1
10.6		●	1060S2D	26.5	42.4	49.5	90	12.0	1
10.7		●	1070S2D	26.8	42.8	50.1	90	12.0	1
10.8		●	1080S2D	27.0	43.2	50.6	90	12.0	1
10.9		●	1090S2D	27.3	43.6	51.2	90	12.0	1
11.0		●	1100S2D	27.5	44.0	51.8	90	12.0	1
11.1		●	1110S2D	27.8	44.4	52.4	90	12.0	1
11.2		●	1120S2D	28.0	44.8	53.0	90	12.0	1
11.22		●	1122S2D	28.1	44.9	53.1	90	12.0	1
11.24		●	1124S2D	28.1	45.0	53.2	90	12.0	1
11.3		●	1130S2D	28.3	45.2	53.5	90	12.0	1
11.36		●	1136S2D	28.4	45.4	53.9	90	12.0	1
11.38		●	1138S2D	28.4	45.5	54.0	90	12.0	1
11.4		●	1140S2D	28.5	45.6	54.1	90	12.0	1
11.5		●	1150S2D	28.8	46.0	54.7	90	12.0	1
11.6		●	1160S2D	29.0	46.4	55.3	90	12.0	1
11.7		●	1170S2D	29.3	46.8	55.9	90	12.0	1
11.8		●	1180S2D	29.5	47.2	56.4	90	12.0	1
11.9		●	1190S2D	29.8	47.6	57.0	90	12.0	1
12.0		●	1200S2D	30.0	48.0	57.6	90	12.0	1
12.1	2	●	MDF 1210S2D	30.3	48.4	52.3	100	14.0	1
12.2		●	1220S2D	30.5	48.8	52.7	100	14.0	1
12.3		●	1230S2D	30.8	49.2	53.1	100	14.0	1
12.4		●	1240S2D	31.0	49.6	53.6	100	14.0	1
12.5		●	1250S2D	31.3	50.0	54.0	100	14.0	1
12.6		●	1260S2D	31.5	50.4	55.1	100	14.0	1
12.7		●	1270S2D	31.8	50.8	55.5	100	14.0	1
12.8		●	1280S2D	32.0	51.2	55.9	100	14.0	1
12.9		●	1290S2D	32.3	51.6	56.4	100	14.0	1
13.0		●	1300S2D	32.5	52.0	56.8	100	14.0	1
13.1		●	1310S2D	32.8	52.4	57.8	110	14.0	1
13.2		●	1320S2D	33.0	52.8	58.3	110	14.0	1
13.3		●	1330S2D	33.3	53.2	58.7	110	14.0	1
13.4		●	1340S2D	33.5	53.6	59.2	110	14.0	1
13.5		●	1350S2D	33.8	54.0	59.6	110	14.0	1
13.6		●	1360S2D	34.0	54.4	60.6	110	14.0	1
13.7		●	1370S2D	34.3	54.8	61.1	110	14.0	1
13.8		●	1380S2D	34.5	55.2	61.5	110	14.0	1
13.9		●	1390S2D	34.8	55.6	62.0	110	14.0	1
14.0		●	1400S2D	35.0	56.0	62.4	110	14.0	1
14.1	2	●	1410S2D	35.3	56.4	63.4	110	16.0	1
14.2		●	1420S2D	35.5	56.8	63.9	110	16.0	1
14.3		●	1430S2D	35.8	57.2	64.3	110	16.0	1
14.4		●	1440S2D	36.0	57.6	64.8	110	16.0	1
14.5		●	1450S2D	36.3	58.0	65.2	110	16.0	1

Grade: ACF75

Diameter ø14.6 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
14.6	2	●	MDF 1460S2D	36.5	58.4	66.2	110	16.0	1
14.7		●	1470S2D	36.8	58.8	66.6	110	16.0	1
14.8		●	1480S2D	37.0	59.2	67.1	110	16.0	1
14.9		●	1490S2D	37.3	59.6	67.5	110	16.0	1
15.0		●	1500S2D	37.5	60.0	68.0	110	16.0	1
15.1	2	●	MDF 1510S2D	37.8	60.4	69.0	115	16.0	1
15.2		●	1520S2D	38.0	60.8	69.4	115	16.0	1
15.3		●	1530S2D	38.3	61.2	69.9	115	16.0	1
15.4		●	1540S2D	38.5	61.6	70.3	115	16.0	1
15.5		●	1550S2D	38.8	62.0	70.8	115	16.0	1
15.6		●	1560S2D	39.0	62.4	71.8	115	16.0	1
15.7		●	1570S2D	39.3	62.8	72.2	115	16.0	1
15.8		●	1580S2D	39.5	63.2	72.7	115	16.0	1
15.9		●	1590S2D	39.8	63.6	73.1	115	16.0	1
16.0		●	1600S2D	40.0	64.0	73.6	115	16.0	1
16.5	2	●	MDF 1650S2D	41.3	66.0	72.4	125	18.0	1
17.0		●	1700S2D	42.5	68.0	75.2	125	18.0	1
17.5	2	●	MDF 1750S2D	43.8	70.0	78.0	130	18.0	1
18.0		●	1800S2D	45.0	72.0	80.8	130	18.0	1
18.5	2	●	MDF 1850S2D	46.3	74.0	83.6	140	20.0	1
19.0		●	1900S2D	47.5	76.0	86.4	140	20.0	1
19.5		●	1950S2D	48.8	78.0	89.2	140	20.0	1
20.0		●	2000S2D	50.0	80.0	92.0	140	20.0	1

Grade: ACF75

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

MDF-S type (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

1. The recommended hole depth is 2 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
2. The recommended cutting conditions are those for drilling in flat horizontal surfaces.
3. Adjust the feed rate according to the inclination angle when drilling in an inclined surface.

4. Set the feed rate at 70% or lower when the inclination angle is 30° or less.
5. Set the feed rate at 50% or lower when the inclination angle is larger than 30°.
6. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø0.5	n	25,500	22,300	12,700	12,700	25,500	19,000	51,000
	vc	30 - 40 - 50	30 - 35 - 40	15 - 20 - 25	15 - 20 - 25	30 - 40 - 50	20 - 30 - 40	60 - 80 - 100
	f	0.004 - 0.005 - 0.006	0.004 - 0.005 - 0.006	0.001 - 0.002 - 0.003	0.003 - 0.004 - 0.005	0.004 - 0.005 - 0.006	0.001 - 0.003 - 0.005	0.003 - 0.005 - 0.007
ø1.0	n	17,500	14,300	9,500	8,000	17,500	12,700	32,000
	vc	45 - 55 - 65	35 - 45 - 55	20 - 30 - 40	20 - 25 - 30	45 - 55 - 65	30 - 40 - 50	80 - 100 - 120
	f	0.01 - 0.03 - 0.05	0.01 - 0.03 - 0.05	0.002 - 0.006 - 0.01	0.005 - 0.007 - 0.01	0.01 - 0.03 - 0.05	0.005 - 0.01 - 0.015	0.01 - 0.02 - 0.03
ø2.0	n	9,500	8,000	4,800	4,800	9,500	8,800	17,500
	vc	50 - 60 - 70	40 - 50 - 60	20 - 30 - 40	20 - 30 - 40	50 - 60 - 70	45 - 55 - 65	90 - 110 - 130
	f	0.02 - 0.04 - 0.06	0.02 - 0.04 - 0.06	0.01 - 0.018 - 0.025	0.01 - 0.015 - 0.02	0.02 - 0.04 - 0.06	0.015 - 0.03 - 0.045	0.03 - 0.05 - 0.07
ø4.0	n	6,000	5,200	3,400	2,400	6,000	5,200	8,800
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 40	60 - 75 - 90	55 - 65 - 75	90 - 110 - 130
	f	0.06 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.06 - 0.08 - 0.10
ø6.0	n	4,000	3,400	1,600	1,600	4,000	3,700	5,800
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.04 - 0.06 - 0.08	0.03 - 0.04 - 0.05	0.05 - 0.10 - 0.15	0.06 - 0.09 - 0.12	0.05 - 0.10 - 0.15
ø8.0	n	3,000	2,600	1,200	1,200	3,000	2,800	4,400
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.10 - 0.15 - 0.20	0.10 - 0.15 - 0.20	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.10 - 0.15 - 0.20	0.10 - 0.12 - 0.15	0.10 - 0.15 - 0.20
ø10.0	n	2,400	2,100	950	950	2,400	2,200	3,500
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.12 - 0.17 - 0.22	0.12 - 0.17 - 0.22	0.08 - 0.10 - 0.12	0.06 - 0.08 - 0.10	0.12 - 0.17 - 0.22	0.12 - 0.15 - 0.18	0.12 - 0.17 - 0.22
ø12.0	n	2,000	1,700	800	800	2,000	1,900	2,900
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.15 - 0.20 - 0.25	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.18	0.08 - 0.10 - 0.12	0.15 - 0.20 - 0.25	0.15 - 0.18 - 0.20	0.15 - 0.20 - 0.25
ø16.0	n	1,500	1,300	600	600	1,500	1,400	2,200
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.14 - 0.17 - 0.20	0.10 - 0.15 - 0.20	0.17 - 0.22 - 0.27	0.15 - 0.20 - 0.25	0.20 - 0.25 - 0.30
ø20.0	n	1,200	1,000	480	480	1,200	1,100	1,750
	vc	60 - 75 - 90	50 - 65 - 80	20 - 30 - 40	20 - 30 - 50	60 - 75 - 90	60 - 70 - 80	90 - 110 - 130
	f	0.25 - 0.30 - 0.35	0.25 - 0.30 - 0.35	0.16 - 0.19 - 0.22	0.15 - 0.20 - 0.25	0.25 - 0.30 - 0.35	0.20 - 0.25 - 0.30	0.25 - 0.30 - 0.35

* If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
In this case, the tool life may be shortened.

Min. - **Optimum** - Max.

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

J30

MDF-L type Long Shank (External Coolant Supply)

Carbon Steel Alloy Steel up to 0.28%
Carbon Steel Alloy Steel from 0.29%
Tempered Steel
Hardened Steel up to 45HRC
Stainless Steel
Cast Iron
Ductile Cast Iron
Aluminum Alloy



*For tolerances, refer to Chapter N - References.

Fig 1 (DC ≤ DCON)

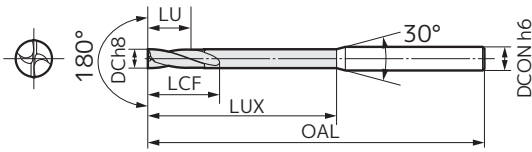
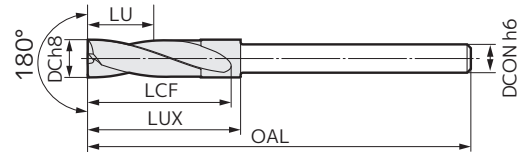


Fig 2 (DC > DCON)



Diameter ø3.0 to 8.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
3.0	2	●	MDF 0300L2D	9.0	13.5	30.0	100	6.0	1
3.1	2	●	0310L2D	9.4	14.0	31.0	100	6.0	1
3.2	2	●	0320L2D	9.6	14.4	32.0	100	6.0	1
3.3	2	●	0330L2D	10.0	14.9	33.0	100	6.0	1
3.4	2	●	0340L2D	10.2	15.3	34.0	100	6.0	1
3.5	2	●	0350L2D	10.6	15.8	35.0	100	6.0	1
3.6	2	●	0360L2D	10.8	16.2	36.0	100	6.0	1
3.7	2	●	0370L2D	11.2	16.7	37.0	100	6.0	1
3.8	2	●	0380L2D	11.4	17.1	38.0	100	6.0	1
3.9	2	●	0390L2D	11.8	17.6	39.0	100	6.0	1
4.0	2	●	0400L2D	12.0	18.0	40.0	100	6.0	1
4.1	2	●	0410L2D	12.4	18.5	41.0	100	6.0	1
4.2	2	●	0420L2D	12.6	18.9	42.0	100	6.0	1
4.3	2	●	0430L2D	13.0	19.4	43.0	100	6.0	1
4.4	2	●	0440L2D	13.2	19.8	44.0	100	6.0	1
4.5	2	●	0450L2D	13.6	20.3	45.0	100	6.0	1
4.6	2	●	0460L2D	13.8	20.7	46.0	100	6.0	1
4.7	2	●	0470L2D	14.2	21.2	47.0	100	6.0	1
4.8	2	●	0480L2D	14.4	21.6	48.0	100	6.0	1
4.9	2	●	0490L2D	14.8	22.1	49.0	100	6.0	1
5.0	2	●	0500L2D	15.0	22.5	50.0	100	6.0	1
5.1	2	●	MDF 0510L2D	15.4	23.0	51.0	110	6.0	1
5.2	2	●	0520L2D	15.6	23.4	52.0	110	6.0	1
5.3	2	●	0530L2D	16.0	23.9	53.0	110	6.0	1
5.4	2	●	0540L2D	16.2	24.3	54.0	110	6.0	1
5.5	2	●	0550L2D	16.6	24.8	55.0	110	6.0	1
5.6	2	●	0560L2D	16.8	25.2	56.0	110	6.0	1
5.7	2	●	0570L2D	17.2	25.7	57.0	110	6.0	1
5.8	2	●	0580L2D	17.4	26.1	58.0	110	6.0	1
5.9	2	●	0590L2D	17.8	26.6	59.0	110	6.0	1
6.0	2	●	MDF 0600L2D-S5	18.0	27.0	60.0	110	5.0	1
6.0	2	●	MDF 0600L2D	18.0	27.0	60.0	110	6.0	1
6.1	2	●	MDF 0610L2D	18.4	27.5	61.0	120	6.0	2
6.2	2	●	0620L2D	18.6	27.9	62.0	120	6.0	2
6.3	2	●	0630L2D	19.0	28.4	63.0	120	6.0	2
6.4	2	●	0640L2D	19.2	28.8	64.0	120	6.0	2
6.5	2	●	0650L2D	19.6	29.3	65.0	120	6.0	2
6.6	2	●	0660L2D	19.8	29.7	66.0	120	6.0	2
6.7	2	●	0670L2D	20.2	30.2	67.0	120	6.0	2
6.8	2	●	0680L2D	20.4	30.6	68.0	120	6.0	2
6.9	2	●	0690L2D	20.8	31.1	69.0	120	6.0	2
7.0	2	●	0700L2D	21.0	31.5	70.0	120	6.0	2
7.1	2	●	MDF 0710L2D	21.4	32.0	71.0	130	6.0	2
7.2	2	●	0720L2D	21.6	32.4	72.0	130	6.0	2
7.3	2	●	0730L2D	22.0	32.9	73.0	130	6.0	2
7.4	2	●	0740L2D	22.2	33.3	74.0	130	6.0	2
7.5	2	●	0750L2D	22.6	33.8	75.0	130	6.0	2
7.6	2	●	0760L2D	22.8	34.2	76.0	130	6.0	2
7.7	2	●	0770L2D	23.2	34.7	77.0	130	6.0	2
7.8	2	●	0780L2D	23.4	35.1	78.0	130	6.0	2
7.9	2	●	0790L2D	23.8	35.6	79.0	130	6.0	2
8.0	2	●	0800L2D-S6	24.0	36.0	80.0	130	6.0	2
8.0	2	●	MDF 0800L2D	24.0	36.0	80.0	130	8.0	1
8.1	2	●	MDF 0810L2D	24.4	36.5	81.0	140	8.0	2
8.2	2	●	0820L2D	24.6	36.9	82.0	140	8.0	2
8.3	2	●	0830L2D	25.0	37.4	83.0	140	8.0	2
8.4	2	●	0840L2D	25.2	37.8	84.0	140	8.0	2
8.5	2	●	0850L2D	25.6	38.3	85.0	140	8.0	2

Grade: ACF75

Diameter ø8.6 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
8.6	2	●	MDF 0860L2D	25.8	38.7	41.7	140	8.0	2
8.7	2	●	0870L2D	26.2	39.2	42.2	140	8.0	2
8.8	2	●	0880L2D	26.4	39.6	42.6	140	8.0	2
8.9	2	●	0890L2D	26.8	40.1	43.1	140	8.0	2
9.0	2	●	0900L2D	27.0	40.5	43.5	140	8.0	2
9.1	2	●	MDF 0910L2D	27.4	41.0	44.0	150	8.0	2
9.2	2	●	0920L2D	27.6	41.4	44.4	150	8.0	2
9.3	2	●	0930L2D	28.0	41.9	44.9	150	8.0	2
9.4	2	●	0940L2D	28.2	42.3	45.3	150	8.0	2
9.5	2	●	0950L2D	28.6	42.8	45.8	150	8.0	2
9.6	2	●	0960L2D	28.8	43.2	46.2	150	8.0	2
9.7	2	●	0970L2D	29.2	43.7	46.7	150	8.0	2
9.8	2	●	0980L2D	29.4	44.1	47.1	150	8.0	2
9.9	2	●	0990L2D	29.8	44.6	47.6	150	8.0	2
10.0	2	●	1000L2D-S8	30.0	45.0	48.0	150	8.0	2
10.0	2	●	MDF 1000L2D	30.0	45.0	100.0	150	10.0	1
10.1	2	●	MDF 1010L2D	30.4	45.5	48.5	160	10.0	2
10.2	2	●	1020L2D	30.6	45.9	48.9	160	10.0	2
10.3	2	●	1030L2D	31.0	46.4	49.4	160	10.0	2
10.4	2	●	1040L2D	31.2	46.8	49.8	160	10.0	2
10.5	2	●	1050L2D	31.6	47.3	50.3	160	10.0	2
10.6	2	●	1060L2D	31.8	47.7	50.7	160	10.0	2
10.7	2	●	1070L2D	32.2	48.2	51.2	160	10.0	2
10.8	2	●	1080L2D	32.4	48.6	51.6	160	10.0	2
10.9	2	●	1090L2D	32.8	49.1	52.1	160	10.0	2
11.0	2	●	1100L2D	33.0	49.5	52.5	160	10.0	2
11.1	2	●	MDF 1110L2D	33.4	50.0	53.0	170	10.0	2
11.2	2	●	1120L2D	33.6	50.4	53.4	160	10.0	2
11.3	2	●	1130L2D	34.0	50.9	53.9	160	10.0	2
11.4	2	●	1140L2D	34.2	51.3	54.3	160	10.0	2
11.5	2	●	1150L2D	34.6	51.8	54.8	160	10.0	2
11.6	2	●	1160L2D	34.8	52.2	55.2	160	10.0	2
11.7	2	●	1170L2D	35.2	52.7	55.7	160	10.0	2
11.8	2	●	1180L2D	35.4	53.1	56.1	160	10.0	2
11.9	2	●	1190L2D	35.8	53.6	56.6	160	10.0	2
12.0	2	●	1200L2D-S10	36.0	54.0	57.0	160	10.0	2
12.0	2	●	MDF 1200L2D	36.0	54.0	120.0	170	12.0	1
12.5	2	●	MDF 1250L2D	37.6	56.3	59.3	180	12.0	2
13.0	2	●	1300L2D	39.0	58.5	61.5	180	12.0	2
13.5	2	●	MDF 1350L2D	40.6	60.8	63.8	190	12.0	2
14.0	2	●	1400L2D-S12	42.0	63.0	66.0	190	12.0	2
14.0	2	●	MDF 1400L2D	42.0	63.0	140.0	190	14.0	2
14.5	2	●	MDF 1450L2D	43.6	65.3	68.3	200	14.0	2
15.0	2	●	1500L2D	45.0	67.5	70.5	200	14.0	2
15.5	2	●	MDF 1550L2D	46.6	69.8	72.8	210	14.0	2
16.0	2	●	1600L2D-S14	48.0	72.0	75.0	210	14.0	2
16.0	2	●	MDF 1600L2D	48.0	72.0	160.0	210	16.0	1
16.5	2	●	MDF 1650L2D	49.6	74.3	77.3	220	16.0	2
17.0	2	●	1700L2D	51.0	76.5	79.5	220	16.0	2
17.5	2	●	MDF 1750L2D	52.6	78.8	81.8	230	16.0	2
18.0	2	●	1800L2D-S16	54.0	81.0	84.0	230	16.0	2
18.0	2	●	MDF 1800L2D	54.0	81.0	180.0	230	18.0	1
18.5	2	●	MDF 1850L2D	55.6	83.3	86.3	240	18.0	2
19.0	2	●	1900L2D	57.0	85.5	88.5	240	18.0	2
19.5	2	●	MDF 1950L2D	58.6	87.8	90.8	250	18.0	2
20.0	2	●	2000L2D-S18	60.0	90.0	93.0	250	18.0	2
20.0	2	●	MDF 2000L2D	60.0	90.0	200.0	250	20.0	1

Grade: ACF75

A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

MDF-L type Long Shank (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

1. A prepared hole with the same diameter is needed for drilling with this tool.
2. The cutting conditions are recommended when there is a prepared hole with the same diameter.

3. The recommended hole depth is 5 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø4.0	n	6,400	5,600	3,400	2,400	6,800	6,000	8,800
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 40	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.06 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.06 - 0.08 - 0.10
ø6.0	n	4,200	3,700	1,600	1,600	4,500	4,000	5,800
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.04 - 0.06 - 0.08	0.03 - 0.04 - 0.05	0.05 - 0.10 - 0.15	0.06 - 0.09 - 0.12	0.05 - 0.10 - 0.15
ø8.0	n	3,200	2,800	1,200	1,200	3,400	3,000	4,400
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.10 - 0.15 - 0.20	0.10 - 0.15 - 0.20	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.10 - 0.15 - 0.20	0.10 - 0.12 - 0.15	0.10 - 0.15 - 0.20
ø10.0	n	2,500	2,200	950	950	2,700	2,400	3,500
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.15 - 0.20 - 0.25	0.15 - 0.20 - 0.25	0.08 - 0.10 - 0.12	0.06 - 0.08 - 0.10	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.18	0.15 - 0.20 - 0.25
ø12.0	n	2,100	1,900	800	800	2,300	2,000	2,900
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.12 - 0.15 - 0.18	0.08 - 0.10 - 0.12	0.17 - 0.22 - 0.27	0.15 - 0.20 - 0.25	0.20 - 0.25 - 0.30
ø16.0	n	1,600	1,400	600	600	1,700	1,500	2,200
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.14 - 0.17 - 0.20	0.10 - 0.15 - 0.20	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.25 - 0.30 - 0.35
ø20.0	n	1,300	1,100	480	480	1,300	1,200	1,750
	vc	60 - 80 - 100	50 - 70 - 90	20 - 30 - 40	20 - 30 - 50	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.25 - 0.30 - 0.35	0.25 - 0.30 - 0.35	0.16 - 0.19 - 0.22	0.15 - 0.20 - 0.25	0.30 - 0.35 - 0.40	0.25 - 0.30 - 0.35	0.35 - 0.40 - 0.45

Min. - **Optimum** - Max.

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

MDF-H type (Internal Coolant Supply)

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Cast Iron

Ductile
Cast IronAluminum
AlloyPVD
Coat 3D 5D

*For tolerances, refer to Chapter N - References.

Fig 1 (3D single margin)

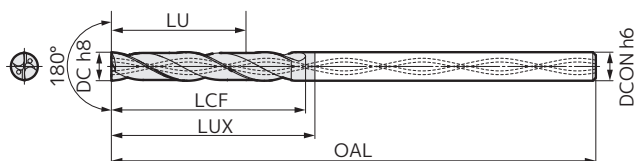
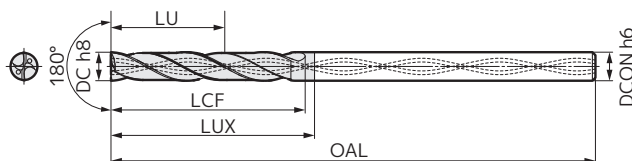


Fig 2 (5D double margin)



Diameter ø3.0 to 5.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
3.0	3	●	MDF 0300H3D	9.0	13.5	16.5	68	3.0	1
	5	●	0300H5D	15.6	20.1	23.1	78	3.0	2
3.1	3	●	MDF 0310H3D	9.4	14.0	17.0	72	4.0	1
	5	●	0310H5D	16.2	20.8	23.8	86	4.0	2
3.2	3	●	MDF 0320H3D	9.6	14.4	17.4	72	4.0	1
	5	●	0320H5D	16.6	21.4	24.4	86	4.0	2
3.3	3	●	MDF 0330H3D	10.0	14.9	17.9	72	4.0	1
	5	●	0330H5D	17.2	22.1	25.1	86	4.0	2
3.4	3	●	MDF 0340H3D	10.2	15.3	18.3	72	4.0	1
	5	●	0340H5D	17.7	22.8	25.8	86	4.0	2
3.5	3	●	MDF 0350H3D	10.6	15.8	18.8	72	4.0	1
	5	●	0350H5D	18.3	23.5	26.5	86	4.0	2
3.6	3	●	MDF 0360H3D	10.8	16.2	19.2	72	4.0	1
	5	●	0360H5D	18.7	24.1	27.1	86	4.0	2
3.7	3	●	MDF 0370H3D	11.2	16.7	19.7	72	4.0	1
	5	●	0370H5D	19.3	24.8	27.8	86	4.0	2
3.8	3	●	MDF 0380H3D	11.4	17.1	20.1	72	4.0	1
	5	●	0380H5D	19.8	25.5	28.5	86	4.0	2
3.9	3	●	MDF 0390H3D	11.8	17.6	20.6	72	4.0	1
	5	●	0390H5D	20.3	26.1	29.1	86	4.0	2
4.0	3	●	MDF 0400H3D	12.0	18.0	21.0	72	4.0	1
	5	●	0400H5D	20.8	26.8	29.8	86	4.0	2
4.1	3	●	MDF 0410H3D	12.4	18.5	21.5	80	5.0	1
	5	●	0410H5D	21.4	27.5	30.5	98	5.0	2
4.2	3	●	MDF 0420H3D	12.6	18.9	21.9	80	5.0	1
	5	●	0420H5D	21.8	28.1	31.1	98	5.0	2
4.3	3	●	MDF 0430H3D	13.0	19.4	22.4	80	5.0	1
	5	●	0430H5D	22.4	28.8	31.8	98	5.0	2
4.4	3	●	MDF 0440H3D	13.2	19.8	22.8	80	5.0	1
	5	●	0440H5D	22.9	29.5	32.5	98	5.0	2
4.5	3	●	MDF 0450H3D	13.6	20.3	23.3	80	5.0	1
	5	●	0450H5D	23.5	30.2	33.2	98	5.0	2
4.6	3	●	MDF 0460H3D	13.8	20.7	23.7	80	5.0	1
	5	●	0460H5D	23.9	30.8	33.8	98	5.0	2
4.7	3	●	MDF 0470H3D	14.2	21.2	24.2	80	5.0	1
	5	●	0470H5D	24.5	31.5	34.5	98	5.0	2
4.8	3	●	MDF 0480H3D	14.4	21.6	24.6	80	5.0	1
	5	●	0480H5D	25.0	32.2	35.2	98	5.0	2
4.9	3	●	MDF 0490H3D	14.8	22.1	25.1	80	5.0	1
	5	●	0490H5D	25.5	32.8	35.8	98	5.0	2
5.0	3	●	MDF 0500H3D	15.0	22.5	25.5	80	5.0	1
	5	●	0500H5D	26.0	33.5	36.5	98	5.0	2
5.1	3	●	MDF 0510H3D	15.4	23.0	26.0	82	6.0	1
	5	●	0510H5D	26.6	34.2	37.2	100	6.0	2
5.2	3	●	MDF 0520H3D	15.6	23.4	26.4	82	6.0	1
	5	●	0520H5D	27.0	34.8	37.8	100	6.0	2
5.3	3	●	MDF 0530H3D	16.0	23.9	26.9	82	6.0	1
	5	●	0530H5D	27.6	35.5	38.5	100	6.0	2
5.4	3	●	MDF 0540H3D	16.2	24.3	27.3	82	6.0	1
	5	●	0540H5D	28.1	36.2	39.2	100	6.0	2
5.5	3	●	MDF 0550H3D	16.6	24.8	27.8	82	6.0	1
	5	●	0550H5D	28.7	36.9	39.9	100	6.0	2
5.6	3	●	MDF 0560H3D	16.8	25.2	28.2	82	6.0	1
	5	●	0560H5D	29.1	37.5	40.5	100	6.0	2
5.7	3	●	MDF 0570H3D	17.2	25.7	28.7	82	6.0	1
	5	●	0570H5D	29.7	38.2	41.2	100	6.0	2

Grade: ACF75

Diameter ø5.8 to 8.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
5.8	3	●	MDF 0580H3D	17.4	26.1	29.1	82	6.0	1
	5	●	0580H5D	30.2	38.9	41.9	100	6.0	2
5.9	3	●	MDF 0590H3D	17.8	26.6	29.6	82	6.0	1
	5	●	0590H5D	30.7	39.5	42.5	100	6.0	2
6.0	3	●	MDF 0600H3D	18.0	27.0	30.0	82	6.0	1
	5	●	0600H5D	31.2	40.2	43.2	100	6.0	2
6.1	3	●	MDF 0610H3D	18.4	27.5	30.5	88	7.0	1
	5	●	0610H5D	31.8	40.9	43.9	109	7.0	2
6.2	3	●	MDF 0620H3D	18.6	27.9	30.9	88	7.0	1
	5	●	0620H5D	32.2	41.5	44.5	109	7.0	2
6.3	3	●	MDF 0630H3D	19.0	28.4	31.4	88	7.0	1
	5	●	0630H5D	32.8	42.2	45.2	109	7.0	2
6.4	3	●	MDF 0640H3D	19.2	28.8	31.8	88	7.0	1
	5	●	0640H5D	33.3	42.9	45.9	109	7.0	2
6.5	3	●	MDF 0650H3D	19.6	29.3	32.3	88	7.0	1
	5	●	0650H5D	33.9	43.6	46.6	109	7.0	2
6.6	3	●	MDF 0660H3D	19.8	29.7	32.7	88	7.0	1
	5	●	0660H5D	34.3	44.2	47.2	109	7.0	2
6.7	3	●	MDF 0670H3D	20.2	30.2	33.2	88	7.0	1
	5	●	0670H5D	34.9	44.9	47.9	109	7.0	2
6.8	3	●	MDF 0680H3D	20.4	30.6	33.6	88	7.0	1
	5	●	0680H5D	35.4	45.6	48.6	109	7.0	2
6.9	3	●	MDF 0690H3D	20.8	31.1	34.1	88	7.0	1
	5	●	0690H5D	35.9	46.2	49.2	109	7.0	2
7.0	3	●	MDF 0700H3D	21.0	31.5	34.5	88	7.0	1
	5	●	0700H5D	36.4	46.9	49.9	109	7.0	2
7.1	3	●	MDF 0710H3D	21.4	32.0	35.0	94	8.0	1
	5	●	0710H5D	37.0	47.6	50.6	118	8.0	2
7.2	3	●	MDF 0720H3D	21.6	32.4	35.4	94	8.0	1
	5	●	0720H5D	37.4	48.2	51.2	118	8.0	2
7.3	3	●	MDF 0730H3D	22.0	32.9	35.9	94	8.0	1
	5	●	0730H5D	38.0	48.9	51.9	118	8.0	2
7.4	3	●	MDF 0740H3D	22.2	33.3	36.3	94	8.0	1
	5	●	0740H5D	38.5	49.6	52.6	118	8.0	2
7.5	3	●	MDF 0750H3D	22.6	33.8	36.8	94	8.0	1
	5	●	0750H5D	39.1	50.3	53.3	118	8.0	2
7.6	3	●	MDF 0760H3D	22.8	34.2	37.2	94	8.0	1
	5	●	0760H5D	39.5	50.9	53.9	118	8.0	2
7.7	3	●	MDF 0770H3D	23.2	34.7	37.7	94	8.0	1
	5	●	0770H5D	40.1	51.6	54.6	118	8.0	2
7.8	3	●	MDF 0780H3D	23.4	35.1	38.1	94	8.0	1
	5	●	0780H5D	40.6	52.3	55.3	118	8.0	2
7.9	3	●	MDF 0790H3D	23.8	35.6	38.6	94	8.0	1
	5	●	0790H5D	41.1	52.9	55.9	118	8.0	2
8.0	3	●	MDF 0800H3D	24.0	36.0	39.0	94	8.0	1
	5	●	0800H5D	41.6	53.6	56.6	118	8.0	2
8.1	3	●	MDF 0810H3D	24.4	36.5	39.5	100	9.0	1
	5	●	0810H5D	42.2	54.3	57.3	127	9.0	2
8.2	3	●	MDF 0820H3D	24.6	36.9	39.9	100	9.0	1
	5	●	0820H5D	42.6	54.9	57.9	127	9.0	2
8.3	3	●	MDF 0830H3D	25.0	37.4	40.4	100	9.0	1
	5	●	0830H5D	43.2	55.6	58.6	127	9.0	2
8.4	3	●	MDF 0840H3D	25.2	37.8	40.8	100	9.0	1
	5	●	0840H5D	43.7	56.3	59.3	127	9.0	2
8.5	3	●	MDF 0850H3D	25.6	38.3	41.3	100	9.0	1
	5	●	0850H5D	44.3	57.0	60.0	127	9.0	2

Grade: ACF75

A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

MDF-H type (Internal Coolant Supply)

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

Fig 1 (3D single margin)

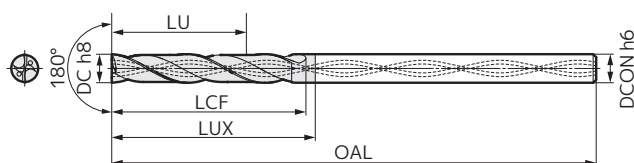
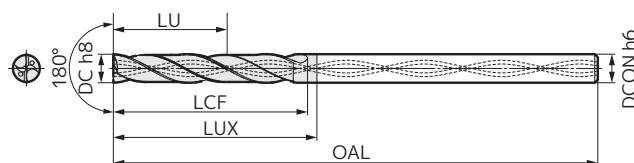


Fig 2 (5D double margin)



Diameter ø8.6 to 11.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
8.6	3	●	MDF 0860H3D	25.8	38.7	41.7	100	9.0	1
	5	●	0860H5D	44.7	57.6	60.6	127	9.0	2
8.7	3	●	MDF 0870H3D	26.2	39.2	42.2	100	9.0	1
	5	●	0870H5D	45.3	58.3	61.3	127	9.0	2
8.8	3	●	MDF 0880H3D	26.4	39.6	42.6	100	9.0	1
	5	●	0880H5D	45.8	59.0	62.0	127	9.0	2
8.9	3	●	MDF 0890H3D	26.8	40.1	43.1	100	9.0	1
	5	●	0890H5D	46.3	59.6	62.6	127	9.0	2
9.0	3	●	MDF 0900H3D	27.0	40.5	43.5	100	9.0	1
	5	●	0900H5D	46.8	60.3	63.3	127	9.0	2
9.1	3	●	MDF 0910H3D	27.4	41.0	44.0	106	10.0	1
	5	●	0910H5D	47.4	61.0	64.0	136	10.0	2
9.2	3	●	MDF 0920H3D	27.6	41.4	44.4	106	10.0	1
	5	●	0920H5D	47.8	61.6	64.6	136	10.0	2
9.3	3	●	MDF 0930H3D	28.0	41.9	44.9	106	10.0	1
	5	●	0930H5D	48.4	62.3	65.3	136	10.0	2
9.4	3	●	MDF 0940H3D	28.2	42.3	45.3	106	10.0	1
	5	●	0940H5D	48.9	63.0	66.0	136	10.0	2
9.5	3	●	MDF 0950H3D	28.6	42.8	45.8	106	10.0	1
	5	●	0950H5D	49.5	63.7	66.7	136	10.0	2
9.6	3	●	MDF 0960H3D	28.8	43.2	46.2	106	10.0	1
	5	●	0960H5D	49.9	64.3	67.3	136	10.0	2
9.7	3	●	MDF 0970H3D	29.2	43.7	46.7	106	10.0	1
	5	●	0970H5D	50.5	65.0	68.0	136	10.0	2
9.8	3	●	MDF 0980H3D	29.4	44.1	47.1	106	10.0	1
	5	●	0980H5D	51.0	65.7	68.7	136	10.0	2
9.9	3	●	MDF 0990H3D	29.8	44.6	47.6	106	10.0	1
	5	●	0990H5D	51.5	66.3	69.3	136	10.0	2
10.0	3	●	MDF 1000H3D	30.0	45.0	48.0	106	10.0	1
	5	●	1000H5D	52.0	67.0	70.0	136	10.0	2
10.1	3	●	MDF 1010H3D	30.4	45.5	48.5	116	11.0	1
	5	●	1010H5D	52.6	67.7	70.7	149	11.0	2
10.2	3	●	MDF 1020H3D	30.6	45.9	48.9	116	11.0	1
	5	●	1020H5D	53.0	68.3	71.3	149	11.0	2
10.3	3	●	MDF 1030H3D	31.0	46.4	49.4	116	11.0	1
	5	●	1030H5D	53.6	69.0	72.0	149	11.0	2
10.4	3	●	MDF 1040H3D	31.2	46.8	49.8	116	11.0	1
	5	●	1040H5D	54.1	69.7	72.7	149	11.0	2
10.5	3	●	MDF 1050H3D	31.6	47.3	50.3	116	11.0	1
	5	●	1050H5D	54.7	70.4	73.4	149	11.0	2
10.6	3	●	MDF 1060H3D	31.8	47.7	50.7	116	11.0	1
	5	●	1060H5D	55.1	71.0	74.0	149	11.0	2
10.7	3	●	MDF 1070H3D	32.2	48.2	51.2	116	11.0	1
	5	●	1070H5D	55.7	71.7	74.7	149	11.0	2
10.8	3	●	MDF 1080H3D	32.4	48.6	51.6	116	11.0	1
	5	●	1080H5D	56.2	72.4	75.4	149	11.0	2
10.9	3	●	MDF 1090H3D	32.8	49.1	52.1	116	11.0	1
	5	●	1090H5D	56.7	73.0	76.0	149	11.0	2
11.0	3	●	MDF 1100H3D	33.0	49.5	52.5	116	11.0	1
	5	●	1100H5D	57.2	73.7	76.7	149	11.0	2
11.1	3	●	MDF 1110H3D	33.4	50.0	53.0	122	12.0	1
	5	●	1110H5D	57.8	74.4	77.4	158	12.0	2
11.2	3	●	MDF 1120H3D	33.6	50.4	53.4	122	12.0	1
	5	●	1120H5D	58.2	75.0	78.0	158	12.0	2
11.3	3	●	MDF 1130H3D	34.0	50.9	53.9	122	12.0	1
	5	●	1130H5D	58.8	75.7	78.7	158	12.0	2

Grade: ACF75

Diameter ø11.4 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
11.4	3	●	MDF 1140H3D	34.2	51.3	54.3	122	12.0	1
	5	●	1140H5D	59.3	76.4	79.4	158	12.0	2
11.5	3	●	MDF 1150H3D	34.6	51.8	54.8	122	12.0	1
	5	●	1150H5D	59.9	77.1	80.1	158	12.0	2
11.6	3	●	MDF 1160H3D	34.8	52.2	55.2	122	12.0	1
	5	●	1160H5D	60.3	77.7	80.7	158	12.0	2
11.7	3	●	MDF 1170H3D	35.2	52.7	55.7	122	12.0	1
	5	●	1170H5D	60.9	78.4	81.4	158	12.0	2
11.8	3	●	MDF 1180H3D	35.4	53.1	56.1	122	12.0	1
	5	●	1180H5D	61.4	79.1	82.1	158	12.0	2
11.9	3	●	MDF 1190H3D	35.8	53.6	56.6	122	12.0	1
	5	●	1190H5D	61.9	79.7	82.7	158	12.0	2
12.0	3	●	MDF 1200H3D	36.0	54.0	57.0	122	12.0	1
	5	●	1200H5D	62.4	80.4	83.4	158	12.0	2
12.5	3	●	MDF 1250H3D	37.6	56.3	59.3	128	13.0	1
	5	●	1250H5D	65.1	83.8	86.8	167	13.0	2
13.0	3	●	MDF 1300H3D	39.0	58.5	61.5	128	13.0	1
	5	●	1300H5D	67.6	87.1	90.1	167	13.0	2
13.5	3	●	MDF 1350H3D	40.6	60.8	63.8	134	14.0	1
	5	●	1350H5D	70.3	90.5	93.5	176	14.0	2
14.0	3	●	MDF 1400H3D	42.0	63.0	66.0	134	14.0	1
	5	●	1400H5D	72.8	93.8	96.8	176	14.0	2
14.5	3	●	MDF 1450H3D	43.6	65.3	68.3	140	15.0	1
	5	●	1450H5D	75.5	97.2	100.2	185	15.0	2
15.0	3	●	MDF 1500H3D	45.0	67.5	70.5	140	15.0	1
	5	●	1500H5D	78.0	100.5	103.5	185	15.0	2
15.5	3	●	MDF 1550H3D	46.6	69.8	72.8	146	16.0	1
	5	●	1550H5D	80.7	103.9	106.9	194	16.0	2
16.0	3	●	MDF 1600H3D	48.0	72.0	75.0	146	16.0	1
	5	●	1600H5D	83.2	107.2	110.2	194	16.0	2

Grade: ACF75

A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

MDF-H type (Internal Coolant Supply)

Recommended Cutting Conditions (for 3D)

1. The recommended hole depth is 3 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
2. The recommended cutting conditions are those for drilling in flat horizontal surfaces.
3. Adjust the feed rate according to the inclination angle when drilling in an inclined surface.
4. Set the feed rate at 70% or lower when the inclination angle is 30° or less.
5. Set the feed rate at 50% or lower when the inclination angle is larger than 30°.
6. This product is a drilling tool. Do not use it for traverse cutting or helical milling.
7. A prepared hole with the same diameter is recommended for drilling of stainless steel.

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
Up to ø4.0	n	6,800	5,600	3,200	2,800	6,800	6,000	9,500
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.06 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.06 - 0.08 - 0.10
ø6.0	n	4,500	3,700	2,100	1,900	4,500	4,200	6,400
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	70 - 80 - 90	90 - 120 - 150
	f	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.04 - 0.06 - 0.08	0.03 - 0.04 - 0.05	0.05 - 0.10 - 0.15	0.06 - 0.09 - 0.12	0.05 - 0.10 - 0.15
ø8.0	n	3,400	2,800	1,600	1,400	3,400	3,200	4,800
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	70 - 80 - 90	90 - 120 - 150
	f	0.10 - 0.15 - 0.20	0.10 - 0.15 - 0.20	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.10 - 0.15 - 0.20	0.10 - 0.12 - 0.15	0.10 - 0.15 - 0.20
ø10.0	n	2,700	2,200	1,300	1,100	2,700	2,500	3,800
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	70 - 80 - 90	90 - 120 - 150
	f	0.12 - 0.17 - 0.22	0.12 - 0.17 - 0.22	0.08 - 0.10 - 0.12	0.06 - 0.08 - 0.10	0.12 - 0.17 - 0.22	0.12 - 0.15 - 0.18	0.15 - 0.20 - 0.25
ø12.0	n	2,300	1,900	1,100	900	2,300	2,100	3,200
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	70 - 80 - 90	90 - 120 - 150
	f	0.15 - 0.20 - 0.25	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.18	0.08 - 0.10 - 0.12	0.15 - 0.20 - 0.25	0.15 - 0.18 - 0.20	0.20 - 0.25 - 0.30
ø16.0	n	1,700	1,400	600	700	1,700	1,600	2,400
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	70 - 80 - 90	90 - 120 - 150
	f	0.15 - 0.20 - 0.25	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.18	0.10 - 0.15 - 0.20	0.17 - 0.22 - 0.27	0.15 - 0.20 - 0.25	0.25 - 0.30 - 0.40

Min. - **Optimum** - Max.

Recommended Cutting Conditions (for 5D)

1. A prepared hole with the same diameter is needed for drilling with this tool.
2. The cutting conditions are recommended when there is a prepared hole with the same diameter.
3. The recommended hole depth is 5 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
Up to ø4.0	n	6,800	5,600	3,200	2,800	6,800	6,000	9,500
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.06 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.06 - 0.08 - 0.10
ø6.0	n	4,500	3,700	2,100	1,900	4,500	4,000	6,400
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.04 - 0.06 - 0.08	0.03 - 0.04 - 0.05	0.05 - 0.10 - 0.15	0.06 - 0.09 - 0.12	0.05 - 0.10 - 0.15
ø8.0	n	3,400	2,800	1,600	1,400	3,400	3,000	4,800
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.10 - 0.15 - 0.20	0.10 - 0.15 - 0.20	0.06 - 0.08 - 0.10	0.04 - 0.06 - 0.08	0.10 - 0.15 - 0.20	0.10 - 0.12 - 0.15	0.10 - 0.15 - 0.20
ø10.0	n	2,700	2,200	1,300	1,100	2,700	2,400	3,800
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.15 - 0.20 - 0.25	0.15 - 0.20 - 0.25	0.08 - 0.10 - 0.12	0.06 - 0.08 - 0.10	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.18	0.15 - 0.20 - 0.25
ø12.0	n	2,300	1,900	1,100	900	2,300	2,000	3,200
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.12 - 0.15 - 0.18	0.08 - 0.10 - 0.12	0.17 - 0.22 - 0.27	0.15 - 0.20 - 0.25	0.20 - 0.25 - 0.30
ø16.0	n	1,700	1,400	600	700	1,700	1,500	2,400
	vc	70 - 85 - 100	60 - 75 - 90	30 - 40 - 50	25 - 35 - 45	70 - 85 - 100	65 - 75 - 85	90 - 120 - 150
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.14 - 0.17 - 0.20	0.10 - 0.15 - 0.20	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.30	0.25 - 0.30 - 0.35

Min. - **Optimum** - Max.

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

New

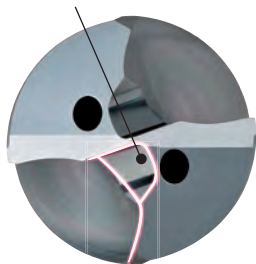


■ Features

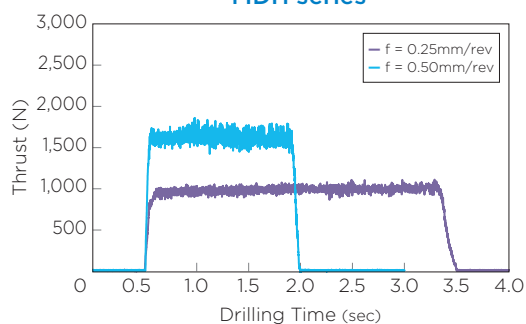
- The use of RP thinning with extremely low resistance achieves stable high-efficiency drilling.
- HF Coat realises superb wear resistance and thermal resistance.

RP THINNING

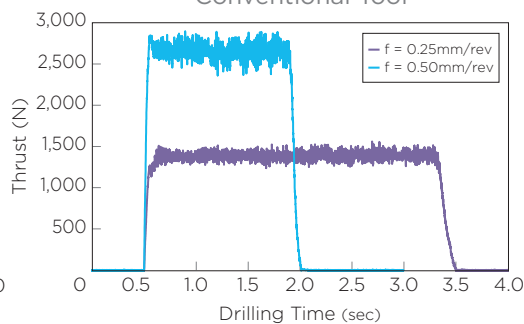
- Wide chip pocket enables smooth chip evacuation and reduced cutting resistance, ensuring stable drilling even in high-efficiency conditions.



MDH series



Conventional Tool

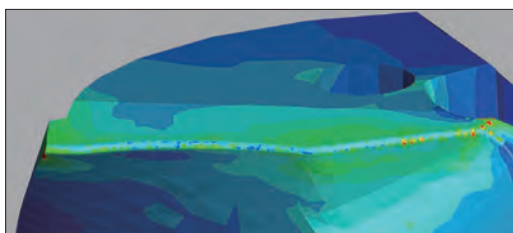


Work Material: S50C, Tool: MDH 0800S08H05 Cutting Conditions: $v_c = 80\text{m/min}$ $H = 38\text{mm}$ (Through) Wet (Water-soluble, Internal Coolant Supply)

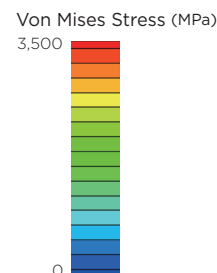
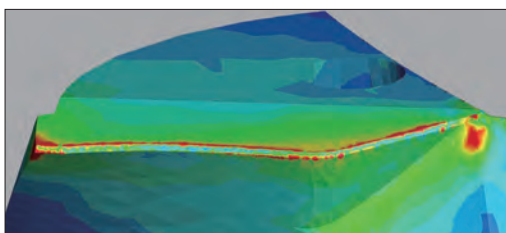
New Cutting Edge Shape

- Optimised cutting edge shape suppresses stress concentration and prevents chipping even in high-efficiency drilling with high cutting edge load.

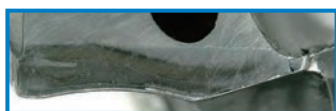
MDH series



Conventional Tool



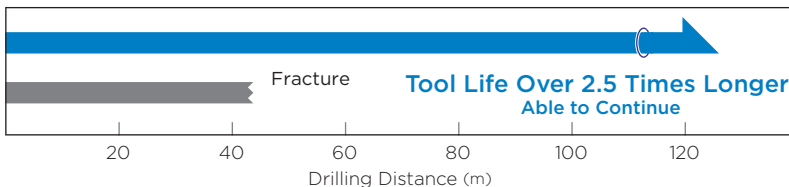
MDH series



After Drilling 111m

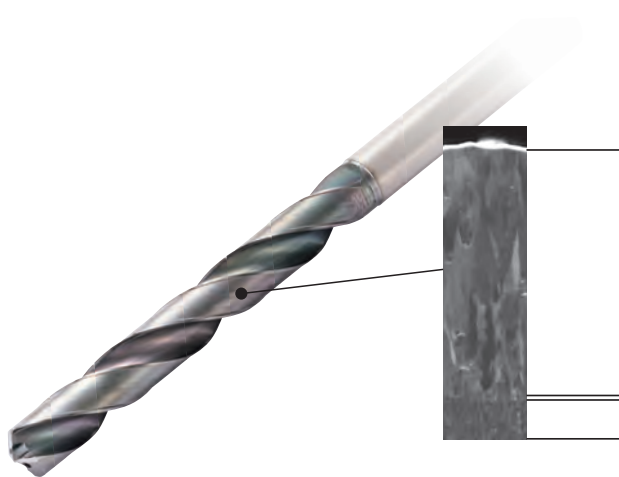
MDH series

Conventional Tool



Work Material: S50C, Tool: MDH 0800S08H05 Cutting Conditions: $v_c = 140\text{m/min}$ $f = 0.40\text{mm/rev}$ $H = 38\text{mm}$ (Through) Wet (Water-soluble, Internal Coolant Supply)

New Grade ACH70 HF Coat



- TiAlCrSi-based super multi-layered coating realises excellent wear resistance and thermal resistance
- Tough TiAlB-based coating is utilised on the carbide substrate to improve coating strength and fracture resistance

Super multi-layered TiAlCrSi

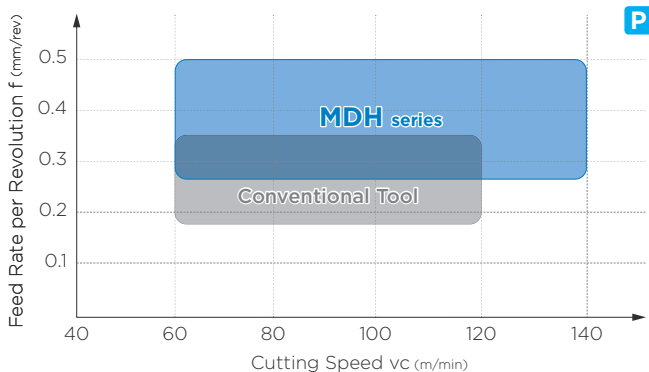
Hardness HV: 46GPa
Starting Temperature for Oxidisation: 1,100°C

TiAlB-based toughness layer

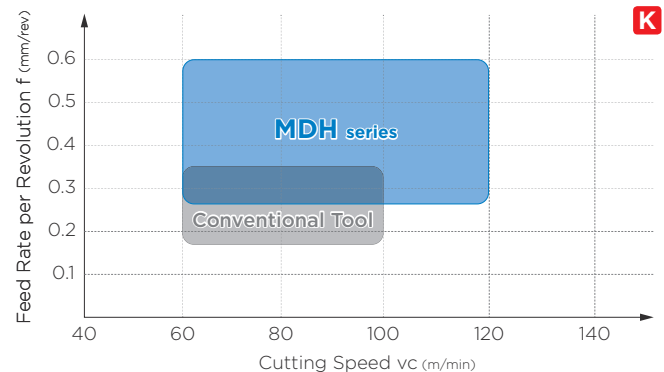
Balances wear and fracture resistance

- High-efficiency drilling realises increased production capacity and yield

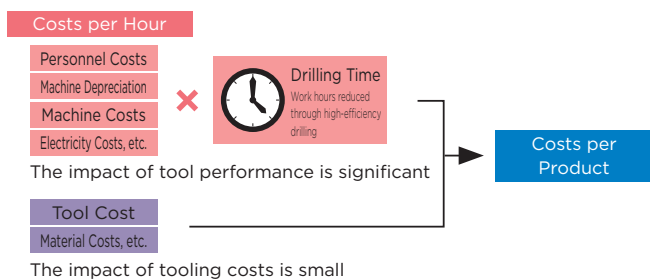
Efficiency Comparison in Steel Drilling (Diameter: ø8mm)



Efficiency Comparison in Cast Iron Drilling (Diameter: ø8mm)

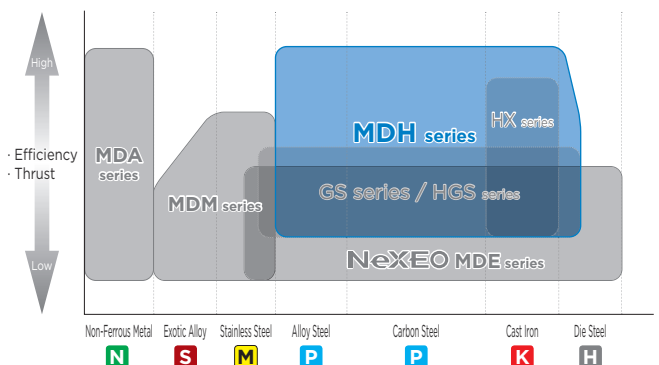


- Contributes to reduced costs through high-efficiency drilling

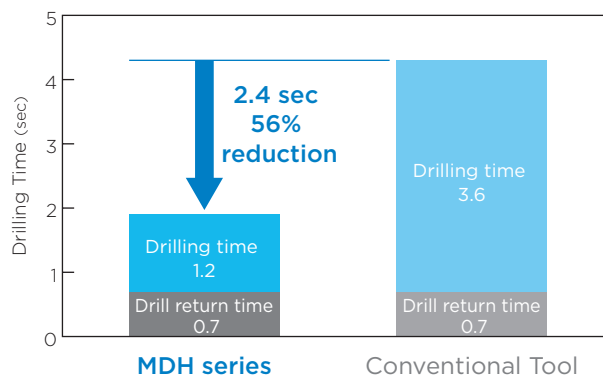


Reduced drilling time enables the reduction of personnel costs and other hourly costs
(Example of cost calculation)

- Solid carbide drill lineup by work material



High-efficiency Drilling Performance 1 Reduced Cycle Time (Cylinder Component)



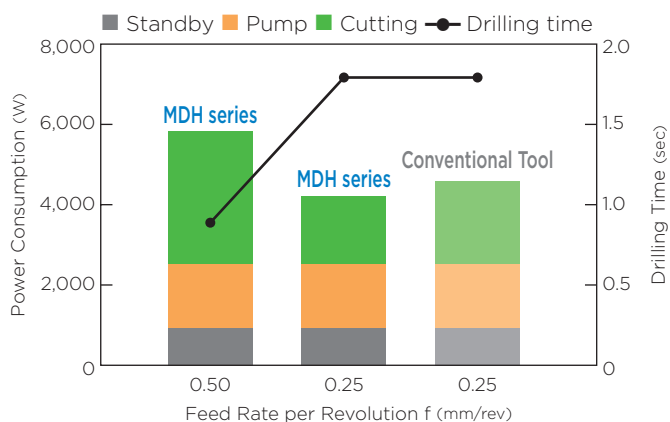
Work Material: SCM440H, Tool: MDH 0600S06H05

Cutting Conditions: MDH series $vc = 80\text{m/min}$ $f = 0.35\text{mm/rev}$ $H = 25\text{mm (Blind)}$ Wet (Water-soluble, Internal Coolant Supply)
Conventional Tool $vc = 51\text{m/min}$ $f = 0.19\text{mm/rev}$ $H = 25\text{mm (Blind)}$ Wet (Water-soluble, Internal Coolant Supply)

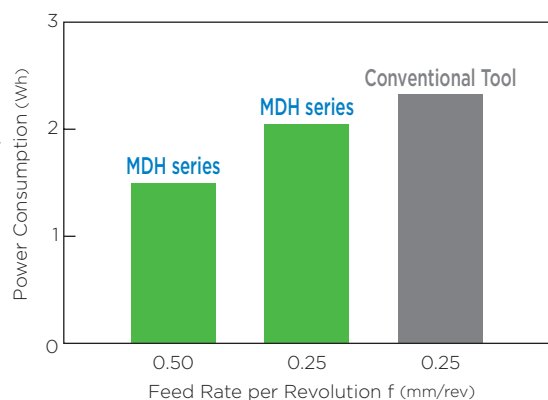
Approx. 3 times the drilling efficiency and 3 times longer tool life

High-efficiency Drilling Performance 2 Power Saving GX

Power Consumption and Drilling Time per Hole



Power Consumption per Hole

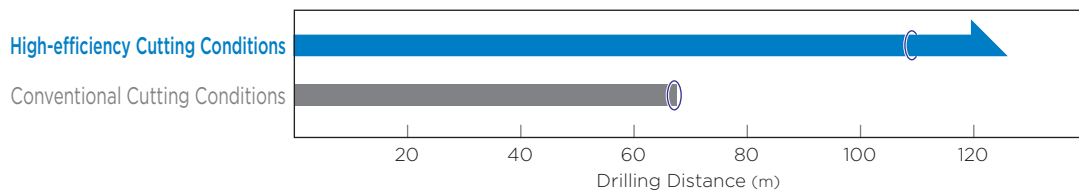


Work Material: S50C, Tool: MDH 0800S08H05 Cutting Conditions: $vc = 80\text{m/min}$ $H = 38\text{mm (Through)}$ Wet (Water-soluble, Internal Coolant Supply)

*Power consumption is based on calculations made at Sumitomo-owned facilities and may vary with operating environment.

High-efficiency drilling dramatically reduces drilling power consumption

High-efficiency Drilling Performance 3 Longer Tool Life

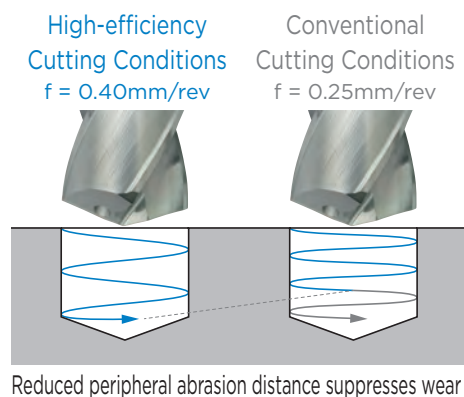


MDH series
High-efficiency
Cutting Conditions
After Drilling 111m



MDH series
Conventional
Cutting Conditions
After Drilling 67m

*Tool life varies based on the workpiece and operating environment.
The above does not guarantee that tool life will be extended.



Work Material: S50C, Tool: MDH 0800S08H05

High-efficiency Cutting Conditions: $vc = 140\text{m/min}$ $f = 0.40\text{mm/rev}$ $H = 38\text{mm}$ (Through)

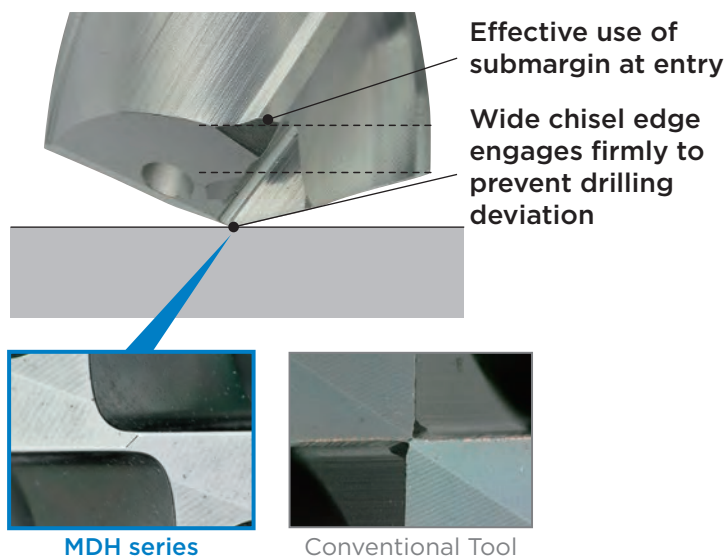
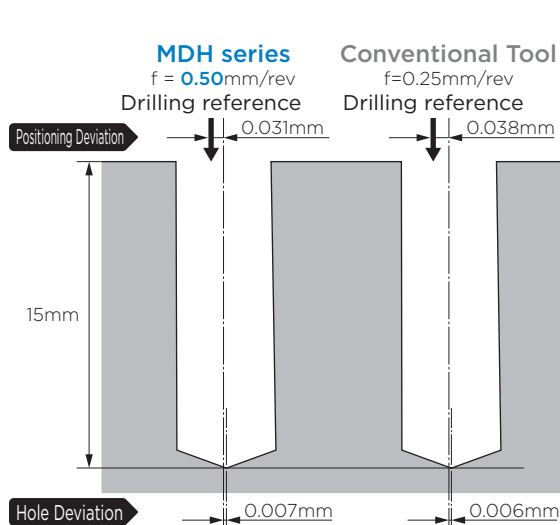
Wet (Water-soluble, Internal Coolant Supply)

Conventional Cutting Conditions: $vc = 80\text{m/min}$ $f = 0.25\text{mm/rev}$ $H = 38\text{mm}$ (Through)

Wet (Water-soluble, Internal Coolant Supply)

2.8 times the drilling efficiency and 1.3 times longer tool life

High-efficiency Drilling Performance 4 Hole Accuracy Comparison



Work Material: S50C, Tool: MDH 0800S08H05 Cutting Conditions: $vc = 100\text{m/min}$ Wet (Water-soluble, Internal Coolant Supply)

Hole position precision and deviation equivalent to conventional cutting conditions, even at twice the drilling efficiency

MDH series (Internal Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%

Carbon Steel/
Alloy Steel
from 0.29%

Tempered
Steel

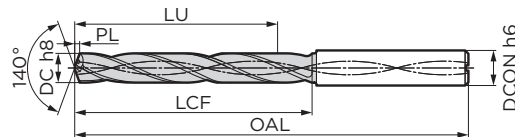
Cast Iron

Ductile
Cast Iron

New HF 3D 5D 8D

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø3.0 to 4.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDH 0300S04H03	16.1	20.6	72.6	0.6	4.0	1
3.0	5	●	0300S04H05	28.1	32.6	86.6	0.6	4.0	1
3.0	8	●	0300S04H08	31.1	35.6	92.6	0.6	4.0	1
3.1	3	●	MDH 0310S04H03	16.0	20.6	72.6	0.6	4.0	1
3.1	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	1
3.1	8	●	0310S04H08	31.0	35.6	92.6	0.6	4.0	1
3.2	3	●	MDH 0320S04H03	15.8	20.6	72.6	0.6	4.0	1
3.2	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	1
3.2	8	●	0320S04H08	30.8	35.6	92.6	0.6	4.0	1
3.3	3	●	MDH 0330S04H03	15.7	20.6	72.6	0.6	4.0	1
3.3	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	1
3.3	8	●	0330S04H08	30.7	35.6	92.6	0.6	4.0	1
3.4	3	●	MDH 0340S04H03	15.5	20.6	72.6	0.6	4.0	1
3.4	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	1
3.4	8	●	0340S04H08	30.5	35.6	92.6	0.6	4.0	1
3.5	3	●	MDH 0350S04H03	15.4	20.6	72.6	0.6	4.0	1
3.5	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	1
3.5	8	●	0350S04H08	30.4	35.6	92.6	0.6	4.0	1
3.6	3	●	MDH 0360S04H03	17.8	23.2	72.7	0.7	4.0	1
3.6	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	1
3.6	8	●	0360S04H08	37.3	42.7	92.7	0.7	4.0	1
3.7	3	●	MDH 0370S04H03	17.7	23.2	72.7	0.7	4.0	1
3.7	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	1
3.7	8	●	0370S04H08	37.2	42.7	92.7	0.7	4.0	1
3.8	3	●	MDH 0380S04H03	17.5	23.2	72.7	0.7	4.0	1
3.8	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	1
3.8	8	●	0380S04H08	37.0	42.7	92.7	0.7	4.0	1
3.9	3	●	MDH 0390S04H03	17.4	23.2	72.7	0.7	4.0	1
3.9	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	1
3.9	8	●	0390S04H08	36.9	42.7	92.7	0.7	4.0	1
4.0	3	●	MDH 0400S04H03	17.2	23.2	72.7	0.7	4.0	1
4.0	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	1
4.0	8	●	0400S04H08	36.7	42.7	92.7	0.7	4.0	1
4.1	3	●	MDH 0410S06H03	19.7	25.8	80.8	0.8	6.0	1
4.1	5	●	0410S06H05	34.7	40.8	98.8	0.8	6.0	1
4.1	8	●	0410S06H08	41.7	47.8	105.8	0.8	6.0	1
4.2	3	●	MDH 0420S06H03	19.5	25.8	80.8	0.8	6.0	1
4.2	5	●	0420S06H05	34.5	40.8	98.8	0.8	6.0	1
4.2	8	●	0420S06H08	41.5	47.8	105.8	0.8	6.0	1
4.3	3	●	MDH 0430S06H03	19.4	25.8	80.8	0.8	6.0	1
4.3	5	●	0430S06H05	34.4	40.8	98.8	0.8	6.0	1
4.3	8	●	0430S06H08	41.4	47.8	105.8	0.8	6.0	1

Grade: ACH70

Diameter ø4.4 to 5.7mm

Dimensions (mm)

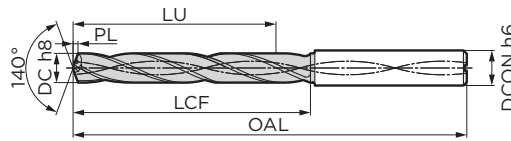
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.4	3	●	MDH 0440S06H03	19.2	25.8	80.8	0.8	6.0	1
4.4	5	●	0440S06H05	34.2	40.8	98.8	0.8	6.0	1
4.4	8	●	0440S06H08	41.2	47.8	105.8	0.8	6.0	1
4.5	3	●	MDH 0450S06H03	19.1	25.8	80.8	0.8	6.0	1
4.5	5	●	0450S06H05	34.1	40.8	98.8	0.8	6.0	1
4.5	8	●	0450S06H08	41.1	47.8	105.8	0.8	6.0	1
4.6	3	●	MDH 0460S06H03	21.0	27.9	80.9	0.9	6.0	1
4.6	5	●	0460S06H05	38.0	44.9	98.9	0.9	6.0	1
4.6	8	●	0460S06H08	46.0	52.9	105.9	0.9	6.0	1
4.7	3	●	MDH 0470S06H03	20.9	27.9	80.9	0.9	6.0	1
4.7	5	●	0470S06H05	37.9	44.9	98.9	0.9	6.0	1
4.7	8	●	0470S06H08	45.9	52.9	105.9	0.9	6.0	1
4.8	3	●	MDH 0480S06H03	20.7	27.9	80.9	0.9	6.0	1
4.8	5	●	0480S06H05	37.7	44.9	98.9	0.9	6.0	1
4.8	8	●	0480S06H08	45.7	52.9	105.9	0.9	6.0	1
4.9	3	●	MDH 0490S06H03	20.6	27.9	80.9	0.9	6.0	1
4.9	5	●	0490S06H05	37.6	44.9	98.9	0.9	6.0	1
4.9	8	●	0490S06H08	45.6	52.9	105.9	0.9	6.0	1
5.0	3	●	MDH 0500S06H03	20.4	27.9	80.9	0.9	6.0	1
5.0	5	●	0500S06H05	37.4	44.9	98.9	0.9	6.0	1
5.0	8	●	0500S06H08	45.4	52.9	105.9	0.9	6.0	1
5.1	3	●	MDH 0510S06H03	20.9	28.5	83.0	1.0	6.0	1
5.1	5	●	0510S06H05	37.4	45.0	101.0	1.0	6.0	1
5.1	8	●	0510S06H08	52.4	60.0	119.0	1.0	6.0	1
5.2	3	●	MDH 0520S06H03	20.7	28.5	83.0	1.0	6.0	1
5.2	5	●	0520S06H05	37.2	45.0	101.0	1.0	6.0	1
5.2	8	●	0520S06H08	52.2	60.0	119.0	1.0	6.0	1
5.3	3	●	MDH 0530S06H03	20.6	28.5	83.0	1.0	6.0	1
5.3	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	1
5.3	8	●	0530S06H08	52.1	60.0	119.0	1.0	6.0	1
5.4	3	●	MDH 0540S06H03	20.4	28.5	83.0	1.0	6.0	1
5.4	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	1
5.4	8	●	0540S06H08	51.9	60.0	119.0	1.0	6.0	1
5.5	3	●	MDH 0550S06H03	20.3	28.5	83.0	1.0	6.0	1
5.5	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	1
5.5	8	●	0550S06H08	51.8	60.0	119.0	1.0	6.0	1
5.6	3	●	MDH 0560S06H03	22.7	31.1	83.1	1.1	6.0	1
5.6	5	●	0560S06H05	40.7	49.1	101.1	1.1	6.0	1
5.6	8	●	0560S06H08	58.7	67.1	119.1	1.1	6.0	1
5.7	3	●	MDH 0570S06H03	22.6	31.1	83.1	1.1	6.0	1
5.7	5	●	0570S06H05	40.6	49.1	101.1	1.1	6.0	1
5.7	8	●	0570S06H08	58.6	67.1	119.1	1.1	6.0	1

Grade: ACH70



*For tolerances, refer to Chapter N - References.

Fig 1

**Diameter ø5.8 to 7.1mm**

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.8	3	●	MDH 0580S06H03	22.4	31.1	83.1	1.1	6.0	1
5.8	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	1
5.8	8	●	0580S06H08	58.4	67.1	119.1	1.1	6.0	1
5.9	3	●	MDH 0590S06H03	22.3	31.1	83.1	1.1	6.0	1
5.9	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	1
5.9	8	●	0590S06H08	58.3	67.1	119.1	1.1	6.0	1
6.0	3	●	MDH 0600S06H03	22.1	31.1	83.1	1.1	6.0	1
6.0	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	1
6.0	8	●	0600S06H08	58.1	67.1	119.1	1.1	6.0	1
6.1	3	●	MDH 0610S08H03	24.6	33.7	89.2	1.2	8.0	1
6.1	5	●	0610S08H05	44.1	53.2	110.2	1.2	8.0	1
6.1	8	●	0610S08H08	62.1	71.2	131.2	1.2	8.0	1
6.2	3	●	MDH 0620S08H03	24.4	33.7	89.2	1.2	8.0	1
6.2	5	●	0620S08H05	43.9	53.2	110.2	1.2	8.0	1
6.2	8	●	0620S08H08	61.9	71.2	131.2	1.2	8.0	1
6.3	3	●	MDH 0630S08H03	24.3	33.7	89.2	1.2	8.0	1
6.3	5	●	0630S08H05	43.8	53.2	110.2	1.2	8.0	1
6.3	8	●	0630S08H08	61.8	71.2	131.2	1.2	8.0	1
6.4	3	●	MDH 0640S08H03	24.1	33.7	89.2	1.2	8.0	1
6.4	5	●	0640S08H05	43.6	53.2	110.2	1.2	8.0	1
6.4	8	●	0640S08H08	61.6	71.2	131.2	1.2	8.0	1
6.5	3	●	MDH 0650S08H03	24.0	33.7	89.2	1.2	8.0	1
6.5	5	●	0650S08H05	43.5	53.2	110.2	1.2	8.0	1
6.5	8	●	0650S08H08	61.5	71.2	131.2	1.2	8.0	1
6.6	3	●	MDH 0660S08H03	24.4	34.3	89.3	1.3	8.0	1
6.6	5	●	0660S08H05	45.4	55.3	110.3	1.3	8.0	1
6.6	8	●	0660S08H08	66.4	76.3	131.3	1.3	8.0	1
6.7	3	●	MDH 0670S08H03	24.3	34.3	89.3	1.3	8.0	1
6.7	5	●	0670S08H05	45.3	55.3	110.3	1.3	8.0	1
6.7	8	●	0670S08H08	66.3	76.3	131.3	1.3	8.0	1
6.8	3	●	MDH 0680S08H03	24.1	34.3	89.3	1.3	8.0	1
6.8	5	●	0680S08H05	45.1	55.3	110.3	1.3	8.0	1
6.8	8	●	0680S08H08	66.1	76.3	131.3	1.3	8.0	1
6.9	3	●	MDH 0690S08H03	24.0	34.3	89.3	1.3	8.0	1
6.9	5	●	0690S08H05	45.0	55.3	110.3	1.3	8.0	1
6.9	8	●	0690S08H08	66.0	76.3	131.3	1.3	8.0	1
7.0	3	●	MDH 0700S08H03	23.8	34.3	89.3	1.3	8.0	1
7.0	5	●	0700S08H05	44.8	55.3	110.3	1.3	8.0	1
7.0	8	●	0700S08H08	65.8	76.3	131.3	1.3	8.0	1
7.1	3	●	MDH 0710S08H03	28.3	38.9	95.4	1.4	8.0	1
7.1	5	●	0710S08H05	50.8	61.4	119.4	1.4	8.0	1
7.1	8	●	0710S08H08	71.8	82.4	143.4	1.4	8.0	1

Grade: ACH70

Diameter ø7.2 to 8.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.2	3	●	MDH 0720S08H03	28.1	38.9	95.4	1.4	8.0	1
7.2	5	●	0720S08H05	50.6	61.4	119.4	1.4	8.0	1
7.2	8	●	0720S08H08	71.6	82.4	143.4	1.4	8.0	1
7.3	3	●	MDH 0730S08H03	28.0	38.9	95.4	1.4	8.0	1
7.3	5	●	0730S08H05	50.5	61.4	119.4	1.4	8.0	1
7.3	8	●	0730S08H08	71.5	82.4	143.4	1.4	8.0	1
7.4	3	●	MDH 0740S08H03	27.8	38.9	95.4	1.4	8.0	1
7.4	5	●	0740S08H05	50.3	61.4	119.4	1.4	8.0	1
7.4	8	●	0740S08H08	71.3	82.4	143.4	1.4	8.0	1
7.5	3	●	MDH 0750S08H03	27.7	38.9	95.4	1.4	8.0	1
7.5	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	1
7.5	8	●	0750S08H08	71.2	82.4	143.4	1.4	8.0	1
7.6	3	●	MDH 0760S08H03	30.1	41.5	95.5	1.5	8.0	1
7.6	5	●	0760S08H05	54.1	65.5	119.5	1.5	8.0	1
7.6	8	●	0760S08H08	78.1	89.5	143.5	1.5	8.0	1
7.7	3	●	MDH 0770S08H03	30.0	41.5	95.5	1.5	8.0	1
7.7	5	●	0770S08H05	54.0	65.5	119.5	1.5	8.0	1
7.7	8	●	0770S08H08	78.0	89.5	143.5	1.5	8.0	1
7.8	3	●	MDH 0780S08H03	29.8	41.5	95.5	1.5	8.0	1
7.8	5	●	0780S08H05	53.8	65.5	119.5	1.5	8.0	1
7.8	8	●	0780S08H08	77.8	89.5	143.5	1.5	8.0	1
7.9	3	●	MDH 0790S08H03	29.7	41.5	95.5	1.5	8.0	1
7.9	5	●	0790S08H05	53.7	65.5	119.5	1.5	8.0	1
7.9	8	●	0790S08H08	77.7	89.5	143.5	1.5	8.0	1
8.0	3	●	MDH 0800S08H03	29.5	41.5	95.5	1.5	8.0	1
8.0	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	1
8.0	8	●	0800S08H08	77.5	89.5	143.5	1.5	8.0	1
8.1	3	●	MDH 0810S10H03	31.9	44.0	101.5	1.5	10.0	1
8.1	5	●	0810S10H05	57.4	69.5	128.5	1.5	10.0	1
8.1	8	●	0810S10H08	81.4	93.5	155.5	1.5	10.0	1
8.2	3	●	MDH 0820S10H03	31.7	44.0	101.5	1.5	10.0	1
8.2	5	●	0820S10H05	57.2	69.5	128.5	1.5	10.0	1
8.2	8	●	0820S10H08	81.2	93.5	155.5	1.5	10.0	1
8.3	3	●	MDH 0830S10H03	31.6	44.0	101.5	1.5	10.0	1
8.3	5	●	0830S10H05	57.1	69.5	128.5	1.5	10.0	1
8.3	8	●	0830S10H08	81.1	93.5	155.5	1.5	10.0	1
8.4	3	●	MDH 0840S10H03	31.4	44.0	101.5	1.5	10.0	1
8.4	5	●	0840S10H05	56.9	69.5	128.5	1.5	10.0	1
8.4	8	●	0840S10H08	80.9	93.5	155.5	1.5	10.0	1
8.5	3	●	MDH 0850S10H03	31.3	44.0	101.5	1.5	10.0	1
8.5	5	●	0850S10H05	56.8	69.5	128.5	1.5	10.0	1
8.5	8	●	0850S10H08	80.8	93.5	155.5	1.5	10.0	1

Grade: ACH70

MDH series (Internal Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
Steel

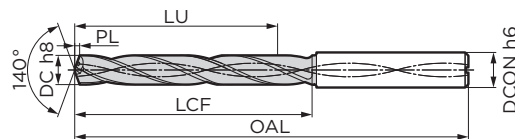
Cast Iron

Ductile
Cast Iron

New **HF** **3D** **5D** **8D**
Coat

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø8.6 to 9.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.6	3	●	MDH 0860S10H03	31.7	44.6	101.6	1.6	10.0	1
8.6	5	●	0860S10H05	58.7	71.6	128.6	1.6	10.0	1
8.6	8	●	0860S10H08	85.7	98.6	155.6	1.6	10.0	1
8.7	3	●	MDH 0870S10H03	31.6	44.6	101.6	1.6	10.0	1
8.7	5	●	0870S10H05	58.6	71.6	128.6	1.6	10.0	1
8.7	8	●	0870S10H08	85.6	98.6	155.6	1.6	10.0	1
8.8	3	●	MDH 0880S10H03	31.4	44.6	101.6	1.6	10.0	1
8.8	5	●	0880S10H05	58.4	71.6	128.6	1.6	10.0	1
8.8	8	●	0880S10H08	85.4	98.6	155.6	1.6	10.0	1
8.9	3	●	MDH 0890S10H03	31.3	44.6	101.6	1.6	10.0	1
8.9	5	●	0890S10H05	58.3	71.6	128.6	1.6	10.0	1
8.9	8	●	0890S10H08	85.3	98.6	155.6	1.6	10.0	1
9.0	3	●	MDH 0900S10H03	31.1	44.6	101.6	1.6	10.0	1
9.0	5	●	0900S10H05	58.1	71.6	128.6	1.6	10.0	1
9.0	8	●	0900S10H08	85.1	98.6	155.6	1.6	10.0	1
9.1	3	●	MDH 0910S10H03	35.6	49.2	107.7	1.7	10.0	1
9.1	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	1
9.1	8	●	0910S10H08	91.1	104.7	167.7	1.7	10.0	1
9.2	3	●	MDH 0920S10H03	35.4	49.2	107.7	1.7	10.0	1
9.2	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	1
9.2	8	●	0920S10H08	90.9	104.7	167.7	1.7	10.0	1
9.3	3	●	MDH 0930S10H03	35.3	49.2	107.7	1.7	10.0	1
9.3	5	●	0930S10H05	63.8	77.7	137.7	1.7	10.0	1
9.3	8	●	0930S10H08	90.8	104.7	167.7	1.7	10.0	1
9.4	3	●	MDH 0940S10H03	35.1	49.2	107.7	1.7	10.0	1
9.4	5	●	0940S10H05	63.6	77.7	137.7	1.7	10.0	1
9.4	8	●	0940S10H08	90.6	104.7	167.7	1.7	10.0	1
9.5	3	●	MDH 0950S10H03	35.0	49.2	107.7	1.7	10.0	1
9.5	5	●	0950S10H05	63.5	77.7	137.7	1.7	10.0	1
9.5	8	●	0950S10H08	90.5	104.7	167.7	1.7	10.0	1
9.6	3	●	MDH 0960S10H03	37.4	51.8	107.8	1.8	10.0	1
9.6	5	●	0960S10H05	67.4	81.8	137.8	1.8	10.0	1
9.6	8	●	0960S10H08	97.4	111.8	167.8	1.8	10.0	1
9.7	3	●	MDH 0970S10H03	37.3	51.8	107.8	1.8	10.0	1
9.7	5	●	0970S10H05	67.3	81.8	137.8	1.8	10.0	1
9.7	8	●	0970S10H08	97.3	111.8	167.8	1.8	10.0	1
9.8	3	●	MDH 0980S10H03	37.1	51.8	107.8	1.8	10.0	1
9.8	5	●	0980S10H05	67.1	81.8	137.8	1.8	10.0	1
9.8	8	●	0980S10H08	97.1	111.8	167.8	1.8	10.0	1
9.9	3	●	MDH 0990S10H03	37.0	51.8	107.8	1.8	10.0	1
9.9	5	●	0990S10H05	67.0	81.8	137.8	1.8	10.0	1
9.9	8	●	0990S10H08	97.0	111.8	167.8	1.8	10.0	1

Grade: ACH70

Diameter ø10.0 to 11.3mm

Dimensions (mm)

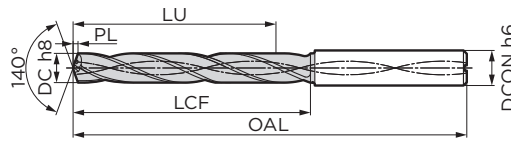
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.0	3	●	MDH 1000S10H03	36.8	51.8	107.8	1.8	10.0	1
10.0	5	●	1000S10H05	66.8	81.8	137.8	1.8	10.0	1
10.0	8	●	1000S10H08	96.8	111.8	167.8	1.8	10.0	1
10.1	3	●	MDH 1010S12H03	39.3	54.4	117.9	1.9	12.0	1
10.1	5	●	1010S12H05	70.8	85.9	150.9	1.9	12.0	1
10.1	8	●	1010S12H08	100.8	115.9	183.9	1.9	12.0	1
10.2	3	●	MDH 1020S12H03	39.1	54.4	117.9	1.9	12.0	1
10.2	5	●	1020S12H05	70.6	85.9	150.9	1.9	12.0	1
10.2	8	●	1020S12H08	100.6	115.9	183.9	1.9	12.0	1
10.3	3	●	MDH 1030S12H03	39.0	54.4	117.9	1.9	12.0	1
10.3	5	●	1030S12H05	70.5	85.9	150.9	1.9	12.0	1
10.3	8	●	1030S12H08	100.5	115.9	183.9	1.9	12.0	1
10.4	3	●	MDH 1040S12H03	38.8	54.4	117.9	1.9	12.0	1
10.4	5	●	1040S12H05	70.3	85.9	150.9	1.9	12.0	1
10.4	8	●	1040S12H08	100.3	115.9	183.9	1.9	12.0	1
10.5	3	●	MDH 1050S12H03	38.7	54.4	117.9	1.9	12.0	1
10.5	5	●	1050S12H05	70.2	85.9	150.9	1.9	12.0	1
10.5	8	●	1050S12H08	100.2	115.9	183.9	1.9	12.0	1
10.6	3	●	MDH 1060S12H03	39.1	55.0	118.0	2.0	12.0	1
10.6	5	●	1060S12H05	72.1	88.0	151.0	2.0	12.0	1
10.6	8	●	1060S12H08	105.1	121.0	184.0	2.0	12.0	1
10.7	3	●	MDH 1070S12H03	39.0	55.0	118.0	2.0	12.0	1
10.7	5	●	1070S12H05	72.0	88.0	151.0	2.0	12.0	1
10.7	8	●	1070S12H08	105.0	121.0	184.0	2.0	12.0	1
10.8	3	●	MDH 1080S12H03	38.8	55.0	118.0	2.0	12.0	1
10.8	5	●	1080S12H05	71.8	88.0	151.0	2.0	12.0	1
10.8	8	●	1080S12H08	104.8	121.0	184.0	2.0	12.0	1
10.9	3	●	MDH 1090S12H03	38.7	55.0	118.0	2.0	12.0	1
10.9	5	●	1090S12H05	71.7	88.0	151.0	2.0	12.0	1
10.9	8	●	1090S12H08	104.7	121.0	184.0	2.0	12.0	1
11.0	3	●	MDH 1100S12H03	38.5	55.0	118.0	2.0	12.0	1
11.0	5	●	1100S12H05	71.5	88.0	151.0	2.0	12.0	1
11.0	8	●	1100S12H08	104.5	121.0	184.0	2.0	12.0	1
11.1	3	●	MDH 1110S12H03	43.0	59.6	124.1	2.1	12.0	1
11.1	5	●	1110S12H05	77.5	94.1	160.1	2.1	12.0	1
11.1	8	●	1110S12H08	110.5	127.1	196.1	2.1	12.0	1
11.2	3	●	MDH 1120S12H03	42.8	59.6	124.1	2.1	12.0	1
11.2	5	●	1120S12H05	77.3	94.1	160.1	2.1	12.0	1
11.2	8	●	1120S12H08	110.3	127.1	196.1	2.1	12.0	1
11.3	3	●	MDH 1130S12H03	42.7	59.6	124.1	2.1	12.0	1
11.3	5	●	1130S12H05	77.2	94.1	160.1	2.1	12.0	1
11.3	8	●	1130S12H08	110.2	127.1	196.1	2.1	12.0	1

Grade: ACH70

New**HF**
Coat**3D****5D****8D**

*For tolerances, refer to Chapter N - References.

Fig 1

**Diameter ø11.4 to 12.7mm**

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.4	3	●	MDH 1140S12H03	42.5	59.6	124.1	2.1	12.0	1
11.4	5	●	1140S12H05	77.0	94.1	160.1	2.1	12.0	1
11.4	8	●	1140S12H08	110.0	127.1	196.1	2.1	12.0	1
11.5	3	●	MDH 1150S12H03	42.4	59.6	124.1	2.1	12.0	1
11.5	5	●	1150S12H05	76.9	94.1	160.1	2.1	12.0	1
11.5	8	●	1150S12H08	109.9	127.1	196.1	2.1	12.0	1
11.6	3	●	MDH 1160S12H03	44.8	62.2	124.2	2.2	12.0	1
11.6	5	●	1160S12H05	80.8	98.2	160.2	2.2	12.0	1
11.6	8	●	1160S12H08	116.8	134.2	196.2	2.2	12.0	1
11.7	3	●	MDH 1170S12H03	44.7	62.2	124.2	2.2	12.0	1
11.7	5	●	1170S12H05	80.7	98.2	160.2	2.2	12.0	1
11.7	8	●	1170S12H08	116.7	134.2	196.2	2.2	12.0	1
11.8	3	●	MDH 1180S12H03	44.5	62.2	124.2	2.2	12.0	1
11.8	5	●	1180S12H05	80.5	98.2	160.2	2.2	12.0	1
11.8	8	●	1180S12H08	116.5	134.2	196.2	2.2	12.0	1
11.9	3	●	MDH 1190S12H03	44.4	62.2	124.2	2.2	12.0	1
11.9	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	1
11.9	8	●	1190S12H08	116.4	134.2	196.2	2.2	12.0	1
12.0	3	●	MDH 1200S12H03	44.2	62.2	124.2	2.2	12.0	1
12.0	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	1
12.0	8	●	1200S12H08	116.2	134.2	196.2	2.2	12.0	1
12.1	3	●	MDH 1210S14H03	46.7	64.8	130.3	2.3	14.0	1
12.1	5	●	1210S14H05	84.2	102.3	169.3	2.3	14.0	1
12.1	8	●	1210S14H08	120.2	138.3	208.3	2.3	14.0	1
12.2	3	●	MDH 1220S14H03	46.5	64.8	130.3	2.3	14.0	1
12.2	5	●	1220S14H05	84.0	102.3	169.3	2.3	14.0	1
12.2	8	●	1220S14H08	120.0	138.3	208.3	2.3	14.0	1
12.3	3	●	MDH 1230S14H03	46.4	64.8	130.3	2.3	14.0	1
12.3	5	●	1230S14H05	83.9	102.3	169.3	2.3	14.0	1
12.3	8	●	1230S14H08	119.9	138.3	208.3	2.3	14.0	1
12.4	3	●	MDH 1240S14H03	46.2	64.8	130.3	2.3	14.0	1
12.4	5	●	1240S14H05	83.7	102.3	169.3	2.3	14.0	1
12.4	8	●	1240S14H08	119.7	138.3	208.3	2.3	14.0	1
12.5	3	●	MDH 1250S14H03	46.1	64.8	130.3	2.3	14.0	1
12.5	5	●	1250S14H05	83.6	102.3	169.3	2.3	14.0	1
12.5	8	●	1250S14H08	119.6	138.3	208.3	2.3	14.0	1
12.6	3	●	MDH 1260S14H03	46.5	65.4	130.4	2.4	14.0	1
12.6	5	●	1260S14H05	85.5	104.4	169.4	2.4	14.0	1
12.6	8	●	1260S14H08	124.5	143.4	208.4	2.4	14.0	1
12.7	3	●	MDH 1270S14H03	46.4	65.4	130.4	2.4	14.0	1
12.7	5	●	1270S14H05	85.4	104.4	169.4	2.4	14.0	1
12.7	8	●	1270S14H08	124.4	143.4	208.4	2.4	14.0	1

Grade: ACH70

Diameter ø12.8 to 14.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.8	3	●	MDH 1280S14H03	46.2	65.4	130.4	2.4	14.0	1
12.8	5	●	1280S14H05	85.2	104.4	169.4	2.4	14.0	1
12.8	8	●	1280S14H08	124.2	143.4	208.4	2.4	14.0	1
12.9	3	●	MDH 1290S14H03	46.1	65.4	130.4	2.4	14.0	1
12.9	5	●	1290S14H05	85.1	104.4	169.4	2.4	14.0	1
12.9	8	●	1290S14H08	124.1	143.4	208.4	2.4	14.0	1
13.0	3	●	MDH 1300S14H03	45.9	65.4	130.4	2.4	14.0	1
13.0	5	●	1300S14H05	84.9	104.4	169.4	2.4	14.0	1
13.0	8	●	1300S14H08	123.9	143.4	208.4	2.4	14.0	1
13.1	3	●	MDH 1310S14H03	50.4	70.0	136.5	2.5	14.0	1
13.1	5	●	1310S14H05	90.9	110.5	178.5	2.5	14.0	1
13.1	8	●	1310S14H08	129.9	149.5	220.5	2.5	14.0	1
13.2	3	●	MDH 1320S14H03	50.2	70.0	136.5	2.5	14.0	1
13.2	5	●	1320S14H05	90.7	110.5	178.5	2.5	14.0	1
13.2	8	●	1320S14H08	129.7	149.5	220.5	2.5	14.0	1
13.3	3	●	MDH 1330S14H03	50.1	70.0	136.5	2.5	14.0	1
13.3	5	●	1330S14H05	90.6	110.5	178.5	2.5	14.0	1
13.3	8	●	1330S14H08	129.6	149.5	220.5	2.5	14.0	1
13.4	3	●	MDH 1340S14H03	49.9	70.0	136.5	2.5	14.0	1
13.4	5	●	1340S14H05	90.4	110.5	178.5	2.5	14.0	1
13.4	8	●	1340S14H08	129.4	149.5	220.5	2.5	14.0	1
13.5	3	●	MDH 1350S14H03	49.8	70.0	136.5	2.5	14.0	1
13.5	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	1
13.5	8	●	1350S14H08	129.3	149.5	220.5	2.5	14.0	1
13.6	3	●	MDH 1360S14H03	52.1	72.5	136.5	2.5	14.0	1
13.6	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	1
13.6	8	●	1360S14H08	136.1	156.5	220.5	2.5	14.0	1
13.7	3	●	MDH 1370S14H03	52.0	72.5	136.5	2.5	14.0	1
13.7	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	1
13.7	8	●	1370S14H08	136.0	156.5	220.5	2.5	14.0	1
13.8	3	●	MDH 1380S14H03	51.8	72.5	136.5	2.5	14.0	1
13.8	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	1
13.8	8	●	1380S14H08	135.8	156.5	220.5	2.5	14.0	1
13.9	3	●	MDH 1390S14H03	51.7	72.5	136.5	2.5	14.0	1
13.9	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	1
13.9	8	●	1390S14H08	135.7	156.5	220.5	2.5	14.0	1
14.0	3	●	MDH 1400S14H03	51.5	72.5	136.5	2.5	14.0	1
14.0	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	1
14.0	8	●	1400S14H08	135.5	156.5	220.5	2.5	14.0	1

Grade: ACH70

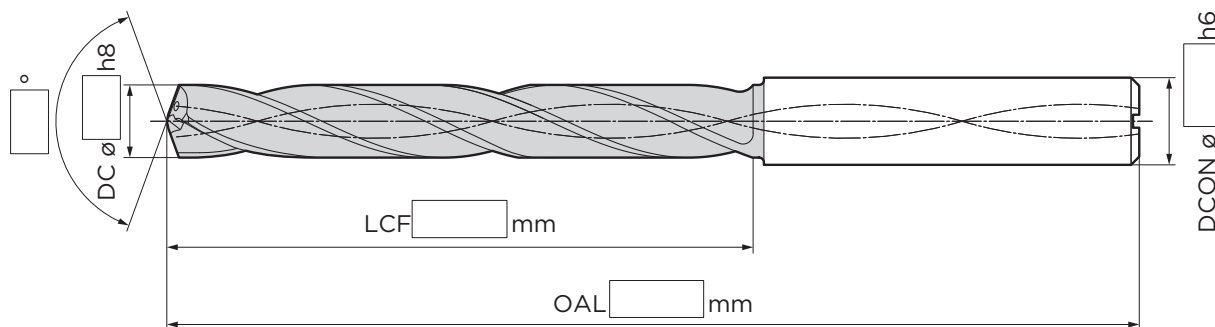
Recommended Cutting Conditions

Work Material	Mild Steel/Low Carbon Steel SS400/S15C Up to 160HB		Carbon Steel S35C/S50C Up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	60 to 120m/min		60 to 140m/min		60 to 100m/min		60 to 100m/min	
Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
3.0	8,500	0.12 to 0.30	10,610	0.12 to 0.30	8,500	0.12 to 0.30	8,500	0.12 to 0.30
4.0	6,400	0.15 to 0.35	8,000	0.15 to 0.35	6,400	0.15 to 0.35	6,400	0.15 to 0.35
5.0	5,100	0.15 to 0.35	6,400	0.15 to 0.35	5,100	0.15 to 0.35	5,100	0.15 to 0.35
6.0	4,300	0.18 to 0.40	5,300	0.18 to 0.40	4,300	0.18 to 0.40	4,300	0.18 to 0.40
7.0	3,700	0.18 to 0.45	4,500	0.18 to 0.45	3,700	0.18 to 0.40	3,700	0.18 to 0.40
8.0	3,200	0.20 to 0.50	4,000	0.20 to 0.50	3,200	0.20 to 0.45	3,200	0.20 to 0.45
9.0	2,900	0.20 to 0.50	3,500	0.20 to 0.50	2,900	0.20 to 0.45	2,900	0.20 to 0.45
10.0	2,600	0.20 to 0.50	3,200	0.20 to 0.50	2,600	0.20 to 0.45	2,600	0.20 to 0.45
11.0	2,400	0.20 to 0.55	2,900	0.20 to 0.55	2,400	0.20 to 0.50	2,400	0.20 to 0.50
12.0	2,200	0.20 to 0.55	2,700	0.20 to 0.55	2,200	0.20 to 0.50	2,200	0.20 to 0.50
13.0	1,900	0.22 to 0.60	2,500	0.22 to 0.60	1,900	0.22 to 0.55	1,900	0.22 to 0.55
14.0	1,600	0.22 to 0.60	2,300	0.22 to 0.60	1,600	0.22 to 0.55	1,600	0.22 to 0.55

Work Material	Cast Iron FC250 Up to 280HB		Ductile Cast Iron FCD450/FCD600 Up to 270HB	
Cutting Speed	60 to 120m/min		60 to 100m/min	
Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
3.0	8,500	0.15 to 0.35	8,500	0.15 to 0.30
4.0	6,400	0.15 to 0.40	6,400	0.15 to 0.35
5.0	5,100	0.15 to 0.45	5,100	0.15 to 0.35
6.0	4,300	0.18 to 0.50	4,300	0.18 to 0.40
7.0	3,700	0.18 to 0.55	3,700	0.18 to 0.45
8.0	3,200	0.20 to 0.60	3,200	0.20 to 0.50
9.0	2,900	0.20 to 0.60	2,900	0.20 to 0.50
10.0	2,600	0.22 to 0.65	2,600	0.22 to 0.55
11.0	2,400	0.22 to 0.65	2,400	0.22 to 0.55
12.0	2,200	0.25 to 0.70	2,200	0.25 to 0.60
13.0	1,900	0.25 to 0.70	1,900	0.25 to 0.60
14.0	1,600	0.25 to 0.75	1,600	0.25 to 0.65

1. The recommended cutting conditions above are for cases where internal supply of a water-soluble coolant is used.
 2. Can also be used for MQL drilling.
 3. If using non-water-soluble coolant, reduce the **cutting speed and feed rate** by 20-30% and ensure that sufficient coolant is supplied.
 4. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
 5. Make sure the flute does not enter the collet.
 6. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
- *If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
7. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.
 8. If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.

MULTIDRILL MDH series Made-to-Order Request Sheet



Machine Information

Manufacturer: _____

Type : ☐ Vertical Machining Centre ☐ Horizontal Machining Centre ☐ Lathe

Spindle : _____

Coolant : ☐ Water-soluble ☐ Oil-based ☐ MQL

Coolant Supply : ☐ Internal Coolant Supply ☐ External Coolant Supply

Workpiece Information

Part Name : _____

Work Material : _____

Work Material Hardness: _____

Hole type : ☐ Through Hole ☐ Blind Hole

Interrupted Drilling : ☐ Yes ☐ No

Hole Depth : _____

Step Part : _____

Workpiece Shape

Required Precision

Hole Dia. Tolerance: _____

Surface Roughness: _____

Hole Positioning Accuracy: _____

Other : _____

Current Drill

Cutting Conditions : vc = _____ m/min f = _____ mm/rev

Tool Life : _____

Tool Life Criteria : _____

Chamfered Edge : _____

After filling in the required dimensions and other information, contact our nearest sales office or distributor.

Feel free to contact us with other requests as well.

Company Name/Contact

Remarks

Drilling

↩

Solid

Indexable
Head type

Indexable
Insert type

Reamers



General Features

Super MULTIDRILL GS and HGS series are solid carbide drills that employ a proprietary J-flute design and wide chip pockets to achieve excellent chip control and evacuation. In addition, DEX Coat enables long and stable tool life over a wide application range for a variety of work materials.

Features and Applications

Long tool life

J-flute and special DEX Coat provide long tool life for a wide variety of work materials.

Stable chip evacuation

J-flute shape significantly improves chip control and evacuation.

Quiet drilling and stable drilling force

Stable drilling with minimal drill deflection even in small machine applications.

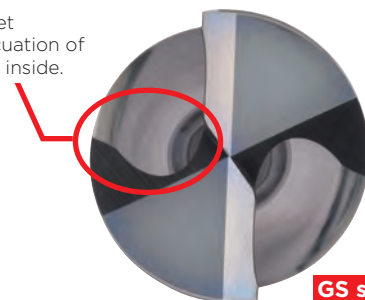
Environmentally friendly

Also compatible with the MQL (Minimum Quantity Lubrication) system.



HGS series

Wide chip pocket for smooth evacuation of chips generated inside.



GS series

Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)
External (GS series)	MDW□□□□GS2	ø1.0 to ø20.0	up to 2
	MDW□□□□GS4		up to 4
Internal (HGS series)	MDW□□□□HGS3	ø1.5 to ø20.0	up to 3
	MDW□□□□HGS5		up to 5
	MDW□□□□HGS8	ø1.5 to ø16.0	up to 8

Performance

Chip Control		Comparison of Cutting Force	
GS series	Conventional Tool	GS series	Conventional Tool
Compact chips		GS series provides stable drill behaviour throughout the drilling process	
Tool : MDW 0800GS4 Work Material : S50C (200HB) Cutting Conditions: vc = 80m/min, f = 0.25mm/rev, H = 24mm, External Coolant Supply (Water-soluble)			

GS series/HGS series

■ Uses Double Margin (HGS series) (excluding $\phi 1.5$ to $\phi 2.4$ mm sizes)

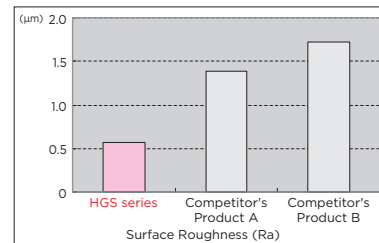
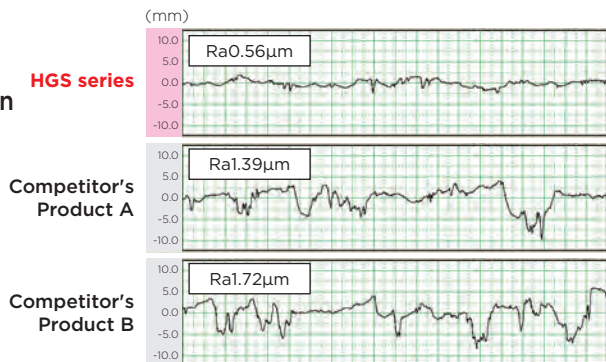
The HGS series uses a double margin for greater stability and hole precision in deep hole drilling



The HGS series uses a double margin

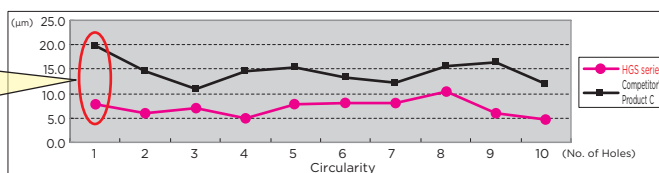
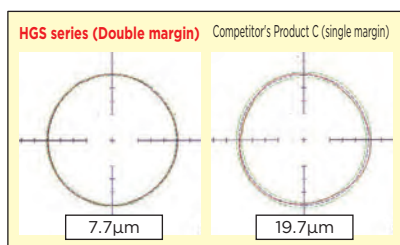
Utilises DEX Coat, the world's first compound super multi-layered coating

● Surface Roughness Comparison



Work Material : SCM415 (120HB)
Tool : MDW0800HGS5
Cutting Conditions: $vc = 80$ m/min, $f = 0.25$ mm/rev, $H = 38$ mm
Internal Coolant Supply (Water-soluble)

● Circularity Comparison



Work Material : S50C (200HB)
Tool : MDW0800HGS8
Cutting Conditions: $vc = 80$ m/min, $f = 0.25$ mm/rev
 $H = 64$ mm, Internal Coolant Supply (Water-soluble)

4-point guide design of the double margin reduces runout for improved stability. Good surface roughness and circularity.

■ Application Examples (Super MULTIDRILL GS series)

● S43C (250HB) Automotive Component	● Boron Steel (30HRC) Machine Component	● SS400 Machine Component
Tool : MDW 0970GS4 Cutting Conditions: $vc = 80$m/min, $f = 0.25$mm/rev $H = 25$mm, External Coolant Supply (Water-soluble) Achieves 1.5 times longer tool life! Reduces wear on peripheral cutting edge GS series : 1,400 holes (Wear) Comp's D : 900 holes (Fracture)	Tool : MDW 0980GS2 Cutting Conditions: $vc = 70$m/min, $f = 0.15$mm/rev $H = 7$mm, External Coolant Supply (Water-soluble) 1.3 times longer tool life than conventional drills Good circularity and cylindricity GS series : 2,600 holes (Wear) Conventional Tool : 2,000 holes (Wear)	Tool : MDW 1050GS4 Cutting Conditions: $vc = 150$m/min, $f = 0.3$mm/rev $H = 12$mm, External Coolant Supply (Water-soluble) Achieves 1.5 times longer tool life! Good chip control GS series : 1,800 holes (Wear) Competitor's Product E : 1,200 holes (Adhesion)

■ Application Examples (Super MULTIDRILL HGS series)

● SCr440H Automotive Component	● SUJ2 Automotive Component	● SCM415 Machine Component
Tool : MDW 0600HGS8 Cutting Conditions: $vc = 80$m/min, $f = 0.25$mm/rev $H = 48$mm, Internal Coolant Supply (Oil-based) Achieves 1.3 times longer tool life! HGS series : 650 holes (Wear) Competitor's Product F : 500 holes (Fracture)	Tool : MDW 0570HGS5 Cutting Conditions: $vc = 80$m/min, $f = 0.1$mm/rev $H = 35$mm, Internal Coolant Supply (Water-soluble) Achieves 2.5 times longer tool life! HGS series : 1,500 holes (Wear) Competitor's Product G : 600 holes (Wear)	Tool : MDW 0860HGS3 Cutting Conditions: $vc = 52$m/min, $f = 0.2$mm/rev $H = 25$mm, Internal Coolant Supply (Water-soluble) Achieves 1.8 times longer tool life! HGS series : 1,500 holes (Wear) Competitor's Product H : 800 holes (Wear)



*For tolerances, refer to Chapter N - References.

Fig 1

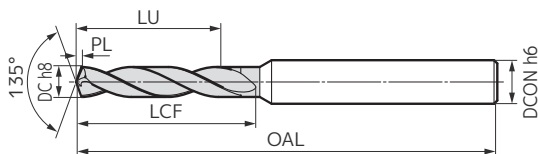
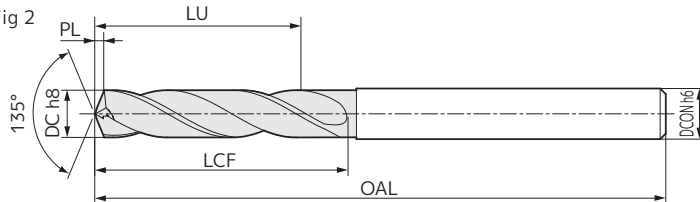


Fig 2



Diameter ø1.0 to 3.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	2	●	MDW 0100GS2	4.7	6.2	45.2	0.2	3.0	1
	4	●	0100GS4	10.7	12.2	49.2	0.2	3.0	1
1.1	2	●	MDW 0110GS2	4.6	6.2	45.2	0.2	3.0	1
	4	●	0110GS4	10.6	12.2	49.2	0.2	3.0	1
1.2	2	●	MDW 0120GS2	4.4	6.2	45.2	0.2	3.0	1
	4	●	0120GS4	10.4	12.2	49.2	0.2	3.0	1
1.3	2	●	MDW 0130GS2	4.4	6.3	45.3	0.3	3.0	1
	4	●	0130GS4	10.4	12.3	49.3	0.3	3.0	1
1.4	2	●	MDW 0140GS2	4.2	6.3	45.3	0.3	3.0	1
	4	●	0140GS4	10.2	12.3	49.3	0.3	3.0	1
1.5	2	●	MDW 0150GS2	4.1	6.3	45.3	0.3	3.0	1
	4	●	0150GS4	10.1	12.3	49.3	0.3	3.0	1
1.6	2	●	MDW 0160GS2	5.9	8.3	45.3	0.3	3.0	1
	4	●	0160GS4	12.9	15.3	49.3	0.3	3.0	1
1.7	2	●	MDW 0170GS2	5.9	8.4	45.4	0.4	3.0	1
	4	●	0170GS4	12.9	15.4	49.4	0.4	3.0	1
1.8	2	●	MDW 0180GS2	5.7	8.4	45.4	0.4	3.0	1
	4	●	0180GS4	12.7	15.4	49.4	0.4	3.0	1
1.9	2	●	MDW 0190GS2	5.6	8.4	45.4	0.4	3.0	1
	4	●	0190GS4	12.6	15.4	49.4	0.4	3.0	1
2.0	2	●	MDW 0200GS2	5.4	8.4	45.4	0.4	3.0	1
	4	●	0200GS4	12.4	15.4	49.4	0.4	3.0	1
2.1	2	●	MDW 0210GS2	7.3	10.4	45.4	0.4	3.0	1
	4	●	0210GS4	14.3	17.4	49.4	0.4	3.0	1
2.2	2	●	MDW 0220GS2	7.2	10.5	45.5	0.5	3.0	1
	4	●	0220GS4	14.2	17.5	49.5	0.5	3.0	1
2.3	2	●	MDW 0230GS2	7.1	10.5	45.5	0.5	3.0	1
	4	●	0230GS4	14.1	17.5	49.5	0.5	3.0	1
2.4	2	●	MDW 0240GS2	6.9	10.5	45.5	0.5	3.0	2
	4	●	0240GS4	13.9	17.5	49.5	0.5	3.0	2
2.5	2	●	MDW 0250GS2	6.8	10.5	45.5	0.5	3.0	2
	4	●	0250GS4	13.8	17.5	49.5	0.5	3.0	2
2.6	2	●	MDW 0260GS2	9.6	13.5	45.5	0.5	3.0	2
	4	●	0260GS4	15.6	19.5	49.5	0.5	3.0	2
2.7	2	●	MDW 0270GS2	9.6	13.6	45.6	0.6	3.0	2
	4	●	0270GS4	15.6	19.6	49.6	0.6	3.0	2
2.8	2	●	MDW 0280GS2	9.4	13.6	45.6	0.6	3.0	2
	4	●	0280GS4	15.4	19.6	49.6	0.6	3.0	2
2.9	2	●	MDW 0290GS2	9.3	13.6	45.6	0.6	3.0	2
	4	●	0290GS4	15.3	19.6	49.6	0.6	3.0	2
3.0	2	●	MDW 0300GS2	9.1	13.6	45.6	0.6	3.0	2
	4	●	0300GS4	15.1	19.6	49.6	0.6	3.0	2
3.1	2	●	MDW 0310GS2	15.0	19.6	54.6	0.6	4.0	2
	4	●	0310GS4	20.0	24.6	60.6	0.6	4.0	2
3.2	2	●	MDW 0320GS2	14.9	19.7	54.7	0.7	4.0	2
	4	●	0320GS4	19.9	24.7	60.7	0.7	4.0	2
3.3	2	●	MDW 0330GS2	14.8	19.7	54.7	0.7	4.0	2
	4	●	0330GS4	19.8	24.7	60.7	0.7	4.0	2
3.4	2	●	MDW 0340GS2	14.6	19.7	54.7	0.7	4.0	2
	4	●	0340GS4	19.6	24.7	60.7	0.7	4.0	2
3.5	2	●	MDW 0350GS2	14.5	19.7	54.7	0.7	4.0	2
	4	●	0350GS4	19.5	24.7	60.7	0.7	4.0	2
3.6	2	●	MDW 0360GS2	16.3	21.7	54.7	0.7	4.0	2
	4	●	0360GS4	22.3	27.7	60.7	0.7	4.0	2
3.7	2	●	MDW 0370GS2	16.3	21.8	54.8	0.8	4.0	2
	4	●	0370GS4	22.3	27.8	60.8	0.8	4.0	2

Grade: ACX70

Diameter ø3.8 to 6.5mm

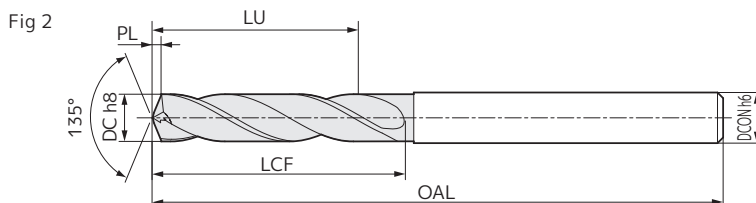
Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.8	2	●	MDW 0380GS2	16.1	21.8	54.8	0.8	4.0	2
	4	●	0380GS4	22.1	27.8	60.8	0.8	4.0	2
3.9	2	●	MDW 0390GS2	16.0	21.8	54.8	0.8	4.0	2
	4	●	0390GS4	22.0	27.8	60.8	0.8	4.0	2
4.0	2	●	MDW 0400GS2	15.8	21.8	54.8	0.8	4.0	2
	4	●	0400GS4	21.8	27.8	60.8	0.8	4.0	2
4.1	2	●	MDW 0410GS2	17.7	23.8	61.8	0.8	5.0	2
	4	●	0410GS4	25.7	31.8	76.8	0.8	5.0	2
4.2	2	●	MDW 0420GS2	17.6	23.9	61.9	0.9	5.0	2
	4	●	0420GS4	25.6	31.9	76.9	0.9	5.0	2
4.3	2	●	MDW 0430GS2	17.5	23.9	61.9	0.9	5.0	2
	4	●	0430GS4	25.5	31.9	76.9	0.9	5.0	2
4.4	2	●	MDW 0440GS2	17.3	23.9	61.9	0.9	5.0	2
	4	●	0440GS4	25.3	31.9	76.9	0.9	5.0	2
4.5	2	●	MDW 0450GS2	17.2	23.9	61.9	0.9	5.0	2
	4	●	0450GS4	25.2	31.9	76.9	0.9	5.0	2
4.6	2	●	MDW 0460GS2	19.1	26.0	62.0	1.0	5.0	2
	4	●	0460GS4	32.1	39.0	77.0	1.0	5.0	2
4.7	2	●	MDW 0470GS2	19.0	26.0	62.0	1.0	5.0	2
	4	●	0470GS4	32.0	39.0	77.0	1.0	5.0	2
4.8	2	●	MDW 0480GS2	18.8	26.0	62.0	1.0	5.0	2
	4	●	0480GS4	31.8	39.0	77.0	1.0	5.0	2
4.9	2	●	MDW 0490GS2	18.7	26.0	62.0	1.0	5.0	2
	4	●	0490GS4	31.7	39.0	77.0	1.0	5.0	2
5.0	2	●	MDW 0500GS2	18.5	26.0	62.0	1.0	5.0	2
	4	●	0500GS4	31.5	39.0	77.0	1.0	5.0	2
5.1	2	●	MDW 0510GS2	18.5	26.1	66.1	1.1	6.0	2
	4	●	0510GS4	32.5	40.1	82.1	1.1	6.0	2
5.2	2	●	MDW 0520GS2	18.3	26.1	66.1	1.1	6.0	2
	4	●	0520GS4	32.3	40.1	82.1	1.1	6.0	2
5.3	2	●	MDW 0530GS2	18.2	26.1	66.1	1.1	6.0	2
	4	●	0530GS4	32.2	40.1	82.1	1.1	6.0	2
5.4	2	●	MDW 0540GS2	18.0	26.1	66.1	1.1	6.0	2
	4	●	0540GS4	32.0	40.1	82.1	1.1	6.0	2
5.5	2	●	MDW 0550GS2	17.9	26.1	66.1	1.1	6.0	2
	4	●	0550GS4	31.9	40.1	82.1	1.1	6.0	2
5.6	2	●	MDW 0560GS2	19.8	28.2	66.2	1.2	6.0	2
	4	●	0560GS4	33.8	42.2	82.2	1.2	6.0	2
5.7	2	●	MDW 0570GS2	19.7	28.2	66.2	1.2	6.0	2
	4	●	0570GS4	33.7	42.2	82.2	1.2	6.0	2
5.8	2	●	MDW 0580GS2	19.5	28.2	66.2	1.2	6.0	2
	4	●	0580GS4	33.5	42.2	82.2	1.2	6.0	2
5.9	2	●	MDW 0590GS2	19.4	28.2	66.2	1.2	6.0	2
	4	●	0590GS4	33.4	42.2	82.2	1.2	6.0	2
6.0	2	●	MDW 0600GS2	19.2	28.2	66.2	1.2	6.0	2
	4	●	0600GS4	33.2	42.2	82.2	1.2	6.0	2
6.1	2	●	MDW 0610GS2	23.2	32.3	74.3	1.3	7.0	2
	4	●	0610GS4	34.2	43.3	84.3	1.3	7.0	2
6.2	2	●	MDW 0620GS2	23.0	32.3	74.3	1.3	7.0	2
	4	●	0620GS4	34.0	43.3	84.3	1.3	7.0	2
6.3	2	●	MDW 0630GS2	22.9	32.3	74.3	1.3	7.0	2
	4	●	0630GS4	33.9	43.3	84.3	1.3	7.0	2
6.4	2	●	MDW 0640GS2	22.7	32.3	74.3	1.3	7.0	2
	4	●	0640GS4	33.7	43.3	84.3	1.3	7.0	2
6.5	2	●	MDW 0650GS2	22.6	32.3	74.3	1.3	7.0	2
	4	●	0650GS4	33.6	43.3	84.3	1.3	7.0	2

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Diameter $\phi 6.6$ to 9.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	2	●	MDW 0660GS2	24.5	34.4	74.4	1.4	7.0	2
	4	●	0660GS4	34.5	44.4	84.4	1.4	7.0	2
6.7	2	●	MDW 0670GS2	24.4	34.4	74.4	1.4	7.0	2
	4	●	0670GS4	34.4	44.4	84.4	1.4	7.0	2
6.8	2	●	MDW 0680GS2	24.2	34.4	74.4	1.4	7.0	2
	4	●	0680GS4	34.2	44.4	84.4	1.4	7.0	2
6.9	2	●	MDW 0690GS2	24.1	34.4	74.4	1.4	7.0	2
	4	●	0690GS4	34.1	44.4	84.4	1.4	7.0	2
7.0	2	●	MDW 0700GS2	23.9	34.4	74.4	1.4	7.0	2
	4	●	0700GS4	33.9	44.4	84.4	1.4	7.0	2
7.1	2	●	MDW 0710GS2	23.9	34.5	79.5	1.5	8.0	2
	4	●	0710GS4	35.9	46.5	91.5	1.5	8.0	2
7.2	2	●	MDW 0720GS2	23.7	34.5	79.5	1.5	8.0	2
	4	●	0720GS4	35.7	46.5	91.5	1.5	8.0	2
7.3	2	●	MDW 0730GS2	23.6	34.5	79.5	1.5	8.0	2
	4	●	0730GS4	35.6	46.5	91.5	1.5	8.0	2
7.4	2	●	MDW 0740GS2	23.4	34.5	79.5	1.5	8.0	2
	4	●	0740GS4	35.4	46.5	91.5	1.5	8.0	2
7.5	2	●	MDW 0750GS2	23.4	34.6	79.6	1.6	8.0	2
	4	●	0750GS4	35.4	46.6	91.6	1.6	8.0	2
7.6	2	●	MDW 0760GS2	26.2	37.6	79.6	1.6	8.0	2
	4	●	0760GS4	38.2	49.6	91.6	1.6	8.0	2
7.7	2	●	MDW 0770GS2	26.1	37.6	79.6	1.6	8.0	2
	4	●	0770GS4	38.1	49.6	91.6	1.6	8.0	2
7.8	2	●	MDW 0780GS2	25.9	37.6	79.6	1.6	8.0	2
	4	●	0780GS4	37.9	49.6	91.6	1.6	8.0	2
7.9	2	●	MDW 0790GS2	25.8	37.6	79.6	1.6	8.0	2
	4	●	0790GS4	37.8	49.6	91.6	1.6	8.0	2
8.0	2	●	MDW 0800GS2	25.7	37.7	79.7	1.7	8.0	2
	4	●	0800GS4	37.7	49.7	91.7	1.7	8.0	2
8.1	2	●	MDW 0810GS2	25.6	37.7	83.7	1.7	9.0	2
	4	●	0810GS4	42.6	54.7	99.7	1.7	9.0	2
8.2	2	●	MDW 0820GS2	25.4	37.7	83.7	1.7	9.0	2
	4	●	0820GS4	42.4	54.7	99.7	1.7	9.0	2
8.3	2	●	MDW 0830GS2	25.3	37.7	83.7	1.7	9.0	2
	4	●	0830GS4	42.3	54.7	99.7	1.7	9.0	2
8.4	2	●	MDW 0840GS2	25.1	37.7	83.7	1.7	9.0	2
	4	●	0840GS4	42.1	54.7	99.7	1.7	9.0	2
8.5	2	●	MDW 0850GS2	25.1	37.8	83.8	1.8	9.0	2
	4	●	0850GS4	42.1	54.8	99.8	1.8	9.0	2
8.6	2	●	MDW 0860GS2	26.9	39.8	83.8	1.8	9.0	2
	4	●	0860GS4	43.9	56.8	99.8	1.8	9.0	2
8.7	2	●	MDW 0870GS2	26.8	39.8	83.8	1.8	9.0	2
	4	●	0870GS4	43.8	56.8	99.8	1.8	9.0	2
8.8	2	●	MDW 0880GS2	26.6	39.8	83.8	1.8	9.0	2
	4	●	0880GS4	43.6	56.8	99.8	1.8	9.0	2
8.9	2	●	MDW 0890GS2	26.5	39.8	83.8	1.8	9.0	2
	4	●	0890GS4	43.5	56.8	99.8	1.8	9.0	2
9.0	2	●	MDW 0900GS2	26.4	39.9	83.9	1.9	9.0	2
	4	●	0900GS4	43.4	56.9	99.9	1.9	9.0	2
9.1	2	●	MDW 0910GS2	26.3	39.9	88.9	1.9	10.0	2
	4	●	0910GS4	46.3	59.9	106.9	1.9	10.0	2
9.2	2	●	MDW 0920GS2	26.1	39.9	88.9	1.9	10.0	2
	4	●	0920GS4	46.1	59.9	106.9	1.9	10.0	2
9.3	2	●	MDW 0930GS2	26.0	39.9	88.9	1.9	10.0	2
	4	●	0930GS4	46.0	59.9	106.9	1.9	10.0	2

Grade: ACX70

Diameter $\phi 9.4$ to 12.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.4	2	●	MDW 0940GS2	25.8	39.9	88.9	1.9	10.0	2
	4	●	0940GS4	45.8	59.9	106.9	1.9	10.0	2
9.5	2	●	MDW 0950GS2	25.8	40.0	89.0	2.0	10.0	2
	4	●	0950GS4	45.8	60.0	107.0	2.0	10.0	2
9.6	2	●	MDW 0960GS2	28.6	43.0	89.0	2.0	10.0	2
	4	●	0960GS4	47.6	62.0	107.0	2.0	10.0	2
9.7	2	●	MDW 0970GS2	28.5	43.0	89.0	2.0	10.0	2
	4	●	0970GS4	47.5	62.0	107.0	2.0	10.0	2
9.8	2	●	MDW 0980GS2	28.3	43.0	89.0	2.0	10.0	2
	4	●	0980GS4	47.3	62.0	107.0	2.0	10.0	2
9.9	2	●	MDW 0990GS2	28.2	43.0	89.0	2.0	10.0	2
	4	●	0990GS4	47.2	62.0	107.0	2.0	10.0	2
10.0	2	●	MDW 1000GS2	28.1	43.1	89.1	2.1	10.0	2
	4	●	1000GS4	47.1	62.1	107.1	2.1	10.0	2
10.1	2	●	MDW 1010GS2	28.0	43.1	95.1	2.1	11.0	2
	4	●	1010GS4	53.0	68.1	116.1	2.1	11.0	2
10.2	2	●	MDW 1020GS2	27.8	43.1	95.1	2.1	11.0	2
	4	●	1020GS4	52.8	68.1	116.1	2.1	11.0	2
10.3	2	●	MDW 1030GS2	27.7	43.1	95.1	2.1	11.0	2
	4	●	1030GS4	52.7	68.1	116.1	2.1	11.0	2
10.4	2	●	MDW 1040GS2	27.6	43.2	95.2	2.2	11.0	2
	4	●	1040GS4	52.6	68.2	116.2	2.2	11.0	2
10.5	2	●	MDW 1050GS2	27.5	43.2	95.2	2.2	11.0	2
	4	●	1050GS4	52.5	68.2	116.2	2.2	11.0	2
10.6	2	●	MDW 1060GS2	31.3	47.2	95.2	2.2	11.0	2
	4	●	1060GS4	54.3	70.2	116.2	2.2	11.0	2
10.7	2	●	MDW 1070GS2	31.2	47.2	95.2	2.2	11.0	2
	4	●	1070GS4	54.2	70.2	116.2	2.2	11.0	2
10.8	2	●	MDW 1080GS2	31.0	47.2	95.2	2.2	11.0	2
	4	●	1080GS4	54.0	70.2	116.2	2.2	11.0	2
10.9	2	●	MDW 1090GS2	31.0	47.3	95.3	2.3	11.0	2
	4	●	1090GS4	54.0	70.3	116.3	2.3	11.0	2
11.0	2	●	MDW 1100GS2	30.8	47.3	95.3	2.3	11.0	2
	4	●	1100GS4	53.8	70.3	116.3	2.3	11.0	2
11.1	2	●	MDW 1110GS2	30.7	47.3	102.3	2.3	12.0	2
	4	●	1110GS4	56.7	73.3	123.3	2.3	12.0	2
11.2	2	●	MDW 1120GS2	30.5	47.3	102.3	2.3	12.0	2
	4	●	1120GS4	56.5	73.3	123.3	2.3	12.0	2
11.3	2	●	MDW 1130GS2	30.4	47.3	102.3	2.3	12.0	2
	4	●	1130GS4	56.4	73.3	123.3	2.3	12.0	2
11.4	2	●	MDW 1140GS2	30.3	47.4	102.4	2.4	12.0	2
	4	●	1140GS4	56.3	73.4	123.4	2.4	12.0	2
11.5	2	●	MDW 1150GS2	30.2	47.4	102.4	2.4	12.0	2
	4	●	1150GS4	56.2	73.4	123.4	2.4	12.0	2
11.6	2	●	MDW 1160GS2	32.0	49.4	102.4	2.4	12.0	2
	4	●	1160GS4	58.0	75.4	123.4	2.4	12.0	2
11.7	2	●	MDW 1170GS2	31.9	49.4	102.4	2.4	12.0	2
	4	●	1170GS4	57.9	75.4	123.4	2.4	12.0	2
11.8	2	●	MDW 1180GS2	31.7	49.4	102.4	2.4	12.0	2
	4	●	1180GS4	57.7	75.4	123.4	2.4	12.0	2
11.9	2	●	MDW 1190GS2	31.7	49.5	102.5	2.5	12.0	2
	4	●	1190GS4	57.7	75.5	123.5	2.5	12.0	2
12.0	2	●	MDW 1200GS2	31.5	49.5	102.5	2.5	12.0	2
	4	●	1200GS4	57.5	75.5	123.5	2.5	12.0	2
12.1	2	●	MDW 1210GS2	31.4	49.5	102.5	2.5	13.0	2
	4	●	1210GS4	60.4	78.5	139.5	2.5	13.0	2

Grade: ACX70

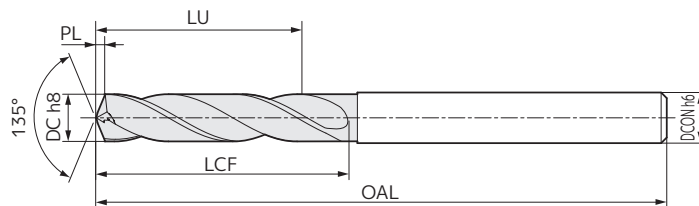


2D

4D

*For tolerances, refer to Chapter N - References.

Fig 2



Diameter ø12.2 to 14.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.2	2		MDW 1220GS2	31.2	49.5	102.5	2.5	13.0	2
	4		1220GS4	60.2	78.5	139.5	2.5	13.0	2
12.3	2		MDW 1230GS2	31.1	49.5	102.5	2.5	13.0	2
	4		1230GS4	60.1	78.5	139.5	2.5	13.0	2
12.4	2		MDW 1240GS2	31.0	49.6	102.6	2.6	13.0	2
	4		1240GS4	60.0	78.6	139.6	2.5	13.0	2
12.5	2		MDW 1250GS2	30.9	49.6	102.6	2.6	13.0	2
	4		1250GS4	59.9	78.6	139.6	2.6	13.0	2
12.6	2		MDW 1260GS2	32.7	51.6	102.6	2.6	13.0	2
	4		1260GS4	61.7	80.6	139.6	2.6	13.0	2
12.7	2		MDW 1270GS2	32.6	51.6	102.6	2.6	13.0	2
	4		1270GS4	61.6	80.6	139.6	2.6	13.0	2
12.8	2		MDW 1280GS2	32.4	51.6	102.6	2.6	13.0	2
	4		1280GS4	61.4	80.6	139.6	2.6	13.0	2
12.9	2		MDW 1290GS2	32.4	51.7	102.7	2.7	13.0	2
	4		1290GS4	61.4	80.7	139.7	2.7	13.0	2
13.0	2		MDW 1300GS2	32.2	51.7	102.7	2.7	13.0	2
	4		1300GS4	61.2	80.7	139.7	2.7	13.0	2
13.1	2		MDW 1310GS2	33.1	52.7	107.7	2.7	14.0	2
	4		1310GS4	67.1	86.7	149.7	2.7	14.0	2
13.2	2		MDW 1320GS2	32.9	52.7	107.7	2.7	14.0	2
	4		1320GS4	66.9	86.7	149.7	2.7	14.0	2
13.3	2		MDW 1330GS2	32.9	52.8	107.8	2.8	14.0	2
	4		1330GS4	66.9	86.8	149.8	2.8	14.0	2
13.4	2		MDW 1340GS2	32.7	52.8	107.8	2.8	14.0	2
	4		1340GS4	66.7	86.8	149.8	2.8	14.0	2
13.5	2		MDW 1350GS2	32.6	52.8	107.8	2.8	14.0	2
	4		1350GS4	66.6	86.8	149.8	2.8	14.0	2
13.6	2		MDW 1360GS2	34.4	54.8	107.8	2.8	14.0	2
	4		1360GS4	68.4	88.8	149.8	2.8	14.0	2
13.7	2		MDW 1370GS2	34.3	54.8	107.8	2.8	14.0	2
	4		1370GS4	68.3	88.8	149.8	2.8	14.0	2
13.8	2		MDW 1380GS2	34.2	54.9	107.9	2.9	14.0	2
	4		1380GS4	68.2	88.9	149.9	2.9	14.0	2
13.9	2		MDW 1390GS2	34.1	54.9	107.9	2.9	14.0	2
	4		1390GS4	68.1	88.9	149.9	2.9	14.0	2
14.0	2		MDW 1400GS2	33.9	54.9	107.9	2.9	14.0	2
	4		1400GS4	67.9	88.9	149.9	2.9	14.0	2
14.1	2		MDW 1410GS2	33.8	54.9	110.9	2.9	15.0	2
	4		1410GS4	70.8	91.9	155.9	2.9	15.0	2
14.2	2		MDW 1420GS2	33.6	54.9	110.9	2.9	15.0	2
	4		1420GS4	70.6	91.9	155.9	2.9	15.0	2
14.3	2		MDW 1430GS2	33.6	55.0	111.0	3.0	15.0	2
	4		1430GS4	70.6	92.0	156.0	3.0	15.0	2
14.4	2		MDW 1440GS2	33.4	55.0	111.0	3.0	15.0	2
	4		1440GS4	70.4	92.0	156.0	3.0	15.0	2
14.5	2		MDW 1450GS2	33.3	55.0	111.0	3.0	15.0	2
	4		1450GS4	70.3	92.0	156.0	3.0	15.0	2
14.6	2		MDW 1460GS2	34.1	56.0	111.0	3.0	15.0	2
	4		1460GS4	72.1	94.0	156.0	3.0	15.0	2
14.7	2		MDW 1470GS2	34.0	56.0	111.0	3.0	15.0	2
	4		1470GS4	72.0	94.0	156.0	3.0	15.0	2
14.8	2		MDW 1480GS2	33.9	56.1	111.1	3.1	15.0	2
	4		1480GS4	71.9	94.1	156.1	3.1	15.0	2
14.9	2		MDW 1490GS2	33.8	56.1	111.1	3.1	15.0	2
	4		1490GS4	71.8	94.1	156.1	3.1	15.0	2

Grade: ACX70

Diameter ø15.0 to 17.7mm

Dimensions (mm)

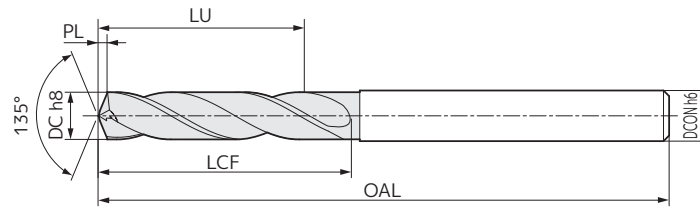
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.0	2		MDW 1500GS2	33.6	56.1	111.1	3.1	15.0	2
	4		1500GS4	71.6	94.1	156.1	3.1	15.0	2
15.1	2		MDW 1510GS2	33.5	56.1	111.1	3.1	16.0	2
	4		1510GS4	74.5	97.1	163.1	3.1	16.0	2
15.2	2		MDW 1520GS2	33.3	56.1	111.1	3.1	16.0	2
	4		1520GS4	74.3	97.1	163.1	3.1	16.0	2
15.3	2		MDW 1530GS2	33.3	56.2	111.2	3.2	16.0	2
	4		1530GS4	74.3	97.2	163.2	3.2	16.0	2
15.4	2		MDW 1540GS2	33.1	56.2	111.2	3.2	16.0	2
	4		1540GS4	74.1	97.2	163.2	3.2	16.0	2
15.5	2		MDW 1550GS2	33.0	56.2	111.2	3.2	16.0	2
	4		1550GS4	74.0	97.2	163.2	3.2	16.0	2
15.6	2		MDW 1560GS2	34.8	58.2	111.2	3.2	16.0	2
	4		1560GS4	75.8	99.2	163.2	3.2	16.0	2
15.7	2		MDW 1570GS2	34.7	58.2	111.2	3.2	16.0	2
	4		1570GS4	75.7	99.2	163.2	3.2	16.0	2
15.8	2		MDW 1580GS2	34.6	58.3	111.3	3.3	16.0	2
	4		1580GS4	75.6	99.3	163.3	3.3	16.0	2
15.9	2		MDW 1590GS2	34.5	58.3	111.3	3.3	16.0	2
	4		1590GS4	75.5	99.3	163.3	3.3	16.0	2
16.0	2		MDW 1600GS2	34.3	58.3	111.3	3.3	16.0	2
	4		1600GS4	75.3	99.3	163.3	3.3	16.0	2
16.1	2		MDW 1610GS2	35.2	59.3	111.3	3.3	17.0	2
	4		1610GS4	77.2	101.3	170.3	3.3	17.0	2
16.2	2		MDW 1620GS2	35.1	59.4	111.4	3.4	17.0	2
	4		1620GS4	77.1	101.4	170.4	3.4	17.0	2
16.3	2		MDW 1630GS2	35.0	59.4	111.4	3.4	17.0	2
	4		1630GS4	77.0	101.4	170.4	3.4	17.0	2
16.4	2		MDW 1640GS2	34.8	59.4	111.4	3.4	17.0	2
	4		1640GS4	76.8	101.4	170.4	3.4	17.0	2
16.5	2		MDW 1650GS2	34.7	59.4	111.4	3.4	17.0	2
	4		1650GS4	76.7	101.4	170.4	3.4	17.0	2
16.6	2		MDW 1660GS2	35.5	60.4	111.4	3.4	17.0	2
	4		1660GS4	76.5	101.4	170.4	3.4	17.0	2
16.7	2		MDW 1670GS2	35.5	60.5	111.5	3.5	17.0	2
	4		1670GS4	76.5	101.5	170.5	3.5	17.0	2
16.8	2		MDW 1680GS2	35.3	60.5	111.5	3.5	17.0	2
	4		1680GS4	76.3	101.5	170.5	3.5	17.0	2
16.9	2		MDW 1690GS2	35.2	60.5	111.5	3.5	17.0	2
	4		1690GS4	76.2	101.5	170.5	3.5	17.0	2
17.0	2		MDW 1700GS2	35.0	60.5	111.5	3.5	17.0	2
	4		1700GS4	76.0	101.5	170.5	3.5	17.0	2
17.1	2		MDW 1710GS2	35.9	61.5	123.5	3.5	18.0	2
	4		1710GS4	77.9	103.5	170.5	3.5	18.0	2
17.2	2		MDW 1720GS2	35.8	61.6	123.6	3.6	18.0	2
	4		1720GS4	77.8	103.6	170.6	3.6	18.0	2
17.3	2		MDW 1730GS2	35.7	61.6	123.6	3.6	18.0	2
	4		1730GS4	77.7	103.6	170.6	3.6	18.0	2
17.4	2		MDW 1740GS2	35.5	61.6	123.6	3.6	18.0	2
	4		1740GS4	77.5	103.6	170.6	3.6	18.0	2
17.5	2		MDW 1750GS2	35.4	61.6	123.6	3.6	18.0	2
	4		1750GS4	77.4	103.6	170.6	3.6	18.0	2
17.6	2		MDW 1760GS2	36.2	62.6	123.6	3.6	18.0	2
	4		1760GS4	79.2	105.6	170.6	3.6	18.0	2
17.7	2		MDW 1770GS2	36.2	62.7	123.7	3.7	18.0	2
	4		1770GS4	79.2	105.7	170.7	3.7	18.0	2

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 2

Diameter $\phi 17.8$ to 18.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
17.8	2		MDW 1780GS2	36.0	62.7	123.7	3.7	18.0	2
	4		1780GS4	79.0	105.7	170.7	3.7	18.0	2
17.9	2		MDW 1790GS2	35.9	62.7	123.7	3.7	18.0	2
	4		1790GS4	78.9	105.7	170.7	3.7	18.0	2
18.0	2		MDW 1800GS2	35.7	62.7	123.7	3.7	18.0	2
	4		1800GS4	78.7	105.7	170.7	3.7	18.0	2
18.1	2		MDW 1810GS2	35.6	62.7	126.7	3.7	19.0	2
	4		1810GS4	80.6	107.7	182.7	3.7	19.0	2
18.2	2		MDW 1820GS2	35.5	62.8	126.8	3.8	19.0	2
	4		1820GS4	80.5	107.8	182.8	3.8	19.0	2
18.3	2		MDW 1830GS2	35.4	62.8	126.8	3.8	19.0	2
	4		1830GS4	80.4	107.8	182.8	3.8	19.0	2
18.4	2		MDW 1840GS2	35.2	62.8	126.8	3.8	19.0	2
	4		1840GS4	80.2	107.8	182.8	3.8	19.0	2
18.5	2		MDW 1850GS2	35.1	62.8	126.8	3.8	19.0	2
	4		1850GS4	80.1	107.8	182.8	3.8	19.0	2
18.6	2		MDW 1860GS2	36.0	63.9	126.9	3.9	19.0	2
	4		1860GS4	82.0	109.9	182.9	3.9	19.0	2
18.7	2		MDW 1870GS2	35.9	63.9	126.9	3.9	19.0	2
	4		1870GS4	81.9	109.9	182.9	3.9	19.0	2
18.8	2		MDW 1880GS2	35.7	63.9	126.9	3.9	19.0	2
	4		1880GS4	81.7	109.9	182.9	3.9	19.0	2
18.9	2		MDW 1890GS2	35.6	63.9	126.9	3.9	19.0	2
	4		1890GS4	81.6	109.9	182.9	3.9	19.0	2

Grade: ACX70

Diameter $\phi 19.0$ to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
19.0	2		MDW 1900GS2	35.4	63.9	126.9	3.9	19.0	2
	4		1900GS4	81.4	109.9	182.9	3.9	19.0	2
19.1	2		MDW 1910GS2	36.4	65.0	131.0	4.0	20.0	2
	4		1910GS4	85.4	114.0	183.0	4.0	20.0	2
19.2	2		MDW 1920GS2	36.2	65.0	131.0	4.0	20.0	2
	4		1920GS4	85.2	114.0	183.0	4.0	20.0	2
19.3	2		MDW 1930GS2	36.1	65.0	131.0	4.0	20.0	2
	4		1930GS4	85.1	114.0	183.0	4.0	20.0	2
19.4	2		MDW 1940GS2	35.9	65.0	131.0	4.0	20.0	2
	4		1940GS4	84.9	114.0	183.0	4.0	20.0	2
19.5	2		MDW 1950GS2	35.8	65.0	131.0	4.0	20.0	2
	4		1950GS4	84.8	114.0	183.0	4.0	20.0	2
19.6	2		MDW 1960GS2	36.7	66.1	131.1	4.1	20.0	2
	4		1960GS4	88.7	118.1	183.1	4.1	20.0	2
19.7	2		MDW 1970GS2	36.6	66.1	131.1	4.1	20.0	2
	4		1970GS4	88.6	118.1	183.1	4.1	20.0	2
19.8	2		MDW 1980GS2	36.4	66.1	131.1	4.1	20.0	2
	4		1980GS4	88.4	118.1	183.1	4.1	20.0	2
19.9	2		MDW 1990GS2	36.3	66.1	131.1	4.1	20.0	2
	4		1990GS4	88.3	118.1	183.1	4.1	20.0	2
20.0	2		MDW 2000GS2	36.1	66.1	131.1	4.1	20.0	2
	4		2000GS4	88.1	118.1	183.1	4.1	20.0	2

Grade: ACX70

Recommended Cutting Conditions (For 2D/4D)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Hardened Steel		Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450
			(up to 45HRC)	(46HRC up)			
$\phi 3.0$	n	6,400	3,200	1,600	2,700	5,300	4,800
	vc	30 - 60 - 70	20 - 30 - 40	10 - 15 - 20	10 - 25 - 40	40 - 50 - 70	35 - 45 - 60
	f	0.1 - 0.15 - 0.2	0.06 - 0.07 - 0.08	0.05 - 0.07 - 0.08	0.06 - 0.08 - 0.12	0.15 - 0.2 - 0.25	0.12 - 0.15 - 0.2
$\phi 4.0$	n	4,800	2,400	1,200	2,000	4,000	3,600
	vc	30 - 60 - 80	20 - 30 - 40	10 - 15 - 20	10 - 25 - 45	40 - 50 - 70	35 - 45 - 60
	f	0.12 - 0.17 - 0.22	0.07 - 0.08 - 0.09	0.05 - 0.07 - 0.08	0.07 - 0.09 - 0.13	0.15 - 0.2 - 0.27	0.13 - 0.17 - 0.22
$\phi 5.0$	n	3,800	1,900	950	1,900	3,200	3,200
	vc	40 - 60 - 100	20 - 30 - 40	10 - 15 - 20	15 - 30 - 55	40 - 50 - 70	40 - 50 - 60
	f	0.15 - 0.2 - 0.25	0.08 - 0.09 - 0.1	0.05 - 0.07 - 0.08	0.08 - 0.1 - 0.15	0.15 - 0.2 - 0.3	0.15 - 0.2 - 0.25
$\phi 8.0$	n	3,200	1,200	600	1,400	2,000	2,400
	vc	40 - 80 - 120	20 - 30 - 40	10 - 15 - 20	15 - 35 - 55	40 - 50 - 80	50 - 60 - 70
	f	0.18 - 0.23 - 0.3	0.09 - 0.1 - 0.13	0.06 - 0.08 - 0.1	0.09 - 0.12 - 0.17	0.18 - 0.23 - 0.33	0.18 - 0.23 - 0.3
$\phi 10.0$	n	2,500	1,000	500	1,300	1,900	1,900
	vc	50 - 80 - 130	20 - 30 - 40	10 - 15 - 20	15 - 40 - 60	50 - 60 - 80	50 - 60 - 70
	f	0.2 - 0.25 - 0.35	0.1 - 0.12 - 0.15	0.06 - 0.08 - 0.1	0.1 - 0.15 - 0.2	0.2 - 0.3 - 0.35	0.2 - 0.25 - 0.35
$\phi 12.0$	n	2,100	800	400	1,100	1,700	1,600
	vc	50 - 80 - 130	20 - 30 - 40	10 - 15 - 20	15 - 40 - 60	50 - 65 - 80	50 - 60 - 70
	f	0.2 - 0.25 - 0.35	0.1 - 0.12 - 0.15	0.06 - 0.08 - 0.1	0.1 - 0.15 - 0.2	0.2 - 0.3 - 0.35	0.2 - 0.25 - 0.35
$\phi 16.0$	n	1,800	600	300	800	1,600	1,200
	vc	50 - 90 - 130	20 - 30 - 40	10 - 15 - 20	20 - 40 - 60	60 - 80 - 90	50 - 60 - 75
	f	0.22 - 0.26 - 0.35	0.1 - 0.12 - 0.15	0.07 - 0.09 - 0.11	0.1 - 0.15 - 0.2	0.22 - 0.3 - 0.35	0.22 - 0.28 - 0.35
$\phi 20.0$	n	1,600	500	250	650	1,300	950
	vc	60 - 100 - 140	20 - 30 - 40	10 - 15 - 20	20 - 40 - 60	60 - 80 - 100	50 - 60 - 80
	f	0.25 - 0.3 - 0.35	0.1 - 0.12 - 0.15	0.08 - 0.1 - 0.12	0.1 - 0.15 - 0.2	0.25 - 0.3 - 0.35	0.25 - 0.3 - 0.35

Min. - Optimum - Max.



*For tolerances, refer to Chapter N - References.

Fig 1 (Diameter ø1.5 to 2.4mm, single margin)

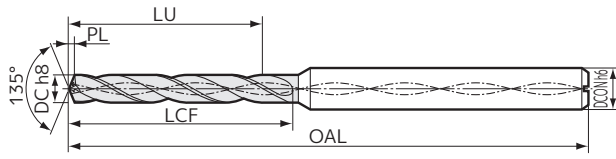
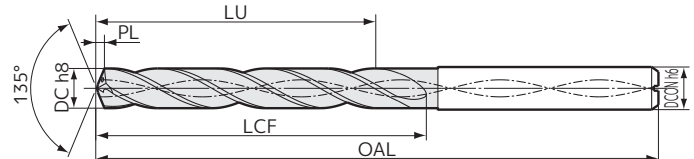


Fig 2 (Diameter ø2.5 to 20.0mm, double margin)



Diameter ø1.5 to 3.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.5	3	●	MDW 0150HGS3	8.1	10.3	63.3	0.3	3.0	1
	5	●	0150HGS5	12.1	14.3	70.3	0.3	3.0	1
	8	●	0150HGS8	16.6	18.8	76.3	0.3	3.0	1
1.6	3	●	MDW 0160HGS3	10.4	12.8	63.3	0.3	3.0	1
	5	●	0160HGS5	16.9	19.3	70.3	0.3	3.0	1
	8	●	0160HGS8	21.9	24.3	76.3	0.3	3.0	1
1.7	3	●	MDW 0170HGS3	10.4	12.9	63.4	0.4	3.0	1
	5	●	0170HGS5	16.9	19.4	70.4	0.4	3.0	1
	8	●	0170HGS8	21.9	24.4	76.4	0.4	3.0	1
1.8	3	●	MDW 0180HGS3	10.2	12.9	63.4	0.4	3.0	1
	5	●	0180HGS5	16.7	19.4	70.4	0.4	3.0	1
	8	●	0180HGS8	21.7	24.4	76.4	0.4	3.0	1
1.9	3	●	MDW 0190HGS3	10.1	12.9	63.4	0.4	3.0	1
	5	●	0190HGS5	16.6	19.4	70.4	0.4	3.0	1
	8	●	0190HGS8	21.6	24.4	76.4	0.4	3.0	1
2.0	3	●	MDW 0200HGS3	9.9	12.9	63.4	0.4	3.0	1
	5	●	0200HGS5	16.4	19.4	70.4	0.4	3.0	1
	8	●	0200HGS8	21.4	24.4	76.4	0.4	3.0	1
2.1	3	●	MDW 0210HGS3	12.3	15.4	68.4	0.4	3.0	1
	5	●	0210HGS5	21.3	24.4	78.4	0.4	3.0	1
	8	●	0210HGS8	24.8	27.9	81.4	0.4	3.0	1
2.2	3	●	MDW 0220HGS3	12.2	15.5	68.5	0.5	3.0	1
	5	●	0220HGS5	21.2	24.5	78.5	0.5	3.0	1
	8	●	0220HGS8	24.7	28.0	81.5	0.5	3.0	1
2.3	3	●	MDW 0230HGS3	12.1	15.5	68.5	0.5	3.0	1
	5	●	0230HGS5	21.1	24.5	78.5	0.5	3.0	1
	8	●	0230HGS8	24.6	28.0	81.5	0.5	3.0	1
2.4	3	●	MDW 0240HGS3	11.9	15.5	68.5	0.5	3.0	1
	5	●	0240HGS5	20.9	24.5	78.5	0.5	3.0	1
	8	●	0240HGS8	24.4	28.0	81.5	0.5	3.0	1
2.5	3	●	MDW 0250HGS3	11.8	15.5	68.5	0.5	3.0	2
	5	●	0250HGS5	20.8	24.5	78.5	0.5	3.0	2
	8	●	0250HGS8	24.3	28.0	81.5	0.5	3.0	2
2.6	3	●	MDW 0260HGS3	14.1	18.0	68.5	0.5	3.0	2
	5	●	0260HGS5	24.6	28.5	78.5	0.5	3.0	2
	8	●	0260HGS8	29.6	33.5	81.5	0.5	3.0	2
2.7	3	●	MDW 0270HGS3	14.1	18.1	68.6	0.6	3.0	2
	5	●	0270HGS5	24.6	28.6	78.6	0.6	3.0	2
	8	●	0270HGS8	29.6	33.6	81.6	0.6	3.0	2
2.8	3	●	MDW 0280HGS3	13.9	18.1	68.6	0.6	3.0	2
	5	●	0280HGS5	24.4	28.6	78.6	0.6	3.0	2
	8	●	0280HGS8	29.4	33.6	81.6	0.6	3.0	2
2.9	3	●	MDW 0290HGS3	13.8	18.1	68.6	0.6	3.0	2
	5	●	0290HGS5	24.3	28.6	78.6	0.6	3.0	2
	8	●	0290HGS8	29.3	33.6	81.6	0.6	3.0	2
3.0	3	●	MDW 0300HGS3	13.6	18.1	68.6	0.6	3.0	2
	5	●	0300HGS5	24.1	28.6	78.6	0.6	3.0	2
	8	●	0300HGS8	29.1	33.6	81.6	0.6	3.0	2
3.1	3	●	MDW 0310HGS3	16.0	20.6	72.6	0.6	4.0	2
	5	●	0310HGS5	28.0	32.6	86.6	0.6	4.0	2
	8	●	0310HGS8	34.5	39.1	92.6	0.6	4.0	2
3.2	3	●	MDW 0320HGS3	15.9	20.7	72.7	0.7	4.0	2
	5	●	0320HGS5	27.9	32.7	86.7	0.7	4.0	2
	8	●	0320HGS8	34.4	39.2	92.7	0.7	4.0	2

Grade: ACX70

Diameter ø3.3 to 5.0mm

Dimensions (mm)

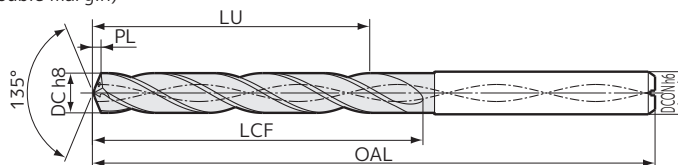
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.3	3	●	MDW 0330HGS3	15.8	20.7	72.7	0.7	4.0	2
	5	●	0330HGS5	27.8	32.7	86.7	0.7	4.0	2
	8	●	0330HGS8	34.3	39.2	92.7	0.7	4.0	2
3.4	3	●	MDW 0340HGS3	15.6	20.7	72.7	0.7	4.0	2
	5	●	0340HGS5	27.6	32.7	86.7	0.7	4.0	2
	8	●	0340HGS8	34.1	39.2	92.7	0.7	4.0	2
3.5	3	●	MDW 0350HGS3	15.5	20.7	72.7	0.7	4.0	2
	5	●	0350HGS5	27.5	32.7	86.7	0.7	4.0	2
	8	●	0350HGS8	34.0	39.2	92.7	0.7	4.0	2
3.6	3	●	MDW 0360HGS3	17.8	23.2	72.7	0.7	4.0	2
	5	●	0360HGS5	31.3	36.7	86.7	0.7	4.0	2
	8	●	0360HGS8	39.3	44.7	92.7	0.7	4.0	2
3.7	3	●	MDW 0370HGS3	17.8	23.3	72.8	0.8	4.0	2
	5	●	0370HGS5	31.3	36.8	86.8	0.8	4.0	2
	8	●	0370HGS8	39.3	44.8	92.8	0.8	4.0	2
3.8	3	●	MDW 0380HGS3	17.6	23.3	72.8	0.8	4.0	2
	5	●	0380HGS5	31.1	36.8	86.8	0.8	4.0	2
	8	●	0380HGS8	39.1	44.8	92.8	0.8	4.0	2
3.9	3	●	MDW 0390HGS3	17.5	23.3	72.8	0.8	4.0	2
	5	●	0390HGS5	31.0	36.8	86.8	0.8	4.0	2
	8	●	0390HGS8	39.0	44.8	92.8	0.8	4.0	2
4.0	3	●	MDW 0400HGS3	17.3	23.3	72.8	0.8	4.0	2
	5	●	0400HGS5	30.8	36.8	86.8	0.8	4.0	2
	8	●	0400HGS8	38.8	44.8	92.8	0.8	4.0	2
4.1	3	●	MDW 0410HGS3	19.7	25.8	80.8	0.8	5.0	2
	5	●	0410HGS5	34.7	40.8	98.8	0.8	5.0	2
	8	●	0410HGS8	44.2	50.3	105.8	0.8	5.0	2
4.2	3	●	MDW 0420HGS3	19.6	25.9	80.9	0.9	5.0	2
	5	●	0420HGS5	34.6	40.9	98.9	0.9	5.0	2
	8	●	0420HGS8	44.1	50.4	105.9	0.9	5.0	2
4.3	3	●	MDW 0430HGS3	19.5	25.9	80.9	0.9	5.0	2
	5	●	0430HGS5	34.5	40.9	98.9	0.9	5.0	2
	8	●	0430HGS8	44.0	50.4	105.9	0.9	5.0	2
4.4	3	●	MDW 0440HGS3	19.3	25.9	80.9	0.9	5.0	2
	5	●	0440HGS5	34.3	40.9	98.9	0.9	5.0	2
	8	●	0440HGS8	43.8	50.4	105.9	0.9	5.0	2
4.5	3	●	MDW 0450HGS3	19.2	25.9	80.9	0.9	5.0	2
	5	●	0450HGS5	34.2	40.9	98.9	0.9	5.0	2
	8	●	0450HGS8	43.7	50.4	105.9	0.9	5.0	2
4.6	3	●	MDW 0460HGS3	21.6	28.5	81.0	1.0	5.0	2
	5	●	0460HGS5	38.1	45.0	99.0	1.0	5.0	2
	8	●	0460HGS8	49.1	56.0	106.0	1.0	5.0	2
4.7	3	●	MDW 0470HGS3	21.5	28.5	81.0	1.0	5.0	2
	5	●	0470HGS5	38.0	45.0	99.0	1.0	5.0	2
	8	●	0470HGS8	49.0	56.0	106.0	1.0	5.0	2
4.8	3	●	MDW 0480HGS3	21.3	28.5	81.0	1.0	5.0	2
	5	●	0480HGS5	37.8	45.0	99.0	1.0	5.0	2
	8	●	0480HGS8	48.8	56.0	106.0	1.0	5.0	2
4.9	3	●	MDW 0490HGS3	21.2	28.5	81.0	1.0	5.0	2
	5	●	0490HGS5	37.7	45.0	99.0	1.0	5.0	2
	8	●	0490HGS8	48.7	56.0	106.0	1.0	5.0	2
5.0	3	●	MDW 0500HGS3	21.0	28.5	81.0	1.0	5.0	2
	5	●	0500HGS5	37.5	45.0	99.0	1.0	5.0	2
	8	●	0500HGS8	48.5	56.0	106.0	1.0	5.0	2

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 2 (Diameter ø2.5 to 20.0mm, double margin)



Diameter ø5.1 to 6.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.1	3	●	MDW 0510HGS3	21.0	28.6	83.1	1.1	6.0	2
	5	●	0510HGS5	37.5	45.1	101.1	1.1	6.0	2
	8	●	0510HGS8	54.0	61.6	119.1	1.1	6.0	2
5.2	3	●	MDW 0520HGS3	20.8	28.6	83.1	1.1	6.0	2
	5	●	0520HGS5	37.3	45.1	101.1	1.1	6.0	2
	8	●	0520HGS8	53.8	61.6	119.1	1.1	6.0	2
5.3	3	●	MDW 0530HGS3	20.7	28.6	83.1	1.1	6.0	2
	5	●	0530HGS5	37.2	45.1	101.1	1.1	6.0	2
	8	●	0530HGS8	53.7	61.6	119.1	1.1	6.0	2
5.4	3	●	MDW 0540HGS3	20.5	28.6	83.1	1.1	6.0	2
	5	●	0540HGS5	37.0	45.1	101.1	1.1	6.0	2
	8	●	0540HGS8	53.5	61.6	119.1	1.1	6.0	2
5.5	3	●	MDW 0550HGS3	20.4	28.6	83.1	1.1	6.0	2
	5	●	0550HGS5	36.9	45.1	101.1	1.1	6.0	2
	8	●	0550HGS8	53.4	61.6	119.1	1.1	6.0	2
5.6	3	●	MDW 0560HGS3	22.8	31.2	83.2	1.2	6.0	2
	5	●	0560HGS5	40.8	49.2	101.2	1.2	6.0	2
	8	●	0560HGS8	58.8	67.2	119.2	1.2	6.0	2
5.7	3	●	MDW 0570HGS3	22.7	31.2	83.2	1.2	6.0	2
	5	●	0570HGS5	40.7	49.2	101.2	1.2	6.0	2
	8	●	0570HGS8	58.7	67.2	119.2	1.2	6.0	2
5.8	3	●	MDW 0580HGS3	22.5	31.2	83.2	1.2	6.0	2
	5	●	0580HGS5	40.5	49.2	101.2	1.2	6.0	2
	8	●	0580HGS8	58.5	67.2	119.2	1.2	6.0	2
5.9	3	●	MDW 0590HGS3	22.4	31.2	83.2	1.2	6.0	2
	5	●	0590HGS5	40.4	49.2	101.2	1.2	6.0	2
	8	●	0590HGS8	58.4	67.2	119.2	1.2	6.0	2
6.0	3	●	MDW 0600HGS3	22.2	31.2	83.2	1.2	6.0	2
	5	●	0600HGS5	40.2	49.2	101.2	1.2	6.0	2
	8	●	0600HGS8	58.2	67.2	119.2	1.2	6.0	2
6.1	3	●	MDW 0610HGS3	24.7	33.8	89.3	1.3	7.0	2
	5	●	0610HGS5	44.2	53.3	110.3	1.3	7.0	2
	8	●	0610HGS8	63.7	72.8	131.3	1.3	7.0	2
6.2	3	●	MDW 0620HGS3	24.5	33.8	89.3	1.3	7.0	2
	5	●	0620HGS5	44.0	53.3	110.3	1.3	7.0	2
	8	●	0620HGS8	63.5	72.8	131.3	1.3	7.0	2
6.3	3	●	MDW 0630HGS3	24.4	33.8	89.3	1.3	7.0	2
	5	●	0630HGS5	43.9	53.3	110.3	1.3	7.0	2
	8	●	0630HGS8	63.4	72.8	131.3	1.3	7.0	2
6.4	3	●	MDW 0640HGS3	24.2	33.8	89.3	1.3	7.0	2
	5	●	0640HGS5	43.7	53.3	110.3	1.3	7.0	2
	8	●	0640HGS8	63.2	72.8	131.3	1.3	7.0	2
6.5	3	●	MDW 0650HGS3	24.1	33.8	89.3	1.3	7.0	2
	5	●	0650HGS5	43.6	53.3	110.3	1.3	7.0	2
	8	●	0650HGS8	63.1	72.8	131.3	1.3	7.0	2
6.6	3	●	MDW 0660HGS3	26.5	36.4	89.4	1.4	7.0	2
	5	●	0660HGS5	47.5	57.4	110.4	1.4	7.0	2
	8	●	0660HGS8	68.5	78.4	131.4	1.4	7.0	2
6.7	3	●	MDW 0670HGS3	26.4	36.4	89.4	1.4	7.0	2
	5	●	0670HGS5	47.4	57.4	110.4	1.4	7.0	2
	8	●	0670HGS8	68.4	78.4	131.4	1.4	7.0	2
6.8	3	●	MDW 0680HGS3	26.2	36.4	89.4	1.4	7.0	2
	5	●	0680HGS5	47.2	57.4	110.4	1.4	7.0	2
	8	●	0680HGS8	68.2	78.4	131.4	1.4	7.0	2

Grade: ACX70

Diameter ø6.9 to 8.6mm

Dimensions (mm)

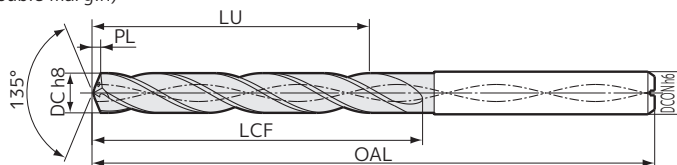
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.9	3	●	MDW 0690HGS3	26.1	36.4	89.4	1.4	7.0	2
	5	●	0690HGS5	47.1	57.4	110.4	1.4	7.0	2
	8	●	0690HGS8	68.1	78.4	131.4	1.4	7.0	2
7.0	3	●	MDW 0700HGS3	25.9	36.4	89.4	1.4	7.0	2
	5	●	0700HGS5	46.9	57.4	110.4	1.4	7.0	2
	8	●	0700HGS8	67.9	78.4	131.4	1.4	7.0	2
7.1	3	●	MDW 0710HGS3	28.4	39.0	95.5	1.5	8.0	2
	5	●	0710HGS5	50.9	61.5	119.5	1.5	8.0	2
	8	●	0710HGS8	73.4	84.0	143.5	1.5	8.0	2
7.2	3	●	MDW 0720HGS3	28.2	39.0	95.5	1.5	8.0	2
	5	●	0720HGS5	50.7	61.5	119.5	1.5	8.0	2
	8	●	0720HGS8	73.2	84.0	143.5	1.5	8.0	2
7.3	3	●	MDW 0730HGS3	28.1	39.0	95.5	1.5	8.0	2
	5	●	0730HGS5	50.6	61.5	119.5	1.5	8.0	2
	8	●	0730HGS8	73.1	84.0	143.5	1.5	8.0	2
7.4	3	●	MDW 0740HGS3	27.9	39.0	95.5	1.5	8.0	2
	5	●	0740HGS5	50.4	61.5	119.5	1.5	8.0	2
	8	●	0740HGS8	72.9	84.0	143.5	1.5	8.0	2
7.5	3	●	MDW 0750HGS3	27.9	39.1	95.6	1.6	8.0	2
	5	●	0750HGS5	50.4	61.6	119.6	1.6	8.0	2
	8	●	0750HGS8	72.9	84.1	143.6	1.6	8.0	2
7.6	3	●	MDW 0760HGS3	30.2	41.6	95.6	1.6	8.0	2
	5	●	0760HGS5	54.2	65.6	119.6	1.6	8.0	2
	8	●	0760HGS8	78.2	89.6	143.6	1.6	8.0	2
7.7	3	●	MDW 0770HGS3	30.1	41.6	95.6	1.6	8.0	2
	5	●	0770HGS5	54.1	65.6	119.6	1.6	8.0	2
	8	●	0770HGS8	78.1	89.6	143.6	1.6	8.0	2
7.8	3	●	MDW 0780HGS3	29.9	41.6	95.6	1.6	8.0	2
	5	●	0780HGS5	53.9	65.6	119.6	1.6	8.0	2
	8	●	0780HGS8	77.9	89.6	143.6	1.6	8.0	2
7.9	3	●	MDW 0790HGS3	29.8	41.6	95.6	1.6	8.0	2
	5	●	0790HGS5	53.8	65.6	119.6	1.6	8.0	2
	8	●	0790HGS8	77.8	89.6	143.6	1.6	8.0	2
8.0	3	●	MDW 0800HGS3	29.7	41.7	95.7	1.7	8.0	2
	5	●	0800HGS5	53.7	65.7	119.7	1.7	8.0	2
	8	●	0800HGS8	77.7	89.7	143.7	1.7	8.0	2
8.1	3	●	MDW 0810HGS3	32.1	44.2	101.7	1.7	9.0	2
	5	●	0810HGS5	57.6	69.7	128.7	1.7	9.0	2
	8	●	0810HGS8	83.1	95.2	155.7	1.7	9.0	2
8.2	3	●	MDW 0820HGS3	31.9	44.2	101.7	1.7	9.0	2
	5	●	0820HGS5	57.4	69.7	128.7	1.7	9.0	2
	8	●	0820HGS8	82.9	95.2	155.7	1.7	9.0	2
8.3	3	●	MDW 0830HGS3	31.8	44.2	101.7	1.7	9.0	2
	5	●	0830HGS5	57.3	69.7	128.7	1.7	9.0	2
	8	●	0830HGS8	82.8	95.2	155.7	1.7	9.0	2
8.4	3	●	MDW 0840HGS3	31.6	44.2	101.7	1.7	9.0	2
	5	●	0840HGS5	57.1	69.7	128.7	1.7	9.0	2
	8	●	0840HGS8	82.6	95.2	155.7	1.7	9.0	2
8.5	3	●	MDW 0850HGS3	31.6	44.3	101.8	1.8	9.0	2
	5	●	0850HGS5	57.1	69.8	128.8	1.8	9.0	2
	8	●	0850HGS8	82.6	95.3	155.8	1.8	9.0	2
8.6	3	●	MDW 0860HGS3	33.9	46.8	101.8	1.8	9.0	2
	5	●	0860HGS5	60.9	73.8	128.8	1.8	9.0	2
	8	●	0860HGS8	87.9	100.8	155.8	1.8	9.0	2

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 2 (Diameter ø2.5 to 20.0mm, double margin)



Diameter ø8.7 to 10.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.7	3	●	MDW 0870HGS3	33.8	46.8	101.8	1.8	9.0	2
	5	●	0870HGS5	60.8	73.8	128.8	1.8	9.0	2
	8	●	0870HGS8	87.8	100.8	155.8	1.8	9.0	2
8.8	3	●	MDW 0880HGS3	33.6	46.8	101.8	1.8	9.0	2
	5	●	0880HGS5	60.6	73.8	128.8	1.8	9.0	2
	8	●	0880HGS8	87.6	100.8	155.8	1.8	9.0	2
8.9	3	●	MDW 0890HGS3	33.5	46.8	101.8	1.8	9.0	2
	5	●	0890HGS5	60.5	73.8	128.8	1.8	9.0	2
	8	●	0890HGS8	87.5	100.8	155.8	1.8	9.0	2
9.0	3	●	MDW 0900HGS3	33.4	46.9	101.9	1.9	9.0	2
	5	●	0900HGS5	60.4	73.9	128.9	1.9	9.0	2
	8	●	0900HGS8	87.4	100.9	155.9	1.9	9.0	2
9.1	3	●	MDW 0910HGS3	35.8	49.4	107.9	1.9	10.0	2
	5	●	0910HGS5	64.3	77.9	137.9	1.9	10.0	2
	8	●	0910HGS8	92.8	106.4	167.9	1.9	10.0	2
9.2	3	●	MDW 0920HGS3	35.6	49.4	107.9	1.9	10.0	2
	5	●	0920HGS5	64.1	77.9	137.9	1.9	10.0	2
	8	●	0920HGS8	92.6	106.4	167.9	1.9	10.0	2
9.3	3	●	MDW 0930HGS3	35.5	49.4	107.9	1.9	10.0	2
	5	●	0930HGS5	64.0	77.9	137.9	1.9	10.0	2
	8	●	0930HGS8	92.5	106.4	167.9	1.9	10.0	2
9.4	3	●	MDW 0940HGS3	35.3	49.4	107.9	1.9	10.0	2
	5	●	0940HGS5	63.8	77.9	137.9	1.9	10.0	2
	8	●	0940HGS8	92.3	106.4	167.9	1.9	10.0	2
9.5	3	●	MDW 0950HGS3	35.3	49.5	108.0	2.0	10.0	2
	5	●	0950HGS5	63.8	78.0	138.0	2.0	10.0	2
	8	●	0950HGS8	92.3	106.5	168.0	2.0	10.0	2
9.6	3	●	MDW 0960HGS3	37.6	52.0	108.0	2.0	10.0	2
	5	●	0960HGS5	67.6	82.0	138.0	2.0	10.0	2
	8	●	0960HGS8	97.6	112.0	168.0	2.0	10.0	2
9.7	3	●	MDW 0970HGS3	37.5	52.0	108.0	2.0	10.0	2
	5	●	0970HGS5	67.5	82.0	138.0	2.0	10.0	2
	8	●	0970HGS8	97.5	112.0	168.0	2.0	10.0	2
9.8	3	●	MDW 0980HGS3	37.3	52.0	108.0	2.0	10.0	2
	5	●	0980HGS5	67.3	82.0	138.0	2.0	10.0	2
	8	●	0980HGS8	97.3	112.0	168.0	2.0	10.0	2
9.9	3	●	MDW 0990HGS3	37.2	52.0	108.0	2.0	10.0	2
	5	●	0990HGS5	67.2	82.0	138.0	2.0	10.0	2
	8	●	0990HGS8	97.2	112.0	168.0	2.0	10.0	2
10.0	3	●	MDW 1000HGS3	37.1	52.1	108.1	2.1	10.0	2
	5	●	1000HGS5	67.1	82.1	138.1	2.1	10.0	2
	8	●	1000HGS8	97.1	112.1	168.1	2.1	10.0	2
10.1	3	●	MDW 1010HGS3	39.5	54.6	118.1	2.1	11.0	2
	5	●	1010HGS5	71.0	86.1	151.1	2.1	11.0	2
	8	●	1010HGS8	102.5	117.6	184.1	2.1	11.0	2
10.2	3	●	MDW 1020HGS3	39.3	54.6	118.1	2.1	11.0	2
	5	●	1020HGS5	70.8	86.1	151.1	2.1	11.0	2
	8	●	1020HGS8	102.3	117.6	184.1	2.1	11.0	2
10.3	3	●	MDW 1030HGS3	39.2	54.6	118.1	2.1	11.0	2
	5	●	1030HGS5	70.7	86.1	151.1	2.1	11.0	2
	8	●	1030HGS8	102.2	117.6	184.1	2.1	11.0	2
10.4	3	●	MDW 1040HGS3	39.1	54.7	118.2	2.2	11.0	2
	5	●	1040HGS5	70.6	86.2	151.2	2.2	11.0	2
	8	●	1040HGS8	102.1	117.7	184.2	2.2	11.0	2

Grade: ACX70

Diameter ø10.5 to 12.2mm

Dimensions (mm)

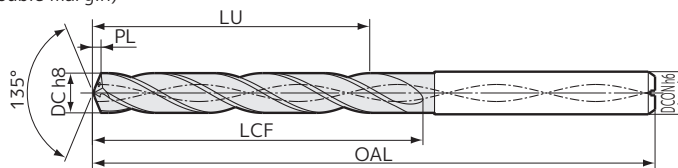
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.5	3	●	MDW 1050HGS3	39.0	54.7	118.2	2.2	11.0	2
	5	●	1050HGS5	70.5	86.2	151.2	2.2	11.0	2
	8	●	1050HGS8	102.0	117.7	184.2	2.2	11.0	2
10.6	3	●	MDW 1060HGS3	41.3	57.2	118.2	2.2	11.0	2
	5	●	1060HGS5	74.3	90.2	151.2	2.2	11.0	2
	8	●	1060HGS8	107.3	123.2	184.2	2.2	11.0	2
10.7	3	●	MDW 1070HGS3	41.2	57.2	118.2	2.2	11.0	2
	5	●	1070HGS5	74.2	90.2	151.2	2.2	11.0	2
	8	●	1070HGS8	107.2	123.2	184.2	2.2	11.0	2
10.8	3	●	MDW 1080HGS3	41.0	57.2	118.2	2.2	11.0	2
	5	●	1080HGS5	74.0	90.3	151.2	2.2	11.0	2
	8	●	1080HGS8	107.0	123.2	184.2	2.2	11.0	2
10.9	3	●	MDW 1090HGS3	41.0	57.3	118.3	2.3	11.0	2
	5	●	1090HGS5	74.0	90.3	151.3	2.3	11.0	2
	8	●	1090HGS8	107.0	123.3	184.3	2.3	11.0	2
11.0	3	●	MDW 1100HGS3	40.8	57.3	118.3	2.3	11.0	2
	5	●	1100HGS5	73.8	90.3	151.3	2.3	11.0	2
	8	●	1100HGS8	106.8	123.3	184.3	2.3	11.0	2
11.1	3	●	MDW 1110HGS3	43.2	59.8	124.3	2.3	12.0	2
	5	●	1110HGS5	77.7	94.3	160.3	2.3	12.0	2
	8	●	1110HGS8	112.2	128.8	196.3	2.3	12.0	2
11.2	3	●	MDW 1120HGS3	43.0	59.8	124.3	2.3	12.0	2
	5	●	1120HGS5	77.5	94.3	160.3	2.3	12.0	2
	8	●	1120HGS8	112.0	128.8	196.3	2.3	12.0	2
11.3	3	●	MDW 1130HGS3	42.9	59.8	124.3	2.3	12.0	2
	5	●	1130HGS5	77.4	94.3	160.3	2.3	12.0	2
	8	●	1130HGS8	111.9	128.8	196.3	2.3	12.0	2
11.4	3	●	MDW 1140HGS3	42.8	59.9	124.4	2.4	12.0	2
	5	●	1140HGS5	77.3	94.4	160.4	2.4	12.0	2
	8	●	1140HGS8	111.8	128.9	196.4	2.4	12.0	2
11.5	3	●	MDW 1150HGS3	42.7	59.9	124.4	2.4	12.0	2
	5	●	1150HGS5	77.2	94.4	160.4	2.4	12.0	2
	8	●	1150HGS8	111.7	128.9	196.4	2.4	12.0	2
11.6	3	●	MDW 1160HGS3	45.0	62.4	124.4	2.4	12.0	2
	5	●	1160HGS5	81.0	98.4	160.4	2.4	12.0	2
	8	●	1160HGS8	117.0	134.4	196.4	2.4	12.0	2
11.7	3	●	MDW 1170HGS3	44.9	62.4	124.4	2.4	12.0	2
	5	●	1170HGS5	80.9	98.4	160.4	2.4	12.0	2
	8	●	1170HGS8	116.9	134.4	196.4	2.4	12.0	2
11.8	3	●	MDW 1180HGS3	44.7	62.4	124.4	2.4	12.0	2
	5	●	1180HGS5	80.7	98.4	160.4	2.4	12.0	2
	8	●	1180HGS8	116.7	134.4	196.4	2.4	12.0	2
11.9	3	●	MDW 1190HGS3	44.7	62.5	124.5	2.5	12.0	2
	5	●	1190HGS5	80.7	98.5	160.5	2.5	12.0	2
	8	●	1190HGS8	116.7	134.5	196.5	2.5	12.0	2
12.0	3	●	MDW 1200HGS3	44.5	62.5	124.5	2.5	12.0	2
	5	●	1200HGS5	80.5	98.5	160.5	2.5	12.0	2
	8	●	1200HGS8	116.5	134.5	196.5	2.5	12.0	2
12.1	3	●	MDW 1210HGS3	46.9	65.0	130.5	2.5	13.0	2
	5	●	1210HGS5	84.4	102.5	169.5	2.5	13.0	2
	8	●	1210HGS8	121.9	140.0	208.5	2.5	13.0	2
12.2	3	●	MDW 1220HGS3	46.7	65.0	130.5	2.5	13.0	2
	5	●	1220HGS5	84.2	102.5	169.5	2.5	13.0	2
	8	●	1220HGS8	121.7	140.0	208.5	2.5	13.0	2

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 2 (Diameter ø2.5 to 20.0mm, double margin)



Diameter ø12.3 to 14.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.3	3	●	MDW 1230HGS3	46.6	65.0	130.5	2.5	13.0	2
	5	●	1230HGS5	84.1	102.5	169.5	2.5	13.0	2
	8	●	1230HGS8	121.6	140.0	208.5	2.5	13.0	2
12.4	3	●	MDW 1240HGS3	46.5	65.1	130.6	2.6	13.0	2
	5	●	1240HGS5	84.0	102.6	169.6	2.6	13.0	2
	8	●	1240HGS8	121.5	140.1	208.6	2.6	13.0	2
12.5	3	●	MDW 1250HGS3	46.4	65.1	130.6	2.6	13.0	2
	5	●	1250HGS5	83.9	102.6	169.6	2.6	13.0	2
	8	●	1250HGS8	121.4	140.1	208.6	2.6	13.0	2
12.6	3	●	MDW 1260HGS3	48.7	67.6	130.6	2.6	13.0	2
	5	●	1260HGS5	87.7	106.6	169.6	2.6	13.0	2
	8	●	1260HGS8	126.7	145.6	208.6	2.6	13.0	2
12.7	3	●	MDW 1270HGS3	48.6	67.6	130.6	2.6	13.0	2
	5	●	1270HGS5	87.6	106.6	169.6	2.6	13.0	2
	8	●	1270HGS8	126.6	145.6	208.6	2.6	13.0	2
12.8	3	●	MDW 1280HGS3	48.4	67.6	130.6	2.6	13.0	2
	5	●	1280HGS5	87.4	106.6	169.6	2.6	13.0	2
	8	●	1280HGS8	126.4	145.6	208.6	2.6	13.0	2
12.9	3	●	MDW 1290HGS3	48.4	67.7	130.7	2.7	13.0	2
	5	●	1290HGS5	87.4	106.7	169.7	2.7	13.0	2
	8	●	1290HGS8	126.4	145.7	208.7	2.7	13.0	2
13.0	3	●	MDW 1300HGS3	48.2	67.7	130.7	2.7	13.0	2
	5	●	1300HGS5	87.2	106.7	169.7	2.7	13.0	2
	8	●	1300HGS8	126.2	145.7	208.7	2.7	13.0	2
13.1	3	●	MDW 1310HGS3	50.6	70.2	136.7	2.7	14.0	2
	5	●	1310HGS5	91.1	110.7	178.7	2.7	14.0	2
	8	●	1310HGS8	131.6	151.2	220.7	2.7	14.0	2
13.2	3	●	MDW 1320HGS3	50.4	70.2	136.7	2.7	14.0	2
	5	●	1320HGS5	90.9	110.7	178.7	2.7	14.0	2
	8	●	1320HGS8	131.4	151.2	220.7	2.7	14.0	2
13.3	3	●	MDW 1330HGS3	50.4	70.3	136.8	2.8	14.0	2
	5	●	1330HGS5	90.9	110.8	178.8	2.8	14.0	2
	8	●	1330HGS8	131.4	151.3	220.8	2.8	14.0	2
13.4	3	●	MDW 1340HGS3	50.2	70.3	136.8	2.8	14.0	2
	5	●	1340HGS5	90.7	110.8	178.8	2.8	14.0	2
	8	●	1340HGS8	131.2	151.3	220.8	2.8	14.0	2
13.5	3	●	MDW 1350HGS3	50.1	70.3	136.8	2.8	14.0	2
	5	●	1350HGS5	90.6	110.8	178.8	2.8	14.0	2
	8	●	1350HGS8	131.1	151.3	220.8	2.8	14.0	2
13.6	3	●	MDW 1360HGS3	52.4	72.8	136.8	2.8	14.0	2
	5	●	1360HGS5	94.4	114.8	178.8	2.8	14.0	2
	8	●	1360HGS8	136.4	156.8	220.8	2.8	14.0	2
13.7	3	●	MDW 1370HGS3	52.3	72.8	136.8	2.8	14.0	2
	5	●	1370HGS5	94.3	114.8	178.8	2.8	14.0	2
	8	●	1370HGS8	136.3	156.8	220.8	2.8	14.0	2
13.8	3	●	MDW 1380HGS3	52.2	72.9	136.9	2.9	14.0	2
	5	●	1380HGS5	94.2	114.9	178.9	2.9	14.0	2
	8	●	1380HGS8	136.2	156.9	220.9	2.9	14.0	2
13.9	3	●	MDW 1390HGS3	52.1	72.9	136.9	2.9	14.0	2
	5	●	1390HGS5	94.1	114.9	178.9	2.9	14.0	2
	8	●	1390HGS8	136.1	156.9	220.9	2.9	14.0	2
14.0	3	●	MDW 1400HGS3	51.9	72.9	136.9	2.9	14.0	2
	5	●	1400HGS5	93.9	114.9	178.9	2.9	14.0	2
	8	●	1400HGS8	135.9	156.9	220.9	2.9	14.0	2

Grade: ACX70

Diameter ø14.1 to 15.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
14.1	3	●	MDW 1410HGS3	54.3	75.4	142.9	2.9	15.0	2
	5	●	1410HGS5	97.8	118.9	187.9	2.9	15.0	2
	8	●	1410HGS8	141.3	162.4	232.9	2.9	15.0	2
14.2	3	●	MDW 1420HGS3	54.1	75.4	142.9	2.9	15.0	2
	5	●	1420HGS5	97.6	118.9	187.9	2.9	15.0	2
	8	●	1420HGS8	141.1	162.4	232.9	2.9	15.0	2
14.3	3	●	MDW 1430HGS3	54.1	75.5	143.0	3.0	15.0	2
	5	●	1430HGS5	97.6	119.0	188.0	3.0	15.0	2
	8	●	1430HGS8	141.1	162.5	233.0	3.0	15.0	2
14.4	3	●	MDW 1440HGS3	53.9	75.5	143.0	3.0	15.0	2
	5	●	1440HGS5	97.4	119.0	188.0	3.0	15.0	2
	8	●	1440HGS8	140.9	162.5	233.0	3.0	15.0	2
14.5	3	●	MDW 1450HGS3	53.8	75.5	143.0	3.0	15.0	2
	5	●	1450HGS5	97.3	119.0	188.0	3.0	15.0	2
	8	●	1450HGS8	140.8	162.5	233.0	3.0	15.0	2
14.6	3	●	MDW 1460HGS3	56.1	78.0	143.0	3.0	15.0	2
	5	●	1460HGS5	101.1	123.0	188.0	3.0	15.0	2
	8	●	1460HGS8	146.1	168.0	233.0	3.0	15.0	2
14.7	3	●	MDW 1470HGS3	56.0	78.0	143.0	3.0	15.0	2
	5	●	1470HGS5	101.0	123.0	188.0	3.0	15.0	2
	8	●	1470HGS8	146.0	168.0	233.0	3.0	15.0	2
14.8	3	●	MDW 1480HGS3	55.9	78.1	143.1	3.1	15.0	2
	5	●	1480HGS5	100.9	123.1	188.1	3.1	15.0	2
	8	●	1480HGS8	145.9	168.1	233.1	3.1	15.0	2
14.9	3	●	MDW 1490HGS3	55.8	78.1	143.1	3.1	15.0	2
	5	●	1490HGS5	100.8	123.1	188.1	3.1	15.0	2
	8	●	1490HGS8	145.8	168.1	233.1	3.1	15.0	2
15.0	3	●	MDW 1500HGS3	55.6	78.1	143.1	3.1	15.0	2
	5	●	1500HGS5	100.6	123.1	188.1	3.1	15.0	2
	8	●	1500HGS8	145.6	168.1	233.1	3.1	15.0	2
15.1	3	●	MDW 1510HGS3	58.0	80.6	149.1	3.1	16.0	2
	5	●	1510HGS5	104.5	127.1	197.1	3.1	16.0	2
	8	●	1510HGS8	151.0	173.6	245.1	3.1	16.0	2
15.2	3	●	MDW 1520HGS3	57.8	80.6	149.1	3.1	16.0	2
	5	●	1520HGS5	104.3	127.1	197.1	3.1	16.0	2
	8	●	1520HGS8	150.8	173.6	245.1	3.1	16.0	2
15.3	3	●	MDW 1530HGS3	57.8	80.7	149.2	3.2	16.0	2
	5	●	1530HGS5	104.3	127.2	197.2	3.2	16.0	2
	8	●	1530HGS8	150.8	173.7	245.2	3.2	16.0	2
15.4	3	●	MDW 1540HGS3	57.6	80.7	149.2	3.2	16.0	2
	5	●	1540HGS5	104.1	127.2	197.2	3.2	16.0	2
	8	●	1540HGS8	150.6	173.7	245.2	3.2	16.0	2
15.5	3	●	MDW 1550HGS3	57.5	80.7	149.2	3.2	16.0	2
	5	●	1550HGS5	104.0	127.2	197.2	3.2	16.0	2
	8	●	1550HGS8	150.5	173.7	245.2	3.2	16.0	2
15.6	3	●	MDW 1560HGS3	59.8	83.2	149.2	3.2	16.0	2
	5	●	1560HGS5	107.8	131.2	197.2	3.2	16.0	2
	8	●	1560HGS8	155.8	179.2	245.2	3.2	16.0	2
15.7	3	●	MDW 1570HGS3	59.7	83.2	149.2	3.2	16.0	2
	5	●	1570HGS5	107.7	131.2	197.2	3.2	16.0	2
	8	●	1570HGS8	155.7	179.2	245.2	3.2	16.0	2
15.8	3	●	MDW 1580HGS3	59.6	83.3	149.3	3.3	16.0	2
	5	●	1580HGS5	107.6	131.3	197.3	3.3	16.0	2
	8	●	1580HGS8	155.6	179.3	245.3	3.3	16.0	2

Grade: ACX70

HGS series (Internal Coolant Supply)

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCHardened
Steel
from 46HRCStainless
Steel

Ti Alloy

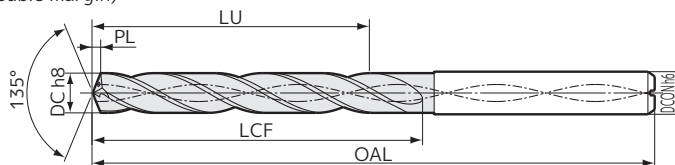
Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronCopper
Alloy

*For tolerances, refer to Chapter N - References.

Fig 2 (Diameter ø2.5 to 20.0mm, double margin)



Diameter ø15.9 to 18.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.9	3	●	MDW 1590HGS3	59.5	83.3	149.3	3.3	16.0	2
	5	●	1590HGS5	107.5	131.3	197.3	3.3	16.0	2
	8		1590HGS8	155.5	179.3	245.3	3.3	16.0	2
16.0	3	●	MDW 1600HGS3	59.3	83.3	149.3	3.3	16.0	2
	5	●	1600HGS5	107.3	131.3	197.3	3.3	16.0	2
	8	●	1600HGS8	155.3	179.3	245.3	3.3	16.0	2
16.1	3		MDW 1610HGS3	61.7	85.8	155.3	3.3	17.0	2
	5		1610HGS5	111.2	135.3	206.3	3.3	17.0	2
16.2	3		MDW 1620HGS3	61.6	85.9	155.4	3.4	17.0	2
	5		1620HGS5	111.1	135.4	206.4	3.4	17.0	2
16.3	3		MDW 1630HGS3	61.5	85.9	155.4	3.4	17.0	2
	5		1630HGS5	111.0	135.4	206.4	3.4	17.0	2
16.4	3		MDW 1640HGS3	61.3	85.9	155.4	3.4	17.0	2
	5		1640HGS5	110.8	135.4	206.4	3.4	17.0	2
16.5	3	●	MDW 1650HGS3	61.2	85.9	155.4	3.4	17.0	2
	5	●	1650HGS5	110.7	135.4	206.4	3.4	17.0	2
16.6	3		MDW 1660HGS3	63.5	88.4	155.4	3.4	17.0	2
	5		1660HGS5	114.5	139.4	206.4	3.4	17.0	2
16.7	3		MDW 1670HGS3	63.5	88.5	155.5	3.5	17.0	2
	5		1670HGS5	114.5	139.5	206.5	3.5	17.0	2
16.8	3		MDW 1680HGS3	63.3	88.5	155.5	3.5	17.0	2
	5		1680HGS5	114.3	139.5	206.5	3.5	17.0	2
16.9	3		MDW 1690HGS3	63.2	88.5	155.5	3.5	17.0	2
	5		1690HGS5	114.2	139.5	206.5	3.5	17.0	2
17.0	3	●	MDW 1700HGS3	63.0	88.5	155.5	3.5	17.0	2
	5	●	1700HGS5	114.0	139.5	206.5	3.5	17.0	2
17.1	3		MDW 1710HGS3	65.4	91.0	161.5	3.5	18.0	2
	5		1710HGS5	117.9	143.5	217.5	3.5	18.0	2
17.2	3		MDW 1720HGS3	65.3	91.1	161.6	3.6	18.0	2
	5		1720HGS5	117.8	143.6	217.6	3.6	18.0	2
17.3	3		MDW 1730HGS3	65.2	91.1	161.6	3.6	18.0	2
	5		1730HGS5	117.7	143.6	217.6	3.6	18.0	2
17.4	3		MDW 1740HGS3	65.0	91.1	161.6	3.6	18.0	2
	5		1740HGS5	117.5	143.6	217.6	3.6	18.0	2
17.5	3	●	MDW 1750HGS3	64.9	91.1	161.6	3.6	18.0	2
	5	●	1750HGS5	117.4	143.6	217.6	3.6	18.0	2
17.6	3		MDW 1760HGS3	67.2	93.6	161.6	3.6	18.0	2
	5		1760HGS5	121.2	147.6	217.6	3.6	18.0	2
17.7	3		MDW 1770HGS3	67.2	93.7	161.7	3.7	18.0	2
	5		1770HGS5	121.2	147.7	217.7	3.7	18.0	2
17.8	3		MDW 1780HGS3	67.0	93.7	161.7	3.7	18.0	2
	5		1780HGS5	121.0	147.7	217.7	3.7	18.0	2
17.9	3		MDW 1790HGS3	66.9	93.7	161.7	3.7	18.0	2
	5		1790HGS5	120.9	147.7	217.7	3.7	18.0	2
18.0	3	●	MDW 1800HGS3	66.7	93.7	161.7	3.7	18.0	2
	5	●	1800HGS5	120.7	147.7	217.7	3.7	18.0	2
18.1	3		MDW 1810HGS3	69.1	96.2	167.7	3.7	19.0	2
	5		1810HGS5	124.6	151.7	224.7	3.7	19.0	2
18.2	3		MDW 1820HGS3	69.0	96.3	167.8	3.8	19.0	2
	5		1820HGS5	124.5	151.8	224.8	3.8	19.0	2
18.3	3		MDW 1830HGS3	68.9	96.3	167.8	3.8	19.0	2
	5		1830HGS5	124.4	151.8	224.8	3.8	19.0	2
18.4	3		MDW 1840HGS3	68.7	96.3	167.8	3.8	19.0	2
	5		1840HGS5	124.2	151.8	224.8	3.8	19.0	2

Grade: ACX70

Diameter ø18.5 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
18.5	3	●	MDW 1850HGS3	68.6	96.3	167.8	3.8	19.0	2
	5	●	1850HGS5	124.1	151.8	224.8	3.8	19.0	2
18.6	3		MDW 1860HGS3	71.0	98.9	167.9	3.9	19.0	2
	5		1860HGS5	128.0	155.9	224.9	3.9	19.0	2
18.7	3		MDW 1870HGS3	70.9	98.9	167.9	3.9	19.0	2
	5		1870HGS5	127.9	155.9	224.9	3.9	19.0	2
18.8	3		MDW 1880HGS3	70.7	98.9	167.9	3.9	19.0	2
	5		1880HGS5	127.7	155.9	224.9	3.9	19.0	2
18.9	3		MDW 1890HGS3	70.6	98.9	167.9	3.9	19.0	2
	5		1890HGS5	127.6	155.9	224.9	3.9	19.0	2
19.0	3	●	MDW 1900HGS3	70.4	98.9	167.9	3.9	19.0	2
	5	●	1900HGS5	127.4	155.9	224.9	3.9	19.0	2
19.1	3		MDW 1910HGS3	72.9	101.5	174.0	4.0	20.0	2
	5		1910HGS5	131.4	160.0	234.0	4.0	20.0	2
19.2	3		MDW 1920HGS3	72.7	101.5	174.0	4.0	20.0	2
	5		1920HGS5	131.2	160.0	234.0	4.0	20.0	2
19.3	3		MDW 1930HGS3	72.6	101.5	174.0	4.0	20.0	2
	5		1930HGS5	131.1	160.0	234.0	4.0	20.0	2
19.4	3		MDW 1940HGS3	72.4	101.5	174.0	4.0	20.0	2
	5		1940HGS5	130.9	160.0	234.0	4.0	20.0	2
19.5	3	●	MDW 1950HGS3	72.3	101.5	174.0	4.0	20.0	2
	5	●	1950HGS5	130.8	160.0	234.0	4.0	20.0	2
19.6	3		MDW 1960HGS3	74.7	104.1	174.1	4.1	20.0	2
	5		1960HGS5	134.7	164.1	234.1	4.1	20.0	2
19.7	3		MDW 1970HGS3	74.6	104.1	174.1	4.1	20.0	2
	5		1970HGS5	134.6	164.1	234.1	4.1	20.0	2
19.8	3		MDW 1980HGS3	74.4	104.1	174.1	4.1	20.0	2
	5		1980HGS5	134.4	164.1	234.1	4.1	20.0	2
19.9	3		MDW 1990HGS3	74.3	104.1	174.1	4.1	20.0	2
	5		1990HGS5	134.3	164.1	234.1	4.1	20.0	2
20.0	3	●	MDW 2000HGS3	74.1	104.1	174.1	4.1	20.0	2
	5	●	2000HGS5	134.1	164.1	234.1	4.1	20.0	2

Grade: ACX70

HGS series (Internal Coolant Supply)

Recommended Cutting Conditions (For 3D/5D/8D)

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Hardened Steel		Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450	Titanium Alloy 6Al-4V-Ti	Ni-based Heat-resistant Alloy (Inconel 718)
			(up to 45HRC)	(46HRC up)					
ø3.0	n	6,400	3,200	1,600	4,200	7,400	5,300	3,200	1,100
	vc	30 - 60 - 100	20 - 30 - 40	10 - 15 - 20	30 - 40 - 50	50 - 70 - 90	40 - 50 - 80	20 - 30 - 40	5 - 10 - 30
	f	0.10 - 0.15 - 0.20	0.06 - 0.07 - 0.08	0.05 - 0.07 - 0.08	0.06 - 0.08 - 0.12	0.15 - 0.20 - 0.25	0.12 - 0.15 - 0.20	0.08 - 0.09 - 0.10	0.05 - 0.06 - 0.08
ø4.0	n	5,600	2,400	1,200	3,200	5,600	4,000	2,400	800
	vc	40 - 70 - 110	20 - 30 - 40	10 - 15 - 20	30 - 40 - 55	50 - 70 - 90	40 - 50 - 80	20 - 30 - 40	5 - 10 - 30
	f	0.15 - 0.2 - 0.25	0.07 - 0.08 - 0.09	0.05 - 0.07 - 0.08	0.07 - 0.10 - 0.13	0.15 - 0.20 - 0.25	0.13 - 0.18 - 0.23	0.08 - 0.09 - 0.10	0.05 - 0.06 - 0.08
ø5.0	n	5,100	1,900	950	2,500	4,500	3,200	1,900	600
	vc	50 - 80 - 120	20 - 30 - 40	10 - 15 - 20	30 - 40 - 60	50 - 70 - 90	40 - 50 - 80	20 - 30 - 40	5 - 10 - 30
	f	0.15 - 0.2 - 0.25	0.08 - 0.09 - 0.10	0.05 - 0.07 - 0.08	0.08 - 0.12 - 0.15	0.15 - 0.20 - 0.30	0.15 - 0.20 - 0.25	0.08 - 0.09 - 0.10	0.05 - 0.06 - 0.08
ø8.0	n	3,600	1,200	600	1,800	3,200	2,400	1,200	600
	vc	60 - 90 - 140	20 - 30 - 40	10 - 15 - 20	30 - 45 - 70	60 - 80 - 100	50 - 60 - 90	20 - 30 - 40	10 - 15 - 30
	f	0.18 - 0.25 - 0.30	0.09 - 0.10 - 0.13	0.06 - 0.08 - 0.10	0.09 - 0.14 - 0.18	0.18 - 0.23 - 0.33	0.18 - 0.23 - 0.30	0.08 - 0.09 - 0.10	0.07 - 0.08 - 0.09
ø10.0	n	3,200	1,000	500	1,600	2,500	1,900	950	500
	vc	70 - 100 - 150	20 - 30 - 40	10 - 15 - 20	40 - 50 - 80	60 - 80 - 100	50 - 60 - 90	20 - 30 - 40	10 - 15 - 30
	f	0.20 - 0.25 - 0.35	0.10 - 0.12 - 0.15	0.06 - 0.08 - 0.10	0.10 - 0.15 - 0.20	0.20 - 0.30 - 0.35	0.20 - 0.25 - 0.35	0.08 - 0.10 - 0.12	0.08 - 0.09 - 0.10
ø12.0	n	2,700	800	400	1,300	2,100	1,600	800	400
	vc	70 - 100 - 150	20 - 30 - 40	10 - 15 - 20	40 - 50 - 80	60 - 80 - 100	50 - 60 - 90	20 - 30 - 40	10 - 15 - 30
	f	0.20 - 0.25 - 0.35	0.10 - 0.12 - 0.15	0.06 - 0.08 - 0.10	0.10 - 0.15 - 0.20	0.20 - 0.30 - 0.35	0.20 - 0.25 - 0.35	0.08 - 0.10 - 0.12	0.08 - 0.09 - 0.10
ø16.0	n	2,200	600	300	1,200	1,800	1,400	600	400
	vc	75 - 110 - 150	20 - 30 - 40	10 - 15 - 20	45 - 60 - 80	65 - 90 - 110	55 - 70 - 95	25 - 30 - 40	15 - 20 - 35
	f	0.22 - 0.27 - 0.35	0.10 - 0.12 - 0.15	0.07 - 0.09 - 0.11	0.10 - 0.15 - 0.20	0.25 - 0.30 - 0.35	0.22 - 0.28 - 0.35	0.09 - 0.11 - 0.13	0.08 - 0.09 - 0.10
ø20.0	n	1,900	500	250	950	1,600	1,300	500	300
	vc	80 - 120 - 160	20 - 30 - 40	10 - 15 - 20	45 - 60 - 80	70 - 100 - 120	60 - 80 - 100	25 - 30 - 40	15 - 20 - 35
	f	0.25 - 0.30 - 0.35	0.10 - 0.12 - 0.15	0.08 - 0.10 - 0.12	0.10 - 0.15 - 0.20	0.25 - 0.30 - 0.35	0.25 - 0.30 - 0.35	0.10 - 0.12 - 0.15	0.08 - 0.09 - 0.10

Min. - Optimum - Max.

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers



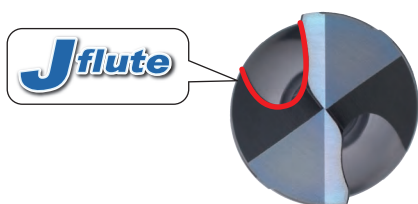
General Features

The J flute of the Super MULTIDRILL WGS series has been tuned for improved chip breaking capabilities during drilling of thin plates. Excellent sharpness prevents work hardening from drilling.

The special double margin structure also achieves stable hole diameter accuracy.

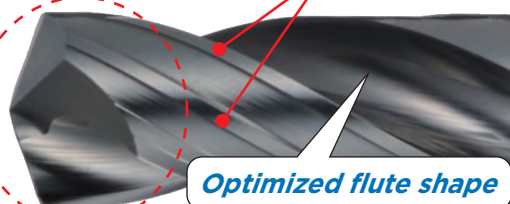
Features and Applications

J flute (flute shape) has been tuned to create a specialized shape for drilling of thin plates. The special double margin structure also achieves stable hole diameter accuracy.



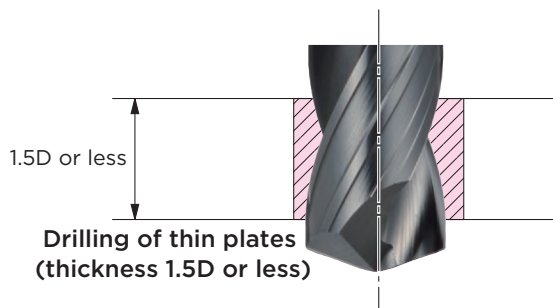
Special cutting edge shape

Special double margin



Optimized flute shape

Target Workpieces

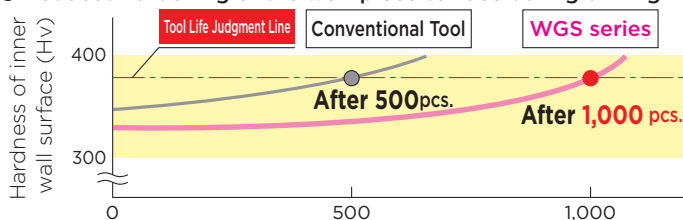


[Common automotive components]

- Bearing hub (inner and outer rings)
- Knuckle
- Differential ring
- Components such as bolt holes in automobile flange parts

Cutting Performance

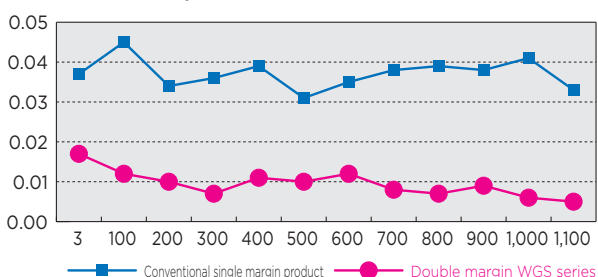
Reduces hardening of the workpiece surface during drilling



Work Material : S53C

Cutting Conditions: $v_c = 70\text{m/min}$, $f = 0.2\text{mm/rev}$
 $H = 13\text{mm}$

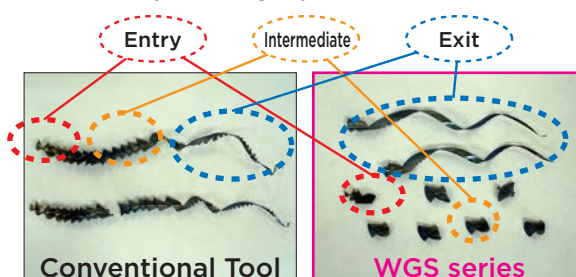
Stable hole expansion tolerance



Work Material : S50C

Cutting Conditions: $v_c = 80\text{m/min}$, $f = 0.25\text{mm/rev}$
 $H = 16\text{mm}$

Better chip breaking capabilities



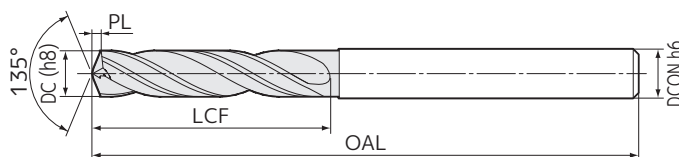
Work Material : SUJ2

Cutting Conditions: $v_c = 80\text{m/min}$, $f = 0.25\text{mm/rev}$
 $H = 13\text{mm}$



*For tolerances, refer to Chapter N - References.

Fig 1

**Body**

Dimensions (mm)

Dia. DC	Cat. No.	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.8 to 7.0	MDW 0680 to 0700WGS2	34	74	1.4	7.0	1
7.1 to 7.5	MDW 0710 to 0750WGS2	35	80	1.5	8.0	1
7.6 to 8.0	0760 to 0800WGS2	38	80	1.6	8.0	1
8.1 to 8.5	MDW 0810 to 0850WGS2	38	84	1.7	9.0	1
8.6 to 9.0	0860 to 0900WGS2	40	84	1.8	9.0	1
9.1 to 9.5	MDW 0910 to 0950WGS2	40	89	1.9	10.0	1
9.6 to 10.0	0960 to 1000WGS2	43	89	2.0	10.0	1
10.1 to 10.5	MDW 1010 to 1050WGS2	43	95	2.1	11.0	1
10.6 to 11.0	1060 to 1100WGS2	47	95	2.2	11.0	1
11.1 to 11.5	MDW 1110 to 1150WGS2	47	102	2.3	12.0	1
11.6 to 12.0	1160 to 1200WGS2	49	102	2.4	12.0	1
12.1 to 12.5	MDW 1210 to 1250WGS2	50	103	2.6	13.0	1
12.6 to 13.0	1260 to 1300WGS2	52	103	2.7	13.0	1
13.1 to 13.5	MDW 1310 to 1350WGS2	53	108	2.8	14.0	1
13.6 to 14.0	1360 to 1400WGS2	55	108	2.9	14.0	1
14.1 to 14.5	MDW 1410 to 1450WGS2	55	111	3.0	15.0	1
14.6 to 15.0	1460 to 1500WGS2	56	111	3.1	15.0	1
15.1 to 15.5	MDW 1510 to 1550WGS2	56	115	3.2	16.0	1
15.6 to 16.0	1560 to 1600WGS2	58	115	3.3	16.0	1

Grade: ACX70

This product is a made-to-order item. Please specify the hole diameter (including tolerance) when ordering.**Recommended Cutting Conditions**(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Stainless Steel (up to 200HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450
ø10.0	n	2,600	1,300	1,900	1,900
	vc	50 - 80 - 130	15 - 40 - 60	50 - 60 - 80	50 - 60 - 70
	f	0.20 - 0.25 - 0.35	0.10 - 0.15 - 0.20	0.20 - 0.30 - 0.35	0.20 - 0.25 - 0.35
ø16.0	n	2,000	800	1,600	1,200
	vc	60 - 100 - 140	20 - 40 - 60	60 - 80 - 100	50 - 60 - 80
	f	0.25 - 0.30 - 0.35	0.10 - 0.15 - 0.20	0.25 - 0.30 - 0.35	0.25 - 0.30 - 0.35

* The recommended cutting conditions are also affected by factors such as machine rigidity and the workpiece clamping.
Please adjust the cutting conditions according to your work environment.

* If work hardening occurs during drilling, it is recommended to use a lower speed than the recommended cutting conditions.

Min. - **Optimum** - Max.



General Features

- Oil holes shaped for excellent cooling performance achieves longer tool life.
- Effective cooling of the cutting edge created through fluid analysis. Reduces adhesion fracture.
- Chip control and workpiece hardening problems resolved.
- Outstanding stability in machining of stainless steel and exotic alloys.

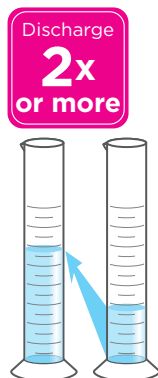
Features and Applications

- Greater discharge of coolant for effective cooling of the cutting edge.

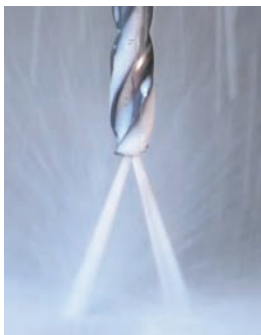
Bean Jet Cooling

*Utilised for diameters of $\phi 4.1\text{mm}$ or larger

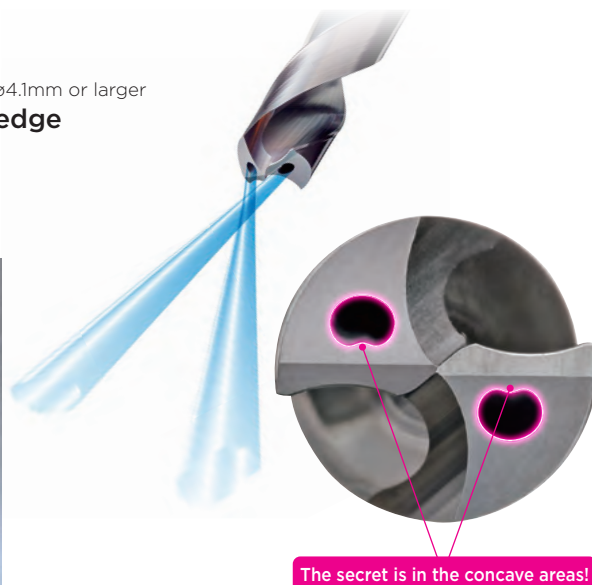
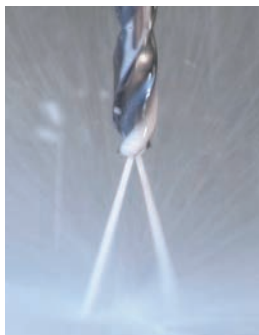
Bean-shaped oil hole supplies coolant at the cutting edge for effective cooling of the cutting edge



MDM series

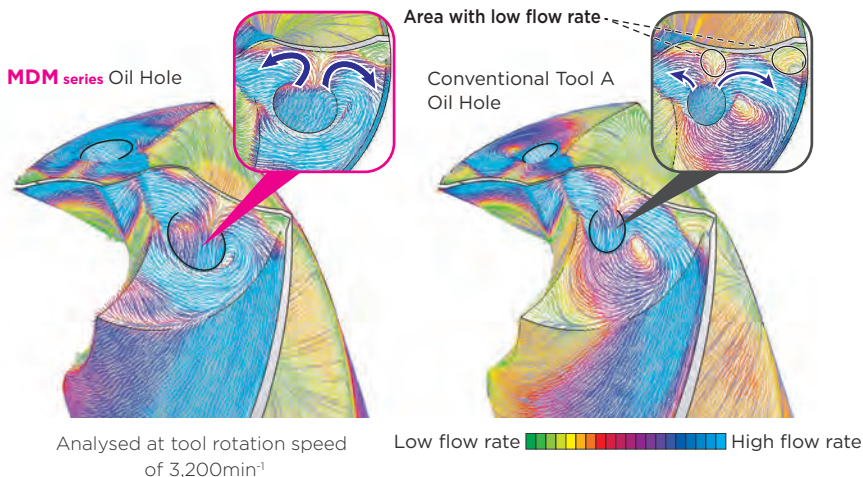


Conventional Tool A



The secret is in the concave areas!

- Effective cooling of the cutting edge created through fluid analysis



- Significantly reduces adhesion on the cutting edge, preventing adhesion fracture

MDM series



Minimal adhesion, able to continue

Competitor's Product A

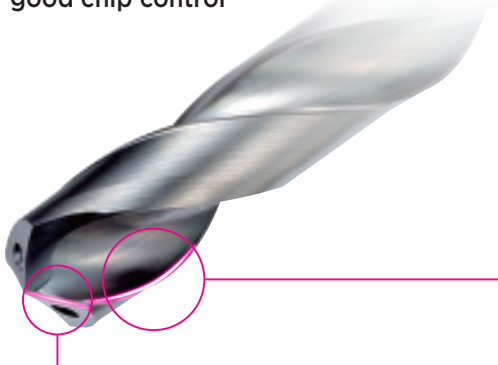


Adhesion fracture at peripheral edge

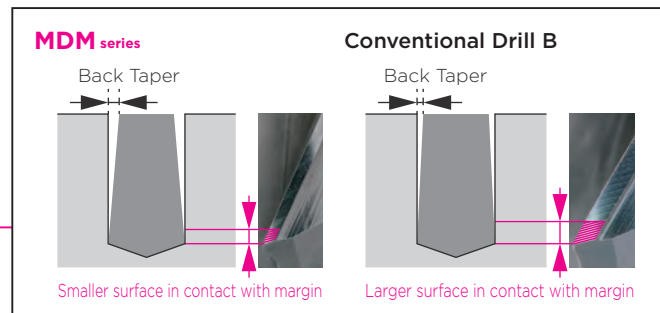
Work Material	: SUS304
Machine	: BT30 vertical machining centre
Tool	: MDM 0800S08H05 ($\phi 8\text{mm} \times 5\text{D}$)
Cutting Conditions:	$v_c = 80\text{m/min}$, $f = 0.25\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)
Drilling Distance	: 40m

MULTIDRILL MDM series

- New cutting edge design that emphasises sharpness for good chip control



- Narrow margin and large back taper
Reducing the contact area with the workpiece, suppressing temperature rise at the margin



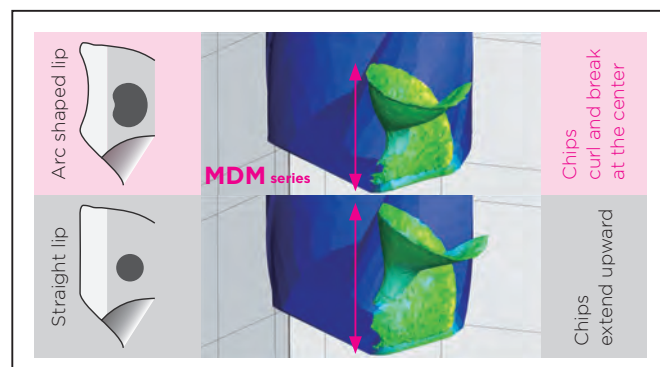
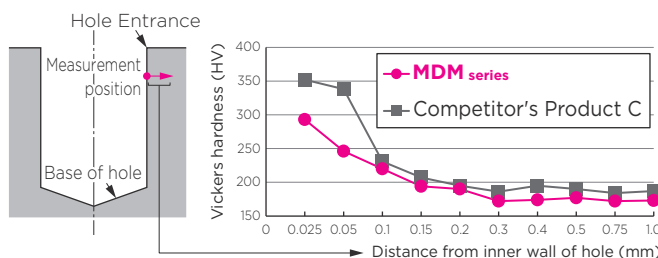
MDM series

Competitor's Product B

Work Material : SUS304
Machine : BT30 vertical machining centre
Tool : MDM 0400S04H05 (ø4.0mmx5D)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.10\text{mm/rev}$, Internal Coolant Supply (Water-soluble)

- Suppressing work hardening on drilled hole wall

Reduces drilling load, reducing damage to the drill and increasing the life of the reamer and tap used in post-processing



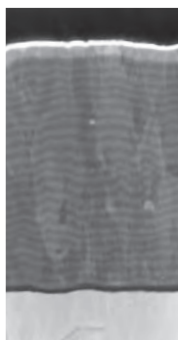
Work Material : SUS304
Machine : BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

- Ideal grade for stainless steel and exotic alloy drilling

ACT70

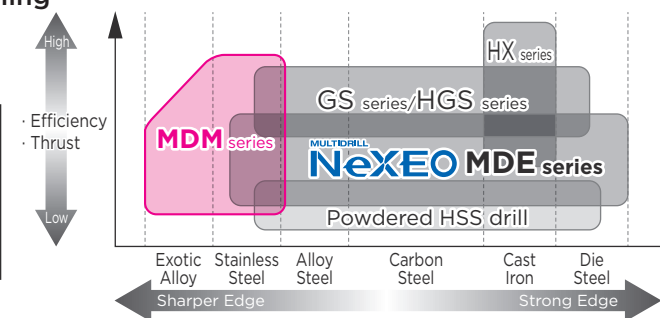
● NX Coat

High-quality, high-hardness, high-strength coating based on ABSOTECH™ technology achieves excellent wear and thermal resistance.

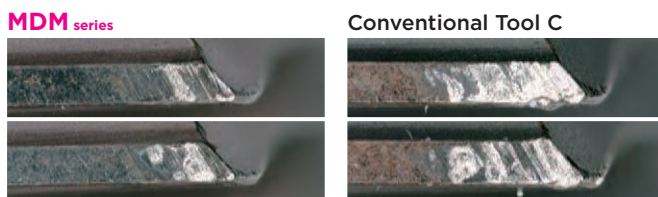


Super multi-layered TiAlCrSi Coated Carbide
Hardness (HV): 46GPa
Oxidisation Starting Temperature: 1,100°C

Highly Adhesive Layer



- NX coat reduces margin wear



Work Material : SUS304, Machine: BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

- Reduces thrust for stable drilling from the entrance to the exit of the hole



Work Material : SUS304, Machine: BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Drilling

Solid

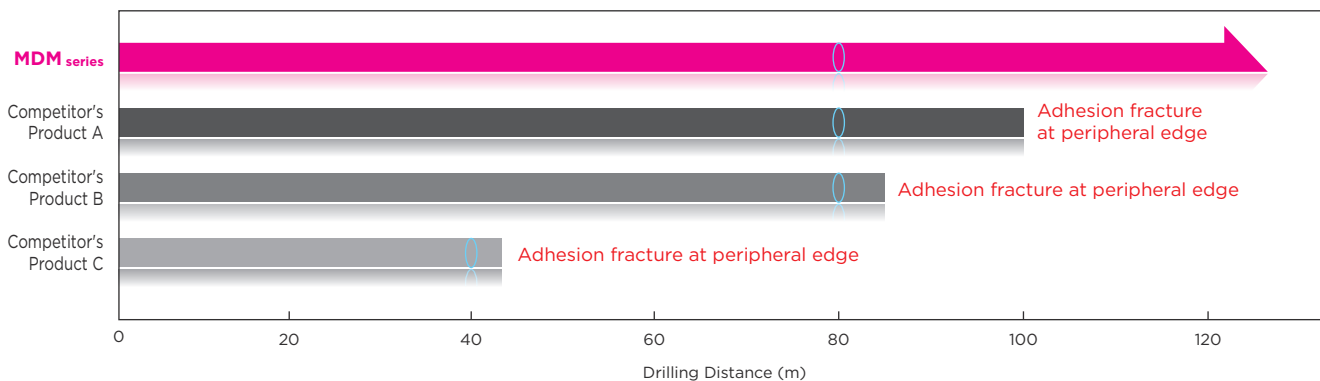
Indexable Head type

Indexable Insert type

Reamers

Application Examples

Austenitic Stainless Steel (Machining Centre)



MDM series after 80m of drilling



Competitor's Product A after 80m of drilling



Competitor's Product B after 80m of drilling

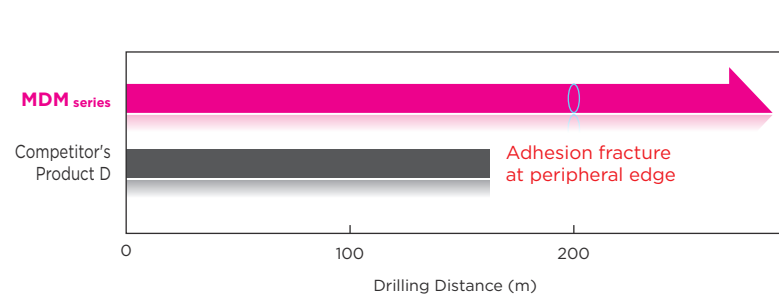


Competitor's Product C after 40m of drilling

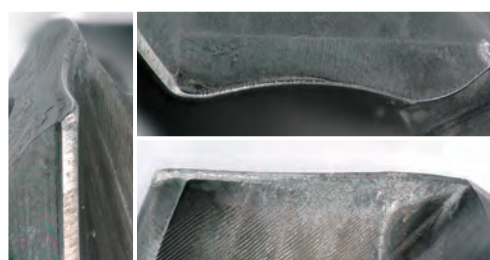


Work Material: SUS304, Machine: BT30 vertical machining centre, Tool: MDM 0800S08H05 (ø8mm×5D)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 40\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Austenitic Stainless Steel (Small Lathe)

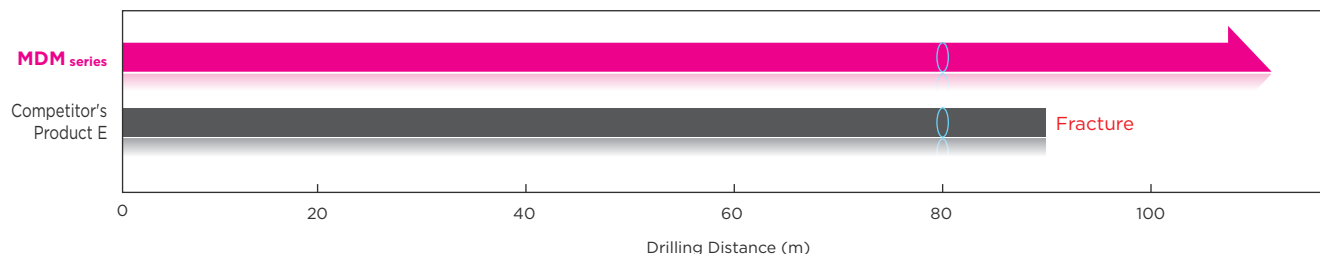


MDM series after 200m of drilling

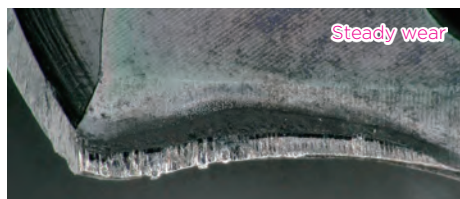


Work Material: SUS304, Machine: CNC autolathe (workpiece rotates), Tool: MDM 0540S06H03 (ø5.4mm×3D)
Cutting Conditions: $vc = 47\text{m/min}$, $f = 0.12\text{mm/rev}$, $H = 25\text{mm}$ (Blind), Internal Coolant Supply (Non-water-soluble)

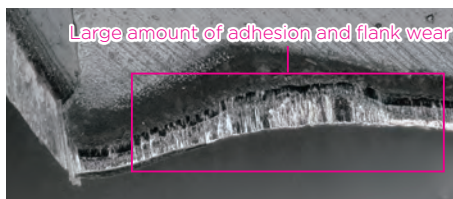
Precipitation Hardened Stainless Steel



MDM series after 80m of drilling

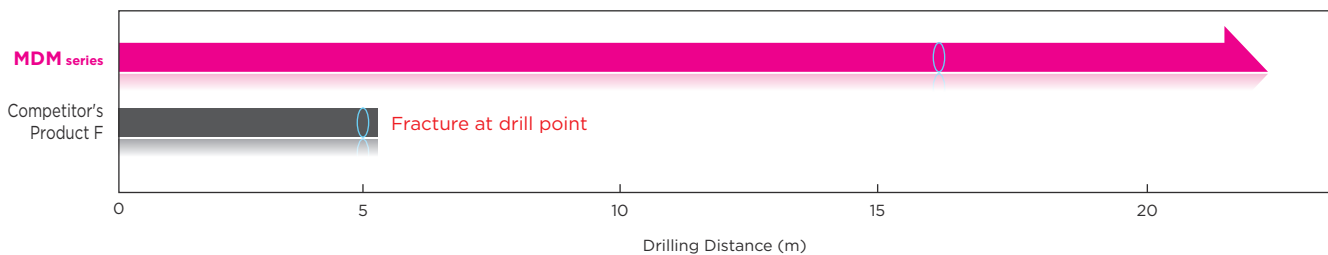


Competitor's Product E after 80m of drilling

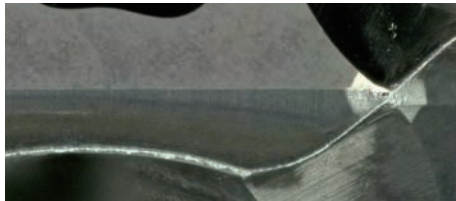


Work Material: SUS630, Machine: BT30 vertical machining centre, Tool: MDM 0400S04H05 (ø4mm×5D)
Cutting Conditions: $vc = 50\text{m/min}$, $f = 0.10\text{mm/rev}$, $H = 14\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

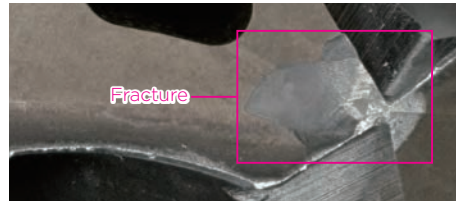
Duplex Stainless Steel



MDM series after 16m of drilling

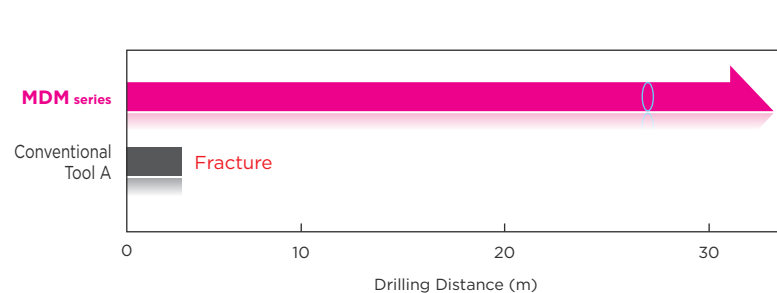


Competitor's Product F after 5m of drilling

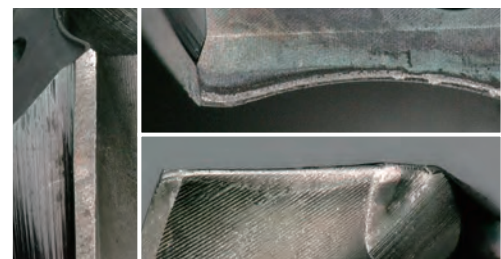


Work Material: SUS329J4L, Machine: BT30 vertical machining centre, Tool: MDM 0800S05H05 (ø8mmx5D)
Cutting Conditions: $vc = 60\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 30\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Titanium Alloy



MDM series after 27m of drilling



MDM series

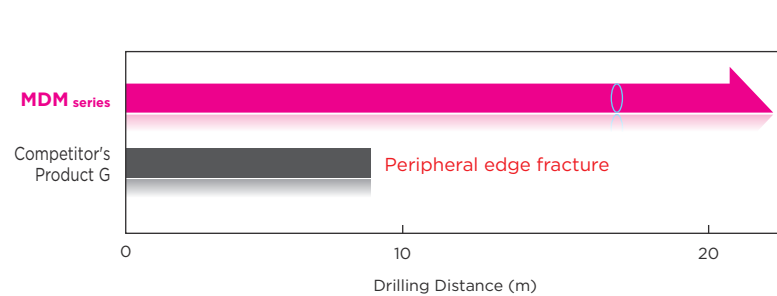


Conventional Tool A

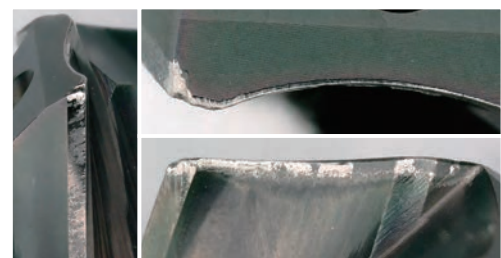


Work Material: Ti-6Al-4V, Machine: BT50 vertical machining centre, Tool: MDM 0500S05H05 (ø5mmx5D)
Cutting Conditions: $vc = 40\text{m/min}$, $f = 0.12\text{mm/rev}$, $H = 19\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

Heat-resistant Cast Steel



MDM series after 17.1m of drilling

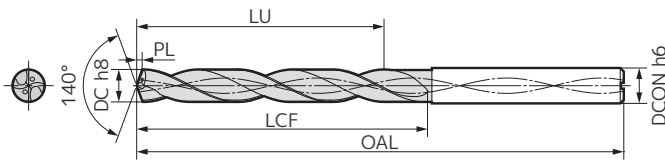
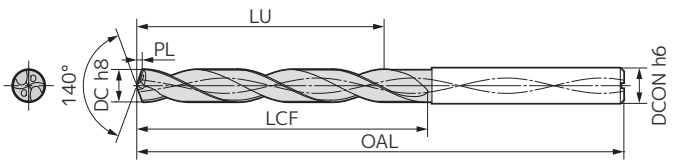


Work Material: SCH13X equivalent, Machine: BT50 vertical machining centre, Tool: MDM 0880S09H03 (ø8.8mmx3D)
Cutting Conditions: $vc = 50\text{m/min}$, $f = 0.11\text{mm/rev}$, $H = 18\text{mm}$ (Blind, Through), Internal Coolant Supply (Water soluble)

MDM series (Internal Coolant Supply)

*Bean Jet Cooling is applicable to diameters $\phi 4.1$ mm and up

*For tolerances, refer to Chapter N - References.

Fig 1 (Diameter under $\phi 4.1$)Fig 2 (Diameter $\phi 4.1$ or larger) **Bean Jet Cooling**Diameter $\phi 3.0$ to 4.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDM 0300S03H03	14.0	18.5	68.5	0.5	3.0	1
	5	●	0300S03H05	24.0	28.5	78.5	0.5	3.0	1
3.1	3	●	MDM 0310S04H03	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	1
3.2	3	●	MDM 0320S04H03	15.8	20.6	72.6	0.6	4.0	1
	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	1
3.3	3	●	MDM 0330S04H03	15.7	20.6	72.6	0.6	4.0	1
	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	1
3.4	3	●	MDM 0340S04H03	15.5	20.6	72.6	0.6	4.0	1
	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	1
3.5	3	●	MDM 0350S04H03	15.4	20.6	72.6	0.6	4.0	1
	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	1
3.6	3	●	MDM 0360S04H03	17.8	23.2	72.7	0.7	4.0	1
	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	1
3.7	3	●	MDM 0370S04H03	17.7	23.2	72.7	0.7	4.0	1
	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	1
3.8	3	●	MDM 0380S04H03	17.5	23.2	72.7	0.7	4.0	1
	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	1
3.9	3	●	MDM 0390S04H03	17.4	23.2	72.7	0.7	4.0	1
	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	1
4.0	3	●	MDM 0400S04H03	17.2	23.2	72.7	0.7	4.0	1
	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	1
4.1	3	●	MDM 0410S05H03	19.6	25.7	80.7	0.7	5.0	2
	5	●	0410S05H05	34.6	40.7	98.7	0.7	5.0	2
4.2	3	●	MDM 0420S05H03	19.5	25.8	80.8	0.8	5.0	2
	5	●	0420S05H05	34.5	40.8	98.8	0.8	5.0	2
4.3	3	●	MDM 0430S05H03	19.4	25.8	80.8	0.8	5.0	2
	5	●	0430S05H05	34.4	40.8	98.8	0.8	5.0	2
4.4	3	●	MDM 0440S05H03	19.2	25.8	80.8	0.8	5.0	2
	5	●	0440S05H05	34.2	40.8	98.8	0.8	5.0	2
4.5	3	●	MDM 0450S05H03	19.1	25.8	80.8	0.8	5.0	2
	5	●	0450S05H05	34.1	40.8	98.8	0.8	5.0	2
4.6	3	●	MDM 0460S05H03	21.4	28.3	80.8	0.8	5.0	2
	5	●	0460S05H05	37.9	44.8	98.8	0.8	5.0	2
4.7	3	●	MDM 0470S05H03	21.4	28.4	80.9	0.9	5.0	2
	5	●	0470S05H05	37.9	44.9	98.9	0.9	5.0	2
4.8	3	●	MDM 0480S05H03	21.2	28.4	80.9	0.9	5.0	2
	5	●	0480S05H05	37.7	44.9	98.9	0.9	5.0	2
4.9	3	●	MDM 0490S05H03	21.1	28.4	80.9	0.9	5.0	2
	5	●	0490S05H05	37.6	44.9	98.9	0.9	5.0	2

Grade: ACT70

Diameter $\phi 5.0$ to 6.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.0	3	●	MDM 0500S05H03	20.9	28.4	80.9	0.9	5.0	2
	5	●	0500S05H05	37.4	44.9	98.9	0.9	5.0	2
5.1	3	●	MDM 0510S06H03	20.8	28.4	82.9	0.9	6.0	2
	5	●	0510S06H05	37.3	44.9	100.9	0.9	6.0	2
5.2	3	●	MDM 0520S06H03	20.6	28.4	82.9	0.9	6.0	2
	5	●	0520S06H05	37.1	44.9	100.9	0.9	6.0	2
5.3	3	●	MDM 0530S06H03	20.6	28.5	83.0	1.0	6.0	2
	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	2
5.4	3	●	MDM 0540S06H03	20.4	28.5	83.0	1.0	6.0	2
	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	2
5.5	3	●	MDM 0550S06H03	20.3	28.5	83.0	1.0	6.0	2
	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	2
5.6	3	●	MDM 0560S06H03	22.6	31.0	83.0	1.0	6.0	2
	5	●	0560S06H05	40.6	49.0	101.0	1.0	6.0	2
5.7	3	●	MDM 0570S06H03	22.5	31.0	83.0	1.0	6.0	2
	5	●	0570S06H05	40.5	49.0	101.0	1.0	6.0	2
5.8	3	●	MDM 0580S06H03	22.4	31.1	83.1	1.1	6.0	2
	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	2
5.9	3	●	MDM 0590S06H03	22.3	31.1	83.1	1.1	6.0	2
	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	2
6.0	3	●	MDM 0600S06H03	22.1	31.1	83.1	1.1	6.0	2
	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	2
6.1	3	●	MDM 0610S07H03	24.5	33.6	89.1	1.1	7.0	2
	5	●	0610S07H05	44.0	53.1	110.1	1.1	7.0	2
6.2	3	●	MDM 0620S07H03	24.3	33.6	89.1	1.1	7.0	2
	5	●	0620S07H05	43.8	53.1	110.1	1.1	7.0	2
6.3	3	●	MDM 0630S07H03	24.2	33.6	89.1	1.1	7.0	2
	5	●	0630S07H05	43.7	53.1	110.1	1.1	7.0	2
6.4	3	●	MDM 0640S07H03	24.1	33.7	89.2	1.2	7.0	2
	5	●	0640S07H05	43.6	53.2	110.2	1.2	7.0	2
6.5	3	●	MDM 0650S07H03	24.0	33.7	89.2	1.2	7.0	2
	5	●	0650S07H05	43.5	53.2	110.2	1.2	7.0	2
6.6	3	●	MDM 0660S07H03	26.3	36.2	89.2	1.2	7.0	2
	5	●	0660S07H05	47.3	57.2	110.2	1.2	7.0	2
6.7	3	●	MDM 0670S07H03	26.2	36.2	89.2	1.2	7.0	2
	5	●	0670S07H05	47.2	57.2	110.2	1.2	7.0	2
6.8	3	●	MDM 0680S07H03	26.0	36.2	89.2	1.2	7.0	2
	5	●	0680S07H05	47.0	57.2	110.2	1.2	7.0	2
6.9	3	●	MDM 0690S07H03	26.0	36.3	89.3	1.3	7.0	2
	5	●	0690S07H05	47.0	57.3	110.3	1.3	7.0	2

Grade: ACT70

Drilling

Solid

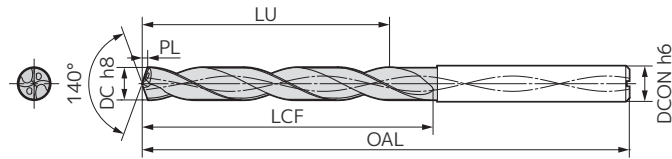
Indexable Head type

Indexable Insert type

Reamers



*For tolerances, refer to Chapter N - References.

Fig 2 **Bean Jet Cooling**Diameter $\varnothing 7.0$ to 8.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.0	3	●	MDM 0700S07H03	25.8	36.3	89.3	1.3	7.0	2
	5	●	0700S07H05	46.8	57.3	110.3	1.3	7.0	2
7.1	3	●	MDM 0710S08H03	28.2	38.8	95.3	1.3	8.0	2
	5	●	0710S08H05	50.7	61.3	119.3	1.3	8.0	2
7.2	3	●	MDM 0720S08H03	28.0	38.8	95.3	1.3	8.0	2
	5	●	0720S08H05	50.5	61.3	119.3	1.3	8.0	2
7.3	3	●	MDM 0730S08H03	27.9	38.8	95.3	1.3	8.0	2
	5	●	0730S08H05	50.4	61.3	119.3	1.3	8.0	2
7.4	3	●	MDM 0740S08H03	27.7	38.8	95.3	1.3	8.0	2
	5	●	0740S08H05	50.2	61.3	119.3	1.3	8.0	2
7.5	3	●	MDM 0750S08H03	27.7	38.9	95.4	1.4	8.0	2
	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	2
7.6	3	●	MDM 0760S08H03	30.0	41.4	95.4	1.4	8.0	2
	5	●	0760S08H05	54.0	65.4	119.4	1.4	8.0	2
7.7	3	●	MDM 0770S08H03	29.9	41.4	95.4	1.4	8.0	2
	5	●	0770S08H05	53.9	65.4	119.4	1.4	8.0	2
7.8	3	●	MDM 0780S08H03	29.7	41.4	95.4	1.4	8.0	2
	5	●	0780S08H05	53.7	65.4	119.4	1.4	8.0	2
7.9	3	●	MDM 0790S08H03	29.6	41.4	95.4	1.4	8.0	2
	5	●	0790S08H05	53.6	65.4	119.4	1.4	8.0	2
8.0	3	●	MDM 0800S08H03	29.5	41.5	95.5	1.5	8.0	2
	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	2
8.1	3	●	MDM 0810S09H03	31.9	44.0	101.5	1.5	9.0	2
	5	●	0810S09H05	57.4	69.5	128.5	1.5	9.0	2
8.2	3	●	MDM 0820S09H03	31.7	44.0	101.5	1.5	9.0	2
	5	●	0820S09H05	57.2	69.5	128.5	1.5	9.0	2
8.3	3	●	MDM 0830S09H03	31.6	44.0	101.5	1.5	9.0	2
	5	●	0830S09H05	57.1	69.5	128.5	1.5	9.0	2
8.4	3	●	MDM 0840S09H03	31.4	44.0	101.5	1.5	9.0	2
	5	●	0840S09H05	56.9	69.5	128.5	1.5	9.0	2
8.5	3	●	MDM 0850S09H03	31.3	44.0	101.5	1.5	9.0	2
	5	●	0850S09H05	56.8	69.5	128.5	1.5	9.0	2
8.6	3	●	MDM 0860S09H03	33.7	46.6	101.6	1.6	9.0	2
	5	●	0860S09H05	60.7	73.6	128.6	1.6	9.0	2
8.7	3	●	MDM 0870S09H03	33.6	46.6	101.6	1.6	9.0	2
	5	●	0870S09H05	60.6	73.6	128.6	1.6	9.0	2
8.8	3	●	MDM 0880S09H03	33.4	46.6	101.6	1.6	9.0	2
	5	●	0880S09H05	60.4	73.6	128.6	1.6	9.0	2
8.9	3	●	MDM 0890S09H03	33.3	46.6	101.6	1.6	9.0	2
	5	●	0890S09H05	60.3	73.6	128.6	1.6	9.0	2

Grade: ACT70

Diameter $\varnothing 9.0$ to 10.9mm

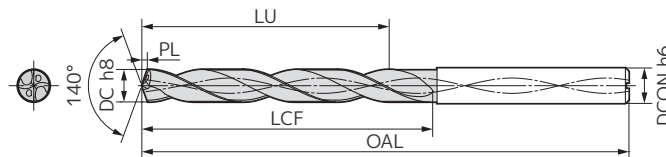
Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.0	3	●	MDM 0900S09H03	33.1	46.6	101.6	1.6	9.0	2
	5	●	0900S09H05	60.1	73.6	128.6	1.6	9.0	2
9.1	3	●	MDM 0910S10H03	35.6	49.2	107.7	1.7	10.0	2
	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	2
9.2	3	●	MDM 0920S10H03	35.4	49.2	107.7	1.7	10.0	2
	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	2
9.3	3	●	MDM 0930S10H03	35.3	49.2	107.7	1.7	10.0	2
	5	●	0930S10H05	63.8	77.7	137.7	1.7	10.0	2
9.4	3	●	MDM 0940S10H03	35.1	49.2	107.7	1.7	10.0	2
	5	●	0940S10H05	63.6	77.7	137.7	1.7	10.0	2
9.5	3	●	MDM 0950S10H03	35.0	49.2	107.7	1.7	10.0	2
	5	●	0950S10H05	63.5	77.7	137.7	1.7	10.0	2
9.6	3	●	MDM 0960S10H03	37.3	51.7	107.7	1.7	10.0	2
	5	●	0960S10H05	67.3	81.7	137.7	1.7	10.0	2
9.7	3	●	MDM 0970S10H03	37.3	51.8	107.8	1.8	10.0	2
	5	●	0970S10H05	67.3	81.8	137.8	1.8	10.0	2
9.8	3	●	MDM 0980S10H03	37.1	51.8	107.8	1.8	10.0	2
	5	●	0980S10H05	67.1	81.8	137.8	1.8	10.0	2
9.9	3	●	MDM 0990S10H03	37.0	51.8	107.8	1.8	10.0	2
	5	●	0990S10H05	67.0	81.8	137.8	1.8	10.0	2
10.0	3	●	MDM 1000S10H03	36.8	51.8	107.8	1.8	10.0	2
	5	●	1000S10H05	66.8	81.8	137.8	1.8	10.0	2
10.1	3	●	MDM 1010S11H03	39.2	54.3	117.8	1.8	11.0	2
	5	●	1010S11H05	70.7	85.8	150.8	1.8	11.0	2
10.2	3	●	MDM 1020S11H03	39.1	54.4	117.9	1.9	11.0	2
	5	●	1020S11H05	70.6	85.9	150.9	1.9	11.0	2
10.3	3	●	MDM 1030S11H03	39.0	54.4	117.9	1.9	11.0	2
	5	●	1030S11H05	70.5	85.9	150.9	1.9	11.0	2
10.4	3	●	MDM 1040S11H03	38.8	54.4	117.9	1.9	11.0	2
	5	●	1040S11H05	70.3	85.9	150.9	1.9	11.0	2
10.5	3	●	MDM 1050S11H03	38.7	54.4	117.9	1.9	11.0	2
	5	●	1050S11H05	70.2	85.9	150.9	1.9	11.0	2
10.6	3	●	MDM 1060S11H03	41.0	56.9	117.9	1.9	11.0	2
	5	●	1060S11H05	74.0	89.9	150.9	1.9	11.0	2
10.7	3	●	MDM 1070S11H03	40.9	56.9	117.9	1.9	11.0	2
	5	●	1070S11H05	73.9	89.9	150.9	1.9	11.0	2
10.8	3	●	MDM 1080S11H03	40.8	57.0	118.0	2.0	11.0	2
	5	●	1080S11H05	73.8	90.0	151.0	2.0	11.0	2
10.9	3	●	MDM 1090S11H03	40.7	57.0	118.0	2.0	11.0	2
	5	●	1090S11H05	73.7	90.0	151.0	2.0	11.0	2

Grade: ACT70



*For tolerances, refer to Chapter N - References.

Fig 2 **Bean Jet Cooling**Diameter $\varnothing 11.0$ to 12.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.0	3	●	MDM 1100S11H03	40.5	57.0	118.0	2.0	11.0	2
	5	●	1100S11H05	73.5	90.0	151.0	2.0	11.0	2
11.1	3	●	MDM 1110S12H03	42.9	59.5	124.0	2.0	12.0	2
	5	●	1110S12H05	77.4	94.0	160.0	2.0	12.0	2
11.2	3	●	MDM 1120S12H03	42.7	59.5	124.0	2.0	12.0	2
	5	●	1120S12H05	77.2	94.0	160.0	2.0	12.0	2
11.3	3	●	MDM 1130S12H03	42.7	59.6	124.1	2.1	12.0	2
	5	●	1130S12H05	77.2	94.1	160.1	2.1	12.0	2
11.4	3	●	MDM 1140S12H03	42.5	59.6	124.1	2.1	12.0	2
	5	●	1140S12H05	77.0	94.1	160.1	2.1	12.0	2
11.5	3	●	MDM 1150S12H03	42.4	59.6	124.1	2.1	12.0	2
	5	●	1150S12H05	76.9	94.1	160.1	2.1	12.0	2
11.6	3	●	MDM 1160S12H03	44.7	62.1	124.1	2.1	12.0	2
	5	●	1160S12H05	80.7	98.1	160.1	2.1	12.0	2
11.7	3	●	MDM 1170S12H03	44.6	62.1	124.1	2.1	12.0	2
	5	●	1170S12H05	80.6	98.1	160.1	2.1	12.0	2
11.8	3	●	MDM 1180S12H03	44.4	62.1	124.1	2.1	12.0	2
	5	●	1180S12H05	80.4	98.1	160.1	2.1	12.0	2
11.9	3	●	MDM 1190S12H03	44.4	62.2	124.2	2.2	12.0	2
	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	2
12.0	3	●	MDM 1200S12H03	44.2	62.2	124.2	2.2	12.0	2
	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	2
12.1	3	●	MDM 1210S13H03	46.6	64.7	130.2	2.2	13.0	2
	5	●	1210S13H05	84.1	102.2	169.2	2.2	13.0	2
12.2	3	●	MDM 1220S13H03	46.4	64.7	130.2	2.2	13.0	2
	5	●	1220S13H05	83.9	102.2	169.2	2.2	13.0	2
12.3	3	●	MDM 1230S13H03	46.3	64.7	130.2	2.2	13.0	2
	5	●	1230S13H05	83.8	102.2	169.2	2.2	13.0	2
12.4	3	●	MDM 1240S13H03	46.2	64.8	130.3	2.3	13.0	2
	5	●	1240S13H05	83.7	102.3	169.3	2.3	13.0	2
12.5	3	●	MDM 1250S13H03	46.1	64.8	130.3	2.3	13.0	2
	5	●	1250S13H05	83.6	102.3	169.3	2.3	13.0	2
12.6	3	●	MDM 1260S13H03	48.4	67.3	130.3	2.3	13.0	2
	5	●	1260S13H05	87.4	106.3	169.3	2.3	13.0	2
12.7	3	●	MDM 1270S13H03	48.3	67.3	130.3	2.3	13.0	2
	5	●	1270S13H05	87.3	106.3	169.3	2.3	13.0	2
12.8	3	●	MDM 1280S13H03	48.1	67.3	130.3	2.3	13.0	2
	5	●	1280S13H05	87.1	106.3	169.3	2.3	13.0	2
12.9	3	●	MDM 1290S13H03	48.0	67.3	130.3	2.3	13.0	2
	5	●	1290S13H05	87.0	106.3	169.3	2.3	13.0	2

Grade: ACT70

Diameter $\varnothing 13.0$ to 14.9mm

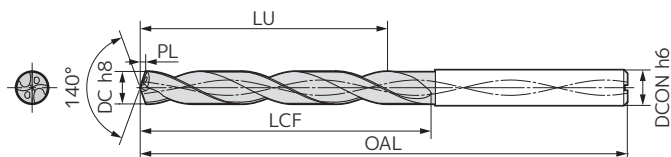
Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.0	3	●	MDM 1300S13H03	47.9	67.4	130.4	2.4	13.0	2
	5	●	1300S13H05	86.9	106.4	169.4	2.4	13.0	2
13.1	3	●	MDM 1310S14H03	50.3	69.9	136.4	2.4	14.0	2
	5	●	1310S14H05	90.8	110.4	178.4	2.4	14.0	2
13.2	3	●	MDM 1320S14H03	50.1	69.9	136.4	2.4	14.0	2
	5	●	1320S14H05	90.6	110.4	178.4	2.4	14.0	2
13.3	3	●	MDM 1330S14H03	50.0	69.9	136.4	2.4	14.0	2
	5	●	1330S14H05	90.5	110.4	178.4	2.4	14.0	2
13.4	3	●	MDM 1340S14H03	49.8	69.9	136.4	2.4	14.0	2
	5	●	1340S14H05	90.3	110.4	178.4	2.4	14.0	2
13.5	3	●	MDM 1350S14H03	49.8	70.0	136.5	2.5	14.0	2
	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	2
13.6	3	●	MDM 1360S14H03	52.1	72.5	136.5	2.5	14.0	2
	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	2
13.7	3	●	MDM 1370S14H03	52.0	72.5	136.5	2.5	14.0	2
	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	2
13.8	3	●	MDM 1380S14H03	51.8	72.5	136.5	2.5	14.0	2
	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	2
13.9	3	●	MDM 1390S14H03	51.7	72.5	136.5	2.5	14.0	2
	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	2
14.0	3	●	MDM 1400S14H03	51.5	72.5	136.5	2.5	14.0	2
	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	2
14.1	3	●	MDM 1410S15H03	54.0	75.1	142.6	2.6	15.0	2
	5	●	1410S15H05	97.5	118.6	187.6	2.6	15.0	2
14.2	3	●	MDM 1420S15H03	53.8	75.1	142.6	2.6	15.0	2
	5	●	1420S15H05	97.3	118.6	187.6	2.6	15.0	2
14.3	3	●	MDM 1430S15H03	53.7	75.1	142.6	2.6	15.0	2
	5	●	1430S15H05	97.2	118.6	187.6	2.6	15.0	2
14.4	3	●	MDM 1440S15H03	53.5	75.1	142.6	2.6	15.0	2
	5	●	1440S15H05	97.0	118.6	187.6	2.6	15.0	2
14.5	3	●	MDM 1450S15H03	53.4	75.1	142.6	2.6	15.0	2
	5	●	1450S15H05	96.9	118.6	187.6	2.6	15.0	2
14.6	3	●	MDM 1460S15H03	55.8	77.7	142.7	2.7	15.0	2
	5	●	1460S15H05	100.8	122.7	187.7	2.7	15.0	2
14.7	3	●	MDM 1470S15H03	55.7	77.7	142.7	2.7	15.0	2
	5	●	1470S15H05	100.7	122.7	187.7	2.7	15.0	2
14.8	3	●	MDM 1480S15H03	55.5	77.7	142.7	2.7	15.0	2
	5	●	1480S15H05	100.5	122.7	187.7	2.7	15.0	2
14.9	3	●	MDM 1490S15H03	55.4	77.7	142.7	2.7	15.0	2
	5	●	1490S15H05	100.4	122.7	187.7	2.7	15.0	2

Grade: ACT70



*For tolerances, refer to Chapter N - References.

Fig 2 **Bean Jet Cooling**Diameter $\varnothing 15.0$ to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.0	3	●	MDM 1500S15H03	55.2	77.7	142.7	2.7	15.0	2
	5	●	1500S15H05	100.2	122.7	187.7	2.7	15.0	2
15.1	3	●	MDM 1510S16H03	57.6	80.2	148.7	2.7	16.0	2
	5	●	1510S16H05	104.1	126.7	196.7	2.7	16.0	2
15.2	3	●	MDM 1520S16H03	57.5	80.3	148.8	2.8	16.0	2
	5	●	1520S16H05	104.0	126.8	196.8	2.8	16.0	2
15.3	3	●	MDM 1530S16H03	57.4	80.3	148.8	2.8	16.0	2
	5	●	1530S16H05	103.9	126.8	196.8	2.8	16.0	2
15.4	3	●	MDM 1540S16H03	57.2	80.3	148.8	2.8	16.0	2
	5	●	1540S16H05	103.7	126.8	196.8	2.8	16.0	2
15.5	3	●	MDM 1550S16H03	57.1	80.3	148.8	2.8	16.0	2
	5	●	1550S16H05	103.6	126.8	196.8	2.8	16.0	2
15.6	3	●	MDM 1560S16H03	59.4	82.8	148.8	2.8	16.0	2
	5	●	1560S16H05	107.4	130.8	196.8	2.8	16.0	2
15.7	3	●	MDM 1570S16H03	59.4	82.9	148.9	2.9	16.0	2
	5	●	1570S16H05	107.4	130.9	196.9	2.9	16.0	2
15.8	3	●	MDM 1580S16H03	59.2	82.9	148.9	2.9	16.0	2
	5	●	1580S16H05	107.2	130.9	196.9	2.9	16.0	2
15.9	3	●	MDM 1590S16H03	59.1	82.9	148.9	2.9	16.0	2
	5	●	1590S16H05	107.1	130.9	196.9	2.9	16.0	2
16.0	3	●	MDM 1600S16H03	58.9	82.9	148.9	2.9	16.0	2
	5	●	1600S16H05	106.9	130.9	196.9	2.9	16.0	2

Grade: ACT70

Metals Symbols Chart

Work Material	Hardness	Japanese Industrial Standards JIS	International Standard ISO 15510	European Standards EN	US Standards AISI
Ferritic/ Martensitic Stainless Steel	≤ 200HB	SUS405	X6CrAl13	1.4002	405
		SUS410	X12Cr13	1.4006	410
		SUS410S	X6Cr13	1.4000	—
		SUS430	X6Cr17	1.4016	430
		SUS434	X6CrMo17-1	1.4113	434
	> 200HB	SUS420J1	X20Cr13	1.4021	420
		SUS420J2	X30Cr13	1.4028	420
		SUS431	X17CrNi16-2	1.4057	431
Austenitic Stainless Steel	≤ 200HB	SUS304	X5CrNi18-10	1.4301	304
		SUS305	X6CrNi18-12	1.4303	305
		SUS303	X10CrNiS18-9	1.4305	303
		SUS304L	X2CrNi18-9	1.4307	304L
		SUS316	X5CrNiMo17-12-2	1.4401	316
		SUS316L	X2CrNiMo17-12-2	1.4404	316L
		SUS317L	X2CrNiMo19-14-4	1.4438	317L
		SUS321	X6CrNiTi18-10	1.4541	321
		SUS347	X6CrNiNb18-10	1.4550	347
		SUS316Ti	X6CrNiMoTi17-12-2	1.4571	—
		SUS309S	X6CrNi23-13	1.4950	309S
		SUS310S	X6CrNi25-20	1.4951	310S
	> 200HB	SUS304N1	X5CrNiN19-9	1.4315	304N
		SUS301	X5CrNi17-7	1.4319	301
		SUS301L	X2CrNiN18-7	1.4318	—
Precipitation Hardened Stainless Steel	≤ 340HB	SUS630	X5CrNiCuNb16-4	1.4542	17-4PH (S17400)
		—	—	—	15-5PH (S15500)
		SUS631	X7CrNiAl17-7	1.4568	17-7PH (S17700)
Duplex Stainless Steel	≤ 310HB	SUS329J1	X6CrNiMo26-4-2	—	329
		SUS329J3L	X2CrNiMoN22-5-3	1.4462	—
		SUS329J4L	X2CrNiMoN25-7-3	—	—

Recommended Cutting Conditions

1. The recommended cutting conditions below are for cases where an internal supply of a water soluble coolant is used.
2. If using non-water-soluble coolant, reduce the cutting speed by 20-30% and ensure that sufficient coolant is supplied.
3. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
4. Make sure the flute does not enter the collet.
5. If the engagement surface of the workpiece is abnormally shaped (tilted, interrupted, etc.), reduce the feed rate to about half when feeding the drill into the workpiece.
*If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
6. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material	Ferritic/Martensitic Stainless Steel				Austenitic Stainless Steel			
	≤ 200HB		> 200HB		≤ 200HB		> 200HB	
Cutting Speed	60 to 100m/min		40 to 80m/min		60 to 100m/min		40 to 80m/min	
Diameter DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
ø3	8,500	0.06 to 0.12	6,400	0.06 to 0.12	8,500	0.06 to 0.12	6,400	0.06 to 0.12
ø4	6,400	0.08 to 0.17	4,800	0.08 to 0.17	6,400	0.08 to 0.17	4,800	0.08 to 0.17
ø5	5,100	0.08 to 0.20	3,900	0.08 to 0.20	5,100	0.08 to 0.20	3,900	0.08 to 0.20
ø6	4,300	0.10 to 0.20	3,200	0.10 to 0.20	4,300	0.10 to 0.20	3,200	0.10 to 0.20
ø7	3,700	0.12 to 0.23	2,800	0.12 to 0.23	3,700	0.12 to 0.23	2,800	0.12 to 0.23
ø8	3,200	0.15 to 0.25	2,400	0.15 to 0.25	3,200	0.15 to 0.25	2,400	0.15 to 0.25
ø9	2,900	0.17 to 0.25	2,200	0.17 to 0.25	2,900	0.17 to 0.25	2,200	0.17 to 0.25
ø10	2,600	0.18 to 0.28	2,000	0.18 to 0.28	2,600	0.18 to 0.28	2,000	0.18 to 0.28
ø11	2,400	0.20 to 0.30	1,800	0.20 to 0.30	2,400	0.20 to 0.30	1,800	0.20 to 0.30
ø12	2,200	0.20 to 0.30	1,600	0.20 to 0.30	2,200	0.20 to 0.30	1,600	0.20 to 0.30
ø13	2,000	0.20 to 0.30	1,500	0.20 to 0.30	2,000	0.20 to 0.30	1,500	0.20 to 0.30
ø14	1,900	0.20 to 0.30	1,400	0.20 to 0.30	1,900	0.20 to 0.30	1,400	0.20 to 0.30
ø15	1,700	0.20 to 0.30	1,300	0.20 to 0.30	1,700	0.20 to 0.30	1,300	0.20 to 0.30
ø16	1,600	0.20 to 0.30	1,200	0.20 to 0.30	1,600	0.20 to 0.30	1,200	0.20 to 0.30

Work Material	Precipitation Hardened Stainless Steel ≤ 340HB		Duplex Stainless Steel ≤ 310HB		Titanium Alloy 260HB to 340HB		Ni-based Heat-resistant Alloy (Inconel 718) 38 to 45HRC	
Cutting Speed	40 to 60m/min		40 to 60m/min		30 to 50m/min		10 to 30m/min	
Diameter DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
ø3	5,300	0.06 to 0.12	5,300	0.06 to 0.12	4,200	0.06 to 0.12	2,100	0.05 to 0.08
ø4	4,000	0.08 to 0.17	4,000	0.08 to 0.17	3,200	0.08 to 0.17	1,600	0.06 to 0.10
ø5	3,200	0.08 to 0.20	3,200	0.08 to 0.20	2,500	0.08 to 0.20	1,250	0.07 to 0.12
ø6	2,700	0.10 to 0.20	2,700	0.10 to 0.20	2,100	0.10 to 0.20	1,050	0.08 to 0.15
ø7	2,300	0.12 to 0.23	2,300	0.12 to 0.23	1,800	0.12 to 0.23	900	0.08 to 0.15
ø8	2,000	0.15 to 0.25	2,000	0.15 to 0.25	1,600	0.15 to 0.25	800	0.10 to 0.18
ø9	1,800	0.17 to 0.25	1,800	0.17 to 0.25	1,400	0.17 to 0.25	700	0.12 to 0.18
ø10	1,600	0.18 to 0.28	1,600	0.18 to 0.28	1,300	0.18 to 0.28	650	0.12 to 0.18
ø11	1,400	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30	600	0.15 to 0.20
ø12	1,300	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30	550	0.15 to 0.20
ø13	1,200	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30	500	0.15 to 0.20
ø14	1,100	0.20 to 0.30	1,100	0.20 to 0.30	900	0.20 to 0.30	450	0.15 to 0.20
ø15	1,050	0.20 to 0.30	1,050	0.20 to 0.30	850	0.20 to 0.30	420	0.15 to 0.20
ø16	1,000	0.20 to 0.30	1,000	0.20 to 0.30	800	0.20 to 0.30	400	0.15 to 0.20

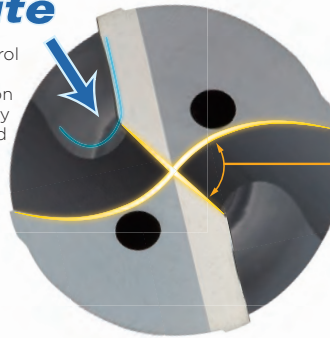


General Features

Strong MULTIDRILL HX series is a special drill for cast iron that combines reduced cutting force and improved drill strength to achieve stable and high efficiency drilling of cast iron.

J flute

Chip control
+
evacuation
drastically
improved



RX
THINNING

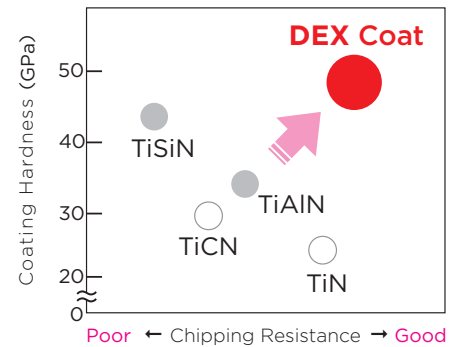
Features and Applications

High-efficiency Drilling of Cast Iron

Thick web and special double margin design ensure stable behaviour even in high-efficiency drilling. Furthermore, RX THINNING drastically reduces cutting force and ensures more stable and efficient drilling. Enables high-efficiency drilling at feed rates of over $v_f=1,000\text{mm/min}$. (for $\phi 10\text{mm}$ sizes)

Long Tool Life

DEX Coat for drills utilises nano-coating technology that provides more than double the tool life of conventional coatings. The drill guide function is enhanced through optimisation of the margin position to prevent breakage due to hole bending.



Low Resistance

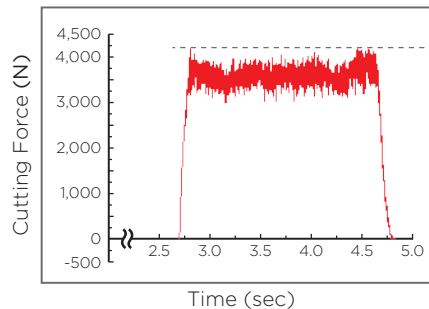
Wide chip pocket reduces thrust resistance.



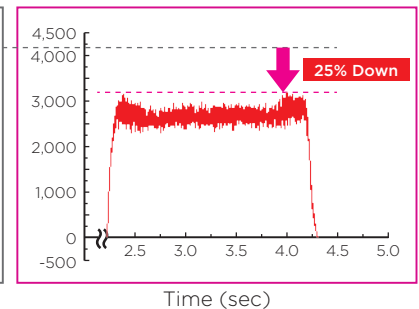
Improves tool load

Also suitable for small machining centres

Conventional tool



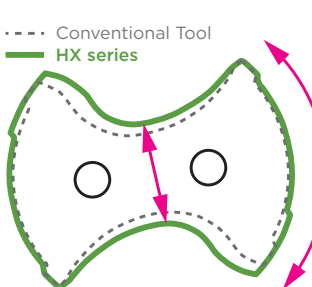
HX series



Work Material : FC250, Tool: Conventional Tool, MDW 1250HX5 ($\phi 12.5\text{mm}$ 5D)
Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.60\text{mm/rev}$, $H = 50\text{mm}$, Internal Coolant Supply (Water-soluble)

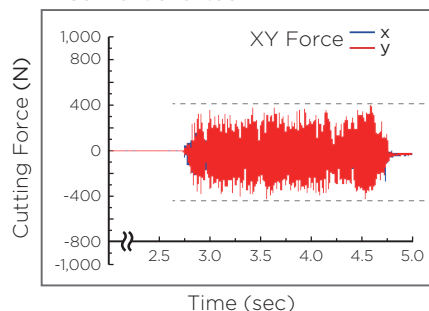
High Rigidity

Combination of large web thickness and wide land reduces vibration.

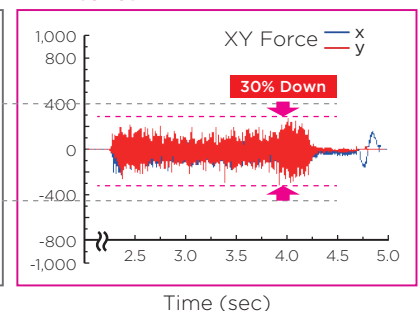


Reduces drill vibration

Conventional tool



HX series

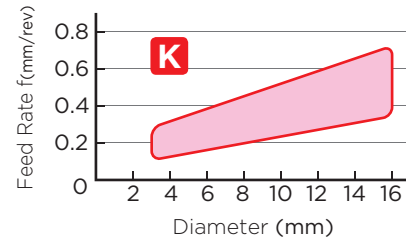


Work Material : FC250, Tool: Conventional Tool, MDW 1250HX5 ($\phi 12.5\text{mm}$ 5D)
Cutting Conditions: $v_c = 100\text{m/min}$, $f = 0.60\text{mm/rev}$, $H = 50\text{mm}$, Internal Coolant Supply (Water-soluble)

Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of Items
Internal	MDW□□□□HX3	ø3.0 to ø20.0	up to 3	108 items in stock
	MDW□□□□HX5	ø3.0 to ø20.0	up to 5	108 items in stock
	MDW□□□□HX8	ø3.0 to ø18.0	up to 8	32 items in stock

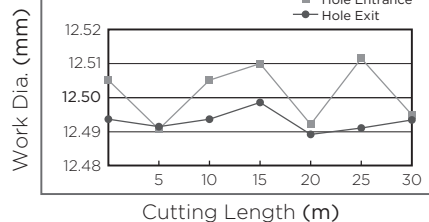
Drilling of Grey cast iron



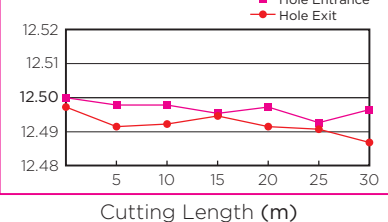
High-precision Improved margin tip position improves drilling precision



Conventional tool



HX series



Work Material : FC250, Tool: Conventional Tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions: $vc = 100\text{m/min}$, $f = 0.60\text{mm/rev}$, $H = 50\text{mm}$, Internal Coolant Supply (Water-soluble)

Longer Tool Life High-feed drilling reduces margin wear and extends tool life
→ Maintains replacement frequency (drilling time) and enables high-efficiency drilling

Conventional tool



Cutting Conditions: $f = 0.30\text{mm/rev}$ Cutting Length: 30m (Drilling Time 39 minutes)

HX series



Cutting Conditions: $f = 0.30\text{mm/rev}$ Cutting Length: 30m (Drilling Time 39 minutes)

Small amount of wear



Cutting Conditions: $f = 0.60\text{mm/rev}$ Cutting Length: 60m (Drilling Time 39 minutes)

Work Material : FC250, Tool: Conventional Tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions: $vc = 100\text{m/min}$, $f = 0.60\text{mm/rev}$, $H = 50\text{mm}$, Internal Coolant Supply (Water-soluble)

Double the feed

Application Examples

Machine Component (FC250)

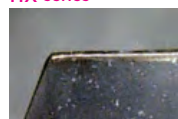
Tool: MDW 1850HX5 (ø18.5mm 5D)
Drilling Distance: 50m
Cutting Conditions: $vc = 70\text{m/min}$, $f = 0.9\text{mm/rev}$, $H = 27\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

Reduced cutting edge wear in ultra-high-speed drilling.

Cutting Edge Rake Face Condition after Preset Tool Life
Competitor's High-efficiency Drill



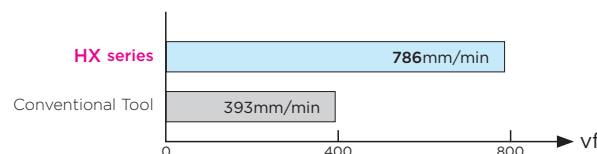
HX series



Equipment Component (FCD450)

Tool: MDW 0850HX5 (ø8.5mm 5D)
Drilling Distance: 60m
Cutting Conditions: $vc = 70\text{m/min}$, $f = 0.30\text{mm/rev}$, $vf = 786\text{mm/min}$, $H = 27\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

Double the drilling efficiency of conventional tools.



Engine Component (FCD700)

Tool: MDW 1200HX3 (ø12.0mm 3D)
Drilling Distance: 60m
Cutting Conditions: Conventional Tool: $vc = 50\text{m/min}$, $f = 0.22\text{mm/rev}$, $vf = 291.7\text{mm/min}$
HX type: $vc = 50\text{m/min}$, $f = 0.40\text{mm/rev}$, $vf = 530.4\text{mm/min}$
 $H = 28\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

Stable drilling performance with 1.8 times the efficiency of conventional tools.

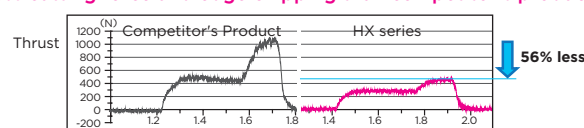
Cutting Edge Wear Comparison after Fixed Tool Life
Conventional Tool ($f = 0.22\text{mm/rev}$) HX type ($f = 0.40\text{mm/rev}$)



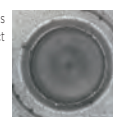
Machine Component (Sintered Material)

Tool: MDW 0570HX3
Cutting Conditions: $vc = 70\text{m/min}$, $f = 0.9\text{mm/rev}$, $H = 27\text{mm}$ (Blind), Internal Coolant Supply (Water-soluble)

Less cutting force and edge chipping than competitor's products.



Hole Entrance



No edge chipping

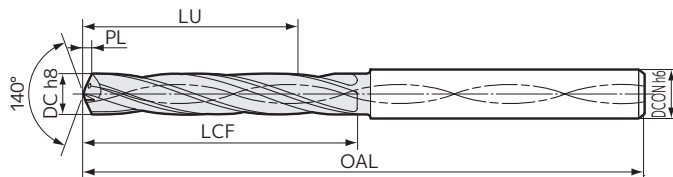
HX series (Internal Coolant Supply)

Cast Iron Ductile Cast Iron



*For tolerances, refer to Chapter N - References.

Fig 1

Diameter $\varnothing 3.0$ to 4.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDW 0300HX3	13.5	18.0	68.5	0.5	3.0	1
	5	●	0300HX5	24.0	28.5	78.5	0.5	3.0	1
	8	●	0300HX8	29.0	33.5	81.5	0.5	3.0	1
3.1	3	●	MDW 0310HX3	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310HX5	28.0	32.6	86.6	0.6	4.0	1
	8	●	0310HX8	34.5	39.1	92.6	0.6	4.0	1
3.2	3	▲	MDW 0320HX3	15.8	20.6	72.6	0.6	4.0	1
	5	▲	0320HX5	27.8	32.6	86.6	0.6	4.0	1
	8	▲	0320HX8	34.3	39.1	92.6	0.6	4.0	1
3.3	3	●	MDW 0330HX3	15.7	20.6	72.6	0.6	4.0	1
	5	●	0330HX5	27.7	32.6	86.6	0.6	4.0	1
	8	●	0330HX8	34.2	39.1	92.6	0.6	4.0	1
3.4	3	▲	MDW 0340HX3	15.5	20.6	72.6	0.6	4.0	1
	5	●	0340HX5	27.5	32.6	86.6	0.6	4.0	1
	8	●	0340HX8	34.0	39.1	92.6	0.6	4.0	1
3.5	3	▲	MDW 0350HX3	15.4	20.6	72.6	0.6	4.0	1
	5	●	0350HX5	27.4	32.6	86.6	0.6	4.0	1
	8	▲	0350HX8	33.9	39.1	92.6	0.6	4.0	1
3.6	3	●	MDW 0360HX3	17.8	23.2	72.7	0.7	4.0	1
	5	▲	0360HX5	31.3	36.7	86.7	0.7	4.0	1
	8	●	0360HX8	39.3	44.7	92.7	0.7	4.0	1
3.7	3	●	MDW 0370HX3	17.7	23.2	72.7	0.7	4.0	1
	5	▲	0370HX5	31.2	36.7	86.7	0.7	4.0	1
	8	●	0370HX8	39.2	44.7	92.7	0.7	4.0	1
3.8	3	●	MDW 0380HX3	17.5	23.2	72.7	0.7	4.0	1
	5	▲	0380HX5	31.0	36.7	86.7	0.7	4.0	1
	8	●	0380HX8	39.0	44.7	92.7	0.7	4.0	1
3.9	3	▲	MDW 0390HX3	17.4	23.2	72.7	0.7	4.0	1
	5	▲	0390HX5	30.9	36.7	86.7	0.7	4.0	1
	8	●	0390HX8	38.9	44.7	92.7	0.7	4.0	1
4.0	3	●	MDW 0400HX3	17.2	23.2	72.7	0.7	4.0	1
	5	●	0400HX5	30.7	36.7	86.7	0.7	4.0	1
	8	●	0400HX8	38.7	44.7	92.7	0.7	4.0	1
4.1	3	▲	MDW 0410HX3	19.6	25.7	80.7	0.7	5.0	1
	5	●	0410HX5	34.6	40.7	98.7	0.7	5.0	1
	8	●	0410HX8	44.1	50.2	105.7	0.7	5.0	1
4.2	3	●	MDW 0420HX3	19.5	25.8	80.8	0.8	5.0	1
	5	●	0420HX5	34.5	40.8	98.8	0.8	5.0	1
	8	●	0420HX8	44.0	50.3	105.8	0.8	5.0	1
4.3	3	▲	MDW 0430HX3	19.4	25.8	80.8	0.8	5.0	1
	5	●	0430HX5	34.4	40.8	98.8	0.8	5.0	1
	8	●	0430HX8	43.9	50.3	105.8	0.8	5.0	1
4.4	3	▲	MDW 0440HX3	19.2	25.8	80.8	0.8	5.0	1
	5	▲	0440HX5	34.2	40.8	98.8	0.8	5.0	1
	8	●	0440HX8	43.7	50.3	105.8	0.8	5.0	1
4.5	3	●	MDW 0450HX3	19.1	25.8	80.8	0.8	5.0	1
	5	▲	0450HX5	34.1	40.8	98.8	0.8	5.0	1
	8	●	0450HX8	43.6	50.3	105.8	0.8	5.0	1
4.6	3	▲	MDW 0460HX3	21.4	28.3	80.8	0.8	5.0	1
	5	●	0460HX5	37.9	44.8	98.8	0.8	5.0	1
	8	●	0460HX8	48.9	55.8	105.8	0.8	5.0	1
4.7	3	●	MDW 0470HX3	21.4	28.4	80.9	0.9	5.0	1
	5	▲	0470HX5	37.9	44.9	98.9	0.9	5.0	1
	8	●	0470HX8	48.9	55.9	105.9	0.9	5.0	1

Grade: ACX70

Diameter $\varnothing 4.8$ to 6.5mm

Dimensions (mm)

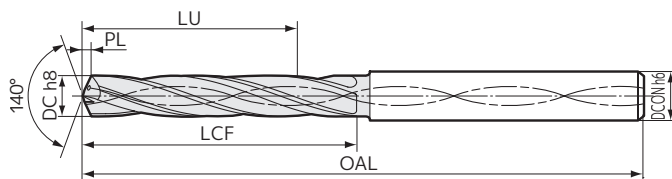
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.8	3	▲	MDW 0480HX3	21.2	28.4	80.9	0.9	5.0	1
	5	▲	0480HX5	37.7	44.9	98.9	0.9	5.0	1
	8	●	0480HX8	48.7	55.9	105.9	0.9	5.0	1
4.9	3	▲	MDW 0490HX3	21.1	28.4	80.9	0.9	5.0	1
	5	▲	0490HX5	37.6	44.9	98.9	0.9	5.0	1
	8	●	0490HX8	48.6	55.9	105.9	0.9	5.0	1
5.0	3	●	MDW 0500HX3	20.9	28.4	80.9	0.9	5.0	1
	5	●	0500HX5	37.4	44.9	98.9	0.9	5.0	1
	8	●	0500HX8	48.4	55.9	105.9	0.9	5.0	1
5.1	3	●	MDW 0510HX3	20.8	28.4	82.9	0.9	6.0	1
	5	●	0510HX5	37.3	44.9	100.9	0.9	6.0	1
	8	●	0510HX8	53.8	61.4	118.9	0.9	6.0	1
5.2	3	▲	MDW 0520HX3	20.6	28.4	82.9	0.9	6.0	1
	5	●	0520HX5	37.1	44.9	100.9	0.9	6.0	1
	8	●	0520HX8	53.6	61.4	118.9	0.9	6.0	1
5.3	3	▲	MDW 0530HX3	20.6	28.5	83.0	1.0	6.0	1
	5	▲	0530HX5	37.1	45.0	101.0	1.0	6.0	1
	8	●	0530HX8	53.6	61.5	119.0	1.0	6.0	1
5.4	3	▲	MDW 0540HX3	20.4	28.5	83.0	1.0	6.0	1
	5	▲	0540HX5	36.9	45.0	101.0	1.0	6.0	1
	8	●	0540HX8	53.4	61.5	119.0	1.0	6.0	1
5.5	3	●	MDW 0550HX3	20.3	28.5	83.0	1.0	6.0	1
	5	▲	0550HX5	36.8	45.0	101.0	1.0	6.0	1
	8	●	0550HX8	53.3	61.5	119.0	1.0	6.0	1
5.6	3	●	MDW 0560HX3	22.6	31.0	83.0	1.0	6.0	1
	5	▲	0560HX5	40.6	49.0	101.0	1.0	6.0	1
	8	●	0560HX8	58.6	67.0	119.0	1.0	6.0	1
5.7	3	●	MDW 0570HX3	22.5	31.0	83.0	1.0	6.0	1
	5	●	0570HX5	40.5	49.0	101.0	1.0	6.0	1
	8	●	0570HX8	58.5	67.0	119.0	1.0	6.0	1
5.8	3	●	MDW 0580HX3	22.4	31.1	83.1	1.1	6.0	1
	5	●	0580HX5	40.4	49.1	101.1	1.1	6.0	1
	8	●	0580HX8	58.4	67.1	119.1	1.1	6.0	1
5.9	3	●	MDW 0590HX3	22.3	31.1	83.1	1.1	6.0	1
	5	●	0590HX5	40.3	49.1	101.1	1.1	6.0	1
	8	▲	0590HX8	58.3	67.1	119.1	1.1	6.0	1
6.0	3	●	MDW 0600HX3	22.1	31.1	83.1	1.1	6.0	1
	5	●	0600HX5	40.1	49.1	101.1	1.1	6.0	1
	8	●	0600HX8	58.1	67.1	119.1	1.1	6.0	1
6.1	3	●	MDW 0610HX3	24.5	33.6	89.1	1.1	7.0	1
	5	●	0610HX5	44.0	53.1	110.1	1.1	7.0	1
	8	●	0610HX8	63.5	72.6	131.1	1.1	7.0	1
6.2	3	●	MDW 0620HX3	24.3	33.6	89.1	1.1	7.0	1
	5	●	0620HX5	43.8	53.1	110.1	1.1	7.0	1
	8	●	0620HX8	63.3	72.6	131.1	1.1	7.0	1
6.3	3	●	MDW 0630HX3	24.2	33.6	89.1	1.1	7.0	1
	5	●	0630HX5	43.7	53.1	110.1	1.1	7.0	1
	8	●	0630HX8	63.2	72.6	131.1	1.1	7.0	1
6.4	3	▲	MDW 0640HX3	24.1	33.7	89.2	1.2	7.0	1
	5	●	0640HX5	43.6	53.2	110.2	1.2	7.0	1
	8	●	0640HX8	63.1	72.7	131.2	1.2	7.0	1
6.5	3	▲	MDW 0650HX3	24.0	33.7	89.2	1.2	7.0	1
	5	▲	0650HX5	43.5	53.2	110.2	1.2	7.0	1
	8	●	0650HX8	63.0	72.7	131.2	1.2	7.0	1

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø6.6 to 8.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	3	●	MDW 0660HX3	26.3	36.2	89.2	1.2	7.0	1
	5	●	0660HX5	47.3	57.2	110.2	1.2	7.0	1
	8	●	0660HX8	68.3	78.2	131.2	1.2	7.0	1
6.7	3	●	MDW 0670HX3	26.2	36.2	89.2	1.2	7.0	1
	5	●	0670HX5	47.2	57.2	110.2	1.2	7.0	1
	8	●	0670HX8	68.2	78.2	131.2	1.2	7.0	1
6.8	3	●	MDW 0680HX3	26.0	36.2	89.2	1.2	7.0	1
	5	●	0680HX5	47.0	57.2	110.2	1.2	7.0	1
	8	●	0680HX8	68.0	78.2	131.2	1.2	7.0	1
6.9	3	●	MDW 0690HX3	26.0	36.3	89.3	1.3	7.0	1
	5	●	0690HX5	47.0	57.3	110.3	1.3	7.0	1
	8	●	0690HX8	68.0	78.3	131.3	1.3	7.0	1
7.0	3	●	MDW 0700HX3	25.8	36.3	89.3	1.3	7.0	1
	5	●	0700HX5	46.8	57.3	110.3	1.3	7.0	1
	8	●	0700HX8	67.8	78.3	131.3	1.3	7.0	1
7.1	3	▲	MDW 0710HX3	28.2	38.8	95.3	1.3	8.0	1
	5	▲	0710HX5	50.7	61.3	119.3	1.3	8.0	1
	8	●	0710HX8	73.2	83.8	143.3	1.3	8.0	1
7.2	3	●	MDW 0720HX3	28.0	38.8	95.3	1.3	8.0	1
	5	▲	0720HX5	50.5	61.3	119.3	1.3	8.0	1
	8	●	0720HX8	73.0	83.8	143.3	1.3	8.0	1
7.3	3	▲	MDW 0730HX3	27.9	38.8	95.3	1.3	8.0	1
	5	▲	0730HX5	50.4	61.3	119.3	1.3	8.0	1
	8	●	0730HX8	72.9	83.8	143.3	1.3	8.0	1
7.4	3	▲	MDW 0740HX3	27.7	38.8	95.3	1.3	8.0	1
	5	●	0740HX5	50.2	61.3	119.3	1.3	8.0	1
	8	●	0740HX8	72.7	83.8	143.3	1.3	8.0	1
7.5	3	●	MDW 0750HX3	27.7	38.9	95.4	1.4	8.0	1
	5	●	0750HX5	50.2	61.4	119.4	1.4	8.0	1
	8	●	0750HX8	72.7	83.9	143.4	1.4	8.0	1
7.6	3	●	MDW 0760HX3	30.0	41.4	95.4	1.4	8.0	1
	5	▲	0760HX5	54.0	65.4	119.4	1.4	8.0	1
	8	●	0760HX8	78.0	89.4	143.4	1.4	8.0	1
7.7	3	●	MDW 0770HX3	29.9	41.4	95.4	1.4	8.0	1
	5	●	0770HX5	53.9	65.4	119.4	1.4	8.0	1
	8	●	0770HX8	77.9	89.4	143.4	1.4	8.0	1
7.8	3	●	MDW 0780HX3	29.7	41.4	95.4	1.4	8.0	1
	5	●	0780HX5	53.7	65.4	119.4	1.4	8.0	1
	8	●	0780HX8	77.7	89.4	143.4	1.4	8.0	1
7.9	3	▲	MDW 0790HX3	29.6	41.4	95.4	1.4	8.0	1
	5	●	0790HX5	53.6	65.4	119.4	1.4	8.0	1
	8	●	0790HX8	77.6	89.4	143.4	1.4	8.0	1
8.0	3	●	MDW 0800HX3	29.5	41.5	95.5	1.5	8.0	1
	5	●	0800HX5	53.5	65.5	119.5	1.5	8.0	1
	8	●	0800HX8	77.5	89.5	143.5	1.5	8.0	1
8.1	3	●	MDW 0810HX3	31.9	44.0	101.5	1.5	9.0	1
	5	●	0810HX5	57.4	69.5	128.5	1.5	9.0	1
	8	●	0810HX8	82.9	95.0	155.5	1.5	9.0	1
8.2	3	●	MDW 0820HX3	31.7	44.0	101.5	1.5	9.0	1
	5	●	0820HX5	57.2	69.5	128.5	1.5	9.0	1
	8	●	0820HX8	82.7	95.0	155.5	1.5	9.0	1
8.3	3	●	MDW 0830HX3	31.6	44.0	101.5	1.5	9.0	1
	5	●	0830HX5	57.1	69.5	128.5	1.5	9.0	1
	8	●	0830HX8	82.6	95.0	155.5	1.5	9.0	1

Grade: ACX70

Diameter ø8.4 to 10.1mm

Dimensions (mm)

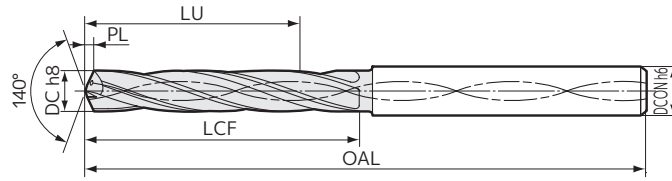
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.4	3	▲	MDW 0840HX3	31.4	44.0	101.5	1.5	9.0	1
	5	▲	0840HX5	56.9	69.5	128.5	1.5	9.0	1
	8	●	0840HX8	82.4	95.0	155.5	1.5	9.0	1
8.5	3	●	MDW 0850HX3	31.3	44.0	101.5	1.5	9.0	1
	5	●	0850HX5	56.8	69.5	128.5	1.5	9.0	1
	8	●	0850HX8	82.3	95.0	155.5	1.5	9.0	1
8.6	3	●	MDW 0860HX3	33.7	46.6	101.6	1.6	9.0	1
	5	●	0860HX5	60.7	73.6	128.6	1.6	9.0	1
	8	●	0860HX8	87.7	100.6	155.6	1.6	9.0	1
8.7	3	●	MDW 0870HX3	33.6	46.6	101.6	1.6	9.0	1
	5	●	0870HX5	60.6	73.6	128.6	1.6	9.0	1
	8	●	0870HX8	87.6	100.6	155.6	1.6	9.0	1
8.8	3	●	MDW 0880HX3	33.4	46.6	101.6	1.6	9.0	1
	5	●	0880HX5	60.4	73.6	128.6	1.6	9.0	1
	8	●	0880HX8	87.4	100.6	155.6	1.6	9.0	1
8.9	3	▲	MDW 0890HX3	33.3	46.6	101.6	1.6	9.0	1
	5	●	0890HX5	60.3	73.6	128.6	1.6	9.0	1
	8	●	0890HX8	87.3	100.6	155.6	1.6	9.0	1
9.0	3	●	MDW 0900HX3	33.1	46.6	101.6	1.6	9.0	1
	5	●	0900HX5	60.1	73.6	128.6	1.6	9.0	1
	8	●	0900HX8	87.1	100.6	155.6	1.6	9.0	1
9.1	3	●	MDW 0910HX3	35.6	49.2	107.7	1.7	10.0	1
	5	●	0910HX5	64.1	77.7	137.7	1.7	10.0	1
	8	●	0910HX8	92.6	106.2	167.7	1.7	10.0	1
9.2	3	▲	MDW 0920HX3	35.4	49.2	107.7	1.7	10.0	1
	5	▲	0920HX5	63.9	77.7	137.7	1.7	10.0	1
	8	●	0920HX8	92.4	106.2	167.7	1.7	10.0	1
9.3	3	●	MDW 0930HX3	35.3	49.2	107.7	1.7	10.0	1
	5	▲	0930HX5	63.8	77.7	137.7	1.7	10.0	1
	8	●	0930HX8	92.3	106.2	167.7	1.7	10.0	1
9.4	3	●	MDW 0940HX3	35.1	49.2	107.7	1.7	10.0	1
	5	●	0940HX5	63.6	77.7	137.7	1.7	10.0	1
	8	●	0940HX8	92.1	106.2	167.7	1.7	10.0	1
9.5	3	●	MDW 0950HX3	35.0	49.2	107.7	1.7	10.0	1
	5	●	0950HX5	63.5	77.7	137.7	1.7	10.0	1
	8	●	0950HX8	92.0	106.2	167.7	1.7	10.0	1
9.6	3	▲	MDW 0960HX3	37.3	51.7	107.7	1.7	10.0	1
	5	▲	0960HX5	67.3	81.7	137.7	1.7	10.0	1
	8	●	0960HX8	97.3	111.7	167.7	1.7	10.0	1
9.7	3	●	MDW 0970HX3	37.3	51.8	107.8	1.8	10.0	1
	5	●	0970HX5	67.3	81.8	137.8	1.8	10.0	1
	8	●	0970HX8	97.3	111.8	167.8	1.8	10.0	1
9.8	3	●	MDW 0980HX3	37.1	51.8	107.8	1.8	10.0	1
	5	▲	0980HX5	67.1	81.8	137.8	1.8	10.0	1
	8	●	0980HX8	97.1	111.8	167.8	1.8	10.0	1
9.9	3	▲	MDW 0990HX3	37.0	51.8	107.8	1.8	10.0	1
	5	▲	0990HX5	67.0	81.8	137.8	1.8	10.0	1
	8	●	0990HX8	97.0	111.8	167.8	1.8	10.0	1
10.0	3	●	MDW 1000HX3	36.8	51.8	107.8	1.8	10.0	1
	5	●	1000HX5	66.8	81.8	137.8	1.8	10.0	1
	8	●	1000HX8	96.8	111.8	167.8	1.8	10.0	1
10.1	3	▲	MDW 1010HX3	39.2	54.3	117.8	1.8	11.0	1
	5	●	1010HX5	70.7	85.8	150.8	1.8	11.0	1
	8	●	1010HX8	102.2	117.3	183.8	1.8	11.0	1

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 1

Diameter $\varnothing 10.2$ to 11.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.2	3	▲	MDW 1020HX3	39.1	54.4	117.9	1.9	11.0	1
	5	●	1020HX5	70.6	85.9	150.9	1.9	11.0	1
	8		1020HX8	102.1	117.4	183.9	1.9	11.0	1
10.3	3	●	MDW 1030HX3	39.0	54.4	117.9	1.9	11.0	1
	5	●	1030HX5	70.5	85.9	150.9	1.9	11.0	1
	8	●	1030HX8	102.0	117.4	183.9	1.9	11.0	1
10.4	3	●	MDW 1040HX3	38.8	54.4	117.9	1.9	11.0	1
	5	●	1040HX5	70.3	85.9	150.9	1.9	11.0	1
	8		1040HX8	101.8	117.4	183.9	1.9	11.0	1
10.5	3	●	MDW 1050HX3	38.7	54.4	117.9	1.9	11.0	1
	5	●	1050HX5	70.2	85.9	150.9	1.9	11.0	1
	8	●	1050HX8	101.7	117.4	183.9	1.9	11.0	1
10.6	3	●	MDW 1060HX3	41.0	56.9	117.9	1.9	11.0	1
	5	●	1060HX5	74.0	89.9	150.9	1.9	11.0	1
	8		1060HX8	107.0	122.9	183.9	1.9	11.0	1
10.7	3	●	MDW 1070HX3	40.9	56.9	117.9	1.9	11.0	1
	5	●	1070HX5	73.9	89.9	150.9	1.9	11.0	1
	8		1070HX8	106.9	122.9	183.9	1.9	11.0	1
10.8	3	●	MDW 1080HX3	40.8	57.0	118.0	2.0	11.0	1
	5	●	1080HX5	73.8	90.0	151.0	2.0	11.0	1
	8		1080HX8	106.8	123.0	184.0	2.0	11.0	1
10.9	3	▲	MDW 1090HX3	40.7	57.0	118.0	2.0	11.0	1
	5	▲	1090HX5	73.7	90.0	151.0	2.0	11.0	1
	8		1090HX8	106.7	123.0	184.0	2.0	11.0	1
11.0	3	●	MDW 1100HX3	40.5	57.0	118.0	2.0	11.0	1
	5	●	1100HX5	73.5	90.0	151.0	2.0	11.0	1
	8	●	1100HX8	106.5	123.0	184.0	2.0	11.0	1
11.1	3	●	MDW 1110HX3	42.9	59.5	124.0	2.0	12.0	1
	5	●	1110HX5	77.4	94.0	160.0	2.0	12.0	1
	8		1110HX8	111.9	128.5	196.0	2.0	12.0	1
11.2	3	▲	MDW 1120HX3	42.7	59.5	124.0	2.0	12.0	1
	5	●	1120HX5	77.2	94.0	160.0	2.0	12.0	1
	8		1120HX8	111.7	128.5	196.0	2.0	12.0	1
11.3	3	▲	MDW 1130HX3	42.7	59.6	124.1	2.1	12.0	1
	5	▲	1130HX5	77.2	94.1	160.1	2.1	12.0	1
	8		1130HX8	111.7	128.6	196.1	2.1	12.0	1
11.4	3	▲	MDW 1140HX3	42.5	59.6	124.1	2.1	12.0	1
	5	▲	1140HX5	77.0	94.1	160.1	2.1	12.0	1
	8		1140HX8	111.5	128.6	196.1	2.1	12.0	1
11.5	3	●	MDW 1150HX3	42.4	59.6	124.1	2.1	12.0	1
	5	●	1150HX5	76.9	94.1	160.1	2.1	12.0	1
	8	●	1150HX8	111.4	128.6	196.1	2.1	12.0	1
11.6	3	●	MDW 1160HX3	44.7	62.1	124.1	2.1	12.0	1
	5	●	1160HX5	80.7	98.1	160.1	2.1	12.0	1
	8		1160HX8	116.7	134.1	196.1	2.1	12.0	1
11.7	3	●	MDW 1170HX3	44.6	62.1	124.1	2.1	12.0	1
	5	●	1170HX5	80.6	98.1	160.1	2.1	12.0	1
	8		1170HX8	116.6	134.1	196.1	2.1	12.0	1
11.8	3	▲	MDW 1180HX3	44.4	62.1	124.1	2.1	12.0	1
	5	●	1180HX5	80.4	98.1	160.1	2.1	12.0	1
	8		1180HX8	116.4	134.1	196.1	2.1	12.0	1
11.9	3	▲	MDW 1190HX3	44.4	62.2	124.2	2.2	12.0	1
	5	▲	1190HX5	80.4	98.2	160.2	2.2	12.0	1
	8		1190HX8	116.4	134.2	196.2	2.2	12.0	1

Grade: ACX70

Diameter $\varnothing 12.0$ to 13.7mm

Dimensions (mm)

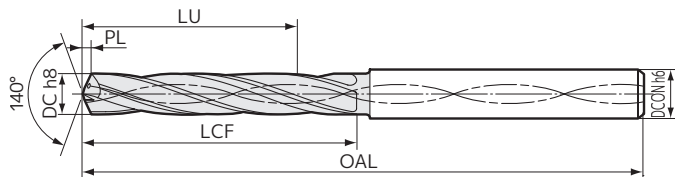
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.0	3	●	MDW 1200HX3	44.2	62.2	124.2	2.2	12.0	1
	5	●	1200HX5	80.2	98.2	160.2	2.2	12.0	1
	8	●	1200HX8	116.2	134.2	196.2	2.2	12.0	1
12.1	3		MDW 1210HX3	46.6	64.7	130.2	2.2	13.0	1
	5		1210HX5	84.1	102.2	169.2	2.2	13.0	1
	8		1210HX8	121.6	139.7	208.2	2.2	13.0	1
12.2	3		MDW 1220HX3	46.4	64.7	130.2	2.2	13.0	1
	5		1220HX5	83.9	102.2	169.2	2.2	13.0	1
	8		1220HX8	121.4	139.7	208.2	2.2	13.0	1
12.3	3		MDW 1230HX3	46.3	64.7	130.2	2.2	13.0	1
	5		1230HX5	83.8	102.3	169.2	2.2	13.0	1
	8		1230HX8	121.3	139.7	208.2	2.2	13.0	1
12.4	3		MDW 1240HX3	46.2	64.8	130.3	2.3	13.0	1
	5		1240HX5	83.7	102.3	169.3	2.3	13.0	1
	8		1240HX8	121.2	139.8	208.3	2.3	13.0	1
12.5	3	●	MDW 1250HX3	46.1	64.8	130.3	2.3	13.0	1
	5	●	1250HX5	83.6	102.3	169.3	2.3	13.0	1
	8	●	1250HX8	121.1	139.8	208.3	2.3	13.0	1
12.6	3		MDW 1260HX3	48.4	67.3	130.3	2.3	13.0	1
	5		1260HX5	87.4	106.3	169.3	2.3	13.0	1
	8		1260HX8	126.4	145.3	208.3	2.3	13.0	1
12.7	3		MDW 1270HX3	48.3	67.3	130.3	2.3	13.0	1
	5		1270HX5	87.3	106.3	169.3	2.3	13.0	1
	8		1270HX8	126.3	145.3	208.3	2.3	13.0	1
12.8	3		MDW 1280HX3	48.1	67.3	130.3	2.3	13.0	1
	5		1280HX5	87.1	106.3	169.3	2.3	13.0	1
	8		1280HX8	126.1	145.3	208.3	2.3	13.0	1
12.9	3		MDW 1290HX3	48.0	67.3	130.3	2.3	13.0	1
	5		1290HX5	87.0	106.3	169.3	2.3	13.0	1
	8		1290HX8	126.0	145.3	208.3	2.3	13.0	1
13.0	3	●	MDW 1300HX3	47.9	67.4	130.4	2.4	13.0	1
	5	●	1300HX5	86.9	106.4	169.4	2.4	13.0	1
	8	●	1300HX8	125.9	145.4	208.4	2.4	13.0	1
13.1	3		MDW 1310HX3	50.3	69.9	136.4	2.4	14.0	1
	5		1310HX5	90.8	110.4	178.4	2.4	14.0	1
	8		1310HX8	131.3	150.9	220.4	2.4	14.0	1
13.2	3		MDW 1320HX3	50.1	69.9	136.4	2.4	14.0	1
	5		1320HX5	90.6	110.4	178.4	2.4	14.0	1
	8		1320HX8	131.1	150.9	220.4	2.4	14.0	1
13.3	3		MDW 1330HX3	50.0	69.9	136.4	2.4	14.0	1
	5		1330HX5	90.5	110.4	178.4	2.4	14.0	1
	8		1330HX8	131.0	150.9	220.4	2.4	14.0	1
13.4	3		MDW 1340HX3	49.8	69.9	136.4	2.4	14.0	1
	5		1340HX5	90.3	110.4	178.4	2.4	14.0	1
	8		1340HX8	130.8	150.9	220.4	2.4	14.0	1
13.5	3	●	MDW 1350HX3	49.8	70.0	136.5	2.5	14.0	1
	5	●	1350HX5	90.3	110.5	178.5	2.5	14.0	1
	8	●	1350HX8	130.8	151.0	220.5	2.5	14.0	1
13.6	3		MDW 1360HX3	52.1	72.5	136.5	2.5	14.0	1
	5		1360HX5	94.1	114.5	178.5	2.5	14.0	1
	8		1360HX8	136.1	156.5	220.5	2.5	14.0	1
13.7	3		MDW 1370HX3	52.0	72.5	136.5	2.5	14.0	1
	5		1370HX5	94.0	114.5	178.5	2.5	14.0	1
	8		1370HX8	136.0	156.5	220.5	2.5	14.0	1

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 1

Diameter $\varnothing 13.8$ to 15.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.8	3		MDW 1380HX3	51.8	72.5	136.5	2.5	14.0	1
	5		1380HX5	93.8	114.5	178.5	2.5	14.0	1
	8		1380HX8	135.8	156.5	220.5	2.5	14.0	1
13.9	3		MDW 1390HX3	51.7	72.5	136.5	2.5	14.0	1
	5		1390HX5	93.7	114.5	178.5	2.5	14.0	1
	8		1390HX8	135.7	156.5	220.5	2.5	14.0	1
14.0	3	●	MDW 1400HX3	51.5	72.5	136.5	2.5	14.0	1
	5	●	1400HX5	93.5	114.5	178.5	2.5	14.0	1
	8		1400HX8	135.5	156.5	220.5	2.5	14.0	1
14.1	3		MDW 1410HX3	54.0	75.1	142.6	2.6	15.0	1
	5		1410HX5	97.5	118.6	187.6	2.6	15.0	1
	8		1410HX8	141.0	162.1	232.6	2.6	15.0	1
14.2	3		MDW 1420HX3	53.8	75.1	142.6	2.6	15.0	1
	5		1420HX5	97.3	118.6	187.6	2.6	15.0	1
	8		1420HX8	140.8	162.1	232.6	2.6	15.0	1
14.3	3		MDW 1430HX3	53.7	75.1	142.6	2.6	15.0	1
	5		1430HX5	97.2	118.6	187.6	2.6	15.0	1
	8		1430HX8	140.7	162.1	232.6	2.6	15.0	1
14.4	3		MDW 1440HX3	53.5	75.1	142.6	2.6	15.0	1
	5		1440HX5	97.0	118.6	187.6	2.6	15.0	1
	8		1440HX8	140.5	162.1	232.6	2.6	15.0	1
14.5	3	●	MDW 1450HX3	53.4	75.1	142.6	2.6	15.0	1
	5	●	1450HX5	96.9	118.6	187.6	2.6	15.0	1
	8		1450HX8	140.4	162.1	232.6	2.6	15.0	1
14.6	3		MDW 1460HX3	55.8	77.7	142.7	2.7	15.0	1
	5		1460HX5	100.8	122.7	187.7	2.7	15.0	1
	8		1460HX8	145.8	167.7	232.7	2.7	15.0	1
14.7	3		MDW 1470HX3	55.7	77.7	142.7	2.7	15.0	1
	5		1470HX5	100.7	122.7	187.7	2.7	15.0	1
	8		1470HX8	145.7	167.7	232.7	2.7	15.0	1
14.8	3		MDW 1480HX3	55.5	77.7	142.7	2.7	15.0	1
	5		1480HX5	100.5	122.7	187.7	2.7	15.0	1
	8		1480HX8	145.5	167.7	232.7	2.7	15.0	1
14.9	3		MDW 1490HX3	55.4	77.7	142.7	2.7	15.0	1
	5		1490HX5	100.4	122.7	187.7	2.7	15.0	1
	8		1490HX8	145.4	167.7	232.7	2.7	15.0	1
15.0	3	●	MDW 1500HX3	55.2	77.7	142.7	2.7	15.0	1
	5	●	1500HX5	100.2	122.7	187.7	2.7	15.0	1
	8	●	1500HX8	145.2	167.7	232.7	2.7	15.0	1
15.1	3		MDW 1510HX3	57.6	80.3	148.7	2.7	16.0	1
	5		1510HX5	104.1	126.7	196.7	2.7	16.0	1
	8		1510HX8	150.6	173.2	244.7	2.7	16.0	1
15.2	3		MDW 1520HX3	57.5	80.3	148.8	2.8	16.0	1
	5		1520HX5	104.0	126.8	196.8	2.8	16.0	1
	8		1520HX8	150.5	173.3	244.8	2.8	16.0	1
15.3	3		MDW 1530HX3	57.4	80.3	148.8	2.8	16.0	1
	5		1530HX5	103.9	126.8	196.8	2.8	16.0	1
	8		1530HX8	150.4	173.3	244.8	2.8	16.0	1
15.4	3		MDW 1540HX3	57.2	80.3	148.8	2.8	16.0	1
	5		1540HX5	103.7	126.8	196.8	2.8	16.0	1
	8		1540HX8	150.2	173.3	244.8	2.8	16.0	1
15.5	3	●	MDW 1550HX3	57.1	80.3	148.8	2.8	16.0	1
	5	●	1550HX5	103.6	126.8	196.8	2.8	16.0	1
	8		1550HX8	150.1	173.3	244.8	2.8	16.0	1

Grade: ACX70

Diameter $\varnothing 15.6$ to 17.3mm

Dimensions (mm)

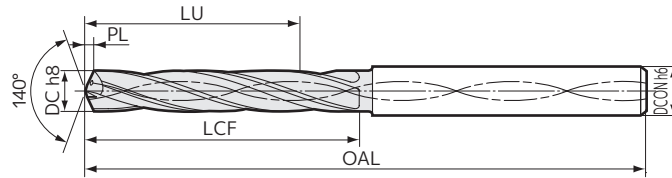
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.6	3		MDW 1560HX3	59.4	82.8	148.8	2.8	16.0	1
	5		1560HX5	107.4	130.8	196.8	2.8	16.0	1
	8		1560HX8	155.4	178.8	244.8	2.8	16.0	1
15.7	3		MDW 1570HX3	59.4	82.9	148.9	2.9	16.0	1
	5		1570HX5	107.4	130.9	196.9	2.9	16.0	1
	8		1570HX8	155.4	178.9	244.9	2.9	16.0	1
15.8	3		MDW 1580HX3	59.2	82.9	148.9	2.9	16.0	1
	5		1580HX5	107.2	130.9	196.9	2.9	16.0	1
	8		1580HX8	155.2	178.9	244.9	2.9	16.0	1
15.9	3		MDW 1590HX3	59.1	82.9	148.9	2.9	16.0	1
	5		1590HX5	107.1	130.9	196.9	2.9	16.0	1
	8		1590HX8	155.1	178.9	244.9	2.9	16.0	1
16.0	3	●	MDW 1600HX3	58.9	82.9	148.9	2.9	16.0	1
	5	●	1600HX5	106.9	130.9	196.9	2.9	16.0	1
	8		1600HX8	154.9	178.9	244.9	2.9	16.0	1
16.1	3		MDW 1610HX3	61.3	85.4	154.9	2.9	17.0	1
	5		1610HX5	110.8	134.9	205.9	2.9	17.0	1
	8		1610HX8	160.3	184.4	256.9	2.9	17.0	1
16.2	3		MDW 1620HX3	61.1	85.4	154.9	2.9	17.0	1
	5		1620HX5	110.6	134.9	205.9	2.9	17.0	1
	8		1620HX8	160.1	184.4	256.9	2.9	17.0	1
16.3	3		MDW 1630HX3	61.1	85.5	155.0	3.0	17.0	1
	5		1630HX5	110.6	135.0	206.0	3.0	17.0	1
	8		1630HX8	160.1	184.5	257.0	3.0	17.0	1
16.4	3		MDW 1640HX3	60.9	85.5	155.0	3.0	17.0	1
	5		1640HX5	110.4	135.0	206.0	3.0	17.0	1
	8		1640HX8	159.9	184.5	257.0	3.0	17.0	1
16.5	3	●	MDW 1650HX3	60.8	85.5	155.0	3.0	17.0	1
	5	●	1650HX5	110.3	135.0	206.0	3.0	17.0	1
	8		1650HX8	159.8	184.5	257.0	3.0	17.0	1
16.6	3		MDW 1660HX3	63.1	88.0	155.0	3.0	17.0	1
	5		1660HX5	114.1	139.0	206.0	3.0	17.0	1
	8		1660HX8	165.1	190.0	257.0	3.0	17.0	1
16.7	3		MDW 1670HX3	63.0	88.0	155.0	3.0	17.0	1
	5		1670HX5	114.0	139.0	206.0	3.0	17.0	1
	8		1670HX8	165.0	190.0	257.0	3.0	17.0	1
16.8	3		MDW 1680HX3	62.9	88.1	155.1	3.1	17.0	1
	5		1680HX5	113.9	139.1	206.1	3.1	17.0	1
	8		1680HX8	164.9	190.1	257.1	3.1	17.0	1
16.9	3		MDW 1690HX3	62.8	88.1	155.1	3.1	17.0	1
	5		1690HX5	113.8	139.1	206.1	3.1	17.0	1
	8		1690HX8	164.8	190.1	257.1	3.1	17.0	1
17.0	3	●	MDW 1700HX3	62.6	88.1	155.1	3.1	17.0	1
	5	●	1700HX5	113.6	139.1	206.1	3.1	17.0	1
	8		1700HX8	164.6	190.1	257.1	3.1	17.0	1
17.1	3	●	MDW 1710HX3	65.0	90.6	161.1	3.1	18.0	1
	5	▲	1710HX5	117.5	143.1	217.1	3.1	18.0	1
	8	▲	1710HX8	170.0	195.6	269.1	3.1	18.0	1
17.2	3		MDW 1720HX3	64.8	90.6	161.1	3.1	18.0	1
	5		1720HX5	117.3	143.1	217.1	3.1	18.0	1
	8		1720HX8	169.8	195.6	269.1	3.1	18.0	1
17.3	3		MDW 1730HX3	64.7	90.6	161.1	3.1	18.0	1
	5		1730HX5	117.2	143.1	217.1	3.1	18.0	1
	8		1730HX8	169.7	195.6	269.1	3.1	18.0	1

Grade: ACX70



*For tolerances, refer to Chapter N - References.

Fig 1

**Diameter ø17.4 to 18.3mm**

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
17.4	3		MDW 1740HX3	64.6	90.7	161.2	3.2	18.0	1
	5		1740HX5	117.1	143.2	217.2	3.2	18.0	1
	8		1740HX8	169.6	195.7	269.2	3.2	18.0	1
17.5	3	●	MDW 1750HX3	64.5	90.7	161.2	3.2	18.0	1
	5	●	1750HX5	117.0	143.2	217.2	3.2	18.0	1
	8		1750HX8	169.5	195.7	269.2	3.2	18.0	1
17.6	3		MDW 1760HX3	66.8	93.2	161.2	3.2	18.0	1
	5		1760HX5	120.8	147.2	217.2	3.2	18.0	1
	8		1760HX8	174.8	201.2	269.2	3.2	18.0	1
17.7	3		MDW 1770HX3	66.7	93.2	161.2	3.2	18.0	1
	5		1770HX5	120.7	147.2	217.2	3.2	18.0	1
	8		1770HX8	174.7	201.2	269.2	3.2	18.0	1
17.8	3		MDW 1780HX3	66.5	93.2	161.2	3.2	18.0	1
	5		1780HX5	120.5	147.2	217.2	3.2	18.0	1
	8		1780HX8	174.5	201.2	269.2	3.2	18.0	1
17.9	3		MDW 1790HX3	66.5	93.3	161.3	3.3	18.0	1
	5		1790HX5	120.5	147.3	217.3	3.3	18.0	1
	8		1790HX8	174.5	201.3	269.3	3.3	18.0	1
18.0	3	●	MDW 1800HX3	66.3	93.3	161.3	3.3	18.0	1
	5	●	1800HX5	120.3	147.3	217.3	3.3	18.0	1
	8		1800HX8	174.3	201.3	269.3	3.3	18.0	1
18.1	3		MDW 1810HX3	68.7	95.8	167.3	3.3	19.0	1
	5		1810HX5	124.2	151.3	224.3	3.3	19.0	1
	8		1810HX8	174.5	201.3	269.3	3.3	19.0	1
18.2	3		MDW 1820HX3	68.5	95.8	167.3	3.3	19.0	1
	5		1820HX5	124.0	151.3	224.3	3.3	19.0	1
	8		1820HX8	174.5	201.3	269.3	3.3	19.0	1
18.3	3		MDW 1830HX3	68.4	95.8	167.3	3.3	19.0	1
	5		1830HX5	123.9	151.3	224.3	3.3	19.0	1

Grade: ACX70

Diameter ø18.4 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
18.4	3		MDW 1840HX3	68.2	95.8	167.3	3.3	19.0	1
	5		1840HX5	123.7	151.3	224.3	3.3	19.0	1
18.5	3	●	MDW 1850HX3	68.2	95.9	167.4	3.4	19.0	1
	5	●	1850HX5	123.7	151.4	224.4	3.4	19.0	1
18.6	3		MDW 1860HX3	70.5	98.4	167.4	3.4	19.0	1
	5		1860HX5	127.5	155.4	224.4	3.4	19.0	1
18.7	3		MDW 1870HX3	70.4	98.4	167.4	3.4	19.0	1
	5		1870HX5	127.4	155.4	224.4	3.4	19.0	1
18.8	3		MDW 1880HX3	70.2	98.4	167.4	3.4	19.0	1
	5		1880HX5	127.2	155.4	224.4	3.4	19.0	1
18.9	3		MDW 1890HX3	70.1	98.4	167.4	3.4	19.0	1
	5		1890HX5	127.1	155.4	224.4	3.4	19.0	1
19.0	3	●	MDW 1900HX3	70.0	98.5	167.5	3.5	19.0	1
	5	●	1900HX5	127.0	155.5	224.5	3.5	19.0	1
19.1	3		MDW 1910HX3	72.4	101.0	173.5	3.5	20.0	1
	5		1910HX5	130.9	159.5	233.5	3.5	20.0	1
19.2	3		MDW 1920HX3	72.2	101.0	173.5	3.5	20.0	1
	5		1920HX5	130.7	159.5	233.5	3.5	20.0	1
19.3	3		MDW 1930HX3	72.1	101.0	173.5	3.5	20.0	1
	5		1930HX5	130.6	159.5	233.5	3.5	20.0	1
19.4	3		MDW 1940HX3	71.9	101.0	173.5	3.5	20.0	1
	5		1940HX5	130.4	159.5	233.5	3.5	20.0	1
19.5	3	●	MDW 1950HX3	71.8	101.0	173.5	3.5	20.0	1
	5	▲	1950HX5	130.3	159.5	233.5	3.5	20.0	1
19.6	3		MDW 1960HX3	74.2	103.6	173.6	3.6	20.0	1
	5		1960HX5	134.2	163.6	233.6	3.6	20.0	1
19.7	3		MDW 1970HX3	74.1	103.6	173.6	3.6	20.0	1
	5		1970HX5	134.1	163.6	233.6	3.6	20.0	1
19.8	3		MDW 1980HX3	73.9	103.6	173.6	3.6	20.0	1
	5		1980HX5	133.9	163.6	233.6	3.6	20.0	1
19.9	3		MDW 1990HX3	73.8	103.6	173.6	3.6	20.0	1
	5		1990HX5	133.8	163.6	233.6	3.6	20.0	1
20.0	3	●	MDW 2000HX3	73.6	103.6	173.6	3.6	20.0	1
	5	●	2000HX5	133.6	163.6	233.6	3.6	20.0	1

Grade: ACX70

Recommended Cutting Conditions(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Grey Cast Iron FC250	Ductile Cast Iron FCD450
ø3.0	n	7,400	5,300
	vc	50 - 70 - 90	40 - 50 - 80
	f	0.10 - 0.20 - 0.30	0.12 - 0.18 - 0.24
ø5.0	n	4,500	3,800
	vc	50 - 70 - 90	40 - 50 - 80
	f	0.15 - 0.25 - 0.35	0.15 - 0.22 - 0.30
ø10.0	n	2,500	1,900
	vc	60 - 80 - 100	50 - 60 - 90
	f	0.20 - 0.35 - 0.50	0.20 - 0.30 - 0.40
ø20.0	n	1,600	1,000
	vc	70 - 100 - 120	60 - 80 - 100
	f	0.25 - 0.50 - 0.70	0.25 - 0.45 - 0.60

Min. - Optimum - Max.

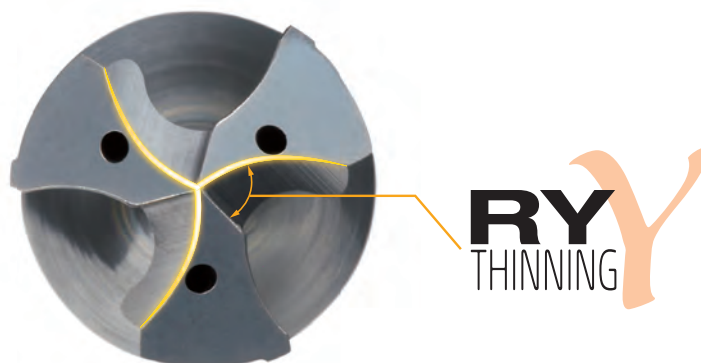
MEMO





General Features

Strong MULTIDRILL HY series is a 3 fluted drill that achieves stability and high-efficiency in drilling of steel and cast iron, reducing the load on each tooth and extending the tool life.



Features and Applications

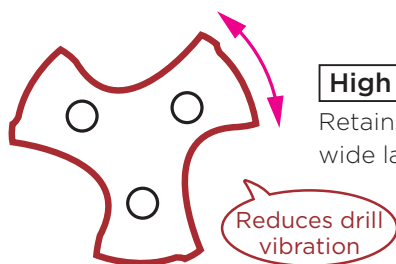
High-efficiency Drilling of Steel and Cast Iron

Thick web and 3-point margin design ensure stable hole diameter accuracy in high-efficiency drilling. RY THINNING also reduces cutting force in high-efficiency drilling.

Applicable to cutting conditions exceeding $v_f = 800\text{mm/min}$ in steel drilling and $v_f = 1,000\text{mm/min}$ in cast iron drilling. (For $\phi 10\text{mm}$ sizes)

Long Tool Life

DEX Coat for drills utilises nano-coating technology to provide more than double the tool life of conventional coatings. 3-point margin design gives excellent guide performance for vibration control and long, stable tool life.



High Rigidity

Retains high rigidity with wide land

Reduces drill vibration



Evacuation

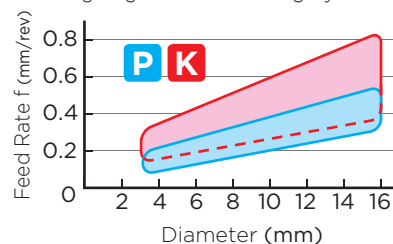
Drastically improved chip control and evacuation

Improves chip evacuation

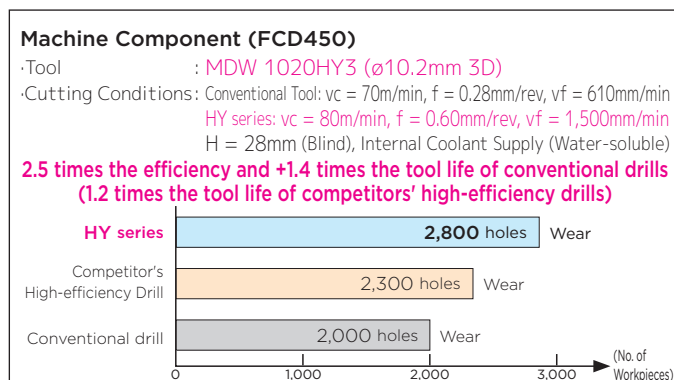
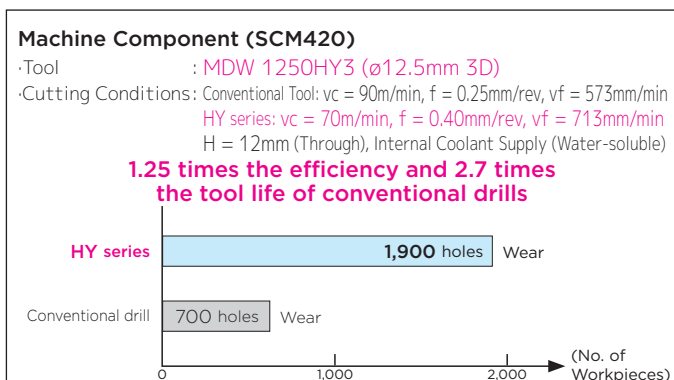
Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of Items
Internal	MDW□□□□HY3	$\phi 5.0$ to $\phi 16.0$	up to 3	23 items in stock
	MDW□□□□HY5		up to 5	23 items in stock
	MDW□□□□HY8		up to 8	6 items in stock

Drilling of general steel and grey cast iron



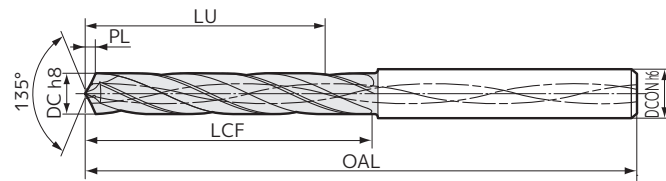
Application Examples





*For tolerances, refer to Chapter N - References.

Fig 1

**Diameter ø5.0 to 9.5mm**

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.0	3	▲	MDW 0500HY3	21.0	28.5	81.0	1.0	5.0	1
	5	▲	0500HY5	37.5	45.0	99.0	1.0	5.0	1
	8	▲	0500HY8	48.5	56.0	106.0	1.0	5.0	1
5.1	3	▲	MDW 0510HY3	21.0	28.6	83.1	1.1	6.0	1
	5	▲	0510HY5	37.5	45.1	101.1	1.1	6.0	1
	8	▲	0510HY8	54.0	61.6	119.1	1.1	6.0	1
6.0	3	▲	MDW 0600HY3	22.2	31.2	83.2	1.2	6.0	1
	5	▲	0600HY5	40.2	49.2	101.2	1.2	6.0	1
	8	▲	0600HY8	58.2	67.2	119.2	1.2	6.0	1
6.5	3	▲	MDW 0650HY3	24.1	33.8	89.3	1.3	7.0	1
	5	▲	0650HY5	43.6	53.3	110.3	1.3	7.0	1
	8	▲	0650HY8	63.1	72.8	131.3	1.3	7.0	1
6.8	3	▲	MDW 0680HY3	26.2	36.4	89.4	1.4	7.0	1
	5	▲	0680HY5	47.2	57.4	110.4	1.4	7.0	1
	8	▲	0680HY8	68.2	78.4	131.4	1.4	7.0	1
7.0	3	▲	MDW 0700HY3	25.9	36.4	89.4	1.4	7.0	1
	5	▲	0700HY5	46.9	57.4	110.4	1.4	7.0	1
	8	▲	0700HY8	67.9	78.4	131.4	1.4	7.0	1
8.0	3	▲	MDW 0800HY3	29.7	41.7	95.7	1.7	8.0	1
	5	▲	0800HY5	53.7	65.7	119.7	1.7	8.0	1
	8	▲	0800HY8	77.7	89.7	143.7	1.7	8.0	1
8.5	3	▲	MDW 0850HY3	31.6	44.3	101.8	1.8	9.0	1
	5	▲	0850HY5	57.1	69.8	128.8	1.8	9.0	1
	8	▲	0850HY8	82.6	95.3	155.8	1.8	9.0	1
8.6	3	▲	MDW 0860HY3	33.9	46.8	101.8	1.8	9.0	1
	5	▲	0860HY5	60.9	73.8	128.8	1.8	9.0	1
	8	▲	0860HY8	87.9	100.8	155.8	1.8	9.0	1
8.8	3	▲	MDW 0880HY3	33.6	46.8	101.8	1.8	9.0	1
	5	▲	0880HY5	60.6	73.8	128.8	1.8	9.0	1
	8	▲	0880HY8	87.6	100.8	155.8	1.8	9.0	1
9.0	3	▲	MDW 0900HY3	33.4	46.9	101.9	1.9	9.0	1
	5	▲	0900HY5	60.4	73.9	128.9	1.9	9.0	1
	8	▲	0900HY8	87.4	100.9	155.9	1.9	9.0	1
9.5	3	▲	MDW 0950HY3	35.3	49.5	108.0	2.0	10.0	1
	5	▲	0950HY5	63.8	78.0	138.0	2.0	10.0	1
	8	▲	0950HY8	92.3	106.5	168.0	2.0	10.0	1

Grade: ACX70

Diameter ø10.0 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.0	3	▲	MDW 1000HY3	37.1	52.1	108.1	2.1	10.0	1
	5	▲	1000HY5	67.1	82.1	138.1	2.1	10.0	1
	8	▲	1000HY8	97.1	112.1	168.1	2.1	10.0	1
10.2	3	▲	MDW 1020HY3	39.3	54.6	118.1	2.1	11.0	1
	5	▲	1020HY5	70.8	86.1	151.1	2.1	11.0	1
	8	▲	1020HY8	102.3	117.6	184.1	2.1	11.0	1
10.3	3	▲	MDW 1030HY3	39.2	54.6	118.1	2.1	11.0	1
	5	▲	1030HY5	70.7	86.1	151.1	2.1	11.0	1
	8	▲	1030HY8	102.2	117.6	184.1	2.1	11.0	1
11.0	3	▲	MDW 1100HY3	40.8	57.3	118.3	2.3	11.0	1
	5	▲	1100HY5	73.8	90.3	151.3	2.3	11.0	1
	8	▲	1100HY8	106.8	123.3	184.3	2.3	11.0	1
11.4	3	▲	MDW 1140HY3	42.8	59.9	124.4	2.4	12.0	1
	5	▲	1140HY5	77.3	94.4	160.4	2.4	12.0	1
	8	▲	1140HY8	111.8	128.9	196.4	2.4	12.0	1
11.5	3	▲	MDW 1150HY3	42.7	59.9	124.4	2.4	12.0	1
	5	▲	1150HY5	77.2	94.4	160.4	2.4	12.0	1
	8	▲	1150HY8	111.7	128.9	196.4	2.4	12.0	1
12.0	3	▲	MDW 1200HY3	44.5	62.5	124.5	2.5	12.0	1
	5	▲	1200HY5	80.5	98.5	160.5	2.5	12.0	1
	8	▲	1200HY8	116.5	134.5	196.5	2.5	12.0	1
12.5	3	▲	MDW 1250HY3	46.4	65.1	130.6	2.6	13.0	1
	5	▲	1250HY5	83.9	102.6	169.6	2.6	13.0	1
	8	▲	1250HY8	121.4	140.1	208.6	2.6	13.0	1
13.0	3	▲	MDW 1300HY3	48.2	67.7	130.7	2.7	13.0	1
	5	▲	1300HY5	87.2	106.7	169.7	2.7	13.0	1
	8	▲	1300HY8	126.2	145.7	208.7	2.7	13.0	1
14.0	3	▲	MDW 1400HY3	51.9	72.9	136.9	2.9	14.0	1
	5	▲	1400HY5	93.9	114.9	178.9	2.9	14.0	1
	8	▲	1400HY8	135.9	156.9	220.9	2.9	14.0	1
16.0	3	▲	MDW 1600HY3	59.3	83.3	149.3	3.3	16.0	1
	5	▲	1600HY5	107.3	131.3	197.3	3.3	16.0	1
	8	▲	1600HY8	155.3	179.3	245.3	3.3	16.0	1

Grade: ACX70

Recommended Cutting Conditions(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Grey Cast Iron FC250	Ductile Cast Iron FCD450
ø5.0	n	2,600	1,900	1,900
	vc	50 - 70 - 120	50 - 70 - 90	40 - 50 - 80
	f	0.15 - 0.20 - 0.25	0.20 - 0.30 - 0.45	0.18 - 0.24 - 0.30
ø10.0	n	2,600	1,900	1,900
	vc	70 - 100 - 150	60 - 80 - 100	50 - 60 - 90
	f	0.20 - 0.30 - 0.40	0.30 - 0.45 - 0.60	0.30 - 0.40 - 0.50
ø16.0	n	2,000	1,600	1,200
	vc	80 - 120 - 160	70 - 100 - 120	60 - 80 - 100
	f	0.35 - 0.45 - 0.55	0.40 - 0.60 - 0.80	0.40 - 0.55 - 0.70

Min. - Optimum - Max.



■ General Features

Super MULTIDRILL XHGS series, a next-generation drill specialized for deep hole drilling, features high drill strength and stable chip control to further enhance efficiency of deep hole drilling.

■ Features

● Deep hole drilling

- J-flute shape achieves improved chip control during deep hole drilling
- High-efficiency drilling at over $v_f = 1,000\text{mm/min}$ at depths 20 times the diameter (diameter $\phi 5$, equivalent to S48C)
- Special web thinning shape (RX THINNING) reduces drilling force during high-efficiency machining

● Long tool life

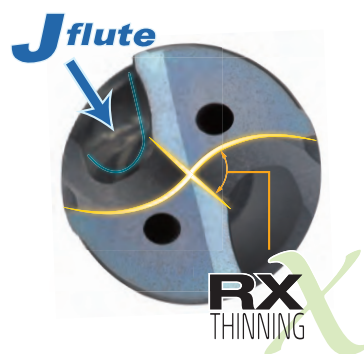
- Special DEX Coat provides long tool life on a wide variety of work materials
- Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring long, stable tool life

● Eco-friendly

- Compatible with the MQL (Minimum Quantity Lubrication) system
- Compatible with dual-fluid mist (simultaneous spray of oil and water)

■ Product Range

Applications	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of Items
Deep Hole Drilling	MDW□□□□XHGS10	$\phi 2.1$ to 16.0	up to 10	76 items in stock
	MDW□□□□XHGS12	$\phi 2.5$ to 16.0	up to 12	28 items in stock
	MDW□□□□XHGS15	$\phi 2.1$ to 16.0	up to 15	76 items in stock
	MDW□□□□XHGS20	$\phi 2.1$ to 14.0	up to 20	72 items in stock
	MDW□□□□XHGS25	$\phi 2.1$ to 12.0	up to 25	68 items in stock
	MDW□□□□XHGS30	$\phi 2.1$ to 10.0	up to 30	64 items in stock
For Guide Hole	MDW□□□□PHT	$\phi 2.1$ to 16.0	up to 2	76 items in stock



■ Application Examples

● Automotive Component (equivalent to S38C)

Tool : $\phi 5.0 \times 115\text{mm}$ (PHT series), $\phi 5.0 \times 170\text{mm}$ (XHGS series)
 Machine : Horizontal Single-Spindle NC Machine
 Coolant : MQL (Air Pressure 0.5MPa, Volume approx. 4cc/h)
 Cutting Conditions: $v_c = 80\text{m/min}$, $f = 0.28\text{mm/rev}$, $H = 85\text{mm}$ per hole (3 holes per unit)
 Tool Life : **500 units (113m)**

● Automotive Component (equivalent to FCD700)

Tool : $\phi 5.0 \times 105\text{mm}$ (PHT series), $\phi 5.0 \times 155\text{mm}$ (XHGS series)
 Machine : Horizontal Single-Spindle NC Machine
 Coolant : MQL (Air Pressure 0.4MPa, Volume approx. 4cc/h)
 Cutting Conditions: $v_c = 50\text{m/min}$, $f = 0.18\text{mm/rev}$, $H = 60\text{mm}$ per hole (5 holes per unit)
 Tool Life : **400 units (120m)**

● Automotive Component (equivalent to S43C)

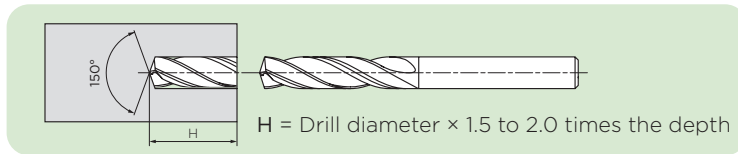
Tool : $\phi 6.0 \times 170\text{mm}$ (PHT series), $\phi 6.0 \times 230\text{mm}$ (XHGS series)
 Machine : Horizontal Single-Spindle NC Machine
 Coolant : MQL (Air Pressure 0.5MPa, Volume approx. 40cc/h)
 Cutting Conditions: $v_c = 80\text{m/min}$, $f = 0.18\text{mm/rev}$, $H = 110\text{mm}$ per hole (4 holes per unit)
 Tool Life : **150 units (113m)**

● Machine Component (equivalent to S45C)

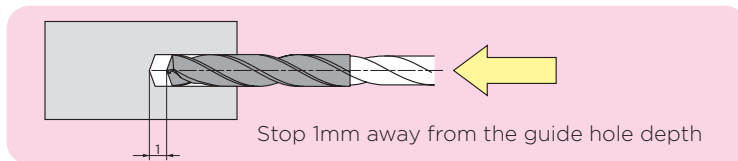
Tool : $\phi 6.0 \times 90\text{mm}$ (PHT series), $\phi 6.0 \times 145\text{mm}$ (XHGS series)
 Machine : Horizontal Single-Spindle NC Machine
 Coolant : MQL (Air Pressure 0.5MPa, Volume approx. 60cc/h)
 Cutting Conditions: $v_c = 80\text{m/min}$, $f = 0.20\text{mm/rev}$, $H = 62\text{mm}$ per hole (3 holes per unit)
 Tool Life : **550 units (104m)**

Recommended Drilling Method**(1) Make a guide hole using the PHT series**

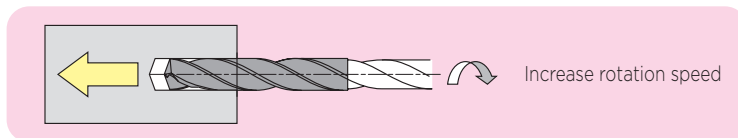
- Select the same nominal diameter for the PHT series dedicated guide hole drill as the XHGS series deep hole drill. (The guide drill diameter is designed to be 0.02mm to 0.05mm larger than the long drill diameter.)

**(2) Feed the XHGS series deep hole drill through the guide hole at low rotation speed**

- Spindle Speed: 500min⁻¹
- Feed Rate: 1,000 to 2,000mm/min



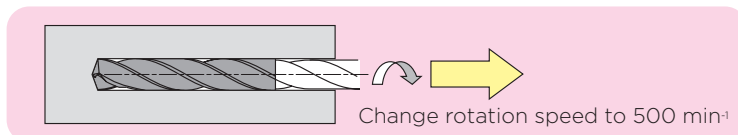
* If the drill is inserted into the guide hole at the set cutting speed, peripheral run-out may cause damage to the drill's peripheral edges.

(3) Increase rotation speed until the set cutting speed is reached, then start normal drilling operation

* On some NC machines, the feed command may be activated before the set spindle speed is reached, so it is recommended to enter a dwell sequence before the feed command.

(4) After drilling, rotation speed is reduced and the drill is retracted from the work material

- Spindle Speed: 500min⁻¹ Feed Rate: 1,000 to 2,000mm/min



* Retracting the drill from the work material at a high rotation speed is dangerous as doing so may result in breakage due to runout.

(5) Other notes

- Spot facing should be performed first if the entry surface is non-flat (e.g., slanted or cylindrical).



Perform spot facing using an endmill or Flat MULTIDRILL MDF series (see page J26).



Concave ended endmills cannot be used.

- If the exit side is a non-flat surface, reduce the feed rate to $f=0.05\text{mm/rev}$ immediately before the breakthrough point to prevent the drill from fracturing or burrs from forming.

Coolant**(1) Internal coolant supply**

- Use coolant equivalent to JIS A1-1 (emulsion).
- Pump Pressure Steel: 1.5 to 2.0MPa (higher pressure results in a stronger cooling effect, which affects chips and wear)
Cast iron and aluminum alloy: 4.0 to 6.0MPa (prioritize cooling performance)

(2) Internal MQL

- Air pressure : 0.5MPa or greater
- Evacuation volume: It is recommended to set the maximum evacuation volume for your equipment.
*Consult the manufacturer if you intend to machine aluminum alloy.

(3) Internal dual-fluid mist

- Air pressure : 0.5MPa or greater
- Evacuation volume: It is recommended to use the optimal setting for your equipment.

XHGS series/PHT series (Internal Coolant Supply)



*For tolerances, refer to Chapter N - References.

Fig 1 (PHT series)

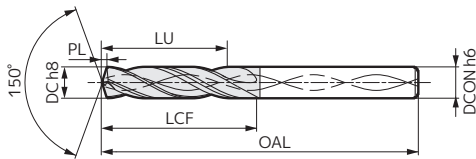
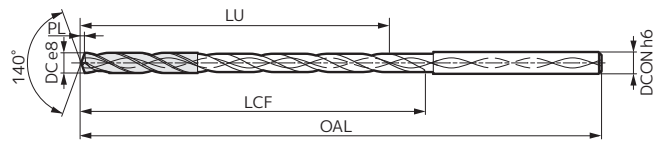


Fig 2 (XHGS series)



Diameter ø2.1 to 2.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.1	3	●	MDW 0210PHT	12.2	15.3	68.3	0.3	3.0	1
	10	●	0210XHGS10	35.3	38.4	88.4	0.4	3.0	2
	15	●	0210XHGS15	45.3	48.4	98.4	0.4	3.0	2
	20	●	0210XHGS20	58.3	61.4	111.4	0.4	3.0	2
	25	●	0210XHGS25	70.3	73.4	123.4	0.4	3.0	2
	30	●	0210XHGS30	83.3	86.4	136.4	0.4	3.0	2
2.2	3	●	MDW 0220PHT	12.0	15.3	68.3	0.3	3.0	1
	10	●	0220XHGS10	35.1	38.4	88.4	0.4	3.0	2
	15	●	0220XHGS15	45.1	48.4	98.4	0.4	3.0	2
	20	●	0220XHGS20	58.1	61.4	111.4	0.4	3.0	2
	25	●	0220XHGS25	70.1	73.4	123.4	0.4	3.0	2
	30	●	0220XHGS30	83.1	86.4	136.4	0.4	3.0	2
2.3	3	●	MDW 0230PHT	11.9	15.3	68.3	0.3	3.0	1
	10	●	0230XHGS10	35.0	38.4	88.4	0.4	3.0	2
	15	●	0230XHGS15	45.0	48.4	98.4	0.4	3.0	2
	20	●	0230XHGS20	58.0	61.4	111.4	0.4	3.0	2
	25	●	0230XHGS25	70.0	73.4	123.4	0.4	3.0	2
	30	●	0230XHGS30	83.0	86.4	136.4	0.4	3.0	2
2.4	3	●	MDW 0240PHT	11.7	15.3	68.3	0.3	3.0	1
	10	●	0240XHGS10	34.8	38.4	88.4	0.4	3.0	2
	15	●	0240XHGS15	44.8	48.4	98.4	0.4	3.0	2
	20	●	0240XHGS20	57.8	61.4	111.4	0.4	3.0	2
	25	●	0240XHGS25	69.8	73.4	123.4	0.4	3.0	2
	30	●	0240XHGS30	82.8	86.4	136.4	0.4	3.0	2
2.5	3	●	MDW 0250PHT	11.6	15.3	68.3	0.3	3.0	1
	10	●	0250XHGS10	34.8	38.5	88.5	0.5	3.0	2
	12	●	0250XHGS12	37.8	41.5	91.5	0.5	3.0	2
	15	●	0250XHGS15	44.8	48.5	98.5	0.5	3.0	2
	20	●	0250XHGS20	57.8	61.5	111.5	0.5	3.0	2
	25	●	0250XHGS25	69.8	73.5	123.5	0.5	3.0	2
2.6	3	●	MDW 0260PHT	13.9	17.8	68.3	0.3	3.0	1
	10	●	0260XHGS10	41.6	45.5	93.5	0.5	3.0	2
	12	●	0260XHGS12	47.6	51.5	99.5	0.5	3.0	2
	15	●	0260XHGS15	56.6	60.5	108.5	0.5	3.0	2
	20	●	0260XHGS20	71.6	75.5	123.5	0.5	3.0	2
	25	●	0260XHGS25	86.6	90.5	138.5	0.5	3.0	2
2.7	3	●	MDW 0270PHT	13.9	17.9	68.4	0.4	3.0	1
	10	●	0270XHGS10	41.5	45.5	93.5	0.5	3.0	2
	12	●	0270XHGS12	47.5	51.5	99.5	0.5	3.0	2
	15	●	0270XHGS15	56.5	60.5	108.5	0.5	3.0	2
	20	●	0270XHGS20	71.5	75.5	123.5	0.5	3.0	2
	25	●	0270XHGS25	86.5	90.5	138.5	0.5	3.0	2
2.8	3	●	MDW 0280PHT	13.7	17.9	68.4	0.4	3.0	1
	10	●	0280XHGS10	41.3	45.5	93.5	0.5	3.0	2
	12	●	0280XHGS12	47.3	51.5	99.5	0.5	3.0	2
	15	●	0280XHGS15	56.3	60.5	108.5	0.5	3.0	2
	20	●	0280XHGS20	71.3	75.5	123.5	0.5	3.0	2
	25	●	0280XHGS25	86.3	90.5	138.5	0.5	3.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø2.9 to 3.6mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.9	3	●	MDW 0290PHT	13.6	17.9	68.4	0.4	3.0	1
	10	●	0290XHGS10	41.2	45.5	93.5	0.5	3.0	2
	12	●	0290XHGS12	47.2	51.5	99.5	0.5	3.0	2
	15	●	0290XHGS15	56.2	60.5	108.5	0.5	3.0	2
	20	●	0290XHGS20	71.2	75.5	123.5	0.5	3.0	2
	25	●	0290XHGS25	86.2	90.5	138.5	0.5	3.0	2
3.0	3	●	MDW 0300PHT	13.4	17.9	68.4	0.4	3.0	1
	10	●	0300XHGS10	41.0	45.5	93.5	0.5	3.0	2
	12	●	0300XHGS12	47.0	51.5	99.5	0.5	3.0	2
	15	●	0300XHGS15	56.0	60.5	108.5	0.5	3.0	2
	20	●	0300XHGS20	71.0	75.5	123.5	0.5	3.0	2
	25	●	0300XHGS25	86.0	90.5	138.5	0.5	3.0	2
3.1	3	●	MDW 0310PHT	15.8	20.4	72.4	0.4	4.0	1
	10	●	0310XHGS10	49.0	53.6	103.6	0.6	4.0	2
	12	●	0310XHGS12	54.0	58.6	108.6	0.6	4.0	2
	15	●	0310XHGS15	64.0	68.6	118.6	0.6	4.0	2
	20	●	0310XHGS20	82.0	86.6	136.6	0.6	4.0	2
	25	●	0310XHGS25	99.0	103.6	153.6	0.6	4.0	2
3.2	3	●	MDW 0320PHT	15.6	20.4	72.4	0.4	4.0	1
	10	●	0320XHGS10	48.8	53.6	103.6	0.6	4.0	2
	12	●	0320XHGS12	53.8	58.6	108.6	0.6	4.0	2
	15	●	0320XHGS15	63.8	68.6	118.6	0.6	4.0	2
	20	●	0320XHGS20	81.8	86.6	136.6	0.6	4.0	2
	25	●	0320XHGS25	98.8	103.6	153.6	0.6	4.0	2
3.3	3	●	MDW 0330PHT	15.5	20.4	72.4	0.4	4.0	1
	10	●	0330XHGS10	48.7	53.6	103.6	0.6	4.0	2
	12	●	0330XHGS12	53.7	58.6	108.6	0.6	4.0	2
	15	●	0330XHGS15	63.7	68.6	118.6	0.6	4.0	2
	20	●	0330XHGS20	81.7	86.6	136.6	0.6	4.0	2
	25	●	0330XHGS25	98.7	103.6	153.6	0.6	4.0	2
3.4	3	●	MDW 0340PHT	15.4	20.5	72.5	0.5	4.0	1
	10	●	0340XHGS10	48.5	53.6	103.6	0.6	4.0	2
	12	●	0340XHGS12	53.5	58.6	108.6	0.6	4.0	2
	15	●	0340XHGS15	63.5	68.6	118.6	0.6	4.0	2
	20	●	0340XHGS20	81.5	86.6	136.6	0.6	4.0	2
	25	●	0340XHGS25	98.5	103.6	153.6	0.6	4.0	2
3.5	3	●	MDW 0350PHT	15.3	20.5	72.5	0.5	4.0	1
	10	●	0350XHGS10	48.4	53.6	103.6	0.6	4.0	2
	12	●	0350XHGS12	53.4	58.6	108.6	0.6	4.0	2
	15	●	0350XHGS15	63.4	68.6	118.6	0.6	4.0	2
	20	●	0350XHGS20	81.4	86.6	136.6	0.6	4.0	2
	25	●	0350XHGS25	98.4	103.6	153.6	0.6	4.0	2
3.6	3	●	MDW 0360PHT	17.6	23.0	72.5	0.5	4.0	1
	10	●	0360XHGS10	55.3	60.7	108.7	0.7	4.0	2
	12	●	0360XHGS12	63.3	68.7	116.7	0.7	4.0	2
	15	●	0360XHGS15	75.3	80.7	128.7	0.7	4.0	2
	20	●	0360XHGS20	95.3	100.7	148.7	0.7	4.0	2
	25	●	0360XHGS25	115.3	120.7	168.7	0.7	4.0	2
3.6	30	●	0360XHGS30	135.3	140.7	188.7	0.7	4.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)



10D

12D

15D

20D

25D

30D

Pilot
3D

*For tolerances, refer to Chapter N - References.

Fig 1 (PHT series)

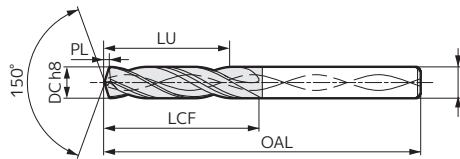
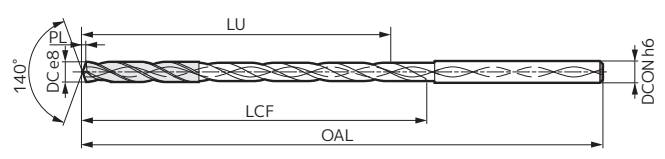


Fig 2 (XHGS series)

Diameter $\varnothing 3.7$ to 4.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.7	3	●	MDW 0370PHT	17.5	23.0	72.5	0.5	4.0	1
	10	●	0370XHGS10	55.2	60.7	108.7	0.7	4.0	2
	12	●	0370XHGS12	63.2	68.7	116.7	0.7	4.0	2
	15	●	0370XHGS15	75.2	80.7	128.7	0.7	4.0	2
	20	●	0370XHGS20	95.2	100.7	148.7	0.7	4.0	2
	25	●	0370XHGS25	115.2	120.7	168.7	0.7	4.0	2
3.8	3	●	MDW 0380PHT	17.3	23.0	72.5	0.5	4.0	1
	10	●	0380XHGS10	55.0	60.7	108.7	0.7	4.0	2
	12	●	0380XHGS12	63.0	68.7	116.7	0.7	4.0	2
	15	●	0380XHGS15	75.0	80.7	128.7	0.7	4.0	2
	20	●	0380XHGS20	95.0	100.7	148.7	0.7	4.0	2
	25	●	0380XHGS25	115.0	120.7	168.7	0.7	4.0	2
3.9	3	●	MDW 0390PHT	17.2	23.0	72.5	0.5	4.0	1
	10	●	0390XHGS10	54.9	60.7	108.7	0.7	4.0	2
	12	●	0390XHGS12	62.9	68.7	116.7	0.7	4.0	2
	15	●	0390XHGS15	74.9	80.7	128.7	0.7	4.0	2
	20	●	0390XHGS20	94.9	100.7	148.7	0.7	4.0	2
	25	●	0390XHGS25	114.9	120.7	168.7	0.7	4.0	2
4.0	3	●	MDW 0400PHT	17.0	23.0	72.5	0.5	4.0	1
	10	●	0400XHGS10	54.7	60.7	108.7	0.7	4.0	2
	12	●	0400XHGS12	62.7	68.7	116.7	0.7	4.0	2
	15	●	0400XHGS15	74.7	80.7	128.7	0.7	4.0	2
	20	●	0400XHGS20	94.7	100.7	148.7	0.7	4.0	2
	25	●	0400XHGS25	114.7	120.7	168.7	0.7	4.0	2
4.1	3	●	MDW 0410PHT	19.4	25.5	80.5	0.5	5.0	1
	10	●	0410XHGS10	62.6	68.7	120.7	0.7	5.0	2
	12	●	0410XHGS12	69.6	75.7	127.7	0.7	5.0	2
	15	●	0410XHGS15	82.6	88.7	140.7	0.7	5.0	2
	20	●	0410XHGS20	105.6	111.7	163.7	0.7	5.0	2
	25	●	0410XHGS25	127.6	133.7	185.7	0.7	5.0	2
4.2	3	●	MDW 0420PHT	19.3	25.6	80.6	0.6	5.0	1
	10	●	0420XHGS10	62.5	68.8	120.8	0.8	5.0	2
	12	●	0420XHGS12	69.5	75.8	127.8	0.8	5.0	2
	15	●	0420XHGS15	82.5	88.8	140.8	0.8	5.0	2
	20	●	0420XHGS20	105.5	111.8	163.8	0.8	5.0	2
	25	●	0420XHGS25	127.5	133.8	185.8	0.8	5.0	2
4.3	3	●	MDW 0430PHT	19.2	25.6	80.6	0.6	5.0	1
	10	●	0430XHGS10	62.4	68.8	120.8	0.8	5.0	2
	12	●	0430XHGS12	69.4	75.8	127.8	0.8	5.0	2
	15	●	0430XHGS15	82.4	88.8	140.8	0.8	5.0	2
	20	●	0430XHGS20	105.4	111.8	163.8	0.8	5.0	2
	25	●	0430XHGS25	127.4	133.8	185.8	0.8	5.0	2
4.4	3	●	MDW 0440PHT	19.0	25.6	80.6	0.6	5.0	1
	10	●	0440XHGS10	62.2	68.8	120.8	0.8	5.0	2
	12	●	0440XHGS12	69.2	75.8	127.8	0.8	5.0	2
	15	●	0440XHGS15	82.2	88.8	140.8	0.8	5.0	2
	20	●	0440XHGS20	105.2	111.8	163.8	0.8	5.0	2
	25	●	0440XHGS25	127.2	133.8	185.8	0.8	5.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)Diameter $\varnothing 4.5$ to 5.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.5	3	●	MDW 0450PHT	18.9	25.6	80.6	0.6	5.0	1
	10	●	0450XHGS10	62.1	68.8	120.8	0.8	5.0	2
	12	●	0450XHGS12	69.1	75.8	127.8	0.8	5.0	2
	15	●	0450XHGS15	82.1	88.8	140.8	0.8	5.0	2
	20	●	0450XHGS20	105.1	111.8	163.8	0.8	5.0	2
	25	●	0450XHGS25	127.1	133.8	185.8	0.8	5.0	2
4.6	3	●	MDW 0460PHT	21.2	28.1	80.6	0.6	5.0	1
	10	●	0460XHGS10	68.9	75.8	125.8	0.8	5.0	2
	12	●	0460XHGS12	78.9	85.8	135.8	0.8	5.0	2
	15	●	0460XHGS15	93.9	100.8	150.8	0.8	5.0	2
	20	●	0460XHGS20	118.9	125.8	175.8	0.8	5.0	2
	25	●	0460XHGS25	143.9	150.8	200.8	0.8	5.0	2
4.7	3	●	MDW 0470PHT	21.1	28.1	80.6	0.6	5.0	1
	10	●	0470XHGS10	68.9	75.9	125.9	0.9	5.0	2
	12	●	0470XHGS12	78.9	85.9	135.9	0.9	5.0	2
	15	●	0470XHGS15	93.9	100.9	150.9	0.9	5.0	2
	20	●	0470XHGS20	118.9	125.9	175.9	0.9	5.0	2
	25	●	0470XHGS25	143.9	150.9	200.9	0.9	5.0	2
4.8	3	●	MDW 0480PHT	20.9	28.1	80.6	0.6	5.0	1
	10	●	0480XHGS10	68.7	75.9	125.9	0.9	5.0	2
	12	●	0480XHGS12	78.7	85.9	135.9	0.9	5.0	2
	15	●	0480XHGS15	93.7	100.9	150.9	0.9	5.0	2
	20	●	0480XHGS20	118.7	125.9	175.9	0.9	5.0	2
	25	●	0480XHGS25	143.7	150.9	200.9	0.9	5.0	2
4.9	3	●	MDW 0490PHT	20.9	28.2	80.7	0.7	5.0	1
	10	●	0490XHGS10	68.6	75.9	125.9	0.9	5.0	2
	12	●	0490XHGS12	78.6	85.9	135.9	0.9	5.0	2
	15	●	0490XHGS15	93.6	100.9	150.9	0.9	5.0	2
	20	●	0490XHGS20	118.6	125.9	175.9	0.9	5.0	2
	25	●	0490XHGS25	143.6	150.9	200.9	0.9	5.0	2
5.0	3	●	MDW 0500PHT	20.7	28.2	80.7	0.7	5.0	1
	10	●	0500XHGS10	68.4	75.9	125.9	0.9	5.0	2
	12	●	0500XHGS12	78.4	85.9	135.9	0.9	5.0	2
	15	●	0500XHGS15	93.4	100.9	150.9	0.9	5.0	2
	20	●	0500XHGS20	118.4	125.9	175.9	0.9	5.0	2
	25	●	0500XHGS25	143.4	150.9	200.9	0.9	5.0	2
5.1	3	●	MDW 0510PHT	20.6	28.2	82.7	0.7	6.0	1
	10	●	0510XHGS10	76.3	83.9	137.9	0.9	6.0	2
	12	●	0510XHGS12	85.3	92.9	146.9	0.9	6.0	2
	15	●	0510XHGS15	101.3	108.9	162.9	0.9	6.0	2
	20	●	0510XHGS20	131.3	138.9	192.9	0.9	6.0	2
	25	●	0510XHGS25	156.3	163.9	217.9	0.9	6.0	2
5.2	3	●	MDW 0520PHT	20.4	28.2	82.7	0.7	6.0	1
	10	●	0520XHGS10	76.1	83.9	137.9	0.9	6.0	2
	12	●	0520XHGS12	85.1	92.9	146.9	0.9	6.0	2
	15	●	0520XHGS15	101.1	108.9	162.9	0.9	6.0	2
	20	●	0520XHGS20	131.1	138.9	192.9	0.9	6.0	2
	25	●	0520XHGS25	156.1	163.9	217.9	0.9	6.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel Alloy Steel up to 0.28%
Carbon Steel Alloy Steel from 0.29%
Tempered Steel
Hardened Steel up to 45HRC
Stainless Steel
Cast Iron
Ductile Cast Iron



10D

12D

15D

20D

25D

30D

Pilot 3D

*For tolerances, refer to Chapter N - References.

Fig 1 (PHT series)

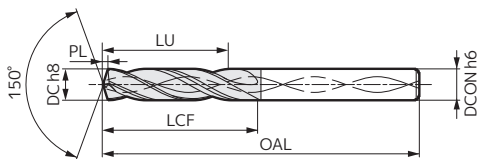
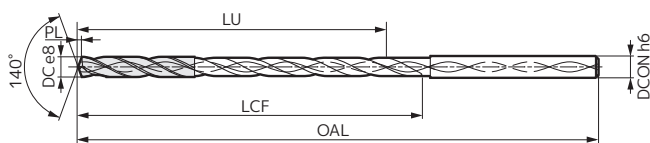


Fig 2 (XHGS series)



Diameter ø5.3 to 5.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.3	3	●	MDW 0530PHT	20.3	28.2	82.7	0.7	6.0	1
	10	●	0530XHGS10	76.1	84.0	138.0	1.0	6.0	2
	12	●	0530XHGS12	85.1	93.0	147.0	1.0	6.0	2
	15	●	0530XHGS15	101.1	109.0	163.0	1.0	6.0	2
	20	●	0530XHGS20	131.1	139.0	193.0	1.0	6.0	2
	25	●	0530XHGS25	156.1	164.0	218.0	1.0	6.0	2
5.4	3	●	MDW 0540PHT	20.1	28.2	82.7	0.7	6.0	1
	10	●	0540XHGS10	75.9	84.0	138.0	1.0	6.0	2
	12	●	0540XHGS12	84.9	93.0	147.0	1.0	6.0	2
	15	●	0540XHGS15	100.9	109.0	163.0	1.0	6.0	2
	20	●	0540XHGS20	130.9	139.0	193.0	1.0	6.0	2
	25	●	0540XHGS25	155.9	164.0	218.0	1.0	6.0	2
5.5	3	●	MDW 0550PHT	20.0	28.2	82.7	0.7	6.0	1
	10	●	0550XHGS10	75.8	84.0	138.0	1.0	6.0	2
	12	●	0550XHGS12	84.8	93.0	147.0	1.0	6.0	2
	15	●	0550XHGS15	100.8	109.0	163.0	1.0	6.0	2
	20	●	0550XHGS20	130.8	139.0	193.0	1.0	6.0	2
	25	●	0550XHGS25	155.8	164.0	218.0	1.0	6.0	2
5.6	3	●	MDW 0560PHT	22.4	30.8	82.8	0.8	6.0	1
	10	●	0560XHGS10	82.6	91.0	143.0	1.0	6.0	2
	12	●	0560XHGS12	94.6	103.0	155.0	1.0	6.0	2
	15	●	0560XHGS15	112.6	121.0	173.0	1.0	6.0	2
	20	●	0560XHGS20	142.6	151.0	203.0	1.0	6.0	2
	25	●	0560XHGS25	172.6	181.0	233.0	1.0	6.0	2
5.7	3	●	MDW 0570PHT	22.3	30.8	82.8	0.8	6.0	1
	10	●	0570XHGS10	82.5	91.0	143.0	1.0	6.0	2
	12	●	0570XHGS12	94.5	103.0	155.0	1.0	6.0	2
	15	●	0570XHGS15	112.5	121.0	173.0	1.0	6.0	2
	20	●	0570XHGS20	142.5	151.0	203.0	1.0	6.0	2
	25	●	0570XHGS25	172.5	181.0	233.0	1.0	6.0	2
5.8	3	●	MDW 0580PHT	22.1	30.8	82.8	0.8	6.0	1
	10	●	0580XHGS10	82.4	91.1	143.1	1.1	6.0	2
	12	●	0580XHGS12	94.4	103.1	155.1	1.1	6.0	2
	15	●	0580XHGS15	112.4	121.1	173.1	1.1	6.0	2
	20	●	0580XHGS20	142.4	151.1	203.1	1.1	6.0	2
	25	●	0580XHGS25	172.4	181.1	233.1	1.1	6.0	2
5.9	3	●	MDW 0590PHT	22.0	30.8	82.8	0.8	6.0	1
	10	●	0590XHGS10	82.3	91.1	143.1	1.1	6.0	2
	12	●	0590XHGS12	94.3	103.1	155.1	1.1	6.0	2
	15	●	0590XHGS15	112.3	121.1	173.1	1.1	6.0	2
	20	●	0590XHGS20	142.3	151.1	203.1	1.1	6.0	2
	25	●	0590XHGS25	172.3	181.1	233.1	1.1	6.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø6.0 to 6.6mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.0	3	●	MDW 0600PHT	21.8	30.8	82.8	0.8	6.0	1
	10	●	0600XHGS10	82.1	91.1	143.1	1.1	6.0	2
	12	●	0600XHGS12	94.1	103.1	155.1	1.1	6.0	2
	15	●	0600XHGS15	112.1	121.1	173.1	1.1	6.0	2
	20	●	0600XHGS20	142.1	151.1	203.1	1.1	6.0	2
	25	●	0600XHGS25	172.1	181.1	233.1	1.1	6.0	2
6.1	3	●	MDW 0610PHT	24.2	33.3	88.8	0.8	7.0	1
	10	●	0610XHGS10	90.0	99.1	154.1	1.1	7.0	2
	12	●	0610XHGS12	101.0	110.1	165.1	1.1	7.0	2
	15	●	0610XHGS15	120.0	129.1	184.1	1.1	7.0	2
	20	●	0610XHGS20	153.0	162.1	217.1	1.1	7.0	2
	25	●	0610XHGS25	185.0	194.1	249.1	1.1	7.0	2
6.2	3	●	MDW 0620PHT	24.0	33.3	88.8	0.8	7.0	1
	10	●	0620XHGS10	89.8	99.1	154.1	1.1	7.0	2
	12	●	0620XHGS12	100.8	110.1	165.1	1.1	7.0	2
	15	●	0620XHGS15	119.8	129.1	184.1	1.1	7.0	2
	20	●	0620XHGS20	152.8	162.1	217.1	1.1	7.0	2
	25	●	0620XHGS25	184.8	194.1	249.1	1.1	7.0	2
6.3	3	●	MDW 0630PHT	23.9	33.3	88.8	0.8	7.0	1
	10	●	0630XHGS10	89.7	99.1	154.1	1.1	7.0	2
	12	●	0630XHGS12	100.7	110.1	165.1	1.1	7.0	2
	15	●	0630XHGS15	119.7	129.1	184.1	1.1	7.0	2
	20	●	0630XHGS20	152.7	162.1	217.1	1.1	7.0	2
	25	●	0630XHGS25	184.7	194.1	249.1	1.1	7.0	2
6.4	3	●	MDW 0640PHT	23.8	33.4	88.9	0.9	7.0	1
	10	●	0640XHGS10	89.6	99.2	154.2	1.2	7.0	2
	12	●	0640XHGS12	100.6	110.2	165.2	1.2	7.0	2
	15	●	0640XHGS15	119.6	129.2	184.2	1.2	7.0	2
	20	●	0640XHGS20	152.6	162.2	217.2	1.2	7.0	2
	25	●	0640XHGS25	184.6	194.2	249.2	1.2	7.0	2
6.5	3	●	MDW 0650PHT	23.7	33.4	88.9	0.9	7.0	1
	10	●	0650XHGS10	89.5	99.2	154.2	1.2	7.0	2
	12	●	0650XHGS12	100.5	110.2	165.2	1.2	7.0	2
	15	●	0650XHGS15	119.5	129.2	184.2	1.2	7.0	2
	20	●	0650XHGS20	152.5	162.2	217.2	1.2	7.0	2
	25	●	0650XHGS25	184.5	194.2	249.2	1.2	7.0	2
6.6	3	●	MDW 0660PHT	26.0	35.9	88.9	0.9	7.0	1
	10	●	0660XHGS10	96.3	106.2	159.2	1.2	7.0	2
	12	●	0660XHGS12	110.3	120.2	173.2	1.2	7.0	2
	15	●	0660XHGS15	131.3	141.2	194.2	1.2	7.0	2
	20	●	0660XHGS20	166.3	176.2	229.2	1.2	7.0	2
	25	●	0660XHGS25	201.3	211.2	264.2	1.2	7.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)



10D

12D

15D

20D

25D

30D

Pilot
3D

*For tolerances, refer to Chapter N - References.

Fig 1 (PHT series)

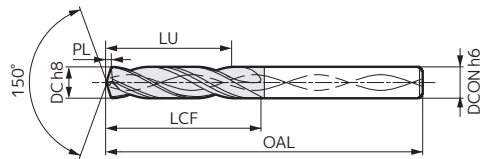
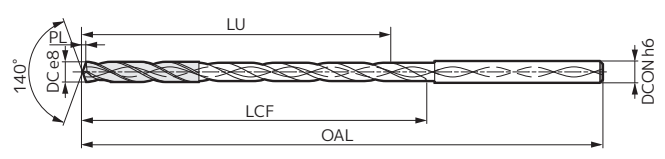


Fig 2 (XHGS series)

Diameter $\phi 6.7$ to 7.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.7	3	●	MDW 0670PHT	25.9	35.9	88.9	0.9	7.0	1
	10	●	0670XHGS10	96.2	106.2	159.2	1.2	7.0	2
	12	●	0670XHGS12	110.2	120.2	173.2	1.2	7.0	2
	15	●	0670XHGS15	131.2	141.2	194.2	1.2	7.0	2
	20	●	0670XHGS20	166.2	176.2	229.2	1.2	7.0	2
	25	●	0670XHGS25	201.2	211.2	264.2	1.2	7.0	2
6.8	3	●	MDW 0680PHT	25.7	35.9	88.9	0.9	7.0	1
	10	●	0680XHGS10	96.0	106.2	159.2	1.2	7.0	2
	12	●	0680XHGS12	110.0	120.2	173.2	1.2	7.0	2
	15	●	0680XHGS15	131.0	141.2	194.2	1.2	7.0	2
	20	●	0680XHGS20	166.0	176.2	229.2	1.2	7.0	2
	25	●	0680XHGS25	201.0	211.2	264.2	1.2	7.0	2
6.9	3	●	MDW 0690PHT	25.6	35.9	88.9	0.9	7.0	1
	10	●	0690XHGS10	96.0	106.3	159.3	1.3	7.0	2
	12	●	0690XHGS12	110.0	120.3	173.3	1.3	7.0	2
	15	●	0690XHGS15	131.0	141.3	194.3	1.3	7.0	2
	20	●	0690XHGS20	166.0	176.3	229.3	1.3	7.0	2
	25	●	0690XHGS25	201.0	211.3	264.3	1.3	7.0	2
7.0	3	●	MDW 0700PHT	25.4	35.9	88.9	0.9	7.0	1
	10	●	0700XHGS10	95.8	106.3	159.3	1.3	7.0	2
	12	●	0700XHGS12	109.8	120.3	173.3	1.3	7.0	2
	15	●	0700XHGS15	130.8	141.3	194.3	1.3	7.0	2
	20	●	0700XHGS20	165.8	176.3	229.3	1.3	7.0	2
	25	●	0700XHGS25	200.8	211.3	264.3	1.3	7.0	2
7.1	3	●	MDW 0710PHT	27.9	38.5	95.0	1.0	8.0	1
	10	●	0710XHGS10	103.7	114.3	170.3	1.3	8.0	2
	12	●	0710XHGS12	116.7	127.3	183.3	1.3	8.0	2
	15	●	0710XHGS15	138.7	149.3	205.3	1.3	8.0	2
	20	●	0710XHGS20	176.7	187.3	243.3	1.3	8.0	2
	25	●	0710XHGS25	213.7	224.3	280.3	1.3	8.0	2
7.2	3	●	MDW 0720PHT	27.7	38.5	95.0	1.0	8.0	1
	10	●	0720XHGS10	103.5	114.3	170.3	1.3	8.0	2
	12	●	0720XHGS12	116.5	127.3	183.3	1.3	8.0	2
	15	●	0720XHGS15	138.5	149.3	205.3	1.3	8.0	2
	20	●	0720XHGS20	176.5	187.3	243.3	1.3	8.0	2
	25	●	0720XHGS25	213.5	224.3	280.3	1.3	8.0	2
7.3	3	●	MDW 0730PHT	27.6	38.5	95.0	1.0	8.0	1
	10	●	0730XHGS10	103.4	114.3	170.3	1.3	8.0	2
	12	●	0730XHGS12	116.4	127.3	183.3	1.3	8.0	2
	15	●	0730XHGS15	138.4	149.3	205.3	1.3	8.0	2
	20	●	0730XHGS20	176.4	187.3	243.3	1.3	8.0	2
	25	●	0730XHGS25	213.4	224.3	280.3	1.3	8.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter $\phi 7.4$ to 8.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.4	3	●	MDW 0740PHT	27.4	38.5	95.0	1.0	8.0	1
	10	●	0740XHGS10	103.2	114.3	170.3	1.3	8.0	2
	12	●	0740XHGS12	116.2	127.3	183.3	1.3	8.0	2
	15	●	0740XHGS15	138.2	149.3	205.3	1.3	8.0	2
	20	●	0740XHGS20	176.2	187.3	243.3	1.3	8.0	2
	25	●	0740XHGS25	213.2	224.3	280.3	1.3	8.0	2
7.5	3	●	MDW 0750PHT	27.3	38.5	95.0	1.0	8.0	1
	10	●	0750XHGS10	103.2	114.4	170.4	1.4	8.0	2
	12	●	0750XHGS12	116.2	127.4	183.4	1.4	8.0	2
	15	●	0750XHGS15	138.2	149.4	205.4	1.4	8.0	2
	20	●	0750XHGS20	176.2	187.4	243.4	1.4	8.0	2
	25	●	0750XHGS25	213.2	224.4	280.4	1.4	8.0	2
7.6	3	●	MDW 0760PHT	29.6	41.0	95.0	1.0	8.0	1
	10	●	0760XHGS10	110.0	121.4	175.4	1.4	8.0	2
	12	●	0760XHGS12	126.0	137.4	191.4	1.4	8.0	2
	15	●	0760XHGS15	150.0	161.4	215.4	1.4	8.0	2
	20	●	0760XHGS20	190.0	201.4	255.4	1.4	8.0	2
	25	●	0760XHGS25	230.0	241.4	295.4	1.4	8.0	2
7.7	3	●	MDW 0770PHT	29.5	41.0	95.0	1.0	8.0	1
	10	●	0770XHGS10	109.9	121.4	175.4	1.4	8.0	2
	12	●	0770XHGS12	125.9	137.4	191.4	1.4	8.0	2
	15	●	0770XHGS15	149.9	161.4	215.4	1.4	8.0	2
	20	●	0770XHGS20	189.9	201.4	255.4	1.4	8.0	2
	25	●	0770XHGS25	229.9	241.4	295.4	1.4	8.0	2
7.8	3	●	MDW 0780PHT	29.3	41.0	95.0	1.0	8.0	1
	10	●	0780XHGS10	109.7	121.4	175.4	1.4	8.0	2
	12	●	0780XHGS12	125.7	137.4	191.4	1.4	8.0	2
	15	●	0780XHGS15	149.7	161.4	215.4	1.4	8.0	2
	20	●	0780XHGS20	189.7	201.4	255.4	1.4	8.0	2
	25	●	0780XHGS25	229.7	241.4	295.4	1.4	8.0	2
7.9	3	●	MDW 0790PHT	29.3	41.1	95.1	1.1	8.0	1
	10	●	0790XHGS10	109.6	121.4	175.4	1.4	8.0	2
	12	●	0790XHGS12	125.6	137.4	191.4	1.4	8.0	2
	15	●	0790XHGS15	149.6	161.4	215.4	1.4	8.0	2
	20	●	0790XHGS20	189.6	201.4	255.4	1.4	8.0	2
	25	●	0790XHGS25	229.6	241.4	295.4	1.4	8.0	2
8.0	3	●	MDW 0800PHT	29.1	41.1	95.1	1.1	8.0	1
	10	●	0800XHGS10	109.5	121.5	175.5	1.5	8.0	2
	12	●	0800XHGS12	125.5	137.5	191.5	1.5	8.0	2
	15	●	0800XHGS15	149.5	161.5	215.5	1.5	8.0	2
	20	●	0800XHGS20	189.5	201.5	255.5	1.5	8.0	2
	25	●	0800XHGS25	229.5	241.5	295.5	1.5	8.0	2

Part Number Suffix - PHT: For Guide Hole

Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel Alloy Steel up to 0.28%
Carbon Steel Alloy Steel from 0.29%
Tempered Steel
Hardened Steel up to 45HRC
Stainless Steel
Cast Iron
Ductile Cast Iron



*For tolerances, refer to Chapter N - References.

Fig 1 (PHT series)

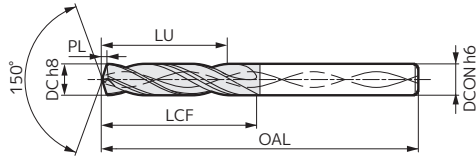
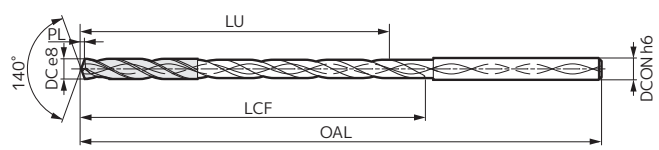


Fig 2 (XHGS series)



Diameter ø8.5 to 11.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.5	3	●	MDW 0850PHT	30.9	43.6	101.1	1.1	9.0	1
	10	●	0850XHGS10	116.8	129.5	186.5	1.5	9.0	2
	12	●	0850XHGS12	131.8	144.5	201.5	1.5	9.0	2
	15	●	0850XHGS15	156.8	169.5	226.5	1.5	9.0	2
	20	●	0850XHGS20	199.8	212.5	269.5	1.5	9.0	2
	25	●	0850XHGS25	241.8	254.5	311.5	1.5	9.0	2
9.0	3	●	MDW 0900PHT	32.7	46.2	101.2	1.2	9.0	1
	10	●	0900XHGS10	123.1	136.6	191.6	1.6	9.0	2
	12	●	0900XHGS12	141.1	154.6	209.6	1.6	9.0	2
	15	●	0900XHGS15	168.1	181.6	236.6	1.6	9.0	2
	20	●	0900XHGS20	213.1	226.6	281.6	1.6	9.0	2
	25	●	0900XHGS25	258.1	271.6	326.6	1.6	9.0	2
9.5	3	●	MDW 0950PHT	34.6	48.8	107.3	1.3	10.0	1
	10	●	0950XHGS10	130.5	144.7	202.7	1.7	10.0	2
	12	●	0950XHGS12	147.5	161.7	219.7	1.7	10.0	2
	15	●	0950XHGS15	175.5	189.7	247.7	1.7	10.0	2
	20	●	0950XHGS20	223.5	237.7	295.7	1.7	10.0	2
	25	●	0950XHGS25	270.5	284.7	342.7	1.7	10.0	2
10.0	3	●	MDW 1000PHT	36.3	51.3	107.3	1.3	10.0	1
	10	●	1000XHGS10	136.8	151.8	207.8	1.8	10.0	2
	12	●	1000XHGS12	156.8	171.8	227.8	1.8	10.0	2
	15	●	1000XHGS15	186.8	201.8	257.8	1.8	10.0	2
	20	●	1000XHGS20	236.8	251.8	307.8	1.8	10.0	2
	25	●	1000XHGS25	286.8	301.8	357.8	1.8	10.0	2
10.5	3	●	MDW 1050PHT	38.2	53.9	117.4	1.4	11.0	1
	10	●	1050XHGS10	144.2	159.9	222.9	1.9	11.0	2
	12	●	1050XHGS12	163.2	178.9	241.9	1.9	11.0	2
	15	●	1050XHGS15	194.2	209.9	272.9	1.9	11.0	2
	20	●	1050XHGS20	247.2	262.9	325.9	1.9	11.0	2
	25	●	1050XHGS25	299.2	314.9	377.9	1.9	11.0	2
11.0	3	●	MDW 1100PHT	40.0	56.5	117.5	1.5	11.0	1
	10	●	1100XHGS10	150.5	167.0	228.0	2.0	11.0	2
	12	●	1100XHGS12	172.5	189.0	250.0	2.0	11.0	2
	15	●	1100XHGS15	205.5	222.0	283.0	2.0	11.0	2
	20	●	1100XHGS20	260.5	277.0	338.0	2.0	11.0	2
	25	●	1100XHGS25	315.5	332.0	393.0	2.0	11.0	2
11.5	3	●	MDW 1150PHT	41.8	59.0	123.5	1.5	12.0	1
	10	●	1150XHGS10	157.9	175.1	239.1	2.1	12.0	2
	12	●	1150XHGS12	178.9	196.1	260.1	2.1	12.0	2
	15	●	1150XHGS15	212.9	230.1	294.1	2.1	12.0	2
	20	●	1150XHGS20	270.9	288.1	352.1	2.1	12.0	2
	25	●	1150XHGS25	327.9	345.1	409.1	2.1	12.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø12.0 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.0	3	●	MDW 1200PHT	43.6	61.6	123.6	1.6	12.0	1
	10	●	1200XHGS10	164.2	182.2	244.2	2.2	12.0	2
	12	●	1200XHGS12	188.2	206.2	268.2	2.2	12.0	2
	15	●	1200XHGS15	224.2	242.2	304.2	2.2	12.0	2
	20	●	1200XHGS20	284.2	302.2	364.2	2.2	12.0	2
	25	●	1200XHGS25	344.2	362.2	424.2	2.2	12.0	2
12.5	3	●	MDW 1250PHT	45.5	64.2	129.7	1.7	13.0	1
	10	●	1250XHGS10	171.6	190.3	255.3	2.3	13.0	2
	12	●	1250XHGS12	194.6	213.3	278.3	2.3	13.0	2
	15	●	1250XHGS15	231.6	250.3	315.3	2.3	13.0	2
	20	●	1250XHGS20	294.6	313.3	378.3	2.3	13.0	2
13.0	3	●	MDW 1300PHT	47.2	66.7	129.7	1.7	13.0	1
	10	●	1300XHGS10	177.9	197.4	260.4	2.4	13.0	2
	12	●	1300XHGS12	203.9	223.4	286.4	2.4	13.0	2
	15	●	1300XHGS15	242.9	262.4	325.4	2.4	13.0	2
	20	●	1300XHGS20	307.9	327.4	390.4	2.4	13.0	2
13.5	3	●	MDW 1350PHT	49.1	69.3	135.8	1.8	14.0	1
	10	●	1350XHGS10	185.3	205.5	271.5	2.5	14.0	2
	12	●	1350XHGS12	210.3	230.5	296.5	2.5	14.0	2
	15	●	1350XHGS15	250.3	270.5	336.5	2.5	14.0	2
	20	●	1350XHGS20	318.3	338.5	404.5	2.5	14.0	2
14.0	3	●	MDW 1400PHT	50.9	71.9	135.9	1.9	14.0	1
	10	●	1400XHGS10	191.5	212.5	276.5	2.5	14.0	2
	12	●	1400XHGS12	219.5	240.5	304.5	2.5	14.0	2
	15	●	1400XHGS15	261.5	282.5	346.5	2.5	14.0	2
	20	●	1400XHGS20	331.5	352.5	416.5	2.5	14.0	2
14.5	3	●	MDW 1450PHT	52.7	74.4	141.9	1.9	15.0	1
	10	●	1450XHGS10	198.9	220.6	287.6	2.6	15.0	2
	12	●	1450XHGS12	225.9	247.6	314.6	2.6	15.0	2
	15	●	1450XHGS15	268.9	290.6	357.6	2.6	15.0	2
15.0	3	●	MDW 1500PHT	54.5	77.0	142.0	2.0	15.0	1
	10	●	1500XHGS10	205.2	227.7	292.7	2.7	15.0	2
	12	●	1500XHGS12	235.2	257.7	322.7	2.7	15.0	2
	15	●	1500XHGS15	280.2	302.7	367.7	2.7	15.0	2
15.5	3	●	MDW 1550PHT	56.4	79.6	148.1	2.1	16.0	1
	10	●	1550XHGS10	212.6	235.8	303.8	2.8	16.0	2
	12	●	1550XHGS12	241.6	264.8	332.8	2.8	16.0	2
	15	●	1550XHGS15	287.6	310.8	378.8	2.8	16.0	2
16.0	3	●	MDW 1600PHT	58.1	82.1	148.1	2.1	16.0	1
	10	●	1600XHGS10	218.9	242.9	308.9	2.9	16.0	2
	12	●	1600XHGS12	248.9	272.9	340.9	2.9	16.0	2
	15	●	1600XHGS15	298.9	322.9	388.9	2.9	16.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)



*For tolerances, refer to Chapter N - References.

Drilling



Solid

Indexable
Head typeIndexable
Insert type

Reamers

Fig 1 (PHT series)

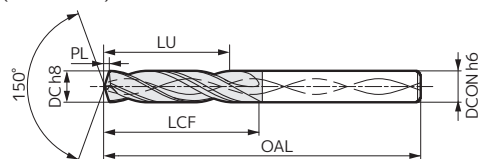
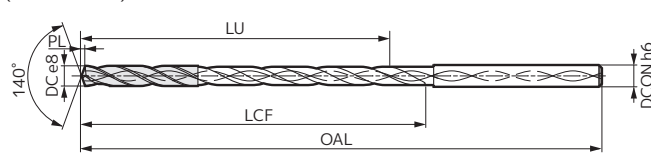


Fig 2 (XHGS series)



Made-to-order items: Inquire about production of drills in tool diameters and lengths that are not listed in the dimensions at left or not in stock.

Recommended Cutting Conditions (For 10D/12D/15D/20D/25D/30D)(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel (up to 200HB)	General Steel (up to 250HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 40HRC)	Grey Cast Iron Ductile Cast Iron
ø3.0	n	6,400	8,500	5,800	4,200	5,800
	vc	50 - 60 - 80	60 - 80 - 100	40 - 55 - 70	30 - 40 - 50	40 - 55 - 70
	f	0.12 - 0.15 - 0.20	0.12 - 0.15 - 0.20	0.10 - 0.13 - 0.16	0.06 - 0.08 - 0.12	0.15 - 0.18 - 0.23
ø5.0	n	3,800	5,100	3,800	2,900	3,800
	vc	50 - 60 - 80	60 - 80 - 100	50 - 60 - 70	30 - 45 - 55	50 - 60 - 70
	f	0.15 - 0.20 - 0.25	0.15 - 0.23 - 0.30	0.12 - 0.15 - 0.20	0.08 - 0.10 - 0.14	0.17 - 0.25 - 0.35
ø10.0	n	2,200	2,500	2,100	1,600	2,100
	vc	50 - 70 - 90	60 - 80 - 110	50 - 65 - 80	30 - 50 - 60	50 - 65 - 80
	f	0.20 - 0.25 - 0.30	0.20 - 0.25 - 0.32	0.15 - 0.20 - 0.25	0.10 - 0.15 - 0.20	0.25 - 0.28 - 0.35
ø16.0	n	1,600	1,800	1,300	1,100	1,300
	vc	60 - 80 - 100	60 - 90 - 120	50 - 65 - 80	40 - 55 - 70	50 - 65 - 80
	f	0.25 - 0.30 - 0.35	0.25 - 0.30 - 0.35	0.15 - 0.23 - 0.27	0.12 - 0.15 - 0.23	0.25 - 0.30 - 0.35

Note: Use lower speed when using MQL coolant, and higher speed when using internal coolant supply or dual-liquid mist.

Min. - **Optimum** - Max.

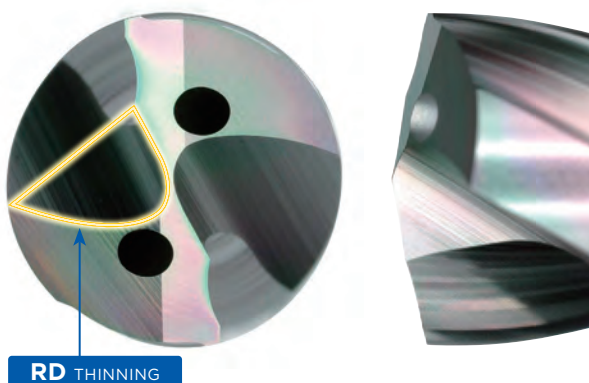


■ Features

- Venturing into new regions of aluminum alloy drilling
Covers a wide application range from high-precision to high-efficiency drilling
- New DLC Coat and AURORA Coat X adopted

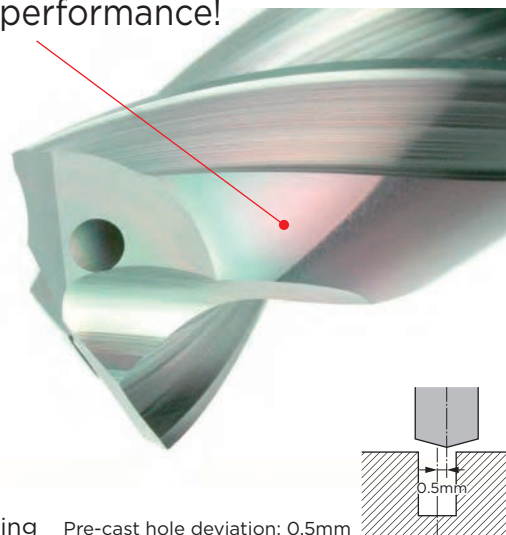
RD THINNING

Outstanding centring with special web thinning effect!



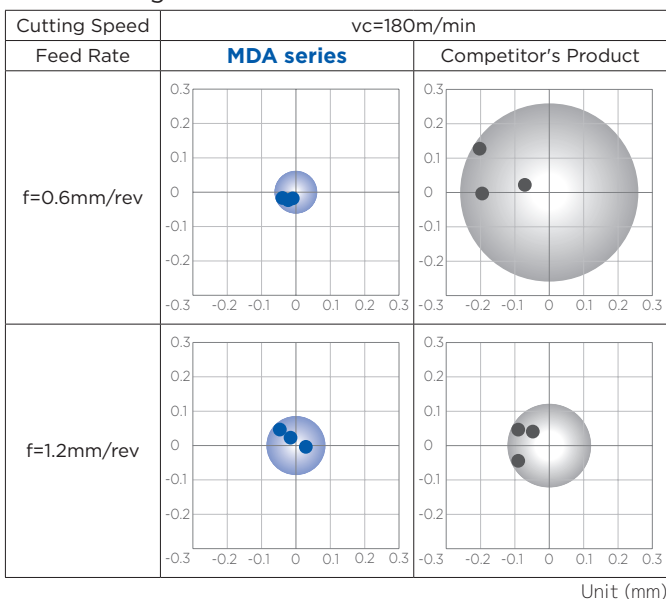
Wide Double Margin *Diameter: 3.1mm up

Hole precision is improved with wide double margin providing excellent guide performance!



■ Hole Position Accuracy

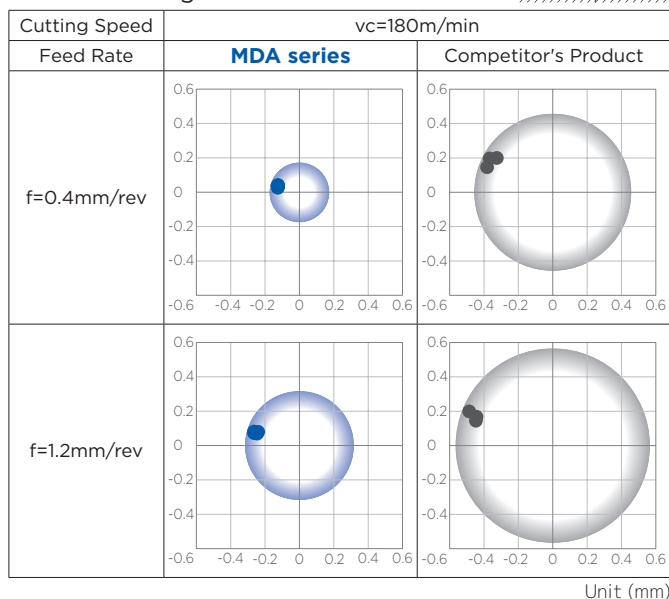
Direct drilling



Work Material: ADC12 Tool: MDA0600S06H05 (ø6mm × 5D) Wet

Hole position stable even under high-efficiency conditions

Pre-cast drilling Pre-cast hole deviation: 0.5mm



Work Material: ADC12 Tool: MDA0600S06H05 (ø6mm × 5D) Wet

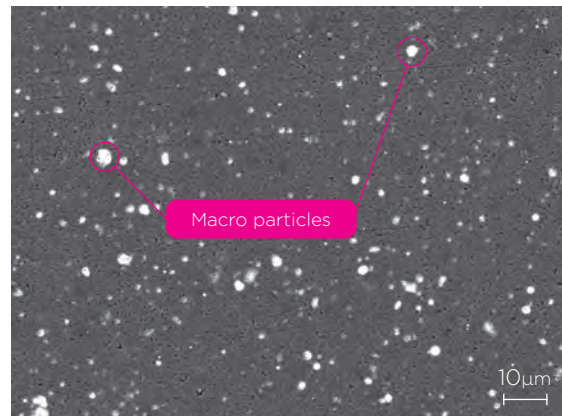
Significantly reduces the effects of pre-cast hole misalignment

AURORA Coat X DLC Coat

● Coating Surface Properties (SEM image)



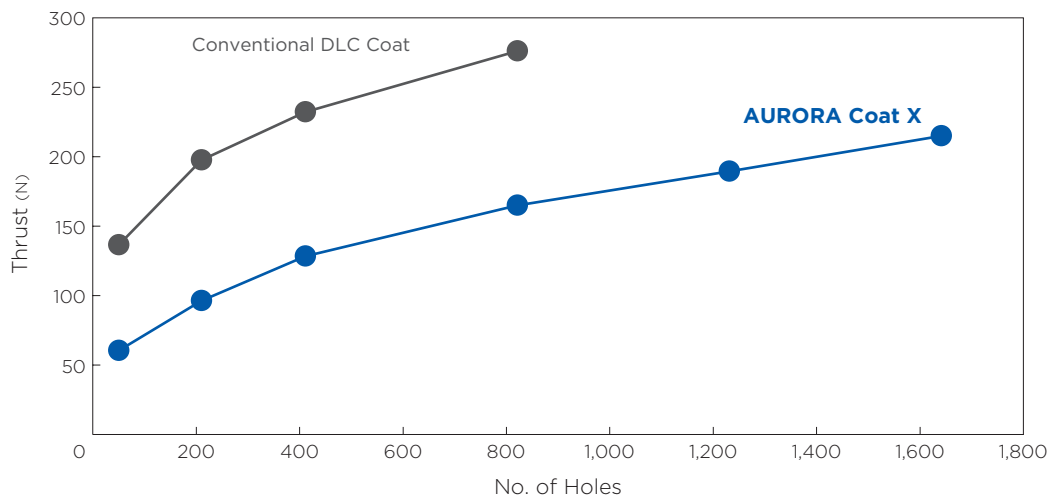
AURORA Coat X



Conventional DLC Coat

New technology significantly improves smoothness

● Cutting Force

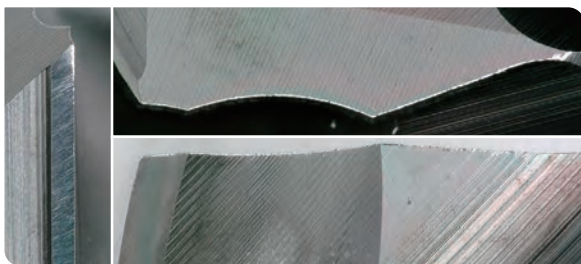


Work Material: ADC12 Machine: Vertical Machining Centre BT30
Tool: MDA0600S06H05 (ø6mm × 5D)
Cutting Conditions: $v_c = 180\text{m/min}$ $f = 0.2\text{mm/rev}$ Internal Coolant Supply (Water-soluble)

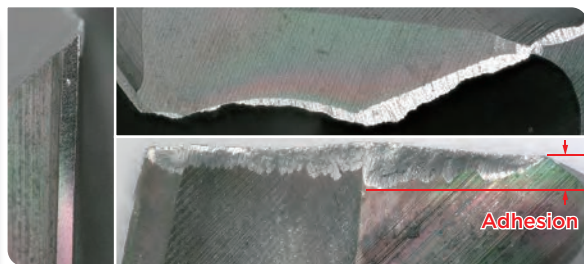
Improved coating surface smoothness keeps resistance low at the initial stage, then transitions to a gradual rise in resistance for a longer tool life

● Adhesion Resistance

AURORA Coat X



Conventional DLC Coat



Work Material: ADC12 Machine: Vertical Machining Centre BT30
Tool: MDA0600S06H05 (ø6mm × 5D)
Cutting Conditions: $v_c = 180\text{m/min}$ $f = 0.2\text{mm/rev}$ Internal Coolant Supply (Water-soluble)

Excellent smoothness significantly reduces adhesion


3D 5D 10D 15D 20D

*For tolerances, refer to Chapter N - References.

Fig 1 L/D = 3/5D single margin

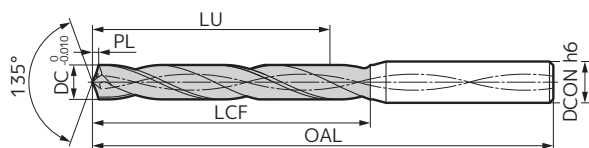
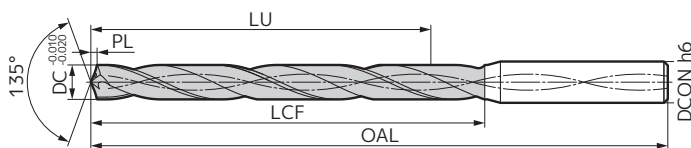


Fig 2 L/D = 10/15/20D single margin



Diameter ø1.0 to 2.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	3	●	MDA 0100S03H03	4.5	6.0	45.0	0.2	3.0	1
	5	●	0100S03H05	8.5	10.0	50.0	0.2	3.0	1
	10	●	0100S03H10	12.5	14.0	55.0	0.2	3.0	2
	15	●	0100S03H15	17.5	19.0	60.0	0.2	3.0	2
	20	●	0100S03H20	22.5	24.0	65.0	0.2	3.0	2
1.1	3	●	MDA 0110S03H03	6.4	8.0	45.0	0.2	3.0	1
	5	●	0110S03H05	10.4	12.0	50.0	0.2	3.0	1
	10	●	0110S03H10	16.4	18.0	55.0	0.2	3.0	2
	15	●	0110S03H15	19.4	21.0	65.0	0.2	3.0	2
	20	●	0110S03H20	24.4	26.0	70.0	0.2	3.0	2
1.2	3	●	MDA 0120S03H03	6.2	8.0	48.0	0.2	3.0	1
	5	●	0120S03H05	10.2	12.0	55.0	0.2	3.0	1
	10	●	0120S03H10	16.2	18.0	60.0	0.2	3.0	2
	15	●	0120S03H15	21.2	23.0	65.0	0.2	3.0	2
	20	●	0120S03H20	27.2	29.0	70.0	0.2	3.0	2
1.3	3	●	MDA 0130S03H03	6.1	8.0	48.0	0.3	3.0	1
	5	●	0130S03H05	12.1	14.0	55.0	0.3	3.0	1
	10	●	0130S03H10	18.1	20.0	60.0	0.3	3.0	2
	15	●	0130S03H15	23.1	25.0	65.0	0.3	3.0	2
	20	●	0130S03H20	29.1	31.0	75.0	0.3	3.0	2
1.4	3	●	MDA 0140S03H03	5.9	8.0	48.0	0.3	3.0	1
	5	●	0140S03H05	11.9	14.0	55.0	0.3	3.0	1
	10	●	0140S03H10	17.9	20.0	60.0	0.3	3.0	2
	15	●	0140S03H15	25.9	28.0	70.0	0.3	3.0	2
	20	●	0140S03H20	31.9	34.0	75.0	0.3	3.0	2
1.5	3	●	MDA 0150S03H03	5.8	8.0	48.0	0.3	3.0	1
	5	●	0150S03H05	13.8	16.0	55.0	0.3	3.0	1
	10	●	0150S03H10	20.8	23.0	65.0	0.3	3.0	2
	15	●	0150S03H15	25.8	28.0	70.0	0.3	3.0	2
	20	●	0150S03H20	33.8	36.0	75.0	0.3	3.0	2
1.6	3	●	MDA 0160S03H03	7.6	10.0	50.0	0.3	3.0	1
	5	●	0160S03H05	13.6	16.0	55.0	0.3	3.0	1
	10	●	0160S03H10	22.6	25.0	65.0	0.3	3.0	2
	15	●	0160S03H15	29.6	32.0	75.0	0.3	3.0	2
	20	●	0160S03H20	35.6	38.0	80.0	0.3	3.0	2
1.7	3	●	MDA 0170S03H03	7.5	10.0	50.0	0.4	3.0	1
	5	●	0170S03H05	15.5	18.0	60.0	0.4	3.0	1
	10	●	0170S03H10	22.5	25.0	65.0	0.4	3.0	2
	15	●	0170S03H15	29.5	32.0	75.0	0.4	3.0	2
	20	●	0170S03H20	38.5	41.0	80.0	0.4	3.0	2
1.8	3	●	MDA 0180S03H03	7.3	10.0	50.0	0.4	3.0	1
	5	●	0180S03H05	15.3	18.0	60.0	0.4	3.0	1
	10	●	0180S03H10	25.3	28.0	70.0	0.4	3.0	2
	15	●	0180S03H15	32.3	35.0	75.0	0.4	3.0	2
	20	●	0180S03H20	40.3	43.0	85.0	0.4	3.0	2
1.9	3	●	MDA 0190S03H03	7.2	10.0	50.0	0.4	3.0	1
	5	●	0190S03H05	17.2	20.0	60.0	0.4	3.0	1
	10	●	0190S03H10	25.2	28.0	70.0	0.4	3.0	2
	15	●	0190S03H15	32.2	35.0	75.0	0.4	3.0	2
	20	●	0190S03H20	43.2	46.0	85.0	0.4	3.0	2
2.0	3	●	MDA 0200S03H03	7.0	10.0	50.0	0.4	3.0	1
	5	●	0200S03H05	17.0	20.0	60.0	0.4	3.0	1
	10	●	0200S03H10	27.0	30.0	70.0	0.4	3.0	2
	15	●	0200S03H15	37.0	40.0	80.0	0.4	3.0	2
	20	●	0200S03H20	45.0	48.0	90.0	0.4	3.0	2

Grade: DLX1700

Diameter ø2.1 to 3.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.1	3	●	MDA 0210S03H03	9.9	13.0	55.0	0.4	3.0	1
	5	●	0210S03H05	18.9	22.0	65.0	0.4	3.0	1
	10	●	0210S03H10	26.9	30.0	70.0	0.4	3.0	2
	15	●	0210S03H15	36.9	40.0	80.0	0.4	3.0	2
	20	●	0210S03H20	46.9	50.0	95.0	0.4	3.0	2
2.2	3	●	MDA 0220S03H03	9.7	13.0	55.0	0.5	3.0	1
	5	●	0220S03H05	18.7	22.0	65.0	0.5	3.0	1
	10	●	0220S03H10	28.7	32.0	75.0	0.5	3.0	2
	15	●	0220S03H15	38.7	42.0	85.0	0.5	3.0	2
	20	●	0220S03H20	47.7	51.0	95.0	0.5	3.0	2
2.3	3	●	MDA 0230S03H03	9.6	13.0	55.0	0.5	3.0	1
	5	●	0230S03H05	20.6	24.0	65.0	0.5	3.0	1
	10	●	0230S03H10	28.6	32.0	75.0	0.5	3.0	2
	15	●	0230S03H15	41.6	45.0	85.0	0.5	3.0	2
	20	●	0230S03H20	49.6	53.0	100.0	0.5	3.0	2
2.4	3	●	MDA 0240S03H03	9.4	13.0	55.0	0.5	3.0	1
	5	●	0240S03H05	20.4	24.0	65.0	0.5	3.0	1
	10	●	0240S03H10	31.4	35.0	75.0	0.5	3.0	2
	15	●	0240S03H15	41.4	45.0	85.0	0.5	3.0	2
	20	●	0240S03H20	52.4	56.0	100.0	0.5	3.0	2
2.5	3	●	MDA 0250S03H03	9.3	13.0	55.0	0.5	3.0	1
	5	●	0250S03H05	22.3	26.0	65.0	0.5	3.0	1
	10	●	0250S03H10	31.3	35.0	75.0	0.5	3.0	2
	15	●	0250S03H15	41.3	45.0	85.0	0.5	3.0	2
	20	●	0250S03H20	56.3	60.0	105.0	0.5	3.0	2
2.6	3	●	MDA 0260S03H03	11.1	15.0	60.0	0.5	3.0	1
	5	●	0260S03H05	22.1	26.0	70.0	0.5	3.0	1
	10	●	0260S03H10	34.1	38.0	80.0	0.5	3.0	2
	15	●	0260S03H15	46.1	50.0	90.0	0.5	3.0	2
	20	●	0260S03H20	57.1	61.0	105.0	0.5	3.0	2
2.7	3	●	MDA 0270S03H03	11.0	15.0	60.0	0.6	3.0	1
	5	●	0270S03H05	24.0	28.0	70.0	0.6	3.0	1
	10	●	0270S03H10	34.0	38.0	80.0	0.6	3.0	2
	15	●	0270S03H15	46.0	50.0	90.0	0.6	3.0	2
	20	●	0270S03H20	59.0	63.0	105.0	0.6	3.0	2
2.8	3	●	MDA 0280S03H03	10.8	15.0	60.0	0.6	3.0	1
	5	●	0280S03H05	23.8	28.0	70.0	0.6	3.0	1
	10	●	0280S03H10	35.8	40.0	80.0	0.6	3.0	2
	15	●	0280S03H15	50.8	55.0	95.0	0.6	3.0	2
	20	●	0280S03H20	60.8	65.0	110.0	0.6	3.0	2
2.9	3	●	MDA 0290S03H03	10.7	15.0	60.0	0.6	3.0	1
	5	●	0290S03H05	25.7	30.0	70.0	0.6	3.0	1
	10	●	0290S03H10	35.7	40.0	80.0	0.6	3.0	2
	15	●	0290S03H15	50.7	55.0	95.0	0.6	3.0	2
	20	●	0290S03H20	62.7	67.0	110.0	0.6	3.0	2
3.0	3	●	MDA 0300S03H03	10.5	15.0	60.0	0.6	3.0	1
	5	●	0300S03H05	25.5	30.0	70.0	0.6	3.0	1
	10	●	0300S03H10	37.5	42.0	82.0	0.6	3.0	2
	15	●	0300S03H15	53.5	58.0	98.0	0.6	3.0	2
	20	●	0300S03H20	64.5	69.0	110.0	0.6	3.0	2

Grade: DLX1700



*For tolerances, refer to Chapter N - References.

Fig 1 L/D = 3/5D double margin

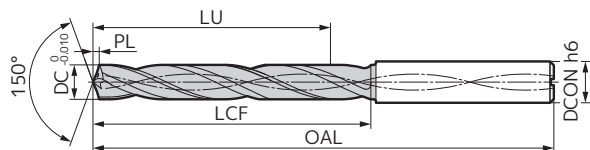
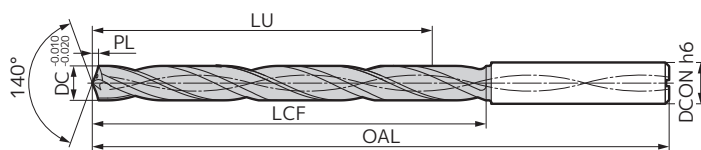


Fig 2 L/D = 10D double margin



Diameter ø3.1 to 4.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.1	3	●	MDA 0310S04H03	15.8	20.4	72.4	0.4	4.0	1
	5	●	0310S04H05	27.8	32.4	86.4	0.4	4.0	1
	10	●	0310S04H10	44.9	49.6	106.6	0.6	4.0	2
3.2	3	●	MDA 0320S04H03	15.6	20.4	72.4	0.4	4.0	1
	5	●	0320S04H05	27.6	32.4	86.4	0.4	4.0	1
	10	●	0320S04H10	44.8	49.6	106.6	0.6	4.0	2
3.3	3	●	MDA 0330S04H03	15.5	20.4	72.4	0.4	4.0	1
	5	●	0330S04H05	27.5	32.4	86.4	0.4	4.0	1
	10	●	0330S04H10	44.7	49.6	106.6	0.6	4.0	2
3.4	3	●	MDA 0340S04H03	15.4	20.5	72.5	0.5	4.0	1
	5	●	0340S04H05	27.4	32.5	86.5	0.5	4.0	1
	10	●	0340S04H10	44.5	49.6	106.6	0.6	4.0	2
3.5	3	●	MDA 0350S04H03	15.2	20.5	72.5	0.5	4.0	1
	5	●	0350S04H05	27.2	32.5	86.5	0.5	4.0	1
	10	●	0350S04H10	44.4	49.6	106.6	0.6	4.0	2
3.6	3	●	MDA 0360S04H03	17.6	23.0	72.5	0.5	4.0	1
	5	●	0360S04H05	31.1	36.5	86.5	0.5	4.0	1
	10	●	0360S04H10	51.3	56.7	106.7	0.7	4.0	2
3.65	3	●	MDA 0365S04H03	17.4	23.0	72.5	0.5	4.0	1
	5	●	0365S04H05	30.9	36.5	86.5	0.5	4.0	1
3.66	5	●	MDA 0366S04H05	30.9	36.5	86.5	0.5	4.0	1
	10	●	MDA 0370S04H10	17.4	23.0	72.5	0.5	4.0	1
3.7	3	●	MDA 0370S04H03	30.9	36.5	86.5	0.5	4.0	1
	5	●	0370S04H05	51.1	56.7	106.7	0.7	4.0	2
	10	●	0370S04H10	51.1	56.7	106.7	0.7	4.0	2
3.8	3	●	MDA 0380S04H03	17.3	23.0	72.5	0.5	4.0	1
	5	●	0380S04H05	30.8	36.5	86.5	0.5	4.0	1
	10	●	0380S04H10	51.0	56.7	106.7	0.7	4.0	2
3.9	3	●	MDA 0390S04H03	17.2	23.0	72.5	0.5	4.0	1
	5	●	0390S04H05	30.7	36.5	86.5	0.5	4.0	1
	10	●	0390S04H10	50.9	56.7	106.7	0.7	4.0	2
4.0	3	●	MDA 0400S04H03	17.0	23.0	72.5	0.5	4.0	1
	5	●	0400S04H05	30.5	36.5	86.5	0.5	4.0	1
	10	●	0400S04H10	50.7	56.7	106.7	0.7	4.0	2
4.1	3	●	MDA 0410S06H03	19.4	25.5	80.5	0.5	6.0	1
	5	●	0410S06H05	34.4	40.5	98.5	0.5	6.0	1
	10	●	0410S06H10	57.6	63.7	121.7	0.7	6.0	2
4.2	3	●	MDA 0420S06H03	19.3	25.6	80.6	0.6	6.0	1
	5	●	0420S06H05	34.3	40.6	98.6	0.6	6.0	1
	10	●	0420S06H10	57.5	63.8	121.8	0.8	6.0	2
4.3	3	●	MDA 0430S06H03	19.1	25.6	80.6	0.6	6.0	1
	5	●	0430S06H05	34.1	40.6	98.6	0.6	6.0	1
	10	●	0430S06H10	57.3	63.8	121.8	0.8	6.0	2
4.4	3	●	MDA 0440S06H03	19.0	25.6	80.6	0.6	6.0	1
	5	●	0440S06H05	34.0	40.6	98.6	0.6	6.0	1
	10	●	0440S06H10	57.2	63.8	121.8	0.8	6.0	2
4.5	3	●	MDA 0450S06H03	18.9	25.6	80.6	0.6	6.0	1
	5	●	0450S06H05	33.9	40.6	98.6	0.6	6.0	1
	10	●	0450S06H10	57.1	63.8	121.8	0.8	6.0	2

Grade: DLX1700

Diameter ø4.6 to 6.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.6	3	●	MDA 0460S06H03	20.7	27.6	80.6	0.6	6.0	1
	5	●	0460S06H05	37.7	44.6	98.6	0.6	6.0	1
	10	●	0460S06H10	61.9	68.8	121.8	0.8	6.0	2
4.7	3	●	MDA 0470S06H03	20.6	27.6	80.6	0.6	6.0	1
	5	●	0470S06H05	37.6	44.6	98.6	0.6	6.0	1
	10	●	0470S06H10	61.8	68.9	121.9	0.9	6.0	2
4.8	3	●	MDA 0480S06H03	20.4	27.6	80.6	0.6	6.0	1
	5	●	0480S06H05	37.4	44.6	98.6	0.6	6.0	1
	10	●	0480S06H10	61.7	68.9	121.9	0.9	6.0	2
4.9	3	●	MDA 0490S06H03	20.5	27.7	80.7	0.7	6.0	1
	5	●	0490S06H05	37.5	44.7	98.7	0.7	6.0	1
	10	●	0490S06H10	61.7	68.9	121.9	0.9	6.0	2
5.0	3	●	MDA 0500S06H03	20.2	27.7	80.7	0.7	6.0	1
	5	●	0500S06H05	37.2	44.7	98.7	0.7	6.0	1
	10	●	0500S06H10	61.4	68.9	121.9	0.9	6.0	2
5.1	3	●	MDA 0510S06H03	20.5	28.2	82.7	0.7	6.0	1
	5	●	0510S06H05	37.0	44.7	100.7	0.7	6.0	1
	10	●	0510S06H10	70.3	77.9	136.9	0.9	6.0	2
5.2	3	●	MDA 0520S06H03	20.4	28.2	82.7	0.7	6.0	1
	5	●	0520S06H05	36.9	44.7	100.7	0.7	6.0	1
	10	●	0520S06H10	70.1	77.9	136.9	0.9	6.0	2
5.3	3	●	MDA 0530S06H03	20.3	28.2	82.7	0.7	6.0	1
	5	●	0530S06H05	36.8	44.7	100.7	0.7	6.0	1
	10	●	0530S06H10	70.0	78.0	137.0	1.0	6.0	2
5.4	3	●	MDA 0540S06H03	20.1	28.2	82.7	0.7	6.0	1
	5	●	0540S06H05	36.6	44.7	100.7	0.7	6.0	1
	10	●	0540S06H10	69.9	78.0	137.0	1.0	6.0	2
5.5	3	●	MDA 0550S06H03	20.0	28.2	82.7	0.7	6.0	1
	5	●	0550S06H05	36.5	44.7	100.7	0.7	6.0	1
	10	●	0550S06H10	69.8	78.0	137.0	1.0	6.0	2
5.6	3	●	MDA 0560S06H03	22.3	30.7	82.7	0.8	6.0	1
	5	●	0560S06H05	40.3	48.7	100.7	0.8	6.0	1
	10	●	0560S06H10	76.6	85.0	137.0	1.0	6.0	2
5.7	3	●	MDA 0570S06H03	22.2	30.8	82.8	0.8	6.0	1
	5	●	0570S06H05	40.2	48.8	100.8	0.8	6.0	1
	10	●	0570S06H10	76.5	85.0	137.0	1.0	6.0	2
5.8	3	●	MDA 0580S06H03	22.1	30.8	82.8	0.8	6.0	1
	5	●	0580S06H05	40.1	48.8	100.8	0.8	6.0	1
	10	●	0580S06H10	76.4	85.1	137.1	1.1	6.0	2
5.9	3	●	MDA 0590S06H03	21.9	30.8	82.8	0.8	6.0	1
	5	●	0590S06H05	39.9	48.8	100.8	0.8	6.0	1
	10	●	0590S06H10	76.2	85.1	137.1	1.1	6.0	2
6.0	3	●	MDA 0600S06H03	21.8	30.8	82.8	0.8	6.0	1
	5	●	0600S06H05	39.8	48.8	100.8	0.8	6.0	1
	10	●	0600S06H10	76.1	85.1	137.1	1.1	6.0	2

Grade: DLX1700

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

MULTIDRILL MDA series

Aluminum Alloy
Copper Alloy

AURORA
Coat X
DLC

3D 5D 10D

*For tolerances, refer to Chapter N - References.

Fig 1 L/D = 3/5D double margin

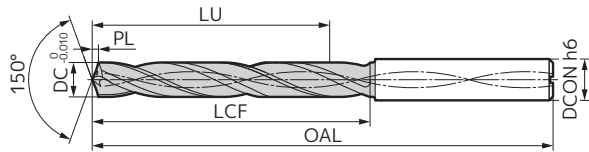
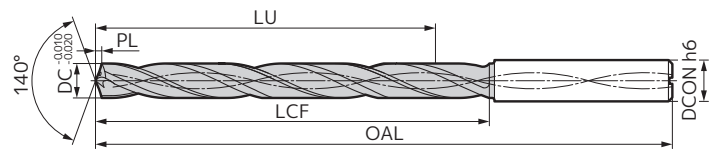


Fig 2 L/D = 10D double margin



Diameter ø6.1 to 7.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.1	3	●	MDA 0610S08H03	24.2	33.3	88.8	0.8	8.0	1
	5	●	0610S08H05	43.7	52.8	109.8	0.8	8.0	1
	10	●	0610S08H10	83.0	92.1	152.1	1.1	8.0	2
6.2	3	●	MDA 0620S08H03	24.0	33.3	88.8	0.8	8.0	1
	5	●	0620S08H05	43.5	52.8	109.8	0.8	8.0	1
	10	●	0620S08H10	82.8	92.1	152.1	1.1	8.0	2
6.3	3	●	MDA 0630S08H03	23.9	33.3	88.8	0.8	8.0	1
	5	●	0630S08H05	43.4	52.8	109.8	0.8	8.0	1
	10	●	0630S08H10	82.7	92.1	152.1	1.1	8.0	2
6.4	3	●	MDA 0640S08H03	23.8	33.4	88.9	0.9	8.0	1
	5	●	0640S08H05	43.3	52.9	109.9	0.9	8.0	1
	10	●	0640S08H10	82.6	92.2	152.2	1.2	8.0	2
6.5	3	●	MDA 0650S08H03	23.6	33.4	88.9	0.9	8.0	1
	5	●	0650S08H05	43.1	52.9	109.9	0.9	8.0	1
	10	●	0650S08H10	82.4	92.2	152.2	1.2	8.0	2
6.6	3	●	MDA 0660S08H03	24.0	33.9	88.9	0.9	8.0	1
	5	●	0660S08H05	45.0	54.9	109.9	0.9	8.0	1
	10	●	0660S08H10	87.3	97.2	152.2	1.2	8.0	2
6.7	3	●	MDA 0670S08H03	24.0	33.9	88.9	0.9	8.0	1
	5	●	0670S08H05	45.0	54.9	109.9	0.9	8.0	1
	10	●	0670S08H10	87.3	97.2	152.2	1.2	8.0	2
6.8	3	●	MDA 0680S08H03	23.7	33.9	88.9	0.9	8.0	1
	5	●	0680S08H05	44.7	54.9	109.9	0.9	8.0	1
	10	●	0680S08H10	87.0	97.2	152.2	1.2	8.0	2
6.9	3	●	MDA 0690S08H03	23.6	33.9	88.9	0.9	8.0	1
	5	●	0690S08H05	44.6	54.9	109.9	0.9	8.0	1
	10	●	0690S08H10	86.9	97.3	152.3	1.3	8.0	2
7.0	3	●	MDA 0700S08H03	23.4	33.9	88.9	0.9	8.0	1
	5	●	0700S08H05	44.4	54.9	109.9	0.9	8.0	1
	10	●	0700S08H10	86.8	97.3	152.3	1.3	8.0	2
7.1	3	●	MDA 0710S08H03	27.8	38.4	94.9	1.0	8.0	1
	5	●	0710S08H05	50.3	60.9	118.9	1.0	8.0	1
	10	●	0710S08H10	95.6	106.3	167.3	1.3	8.0	2
7.2	3	●	MDA 0720S08H03	27.7	38.5	95.0	1.0	8.0	1
	5	●	0720S08H05	50.2	61.0	119.0	1.0	8.0	1
	10	●	0720S08H10	95.5	106.3	167.3	1.3	8.0	2
7.3	3	●	MDA 0730S08H03	27.5	38.5	95.0	1.0	8.0	1
	5	●	0730S08H05	50.0	61.0	119.0	1.0	8.0	1
	10	●	0730S08H10	95.4	106.3	167.3	1.3	8.0	2
7.35	3	●	MDA 0735S08H03	27.4	38.5	95.0	1.0	8.0	1
	5	●	0735S08H05	49.9	61.0	119.0	1.0	8.0	1
	10	●	0735S08H10	95.2	106.3	167.3	1.3	8.0	2
7.4	3	●	MDA 0740S08H03	27.4	38.5	95.0	1.0	8.0	1
	5	●	0740S08H05	49.9	61.0	119.0	1.0	8.0	1
	10	●	0740S08H10	95.2	106.3	167.3	1.3	8.0	2
7.5	3	●	MDA 0750S08H03	27.3	38.5	95.0	1.0	8.0	1
	5	●	0750S08H05	49.8	61.0	119.0	1.0	8.0	1
	10	●	0750S08H10	95.1	106.4	167.4	1.4	8.0	2

Grade: DLX1700

Diameter ø7.6 to 9.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.6	3	●	MDA 0760S08H03	29.6	41.0	95.0	1.0	8.0	1
	5	●	0760S08H05	53.6	65.0	119.0	1.0	8.0	1
	10	●	0760S08H10	102.0	113.4	167.4	1.4	8.0	2
7.7	3	●	MDA 0770S08H03	29.5	41.0	95.0	1.0	8.0	1
	5	●	0770S08H05	53.5	65.0	119.0	1.0	8.0	1
	10	●	0770S08H10	101.9	113.4	167.4	1.4	8.0	2
7.8	3	●	MDA 0780S08H03	29.3	41.0	95.0	1.0	8.0	1
	5	●	0780S08H05	53.3	65.0	119.0	1.0	8.0	1
	10	●	0780S08H10	101.7	113.4	167.4	1.4	8.0	2
7.9	3	●	MDA 0790S08H03	29.2	41.1	95.1	1.1	8.0	1
	5	●	0790S08H05	53.2	65.1	119.1	1.1	8.0	1
	10	●	0790S08H10	101.6	113.4	167.4	1.4	8.0	2
8.0	3	●	MDA 0800S08H03	29.1	41.1	95.1	1.1	8.0	1
	5	●	0800S08H05	53.1	65.1	119.1	1.1	8.0	1
	10	●	0800S08H10	101.5	113.5	167.5	1.5	8.0	2
8.1	3	●	MDA 0810S10H03	31.4	43.6	101.1	1.1	10.0	1
	5	●	0810S10H05	56.9	69.1	128.1	1.1	10.0	1
	10	●	0810S10H10	108.3	120.5	182.5	1.5	10.0	2
8.2	3	●	MDA 0820S10H03	31.3	43.6	101.1	1.1	10.0	1
	5	●	0820S10H05	56.8	69.1	128.1	1.1	10.0	1
	10	●	0820S10H10	108.2	120.5	182.5	1.5	10.0	2
8.3	3	●	MDA 0830S10H03	31.2	43.6	101.1	1.1	10.0	1
	5	●	0830S10H05	56.7	69.1	128.1	1.1	10.0	1
	10	●	0830S10H10	108.1	120.5	182.5	1.5	10.0	2
8.4	3	●	MDA 0840S10H03	31.0	43.6	101.1	1.1	10.0	1
	5	●	0840S10H05	56.5	69.1	128.1	1.1	10.0	1
	10	●	0840S10H10	107.9	120.5	182.5	1.5	10.0	2
8.5	3	●	MDA 0850S10H03	31.0	43.6	101.1	1.1	10.0	1
	5	●	0850S10H05	56.5	69.1	128.1	1.1	10.0	1
	10	●	0850S10H10	107.9	120.5	182.5	1.5	10.0	2
8.6	3	●	MDA 0860S10H03	31.2	44.1	101.1	1.2	10.0	1
	5	●	0860S10H05	58.2	71.1	128.1	1.2	10.0	1
	10	●	0860S10H10	112.7	125.6	182.6	1.6	10.0	2
8.7	3	●	MDA 0870S10H03	31.1	44.2	101.2	1.2	10.0	1
	5	●	0870S10H05	58.1	71.2	128.2	1.2	10.0	1
	10	●	0870S10H10	112.5	125.6	182.6	1.6	10.0	2
8.8	3	●	MDA 0880S10H03	31.0	44.2	101.2	1.2	10.0	1
	5	●	0880S10H05	58.0	71.2	128.2	1.2	10.0	1
	10	●	0880S10H10	112.4	125.6	182.6	1.6	10.0	2
8.9	3	●	MDA 0890S10H03	30.8	44.2	101.2	1.2	10.0	1
	5	●	0890S10H05	57.8	71.2	128.2	1.2	10.0	1
	10	●	0890S10H10	112.3	125.6	182.6	1.6	10.0	2
9.0	3	●	MDA 0900S10H03	30.7	44.2	101.2	1.2	10.0	1
	5	●	0900S10H05	57.7	71.2	128.2	1.2	10.0	1
	10	●	0900S10H10	112.1	125.6	182.6	1.6	10.0	2

Grade: DLX1700

Drilling

Solid

Indexable
Head type

Indexable
Insert type

Reamers



*For tolerances, refer to Chapter N - References.

Fig 1 L/D = 3/5D double margin

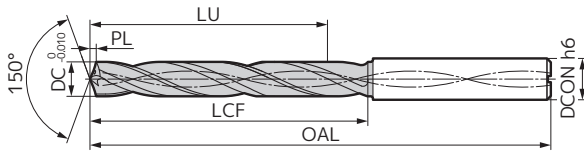
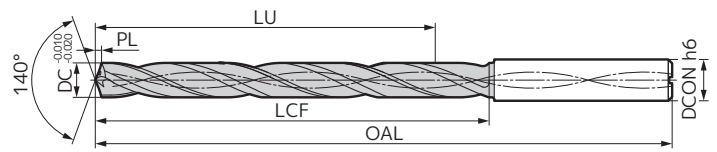


Fig 2 L/D = 10D double margin



Diameter ø9.1 to 10.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.1	3	●	MDA 0910S10H03	35.1	48.7	107.2	1.2	10.0	1
	5	●	0910S10H05	63.6	77.2	137.2	1.2	10.0	1
	10	●	0910S10H10	121.0	134.7	197.7	1.7	10.0	2
9.2	3	●	MDA 0920S10H03	34.9	48.7	107.2	1.2	10.0	1
	5	●	0920S10H05	63.4	77.2	137.2	1.2	10.0	1
	10	●	0920S10H10	120.9	134.7	197.7	1.7	10.0	2
9.21	3	●	MDA 0921S10H05	63.3	77.2	137.2	1.2	10.0	1
	5	●	MDA 0930S10H03	34.8	48.7	107.2	1.2	10.0	1
	10	●	0930S10H10	120.7	134.7	197.7	1.7	10.0	2
9.3	3	●	MDA 0930S10H03	34.7	48.8	107.3	1.3	10.0	1
	5	●	0930S10H05	63.3	77.2	137.2	1.2	10.0	1
	10	●	0930S10H10	120.7	134.7	197.7	1.7	10.0	2
9.4	3	●	MDA 0940S10H03	34.7	48.8	107.3	1.3	10.0	1
	5	●	0940S10H05	63.2	77.3	137.3	1.3	10.0	1
	10	●	0940S10H10	120.6	134.7	197.7	1.7	10.0	2
9.5	3	●	MDA 0950S10H03	34.5	48.8	107.3	1.3	10.0	1
	5	●	0950S10H05	63.0	77.3	137.3	1.3	10.0	1
	10	●	0950S10H10	120.5	134.7	197.7	1.7	10.0	2
9.6	3	●	MDA 0960S10H03	36.9	51.3	107.3	1.3	10.0	1
	5	●	0960S10H05	66.9	81.3	137.3	1.3	10.0	1
	10	●	0960S10H10	127.3	141.7	197.7	1.7	10.0	2
9.7	3	●	MDA 0970S10H03	36.7	51.3	107.3	1.3	10.0	1
	5	●	0970S10H05	66.7	81.3	137.3	1.3	10.0	1
	10	●	0970S10H10	127.2	141.8	197.8	1.8	10.0	2
9.8	3	●	MDA 0980S10H03	36.6	51.3	107.3	1.3	10.0	1
	5	●	0980S10H05	66.6	81.3	137.3	1.3	10.0	1
	10	●	0980S10H10	127.1	141.8	197.8	1.8	10.0	2
9.9	3	●	MDA 0990S10H03	36.5	51.3	107.3	1.3	10.0	1
	5	●	0990S10H05	66.5	81.3	137.3	1.3	10.0	1
	10	●	0990S10H10	127.0	141.8	197.8	1.8	10.0	2
10.0	3	●	MDA 1000S10H03	36.3	51.3	107.3	1.3	10.0	1
	5	●	1000S10H05	66.3	81.3	137.3	1.3	10.0	1
	10	●	1000S10H10	126.8	141.8	197.8	1.8	10.0	2
10.1	3	●	MDA 1010S12H03	38.7	53.8	117.3	1.4	12.0	1
	5	●	1010S12H05	70.2	85.3	150.3	1.4	12.0	1
	10	●	1010S12H10	133.7	148.8	216.8	1.8	12.0	2
10.2	3	●	MDA 1020S12H03	38.6	53.9	117.4	1.4	12.0	1
	5	●	1020S12H05	70.1	85.4	150.4	1.4	12.0	1
	10	●	1020S12H10	133.6	148.9	216.9	1.9	12.0	2
10.3	3	●	MDA 1030S12H03	38.6	53.9	117.4	1.4	12.0	1
	5	●	1030S12H05	70.1	85.4	150.4	1.4	12.0	1
	10	●	1030S12H10	133.6	148.9	216.9	1.9	12.0	2
10.4	3	●	MDA 1040S12H03	38.3	53.9	117.4	1.4	12.0	1
	5	●	1040S12H05	69.8	85.4	150.4	1.4	12.0	1
	10	●	1040S12H10	133.3	148.9	216.9	1.9	12.0	2
10.5	3	●	MDA 1050S12H03	38.2	53.9	117.4	1.4	12.0	1
	5	●	1050S12H05	69.7	85.4	150.4	1.4	12.0	1
	10	●	1050S12H10	133.2	148.9	216.9	1.9	12.0	2

Grade: DLX1700

Diameter ø10.6 to 12.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.6	3	●	MDA 1060S12H03	38.5	54.4	117.4	1.4	12.0	1
	5	●	1060S12H05	71.5	87.4	150.4	1.4	12.0	1
	10	●	1060S12H10	138.0	153.9	216.9	1.9	12.0	2
10.7	3	●	MDA 1070S12H03	38.4	54.4	117.4	1.4	12.0	1
	5	●	1070S12H05	71.4	87.4	150.4	1.4	12.0	1
	10	●	1070S12H10	137.9	153.9	216.9	1.9	12.0	2
10.8	3	●	MDA 1080S12H03	38.2	54.4	117.4	1.4	12.0	1
	5	●	1080S12H05	71.2	87.4	150.4	1.4	12.0	1
	10	●	1080S12H10	137.8	154.0	217.0	2.0	12.0	2
10.9	3	●	MDA 1090S12H03	38.1	54.5	117.5	1.5	12.0	1
	5	●	1090S12H05	71.1	87.5	150.5	1.5	12.0	1
	10	●	1090S12H10	137.6	154.0	217.0	2.0	12.0	2
11.0	3	●	MDA 1100S12H03	38.0	54.5	117.5	1.5	12.0	1
	5	●	1100S12H05	71.0	87.5	150.5	1.5	12.0	1
	10	●	1100S12H10	137.5	154.0	217.0	2.0	12.0	2
11.1	3	●	MDA 1110S12H03	42.3	59.0	123.5	1.5	12.0	1
	5	●	1110S12H05	76.8	93.5	159.5	1.5	12.0	1
	10	●	1110S12H10	146.4	163.0	232.0	2.0	12.0	2
11.2	3	●	MDA 1120S12H03	42.2	59.0	123.5	1.5	12.0	1
	5	●	1120S12H05	76.7	93.5	159.5	1.5	12.0	1
	10	●	1120S12H10	146.2	163.0	232.0	2.0	12.0	2
11.3	3	●	MDA 1130S12H03	42.1	59.0	123.5	1.5	12.0	1
	5	●	1130S12H05	76.6	93.5	159.5	1.5	12.0	1
	10	●	1130S12H10	146.1	163.1	232.1	2.1	12.0	2
11.4	3	●	MDA 1140S12H03	41.9	59.0	123.5	1.5	12.0	1
	5	●	1140S12H05	76.4	93.5	159.5	1.5	12.0	1
	10	●	1140S12H10	146.0	163.1	232.1	2.1	12.0	2
11.5	3	●	MDA 1150S12H03	41.8	59.0	123.5	1.5	12.0	1
	5	●	1150S12H05	76.3	93.5	159.5	1.5	12.0	1
	10	●	1150S12H10	145.8	163.1	232.1	2.1	12.0	2
11.6	3	●	MDA 1160S12H03	44.1	61.5	123.5	1.6	12.0	1
	5	●	1160S12H05	80.1	97.5	159.5	1.6	12.0	1
	10	●	1160S12H10	152.7	170.1	232.1	2.1	12.0	2
11.7	3	●	MDA 1170S12H03	44.0	61.6	123.6	1.6	12.0	1
	5	●	1170S12H05	80.0	97.6	159.6	1.6	12.0	1
	10	●	1170S12H10	152.6	170.1	232.1	2.1	12.0	2
11.8	3	●	MDA 1180S12H03	43.9	61.6	123.6	1.6	12.0	1
	5	●	1180S12H05	79.9	97.6	159.6	1.6	12.0	1
	10	●	1180S12H10	152.4	170.1	232.1	2.1	12.0	2
11.9	3	●	MDA 1190S12H03	43.7	61.6	123.6	1.6	12.0	1
	5	●	1190S12H05	79.7	97.6	159.6	1.6	12.0	1
	10	●	1190S12H10	152.3	170.2	232.2	2.2	12.0	2
12.0	3	●	MDA 1200S12H03	43.6	61.6	123.6	1.6	12.0	1
	5	●	1200S12H05	79.6	97.6	159.6	1.6	12.0	1
	10	●	1200S12H10	152.2	170.2	232.2	2.2	12.0	2

Grade: DLX1700

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

Recommended Cutting Conditions (L/D = 3D, 5D)

Work Material	Aluminum alloy casting/Aluminum alloy die cast material ADC, AC		Duralumin-based aluminum alloy Al-Zn-Mg type (7075)		Wrought aluminum alloy Al-Mg type (5052)	
Dia. (mm)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)
Up to ø2.00	50 - 120	0.05 - 0.40	40 - 90	0.05 - 0.20	50 - 120	0.04 - 0.08
Up to ø3.00	60 - 150	0.10 - 0.60	50 - 100	0.10 - 0.30	60 - 150	0.04 - 0.08
Up to ø4.00	60 - 150	0.15 - 0.80	50 - 120	0.15 - 0.40	60 - 150	0.05 - 0.12
Up to ø6.00	80 - 200	0.20 - 1.20	80 - 180	0.20 - 0.60	80 - 200	0.08 - 0.18
Up to ø8.00	100 - 200	0.20 - 1.20	80 - 180	0.20 - 0.80	100 - 200	0.10 - 0.20
Up to ø10.00	100 - 200	0.20 - 1.20	100 - 180	0.20 - 0.80	100 - 200	0.10 - 0.25
Up to ø12.00	120 - 250	0.20 - 1.20	120 - 200	0.20 - 0.80	120 - 250	0.10 - 0.30

- The recommended cutting conditions above are for cases where a water-soluble coolant is used.
- Use with internal coolant supply.
- Recommended coolant supply pressure of 2.0MPa or higher for ø3 or below, and 1.5MPa or higher for over ø3.
- Keep the drill runout at 0.02mm or lower.
- If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.
- When drilling with pre-cast holes, we recommend the lower-limit end of the recommended conditions.

Recommended Cutting Conditions (L/D = 10D or longer)

Work Material	Aluminum alloy casting/Aluminum alloy die cast material ADC, AC		Duralumin-based aluminum alloy Al-Zn-Mg type (7075)		Wrought aluminum alloy Al-Mg type (5052)	
Dia. (mm)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)
Up to ø2.00	50 - 100	0.05 - 0.20	40 - 60	0.05 - 0.15	50 - 100	0.04 - 0.08
Up to ø3.00	60 - 120	0.10 - 0.30	50 - 80	0.10 - 0.20	60 - 120	0.04 - 0.08
Up to ø4.00	60 - 120	0.15 - 0.40	50 - 100	0.10 - 0.25	60 - 120	0.04 - 0.10
Up to ø6.00	80 - 150	0.20 - 0.60	60 - 120	0.15 - 0.30	80 - 150	0.06 - 0.12
Up to ø8.00	80 - 180	0.20 - 0.60	80 - 150	0.20 - 0.40	80 - 180	0.08 - 0.15
Up to ø10.00	100 - 180	0.20 - 0.60	100 - 150	0.20 - 0.40	100 - 180	0.10 - 0.20
Up to ø12.00	120 - 200	0.20 - 0.60	120 - 180	0.20 - 0.40	120 - 200	0.10 - 0.25

- The recommended cutting conditions above are for cases where a water-soluble coolant is used.
- Use with internal coolant supply.
- Recommended coolant supply pressure of 2.0MPa or higher for ø3 or below, and 1.5MPa or higher for over ø3.
- Keep the drill runout at 0.02mm or lower.
- If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.
- For drilling with pre-cast holes, drills of 10D (or longer) are not recommended.
- Drilling holes 10D or longer may lead to abnormalities; drill a guide hole (hole depth 1D to 2D) in advance.
- A 3D (5D) drill can be used for guide hole drilling. (For guide hole drilling, use conditions lower than the "Recommended feed for 10D or longer")

MEMO



Super MULTIDRILL NHGS series



■ Features

● High-efficiency drilling

AURORA Coat (DLC Coat) and low resistance WL (Wide L) THINNING drastically reduce cutting force.

● Stable drilling performance

Special cutting edge design and WW (Wide W) margin improve hole quality.

● Long tool life

With AURORA Coat coupled with the cutting edge shape, a long and stable tool life is achieved.

● Deep hole drilling

Drills for deep hole drilling can be made to order.

(Production range: Diameters: $\phi 3.0$ to $\phi 16.0$ mm)

Overall length: Available on inquiry)

■ Product Range (Stocked Sizes)

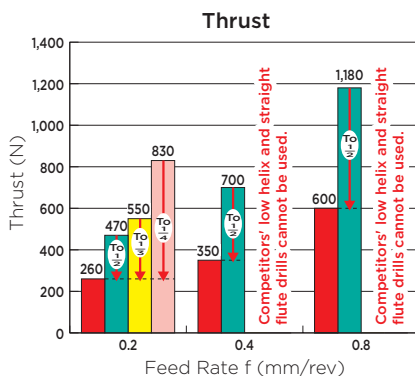
Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)
Internal	MDW□□□□NHGS3	$\phi 3.0$ to 16.0	up to 3
	MDW□□□□NHGS5		up to 5
	MDW□□□□NHGS10	$\phi 3.0$ to 13.0	up to 10

■ Performance

Cutting Force

● Low cutting force, achieving 2 to 4 times the feed rate

The cutting force of the NHGS series is
1/2 that of competitors' 30° helix drills $\Rightarrow$ double the feed rate!
1/3 that of competitors' low helix drills $\Rightarrow$ 3x the feed rate!
1/4 that of straight flute drills $\Rightarrow$ 4x the feed rate!



Tool: MDW 0800NHGS5 (DL1300) Work Material: ADC12
Cutting Speed: $vc=200$ m/min Machine: Vertical Machining Centre (BT30)
Coolant: Internal Coolant Supply (1.5MPa) Coolant: Emulsion (Diluted to approx. 25x)

Machined Surface Quality

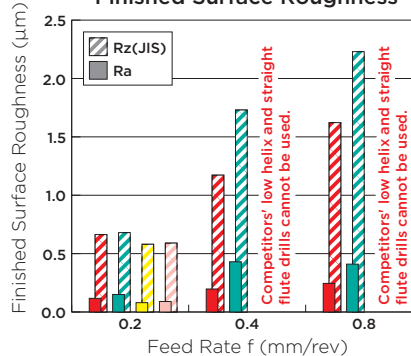
● Achieves good surface roughness over a wide range of feed rates

Good surface roughness from low to high feed rates:

$Ra=0.11$ to 0.25

Rz (JIS)= 0.66 to 1.62

Finished Surface Roughness



Tool: MDW 0800NHGS5 (DL1300) Work Material: ADC12
Cutting Speed: $vc=200$ m/min Machine: Vertical Machining Centre (BT30)
Coolant: Internal Coolant Supply (1.5MPa) Coolant: Emulsion (Diluted to approx. 25x)

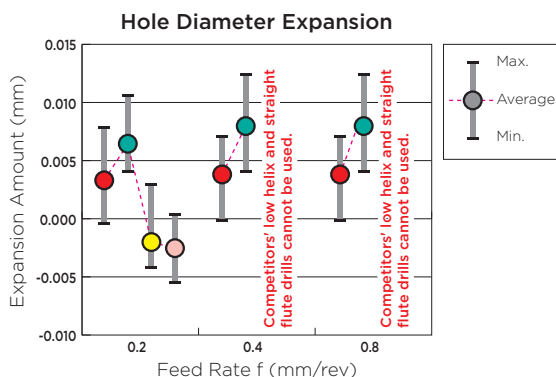
Legend (common)



Drilled hole accuracy (hole expansion)

● Stable hole accuracy with hole expansion within 0.01mm

Achieves minimal expansion and stable machining from low to high feed rates



Tool: MDW 0800NHGS5 (DL1300) Work Material: ADC12
Cutting Speed: $vc=200$ m/min Machine: Vertical Machining Centre (BT30)
Coolant: Internal Coolant Supply (1.5MPa) Coolant: Emulsion (Diluted to approx. 25x)

Drilled hole accuracy (hole position accuracy)

● Pre-cast hole accuracy within $\pm 1/10$ to $\pm 1/5$ of axial offset

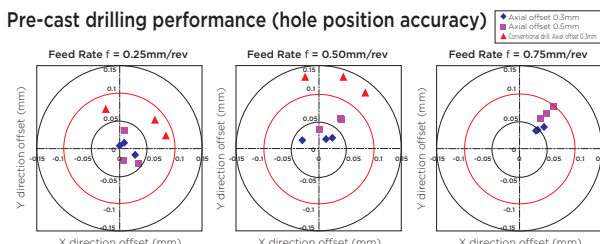
Pre-cast hole accuracy (hole position accuracy)

Feed Rate	0.25mm/rev	0.50mm/rev	0.75mm/rev
Offset			
0.3mm	± 0.03 mm	± 0.04 mm	± 0.06 mm
0.5mm	± 0.05 mm	± 0.07 mm	± 0.10 mm
Conventional drill: 0.3mm	± 0.09 mm	± 0.19 mm	

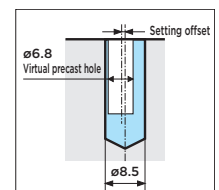
● Test method

An axial offset of 0.3mm to 0.5mm is set for a virtual pre-cast hole ($\phi 6.8$) and a hole is drilled with an $\phi 8.5$ drill before measuring the deviation from the target position.

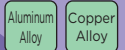
Pre-cast drilling performance (hole position accuracy)



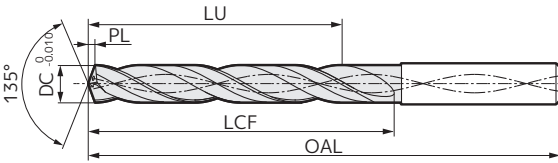
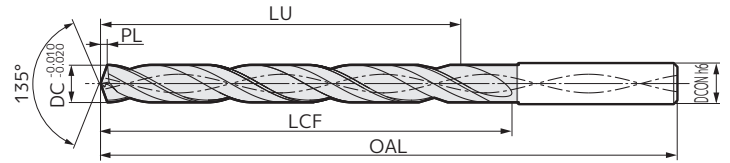
Tool: MDW 0850NHGS5 (DL1300) Work Material: AC4C-T6
Cutting Speed: $vc=200$ m/min ($n=7,489$ min⁻¹) Machine: Vertical Machining Centre (BT30)
Coolant: Internal Coolant Supply



NHGS series (Internal Coolant Supply)



*For tolerances, refer to Chapter N - References.

Fig 1 (NHGS3/5 type, $\phi 3.0$ to 16.0mm)Fig 2 (NHGS10 type, $\phi 3.0$ to 16.0mm)Diameter $\phi 3.0$ to 4.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDW 0300NHGS3	13.6	18.1	68.6	0.6	3.0	1
	5	●	0300NHGS5	24.1	28.6	78.6	0.6	3.0	1
	10	●	0300NHGS10	38.1	42.6	92.6	0.6	3.0	2
3.1	3	●	MDW 0310NHGS3	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310NHGS5	28.0	32.6	86.6	0.6	4.0	1
	10	●	0310NHGS10	45.0	49.6	106.6	0.6	4.0	2
3.2	3	●	MDW 0320NHGS3	15.9	20.7	72.7	0.7	4.0	1
	5	●	0320NHGS5	27.9	32.7	86.7	0.7	4.0	1
	10	●	0320NHGS10	44.9	49.7	106.7	0.7	4.0	2
3.3	3	●	MDW 0330NHGS3	15.8	20.7	72.7	0.7	4.0	1
	5	●	0330NHGS5	27.8	32.7	86.7	0.7	4.0	1
	10	●	0330NHGS10	44.8	49.7	106.7	0.7	4.0	2
3.4	3	●	MDW 0340NHGS3	15.6	20.7	72.7	0.7	4.0	1
	5	●	0340NHGS5	27.6	32.7	86.7	0.7	4.0	1
	10	●	0340NHGS10	44.6	49.7	106.7	0.7	4.0	2
3.5	3	●	MDW 0350NHGS3	15.5	20.7	72.7	0.7	4.0	1
	5	●	0350NHGS5	27.5	32.7	86.7	0.7	4.0	1
	10	●	0350NHGS10	44.5	49.7	106.7	0.7	4.0	2
3.6	3	●	MDW 0360NHGS3	17.8	23.2	72.7	0.7	4.0	1
	5	●	0360NHGS5	31.3	36.7	86.7	0.7	4.0	1
	10	●	0360NHGS10	51.3	56.7	106.7	0.7	4.0	2
3.65	3	●	MDW 0365NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0365NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10	●	0365NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.66	3	●	MDW 0366NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0366NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10	●	0366NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.7	3	●	MDW 0370NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0370NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10	●	0370NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.8	3	●	MDW 0380NHGS3	17.6	23.3	72.8	0.8	4.0	1
	5	●	0380NHGS5	31.1	36.8	86.8	0.8	4.0	1
	10	●	0380NHGS10	51.1	56.8	106.8	0.8	4.0	2
3.9	3	●	MDW 0390NHGS3	17.5	23.3	72.8	0.8	4.0	1
	5	●	0390NHGS5	31.0	36.8	86.8	0.8	4.0	1
	10	●	0390NHGS10	51.0	56.8	106.8	0.8	4.0	2
4.0	3	●	MDW 0400NHGS3	17.3	23.3	72.8	0.8	4.0	1
	5	●	0400NHGS5	30.8	36.8	86.8	0.8	4.0	1
	10	●	0400NHGS10	50.8	56.8	106.8	0.8	4.0	2
4.1	3	●	MDW 0410NHGS3	19.7	25.8	80.8	0.8	5.0	1
	5	●	0410NHGS5	34.7	40.8	98.8	0.8	5.0	1
	10	●	0410NHGS10	57.7	63.8	121.8	0.8	5.0	2
4.2	3	●	MDW 0420NHGS3	19.6	25.9	80.9	0.9	5.0	1
	5	●	0420NHGS5	34.6	40.9	98.9	0.9	5.0	1
	10	●	0420NHGS10	57.6	63.9	121.9	0.9	5.0	2
4.3	3	●	MDW 0430NHGS3	19.5	25.9	80.9	0.9	5.0	1
	5	●	0430NHGS5	34.5	40.9	98.9	0.9	5.0	1
	10	●	0430NHGS10	57.5	63.9	121.9	0.9	5.0	2
4.4	3	●	MDW 0440NHGS3	19.3	25.9	80.9	0.9	5.0	1
	5	●	0440NHGS5	34.3	40.9	98.9	0.9	5.0	1
	10	●	0440NHGS10	57.3	63.9	121.9	0.9	5.0	2
4.5	3	●	MDW 0450NHGS3	19.2	25.9	80.9	0.9	5.0	1
	5	●	0450NHGS5	34.2	40.9	98.9	0.9	5.0	1
	10	●	0450NHGS10	57.2	63.9	121.9	0.9	5.0	2

Grade: DL1300

Diameter $\phi 4.6$ to 6.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.6	3	●	MDW 0460NHGS3	21.6	28.5	81.0	1.0	5.0	1
	5	●	0460NHGS5	38.1	45.0	99.0	1.0	5.0	1
	10	●	0460NHGS10	64.1	71.0	122.0	1.0	5.0	2
4.7	3	●	MDW 0470NHGS3	21.5	28.5	81.0	1.0	5.0	1
	5	●	0470NHGS5	38.0	45.0	99.0	1.0	5.0	1
	10	●	0470NHGS10	64.0	71.0	122.0	1.0	5.0	2
4.8	3	●	MDW 0480NHGS3	21.3	28.5	81.0	1.0	5.0	1
	5	●	0480NHGS5	37.8	45.0	99.0	1.0	5.0	1
	10	●	0480NHGS10	63.8	71.0	122.0	1.0	5.0	2
4.9	3	●	MDW 0490NHGS3	21.2	28.5	81.0	1.0	5.0	1
	5	●	0490NHGS5	37.7	45.0	99.0	1.0	5.0	1
	10	●	0490NHGS10	63.7	71.0	122.0	1.0	5.0	2
5.0	3	●	MDW 0500NHGS3	21.0	28.5	81.0	1.0	5.0	1
	5	●	0500NHGS5	37.5	45.0	99.0	1.0	5.0	1
	10	●	0500NHGS10	63.5	71.0	122.0	1.0	5.0	2
5.1	3	●	MDW 0510NHGS3	21.0	28.6	83.1	1.1	6.0	1
	5	●	0510NHGS5	37.5	45.1	101.1	1.1	6.0	1
	10	●	0510NHGS10	70.5	78.1	137.1	1.1	6.0	2
5.2	3	●	MDW 0520NHGS3	20.8	28.6	83.1	1.1	6.0	1
	5	●	0520NHGS5	37.3	45.1	101.1	1.1	6.0	1
	10	●	0520NHGS10	70.3	78.1	137.1	1.1	6.0	2
5.3	3	●	MDW 0530NHGS3	20.7	28.6	83.1	1.1	6.0	1
	5	●	0530NHGS5	37.2	45.1	101.1	1.1	6.0	1
	10	●	0530NHGS10	70.2	78.1	137.1	1.1	6.0	2
5.4	3	●	MDW 0540NHGS3	20.5	28.6	83.1	1.1	6.0	1
	5	●	0540NHGS5	37.0	45.1	101.1	1.1	6.0	1
	10	●	0540NHGS10	70.0	78.1	137.1	1.1	6.0	2
5.5	3	●	MDW 0550NHGS3	20.4	28.6	83.1	1.1	6.0	1
	5	●	0550NHGS5	36.9	45.1	101.1	1.1	6.0	1
	10	●	0550NHGS10	69.9	78.1	137.1	1.1	6.0	2
5.6	3	●	MDW 0560NHGS3	22.8	31.2	83.2	1.2	6.0	1
	5	●	0560NHGS5	40.8	49.2	101.2	1.2	6.0	1
	10	●	0560NHGS10	76.8	85.2	137.2	1.2	6.0	2
5.7	3	●	MDW 0570NHGS3	22.7	31.2	83.2	1.2	6.0	1
	5	●	0570NHGS5	40.7	49.2	101.2	1.2	6.0	1
	10	●	0570NHGS10	76.7	85.2	137.2	1.2	6.0	2
5.8	3	●	MDW 0580NHGS3	22.5	31.2	83.2	1.2	6.0	1
	5	●	0580NHGS5	40.5	49.2	101.2	1.2	6.0	1
	10	●	0580NHGS10	76.5	85.2	137.2	1.2	6.0	2
5.9	3	●	MDW 0590NHGS3	22.4	31.2	83.2	1.2	6.0	1
	5	●	0590NHGS5	40.4	49.2	101.2	1.2	6.0	1
	10	●	0590NHGS10	76.4	85.2	137.2	1.2	6.0	2
6.0	3	●	MDW 0600NHGS3	22.2	31.2	83.2	1.2	6.0	1
	5	●	0600NHGS5	40.2	49.2	101.2	1.2	6.0	1
	10	●	0600NHGS10	76.2	85.2	137.2	1.2	6.0	2
6.1	3	●	MDW 0610NHGS3	24.7	33.8	89.3	1.3	7.0	1
	5	●	0610NHGS5	44.2	53.3	110.3	1.3	7.0	1
	10	●	0610NHGS10	83.2	92.3	152.3	1.3	7.0	2
6.2	3	●	MDW 0620NHGS3	24.5	33.8	89.3	1.3	7.0	1
	5	●	0620NHGS5	44.0	53.3	110.3	1.3	7.0	1
	10	●	0620NHGS10	83.0	92.3	152.3	1.3	7.0	2
6.3	3	●	MDW 0630NHGS3	24.4	33.8	89.3	1.3	7.0	1
	5	●	0630NHGS5	43.9	53.3	110.3	1.3	7.0	1
	10	●	0630NHGS10	82.9	92.3	152.3	1.3	7.0	2

Grade: DL1300

Drilling

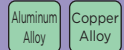
Solid

Indexable Head type

Indexable Insert type

Reamers

NHGS series (Internal Coolant Supply)



*For tolerances, refer to Chapter N - References.

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

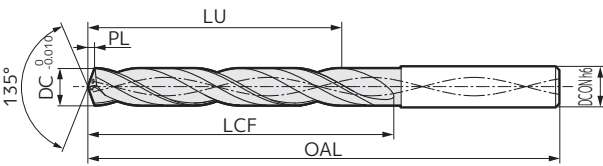
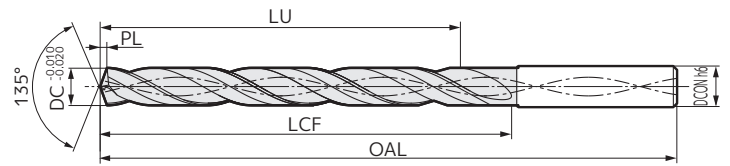


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø6.4 to 8.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCONH6	Fig
6.4	3	●	MDW 0640NHGS3	24.2	33.8	89.3	1.3	7.0	1
	5	●	0640NHGS5	43.7	53.3	110.3	1.3	7.0	1
	10	●	0640NHGS10	82.7	92.3	152.3	1.3	7.0	2
6.5	3	●	MDW 0650NHGS3	24.1	33.8	89.3	1.3	7.0	1
	5	●	0650NHGS5	43.6	53.3	110.3	1.3	7.0	1
	10	●	0650NHGS10	82.6	92.3	152.3	1.3	7.0	2
6.6	3	●	MDW 0660NHGS3	26.5	36.4	89.4	1.4	7.0	1
	5	●	0660NHGS5	47.5	57.4	110.4	1.4	7.0	1
	10	●	0660NHGS10	89.5	99.4	152.4	1.4	7.0	2
6.7	3	●	MDW 0670NHGS3	26.4	36.4	89.4	1.4	7.0	1
	5	●	0670NHGS5	47.4	57.4	110.4	1.4	7.0	1
	10	●	0670NHGS10	89.4	99.4	152.4	1.4	7.0	2
6.8	3	●	MDW 0680NHGS3	26.2	36.4	89.4	1.4	7.0	1
	5	●	0680NHGS5	47.2	57.4	110.4	1.4	7.0	1
	10	●	0680NHGS10	89.2	99.4	152.4	1.4	7.0	2
6.9	3	●	MDW 0690NHGS3	26.1	36.4	89.4	1.4	7.0	1
	5	●	0690NHGS5	47.1	57.4	110.4	1.4	7.0	1
	10	●	0690NHGS10	89.1	99.4	152.4	1.4	7.0	2
7.0	3	●	MDW 0700NHGS3	25.9	36.4	89.4	1.4	7.0	1
	5	●	0700NHGS5	46.9	57.4	110.4	1.4	7.0	1
	10	●	0700NHGS10	88.9	99.4	152.4	1.4	7.0	2
7.1	3	●	MDW 0710NHGS3	28.4	39.0	95.5	1.5	8.0	1
	5	●	0710NHGS5	50.9	61.5	119.5	1.5	8.0	1
	10	●	0710NHGS10	95.9	106.5	167.5	1.5	8.0	2
7.2	3	●	MDW 0720NHGS3	28.2	39.0	95.5	1.5	8.0	1
	5	●	0720NHGS5	50.7	61.5	119.5	1.5	8.0	1
	10	●	0720NHGS10	95.7	106.5	167.5	1.5	8.0	2
7.3	3	●	MDW 0730NHGS3	28.1	39.0	95.5	1.5	8.0	1
	5	●	0730NHGS5	50.6	61.5	119.5	1.5	8.0	1
	10	●	0730NHGS10	95.6	106.5	167.5	1.5	8.0	2
7.35	3	●	MDW 0735NHGS3	28.0	39.0	95.5	1.5	8.0	1
	5	●	0735NHGS5	50.5	61.5	119.5	1.5	8.0	1
	10	●	0735NHGS10	95.5	106.5	167.5	1.5	8.0	2
7.4	3	●	MDW 0740NHGS3	27.9	39.0	95.5	1.5	8.0	1
	5	●	0740NHGS5	50.4	61.5	119.5	1.5	8.0	1
	10	●	0740NHGS10	95.4	106.5	167.5	1.5	8.0	2
7.5	3	●	MDW 0750NHGS3	27.9	39.1	95.6	1.6	8.0	1
	5	●	0750NHGS5	50.4	61.6	119.6	1.6	8.0	1
	10	●	0750NHGS10	95.4	106.6	167.6	1.6	8.0	2
7.6	3	●	MDW 0760NHGS3	30.2	41.6	95.6	1.6	8.0	1
	5	●	0760NHGS5	54.2	65.6	119.6	1.6	8.0	1
	10	●	0760NHGS10	102.2	113.6	167.6	1.6	8.0	2
7.7	3	●	MDW 0770NHGS3	30.1	41.6	95.6	1.6	8.0	1
	5	●	0770NHGS5	54.1	65.6	119.6	1.6	8.0	1
	10	●	0770NHGS10	102.1	113.6	167.6	1.6	8.0	2
7.8	3	●	MDW 0780NHGS3	29.9	41.6	95.6	1.6	8.0	1
	5	●	0780NHGS5	53.9	65.6	119.6	1.6	8.0	1
	10	●	0780NHGS10	101.9	113.6	167.6	1.6	8.0	2
7.9	3	●	MDW 0790NHGS3	29.8	41.6	95.6	1.6	8.0	1
	5	●	0790NHGS5	53.8	65.6	119.6	1.6	8.0	1
	10	●	0790NHGS10	101.8	113.6	167.6	1.6	8.0	2
8.0	3	●	MDW 0800NHGS3	29.7	41.7	95.7	1.7	8.0	1
	5	●	0800NHGS5	53.7	65.7	119.7	1.7	8.0	1
	10	●	0800NHGS10	101.7	113.7	167.7	1.7	8.0	2

Grade: DL1300

Diameter ø8.1 to 9.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCONH6	Fig
8.1	3	●	MDW 0810NHGS3	32.1	44.2	101.7	1.7	9.0	1
	5	●	0810NHGS5	57.6	69.7	128.7	1.7	9.0	1
	10	●	0810NHGS10	108.6	120.7	182.7	1.7	9.0	2
8.2	3	●	MDW 0820NHGS3	31.9	44.2	101.7	1.7	9.0	1
	5	●	0820NHGS5	57.4	69.7	128.7	1.7	9.0	1
	10	●	0820NHGS10	108.4	120.7	182.7	1.7	9.0	2
8.3	3	●	MDW 0830NHGS3	31.8	44.2	101.7	1.7	9.0	1
	5	●	0830NHGS5	57.3	69.7	128.7	1.7	9.0	1
	10	●	0830NHGS10	108.3	120.7	182.7	1.7	9.0	2
8.4	3	●	MDW 0840NHGS3	31.6	44.2	101.7	1.7	9.0	1
	5	●	0840NHGS5	57.1	69.7	128.7	1.7	9.0	1
	10	●	0840NHGS10	108.1	120.7	182.7	1.7	9.0	2
8.5	3	●	MDW 0850NHGS3	31.6	44.3	101.8	1.8	9.0	1
	5	●	0850NHGS5	57.1	69.8	128.8	1.8	9.0	1
	10	●	0850NHGS10	108.1	120.8	182.8	1.8	9.0	2
8.6	3	●	MDW 0860NHGS3	33.9	46.8	101.8	1.8	9.0	1
	5	●	0860NHGS5	60.9	73.8	128.8	1.8	9.0	1
	10	●	0860NHGS10	114.9	127.8	182.8	1.8	9.0	2
8.7	3	●	MDW 0870NHGS3	33.8	46.8	101.8	1.8	9.0	1
	5	●	0870NHGS5	60.8	73.8	128.8	1.8	9.0	1
	10	●	0870NHGS10	114.8	127.8	182.8	1.8	9.0	2
8.8	3	●	MDW 0880NHGS3	33.6	46.8	101.8	1.8	9.0	1
	5	●	0880NHGS5	60.6	73.8	128.8	1.8	9.0	1
	10	●	0880NHGS10	114.6	127.8	182.8	1.8	9.0	2
8.9	3	●	MDW 0890NHGS3	33.5	46.8	101.8	1.8	9.0	1
	5	●	0890NHGS5	60.5	73.8	128.8	1.8	9.0	1
	10	●	0890NHGS10	114.5	127.8	182.8	1.8	9.0	2
9.0	3	●	MDW 0900NHGS3	33.4	46.9	101.9	1.9	9.0	1
	5	●	0900NHGS5	60.4	73.9	128.9	1.9	9.0	1
	10	●	0900NHGS10	114.4	127.9	182.9	1.9	9.0	2
9.1	3	●	MDW 0910NHGS3	35.8	49.4	107.9	1.9	10.0	1
	5	●	0910NHGS5	64.3	77.9	137.9	1.9	10.0	1
	10	●	0910NHGS10	121.3	134.9	197.9	1.9	10.0	2
9.2	3	●	MDW 0920NHGS3	35.6	49.4	107.9	1.9	10.0	1
	5	●	0920NHGS5	64.1	77.9	137.9	1.9	10.0	1
	10	●	0920NHGS10	121.1	134.9	197.9	1.9	10.0	2
9.21	3	●	MDW 0921NHGS3	35.6	49.4	107.9	1.9	10.0	1
	5	●	0921NHGS5	64.1	77.9	137.9	1.9	10.0	1
	10	●	0921NHGS10	121.1	134.9	197.9	1.9	10.0	2
9.3	3	●	MDW 0930NHGS3	35.5	49.4	107.9	1.9	10.0	1
	5	●	0930NHGS5	64.0	77.9	137.9	1.9	10.0	1
	10	●	0930NHGS10	121.0	134.9	197.9	1.9	10.0	2
9.4	3	●	MDW 0940NHGS3	35.3	49.4	107.9	1.9	10.0	1
	5	●	0940NHGS5	63.8	77.9	137.9	1.9	10.0	1
	10	●	0940NHGS10	120.8	134.9	197.9	1.9	10.0	2
9.5	3	●	MDW 0950NHGS3	35.3	49.5	108.0	2.0	10.0	1
	5	●	0950NHGS5	63.8	78.0	138.0	2.0	10.0	1
	10	●	0950NHGS10	120.8	135.0	198.0	2.0	10.0	2
9.6	3	●	MDW 0960NHGS3	37.6	52.0	108.0	2.0	10.0	1
	5	●	0960NHGS5	67.6	82.0	138.0	2.0	10.0	1
	10	●	0960NHGS10	127.6	142.0	198.0	2.0	10.0	2
9.7	3	●	MDW 0970NHGS3	37.5	52.0	108.0	2.0	10.0	1
	5	●	0970NHGS5	67.5	82.0	138.0	2.0	10.0	1
	10	●	0970NHGS10	127.5	142.0	198.0	2.0	10.0	2

Grade: DL1300



*For tolerances, refer to Chapter N - References.

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

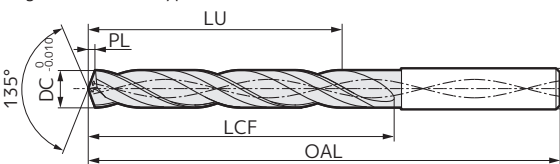
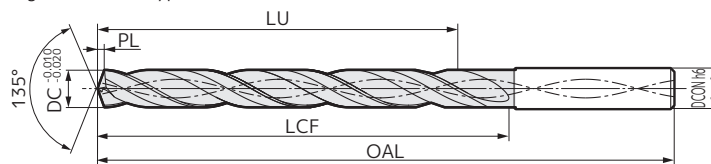


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø9.8 to 11.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCONH	Fig
9.8	3	●	MDW 0980NHGS3	37.3	52.0	108.0	2.0	10.0	1
	5	●	0980NHGS5	67.3	82.0	138.0	2.0	10.0	1
	10	●	0980NHGS10	127.3	142.0	198.0	2.0	10.0	2
9.9	3	●	MDW 0990NHGS3	37.2	52.0	108.0	2.0	10.0	1
	5	●	0990NHGS5	67.2	82.0	138.0	2.0	10.0	1
	10	●	0990NHGS10	127.2	142.0	198.0	2.0	10.0	2
10.0	3	●	MDW 1000NHGS3	37.1	52.1	108.1	2.1	10.0	1
	5	●	1000NHGS5	67.1	82.1	138.1	2.1	10.0	1
	10	●	1000NHGS10	127.1	142.1	198.1	2.1	10.0	2
10.1	3	●	MDW 1010NHGS3	39.5	54.6	118.1	2.1	11.0	1
	5	●	1010NHGS5	71.0	86.1	151.1	2.1	11.0	1
	10	●	1010NHGS10	134.0	149.1	217.1	2.1	11.0	2
10.2	3	●	MDW 1020NHGS3	39.3	54.6	118.1	2.1	11.0	1
	5	●	1020NHGS5	70.8	86.1	151.1	2.1	11.0	1
	10	●	1020NHGS10	133.8	149.1	217.1	2.1	11.0	2
10.3	3	●	MDW 1030NHGS3	39.2	54.6	118.1	2.1	11.0	1
	5	●	1030NHGS5	70.7	86.1	151.1	2.1	11.0	1
	10	●	1030NHGS10	133.7	149.1	217.1	2.1	11.0	2
10.4	3	●	MDW 1040NHGS3	39.1	54.7	118.2	2.2	11.0	1
	5	●	1040NHGS5	70.6	86.2	151.2	2.2	11.0	1
	10	●	1040NHGS10	133.6	149.2	217.2	2.2	11.0	2
10.5	3	●	MDW 1050NHGS3	39.0	54.7	118.2	2.2	11.0	1
	5	●	1050NHGS5	70.5	86.2	151.2	2.2	11.0	1
	10	●	1050NHGS10	133.5	149.2	217.2	2.2	11.0	2
10.6	3	●	MDW 1060NHGS3	41.3	57.2	118.2	2.2	11.0	1
	5	●	1060NHGS5	74.3	90.2	151.2	2.2	11.0	1
	10	●	1060NHGS10	140.3	156.2	217.2	2.2	11.0	2
10.7	3	●	MDW 1070NHGS3	41.2	57.2	118.2	2.2	11.0	1
	5	●	1070NHGS5	74.2	90.2	151.2	2.2	11.0	1
	10	●	1070NHGS10	140.2	156.2	217.2	2.2	11.0	2
10.8	3	●	MDW 1080NHGS3	41.0	57.2	118.2	2.2	11.0	1
	5	●	1080NHGS5	74.0	90.2	151.2	2.2	11.0	1
	10	●	1080NHGS10	140.0	156.2	217.2	2.2	11.0	2
10.9	3	●	MDW 1090NHGS3	41.0	57.3	118.3	2.3	11.0	1
	5	●	1090NHGS5	74.0	90.3	151.3	2.3	11.0	1
	10	●	1090NHGS10	140.0	156.3	217.3	2.3	11.0	2
11.0	3	●	MDW 1100NHGS3	40.8	57.3	118.3	2.3	11.0	1
	5	●	1100NHGS5	73.8	90.3	151.3	2.3	11.0	1
	10	●	1100NHGS10	139.8	156.3	217.3	2.3	11.0	2
11.08	3	●	MDW 1108NHGS3	43.2	59.8	124.3	2.3	12.0	1
	5	●	1108NHGS5	77.7	94.3	160.3	2.3	12.0	1
	10	●	1108NHGS10	146.7	163.3	232.3	2.3	12.0	2
11.1	3	●	MDW 1110NHGS3	43.2	59.8	124.3	2.3	12.0	1
	5	●	1110NHGS5	77.7	94.3	160.3	2.3	12.0	1
	10	●	1110NHGS10	146.7	163.3	232.3	2.3	12.0	2
11.2	3	●	MDW 1120NHGS3	43.0	59.8	124.3	2.3	12.0	1
	5	●	1120NHGS5	77.5	94.3	160.3	2.3	12.0	1
	10	●	1120NHGS10	146.5	163.3	232.3	2.3	12.0	2
11.3	3	●	MDW 1130NHGS3	42.9	59.8	124.3	2.3	12.0	1
	5	●	1130NHGS5	77.4	94.3	160.3	2.3	12.0	1
	10	●	1130NHGS10	146.4	163.3	232.3	2.3	12.0	2
11.4	3	●	MDW 1140NHGS3	42.8	59.9	124.4	2.4	12.0	1
	5	●	1140NHGS5	77.3	94.4	160.4	2.4	12.0	1
	10	●	1140NHGS10	146.3	163.4	232.4	2.4	12.0	2

Grade: DL1300

Diameter ø11.5 to 13.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCONH	Fig
11.5	3	●	MDW 1150NHGS3	42.7	59.9	124.4	2.4	12.0	1
	5	●	1150NHGS5	77.2	94.4	160.4	2.4	12.0	1
	10	●	1150NHGS10	146.2	163.4	232.4	2.4	12.0	2
11.6	3	●	MDW 1160NHGS3	45.0	62.4	124.4	2.4	12.0	1
	5	●	1160NHGS5	81.0	98.4	160.4	2.4	12.0	1
	10	●	1160NHGS10	153.0	170.4	232.4	2.4	12.0	2
11.7	3	●	MDW 1170NHGS3	44.9	62.4	124.4	2.4	12.0	1
	5	●	1170NHGS5	80.9	98.4	160.4	2.4	12.0	1
	10	●	1170NHGS10	152.9	170.4	232.4	2.4	12.0	2
11.8	3	●	MDW 1180NHGS3	44.7	62.4	124.4	2.4	12.0	1
	5	●	1180NHGS5	80.7	98.4	160.4	2.4	12.0	1
	10	●	1180NHGS10	152.7	170.4	232.4	2.4	12.0	2
11.9	3	●	MDW 1190NHGS3	44.7	62.5	124.5	2.5	12.0	1
	5	●	1190NHGS5	80.7	98.5	160.5	2.5	12.0	1
	10	●	1190NHGS10	152.7	170.5	232.5	2.5	12.0	2
12.0	3	●	MDW 1200NHGS3	44.5	62.5	124.5	2.5	12.0	1
	5	●	1200NHGS5	80.5	98.5	160.5	2.5	12.0	1
	10	●	1200NHGS10	152.5	170.5	232.5	2.5	12.0	2
12.1	3	●	MDW 1210NHGS3	46.9	65.0	130.5	2.5	13.0	1
	5	●	1210NHGS5	84.4	102.5	169.5	2.5	13.0	1
	10	●	1210NHGS10	159.4	177.5	247.5	2.5	13.0	2
12.2	3	●	MDW 1220NHGS3	46.7	65.0	130.5	2.5	13.0	1
	5	●	1220NHGS5	84.2	102.5	169.5	2.5	13.0	1
	10	●	1220NHGS10	159.2	177.5	247.5	2.5	13.0	2
12.3	3	●	MDW 1230NHGS3	46.6	65.0	130.5	2.5	13.0	1
	5	●	1230NHGS5	84.1	102.5	169.5	2.5	13.0	1
	10	●	1230NHGS10	159.1	177.5	247.5	2.5	13.0	2
12.4	3	●	MDW 1240NHGS3	46.5	65.1	130.6	2.6	13.0	1
	5	●	1240NHGS5	84.0	102.6	169.6	2.6	13.0	1
	10	●	1240NHGS10	159.0	177.6	247.6	2.6	13.0	2
12.5	3	●	MDW 1250NHGS3	46.4	65.1	130.6	2.6	13.0	1
	5	●	1250NHGS5	83.9	102.6	169.6	2.6	13.0	1
	10	●	1250NHGS10	158.9	177.6	247.6	2.6	13.0	2
12.6	3	●	MDW 1260NHGS3	48.7	67.6	130.6	2.6	13.0	1
	5	●	1260NHGS5	87.7	106.6	169.6	2.6	13.0	1
	10	●	1260NHGS10	165.7	184.6	247.6	2.6	13.0	2
12.7	3	●	MDW 1270NHGS3	48.6	67.6	130.6	2.6	13.0	1
	5	●	1270NHGS5	87.6	106.6	169.6	2.6	13.0	1
	10	●	1270NHGS10	165.6	184.6	247.6	2.6	13.0	2
12.8	3	●	MDW 1280NHGS3	48.4	67.6	130.6	2.6	13.0	1
	5	●	1280NHGS5	87.4	106.6	169.6	2.6	13.0	1
	10	●	1280NHGS10	165.4	184.6	247.6	2.6	13.0	2
12.9	3	●	MDW 1290NHGS3	48.4	67.7	130.7	2.7	13.0	1
	5	●	1290NHGS5	87.4	106.7	169.7	2.7	13.0	1
	10	●	1290NHGS10	165.4	184.7	247.7	2.7	13.0	2
12.96	3	●	MDW 1296NHGS3	48.3	67.7	130.7	2.7	13.0	1
	5	●	1296NHGS5	87.3	106.7	169.7	2.7	13.0	1
	10	●	1296NHGS10	165.3	184.7	247.7	2.7	13.0	2
13.0	3	●	MDW 1300NHGS3	48.2	67.7	130.7	2.7	13.0	1
	5	●	1300NHGS5	87.2	106.7	169.7	2.7	13.0	1
	10	●	1300NHGS10	165.2	184.7	247.7	2.7	13.0	2
13.1	3	●	MDW 1310NHGS3	50.6	70.2	136.7	2.7	14.0	1
	5	●	1310NHGS5	91.1	110.7	178.7	2.7	14.0	1
	10	●	1310NHGS10	172.1	191.7	262.7	2.7	14.0	2

Grade: DL1300

NHGS series (Internal Coolant Supply)



*For tolerances, refer to Chapter N - References.

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

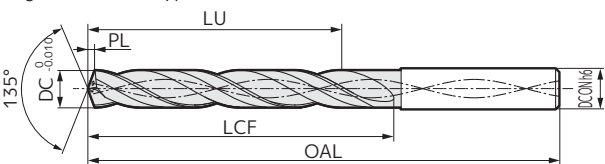
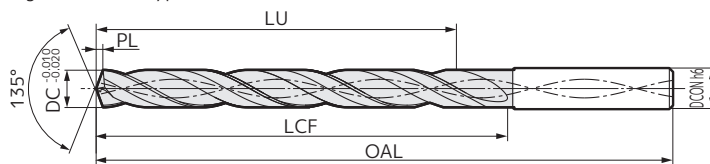


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø13.2 to 14.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.2	3	●	MDW 1320NHGS3	50.4	70.2	136.7	2.7	14.0	1
	5	●	1320NHGS5	90.9	110.7	178.7	2.7	14.0	1
	10	●	1320NHGS10	171.9	191.7	262.7	2.7	14.0	2
13.3	3	●	MDW 1330NHGS3	50.4	70.3	136.8	2.8	14.0	1
	5	●	1330NHGS5	90.9	110.8	178.8	2.8	14.0	1
	10	●	1330NHGS10	171.9	191.8	262.8	2.8	14.0	2
13.4	3	●	MDW 1340NHGS3	50.2	70.3	136.8	2.8	14.0	1
	5	●	1340NHGS5	90.7	110.8	178.8	2.8	14.0	1
	10	●	1340NHGS10	171.7	191.8	262.8	2.8	14.0	2
13.5	3	●	MDW 1350NHGS3	50.1	70.3	136.8	2.8	14.0	1
	5	●	1350NHGS5	90.6	110.8	178.8	2.8	14.0	1
	10	●	1350NHGS10	171.6	191.8	262.8	2.8	14.0	2
13.6	3	●	MDW 1360NHGS3	52.4	72.8	136.8	2.8	14.0	1
	5	●	1360NHGS5	94.4	114.8	178.8	2.8	14.0	1
	10	●	1360NHGS10	178.4	198.8	262.8	2.8	14.0	2
13.7	3	●	MDW 1370NHGS3	52.3	72.8	136.8	2.8	14.0	1
	5	●	1370NHGS5	94.3	114.8	178.8	2.8	14.0	1
	10	●	1370NHGS10	178.3	198.8	262.8	2.8	14.0	2
13.8	3	●	MDW 1380NHGS3	52.2	72.9	136.9	2.9	14.0	1
	5	●	1380NHGS5	94.2	114.9	178.9	2.9	14.0	1
	10	●	1380NHGS10	178.2	198.9	262.9	2.9	14.0	2
13.9	3	●	MDW 1390NHGS3	52.1	72.9	136.9	2.9	14.0	1
	5	●	1390NHGS5	94.1	114.9	178.9	2.9	14.0	1
	10	●	1390NHGS10	178.1	198.9	262.9	2.9	14.0	2
14.0	3	●	MDW 1400NHGS3	51.9	72.9	136.9	2.9	14.0	1
	5	●	1400NHGS5	93.9	114.9	178.9	2.9	14.0	1
	10	●	1400NHGS10	177.9	198.9	262.9	2.9	14.0	2
14.1	3	●	MDW 1410NHGS3	54.3	75.4	142.9	2.9	15.0	1
	5	●	1410NHGS5	97.8	118.9	187.9	2.9	15.0	1
	10	●	1410NHGS10	184.8	205.9	277.9	2.9	15.0	2
14.2	3	●	MDW 1420NHGS3	54.1	75.4	142.9	2.9	15.0	1
	5	●	1420NHGS5	97.6	118.9	187.9	2.9	15.0	1
	10	●	1420NHGS10	184.6	205.9	277.9	2.9	15.0	2
14.3	3	●	MDW 1430NHGS3	54.1	75.5	143.0	3.0	15.0	1
	5	●	1430NHGS5	97.6	119.0	188.0	3.0	15.0	1
	10	●	1430NHGS10	184.6	206.0	278.0	3.0	15.0	2
14.4	3	●	MDW 1440NHGS3	53.9	75.5	143.0	3.0	15.0	1
	5	●	1440NHGS5	97.4	119.0	188.0	3.0	15.0	1
	10	●	1440NHGS10	184.4	206.0	278.0	3.0	15.0	2
14.5	3	●	MDW 1450NHGS3	53.8	75.5	143.0	3.0	15.0	1
	5	●	1450NHGS5	97.3	119.0	188.0	3.0	15.0	1
	10	●	1450NHGS10	184.3	206.0	278.0	3.0	15.0	2
14.6	3	●	MDW 1460NHGS3	56.1	78.0	143.0	3.0	15.0	1
	5	●	1460NHGS5	101.1	123.0	188.0	3.0	15.0	1
	10	●	1460NHGS10	191.1	213.0	278.0	3.0	15.0	2
14.7	3	●	MDW 1470NHGS3	56.0	78.0	143.0	3.0	15.0	1
	5	●	1470NHGS5	101.0	123.0	188.0	3.0	15.0	1
	10	●	1470NHGS10	191.0	213.0	278.0	3.0	15.0	2
14.8	3	●	MDW 1480NHGS3	55.9	78.1	143.1	3.1	15.0	1
	5	●	1480NHGS5	100.9	123.1	188.1	3.1	15.0	1
	10	●	1480NHGS10	190.9	213.1	278.1	3.1	15.0	2
14.9	3	●	MDW 1490NHGS3	55.8	78.1	143.1	3.1	15.0	1
	5	●	1490NHGS5	100.8	123.1	188.1	3.1	15.0	1
	10	●	1490NHGS10	190.8	213.1	278.1	3.1	15.0	2

Grade: DL1300

Diameter ø14.96 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
14.96	3	●	MDW 1496NHGS3	55.7	78.1	143.1	3.1	15.0	1
	5	●	1496NHGS5	100.7	123.1	188.1	3.1	15.0	1
	10	●	1496NHGS10	190.7	213.1	278.1	3.1	15.0	2
15.0	3	●	MDW 1500NHGS3	55.6	78.1	143.1	3.1	15.0	1
	5	●	1500NHGS5	100.6	123.1	188.1	3.1	15.0	1
	10	●	1500NHGS10	190.6	213.1	278.1	3.1	15.0	2
15.1	3	●	MDW 1510NHGS3	58.0	80.6	149.1	3.1	16.0	1
	5	●	1510NHGS5	104.5	127.1	197.1	3.1	16.0	1
	10	●	1510NHGS10	197.5	220.1	293.1	3.1	16.0	2
15.2	3	●	MDW 1520NHGS3	57.8	80.6	149.1	3.1	16.0	1
	5	●	1520NHGS5	104.3	127.1	197.1	3.1	16.0	1
	10	●	1520NHGS10	197.3	220.1	293.1	3.1	16.0	2
15.3	3	●	MDW 1530NHGS3	57.8	80.7	149.2	3.2	16.0	1
	5	●	1530NHGS5	104.3	127.2	197.2	3.2	16.0	1
	10	●	1530NHGS10	197.3	220.2	293.2	3.2	16.0	2
15.4	3	●	MDW 1540NHGS3	57.6	80.7	149.2	3.2	16.0	1
	5	●	1540NHGS5	104.1	127.2	197.2	3.2	16.0	1
	10	●	1540NHGS10	197.1	220.2	293.2	3.2	16.0	2
15.5	3	●	MDW 1550NHGS3	57.5	80.7	149.2	3.2	16.0	1
	5	●	1550NHGS5	104.0	127.2	197.2	3.2	16.0	1
	10	●	1550NHGS10	197.0	220.2	293.2	3.2	16.0	2
15.6	3	●	MDW 1560NHGS3	59.8	83.2	149.2	3.2	16.0	1
	5	●	1560NHGS5	107.8	131.2	197.2	3.2	16.0	1
	10	●	1560NHGS10	203.8	227.2	293.2	3.2	16.0	2
15.7	3	●	MDW 1570NHGS3	59.7	83.2	149.2	3.2	16.0	1
	5	●	1570NHGS5	107.7	131.2	197.2	3.2	16.0	1
	10	●	1570NHGS10	203.7	227.2	293.2	3.2	16.0	2
15.8	3	●	MDW 1580NHGS3	59.6	83.3	149.3	3.3	16.0	1
	5	●	1580NHGS5	107.6	131.3	197.3	3.3	16.0	1
	10	●	1580NHGS10	203.6	227.3	293.3	3.3	16.0	2
15.9	3	●	MDW 1590NHGS3	59.5	83.3	149.3	3.3	16.0	1
	5	●	1590NHGS5	107.5	131.3	197.3	3.3	16.0	1
	10	●	1590NHGS10	203.5	227.3	293.3	3.3	16.0	2
16.0	3	●	MDW 1600NHGS3	59.3	83.3	149.3	3.3	16.0	1
	5	●	1600NHGS5	107.3	131.3	197.3	3.3	16.0	1
	10	●	1600NHGS10	203.3	227.3	293.3	3.3	16.0	2

Grade: DL1300

Recommended Cutting Conditions

(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Aluminum alloy castings/ aluminum alloy die castings	Wrought Aluminum Alloy
ø6.0	n	7,400	6,400
	vc	80 - 140 - 200	80 - 120 - 200
	f	0.2 - 0.4 - 0.6	0.2 - 0.3 - 0.4
ø10.0	n	5,700	4,800
	vc	100 - 180 - 250	100 - 150 - 250
	f	0.4 - 0.6 - 0.8	0.2 - 0.35 - 0.5
ø16.0	n	4,000	3,600
	vc	120 - 200 - 250	120 - 180 - 250
	f	0.4 - 0.7 - 1.0	0.3 - 0.45 - 0.6

Min. - Optimum - Max.



General Features

SUMIDIA Coat SDC series drills for carbon fibre reinforced plastic (CFRP) employ our proprietary multi-stepped point angle. Combined with a diamond coating, improved drilled hole quality and long tool life can be achieved.

Product Range

Cat. No.	Diameter Range (mm)	Point Angle	Hole Depth (L/D)
MDS□□□□SDC3	ø2.0 to ø4.0	90°	up to 3
	ø4.851 to ø10.0	130°	

Features and Applications

Excellent Drilled-Hole Quality

- Sharp cutting edge shape reduces delamination of fibre layers and minimizes burrs.
- Continuously changing point angle, disperses the load placed on the cutting edge and preventing breakage.

Long Tool Life

- Utilises high-strength diamond coating with excellent adhesion, delivering high quality and long tool life.

Performance

Comparison of Machined Surface Quality				
Excellent drilled hole surface quality Prevents Delamination and Burrs				
	SDC series	Competitor's Product A	Competitor's Product B	Competitor's Product C
Entrance				
Exit				
Tool : SUMIDIA Coat Drill SDC series ø6.35 Work Material : CFRP Cutting Conditions: $n = 6,000 \text{ min}^{-1}$, $f = 0.1 \text{ mm/rev}$, $H = 28 \text{ mm}$ (Through), Dry				

Tool Life Comparison	
Effects of Diamond Coating	
SDC series (After Drilling 600 Holes) No delamination Minimal flank wear	Competitor's Product (After Drilling 50 Holes) Large delamination from cutting edge to flank
Stable diamond layer adhesion prevents delamination. Excellent wear resistance enables high-quality drilling with long tool life.	
SDC series Tool : SUMIDIA Coat Drill ø6.35 Work Material : CFRP Cutting Conditions: $n = 6,000 \text{ min}^{-1}$, $f = 0.075 \text{ mm/rev}$, $H = 15 \text{ mm}$ (Through), Dry	



*For tolerances, refer to Chapter N - References.

Fig 1 (Diameter ø2.0 to 4.0mm)

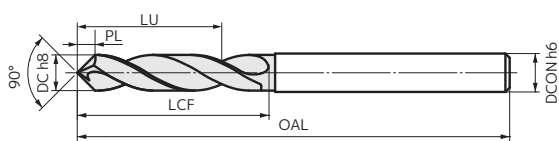
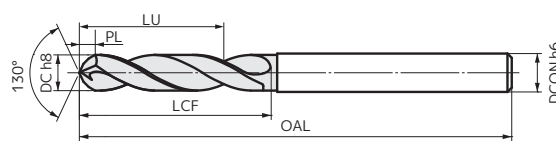


Fig 2 (Diameter ø4.851 to 10.0mm)



Diameter ø2.0 to 10.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.0	3	●	MDS 02000SDC3	10.50	13.5	50.0	1.0	2.0	1
2.489	3	●	02489SDC3	12.47	16.2	50.2	1.2	2.489	1
3.0	3	●	03000SDC3	14.5	19.0	50.5	1.5	3.0	1
3.300	3	●	03300SDC3	16.8	21.7	61.7	1.7	3.300	1
4.0	3	●	04000SDC3	18.5	24.5	62.0	2.0	4.0	1
4.851	3	●	04851SDC3	21.3	28.6	77.1	1.1	4.851	2
5.0	3	●	05000SDC3	21.2	28.7	77.2	1.2	5.0	2
5.6	3	●	05600SDC3	22.9	31.3	82.3	1.3	5.6	2
6.0	3	●	06000SDC3	22.4	31.4	82.4	1.4	6.0	2
6.375	3	●	06375SDC3	24.4	34.0	84.5	1.5	6.375	2
7.0	3	●	07000SDC3	26.1	36.6	84.6	1.6	7.0	2
7.938	3	●	07938SDC3	30.0	41.9	91.9	1.9	7.938	2
8.0	3	●	08000SDC3	29.9	41.9	91.9	1.9	8.0	2
9.0	3	●	09000SDC3	33.6	47.1	100.1	2.1	9.0	2
9.550	3	●	09550SDC3	37.9	52.2	107.2	2.2	9.550	2
10.0	3	●	10000SDC3	37.3	52.3	107.3	2.3	10.0	2

Grade: DCX20

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	CFRP Only (Dry Drilling)	Stacked Sheets of CFRP and Aluminum Alloys (Dry Drilling)
ø6.0	n	6,400	3,200
	vc	80 - 120 - 150	40 - 60 - 80
	f	0.05 - 0.08 - 0.10	0.03 - 0.05 - 0.10
ø12.0	n	2,700	1,600
	vc	80 - 100 - 120	40 - 60 - 80
	f	0.05 - 0.08 - 0.10	0.03 - 0.05 - 0.10

Min. - Optimum - Max.



From General to High Precision Drilling of Aluminum Alloys

- High precision DAL series is able to produce holes of IT Class of 7 to 8.
- General DDL series is able to produce holes of IT class 11 to 12, mainly for pre-tap hole drilling.

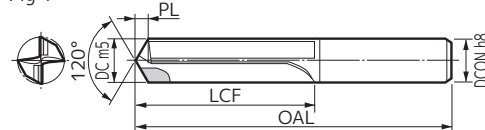
DAL series

*For tolerances, refer to Chapter N - References. Dimensions (mm)

Grade Classification		SUMIDIA				
Process	High-speed/Light Cutting	N				
	Medium Cutting					
	Roughing					
Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DAL 0500H to 0600H		$\phi 5 \leq DC \leq \phi 6$	31.6	81.6	1.6	1
0601H to 0700H		$\phi 6 < DC \leq \phi 7$	36.9	91.9	1.9	1
0701H to 0800H		$\phi 7 < DC \leq \phi 8$	37.2	92.2	2.2	1
0801H to 0900H		$\phi 8 < DC \leq \phi 9$	42.5	102.5	2.5	1
0901H to 1000H		$\phi 9 < DC \leq \phi 10$	42.8	102.8	2.8	1
1001H to 1100H		$\phi 10 < DC \leq \phi 11$	53.1	113.1	3.1	1
1101H to 1200H		$\phi 11 < DC \leq \phi 12$	53.4	113.4	3.4	1

Ordering numbers should be handled according to this example: $\phi 6.05\text{mm}$ drill $\rightarrow$ DAL0605H.

Fig 1



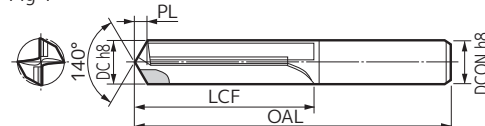
DDL series

*For tolerances, refer to Chapter N - References. Dimensions (mm)

Grade Classification		SUMIDIA				
Process	High-speed/Light Cutting	N				
	Medium Cutting					
	Roughing					
Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DDL 050V to 060V		$\phi 5 \leq DC \leq \phi 6$	31.5	81.0	1.0	1
061V to 070V		$\phi 6 < DC \leq \phi 7$	36.2	91.2	1.2	1
071V to 080V		$\phi 7 < DC \leq \phi 8$	36.4	91.4	1.4	1
081V to 090V		$\phi 8 < DC \leq \phi 9$	41.6	101.6	1.6	1
091V to 100V		$\phi 9 < DC \leq \phi 10$	41.7	101.7	1.7	1
101V to 110V		$\phi 10 < DC \leq \phi 11$	51.9	111.9	1.9	1
111V to 120V		$\phi 11 < DC \leq \phi 12$	52.1	112.1	2.1	1

Ordering numbers should be handled according to this example: $\phi 10.5\text{mm}$ drill $\rightarrow$ DDL105V.

Fig 1



Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	DAL series	DDL series	Depth of Cut	Oil
$\phi 8.0$	n	4,000	8,000	L/D= Below 3	Emulsion type
	vc	80 - 100 - 150	150 - 200 - 250		
	f	0.05 - 0.1 - 0.15	0.1 - 0.15 - 0.25		
$\phi 12.0$	n	2,700	5,300	L/D= Below 3	Emulsion type
	vc	80 - 100 - 150	150 - 200 - 250		
	f	0.08 - 0.13 - 0.2	0.15 - 0.2 - 0.3		

Min. - Optimum - Max.

Important Notes

- When using DAL series for high-precision machining, select a high rigidity machine and high precision holder.
- Supply coolant generously at the entrance of the hole.

MLDH-L type / MLDH-P type



■ Features

Micro Long Drills are oil-hole drills for high-efficiency drilling developed for drilling deep, small-diameter holes. Featuring improved drill strength, often a problem area with small drills.

● Deep hole drilling

Flute shape ensures good drill rigidity and chip evacuation. High-efficiency drilling to depths of over 20 times the diameter at over $v_f = 500\text{mm/min}$ (for drill diameter $\phi 1.3\text{mm}$ on SUS416 equivalent). Optimal thinning and edge balance for stable chip control.

● Long tool life

Special coating provides long tool life with a wide variety of work materials.

Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring stable tool life.

■ Product Range

Applications	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of Items
Deep Hole Drilling	MLDH□□□□L5	$\phi 0.8$ to 2.0	up to 5	41 items in stock
	MLDH□□□□L12	$\phi 0.8$ to 2.0	up to 12	41 items in stock
	MLDH□□□□L20	$\phi 0.8$ to 2.0	up to 20	41 items in stock
	MLDH□□□□L30	$\phi 0.8$ to 2.0	up to 30	41 items in stock
For Guide Hole	MLDH□□□□P	$\phi 0.8$ to 2.0	up to 2	41 items in stock

■ Recommended Cutting Conditions

MLDH-P type / MLDH-L5 type

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel up to 200HB	General Steel up to 250HB	Alloy Steel up to 300HB	Stainless Steel up to 200HB	Cast Iron FC/FCD	Aluminum Alloy	Heat-resistant Alloy
$\phi 1.0$	n	16,000	16,000	16,000	9,500	16,000	19,000	3,200
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
$\phi 1.5$	n	11,000	11,000	11,000	6,400	11,000	13,000	2,100
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.02 - 0.05 - 0.10	0.04 - 0.08 - 0.12	0.05 - 0.10 - 0.15	0.01 - 0.03 - 0.05
$\phi 2.0$	n	8,000	8,000	8,000	4,800	8,000	9,500	1,600
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.04 - 0.06 - 0.10	0.06 - 0.08 - 0.12	0.08 - 0.12 - 0.15	0.01 - 0.03 - 0.05

Min. - Optimum - Max.

MLDH-L12 type / MLDH-L20 type / MLDH-L30 type

Diameter DC (mm)	Cutting Conditions	Mild Steel up to 200HB	General Steel up to 250HB	Alloy Steel up to 300HB	Stainless Steel up to 200HB	Cast Iron FC/FCD	Aluminum Alloy	Heat-resistant Alloy
$\phi 1.0$	n	16,000	16,000	16,000	9,500	16,000	19,000	3,200
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
$\phi 1.5$	n	11,000	11,000	11,000	6,400	11,000	13,000	2,100
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.02 - 0.04 - 0.07	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03
$\phi 2.0$	n	8,000	8,000	8,000	4,800	8,000	9,500	1,600
	vc	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03

* If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available. In this case, the tool life may be shortened.

Min. - Optimum - Max.

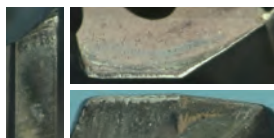
■ Application Examples

● Automotive component molds (equivalent to SUS416)

Tool : MLDH 1400L20 (guide: MLDH1400P)
Machine : Vertical Machining Centre (HSKA63)
Coolant : Internal Coolant Supply (Emulsion type, pump source pressure: 4MPa)

Cutting Conditions: $vc = 60\text{m/min}$,
 $f = 0.03\text{mm/rev}$,
 $H = 21\text{mm}$

Tool Life : 600 holes (11.4m)

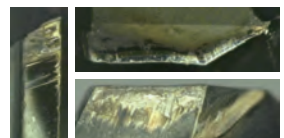


● Tooling components (equivalent to SKD11)

Tool : MLDH 1900L20 (guide: MLDH1900P)
Machine : Vertical Machining Centre (HSKA63)
Coolant : Internal Coolant Supply (Emulsion type, pump source pressure: 4MPa)

Cutting Conditions: $vc = 60\text{m/min}$,
 $f = 0.10\text{mm/rev}$,
 $H = 27\text{mm}$

Tool Life : 600 units (18m)



MLDH-L type/MLDH-P type (Internal Coolant Supply)

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
Alloy

Fig 1 (MLDH-P type)

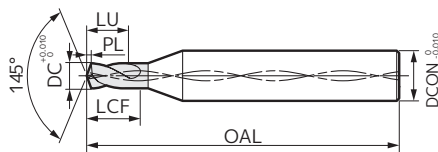
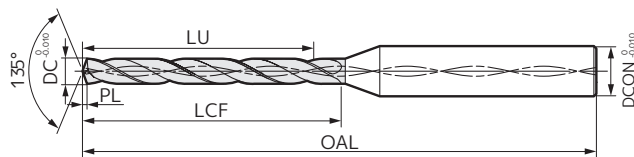


Fig 2 (MLDH-L type)



Diameter ø0.80 to 0.90mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
0.80	2	●	MLDH 0800P	2.0	3.2	45	0.1	3.0	1
	5	●	0800L5	6.8	8	50.0	0.2	3.0	2
	12	●	0800L12	12.8	14	55	0.2	3.0	2
	20	●	0800L20	17.8	19	60	0.2	3.0	2
	30	●	0800L30	26.8	28	70	0.2	3.0	2
0.81	2	●	MLDH 0810P	2.0	3.2	45	0.1	3.0	1
	5	●	0810L5	7.8	9	50.0	0.2	3.0	2
	12	●	0810L12	12.8	14	55	0.2	3.0	2
	20	●	0810L20	17.8	19	60	0.2	3.0	2
	30	●	0810L30	26.8	28	70	0.2	3.0	2
0.82	2	●	MLDH 0820P	2.1	3.3	45	0.1	3.0	1
	5	●	0820L5	7.8	9	50.0	0.2	3.0	2
	12	●	0820L12	12.8	14	55	0.2	3.0	2
	20	●	0820L20	18.8	20	60	0.2	3.0	2
	30	●	0820L30	26.8	28	70	0.2	3.0	2
0.83	2	●	MLDH 0830P	2.1	3.3	45	0.1	3.0	1
	5	●	0830L5	7.8	9	50.0	0.2	3.0	2
	12	●	0830L12	12.8	14	55	0.2	3.0	2
	20	●	0830L20	18.8	20	60	0.2	3.0	2
	30	●	0830L30	26.8	28	70	0.2	3.0	2
0.84	2	●	MLDH 0840P	2.1	3.4	45	0.1	3.0	1
	5	●	0840L5	7.7	9	50.0	0.2	3.0	2
	12	●	0840L12	12.7	14	55	0.2	3.0	2
	20	●	0840L20	18.7	20	60	0.2	3.0	2
	30	●	0840L30	27.7	29	70	0.2	3.0	2
0.85	2	●	MLDH 0850P	2.1	3.4	45	0.1	3.0	1
	5	●	0850L5	7.7	9	50.0	0.2	3.0	2
	12	●	0850L12	12.7	14	55	0.2	3.0	2
	20	●	0850L20	18.7	20	60	0.2	3.0	2
	30	●	0850L30	27.7	29	70	0.2	3.0	2
0.86	2	●	MLDH 0860P	2.1	3.4	45	0.1	3.0	1
	5	●	0860L5	7.7	9	50.0	0.2	3.0	2
	12	●	0860L12	13.7	15	55	0.2	3.0	2
	20	●	0860L20	19.7	21	65	0.2	3.0	2
	30	●	0860L30	27.7	29	70	0.2	3.0	2
0.87	2	●	MLDH 0870P	2.2	3.5	45	0.1	3.0	1
	5	●	0870L5	7.7	9	50.0	0.2	3.0	2
	12	●	0870L12	13.7	15	55	0.2	3.0	2
	20	●	0870L20	19.7	21	65	0.2	3.0	2
	30	●	0870L30	28.7	30	70	0.2	3.0	2
0.88	2	●	MLDH 0880P	2.2	3.5	45	0.1	3.0	1
	5	●	0880L5	7.7	9	50.0	0.2	3.0	2
	12	●	0880L12	13.7	15	55	0.2	3.0	2
	20	●	0880L20	19.7	21	65	0.2	3.0	2
	30	●	0880L30	28.7	30	70	0.2	3.0	2
0.89	2	●	MLDH 0890P	2.3	3.6	45	0.1	3.0	1
	5	●	0890L5	7.7	9	50.0	0.2	3.0	2
	12	●	0890L12	13.7	15	55	0.2	3.0	2
	20	●	0890L20	19.7	21	65	0.2	3.0	2
	30	●	0890L30	28.7	30	70	0.2	3.0	2
0.90	2	●	MLDH 0900P	2.3	3.6	45	0.1	3.0	1
	5	●	0900L5	7.7	9	50.0	0.2	3.0	2
	12	●	0900L12	13.7	15	55	0.2	3.0	2
	20	●	0900L20	20.7	22	65	0.2	3.0	2
	30	●	0900L30	29.7	31	75	0.2	3.0	2

Part Number Suffix - P: For Guide Hole

Grade: ACV70

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

Diameter ø0.91 to 1.05mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
0.91	2	●	MLDH 0910P	2.2	3.6	45	0.1	3.0	1
	5	●	0910L5	8.6	10	50.0	0.2	3.0	2
	12	●	0910L12	13.6	15	55	0.2	3.0	2
	20	●	0910L20	20.6	22	65	0.2	3.0	2
	30	●	0910L30	29.6	31	75	0.2	3.0	2
0.92	2	●	MLDH 0920P	2.3	3.7	45	0.1	3.0	1
	5	●	0920L5	8.6	10	50.0	0.2	3.0	2
	12	●	0920L12	14.6	16	60	0.2	3.0	2
	20	●	0920L20	20.6	22	65	0.2	3.0	2
	30	●	0920L30	29.6	31	75	0.2	3.0	2
0.93	2	●	MLDH 0930P	2.3	3.7	45	0.1	3.0	1
	5	●	0930L5	8.6	10	50.0	0.2	3.0	2
	12	●	0930L12	14.6	16	60	0.2	3.0	2
	20	●	0930L20	20.6	22	65	0.2	3.0	2
	30	●	0930L30	30.6	32	75	0.2	3.0	2
0.94	2	●	MLDH 0940P	2.4	3.8	45	0.1	3.0	1
	5	●	0940L5	8.6	10	50.0	0.2	3.0	2
	12	●	0940L12	14.6	16	60	0.2	3.0	2
	20	●	0940L20	21.6	23	65	0.2	3.0	2
	30	●	0940L30	30.6	32	75	0.2	3.0	2
0.95	2	●	MLDH 0950P	2.4	3.8	45	0.2	3.0	1
	5	●	0950L5	8.6	10	50.0	0.2	3.0	2
	12	●	0950L12	14.6	16	60	0.2	3.0	2
	20	●	0950L20	21.6	23	65	0.2	3.0	2
	30	●	0950L30	30.6	32	75	0.2	3.0	2
0.96	2	●	MLDH 0960P	2.4	3.8	45	0.2	3.0	1
	5	●	0960L5	8.6	10	50.0	0.2	3.0	2
	12	●	0960L12	14.6	16	60	0.2	3.0	2
	20	●	0960L20	21.6	23	65	0.2	3.0	2
	30	●	0960L30	31.6	33	75	0.2	3.0	2
0.97	2	●	MLDH 0970P	2.4	3.9	45	0.2	3.0	1
	5	●	0970L5	8.5	10	50.0	0.2	3.0	2
	12	●	0970L12	14.5	16	60	0.2	3.0	2
	20	●	0970L20	21.5	23	65	0.2	3.0	2
	30	●	0970L30	31.5	33	75	0.2	3.0	2
0.98	2	●	MLDH 0980P	2.4	3.9	45	0.2	3.0	1
	5	●	0980L5	8.5	10	50.0	0.2	3.0	2
	12	●	0980L12	15.5	17	60	0.2	3.0	2
	20	●	0980L20	22.5	24	65	0.2	3.0	2
	30	●	0980L30	31.5	33	75	0.2	3.0	2
0.99	2	●	MLDH 0990P	2.5	4	45	0.2	3.0	1
	5	●	0990L5	8.5	10	50.0	0.2	3.0	2
	12	●	0990L12	15.5	17	60	0.2	3.0	2
	20	●	0990L20	22.5	24	65	0.2	3.0	2
	30	●	0990L30	32.5	34	75	0.2	3.0	2
1.00	2	●	MLDH 1000P	2.5	4	45	0.2	3.0	1
	5	●	1000L5	8.5	10	50.0	0.2	3.0	2
	12	●	1000L12	15.5	17	60	0.2	3.0	2
	20	●	1000L20	22.5	24	65	0.2	3.0	2
	30	●	1000L30	32.5	34	75	0.2	3.0	2
1.05	2	●	MLDH 1050P	2.6	4.2	45	0.2	3.0	1
	5	●	1050L5	10.4	12	55.0	0.2	3.0	2
	12	●	1050L12	16.4	18	60	0.2	3.0	2
	20	●	1050L20	23.4	25	65	0.2	3.0	2
	30	●	1050L30	34.4	36	80	0.2	3.0	2

Part Number Suffix - P: For Guide Hole

Grade: ACV70

Made-to-order items: Contact us for drills in diameters and lengths that are not listed in the dimensions above or not in stock.



Fig 1 (MLDH-P type)

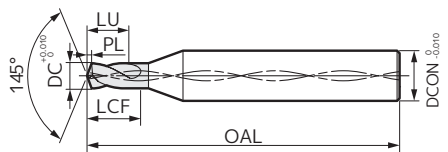
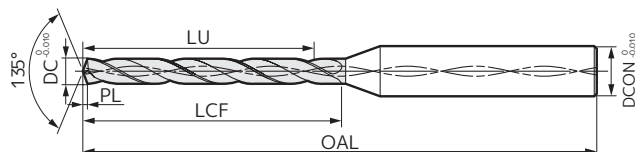


Fig 2 (MLDH-L type)

Diameter ϕ 1.10 to 1.60mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.10	2	●	MLDH 1100P	2.8	4.4	45	0.2	3.0	1
	5	●	1100L5	10.4	12	55.0	0.2	3.0	2
	12	●	1100L12	17.4	19	60	0.2	3.0	2
	20	●	1100L20	24.4	26	70	0.2	3.0	2
	30	●	1100L30	35.4	37	80	0.2	3.0	2
1.15	2	●	MLDH 1150P	2.9	4.6	45	0.2	3.0	1
	5	●	1150L5	10.3	12	55.0	0.2	3.0	2
	12	●	1150L12	18.3	20	60	0.2	3.0	2
	20	●	1150L20	26.3	28	70	0.2	3.0	2
	30	●	1150L30	37.3	39	80	0.2	3.0	2
1.20	2	●	MLDH 1200P	3.0	4.8	45	0.2	3.0	1
	5	●	1200L5	10.2	12	55.0	0.2	3.0	2
	12	●	1200L12	18.2	20	60	0.2	3.0	2
	20	●	1200L20	27.2	29	70	0.2	3.0	2
	30	●	1200L30	39.2	41	85	0.2	3.0	2
1.25	2	●	MLDH 1250P	3.1	5.0	45	0.2	3.0	1
	5	●	1250L5	12.1	14	55.0	0.3	3.0	2
	12	●	1250L12	19.1	21	65	0.3	3.0	2
	20	●	1250L20	28.1	30	70	0.3	3.0	2
	30	●	1250L30	41.1	43	85	0.3	3.0	2
1.30	2	●	MLDH 1300P	3.3	5.2	45	0.2	3.0	1
	5	●	1300L5	12.1	14	55.0	0.3	3.0	2
	12	●	1300L12	20.1	22	65	0.3	3.0	2
	20	●	1300L20	29.1	31	75	0.3	3.0	2
	30	●	1300L30	42.1	44	85	0.3	3.0	2
1.35	2	●	MLDH 1350P	3.4	5.4	45	0.2	3.0	1
	5	●	1350L5	12.0	14	55.0	0.3	3.0	2
	12	●	1350L12	21.0	23	65	0.3	3.0	2
	20	●	1350L20	30.0	32	75	0.3	3.0	2
	30	●	1350L30	44.0	46	90	0.3	3.0	2
1.40	2	●	MLDH 1400P	3.5	5.6	45	0.2	3.0	1
	5	●	1400L5	11.9	14	55.0	0.3	3.0	2
	12	●	1400L12	21.9	24	65	0.3	3.0	2
	20	●	1400L20	31.9	34	75	0.3	3.0	2
	30	●	1400L30	45.9	48	90	0.3	3.0	2
1.45	2	●	MLDH 1450P	3.6	5.8	45	0.2	3.0	1
	5	●	1450L5	13.8	16	55.0	0.3	3.0	2
	12	●	1450L12	22.8	25	65	0.3	3.0	2
	20	●	1450L20	32.8	35	75	0.3	3.0	2
	30	●	1450L30	46.8	49	90	0.3	3.0	2
1.50	2	●	MLDH 1500P	3.8	6	45	0.2	3.0	1
	5	●	1500L5	13.8	16	55.0	0.3	3.0	2
	12	●	1500L12	23.8	26	65	0.3	3.0	2
	20	●	1500L20	33.8	36	75	0.3	3.0	2
	30	●	1500L30	48.8	51	90	0.3	3.0	2
1.55	2	●	MLDH 1550P	3.9	6.2	45	0.2	3.0	1
	5	●	1550L5	13.7	16	55.0	0.3	3.0	2
	12	●	1550L12	23.7	26	65	0.3	3.0	2
	20	●	1550L20	34.7	37	80	0.3	3.0	2
	30	●	1550L30	50.7	53	95	0.3	3.0	2
1.60	2	●	MLDH 1600P	4.0	6.4	45	0.3	3.0	1
	5	●	1600L5	13.6	16	55.0	0.3	3.0	2
	12	●	1600L12	24.6	27	70	0.3	3.0	2
	20	●	1600L20	35.6	38	80	0.3	3.0	2
	30	●	1600L30	51.6	54	95	0.3	3.0	2

Part Number Suffix - P: For Guide Hole

Grade: ACV70

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2023-2024 General Catalogue, but the specifications have not changed.

Diameter ϕ 1.65 to 2.00mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.65	2	●	MLDH 1650P	4.1	6.6	50	0.3	3.0	1
	5	●	1650L5	15.5	18	60.0	0.3	3.0	2
	12	●	1650L12	25.5	28	70	0.3	3.0	2
	20	●	1650L20	37.5	40	80	0.3	3.0	2
	30	●	1650L30	53.5	56	95	0.3	3.0	2
1.70	2	●	MLDH 1700P	4.3	6.8	50	0.3	3.0	1
	5	●	1700L5	15.5	18	60.0	0.4	3.0	2
	12	●	1700L12	26.5	29	70	0.4	3.0	2
	20	●	1700L20	38.5	41	80	0.4	3.0	2
	30	●	1700L30	55.5	58	100	0.4	3.0	2
1.75	2	●	MLDH 1750P	4.4	7	50	0.3	3.0	1
	5	●	1750L5	15.4	18	60.0	0.4	3.0	2
	12	●	1750L12	27.4	30	70	0.4	3.0	2
	20	●	1750L20	39.4	42	85	0.4	3.0	2
	30	●	1750L30	57.4	60	100	0.4	3.0	2
1.80	2	●	MLDH 1800P	4.5	7.2	50	0.3	3.0	1
	5	●	1800L5	15.3	18	60.0	0.4	3.0	2
	12	●	1800L12	28.3	31	70	0.4	3.0	2
	20	●	1800L20	40.3	43	85	0.4	3.0	2
	30	●	1800L30	58.3	61	100	0.4	3.0	2
1.85	2	●	MLDH 1850P	4.6	7.4	50	0.3	3.0	1
	5	●	1850L5	17.2	20	60.0	0.4	3.0	2
	12	●	1850L12	28.2	31	70	0.4	3.0	2
	20	●	1850L20	41.2	44	85	0.4	3.0	2
	30	●	1850L30	59.2	62	103	0.4	3.0	2
1.90	2	●	MLDH 1900P	4.8	7.6	50	0.3	3.0	1
	5	●	1900L5	17.2	20	60.0	0.4	3.0	2
	12	●	1900L12	29.2	32	75	0.4	3.0	2
	20	●	1900L20	43.2	46	85	0.4	3.0	2
	30	●	1900L30	60.2	63	103	0.4	3.0	2
1.95	2	●	MLDH 1950P	4.9	7.8	50	0.3	3.0	1
	5	●	1950L5	17.1	20	60.0	0.4	3.0	2
	12	●	1950L12	30.1	33	75	0.4	3.0	2
	20	●	1950L20	44.1	47	85	0.4	3.0	2
	30	●	1950L30	61.1	64	103	0.4	3.0	2
2.00	2	●	MLDH 2000P	5.0	8	50	0.3	3.0	1
	5	●	2000L5	17.0	20	60.0	0.4	3.0	2
	12	●	2000L12	31.0	34	75	0.4	3.0	2
	20	●	2000L20	45.0	48	90	0.4	3.0	2
	30	●	2000L30	63.0	66	103	0.4	3.0	2

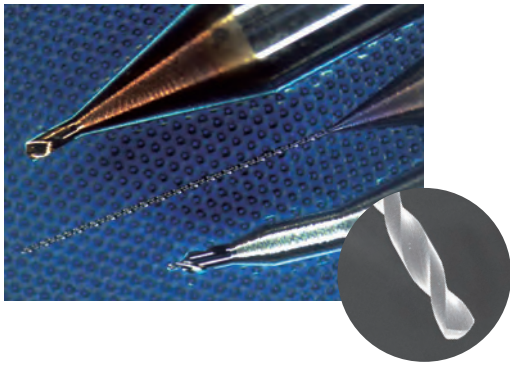
Part Number Suffix - P: For Guide Hole

Grade: ACV70

MDUS series/MDUP series/MDSS series

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Stainless
SteelAluminum
AlloyCopper
Alloy

For Steel, Stainless Steel and Other Metals

■ Micro MULTIDRILL MDUS series $\phi 0.03$ to $\phi 0.19$ mm

- High-precision shank (Shank tolerance h3, circularity 0.3 μ m or less, cylindricity 0.5 μ m or less)
- Ultra-thin TiAlN coating gives improved wear resistance
- Perfect for drilling steel, stainless steel, or copper
- Available from $\phi 0.03$ mm to $\phi 0.19$ mm in 0.005mm increments

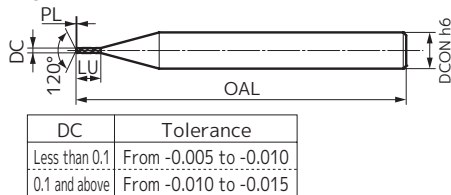
■ Micro Multi Pointing Drill MDUP series $\phi 0.03$ to $\phi 0.18$ mm

- For drilling guide hole for MDUS series drills



*For tolerances, refer to Chapter N - References.

Fig 1 (Helix Angle: 30°)

Micro Multi Pointing Drill MDUP series Diameter $\phi 0.03$ to 0.18mm

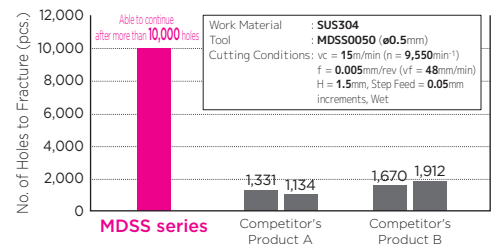
Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
0.03	●	MDUP 0030-30C	0.02	38.2	0.01	3.0	1
0.04	●	0040-30C	0.04	38.2	0.01	3.0	1
0.05	●	0050-30C	0.05	38.2	0.01	3.0	1
0.08	●	0080-30C	0.06	38.2	0.02	3.0	1
0.10	●	0100-30C	0.10	38.2	0.03	3.0	1
0.12	●	0120-30C	0.08	38.2	0.03	3.0	1
0.15	●	0150-30C	0.08	38.2	0.04	3.0	1
0.18	●	0180-30C	0.17	38.2	0.05	3.0	1

Grade: KP011

■ Solid Carbide MINI-MULTIDRILL MDSS series $\phi 0.20$ to $\phi 1.00$ mm

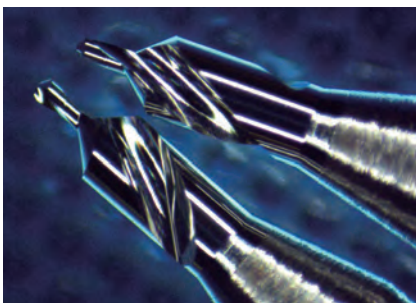
- The combination of a hard, tough carbide substrate and a high-rigidity design (web thickness, flute width ratio, helix angle) greatly improves fracture resistance.
- PVD coating dedicated for small drills significantly extends tool life.
- Applicable to a wide range of work materials including carbon steel, alloy steel, die steel, and stainless steel.
- Shanks standardised to $\phi 3$ mm diameter and overall length of 38mm for greater ease of use.



MDSS Recommended Cutting Conditions (Wet) (Inquire about cutting conditions for the MDUS series)

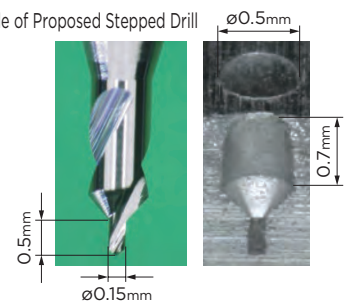
Work Material	Alloy Steel, Pre-hardened Steel SCM, NAK			Die Steel, Tempered Steel (30 to 40HRC)			Stainless Steel SUS		
Cutting Conditions	Spindle Speed min ⁻¹	Feed Rate mm/min	Step Feed (mm)	Spindle Speed min ⁻¹	Feed Rate mm/min	Step Feed (mm)	Spindle Speed min ⁻¹	Feed Rate mm/min	Step Feed (mm)
Dia. DC (mm)									
$\phi 0.2$	26,500	50	0.1D	21,200	40	0.1D	10,600	20	0.1D
$\phi 0.3$	26,500	80		21,200	60		10,600	30	
$\phi 0.4$	25,900	100		19,900	80		9,500	40	
$\phi 0.5$	25,500	150		19,100	110		9,500	50	
$\phi 1.0$	15,900	240	0.2D to 0.5D*	12,700	190	0.2D to 0.5D*	5,600	80	

1. The conditions at left are recommended under wet conditions, using water-soluble coolant.
 2. If cutting noise and vibration are present, please adjust the cutting conditions accordingly.
 3. If the machine cannot achieve the recommended spindle speed, use the maximum spindle speed available. In this case, lower the feed rate by the same ratio.
- *Step feed is recommended for drilling of holes deeper than 3D (D=drill diameter).

■ Made-to-order Micro Drills $\phi 0.02$ mm up

- Dedicated cutting edge designs are available for various work materials including non-metals, ceramics, and resins.
- Customised designs are also available for improved efficiency, such as integration of processes by using a stepped drill.
- Various drill diameters (from $\phi 0.02$) and LxDs are available to order. (Contact us for possible profiles.)

Example of Proposed Stepped Drill





*For tolerances, refer to Chapter N - References.

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

Fig 1 (ø0.030 to 0.190mm)

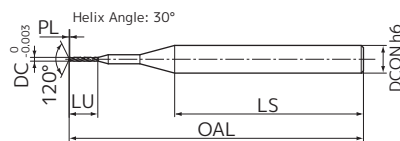


Fig 2 (ø0.20 to 0.34mm)

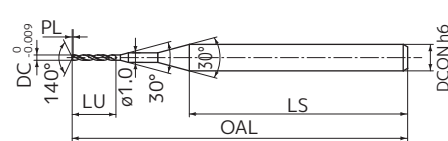
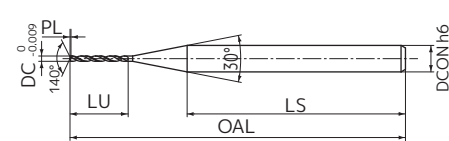


Fig 3 (ø0.35 to 1.00mm)



Diameter ø0.030 to 0.49mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank LS	Shank Dia. DCON	Fig
0.030	10	●	MDUS 0030-30C	0.26	38.0	0.01	28	3.0	1
0.035		●	0035-30C	0.35	38.0	0.01	28	3.0	1
0.040		●	0040-30C	0.34	38.0	0.01	28	3.0	1
0.045		●	0045-30C	0.46	38.0	0.01	28	3.0	1
0.050		●	0050-30C	0.45	38.0	0.01	28	3.0	1
0.055	10	●	MDUS 0055-30C	0.55	38.0	0.02	28	3.0	1
0.060		●	0060-30C	0.54	38.0	0.02	28	3.0	1
0.065		●	0065-30C	0.64	38.0	0.02	28	3.0	1
0.070		●	0070-30C	0.63	38.0	0.02	28	3.0	1
0.075		●	0075-30C	0.73	38.0	0.02	28	3.0	1
0.080	10	●	0080-30C	0.72	38.0	0.02	28	3.0	1
0.085		●	0085-30C	0.92	38.0	0.02	28	3.0	1
0.090		●	MDUS 0090-30C	0.91	38.0	0.03	28	3.0	1
0.095		●	0095-30C	0.91	38.0	0.03	28	3.0	1
0.100		●	0100-30C	0.90	38.0	0.03	28	3.0	1
0.110	10	●	0110-30C	1.09	38.0	0.03	28	3.0	1
0.120		●	0120-30C	1.08	38.0	0.03	28	3.0	1
0.130		●	MDUS 0130-30C	1.37	38.0	0.04	28	3.0	1
0.140		●	0140-30C	1.36	38.0	0.04	28	3.0	1
0.150		●	0150-30C	1.35	38.0	0.04	28	3.0	1
0.160	10	●	MDUS 0160-30C	1.64	38.0	0.05	28	3.0	1
0.170		●	0170-30C	1.63	38.0	0.05	28	3.0	1
0.180		●	0180-30C	1.62	38.0	0.05	28	3.0	1
0.190		●	0190-30C	1.71	38.0	0.05	28	3.0	1
0.20	10	●	MDSS 0020	2.25	38	0.04	28	3.0	2
0.21		●	0021	2.24	38	0.04	28	3.0	2
0.22		●	0022	2.23	38	0.04	28	3.0	2
0.23		●	0023	2.21	38	0.04	28	3.0	2
0.24		●	0024	2.20	38	0.04	28	3.0	2
0.25	10	●	MDSS 0025	2.19	38	0.05	28	3.0	2
0.26		●	0026	2.18	38	0.05	28	3.0	2
0.27		●	0027	2.16	38	0.05	28	3.0	2
0.28		●	0028	2.15	38	0.05	28	3.0	2
0.29		●	0029	2.14	38	0.05	28	3.0	2
0.30	10	●	0030	2.6	38	0.05	28	3.0	2
0.31		●	MDSS 0031	2.6	38	0.06	28	3.0	2
0.32		●	0032	2.6	38	0.06	28	3.0	2
0.33		●	0033	2.6	38	0.06	28	3.0	2
0.34		●	0034	2.6	38	0.06	28	3.0	2
0.35	10	●	0035	3.6	38	0.06	28	3.0	3
0.36		●	MDSS 0036	3.6	38	0.07	28	3.0	3
0.37		●	0037	3.5	38	0.07	28	3.0	3
0.38		●	0038	3.5	38	0.07	28	3.0	3
0.39		●	0039	3.5	38	0.07	28	3.0	3
0.40	10	●	0040	4.5	38	0.07	28	3.0	3
0.41		●	0041	4.5	38	0.07	28	3.0	3
0.42		●	MDSS 0042	4.5	38	0.08	28	3.0	3
0.43		●	0043	4.5	38	0.08	28	3.0	3
0.44		●	0044	4.5	38	0.08	28	3.0	3
0.45	10	●	0045	4.4	38	0.08	28	3.0	3
0.46		●	0046	4.4	38	0.08	28	3.0	3
0.47		●	MDSS 0047	4.4	38	0.09	28	3.0	3
0.48		●	0048	4.4	38	0.09	28	3.0	3
0.49		●	0049	4.4	38	0.09	28	3.0	3

Grade: MDUS series KP011 / MDSS series ACF40B

Diameter ø0.50 to 1.00mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank LS	Shank Dia. DCON	Fig
0.50	10	●	MDSS 0050	5.4	38	0.09	27	3.0	3
0.51		●	0051	5.4	38	0.09	27	3.0	3
0.52		●	0052	5.4	38	0.09	27	3.0	3
0.53		●	MDSS 0053	5.3	38	0.10	27	3.0	3
0.54		●	0054	5.3	38	0.10	27	3.0	3
0.55	10	●	0055	5.3	38	0.10	27	3.0	3
0.56		●	0056	5.3	38	0.10	27	3.0	3
0.57		●	0057	5.3	38	0.10	27	3.0	3
0.58		●	MDSS 0058	5.3	38	0.11	27	3.0	3
0.59		●	0059	5.3	38	0.11	27	3.0	3
0.60	10	●	0060	6.3	38	0.11	26	3.0	3
0.61		●	0061	6.2	38	0.11	26	3.0	3
0.62		●	0062	6.2	38	0.11	26	3.0	3
0.63		●	0063	6.2	38	0.11	26	3.0	3
0.64		●	MDSS 0064	6.2	38	0.12	26	3.0	3
0.65	10	●	0065	6.2	38	0.12	26	3.0	3
0.66		●	0066	6.2	38	0.12	26	3.0	3
0.67		●	0067	6.2	38	0.12	26	3.0	3
0.68		●	0068	6.2	38	0.12	26	3.0	3
0.69		●	MDSS 0069	6.1	38	0.13	26	3.0	3
0.70	10	●	0070	8.1	38	0.13	24	3.0	3
0.71		●	0071	8.1	38	0.13	24	3.0	3
0.72		●	0072	8.1	38	0.13	24	3.0	3
0.73		●	0073	8.1	38	0.13	24	3.0	3
0.74		●	0074	8.1	38	0.13	24	3.0	3
0.75	10	●	MDSS 0075	8.1	38	0.14	24	3.0	3
0.76		●	0076	8.1	38	0.14	24	3.0	3
0.77		●	0077	8.0	38	0.14	24	3.0	3
0.78		●	0078	8.0	38	0.14	24	3.0	3
0.79		●	0079	8.0	38	0.14	24	3.0	3
0.80	10	●	MDSS 0080	9.0	38	0.15	23	3.0	3
0.81		●	0081	9.0	38	0.15	23	3.0	3
0.82		●	0082	9.0	38	0.15	23	3.0	3
0.83		●	0083	9.0	38	0.15	23	3.0	3
0.84		●	0084	9.0	38	0.15	23	3.0	3
0.85	10	●	0085	8.9	38	0.15	23	3.0	3
0.86		●	MDSS 0086	8.9	38	0.16	23	3.0	3
0.87		●	0087	8.9	38	0.16	23	3.0	3
0.88		●	0088	8.9	38	0.16	23	3.0	3
0.89		●	0089	8.9	38	0.16	23	3.0	3
0.90	10	●	0090	9.9	38	0.16	22	3.0	3
0.91		●	MDSS 0091	9.9	38	0.17	22	3.0	3
0.92		●	0092	9.9	38	0.17	22	3.0	3
0.93		●	0093	9.8	38	0.17	22	3.0	3
0.94		●	0094	9.8	38	0.17	22	3.0	3
0.95	10	●	0095	9.8	38	0.17	22	3.0	3
0.96		●	0096	9.8	38	0.17	22	3.0	3
0.97		●	MDSS 0097	9.8	38	0.18	22	3.0	3
0.98		●	0098	9.8	38	0.18	22	3.0	3
0.99		●	0099	9.8	38	0.18	22	3.0	3
1.00		●	0100	10.8	38	0.18	21	3.0	3

Grade: MDUS series KP011 / MDSS series ACF40B

MULTIDRILL Made-to-Order Design Request Sheet

Drilling

Solid

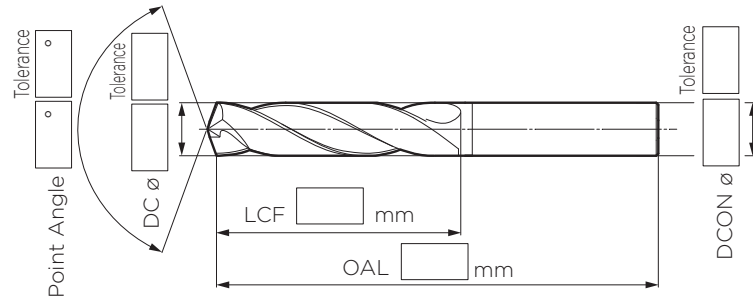
Indexable Head type

Indexable Insert type

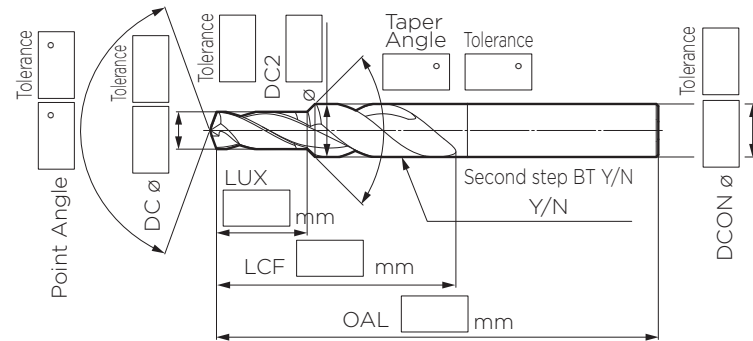
Reamers

Drill Shape

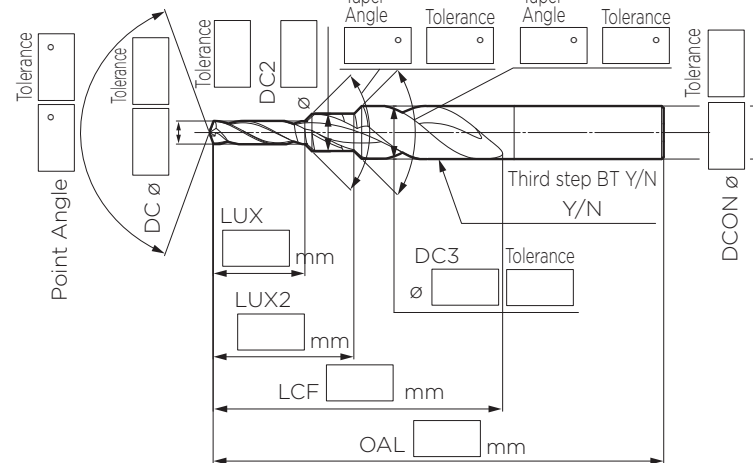
☐ Straight MULTIDRILL



☐ Stepped MULTIDRILL



☐ 3-stepped MULTIDRILL



MULTIDRILL Details

Cutting Edge Specification: type

Material:

Oil Hole: Y/N

Regrinding Limit: OAL mm

No. of Flutes: 2-flute / 3-flute

Workpiece Information

Work Material:

Hole Type: Through / Blind

Stepped Part Application: Chamfer/Counterbore

Tip Angle: 118° to 179° (180°)

*For blind holes, please let us know if there is a hole bottom profile requirement.

*We may not be able to fulfill requests for cutting edge specifications if the drill point angle is not within 130° to 160°.

Machine Information

Coolant: ☐ Water-soluble ☐ Oil-based ☐ MQL

Coolant Supply Information: ☐ Internal Coolant Supply

☐ External Coolant Supply

Current Tool

Cutting Conditions:

Tool Life:

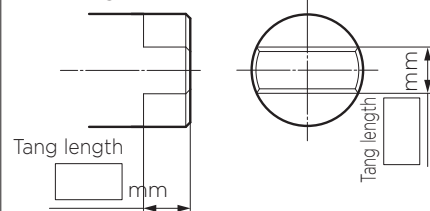
Tool Life Criteria:

After filling in the required dimensions and other information, contact our nearest sales office or distributor.

Feel free to contact us with other requests as well.

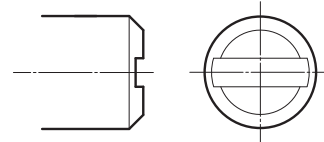
Shank Shape

☐ Tang



*Tang is not available for 3-fluted drills.

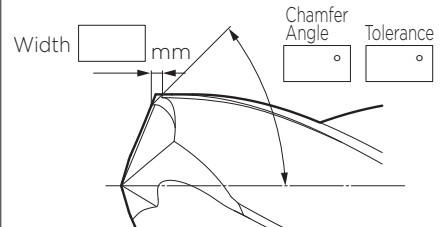
☐ Slit



☐ Tang/slit not required

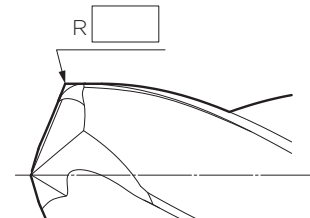
Drill Point Corner Edge Shape

☐ Corner Edge Chamfer



Burr Countermeasures / Chipping Countermeasures / Hole Bottom Shape

☐ Corner Edge Radius



Burr Countermeasures / Chipping Countermeasures / Hole Bottom Shape

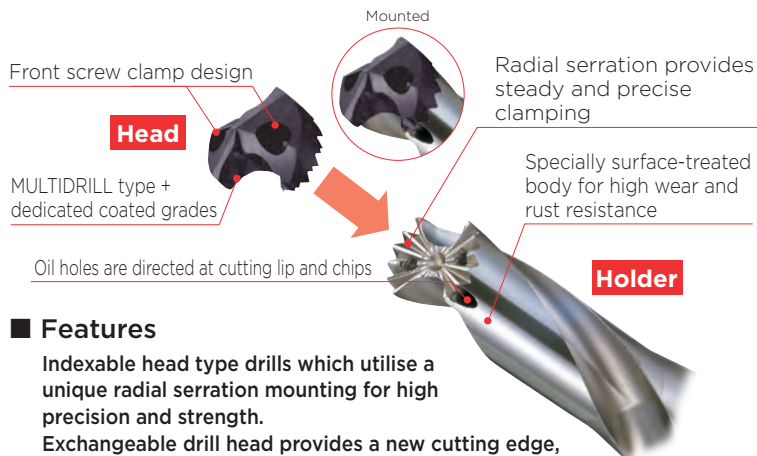
☐ Corner Edge Chamfering or Radius Not Required

Other Requests

Company Name/Contact

MEMO





Features

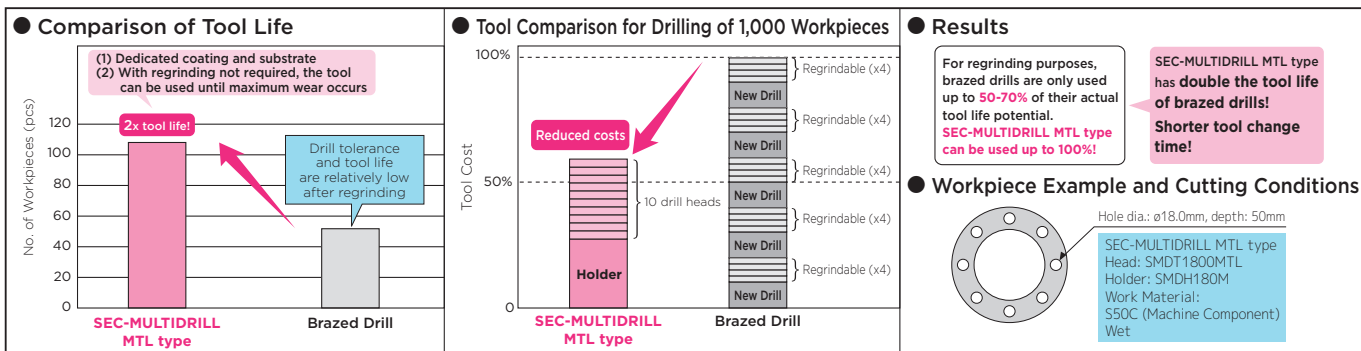
Indexable head type drills which utilise a unique radial serration mounting for high precision and strength. Exchangeable drill head provides a new cutting edge, higher productivity, and lower costs with easy tool management. Regrinding allowance of 1.5mm to 3mm makes further tool cost reductions possible. * Regrinding is available only for MTL/MSL/MEL/MB

Product Range

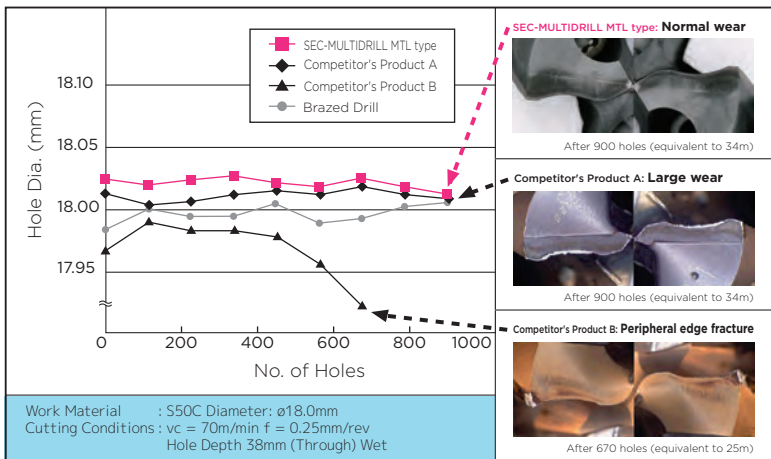
Head	Application	Holder (L/D)	Dia. (mm)
MTL type	General Steel	1.5D type / 1.5DF type (1.5D)	ø12.0 to ø30.8
		M type / 3D type / 3DF type (3D)	M type / L type: ø12.0 to ø42.5
		L type / 5D type / 5DF type (5D)	D type: ø13.5 to ø42.5
		D type / 8D type / 8DF type (8D)	
MSL type	SUS SS FC	1.5D type / 1.5DF type (1.5D)	ø12.0 to ø30.8
		M type / 3D type / 3DF type (3D)	M type / L type: ø12.0 to ø42.5
		L type / 5D type / 5DF type (5D)	D type: ø13.5 to ø42.5
		D type / 8D type / 8DF type (8D)	
MFS type	Flat Bottom	1.5D type/1.5DF type	ø12.0 to ø30.0
MB type	Bridge	B3 type (3D)	ø24.5 to ø26.7

*MFS type can also be used with 3D, 5D, 8D, and 12D holders.

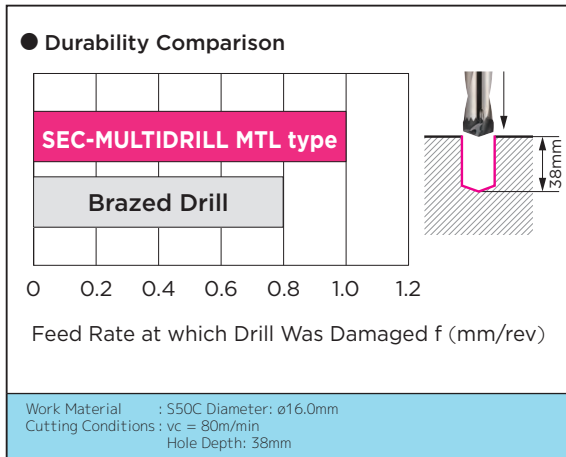
Tool Life and Cost



Drilling Precision

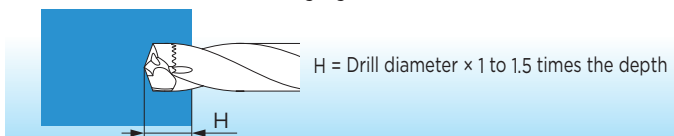


Tool Strength

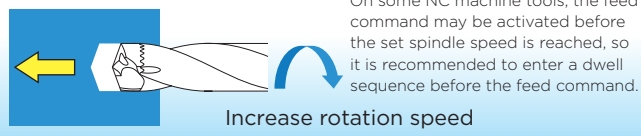
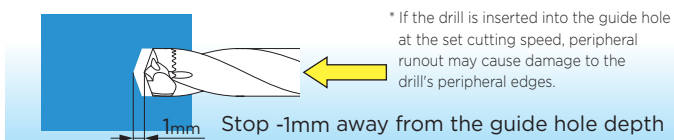


Recommended Drilling Method for 8D and 12D type: Use a hydro chuck, milling chuck, or collet chuck to hold the 12D drill body

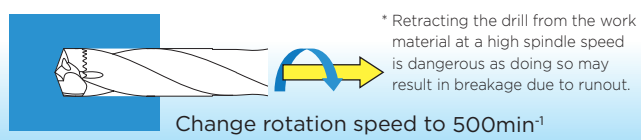
- Use a SMDH000-1.5D(F) type (1.5D holder) + MTL type, MSL type (head) to drill a guide hole
- Use a 1.5D drill body and a drill head with the same diameter (same Cat. No.) as the 8D or 12D drill when drilling a guide hole.
- Increase spindle speed until the set spindle speed is reached, then start drilling



- Feed the 8D or 12D holder + MTL type, MSL type (head) through the guide hole at a low spindle speed
- Spindle speed: 500min⁻¹ ● Feed rate: 1,000 to 2,000mm/min



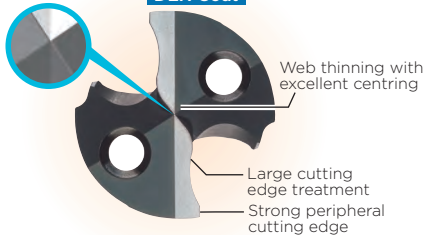
- After drilling, rotation speed is reduced and the drill is retracted from the work material
- Spindle speed: 500min⁻¹ ● Feed rate: 1,000 to 2,000mm/min



MTL type Suitable for high-efficiency drilling of general steel

X THINNING

DEX Coat



Excellent cutting edge strength

Large edge treatment is used to reduce fracture of the cutting edge.

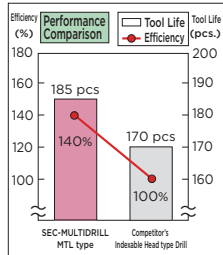
Stable machined hole accuracy

X type thinning achieves excellent centring on drill entry and stable drilling.

Longer Tool Life

Improved tool life and efficiency

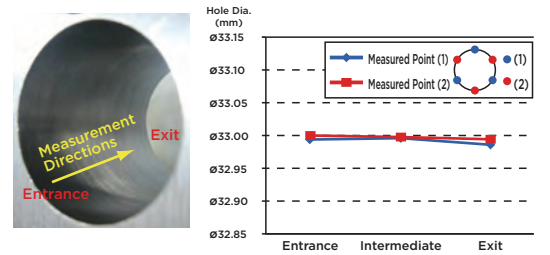
Work Material : Housing (S20C)
Tool : $\phi 15 \times 5D$
Cutting Conditions : $vc = 107\text{m/min}$
 $f = 0.3\text{mm/rev}$
Hole depth : $32\text{mm} \times 12$ holes



Drilling Precision

High drilling accuracy even with large diameters

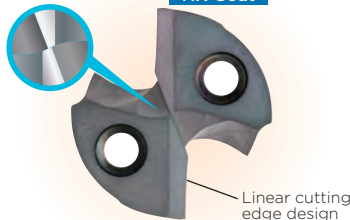
Work Material : SM490 (base plate for construction machinery)
Tool : $\phi 33 \times 5D$
Cutting Conditions : $vc = 120\text{m/min}$
 $f = 0.25\text{mm/rev}$
Coolant : Emulsion type



MSL type Stable drilling of mild steel, stainless steel, etc.

Special R THINNING

NX Coat



Exceptional cutting edge sharpness in mild steel and SUS drilling

Newly designed linear cutting edge and special R THINNING enable improved chip evacuation and stable drilling.

Long and stable tool life

NX Coat based on ABSOTECH™ technology for improved fracture resistance and adhesion resistance.

Chip Evacuation

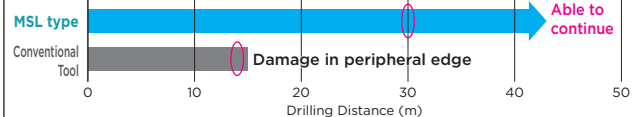
MSL type

Competitor's Product A



Equipment: Vertical Machining Centre BT50 Internal Coolant Supply 2MPa
Work Material: SS400 Tool: $\phi 14 \times 5D$
Cutting Conditions: $vc = 80\text{m/min}$ $f = 0.2\text{mm/rev}$ $H = 50\text{mm}$

Longer Tool Life



Equipment: Vertical Machining Centre BT50 Internal Coolant Supply 2MPa
Work Material: SUS304 Tool: $\phi 14 \times 5D$
Cutting Conditions: $vc = 65\text{m/min}$ $f = 0.15\text{mm/rev}$ $H = 40\text{mm}$

Recommended Cutting Conditions (MSL type / MTL type / MEL type)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Work Material	Mild Steel (up to 250HB)	General Steel (250 to 320HB)		Hardened Steel (45HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron	Ductile Cast Iron	Aluminum Alloy
Recommended Head	MSL type	MTL type	MSL type	MTL type	MSL type / MEL type	MTL type / MSL type	MTL type / MSL type	(Special Cutting Edge)*
Diameter DC (mm)	Cutting Conditions	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.
Up to $\phi 16.0$	n	2,000 (1,400)	2,000 (1,400)	2,000 (1,400)	1,200 (1,000)	1,200 (1,000)	1,400 (1,200)	1,200 (1,000)
	vc	80-100-120 (50-70-80)	70-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	30-50-80 (30-50-60)	50-70-90 (40-60-80)	50-60-80 (40-50-70)
	f	0.15-0.20-0.25	0.15-0.20-0.30	0.10-0.15-0.20	0.10-0.15-0.20	0.10-0.15-0.20	0.20-0.25-0.30	0.20-0.25-0.30
Up to $\phi 20.0$	n	1,600 (1,100)	1,600 (1,100)	1,600 (1,100)	1,000 (800)	1,100 (950)	1,300 (1,100)	1,100 (950)
	vc	80-100-120 (50-70-80)	70-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	30-60-90 (30-50-70)	60-80-100 (50-70-90)	50-70-90 (40-60-80)
	f	0.15-0.25-0.30	0.20-0.25-0.35	0.15-0.20-0.25	0.15-0.20-0.25	0.10-0.20-0.25	0.20-0.30-0.35	0.20-0.25-0.35
Up to $\phi 30.8$	n	1,000 (700)	1,000 (700)	1,000 (700)	600 (500)	700 (600)	800 (700)	700 (600)
	vc	80-100-120 (50-70-80)	70-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	30-60-90 (30-50-70)	60-80-100 (50-70-90)	50-70-90 (40-60-80)
	f	0.20-0.25-0.30	0.20-0.25-0.35	0.15-0.20-0.25	0.15-0.20-0.25	0.10-0.20-0.25	0.20-0.30-0.40	0.25-0.30-0.35
Recommended Head	Large Diameter MTL type ($\phi 31.0$ up)							
$\phi 31.0$ to $\phi 42.5$	n	650 (520)	650 (520)	380 (300)	450 (300)	520 (450)	450 (380)	1,800 (1,500)
	vc	70-90-120 (50-70-80)	70-90-120 (50-70-80)	40-50-80 (30-40-60)	40-60-80 (30-40-60)	60-70-100 (50-60-90)	50-60-90 (40-50-70)	200-240-260 (180-200-240)
	f	0.25-0.35-0.45	0.25-0.30-0.40	0.15-0.25-0.30	0.20-0.25-0.30	0.25-0.35-0.45	0.25-0.30-0.35	0.35-0.50-0.60

Note: Adjustment of cutting feed f, etc., may be required depending on machine rigidity and workpiece rigidity.

For 8D and 12D drills, use the cutting speeds in parentheses as a guideline. Before drilling 8D and 12D holes, a guide hole of a similar diameter is recommended.

*Inquire if you require special drill heads for aluminum alloy.

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

SMD series (Internal Coolant Supply)

MTL

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Tempered
SteelHardened
Steel
up to 45HRC

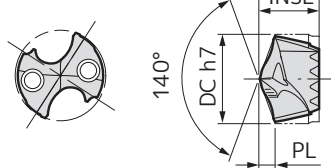
Cast Iron

Ductile
Cast Iron

*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1 (DC ≤ 30.8mm)

Indexable Head MTL type Diameter $\varnothing 12.0$ to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	●	SMDT 1200 MTL	9.1	2.2	SMDH120□	1
12.1	●	1210 MTL	9.1	2.2		1
12.2	●	1220 MTL	9.1	2.2		1
12.3	●	1230 MTL	9.1	2.2		1
12.4	●	1240 MTL	9.1	2.3		1
12.5	●	SMDT 1250 MTL	9.4	2.3	SMDH125□	1
12.6	●	1260 MTL	9.4	2.3		1
12.7	●	1270 MTL	9.4	2.3		1
12.8	●	1280 MTL	9.4	2.3		1
12.9	●	1290 MTL	9.4	2.3		1
13.0	●	SMDT 1300 MTL	9.7	2.4	SMDH130□	1
13.1	●	1310 MTL	9.7	2.4		1
13.2	●	1320 MTL	9.7	2.4		1
13.3	●	1330 MTL	9.7	2.4		1
13.4	●	1340 MTL	9.7	2.4		1
13.5	●	SMDT 1350 MTL	10.3	2.5	SMDH140□	1
13.6	●	1360 MTL	10.3	2.5		1
13.7	●	1370 MTL	10.3	2.5		1
13.8	●	1380 MTL	10.3	2.5		1
13.9	●	1390 MTL	10.3	2.5		1
14.0	●	1400 MTL	10.3	2.5		1
14.1	●	1410 MTL	10.3	2.6		1
14.2	●	1420 MTL	10.3	2.6		1
14.3	●	1430 MTL	10.3	2.6		1
14.4	●	1440 MTL	10.3	2.6		1
14.5	●	1450 MTL	10.3	2.6		1
14.6	●	SMDT 1460 MTL	11.0	2.7	SMDH150□	1
14.7	●	1470 MTL	11.0	2.7		1
14.8	●	1480 MTL	11.0	2.7		1
14.9	●	1490 MTL	11.0	2.7		1
15.0	●	1500 MTL	11.0	2.7		1
15.1	●	1510 MTL	11.0	2.7		1
15.2	●	1520 MTL	11.0	2.8		1
15.3	●	1530 MTL	11.0	2.8		1
15.4	●	1540 MTL	11.0	2.8		1
15.5	●	1550 MTL	11.0	2.8		1
15.6	●	SMDT 1560 MTL	11.6	2.8	SMDH160□	1
15.7	●	1570 MTL	11.6	2.9		1
15.8	●	1580 MTL	11.6	2.9		1
15.9	●	1590 MTL	11.6	2.9		1
16.0	●	1600 MTL	11.6	2.9		1
16.1	●	1610 MTL	11.6	2.9		1
16.2	●	1620 MTL	11.6	2.9		1
16.3	●	1630 MTL	11.6	3.0		1
16.4	●	1640 MTL	11.6	3.0		1
16.5	●	1650 MTL	11.6	3.0		1
16.6	●	SMDT 1660 MTL	12.2	3.0	SMDH170□	1
16.7	●	1670 MTL	12.2	3.0		1
16.8	●	1680 MTL	12.2	3.1		1
16.9	●	1690 MTL	12.2	3.1		1
17.0	●	1700 MTL	12.2	3.1		1
17.1	●	1710 MTL	12.2	3.1		1
17.2	●	1720 MTL	12.2	3.1		1
17.3	●	1730 MTL	12.2	3.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J113 Applicable Holders J120

Indexable Head MTL type Diameter $\varnothing 17.4$ to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	●	SMDT 1740 MTL	12.2	3.2	SMDH170□	1
17.5	●	1750 MTL	12.2	3.2		1
17.6	●	SMDT 1760 MTL	12.9	3.2	SMDH180□	1
17.7	●	1770 MTL	12.9	3.2		1
17.8	●	1780 MTL	12.9	3.2		1
17.9	●	1790 MTL	12.9	3.3		1
18.0	●	1800 MTL	12.9	3.3		1
18.1	●	1810 MTL	12.9	3.3		1
18.2	●	1820 MTL	12.9	3.3		1
18.3	●	1830 MTL	12.9	3.3		1
18.4	●	1840 MTL	12.9	3.3		1
18.5	●	1850 MTL	12.9	3.4		1
18.6	●	SMDT 1860 MTL	13.5	3.4	SMDH190□	1
18.7	●	1870 MTL	13.5	3.4		1
18.8	●	1880 MTL	13.5	3.4		1
18.9	●	1890 MTL	13.5	3.4		1
19.0	●	1900 MTL	13.5	3.5		1
19.1	●	1910 MTL	13.5	3.5		1
19.2	●	1920 MTL	13.5	3.5		1
19.3	●	1930 MTL	13.5	3.5		1
19.4	●	1940 MTL	13.5	3.5		1
19.5	●	1950 MTL	13.5	3.5		1
19.6	●	SMDT 1960 MTL	14.1	3.6	SMDH200□	1
19.7	●	1970 MTL	14.1	3.6		1
19.8	●	1980 MTL	14.1	3.6		1
19.9	●	1990 MTL	14.1	3.6		1
20.0	●	2000 MTL	14.1	3.6		1
20.1	●	2010 MTL	14.1	3.7		1
20.2	●	2020 MTL	14.1	3.7		1
20.3	●	2030 MTL	14.1	3.7		1
20.4	●	2040 MTL	14.1	3.7		1
20.5	●	2050 MTL	14.1	3.7		1
20.6	●	SMDT 2060 MTL	14.8	3.7	SMDH210□	1
20.7	●	2070 MTL	14.8	3.8		1
20.8	●	2080 MTL	14.8	3.8		1
20.9	●	2090 MTL	14.8	3.8		1
21.0	●	2100 MTL	14.8	3.8		1
21.1	●	2110 MTL	14.8	3.8		1
21.2	●	2120 MTL	14.8	3.9		1
21.3	●	2130 MTL	14.8	3.9		1
21.4	●	2140 MTL	14.8	3.9		1
21.5	●	2150 MTL	14.8	3.9		1
21.6	●	SMDT 2160 MTL	15.0	3.9	SMDH220□	1
21.7	●	2170 MTL	15.0	3.9		1
21.8	●	2180 MTL	15.0	4.0		1
21.9	●	2190 MTL	15.0	4.0		1
22.0	●	2200 MTL	15.0	4.0		1
22.1	●	2210 MTL	15.0	4.0		1
22.2	●	2220 MTL	15.0	4.0		1
22.3	●	2230 MTL	15.0	4.1		1
22.4	●	2240 MTL	15.0	4.1		1
22.5	●	2250 MTL	15.0	4.1		1
22.6	●	2260 MTL	15.0	4.1		1
22.7	●	2270 MTL	15.0	4.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J113 Applicable Holders J120



*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1 (DC ≤ 30.8mm)

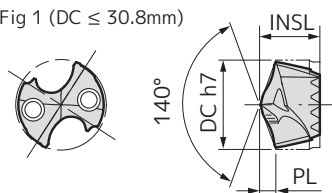
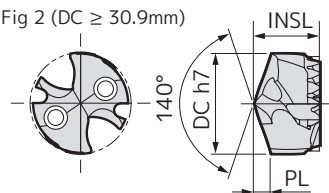


Fig 2 (DC ≥ 30.9mm)



Indexable Head MTL type Diameter ø22.8 to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	●	SMDT 2280 MTL	15.0	4.1	SMDH220□	1
22.9	●	SMDT 2290 MTL	15.1	4.2	SMDH230□	1
23.0	●	2300 MTL	15.1	4.2		1
23.1	●	2310 MTL	15.1	4.2		1
23.2	●	2320 MTL	15.1	4.2		1
23.3	●	2330 MTL	15.1	4.2		1
23.4	●	2340 MTL	15.1	4.3		1
23.5	●	2350 MTL	15.1	4.3		1
23.6	●	2360 MTL	15.1	4.3		1
23.7	●	2370 MTL	15.1	4.3		1
23.8	●	2380 MTL	15.1	4.3		1
23.9	●	SMDT 2390 MTL	15.4	4.3	SMDH240□	1
24.0	●	2400 MTL	15.4	4.4		1
24.1	●	2410 MTL	15.4	4.4		1
24.2	●	2420 MTL	15.4	4.4		1
24.3	●	2430 MTL	15.4	4.4		1
24.4	●	2440 MTL	15.4	4.4		1
24.5	●	2450 MTL	15.4	4.5		1
24.6	●	2460 MTL	15.4	4.5		1
24.7	●	2470 MTL	15.4	4.5		1
24.8	●	2480 MTL	15.4	4.5		1
24.9	●	SMDT 2490 MTL	15.8	4.5	SMDH250□	1
25.0	●	2500 MTL	15.8	4.5		1
25.1	●	2510 MTL	15.8	4.6		1
25.2	●	2520 MTL	15.8	4.6		1
25.3	●	2530 MTL	15.8	4.6		1
25.4	●	2540 MTL	15.8	4.6		1
25.5	●	2550 MTL	15.8	4.6		1
25.6	●	2560 MTL	15.8	4.7		1
25.7	●	2570 MTL	15.8	4.7		1
25.8	●	2580 MTL	15.8	4.7		1
25.9	●	SMDT 2590 MTL	16.4	4.7	SMDH260□	1
26.0	●	2600 MTL	16.4	4.7		1
26.1	●	2610 MTL	16.4	4.7		1
26.2	●	2620 MTL	16.4	4.8		1
26.3	●	2630 MTL	16.4	4.8		1
26.4	●	2640 MTL	16.4	4.8		1
26.5	●	2650 MTL	16.4	4.8		1
26.6	●	2660 MTL	16.4	4.8		1
26.7	●	2670 MTL	16.4	4.9		1
26.8	●	2680 MTL	16.4	4.9		1
26.9	●	SMDT 2690 MTL	17.1	4.9	SMDH270□	1
27.0	●	2700 MTL	17.1	4.9		1
27.1	●	2710 MTL	17.1	4.9		1
27.2	●	2720 MTL	17.1	4.9		1
27.3	●	2730 MTL	17.1	5.0		1
27.4	●	2740 MTL	17.1	5.0		1
27.5	●	2750 MTL	17.1	5.0		1
27.6	●	2760 MTL	17.1	5.0		1
27.7	●	2770 MTL	17.1	5.0		1
27.8	●	2780 MTL	17.1	5.1		1
27.9	●	SMDT 2790 MTL	17.7	5.1	SMDH280□	1
28.0	●	2800 MTL	17.7	5.1		1
28.1	●	2810 MTL	17.7	5.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions **J113** Applicable Holders **J120**

Indexable Head MTL type Diameter ø28.2 to 42.5mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	●	SMDT 2820 MTL	17.7	5.1	SMDH280□	1
28.3	●	2830 MTL	17.7	5.2		1
28.4	●	2840 MTL	17.7	5.2		1
28.5	●	2850 MTL	17.7	5.2		1
28.6	●	2860 MTL	17.7	5.2		1
28.7	●	2870 MTL	17.7	5.2		1
28.8	●	2880 MTL	17.7	5.2		1
28.9	●	SMDT 2890 MTL	18.3	5.3	SMDH290□	1
29.0	●	2900 MTL	18.3	5.3		1
29.1	●	2910 MTL	18.3	5.3		1
29.2	●	2920 MTL	18.3	5.3		1
29.3	●	2930 MTL	18.3	5.3		1
29.4	●	2940 MTL	18.3	5.4		1
29.5	●	2950 MTL	18.3	5.4		1
29.6	●	2960 MTL	18.3	5.4		1
29.7	●	2970 MTL	18.3	5.4	SMDH300□	1
29.8	●	2980 MTL	18.3	5.4		1
29.9	●	SMDT 2990 MTL	19.0	5.4		1
30.0	●	3000 MTL	19.0	5.5		1
30.1	●	3010 MTL	19.0	5.5		1
30.2	●	3020 MTL	19.0	5.5		1
30.3	●	3030 MTL	19.0	5.5		1
30.4	●	3040 MTL	19.0	5.5		1
30.5	●	3050 MTL	19.0	5.6	SMDH320□	1
30.6	●	3060 MTL	19.0	5.6		1
30.7	●	3070 MTL	19.0	5.6		1
30.8	●	3080 MTL	19.0	5.6		1
31.0	●	SMDT 3100 MTL	21.0	5.6		2
31.5	●	3150 MTL	21.0	5.7		2
32.0	●	3200 MTL	21.0	5.8		2
32.5	●	SMDT 3250 MTL	21.0	5.9	SMDH335□	2
33.0	●	3300 MTL	21.0	6.0		2
33.5	●	3350 MTL	21.0	6.1	SMDH350□	2
34.0	●	SMDT 3400 MTL	23.0	6.2		2
34.5	●	3450 MTL	23.0	6.3	SMDH365□	2
35.0	●	3500 MTL	23.0	6.4		2
35.5	●	SMDT 3550 MTL	23.0	6.5	SMDH380□	2
36.0	●	3600 MTL	23.0	6.6		2
36.5	●	3650 MTL	23.0	6.6	SMDH395□	2
37.0	●	SMDT 3700 MTL	25.0	6.7		2
37.5	●	3750 MTL	25.0	6.8	SMDH410□	2
38.0	●	3800 MTL	25.0	6.9		2
38.5	●	SMDT 3850 MTL	25.0	7.0	SMDH425□	2
39.0	●	3900 MTL	25.0	7.1		2
39.5	●	3950 MTL	25.0	7.2		2
40.0	●	SMDT 4000 MTL	27.0	7.3		2
40.5	●	4050 MTL	27.0	7.4		2
41.0	●	4100 MTL	27.0	7.5		2
41.5	●	SMDT 4150 MTL	27.0	7.6		2
42.0	●	4200 MTL	27.0	7.6		2
42.5	●	4250 MTL	27.0	7.7		2

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions **J113** Applicable Holders **J120, J121**

SMD series (Internal Coolant Supply)

MSL

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Stainless
Steel

Ti Alloy

Heat Resistant
Alloy

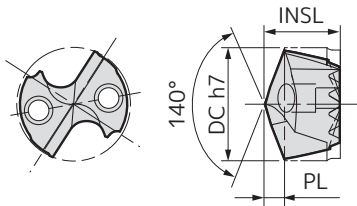
Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1

Indexable Head MSL type Diameter $\phi 12.0$ to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	●	SMDT 1200 MSL	9.1	2.2	SMDH120□	1
12.1	●	1210 MSL	9.1	2.2		1
12.2	●	1220 MSL	9.1	2.2		1
12.3	●	1230 MSL	9.1	2.2		1
12.4	●	1240 MSL	9.1	2.3		1
12.5	●	SMDT 1250 MSL	9.4	2.3	SMDH125□	1
12.6	●	1260 MSL	9.4	2.3		1
12.7	●	1270 MSL	9.4	2.3		1
12.8	●	1280 MSL	9.4	2.3		1
12.9	●	1290 MSL	9.4	2.3		1
13.0	●	SMDT 1300 MSL	9.7	2.4	SMDH130□	1
13.1	●	1310 MSL	9.7	2.4		1
13.2	●	1320 MSL	9.7	2.4		1
13.3	●	1330 MSL	9.7	2.4		1
13.4	●	1340 MSL	9.7	2.4		1
13.5	●	SMDT 1350 MSL	10.3	2.5	SMDH140□	1
13.6	●	1360 MSL	10.3	2.5		1
13.7	●	1370 MSL	10.3	2.5		1
13.8	●	1380 MSL	10.3	2.5		1
13.9	●	1390 MSL	10.3	2.5		1
14.0	●	1400 MSL	10.3	2.5		1
14.1	●	1410 MSL	10.3	2.6		1
14.2	●	1420 MSL	10.3	2.6		1
14.3	●	1430 MSL	10.3	2.6		1
14.4	●	1440 MSL	10.3	2.6		1
14.5	●	1450 MSL	10.3	2.6		1
14.6	●	SMDT 1460 MSL	11.0	2.7	SMDH150□	1
14.7	●	1470 MSL	11.0	2.7		1
14.8	●	1480 MSL	11.0	2.7		1
14.9	●	1490 MSL	11.0	2.7		1
15.0	●	1500 MSL	11.0	2.7		1
15.1	●	1510 MSL	11.0	2.7		1
15.2	●	1520 MSL	11.0	2.8		1
15.3	●	1530 MSL	11.0	2.8		1
15.4	●	1540 MSL	11.0	2.8		1
15.5	●	1550 MSL	11.0	2.8		1
15.6	●	SMDT 1560 MSL	11.6	2.8	SMDH160□	1
15.7	●	1570 MSL	11.6	2.9		1
15.8	●	1580 MSL	11.6	2.9		1
15.9	●	1590 MSL	11.6	2.9		1
16.0	●	1600 MSL	11.6	2.9		1
16.1	●	1610 MSL	11.6	2.9		1
16.2	●	1620 MSL	11.6	2.9		1
16.3	●	1630 MSL	11.6	3.0		1
16.4	●	1640 MSL	11.6	3.0		1
16.5	●	1650 MSL	11.6	3.0		1
16.6	●	SMDT 1660 MSL	12.2	3.0	SMDH170□	1
16.7	●	1670 MSL	12.2	3.0		1
16.8	●	1680 MSL	12.2	3.1		1
16.9	●	1690 MSL	12.2	3.1		1
17.0	●	1700 MSL	12.2	3.1		1
17.1	●	1710 MSL	12.2	3.1		1
17.2	●	1720 MSL	12.2	3.1		1
17.3	●	1730 MSL	12.2	3.1		1

Grade: ACT100

Recommended Cutting Conditions J113 Applicable Holders J120

Indexable Head MSL type Diameter $\phi 17.4$ to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	●	SMDT 1740 MSL	12.2	3.2	SMDH170□	1
17.5	●	1750 MSL	12.2	3.2		1
17.6	●	SMDT 1760 MSL	12.9	3.2	SMDH180□	1
17.7	●	1770 MSL	12.9	3.2		1
17.8	●	1780 MSL	12.9	3.2		1
17.9	●	1790 MSL	12.9	3.3		1
18.0	●	1800 MSL	12.9	3.3		1
18.1	●	1810 MSL	12.9	3.3		1
18.2	●	1820 MSL	12.9	3.3		1
18.3	●	1830 MSL	12.9	3.3		1
18.4	●	1840 MSL	12.9	3.3		1
18.5	●	1850 MSL	12.9	3.4		1
18.6	●	SMDT 1860 MSL	13.5	3.4	SMDH190□	1
18.7	●	1870 MSL	13.5	3.4		1
18.8	●	1880 MSL	13.5	3.4		1
18.9	●	1890 MSL	13.5	3.4		1
19.0	●	1900 MSL	13.5	3.5		1
19.1	●	1910 MSL	13.5	3.5		1
19.2	●	1920 MSL	13.5	3.5		1
19.3	●	1930 MSL	13.5	3.5		1
19.4	●	1940 MSL	13.5	3.5		1
19.5	●	1950 MSL	13.5	3.5		1
19.6	●	SMDT 1960 MSL	14.1	3.6	SMDH200□	1
19.7	●	1970 MSL	14.1	3.6		1
19.8	●	1980 MSL	14.1	3.6		1
19.9	●	1990 MSL	14.1	3.6		1
20.0	●	2000 MSL	14.1	3.6		1
20.1	●	2010 MSL	14.1	3.7		1
20.2	●	2020 MSL	14.1	3.7		1
20.3	●	2030 MSL	14.1	3.7		1
20.4	●	2040 MSL	14.1	3.7		1
20.5	●	2050 MSL	14.1	3.7		1
20.6	●	SMDT 2060 MSL	14.8	3.7	SMDH210□	1
20.7	●	2070 MSL	14.8	3.8		1
20.8	●	2080 MSL	14.8	3.8		1
20.9	●	2090 MSL	14.8	3.8		1
21.0	●	2100 MSL	14.8	3.8		1
21.1	●	2110 MSL	14.8	3.8		1
21.2	●	2120 MSL	14.8	3.9		1
21.3	●	2130 MSL	14.8	3.9		1
21.4	●	2140 MSL	14.8	3.9		1
21.5	●	2150 MSL	14.8	3.9		1
21.6	●	SMDT 2160 MSL	15.0	3.9	SMDH220□	1
21.7	●	2170 MSL	15.0	3.9		1
21.8	●	2180 MSL	15.0	4.0		1
21.9	●	2190 MSL	15.0	4.0		1
22.0	●	2200 MSL	15.0	4.0		1
22.1	●	2210 MSL	15.0	4.0		1
22.2	●	2220 MSL	15.0	4.0		1
22.3	●	2230 MSL	15.0	4.1		1
22.4	●	2240 MSL	15.0	4.1		1
22.5	●	2250 MSL	15.0	4.1		1
22.6	●	2260 MSL	15.0	4.1		1
22.7	●	2270 MSL	15.0	4.1		1

Grade: ACT100

Recommended Cutting Conditions J113 Applicable Holders J120

SMD series (Internal Coolant Supply)

MSL

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Stainless
Steel

Ti Alloy

Heat Resistant
Alloy

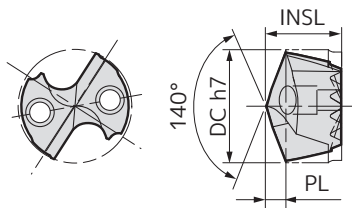
Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1

Indexable Head MSL type Diameter $\varnothing 22.8$ to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	●	SMDT 2280 MSL	15.0	4.1	SMDH220□	1
22.9	●	SMDT 2290 MSL	15.1	4.2	SMDH230□	1
23.0	●	2300 MSL	15.1	4.2		1
23.1	●	2310 MSL	15.1	4.2		1
23.2	●	2320 MSL	15.1	4.2		1
23.3	●	2330 MSL	15.1	4.2		1
23.4	●	2340 MSL	15.1	4.3		1
23.5	●	2350 MSL	15.1	4.3		1
23.6	●	2360 MSL	15.1	4.3		1
23.7	●	2370 MSL	15.1	4.3		1
23.8	●	2380 MSL	15.1	4.3		1
23.9	●	SMDT 2390 MSL	15.4	4.3	SMDH240□	1
24.0	●	2400 MSL	15.4	4.4		1
24.1	●	2410 MSL	15.4	4.4		1
24.2	●	2420 MSL	15.4	4.4		1
24.3	●	2430 MSL	15.4	4.4		1
24.4	●	2440 MSL	15.4	4.4		1
24.5	●	2450 MSL	15.4	4.5		1
24.6	●	2460 MSL	15.4	4.5		1
24.7	●	2470 MSL	15.4	4.5		1
24.8	●	2480 MSL	15.4	4.5		1
24.9	●	SMDT 2490 MSL	15.8	4.5	SMDH250□	1
25.0	●	2500 MSL	15.8	4.5		1
25.1	●	2510 MSL	15.8	4.6		1
25.2	●	2520 MSL	15.8	4.6		1
25.3	●	2530 MSL	15.8	4.6		1
25.4	●	2540 MSL	15.8	4.6		1
25.5	●	2550 MSL	15.8	4.6		1
25.6	●	2560 MSL	15.8	4.7		1
25.7	●	2570 MSL	15.8	4.7		1
25.8	●	2580 MSL	15.8	4.7		1
25.9	●	SMDT 2590 MSL	16.4	4.7	SMDH260□	1
26.0	●	2600 MSL	16.4	4.7		1
26.1	●	2610 MSL	16.4	4.7		1
26.2	●	2620 MSL	16.4	4.8		1
26.3	●	2630 MSL	16.4	4.8		1
26.4	●	2640 MSL	16.4	4.8		1
26.5	●	2650 MSL	16.4	4.8		1
26.6	●	2660 MSL	16.4	4.8		1
26.7	●	2670 MSL	16.4	4.9		1
26.8	●	2680 MSL	16.4	4.9		1
26.9	●	SMDT 2690 MSL	17.1	4.9	SMDH270□	1
27.0	●	2700 MSL	17.1	4.9		1
27.1	●	2710 MSL	17.1	4.9		1
27.2	●	2720 MSL	17.1	4.9		1
27.3	●	2730 MSL	17.1	5.0		1
27.4	●	2740 MSL	17.1	5.0		1
27.5	●	2750 MSL	17.1	5.0		1
27.6	●	2760 MSL	17.1	5.0		1
27.7	●	2770 MSL	17.1	5.0		1
27.8	●	2780 MSL	17.1	5.1		1
27.9	●	SMDT 2790 MSL	17.7	5.1	SMDH280□	1
28.0	●	2800 MSL	17.7	5.1		1
28.1	●	2810 MSL	17.7	5.1		1

Grade: ACT100

Recommended Cutting Conditions J113 Applicable Holders J120

Indexable Head MSL type Diameter $\varnothing 28.2$ to 30.8mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	●	SMDT 2820 MSL	17.7	5.1	SMDH280□	1
28.3	●	2830 MSL	17.7	5.2		1
28.4	●	2840 MSL	17.7	5.2		1
28.5	●	2850 MSL	17.7	5.2		1
28.6	●	2860 MSL	17.7	5.2		1
28.7	●	2870 MSL	17.7	5.2		1
28.8	●	2880 MSL	17.7	5.2		1
28.9	●	SMDT 2890 MSL	18.3	5.3	SMDH290□	1
29.0	●	2900 MSL	18.3	5.3		1
29.1	●	2910 MSL	18.3	5.3		1
29.2	●	2920 MSL	18.3	5.3		1
29.3	●	2930 MSL	18.3	5.3		1
29.4	●	2940 MSL	18.3	5.4		1
29.5	●	2950 MSL	18.3	5.4		1
29.6	●	2960 MSL	18.3	5.4		1
29.7	●	2970 MSL	18.3	5.4		1
29.8	●	2980 MSL	18.3	5.4		1
29.9	●	SMDT 2990 MSL	19.0	5.4	SMDH300□	1
30.0	●	3000 MSL	19.0	5.5		1
30.1	●	3010 MSL	19.0	5.5		1
30.2	●	3020 MSL	19.0	5.5		1
30.3	●	3030 MSL	19.0	5.5		1
30.4	●	3040 MSL	19.0	5.5		1
30.5	●	3050 MSL	19.0	5.6		1
30.6	●	3060 MSL	19.0	5.6		1
30.7	●	3070 MSL	19.0	5.6		1
30.8	●	3080 MSL	19.0	5.6		1

Grade: ACT100

Recommended Cutting Conditions J113 Applicable Holders J120, J121

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

SMD series (Internal Coolant Supply)

MEL

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
AlloyDEX
CoatIndexable head
MEL

Coolant Hole

Indexable
Head type

1.5D

3D

5D

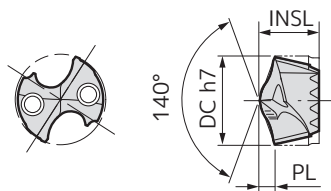
8D

12D

*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1

Indexable Head MEL type Diameter $\varnothing 12.0$ to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	▲	SMDT 1200 MEL	9.1	2.2	SMDH120□	1
12.1	▲	1210 MEL	9.1	2.2		1
12.2	▲	1220 MEL	9.1	2.2		1
12.3	▲	1230 MEL	9.1	2.2		1
12.4	▲	1240 MEL	9.1	2.3		1
12.5	▲	SMDT 1250 MEL	9.4	2.3	SMDH125□	1
12.6	▲	1260 MEL	9.4	2.3		1
12.7	▲	1270 MEL	9.4	2.3		1
12.8	▲	1280 MEL	9.4	2.3		1
12.9	▲	1290 MEL	9.4	2.3		1
13.0	▲	SMDT 1300 MEL	9.7	2.4	SMDH130□	1
13.1	▲	1310 MEL	9.7	2.4		1
13.2	▲	1320 MEL	9.7	2.4		1
13.3	▲	1330 MEL	9.7	2.4		1
13.4	▲	1340 MEL	9.7	2.4		1
13.5	▲	SMDT 1350 MEL	10.3	2.5	SMDH140□	1
13.6	▲	1360 MEL	10.3	2.5		1
13.7	▲	1370 MEL	10.3	2.5		1
13.8	▲	1380 MEL	10.3	2.5		1
13.9	▲	1390 MEL	10.3	2.5		1
14.0	▲	1400 MEL	10.3	2.5		1
14.1	▲	1410 MEL	10.3	2.6		1
14.2	▲	1420 MEL	10.3	2.6		1
14.3	▲	1430 MEL	10.3	2.6		1
14.4	▲	1440 MEL	10.3	2.6		1
14.5	▲	1450 MEL	10.3	2.6		1
14.6	▲	SMDT 1460 MEL	11.0	2.7	SMDH150□	1
14.7	▲	1470 MEL	11.0	2.7		1
14.8	▲	1480 MEL	11.0	2.7		1
14.9	▲	1490 MEL	11.0	2.7		1
15.0	▲	1500 MEL	11.0	2.7		1
15.1	▲	1510 MEL	11.0	2.7		1
15.2	▲	1520 MEL	11.0	2.8		1
15.3	▲	1530 MEL	11.0	2.8		1
15.4	▲	1540 MEL	11.0	2.8		1
15.5	▲	1550 MEL	11.0	2.8		1
15.6	▲	SMDT 1560 MEL	11.6	2.8	SMDH160□	1
15.7	▲	1570 MEL	11.6	2.9		1
15.8	▲	1580 MEL	11.6	2.9		1
15.9	▲	1590 MEL	11.6	2.9		1
16.0	▲	1600 MEL	11.6	2.9		1
16.1	▲	1610 MEL	11.6	2.9		1
16.2	▲	1620 MEL	11.6	2.9		1
16.3	▲	1630 MEL	11.6	3.0		1
16.4	▲	1640 MEL	11.6	3.0		1
16.5	▲	1650 MEL	11.6	3.0		1
16.6	▲	SMDT 1660 MEL	12.2	3.0	SMDH170□	1
16.7	▲	1670 MEL	12.2	3.0		1
16.8	▲	1680 MEL	12.2	3.1		1
16.9	▲	1690 MEL	12.2	3.1		1
17.0	▲	1700 MEL	12.2	3.1		1
17.1	▲	1710 MEL	12.2	3.1		1
17.2	▲	1720 MEL	12.2	3.1		1
17.3	▲	1730 MEL	12.2	3.1		1

Grade: ACX80

Recommended Cutting Conditions J113 Applicable Holders J120

Indexable Head MEL type Diameter $\varnothing 17.4$ to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	▲	SMDT 1740 MEL	12.2	3.2	SMDH170□	1
17.5	▲	1750 MEL	12.2	3.2		1
17.6	▲	SMDT 1760 MEL	12.9	3.2	SMDH180□	1
17.7	▲	1770 MEL	12.9	3.2		1
17.8	▲	1780 MEL	12.9	3.2		1
17.9	▲	1790 MEL	12.9	3.3		1
18.0	▲	1800 MEL	12.9	3.3		1
18.1	▲	1810 MEL	12.9	3.3		1
18.2	▲	1820 MEL	12.9	3.3		1
18.3	▲	1830 MEL	12.9	3.3		1
18.4	▲	1840 MEL	12.9	3.3	SMDH190□	1
18.5	▲	1850 MEL	12.9	3.4		1
18.6	▲	SMDT 1860 MEL	13.5	3.4		1
18.7	▲	1870 MEL	13.5	3.4		1
18.8	▲	1880 MEL	13.5	3.4		1
18.9	▲	1890 MEL	13.5	3.4		1
19.0	▲	1900 MEL	13.5	3.5		1
19.1	▲	1910 MEL	13.5	3.5		1
19.2	▲	1920 MEL	13.5	3.5		1
19.3	▲	1930 MEL	13.5	3.5		1
19.4	▲	1940 MEL	13.5	3.5	SMDH200□	1
19.5	▲	1950 MEL	13.5	3.5		1
19.6	▲	SMDT 1960 MEL	14.1	3.6		1
19.7	▲	1970 MEL	14.1	3.6		1
19.8	▲	1980 MEL	14.1	3.6		1
19.9	▲	1990 MEL	14.1	3.6		1
20.0	▲	2000 MEL	14.1	3.6		1
20.1	▲	2010 MEL	14.1	3.7		1
20.2	▲	2020 MEL	14.1	3.7		1
20.3	▲	2030 MEL	14.1	3.7		1
20.4	▲	2040 MEL	14.1	3.7	SMDH210□	1
20.5	▲	2050 MEL	14.1	3.7		1
20.6	▲	SMDT 2060 MEL	14.8	3.7		1
20.7	▲	2070 MEL	14.8	3.8		1
20.8	▲	2080 MEL	14.8	3.8		1
20.9	▲	2090 MEL	14.8	3.8		1
21.0	▲	2100 MEL	14.8	3.8		1
21.1	▲	2110 MEL	14.8	3.8		1
21.2	▲	2120 MEL	14.8	3.9		1
21.3	▲	2130 MEL	14.8	3.9	SMDH220□	1
21.4	▲	2140 MEL	14.8	3.9		1
21.5	▲	2150 MEL	14.8	3.9		1
21.6	▲	SMDT 2160 MEL	15.0	3.9		1
21.7	▲	2170 MEL	15.0	3.9		1
21.8	▲	2180 MEL	15.0	4.0		1
21.9	▲	2190 MEL	15.0	4.0		1
22.0	▲	2200 MEL	15.0	4.0		1
22.1	▲	2210 MEL	15.0	4.0		1
22.2	▲	2220 MEL	15.0	4.0		1
22.3	▲	2230 MEL	15.0	4.1	SMDH220□	1
22.4	▲	2240 MEL	15.0	4.1		1
22.5	▲	2250 MEL	15.0	4.1		1
22.6	▲	2260 MEL	15.0	4.1		1
22.7	▲	2270 MEL	15.0	4.1		1

Grade: ACX80

Recommended Cutting Conditions J113 Applicable Holders J120

SMD series (Internal Coolant Supply)

MEL

Carbon Steel/
Alloy Steel
up to 0.28%Carbon Steel/
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Ti Alloy

Heat Resistant
Alloy

Cast Iron

Ductile
Cast IronAluminum
AlloyDEX
CoatIndexable head
MEL

Coolant Hole

Indexable
Head type

1.5D

3D

5D

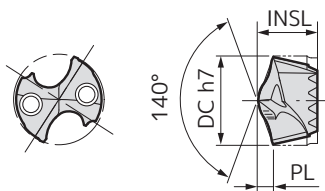
8D

12D

*For tolerances, refer to Chapter N - References.

Indexable Head

Fig 1



Indexable Head MEL type Diameter ø22.8 to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	▲	SMDT 2280 MEL	15.0	4.1	SMDH220□	1
22.9	▲	SMDT 2290 MEL	15.1	4.2	SMDH230□	1
23.0	▲	2300 MEL	15.1	4.2		1
23.1	▲	2310 MEL	15.1	4.2		1
23.2	▲	2320 MEL	15.1	4.2		1
23.3	▲	2330 MEL	15.1	4.2		1
23.4	▲	2340 MEL	15.1	4.3		1
23.5	▲	2350 MEL	15.1	4.3		1
23.6	▲	2360 MEL	15.1	4.3		1
23.7	▲	2370 MEL	15.1	4.3		1
23.8	▲	2380 MEL	15.1	4.3		1
23.9	▲	SMDT 2390 MEL	15.4	4.3	SMDH240□	1
24.0	▲	2400 MEL	15.4	4.4		1
24.1	▲	2410 MEL	15.4	4.4		1
24.2	▲	2420 MEL	15.4	4.4		1
24.3	▲	2430 MEL	15.4	4.4		1
24.4	▲	2440 MEL	15.4	4.4		1
24.5	▲	2450 MEL	15.4	4.5		1
24.6	▲	2460 MEL	15.4	4.5		1
24.7	▲	2470 MEL	15.4	4.5		1
24.8	▲	2480 MEL	15.4	4.5		1
24.9	▲	SMDT 2490 MEL	15.8	4.5	SMDH250□	1
25.0	▲	2500 MEL	15.8	4.5		1
25.1	▲	2510 MEL	15.8	4.6		1
25.2	▲	2520 MEL	15.8	4.6		1
25.3	▲	2530 MEL	15.8	4.6		1
25.4	▲	2540 MEL	15.8	4.6		1
25.5	▲	2550 MEL	15.8	4.6		1
25.6	▲	2560 MEL	15.8	4.7		1
25.7	▲	2570 MEL	15.8	4.7		1
25.8	▲	2580 MEL	15.8	4.7		1
25.9	▲	SMDT 2590 MEL	16.4	4.7	SMDH260□	1
26.0	▲	2600 MEL	16.4	4.7		1
26.1	▲	2610 MEL	16.4	4.7		1
26.2	▲	2620 MEL	16.4	4.8		1
26.3	▲	2630 MEL	16.4	4.8		1
26.4	▲	2640 MEL	16.4	4.8		1
26.5	▲	2650 MEL	16.4	4.8		1
26.6	▲	2660 MEL	16.4	4.8		1
26.7	▲	2670 MEL	16.4	4.9		1
26.8	▲	2680 MEL	16.4	4.9		1
26.9	▲	SMDT 2690 MEL	17.1	4.9	SMDH270□	1
27.0	▲	2700 MEL	17.1	4.9		1
27.1	▲	2710 MEL	17.1	4.9		1
27.2	▲	2720 MEL	17.1	4.9		1
27.3	▲	2730 MEL	17.1	5.0		1
27.4	▲	2740 MEL	17.1	5.0		1
27.5	▲	2750 MEL	17.1	5.0		1
27.6	▲	2760 MEL	17.1	5.0		1
27.7	▲	2770 MEL	17.1	5.0		1
27.8	▲	2780 MEL	17.1	5.1		1
27.9	▲	SMDT 2790 MEL	17.7	5.1	SMDH280□	1
28.0	▲	2800 MEL	17.7	5.1		1
28.1	▲	2810 MEL	17.7	5.1		1

Grade: ACX80

Recommended Cutting Conditions J113 Applicable Holders J120, J121

Indexable Head MEL type Diameter ø28.2 to 30.8mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	▲	SMDT 2820 MEL	17.7	5.1	SMDH280□	1
28.3	▲	2830 MEL	17.7	5.2		1
28.4	▲	2840 MEL	17.7	5.2		1
28.5	▲	2850 MEL	17.7	5.2		1
28.6	▲	2860 MEL	17.7	5.2		1
28.7	▲	2870 MEL	17.7	5.2		1
28.8	▲	2880 MEL	17.7	5.2		1
28.9	▲	SMDT 2890 MEL	18.3	5.3	SMDH290□	1
29.0	▲	2900 MEL	18.3	5.3		1
29.1	▲	2910 MEL	18.3	5.3		1
29.2	▲	2920 MEL	18.3	5.3		1
29.3	▲	2930 MEL	18.3	5.3		1
29.4	▲	2940 MEL	18.3	5.4		1
29.5	▲	2950 MEL	18.3	5.4		1
29.6	▲	2960 MEL	18.3	5.4		1
29.7	▲	2970 MEL	18.3	5.4		1
29.8	▲	2980 MEL	18.3	5.4		1
29.9	▲	SMDT 2990 MEL	19.0	5.4	SMDH300□	1
30.0	▲	3000 MEL	19.0	5.5		1
30.1	▲	3010 MEL	19.0	5.5		1
30.2	▲	3020 MEL	19.0	5.5		1
30.3	▲	3030 MEL	19.0	5.5		1
30.4	▲	3040 MEL	19.0	5.5		1
30.5	▲	3050 MEL	19.0	5.6		1
30.6	▲	3060 MEL	19.0	5.6		1
30.7	▲	3070 MEL	19.0	5.6		1
30.8	▲	3080 MEL	19.0	5.6		1

Grade: ACX80

Recommended Cutting Conditions J113 Applicable Holders J120, J121

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

SMD series (Internal Coolant Supply) Side Lock Flat/No Flange

MTL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron			
	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron		Ductile Cast Iron	Aluminum Alloy
	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy		Cast Iron	Ductile Cast Iron

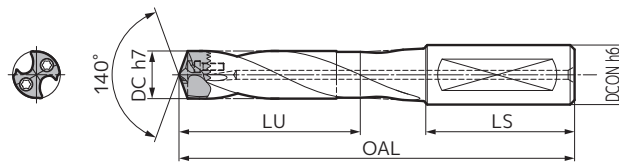


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø12.0 to 29.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
												
12.0 ≤ D < 12.5	3	SMDH 120M	●	42.0	107.2	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	120L	●	67.0	132.2	48	16	MEL	1			
12.5 ≤ D < 13.0	3	SMDH 125M	●	44.0	107.3	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	125L	●	69.0	132.3	48	16	MEL	1			
13.0 ≤ D < 13.5	3	SMDH 130M	●	45.0	112.4	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	130L	●	72.0	142.4	48	16	MEL	1			
13.5 ≤ D ≤ 14.5	3	SMDH 140M	●	51.0	119.0	48	16	MTL/MSL MEL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	140L	●	80.0	149.0	48	16		1			
	8	140D	●	123.0	194.0	48	16		1			
14.5 < D ≤ 15.5	3	SMDH 150M	●	54.0	129.2	50	20	MTL/MSL MEL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	150L	●	85.0	159.2	50	20		1			
	8	150D	●	131.0	204.2	50	20		1			
15.5 < D ≤ 16.5	3	SMDH 160M	●	57.0	134.4	50	20	MTL/MSL MEL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	160L	●	90.0	169.4	50	20		1			
	8	160D	●	140.0	214.4	50	20		1			
16.5 < D ≤ 17.5	3	SMDH 170M	●	60.0	139.6	50	20	MTL/MSL MEL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	170L	●	95.0	174.6	50	20		1			
	8	170D	●	148.0	224.6	50	20		1			
17.5 < D ≤ 18.5	3	SMDH 180M	●	63.0	144.8	50	20	MTL/MSL MEL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	180L	●	100.0	179.8	50	20		1			
	8	180D	●	156.0	229.8	50	20		1			
18.5 < D ≤ 19.5	3	SMDH 190M	●	67.0	160.0	56	25	MTL/MSL MEL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	190L	●	106.0	195.0	56	25		1			
	8	190D	●	164.0	255.0	56	25		1			
19.5 < D ≤ 20.5	3	SMDH 200M	●	70.0	160.1	56	25	MTL/MSL MEL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	200L	●	111.0	200.1	56	25		1			
	8	200D	●	172.0	265.1	56	25		1			
20.5 < D ≤ 21.5	3	SMDH 210M	●	73.0	160.3	56	25	MTL/MSL MEL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	210L	●	116.0	200.3	56	25		1			
	8	210D	●	180.0	270.3	56	25		1			
21.5 < D ≤ 22.8	3	SMDH 220M	●	77.0	165.1	56	25	MTL/MSL MEL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	220L	●	123.0	205.1	56	25		1			
	8	220D	●	191.0	275.1	56	25		1			
22.8 < D ≤ 23.8	3	SMDH 230M	●	80.0	164.7	56	25	MTL/MSL MEL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	230L	●	128.0	214.7	56	25		1			
	8	230D	●	199.0	284.7	56	25		1			
23.8 < D ≤ 24.8	3	SMDH 240M	●	83.0	174.6	60	32	MTL/MSL MEL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	240L	●	133.0	224.6	60	32		1			
	8	240D	●	207.0	299.6	60	32		1			
24.8 < D ≤ 25.8	3	SMDH 250M	●	87.0	174.5	60	32	MTL/MSL MEL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	250L	●	138.0	229.5	60	32		1			
	8	250D	●	216.0	304.5	60	32		1			
25.8 < D ≤ 26.8	3	SMDH 260M	●	90.0	179.7	60	32	MTL/MSL MEL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	260L	●	143.0	234.7	60	32		1			
	8	260D	●	224.0	314.7	60	32		1			
26.8 < D ≤ 27.8	3	SMDH 270M	●	93.0	179.9	60	32	MTL/MSL MEL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	270L	●	149.0	239.9	60	32		1			
	8	270D	●	232.0	324.9	60	32		1			
27.8 < D ≤ 28.8	3	SMDH 280M	●	96.0	185.1	60	32	MTL/MSL MEL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	280L	●	154.0	245.1	60	32		1			
	8	280D	●	240.0	330.1	60	32		1			
28.8 < D ≤ 29.8	3	SMDH 290M	●	99.0	190.3	60	32	MTL/MSL MEL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	290L	●	159.0	250.3	60	32		1			
	8	290D	●	248.0	340.3	60	32		1			

Recommended Cutting Conditions **J113** MTL type Heads **J114, J115** MSL type Heads **J116, J117** MEL type Heads **J118, J119**

MTL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron
MSL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron
MEL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy

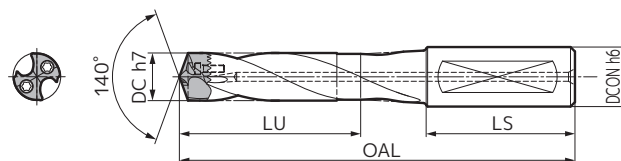


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1

Holder ø29.8 to 42.5mm with MTL type / MSL type / MEL type set **Parts**

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
29.8 < D ≤ 30.8	3	SMDH 300M	●	103.0	190.5	60	32	MTL/MSL MEL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	300L	●	164.0	260.5	60	32		1			
	8	300D	●	257.0	350.5	60	32		1			
30.8 < D ≤ 32.0	3	SMDH 320M	●	106.0	200.7	60	32	MTL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	320L	●	170.0	265.8	60	32		1			
	8	320D	●	266.0	360.8	60	32		1			
32.0 < D ≤ 33.5	3	SMDH 335M	●	111.0	205.9	60	32	MTL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	335L	●	178.0	274.1	60	32		1			
	8	335D	●	279.0	376.1	60	32		1			
33.5 < D ≤ 35.0	3	SMDH 350M	●	116.0	221.2	70	40	MTL	1	BX0515	7.2	HD040
	5	350L	●	186.0	296.4	70	40		1			
	8	350D	●	291.0	401.4	70	40		1			
35.0 < D ≤ 36.5	3	SMDH 365M	●	121.0	226.4	70	40	MTL	1	BX0515	7.2	HD040
	5	365L	●	194.0	301.6	70	40		1			
	8	365D	●	303.0	411.6	70	40		1			
36.5 < D ≤ 38.0	3	SMDH 380M	●	125.0	231.7	70	40	MTL	1	BX0515	7.2	HD040
	5	380L	●	201.0	311.9	70	40		1			
	8	380D	●	315.0	426.9	70	40		1			
38.0 < D ≤ 39.5	3	SMDH 395M	●	130.0	237.0	70	40	MTL	1	BX0515	7.2	HD040
	5	395L	●	209.0	322.2	70	40		1			
	8	395D	●	328.0	437.2	70	40		1			
39.5 < D ≤ 41.0	3	SMDH 410M	●	135.0	252.2	70	40	MTL	1	BX0515	7.2	HD040
	5	410L	●	217.0	332.5	70	40		1			
	8	410D	●	340.0	457.5	70	40		1			
41.0 < D ≤ 42.5	3	SMDH 425M	●	140.0	257.5	70	40	MTL	1	BX0515	7.2	HD040
	5	425L	●	225.0	342.7	70	40		1			
	8	425D	●	352.0	467.7	70	40		1			

Recommended Cutting Conditions J113 MTL type Head J115 MSL type Head J117 MEL type Head J119

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

MTL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron
MSL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron
MEL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy

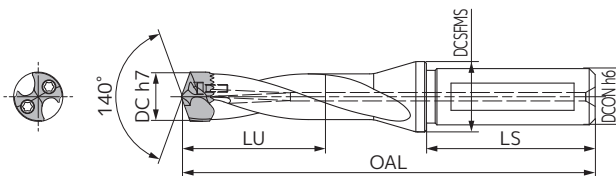


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø12.0 to 24.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5DF	●	23.0	90.5	48	20	16	MTL/MSL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3DF	●	42.0	107.2	48	20	16	MEL	1			
	5	120-5DF	●	67.0	132.2	48	20	16		1			
	8	120-8DF	●	98.0	164.4	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5DF	●	24.0	91.0	48	20	16	MTL/MSL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3DF	●	44.0	107.3	48	20	16	MEL	1			
	5	125-5DF	●	69.0	132.3	48	20	16		1			
	8	125-8DF	●	102.0	170.1	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5DF	●	25.0	92.2	48	20	16	MTL/MSL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3DF	●	45.0	112.4	48	20	16	MEL	1			
	5	130-5DF	●	72.0	142.4	48	20	16		1			
	8	130-8DF	●	106.0	178.4	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5DF	●	29.0	96.3	48	20	16	MTL/MSL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3DF	●	51.0	119.0	48	20	16	MEL	1			
	5	140-5DF	●	80.0	149.0	48	20	16		1			
	8	140-8DF	●	123.0	194.0	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5DF	●	31.0	100.0	50	25	20	MTL/MSL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3DF	●	54.0	129.2	50	25	20	MEL	1			
	5	150-5DF	●	85.0	159.2	50	25	20		1			
	8	150-8DF	●	131.0	204.2	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5DF	●	32.0	102.7	50	25	20	MTL/MSL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3DF	●	57.0	134.4	50	25	20	MEL	1			
	5	160-5DF	●	90.0	169.4	50	25	20		1			
	8	160-8DF	●	140.0	214.4	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5DF	●	34.0	104.4	50	25	20	MTL/MSL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3DF	●	60.0	139.6	50	25	20	MEL	1			
	5	170-5DF	●	95.0	174.6	50	25	20		1			
	8	170-8DF	●	148.0	224.6	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5DF	●	36.0	107.1	50	25	20	MTL/MSL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3DF	●	63.0	144.8	50	25	20	MEL	1			
	5	180-5DF	●	100.0	179.8	50	25	20		1			
	8	180-8DF	●	156.0	229.8	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5DF	●	37.0	114.8	56	30	25	MTL/MSL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3DF	●	67.0	160.0	56	30	25	MEL	1			
	5	190-5DF	●	106.0	195.0	56	30	25		1			
	8	190-8DF	●	164.0	255.0	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5DF	●	39.0	117.4	56	30	25	MTL/MSL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3DF	●	70.0	160.1	56	30	25	MEL	1			
	5	200-5DF	●	111.0	200.1	56	30	25		1			
	8	200-8DF	●	172.0	265.1	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5DF	●	41.0	119.1	56	30	25	MTL/MSL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3DF	●	73.0	160.3	56	30	25	MEL	1			
	5	210-5DF	●	116.0	200.3	56	30	25		1			
	8	210-8DF	●	180.0	270.3	56	30	25		1			
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5DF	●	43.0	120.9	56	30	25	MTL/MSL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3DF	●	77.0	165.1	56	30	25	MEL	1			
	5	220-5DF	●	123.0	205.1	56	30	25		1			
	8	220-8DF	●	191.0	275.1	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5DF	●	45.0	122.0	56	30	25	MTL/MSL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3DF	●	80.0	164.7	56	30	25	MEL	1			
	5	230-5DF	●	128.0	214.7	56	30	25		1			
	8	230-8DF	●	199.0	284.7	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5DF	●	46.0	128.4	60	37	32	MTL/MSL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3DF	●	83.0	174.6	60	37	32	MEL	1			
	5	240-5DF	●	133.0	224.6	60	37	32		1			
	8	240-8DF	●	207.0	299.6	60	37	32		1			

Recommended Cutting Conditions J113 MTL type Heads J114, J115 MSL type Heads J116, J117 MEL type Heads J118, J119

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

MTL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron
MSL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron
MEL	Carbon Steel Alloy Steel up to 0.25%	Carbon Steel Alloy Steel from 0.25%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy

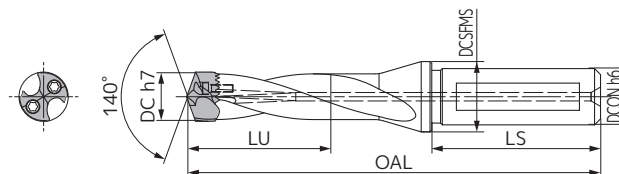


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø24.8 to 30.8mm with MTL type / MSL type / MEL type set

Parts

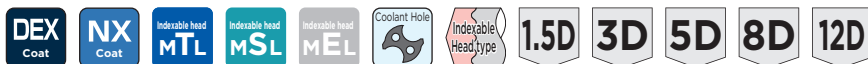
Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5DF	●	48.0	128.8	60	37	32	MTL/MSL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3DF	●	87.0	174.5	60	37	32	MTL/MSL	1			
	5	250-5DF	●	138.0	229.5	60	37	32	MEL	1			
	8	250-8DF	●	216.0	304.5	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5DF	●	50.0	131.5	60	37	32	MTL/MSL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3DF	●	90.0	179.7	60	37	32	MTL/MSL	1			
	5	260-5DF	●	143.0	234.7	60	37	32	MEL	1			
	8	260-8DF	●	224.0	314.7	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5DF	●	51.0	132.2	60	37	32	MTL/MSL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3DF	●	93.0	179.9	60	37	32	MTL/MSL	1			
	5	270-5DF	●	149.0	239.9	60	37	32	MEL	1			
	8	270-8DF	●	232.0	324.9	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5DF	●	53.0	133.9	60	37	32	MTL/MSL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3DF	●	96.0	185.1	60	37	32	MTL/MSL	1			
	5	280-5DF	●	154.0	245.1	60	37	32	MEL	1			
	8	280-8DF	●	240.0	330.1	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5DF	●	55.0	135.6	60	37	32	MTL/MSL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3DF	●	99.0	190.3	60	37	32	MTL/MSL	1			
	5	290-5DF	●	159.0	250.3	60	37	32	MEL	1			
	8	290-8DF	●	248.0	340.3	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5DF	●	56.0	138.3	60	37	32	MTL/MSL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3DF	●	103.0	190.5	60	37	32	MTL/MSL	1			
	5	300-5DF	●	164.0	260.5	60	37	32	MEL	1			
	8	300-8DF	●	257.0	350.5	60	37	32		1			

Recommended Cutting Conditions J113 MTL type Head J115 MSL type Head J117 MEL type Head J119

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

MTL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron
MSL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron
MEL	Carbon Steel Alloy Steel up to 0.28%	Carbon Steel Alloy Steel from 0.29%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy

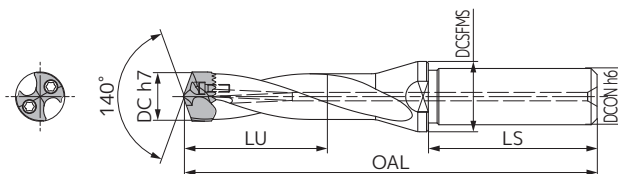


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø12.0 to 21.5mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5D	●	23.0	90.5	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00
	3	120-3D	●	42.0	107.2	48	20	16		1		
	5	120-5D	●	67.0	132.2	48	20	16		1		
	8	120-8D	●	98.0	164.4	48	20	16		1		
	12	120-12D	●	146.0	213.3	48	20	16		1		
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5D	●	24.0	91.0	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00
	3	125-3D	●	44.0	107.3	48	20	16		1		
	5	125-5D	●	69.0	132.3	48	20	16		1		
	8	125-8D	●	102.0	170.1	48	20	16		1		
	12	125-12D	●	152.0	219.5	48	20	16		1		
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5D	●	25.0	92.2	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00
	3	130-3D	●	45.0	112.4	48	20	16		1		
	5	130-5D	●	72.0	142.4	48	20	16		1		
	8	130-8D	●	106.0	178.4	48	20	16		1		
	12	130-12D	●	158.0	225.7	48	20	16		1		
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5D	●	29.0	96.3	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00
	3	140-3D	●	51.0	119.0	48	20	16		1		
	5	140-5D	●	80.0	149.0	48	20	16		1		
	8	140-8D	●	123.0	194.0	48	20	16		1		
	12	140-12D	●	170.0	238.5	48	20	16		1		
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5D	●	31.0	100.0	50	25	20	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00
	3	150-3D	●	54.0	129.2	50	25	20		1		
	5	150-5D	●	85.0	159.2	50	25	20		1		
	8	150-8D	●	131.0	204.2	50	25	20		1		
	12	150-12D	●	182.0	253.0	50	25	20		1		
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5D	●	32.0	102.7	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24
	3	160-3D	●	57.0	134.4	50	25	20		1		
	5	160-5D	●	90.0	169.4	50	25	20		1		
	8	160-8D	●	140.0	214.4	50	25	20		1		
	12	160-12D	●	194.0	265.5	50	25	20		1		
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5D	●	34.0	104.4	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24
	3	170-3D	●	60.0	139.6	50	25	20		1		
	5	170-5D	●	95.0	174.6	50	25	20		1		
	8	170-8D	●	148.0	224.6	50	25	20		1		
	12	170-12D	●	207.0	278.1	50	25	20		1		
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5D	●	36.0	107.1	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24
	3	180-3D	●	63.0	144.8	50	25	20		1		
	5	180-5D	●	100.0	179.8	50	25	20		1		
	8	180-8D	●	156.0	229.8	50	25	20		1		
	12	180-12D	●	219.0	290.5	50	25	20		1		
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5D	●	37.0	114.8	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44
	3	190-3D	●	67.0	160.0	56	30	25		1		
	5	190-5D	●	106.0	195.0	56	30	25		1		
	8	190-8D	●	164.0	255.0	56	30	25		1		
	12	190-12D	●	231.0	309.1	56	30	25		1		
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5D	●	39.0	117.4	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44
	3	200-3D	●	70.0	160.1	56	30	25		1		
	5	200-5D	●	111.0	200.1	56	30	25		1		
	8	200-8D	●	172.0	265.1	56	30	25		1		
	12	200-12D	●	243.0	321.4	56	30	25		1		
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5D	●	41.0	119.1	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44
	3	210-3D	●	73.0	160.3	56	30	25		1		
	5	210-5D	●	116.0	200.3	56	30	25		1		
	8	210-8D	●	180.0	270.3	56	30	25		1		
	12	210-12D	●	255.0	333.9	56	30	25		1		

Recommended Cutting Conditions J113

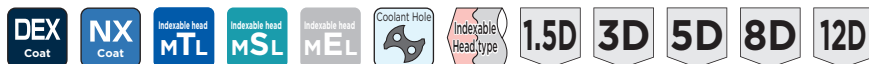
MTL type Head J114

MSL type Head J116

MEL type Head J118



MTL	Carbon Steel Alloy Steel up to 0.2%N	Carbon Steel Alloy Steel from 0.2%N	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron
MSL	Carbon Steel Alloy Steel up to 0.2%N	Carbon Steel Alloy Steel from 0.2%N	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron
MEL	Carbon Steel Alloy Steel up to 0.2%N	Carbon Steel Alloy Steel from 0.2%N	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy

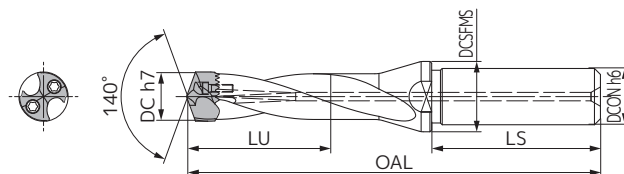


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø21.5 to 30.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5D	●	43.0	120.9	56	30	25	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3D	●	77.0	165.1	56	30	25		1			
	5	220-5D	●	123.0	205.1	56	30	25		1			
	8	220-8D	●	191.0	275.1	56	30	25		1			
	12	220-12D	●	268.0	347.0	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5D	●	45.0	122.0	56	30	25	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3D	●	80.0	164.7	56	30	25		1			
	5	230-5D	●	128.0	214.7	56	30	25		1			
	8	230-8D	●	199.0	284.7	56	30	25		1			
	12	230-12D	●	280.0	359.0	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5D	●	46.0	128.4	60	37	32	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3D	●	83.0	174.6	60	37	32		1			
	5	240-5D	●	133.0	224.6	60	37	32		1			
	8	240-8D	●	207.0	299.6	60	37	32		1			
	12	240-12D	●	292.0	376.1	60	37	32		1			
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5D	●	48.0	128.8	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3D	●	87.0	174.5	60	37	32		1			
	5	250-5D	●	138.0	229.5	60	37	32		1			
	8	250-8D	●	216.0	304.5	60	37	32		1			
	12	250-12D	●	304.0	388.3	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5D	●	50.0	131.5	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3D	●	90.0	179.7	60	37	32		1			
	5	260-5D	●	143.0	234.7	60	37	32		1			
	8	260-8D	●	224.0	314.7	60	37	32		1			
	12	260-12D	●	316.0	400.8	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5D	●	51.0	132.2	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3D	●	93.0	179.9	60	37	32		1			
	5	270-5D	●	149.0	239.9	60	37	32		1			
	8	270-8D	●	232.0	324.9	60	37	32		1			
	12	270-12D	●	328.0	413.3	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5D	●	53.0	133.9	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3D	●	96.0	185.1	60	37	32		1			
	5	280-5D	●	154.0	245.1	60	37	32		1			
	8	280-8D	●	240.0	330.1	60	37	32		1			
	12	280-12D	●	341.0	425.8	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5D	●	55.0	135.6	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3D	●	99.0	190.3	60	37	32		1			
	5	290-5D	●	159.0	250.3	60	37	32		1			
	8	290-8D	●	248.0	340.3	60	37	32		1			
	12	290-12D	●	353.0	438.4	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5D	●	56.0	138.3	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3D	●	103.0	190.5	60	37	32		1			
	5	300-5D	●	164.0	260.5	60	37	32		1			
	8	300-8D	●	257.0	350.5	60	37	32		1			
	12	300-12D	●	365.0	450.8	60	37	32		1			

Recommended Cutting Conditions J113 MTL type Heads J114, J115 MSL type Heads J116, J117 MEL type Heads J118, J119



Recommended Tightening Torque (N·m)

J125

Drilling

Solid

Indexable
Head typeIndexable
Insert type

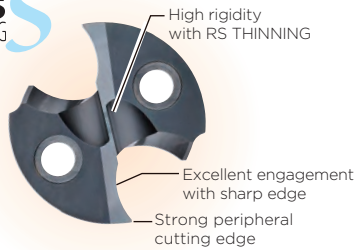
Reamers

MFS type

Ideal for drilling on non-flat surfaces and burr prevention

RS
THINNING

DEX Coat



● Suited to various types of drilling thanks to a point angle of 180°

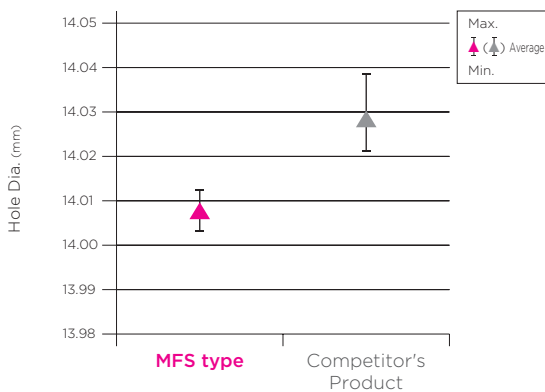
Supports high-efficiency flat bottom drilling, drilling on non-flat surfaces such as inclined, cylindrical surfaces, and interrupted drilling. Also effective in suppressing burrs at the hole exit.

● Improved drilling stability

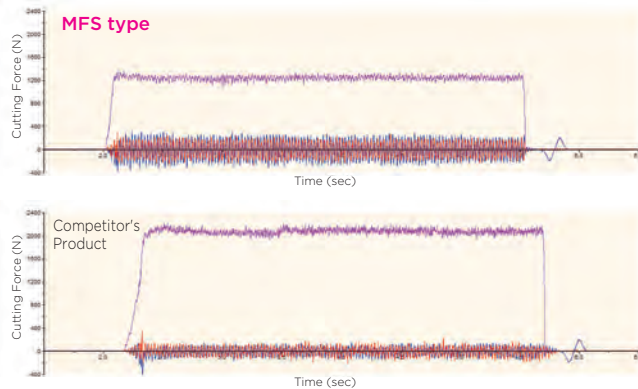
Achieves high rigidity by employing RS THINNING, which ensures thick web at the base.

■ Performance

Comparison of Hole Diameter Accuracy



Comparison of Cutting Force



Tool : SMDH140-1.5DF + SMDT1400MFS
Work Material : S50C
Cutting Conditions: $vc = 100\text{mm/min}$ $f = 0.15\text{mm/rev}$ Hole Depth 21mm Wet

■ Precautions when Using MFS type Heads

	No guide hole (direct drilling)	With guide hole	Flat Finishing of Hole Bottom
Applications	Flat Surface Non-flat surface	Guide Holes	
1.5D holder	○	○ (guide hole not needed)	○
3D to 12D holders	×	×	○

■ Recommended Cutting Conditions (MFS type) (n: Spindle Speed min^{-1} vc : Cutting Speed m/min f : Feed Rate mm/rev)

Work Material	Mild Steel (up to 250HB)	General Steel (250 to 320HB)	Hardened Steel (45HRC)	Stainless Steel (up to 200HB)	Grey Cast Iron	Ductile Cast Iron	Aluminum Alloy*
Diameter DC (mm)	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.
16.0	n 2,000 vc 60-100-120 f 0.15-0.20-0.35	n 2,000 vc 70-100-120 f 0.15-0.20-0.35	n 1,200 vc 40-60-90 f 0.10-0.15-0.20	n 1,200 vc 50-60-80 f 0.10-0.15-0.20	n 1,400 vc 50-70-90 f 0.20-0.25-0.30	n 1,200 vc 50-60-80 f 0.20-0.25-0.30	n 4,800 vc 200-240-260 f 0.35-0.45-0.55
20.0	n 1,600 vc 80-100-120 f 0.15-0.25-0.35	n 1,600 vc 70-100-120 f 0.15-0.25-0.35	n 1,000 vc 40-60-90 f 0.15-0.20-0.25	n 1,100 vc 60-70-90 f 0.15-0.20-0.25	n 1,300 vc 60-80-100 f 0.20-0.30-0.35	n 1,100 vc 50-70-90 f 0.20-0.25-0.35	n 3,800 vc 200-240-260 f 0.35-0.50-0.60
30.8	n 1,000 vc 80-100-120 f 0.20-0.30-0.35	n 1,000 vc 70-100-120 f 0.20-0.25-0.35	n 600 vc 40-60-90 f 0.15-0.20-0.25	n 700 vc 60-70-90 f 0.15-0.20-0.25	n 800 vc 60-80-100 f 0.20-0.30-0.40	n 700 vc 50-70-90 f 0.25-0.30-0.35	n 2,500 vc 200-240-260 f 0.35-0.50-0.60

Note: The recommended hole depth is 2 x DC. The depth is measured from the highest point of the hole when drilling in inclined surfaces.

The recommended cutting conditions are those for drilling in flat horizontal surfaces.

Adjust the feed rate according to the inclination angle when drilling in an inclined surface.

Set the feed rate at 70% or lower when the inclination angle is 30° or less.

Set the feed rate at 50% or lower when the inclination angle is larger than 30°.

This product is a drilling tool. Do not use it for traverse cutting or helical milling.

*Inquire if you require special drill heads for aluminum alloy.

SMD series (Internal Coolant Supply)

MFS

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

Drilling

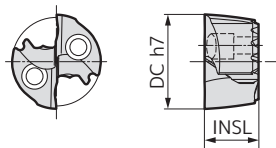
Solid

Indexable
Head typeIndexable
Insert type

Reamers

Indexable Head

Fig 1



Indexable Head MFS type Diameter $\varnothing 12.0$ to 21.5mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Applicable Holder	Fig
12.0	●	SMDT 1200 MFS	7.1	SMDH120□	1
12.5	●	1250 MFS	7.2	SMDH125□	1
13.0	●	1300 MFS	7.5	SMDH130□	1
13.5	●	SMDT 1350 MFS	7.9		1
14.0	●	1400 MFS	7.9	SMDH140□	1
14.5	●	1450 MFS	7.9		1
15.0	●	SMDT 1500 MFS	8.3	SMDH150□	1
15.5	●	1550 MFS	8.3		1
16.0	●	SMDT 1600 MFS	8.8	SMDH160□	1
16.5	●	1650 MFS	8.8		1
17.0	●	SMDT 1700 MFS	9.3	SMDH170□	1
17.5	●	1750 MFS	9.3		1
18.0	●	SMDT 1800 MFS	9.8	SMDH180□	1
18.5	●	1850 MFS	9.8		1
19.0	●	SMDT 1900 MFS	10.2	SMDH190□	1
19.5	●	1950 MFS	10.2		1
20.0	●	SMDT 2000 MFS	10.7	SMDH200□	1
20.5	●	2050 MFS	10.7		1
21.0	●	SMDT 2100 MFS	11.2	SMDH210□	1
21.5	●	2150 MFS	11.2		1

Grade: ACX70

Recommended Cutting Conditions **J126**Applicable Holders **J128, J130, J132**

Indexable Head MFS type Diameter $\varnothing 22.0$ to 30.0mm

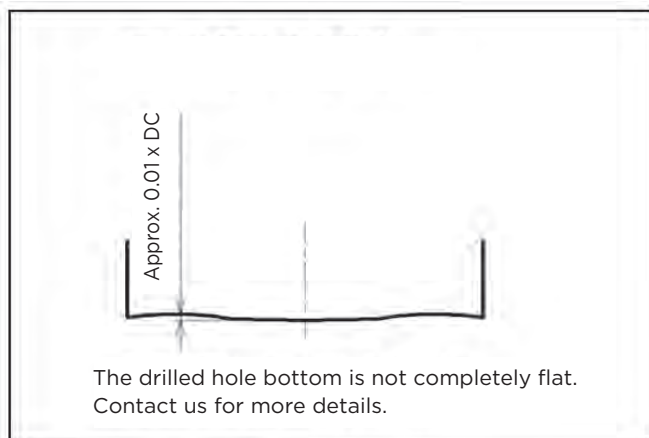
Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Applicable Holder	Fig
22.0	●	SMDT 2200 MFS	11.2	SMDH220□	1
22.5	●	2250 MFS	11.2		1
23.0	●	SMDT 2300 MFS	11.2	SMDH230□	1
23.5	●	2350 MFS	11.2		1
24.0	●	SMDT 2400 MFS	11.3	SMDH240□	1
24.5	●	2450 MFS	11.3		1
25.0	●	SMDT 2500 MFS	11.7	SMDH250□	1
25.5	●	2550 MFS	11.7		1
26.0	●	SMDT 2600 MFS	12.2	SMDH260□	1
26.5	●	2650 MFS	12.2		1
27.0	●	SMDT 2700 MFS	12.7	SMDH270□	1
27.5	●	2750 MFS	12.7		1
28.0	●	SMDT 2800 MFS	13.2	SMDH280□	1
28.5	●	2850 MFS	13.2		1
29.0	●	SMDT 2900 MFS	13.6	SMDH290□	1
29.5	●	2950 MFS	13.6		1
30.0	●	SMDT 3000 MFS	14.1	SMDH300□	1

Grade: ACX70

Recommended Cutting Conditions **J126**Applicable Holders **J128 to J131, J133**

Shape of Hole Bottom Drilled with MFS type



SMD series (Internal Coolant Supply) Side Lock Flat/No Flange **MFS**Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

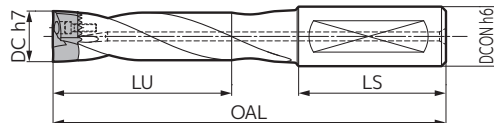
Cast Iron

Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

● Set Figure

Fig 1

**Holder ø12.0 to 29.8mm with MFS type set****Parts**

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
12.0 ≤ D < 12.5	3	SMDH 120M	●	40.0	105.2	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	120L	●	65.0	130.2	48	16		1			
12.5 ≤ D < 13.0	3	SMDH 125M	●	41.0	105.1	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	125L	●	67.0	130.1	48	16		1			
13.0 ≤ D < 13.5	3	SMDH 130M	●	43.0	110.2	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	130L	●	70.0	140.2	48	16		1			
13.5 ≤ D ≤ 14.5	3	SMDH 140M	●	48.0	116.6	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	140L	●	77.0	146.6	48	16		1			
	8	140D	●	121.0	191.6	48	16		1			
14.5 < D ≤ 15.5	3	SMDH 150M	●	51.0	126.6	50	20	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	150L	●	82.0	156.6	50	20		1			
	8	150D	●	129.0	201.6	50	20		1			
15.5 < D ≤ 16.5	3	SMDH 160M	●	54.0	131.6	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	160L	●	87.0	166.6	50	20		1			
	8	160D	●	137.0	211.6	50	20		1			
16.5 < D ≤ 17.5	3	SMDH 170M	●	57.0	136.6	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	170L	●	92.0	171.6	50	20		1			
	8	170D	●	145.0	221.6	50	20		1			
17.5 < D ≤ 18.5	3	SMDH 180M	●	60.0	141.7	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	180L	●	97.0	176.7	50	20		1			
	8	180D	●	153.0	226.7	50	20		1			
18.5 < D ≤ 19.5	3	SMDH 190M	●	63.0	156.6	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	190L	●	102.0	191.6	56	25		1			
	8	190D	●	161.0	251.6	56	25		1			
19.5 < D ≤ 20.5	3	SMDH 200M	●	66.0	156.7	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	200L	●	107.0	196.7	56	25		1			
	8	200D	●	169.0	261.7	56	25		1			
20.5 < D ≤ 21.5	3	SMDH 210M	●	69.0	156.7	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	210L	●	112.0	196.7	56	25		1			
	8	210D	●	177.0	266.7	56	25		1			
21.5 < D ≤ 22.8	3	SMDH 220M	●	73.0	161.3	56	25	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	220L	●	119.0	201.3	56	25		1			
	8	220D	●	187.0	271.3	56	25		1			
22.8 < D ≤ 23.8	3	SMDH 230M	●	76.0	160.7	56	25	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	230L	●	124.0	210.7	56	25		1			
	8	230D	●	195.0	280.7	56	25		1			
23.8 < D ≤ 24.8	3	SMDH 240M	●	79.0	170.5	60	32	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	240L	●	129.0	220.5	60	32		1			
	8	240D	●	203.0	295.5	60	32		1			
24.8 < D ≤ 25.8	3	SMDH 250M	●	82.0	170.4	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	250L	●	134.0	225.4	60	32		1			
	8	250D	●	211.0	300.4	60	32		1			
25.8 < D ≤ 26.8	3	SMDH 260M	●	85.0	175.5	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	260L	●	139.0	230.5	60	32		1			
	8	260D	●	219.0	310.5	60	32		1			
26.8 < D ≤ 27.8	3	SMDH 270M	●	88.0	175.5	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	270L	●	144.0	235.5	60	32		1			
	8	270D	●	227.0	320.5	60	32		1			
27.8 < D ≤ 28.8	3	SMDH 280M	●	91.0	180.6	60	32	MFS	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	280L	●	149.0	240.6	60	32		1			
	8	280D	●	235.0	325.6	60	32		1			
28.8 < D ≤ 29.8	3	SMDH 290M	●	94.0	185.4	60	32	MFS	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	290L	●	154.0	245.4	60	32		1			
	8	290D	●	243.0	335.4	60	32		1			

Recommended Cutting Conditions **J126** MFS type Head **J127**

SMD series (Internal Coolant Supply) Side Lock Flat/No Flange MFS

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Cast Iron

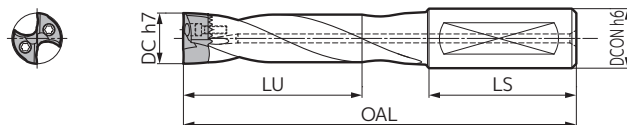
Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø29.8 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
29.8 < D ≤ 30.8	3	SMDH 300M	●	97.0	185.6	60	32	MFS	1		4.98 to 6.64	TRDR25IP
	5	300L	●	159.0	255.6	60	32		1			
	8	300D	●	251.0	345.6	60	32		1			

Recommended Cutting Conditions J126 MFS type Head J127

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers



Recommended Tightening Torque (N·m)

J129

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

MFS

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Cast Iron

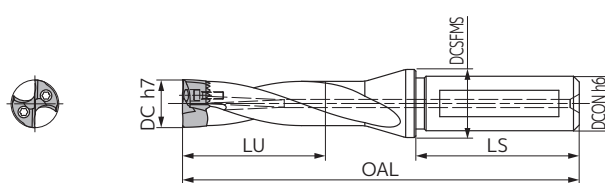
Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø12.0 to 24.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5DF	●	21.0	88.5	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3DF	●	40.0	105.2	48	20	16		1			
	5	120-5DF	●	65.0	130.2	48	20	16		1			
	8	120-8DF	●	96.0	162.4	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5DF	●	22.0	88.8	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3DF	●	41.0	105.1	48	20	16		1			
	5	125-5DF	●	67.0	130.1	48	20	16		1			
	8	125-8DF	●	100.0	167.9	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5DF	●	23.0	90.0	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3DF	●	43.0	110.2	48	20	16		1			
	5	130-5DF	●	70.0	140.2	48	20	16		1			
	8	130-8DF	●	104.0	176.2	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5DF	●	26.0	93.9	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3DF	●	48.0	116.6	48	20	16		1			
	5	140-5DF	●	77.0	146.6	48	20	16		1			
	8	140-8DF	●	121.0	191.6	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5DF	●	28.0	97.3	50	25	20	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3DF	●	51.0	126.6	50	25	20		1			
	5	150-5DF	●	82.0	156.6	50	25	20		1			
	8	150-8DF	●	129.0	201.6	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5DF	●	29.0	99.9	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3DF	●	54.0	131.6	50	25	20		1			
	5	160-5DF	●	87.0	166.6	50	25	20		1			
	8	160-8DF	●	137.0	211.6	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5DF	●	31.0	101.4	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3DF	●	57.0	136.6	50	25	20		1			
	5	170-5DF	●	92.0	171.6	50	25	20		1			
	8	170-8DF	●	145.0	221.6	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5DF	●	32.0	104.0	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3DF	●	60.0	141.7	50	25	20		1			
	5	180-5DF	●	97.0	176.7	50	25	20		1			
	8	180-8DF	●	153.0	226.7	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5DF	●	34.0	111.4	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3DF	●	63.0	156.6	56	30	25		1			
	5	190-5DF	●	102.0	191.6	56	30	25		1			
	8	190-8DF	●	161.0	251.6	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5DF	●	35.0	114.0	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3DF	●	66.0	156.7	56	30	25		1			
	5	200-5DF	●	107.0	196.7	56	30	25		1			
	8	200-8DF	●	169.0	261.7	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5DF	●	37.0	115.5	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3DF	●	69.0	156.7	56	30	25		1			
	5	210-5DF	●	112.0	196.7	56	30	25		1			
	8	210-8DF	●	177.0	266.7	56	30	25		1			
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5DF	●	39.0	117.1	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3DF	●	73.0	161.3	56	30	25		1			
	5	220-5DF	●	119.0	201.3	56	30	25		1			
	8	220-8DF	●	187.0	271.3	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5DF	●	40.0	118.0	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3DF	●	76.0	160.7	56	30	25		1			
	5	230-5DF	●	124.0	210.7	56	30	25		1			
	8	230-8DF	●	195.0	280.7	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5DF	●	42.0	124.3	60	37	32	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3DF	●	79.0	170.5	60	37	32		1			
	5	240-5DF	●	129.0	220.5	60	37	32		1			
	8	240-8DF	●	203.0	295.5	60	37	32		1			

Recommended Cutting Conditions J126 MFS type Head J127



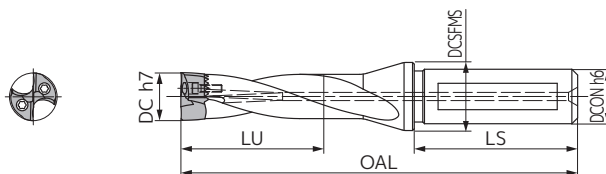


*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø24.8 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5DF	●	43.0	124.7	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3DF	●	82.0	170.4	60	37	32		1			
	5	250-5DF	●	134.0	225.4	60	37	32		1			
	8	250-8DF	●	211.0	300.4	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5DF	●	45.0	127.3	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3DF	●	85.0	175.5	60	37	32		1			
	5	260-5DF	●	139.0	230.5	60	37	32		1			
	8	260-8DF	●	219.0	310.5	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5DF	●	46.0	127.8	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3DF	●	88.0	175.5	60	37	32		1			
	5	270-5DF	●	144.0	235.5	60	37	32		1			
	8	270-8DF	●	227.0	320.5	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5DF	●	48.0	129.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3DF	●	91.0	180.6	60	37	32		1			
	5	280-5DF	●	149.0	240.6	60	37	32		1			
	8	280-8DF	●	235.0	325.6	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5DF	●	49.0	130.8	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3DF	●	94.0	185.4	60	37	32		1			
	5	290-5DF	●	154.0	245.4	60	37	32		1			
	8	290-8DF	●	243.0	335.4	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5DF	●	51.0	133.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3DF	●	97.0	185.6	60	37	32		1			
	5	300-5DF	●	159.0	255.6	60	37	32		1			
	8	300-8DF	●	251.0	345.6	60	37	32		1			

Recommended Cutting Conditions J126 MFS type Head J127

Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers



Recommended Tightening Torque (N·m)

J131

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange **MFS**Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Cast Iron

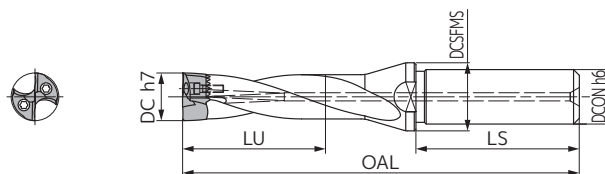
Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1

**Holder ø12.0 to 21.5mm with MFS type set****Parts**

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5D	●	21.0	88.5	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3D	●	40.0	105.2	48	20	16		1			
	5	120-5D	●	65.0	130.2	48	20	16		1			
	8	120-8D	●	96.0	162.4	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5D	●	22.0	88.8	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3D	●	41.0	105.1	48	20	16		1			
	5	125-5D	●	67.0	130.1	48	20	16		1			
	8	125-8D	●	100.0	167.9	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5D	●	23.0	90.0	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3D	●	43.0	110.2	48	20	16		1			
	5	130-5D	●	70.0	140.2	48	20	16		1			
	8	130-8D	●	104.0	176.2	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5D	●	26.0	93.9	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3D	●	48.0	116.6	48	20	16		1			
	5	140-5D	●	77.0	146.6	48	20	16		1			
	8	140-8D	●	121.0	191.6	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5D	●	28.0	97.3	50	25	20	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3D	●	51.0	126.6	50	25	20		1			
	5	150-5D	●	82.0	156.6	50	25	20		1			
	8	150-8D	●	129.0	201.6	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5D	●	29.0	99.9	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3D	●	54.0	131.6	50	25	20		1			
	5	160-5D	●	87.0	166.6	50	25	20		1			
	8	160-8D	●	137.0	211.6	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5D	●	31.0	101.4	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3D	●	57.0	136.6	50	25	20		1			
	5	170-5D	●	92.0	171.6	50	25	20		1			
	8	170-8D	●	145.0	221.6	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5D	●	32.0	104.0	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3D	●	60.0	141.7	50	25	20		1			
	5	180-5D	●	97.0	176.7	50	25	20		1			
	8	180-8D	●	153.0	226.7	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5D	●	34.0	111.4	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3D	●	63.0	156.6	56	30	25		1			
	5	190-5D	●	102.0	191.6	56	30	25		1			
	8	190-8D	●	161.0	251.6	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5D	●	35.0	114.0	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3D	●	66.0	156.7	56	30	25		1			
	5	200-5D	●	107.0	196.7	56	30	25		1			
	8	200-8D	●	169.0	261.7	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5D	●	37.0	115.5	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3D	●	69.0	156.7	56	30	25		1			
	5	210-5D	●	112.0	196.7	56	30	25		1			
	8	210-8D	●	177.0	266.7	56	30	25		1			
21.5 < D ≤ 22.5	1.5	SMDH 220-1.5D	●	38.0	117.0	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	220-3D	●	70.0	157.0	56	30	25		1			
	5	220-5D	●	113.0	197.0	56	30	25		1			
	8	220-8D	●	178.0	267.0	56	30	25		1			

Recommended Cutting Conditions J126 MFS type Head J127



SMD series (Internal Coolant Supply) No Side Lock Flat/Flange MFS

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%Hardened
Steel
up to 45HRCStainless
Steel

Cast Iron

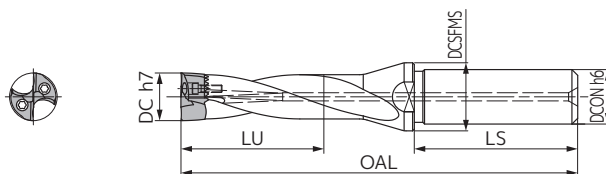
Ductile
Cast IronAluminum
Alloy

*For tolerances, refer to Chapter N - References.

● Set Figure



Fig 1



Holder ø21.5 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5D	●	39.0	117.1	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3D	●	73.0	161.3	56	30	25		1			
	5	220-5D	●	119.0	201.3	56	30	25		1			
	8	220-8D	●	187.0	271.3	56	30	25		1			
	12	220-12D	●	264.0	343.2	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5D	●	40.0	118.0	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3D	●	76.0	160.7	56	30	25		1			
	5	230-5D	●	124.0	210.7	56	30	25		1			
	8	230-8D	●	195.0	280.7	56	30	25		1			
	12	230-12D	●	276.0	355.0	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5D	●	42.0	124.3	60	37	32	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3D	●	79.0	170.5	60	37	32		1			
	5	240-5D	●	129.0	220.5	60	37	32		1			
	8	240-8D	●	203.0	295.5	60	37	32		1			
	12	240-12D	●	288.0	372.0	60	37	32		1			
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5D	●	43.0	124.7	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3D	●	82.0	170.4	60	37	32		1			
	5	250-5D	●	134.0	225.4	60	37	32		1			
	8	250-8D	●	211.0	300.4	60	37	32		1			
	12	250-12D	●	300.0	384.2	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5D	●	45.0	127.3	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3D	●	85.0	175.5	60	37	32		1			
	5	260-5D	●	139.0	230.5	60	37	32		1			
	8	260-8D	●	219.0	310.5	60	37	32		1			
	12	260-12D	●	312.0	396.6	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5D	●	46.0	127.8	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3D	●	88.0	175.5	60	37	32		1			
	5	270-5D	●	144.0	235.5	60	37	32		1			
	8	270-8D	●	227.0	320.5	60	37	32		1			
	12	270-12D	●	324.0	408.9	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5D	●	48.0	129.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3D	●	91.0	180.6	60	37	32		1			
	5	280-5D	●	149.0	240.6	60	37	32		1			
	8	280-8D	●	235.0	325.6	60	37	32		1			
	12	280-12D	●	336.0	421.3	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5D	●	49.0	130.8	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3D	●	94.0	185.4	60	37	32		1			
	5	290-5D	●	154.0	245.4	60	37	32		1			
	8	290-8D	●	243.0	335.4	60	37	32		1			
	12	290-12D	●	348.0	433.5	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5D	●	51.0	133.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3D	●	97.0	185.6	60	37	32		1			
	5	300-5D	●	159.0	255.6	60	37	32		1			
	8	300-8D	●	251.0	345.6	60	37	32		1			
	12	300-12D	●	360.0	445.9	60	37	32		1			

Recommended Cutting Conditions J126

MFS type Head J127



Recommended Tightening Torque (N·m)

SMD-MB type for Bridge

MB type Ideal for drilling rolled steels for welded structures for bridge (single layer and stacked)

X THINNING

DEX Coat

Unique wide and smooth flute shape significantly improves chip control and evacuation

Gradual Arc Shape J-Flute

Reduces peripheral edge fracture caused by workpiece rebounding

Robust Substrate and Reinforced Edge Treatment

Excellent fracture resistance + chip control
Dedicated Cutting Edge Design

Directs coolant to cutting edge even during MQL drilling
Central Oil Holes

150° Point Angle

Improved surface roughness of flutes greatly improves chip evacuation

Highly Polished Flute Surface

Chip Control

MB type for Bridge **Good chip control**



Work Material: SM490YB
Cutting Conditions: $vc = 87\text{m/min}$, $f = 0.29\text{mm/rev}$

Competitor's Product **Elongated chips**



Work Material: SM490YB
Cutting Conditions: $vc = 87\text{m/min}$, $f = 0.29\text{mm/rev}$

Cutting Length Comparison (MB type)

Case	Current Tool	Tool Life Comparison (Cutting Length)		Cutting Conditions
1	Competitor's Product A Indexable Head type	MB type	42m	$vc=46\text{m/min}$ $f=0.35\text{mm/rev}$ Coolant: MQL
	Competitor's Product A	17m	2.5x tool life	
2	Competitor's Product B Indexable Head type	MB type	87m	$vc=56\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant: MQL
	Competitor's Product B	50m	1.7x tool life	
3	Competitor's Product C Brazed	MB type	95m	$vc=54\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant: MQL
	Competitor's Product C	32m	3.0x tool life	
4	Competitor's Product D Indexable Head type	MB type	120m	$vc=60\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant: MQL
	Competitor's Product D	70m	1.7x tool life	

1.7 to 3 times
the current tool life



Tool Cost

Major Potential Savings

Recommended Cutting Conditions (MB type)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Work Material		Rolled Steel for Welded Structures SS400	Rolled Steel for Welded Structures SM490	Rolled Steel for Welded Structures SM520	Rolled Steel for Welded Structures SM570
Diameter DC (mm)	Cutting Conditions	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.	Min. - Optimum - Max.
ø24.7	n	900	840	700	700
	vc	60-70-80	55-65-75	45-55-65	45-55-65
	f	0.20-0.30-0.40	0.20-0.30-0.40	0.20-0.25-0.30	0.20-0.25-0.30
ø26.7	n	830	770	650	650
	vc	60-70-80	55-65-75	45-55-65	45-55-65
	f	0.20-0.30-0.40	0.20-0.30-0.40	0.20-0.25-0.30	0.20-0.25-0.30

SMD-MB type for Bridge (Internal Coolant Supply)

MB

Carbon Steel
Alloy Steel
up to 0.28%Carbon Steel
Alloy Steel
from 0.29%DEX
CoatIndexable head
MB

Coolant Hole

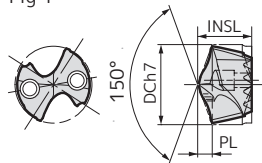
Indexable
Head type

3D

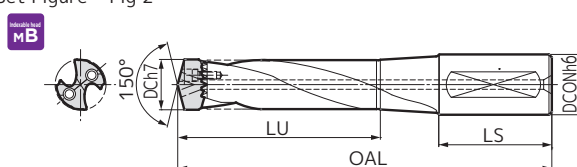
Only use the special MB type head with a B3 type holder.

*For tolerances, refer to Chapter N - References.

Indexable Head Fig 1



Set Figure Fig 2

Indexable Head MB type Diameter $\varnothing 24.5/24.7\text{mm}$ Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
24.5	●	SMDT 2450 MB	14.1	3.3	SMDH 240B3	1
24.7	●	SMDT 2470 MB	14.1	3.3	SMDH 240B3	1

Grade: ACX80

Indexable Head MB type Diameter $\varnothing 26.5/26.7\text{mm}$ Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
26.5	●	SMDT 2650 MB	15.3	3.6	SMDH 260B3	1
26.7	●	SMDT 2670 MB	15.3	3.6	SMDH 260B3	1

Grade: ACX80

Holder $\varnothing 24.5$ to 26.7mm with MB type set

Parts

Dimensions (mm)

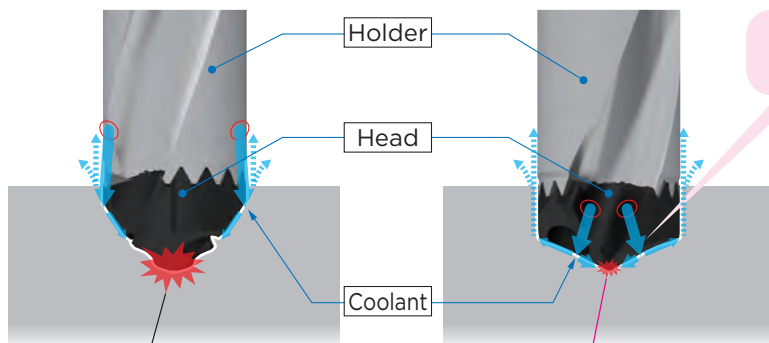
Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench	
24.5 < D ≤ 24.7	3	SMDH 240B3	●	90.3	173.3	60	32	MB	2	BXD03512IP	2.79 to 3.72	TRDR15IP	
26.5 < D ≤ 26.7	3	SMDH 260B3	●	95.6	178.6	60	32	MB	2	BXD04014IP	4.14 to 5.52	TRDR20IP	

Inquire about production of holders not listed in stock.

Coolant Supply for Improved Lubricity

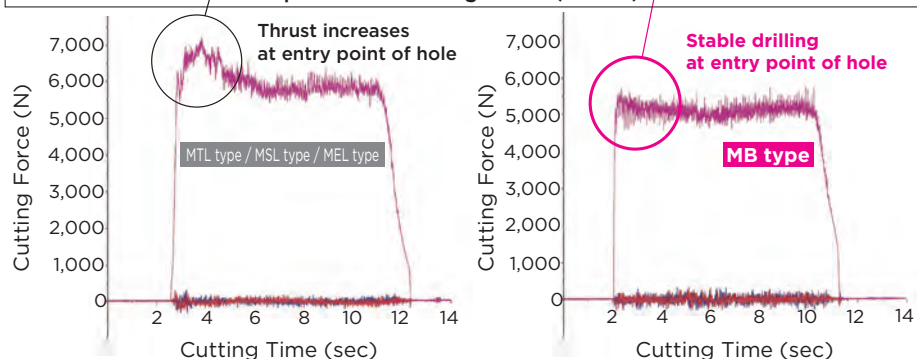
MTL type / MSL type / MEL type

MB type



Coolant supply to the drill tip has been improved.

Comparison of Cutting Force (Thrust)



Work Material: SS400, Diameter: $\varnothing 24.7\text{mm}$, Cutting Conditions: $v_c = 70\text{m/min}$, $f = 0.35\text{mm/rev}$, Coolant: MQL

*Due to the difference in oil hole positions and flute shapes, MTL type / MSL type / MEL type drill heads are not compatible to use with B3 type drill holders (for bridge); similarly, MB type drill heads (for bridge) are not compatible for use with -1.5D(F) to -12D type / M type / L type / D type drill holders.



Recommended Tightening Torque (N·m)

J135

Drilling

Solid

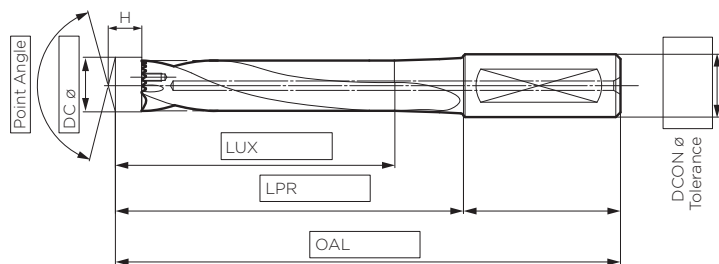
Indexable
Head typeIndexable
Insert type

Reamers

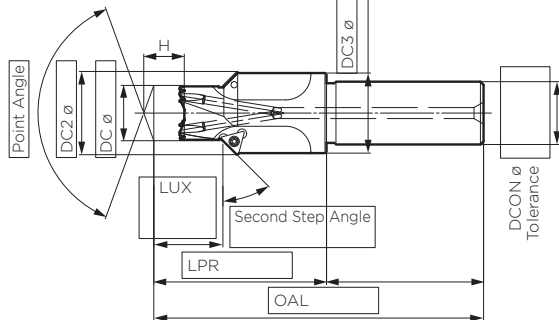
SEC-MULTIDRILL Made-to-Order Design Request Sheet

Drill Shape

☐ Straight Holder



☐ Stepped Holder



Dc [Diameter]: $\varnothing 12$ to $\varnothing 42.5$ h7 DC2. DC3: Less than $\varnothing 50$

OAL [Overall length]: Holder overall length max. 450mm

H: Not for designation

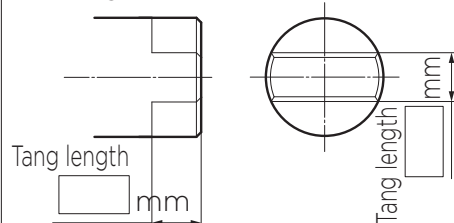
Tip Angle: 118° to 179° (180°)

*For blind holes, please let us know if there is a hole bottom profile requirement.

*We may not be able to fulfill requests for cutting edge specifications if the drill point angle is not within 130° to 160° .

End Shape

☐ Tang



☐ Tang not required

Shank Shape

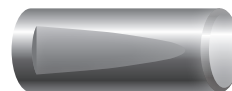
☐ Cylindrical



☐ Side Lock Flat



☐ Whistle Notch



Head Details

Cutting Edge Specification: type

Material:

Oil Hole: Y/N

Submargin: Y/N

Corner Edge Chamfer: Angle Width

Corner Edge Radius: R

Purpose for Corner Edge: Burrs / Chipping / Others

Machine Information

Coolant: ☐ Water-soluble ☐ Oil-based ☐ MQL

Coolant Supply Information: ☐ Internal Coolant Supply
☐ External Coolant Supply

Current Tool

Cutting Conditions:

Tool Life:

Tool Life Criteria:

Other Requests

Workpiece Information

Work Material:

Hole Type: Through / Blind

Stepped Part Application: Chamfer/Counterbore

Part Name:

After filling in the required dimensions and other information, contact our nearest sales office or distributor.

Feel free to contact us with other requests as well.

Company Name/Contact

Drilling

Solid

Indexable
Head type

Indexable
Insert type

Reamers

New

Drilling

Solid

Indexable
Head type

Indexable
Insert type

Reamers



■ Features

The SumiDrill GDX series drastically reduces drilling vibration through a high-rigidity holder design. In addition, insert design is individually optimised for the central and peripheral cutting edges to achieve excellent drilling balance and chip evacuation. Dramatically improved stability for deep hole drilling up to $L/D=7$.

■ Product Range

Insert Size	GDXT05	GDXT06	GDXT07
Drilling Depth	Compatible Holders (Dia. mm)		
2D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0
3D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0
4D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0
5D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0
6D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0
7D	ø15.5 to 18.0	ø18.5 to 22.0	ø22.5 to 27.0

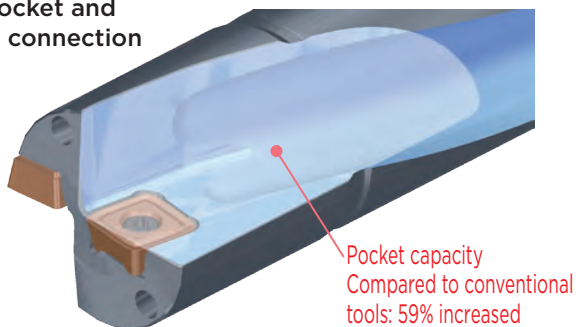
■ High-rigidity Holder Design

Proprietary flute design balances chip evacuation and holder rigidity at a high level. Machining vibration is effectively suppressed and cutting force reduced to realise stable deep hole drilling.

Evacuation flute design

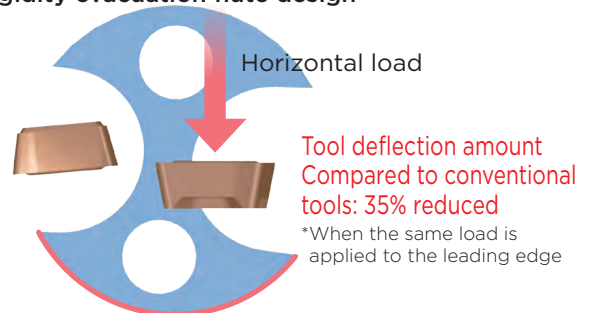


Wide pocket and smooth connection



Expanded pocket capacity essential for chip evacuation

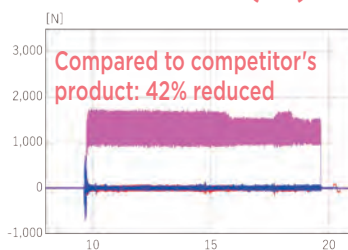
High-rigidity evacuation flute design



Design increases thickness in load direction to suppress deformation

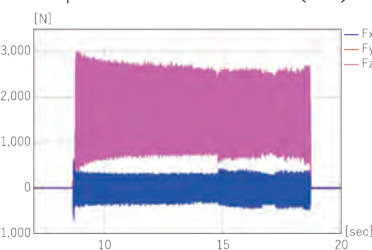
Cutting Force

GDx series (5D)



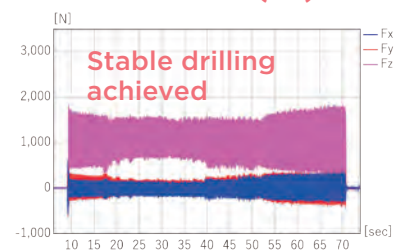
Max. 1,752N

Competitor's Product A (5D)



Max. 3,014N

GDx series (7D)



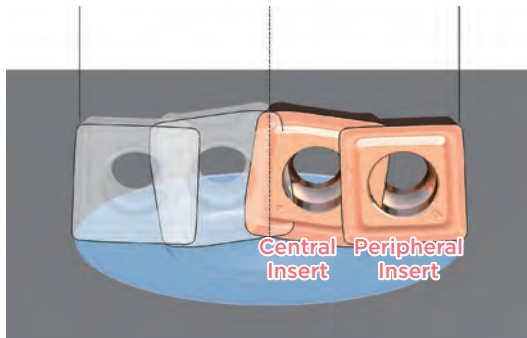
Max. 1,847N

Work Material: S50C Tool: GDxH200D5S25-06 (ø20, 5D) GDxH200D7S25-06 (ø20, 7D)
Insert: Peripheral Insert GDXT06T204P-G (ACU2500) Central Insert: GDXT06T206C-G (ACU2500)
Cutting Conditions (5D Holder): $vc = 150\text{m/min}$ $f = 0.10\text{mm/rev}$ $H = 85\text{mm}$ (Stop Hole) Internal Coolant Supply (Water-soluble)
(7D Holder): $vc = 150\text{m/min}$ $f = 0.06\text{mm/rev}$ $H = 140\text{mm}$ (Stop Hole) Internal Coolant Supply (Water-soluble)

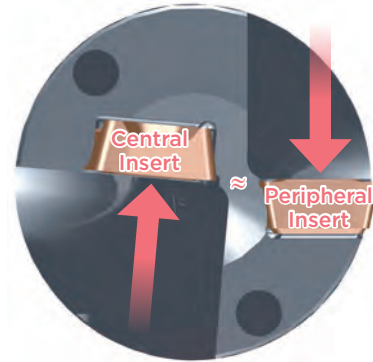
■ Dedicated Insert Design

Dedicated central and peripheral inserts, with shapes and relative positioning adjusted to improve cutting force balance. In addition, the wiper flat shape has been optimised to achieve excellent machined surface quality.

Dedicated insert design



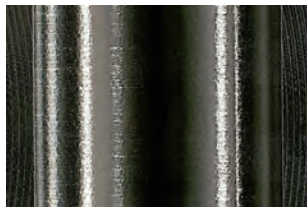
Balanced design



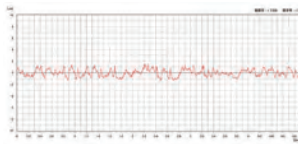
Using simulations to create dedicated designs for the central insert and peripheral insert to ensure uniform cutting resistance

Machined Surface Quality

GDX series

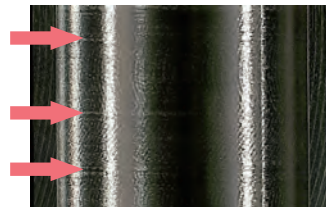


Glossy surface with no scratches

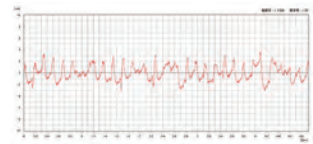


Ra = 0.80µm

Competitor's Product B



Wavy pattern



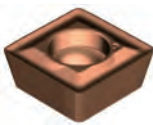
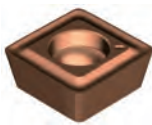
Ra = 1.04µm

Work Material: S50C Tool: GDXH200D5S25-06 (ø20, 5D) Insert: Peripheral Insert: GDXT06T204P-G (ACU2500) Central Insert: GDXT06T206C-G (ACU2500)
Cutting Conditions: $v_c = 150\text{m/min}$ $f = 0.10\text{mm/rev}$ $H = 85\text{mm}$ (Stop Hole) Internal Coolant Supply (Water-soluble)

■ Insert Combinations

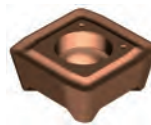
Utilising different chipbreakers for the central and peripheral inserts enables the drilling of stainless steel and general structural rolled steel.

Peripheral Insert

Chipbreaker	L type	G type
Features	Chip Control	General-purpose
Appearance		
Cross Section		

*Shape of GDXT06

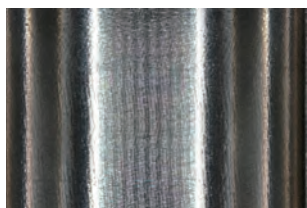
Central Insert

Chipbreaker	L type	G type
Features	Chip Control	General-purpose
Appearance		
Cross Section		

*Shape of GDXT06

Example of drilling in general structure rolled steel (SS400)

GDX series

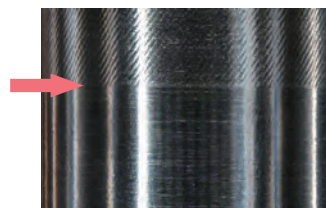


Glossy surface with no scratches



Wavy pattern

Competitor's Product C

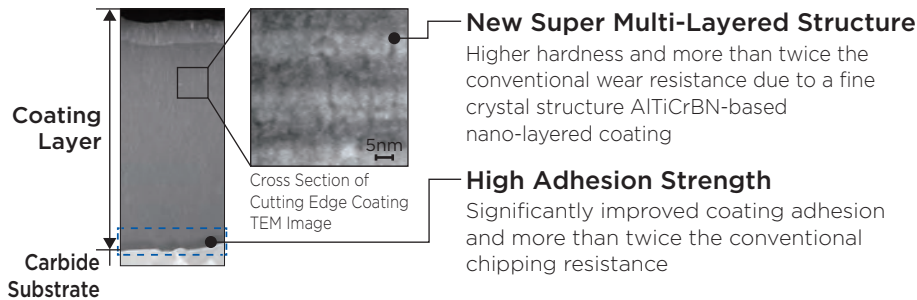


Work Material: SS400, Tool: GDXH200D5S25-06 (ø20, 5D)
Insert: Peripheral Insert GDXT06T204P-L (ACU2500) Central Insert: GDXT06T206C-L (ACU2500)
Cutting Conditions: $v_c = 200\text{m/min}$, $f = 0.05\text{mm/rev}$, $H = 85\text{mm}$ (Stop Hole), Internal Coolant Supply (Water-soluble)

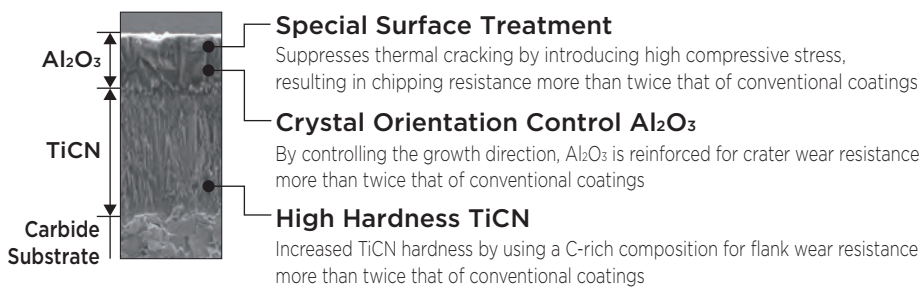
■ Insert Grade Features

Utilise ACU2500, the latest general-purpose grade, coupled with dedicated grades for different work materials ACP2000 or ACS3000 for the peripheral insert, to achieve a long tool life.

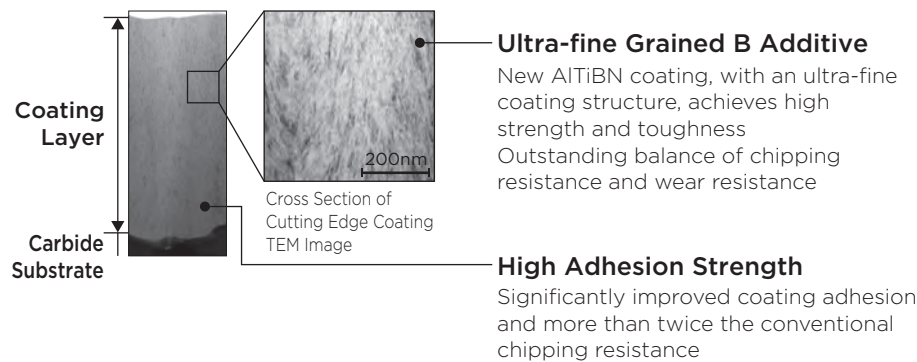
ABSO TECH PVD Applicable Grade: ACU2500



ABSO TECH CVD Applicable Grade: ACP2000



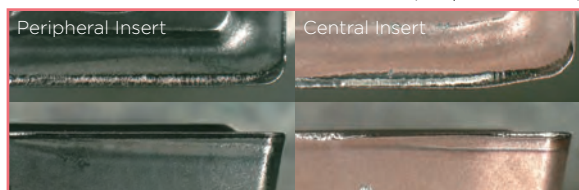
ABSO TECH PVD Applicable Grade: ACS3000



Comparison of Wear Resistance

GDX series

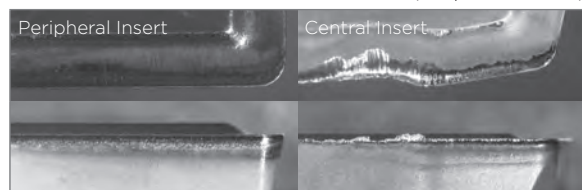
(Output: 156 holes)



Normal wear

Competitor's Product A

(Output: 156 holes)

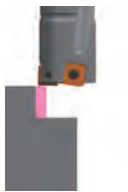


Rake face wear/fracture

Work Material: S50C, Tool: GDXH200D5S25-06 (ø20, 5D)
Insert: Peripheral Insert GDXT06T204P-G (ACP2000) Central Insert: GDXT06T206C-G (ACU2500)
Cutting Conditions: vc = 150m/min, f = 0.10mm/rev, H = 38mm (Through Hole), Internal Coolant Supply (Water-soluble)

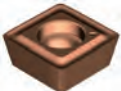
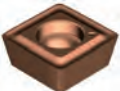
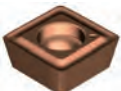
Compatible Drilling Applications/Workpiece Shapes

Depending on the application or workpiece shape, set the cutting conditions with reference to the table below.

	OK	OK	OK	OK	OK	OK	NG	NG
Machining Application / Workpiece Shape								
Recommended Holder	See Recommended Cutting Conditions	5D or below	5D or below	5D or below	5D or below	5D or below	—	—
Recommended Cutting Conditions	See Recommended Cutting Conditions	Feed Rate 70%	Feed Rate 50%	Feed Rate 70%	Feed Rate 50%	Feed Rate 50%		

Insert Selection Guide

The GDX insert series has a variety of options

ISO	Work Material	1st Recommendation			2nd Recommendation	
		Peripheral Insert	Central Insert		Peripheral Insert	Central Insert
P	Steel/ Carbon Steel			Initial chipping countermeasures Insufficient wear resistance Improved chip control (long chips)		
		G type Chipbreaker ACP2500	G type Chipbreaker ACU2500			
M	General Structure Rolled Steel / Low Carbon Steel (SS400/S15C, etc.)			Insufficient wear resistance Improved chip control (for poor evacuation)		
		L type Chipbreaker ACU2500	L type Chipbreaker ACU2500			
M	Stainless Steel			Insufficient fracture resistance Improved chip control (for poor evacuation)		
		L type Chipbreaker ACU2500	L type Chipbreaker ACU2500			
K	Cast Iron			Insufficient wear resistance		

*If chips from the peripheral insert are long or chips at the central insert cannot be easily evacuated, causing jamming or clogging, select a L type chipbreaker.

GDX series Recommended Cutting Conditions (2D/3D/4D)

L/D	Classification	Work Material	Work Material Hardness	Chipbreaker		Recommended Peripheral Insert Grade	Cutting Speed, vc (m/min)	Feed Rate, f (mm/rev) (Min. - Optimum - Max.)		
			HB	Peripheral Insert	Central Insert			ø15.5 to ø18.0	ø18.5 to ø22.0	ø22.5 to ø27.0
2D	P	Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 210 - 250 100 - 160 - 220	0.06 - 0.13 - 0.20	0.06 - 0.13 - 0.20	0.06 - 0.14 - 0.22
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 180 - 250 90 - 140 - 200	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14
		S75C	270	G	G	ACP2000 ACU2500	110 - 180 - 250 70 - 140 - 200	0.06 - 0.12 - 0.17	0.06 - 0.12 - 0.17	0.06 - 0.12 - 0.17
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 150 - 200 90 - 120 - 150	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 180 - 220 110 - 140 - 170	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14	0.05 - 0.10 - 0.14
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 170 - 210 100 - 130 - 140	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 150 - 180 65 - 100 - 135	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 120 - 160 50 - 80 - 110	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 180 - 210 100 - 150 - 180	0.08 - 0.13 - 0.17	0.08 - 0.13 - 0.18	0.08 - 0.13 - 0.18
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 150 - 180 60 - 80 - 100	0.06 - 0.11 - 0.15	0.06 - 0.11 - 0.15	0.06 - 0.11 - 0.15
		Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 160 - 180	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15
		SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 150 - 170	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 180 - 210	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15	0.05 - 0.10 - 0.15
3D	P	Cast Iron		G	G	ACP2000 ACU2500	150 - 210 - 240 120 - 180 - 210	0.10 - 0.19 - 0.28	0.10 - 0.19 - 0.28	0.09 - 0.21 - 0.32
		Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 150 - 180 100 - 125 - 150	0.10 - 0.19 - 0.28	0.10 - 0.19 - 0.28	0.09 - 0.21 - 0.32
		Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 210 - 250 100 - 160 - 220	0.06 - 0.12 - 0.18	0.06 - 0.12 - 0.18	0.06 - 0.13 - 0.20
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 180 - 250 90 - 140 - 200	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13
		S75C	270	G	G	ACP2000 ACU2500	110 - 180 - 250 70 - 140 - 200	0.06 - 0.11 - 0.15	0.06 - 0.11 - 0.15	0.06 - 0.11 - 0.15
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 150 - 200 90 - 120 - 150	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 180 - 220 110 - 140 - 170	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13	0.05 - 0.09 - 0.13
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 170 - 210 100 - 130 - 140	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 150 - 180 65 - 100 - 135	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 120 - 160 50 - 80 - 110	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13	0.06 - 0.09 - 0.13
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 180 - 210 100 - 150 - 180	0.07 - 0.11 - 0.15	0.07 - 0.12 - 0.16	0.07 - 0.12 - 0.16
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 150 - 180 60 - 80 - 100	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14
		Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 160 - 180	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14
		SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 150 - 170	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 180 - 210	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14	0.05 - 0.09 - 0.14
4D	P	Cast Iron		G	G	ACP2000 ACU2500	150 - 210 - 240 120 - 180 - 210	0.09 - 0.17 - 0.25	0.10 - 0.18 - 0.25	0.09 - 0.19 - 0.29
		Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 150 - 180 100 - 125 - 150	0.09 - 0.17 - 0.25	0.10 - 0.18 - 0.25	0.09 - 0.19 - 0.29
		Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 210 - 250 100 - 160 - 220	0.06 - 0.11 - 0.16	0.06 - 0.11 - 0.16	0.06 - 0.12 - 0.18
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 180 - 250 90 - 140 - 200	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11
		S75C	270	G	G	ACP2000 ACU2500	110 - 180 - 250 70 - 140 - 200	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 150 - 200 90 - 120 - 150	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 180 - 220 110 - 140 - 170	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11	0.05 - 0.08 - 0.11
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 170 - 210 100 - 130 - 140	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 150 - 180 65 - 100 - 135	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 120 - 160 50 - 80 - 110	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11	0.06 - 0.09 - 0.11
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 180 - 210 100 - 150 - 180	0.06 - 0.10 - 0.14	0.06 - 0.11 - 0.15	0.06 - 0.11 - 0.15
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 150 - 180 60 - 80 - 100	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12
		Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 160 - 180	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12
		SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 150 - 170	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 180 - 210	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12	0.05 - 0.09 - 0.12
	M	Cast Iron		G	G	ACP2000 ACU2500	150 - 210 - 240 120 - 180 - 210	0.09 - 0.16 - 0.23	0.10 - 0.16 - 0.23	0.09 - 0.18 - 0.26
		Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 150 - 180 100 - 125 - 150	0.09 - 0.16 - 0.23	0.10 - 0.16 - 0.23	0.09 - 0.18 - 0.26

· The recommended conditions may not be practical depending on the operating conditions (e.g. machine tool, workpiece shape, clamping system).

*Note · The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, and other factors.

GDX series Recommended Cutting Conditions (5D/6D/7D)

L/D	Classification	Work Material	Work Material Hardness	Chipbreaker		Recommended Peripheral Insert Grade	Cutting Speed, vc (m/min)	Feed Rate, f (mm/rev) (Min. - Optimum - Max.)		
			HB	Peripheral Insert	Central Insert			ø15.5 to ø18.0	ø18.5 to ø22.0	ø22.5 to ø27.0
5D	P	Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 220 - 280 120 - 170 - 220	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 210 - 250 100 - 160 - 220	0.06 - 0.10 - 0.14	0.06 - 0.10 - 0.14	0.06 - 0.11 - 0.15
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 180 - 250 90 - 140 - 200	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10
		S75C	270	G	G	ACP2000 ACU2500	110 - 180 - 250 70 - 140 - 200	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 150 - 200 90 - 120 - 150	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 180 - 220 110 - 140 - 170	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10	0.05 - 0.07 - 0.10
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 170 - 210 100 - 130 - 140	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 150 - 180 65 - 100 - 135	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 120 - 160 50 - 80 - 110	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 180 - 210 100 - 150 - 180	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12	0.06 - 0.09 - 0.12
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 150 - 180 60 - 80 - 100	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10	0.06 - 0.08 - 0.10
	M	Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 160 - 180	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10
	K	SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 150 - 170	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 180 - 210	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10	0.05 - 0.08 - 0.10
6D	P	Cast Iron		G	G	ACP2000 ACU2500	150 - 210 - 240 120 - 180 - 210	0.09 - 0.14 - 0.19	0.10 - 0.15 - 0.19	0.09 - 0.16 - 0.22
		Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 150 - 180 100 - 125 - 150	0.09 - 0.14 - 0.19	0.10 - 0.15 - 0.19	0.09 - 0.16 - 0.22
		Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 200 - 240 120 - 150 - 180	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 200 - 240 120 - 150 - 180	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 190 - 210 100 - 140 - 180	0.05 - 0.07 - 0.09	0.05 - 0.07 - 0.09	0.05 - 0.07 - 0.09
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 160 - 210 90 - 120 - 160	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		S75C	270	G	G	ACP2000 ACU2500	110 - 160 - 210 70 - 120 - 160	0.06 - 0.07 - 0.09	0.06 - 0.07 - 0.09	0.06 - 0.07 - 0.09
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 130 - 160 90 - 100 - 110	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 160 - 180 110 - 120 - 130	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 150 - 170 100 - 110 - 100	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 130 - 140 65 - 80 - 95	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 100 - 120 50 - 60 - 70	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 170 - 190 100 - 140 - 160	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 140 - 160 60 - 70 - 80	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08
	M	Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 150 - 160	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
7D	P	SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 140 - 150	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 170 - 190	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
		Cast Iron		G	G	ACP2000 ACU2500	150 - 200 - 220 120 - 170 - 190	0.09 - 0.12 - 0.14	0.10 - 0.12 - 0.14	0.09 - 0.13 - 0.16
		Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 140 - 160 100 - 115 - 130	0.09 - 0.12 - 0.14	0.10 - 0.12 - 0.14	0.09 - 0.13 - 0.16
		Steel, Carbon Steel SS400	125	L	L	ACP2000 ACU2500	160 - 200 - 240 120 - 150 - 180	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S15C	125	L	L	ACP2000 ACU2500	160 - 200 - 240 120 - 150 - 180	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C	190	G	G	ACP2000 ACU2500	170 - 190 - 210 100 - 140 - 180	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08
		S45C Hardened	250	G	G	ACP2000 ACU2500	110 - 160 - 210 90 - 120 - 160	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		S75C	270	G	G	ACP2000 ACU2500	110 - 160 - 210 70 - 120 - 160	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08
		S75C Hardened	300	G	G	ACP2000 ACU2500	100 - 130 - 160 90 - 100 - 110	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		Low-alloy Steel SCM, SNCM	180	G	G	ACP2000 ACU2500	140 - 160 - 180 110 - 120 - 130	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07	0.05 - 0.06 - 0.07
		SCM, SNCM Hardened	275	G	G	ACP2000 ACU2500	130 - 150 - 170 100 - 110 - 100	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		SCM, SNCM Hardened	300	G	G	ACP2000 ACU2500	120 - 130 - 140 65 - 80 - 95	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		SCM, SNCM Hardened	350	G	G	ACP2000 ACU2500	80 - 100 - 120 50 - 60 - 70	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07	0.06 - 0.07 - 0.07
		High-alloy Steel SKD, SKT, SKH	200	G	G	ACP2000 ACU2500	150 - 170 - 190 100 - 140 - 160	0.04 - 0.06 - 0.08	0.04 - 0.07 - 0.08	0.04 - 0.07 - 0.08
		SKD, SKT, SKH Hardened	325	G	G	ACP2000 ACU2500	120 - 140 - 160 60 - 70 - 80	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08	0.06 - 0.07 - 0.08
	M	Stainless Steel SUS430 and Others (Martensitic/Ferritic)	200	L	L	ACU2500	120 - 150 - 160	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
7D	K	SUS403 and Others (Martensitic/Hardened)	240	L	L	ACU2500	120 - 140 - 150	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
		SUS304, SUS316 (Austenitic)	180	L	L	ACU2500	120 - 170 - 190	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08	0.05 - 0.06 - 0.08
	K	Cast Iron		G	G	ACP2000 ACU2500	150 - 200 - 220 120 - 170 - 190	0.09 - 0.12 - 0.14	0.10 - 0.12 - 0.14	0.09 - 0.13 - 0.16
	K	Ductile Cast Iron		G	G	ACP2000 ACU2500	120 - 140 - 160 100 - 115 - 130	0.09 - 0.12 - 0.14	0.10 - 0.12 - 0.14	0.09 - 0.13 - 0.16

· The recommended conditions may not be practical depending on the operating conditions (e.g. machine tool, workpiece shape, clamping system).

· For 6D and 7D drilling, reduce the feed to 75% of recommended conditions at engagement (3mm from entrance). Use the lower recommended limit feed at the exit of through holes (5mm from exit).

*Note · The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, and other factors.

Drilling

Solid

Indexable Head type

Indexable Insert type

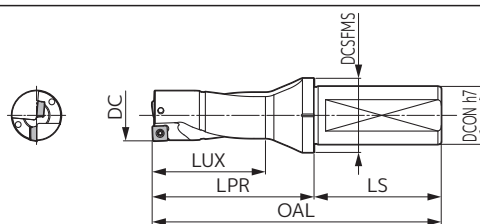
Reamers



Drilling tolerance: -0.05 to +0.15mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D2S20-05	36.0	53.75	102.75	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D2S20-05	37.0	55.00	104.00	49.0	25.0	20.0	0.35			1
16.5	○	165D2S20-05	38.0	56.25	105.25	49.0	25.0	20.0	0.30			1
17.0	○	170D2S20-05	39.0	57.50	106.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D2S25-05	40.0	58.75	113.75	55.0	32.0	25.0	0.15	GDXT06T204P	GDXT06T206C	1
18.0	○	180D2S25-05	41.0	60.00	115.00	55.0	32.0	25.0	0.10			1
18.5	●	GDXH 185D2S25-06	42.0	61.25	116.25	55.0	32.0	25.0	0.55			1
19.0	●	190D2S25-06	43.0	62.50	117.50	55.0	32.0	25.0	0.50			1
19.5	●	195D2S25-06	44.0	63.75	118.75	55.0	32.0	25.0	0.45			1
20.0	●	200D2S25-06	45.0	65.00	120.00	55.0	32.0	25.0	0.40			1
20.5	●	205D2S25-06	46.0	66.25	121.25	55.0	32.0	25.0	0.35			1
21.0	●	210D2S25-06	47.0	67.50	122.50	55.0	32.0	25.0	0.30			1
21.5	●	215D2S25-06	48.0	68.75	123.75	55.0	32.0	25.0	0.20	GDXT070305P	GDXT070308C	1
21.5	●	215D2S25-06	48.0	68.75	123.75	55.0	32.0	25.0	0.20			1
22.0	●	220D2S25-06	49.0	70.00	125.00	55.0	32.0	25.0	0.15			1
22.5	○	GDXH 225D2S25-07	50.0	71.25	126.25	55.0	32.0	25.0	0.70			1
23.0	○	230D2S25-07	51.0	72.50	127.50	55.0	32.0	25.0	0.65			1
23.5	○	235D2S25-07	52.0	73.75	128.75	55.0	32.0	25.0	0.60			1
24.0	○	240D2S25-07	53.0	75.00	130.00	55.0	32.0	25.0	0.55			1
24.5	○	245D2S25-07	54.0	76.25	131.25	55.0	32.0	25.0	0.50			1
25.0	○	250D2S25-07	55.0	77.50	132.50	55.0	32.0	25.0	0.45	GDXT070305P	GDXT070308C	1
25.5	○	255D2S25-07	56.0	78.75	133.75	55.0	32.0	25.0	0.35			1
26.0	○	GDXH 260D2S32-07	57.0	80.00	139.00	59.0	40.0	32.0	0.30			1
26.5	○	265D2S32-07	58.0	81.25	140.25	59.0	40.0	32.0	0.25			1
27.0	○	270D2S32-07	59.0	82.50	141.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions J142

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D2S20-05 to GDHX180D2S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D2S25-06 to GDHX220D2S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D2S25-07 to GDHX270D2S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D2 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(2D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting								
	Medium Cutting								
	Roughing								
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L	○	○	○	5.1	2.58	0.3	1	GDXH155D2S20-05
	050203P-G	○	○	○	5.1	2.51	0.3	2	to GDXH180D2S25-05
	GDXT 06T204P-L	●	●	●	6.3	2.98	0.4	1	GDXH185D2S25-06
	06T204P-G	●	●	●	6.3	2.93	0.4	2	to GDXH220D2S25-06
	GDXT 070305P-L	○	○	○	7.7	3.43	0.5	1	GDXH225D2S25-07
	070305P-G	○	○	○	7.7	3.38	0.5	2	to GDXH270D2S32-07
Central Insert	GDXT 050205C-L	○	—	—	5.6	2.38	0.5	3	GDXH155D2S20-05
	050205C-G	○	—	—	5.6	2.38	0.5	4	to GDXH180D2S25-05
	GDXT 06T206C-L	●	—	—	6.9	2.78	0.6	3	GDXH185D2S25-06
	06T206C-G	●	—	—	6.9	2.88	0.6	4	to GDXH220D2S25-06
	GDXT 070308C-L	○	—	—	8.6	3.18	0.8	3	GDXH225D2S25-07
	070308C-G	○	—	—	8.6	3.18	0.8	4	to GDXH270D2S32-07

Fig 1 Peripheral insert L type

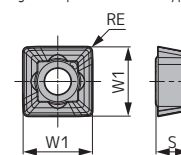


Fig 2 Peripheral insert G type

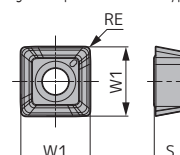


Fig 3 Central insert L type

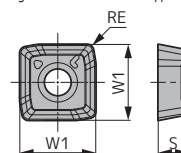
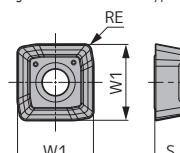


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert

New

CVD
CoatPVD
Coat

Coolant Hole

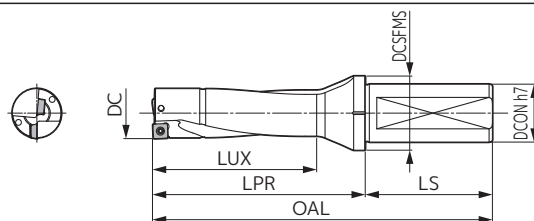
3D

Indexable
insert type

Drilling tolerance: 0 to +0.20mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D3S20-05	51.5	69.25	118.25	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D3S20-05	53.0	71.00	120.00	49.0	25.0	20.0	0.35			1
16.5	○	165D3S20-05	54.5	72.75	121.75	49.0	25.0	20.0	0.30			1
17.0	○	170D3S20-05	56.0	74.50	123.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D3S25-05	57.5	76.25	131.25	55.0	32.0	25.0	0.15	GDXT06T204P	GDXT06T206C	1
18.0	○	180D3S25-05	59.0	78.00	133.00	55.0	32.0	25.0	0.10			1
18.5	●	GDXH 185D3S25-06	60.5	79.75	134.75	55.0	32.0	25.0	0.55			1
19.0	●	190D3S25-06	62.0	81.50	136.50	55.0	32.0	25.0	0.50			1
19.5	●	195D3S25-06	63.5	83.25	138.25	55.0	32.0	25.0	0.45			1
20.0	●	200D3S25-06	65.0	85.00	140.00	55.0	32.0	25.0	0.40			1
20.5	●	205D3S25-06	66.5	86.75	141.75	55.0	32.0	25.0	0.35			1
21.0	●	210D3S25-06	68.0	88.50	143.50	55.0	32.0	25.0	0.30			1
21.5	●	215D3S25-06	69.5	90.25	145.25	55.0	32.0	25.0	0.20	GDXT070305P	GDXT070308C	1
22.0	●	220D3S25-06	71.0	92.00	147.00	55.0	32.0	25.0	0.15			1
22.5	○	GDXH 225D3S25-07	72.5	93.75	148.75	55.0	32.0	25.0	0.70			1
23.0	○	230D3S25-07	74.0	95.50	150.50	55.0	32.0	25.0	0.65			1
23.5	○	235D3S25-07	75.5	97.25	152.25	55.0	32.0	25.0	0.60			1
24.0	○	240D3S25-07	77.0	99.00	154.00	55.0	32.0	25.0	0.55			1
24.5	○	245D3S25-07	78.5	100.75	155.75	55.0	32.0	25.0	0.50			1
25.0	○	250D3S25-07	80.0	102.50	157.50	55.0	32.0	25.0	0.45			1
25.5	○	255D3S25-07	81.5	104.25	159.25	55.0	32.0	25.0	0.35	GDXT070305P	GDXT070308C	1
26.0	○	GDXH 260D3S32-07	83.0	106.00	165.00	59.0	40.0	32.0	0.30			1
26.5	○	265D3S32-07	84.5	107.75	166.75	59.0	40.0	32.0	0.25			1
27.0	○	270D3S32-07	86.0	109.50	168.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions **J142**

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D3S20-05 to GDHX180D3S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D3S25-06 to GDHX220D3S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D3S25-07 to GDHX270D3S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D3 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(3D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting								
	Medium Cutting								
	Roughing								
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L				5.1	2.58	0.3	1	GDXH155D3S20-05
	050203P-G				5.1	2.51	0.3	2	to GDXH180D3S25-05
	GDXT 06T204P-L				6.3	2.98	0.4	1	GDXH185D3S25-06
	06T204P-G				6.3	2.93	0.4	2	to GDXH220D3S25-06
	GDXT 070305P-L				7.7	3.43	0.5	1	GDXH225D3S25-07
	070305P-G				7.7	3.38	0.5	2	to GDXH270D3S32-07
Central Insert	GDXT 050205C-L				5.6	2.38	0.5	3	GDXH155D3S20-05
	050205C-G				5.6	2.38	0.5	4	to GDXH180D3S25-05
	GDXT 06T206C-L				6.9	2.78	0.6	3	GDXH185D3S25-06
	06T206C-G				6.9	2.88	0.6	4	to GDXH220D3S25-06
	GDXT 070308C-L				8.6	3.18	0.8	3	GDXH225D3S25-07
	070308C-G				8.6	3.18	0.8	4	to GDXH270D3S32-07

Fig 1 Peripheral insert L type

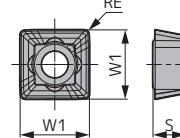


Fig 2 Peripheral insert G type

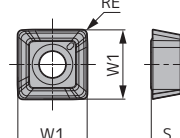


Fig 3 Central insert L type

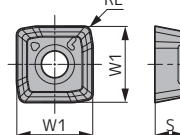
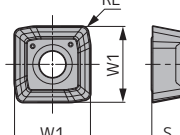


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert

New

CVD
CoatPVD
Coat

Coolant Hole

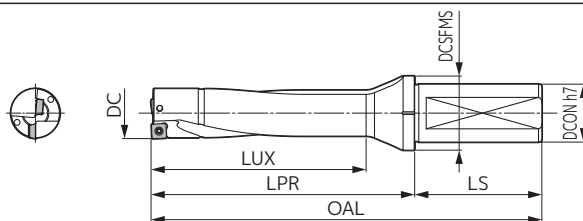
4D

Indexable
Insert type

Drilling tolerance: 0 to +0.25mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D4S20-05	67.0	84.75	133.75	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D4S20-05	69.0	87.00	136.00	49.0	25.0	20.0	0.35			1
16.5	○	165D4S20-05	71.0	89.25	138.25	49.0	25.0	20.0	0.30			1
17.0	○	170D4S20-05	73.0	91.50	140.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D4S25-05	75.0	93.75	148.75	55.0	32.0	25.0	0.15	GDXT06T204P	GDXT06T206C	1
18.0	○	180D4S25-05	77.0	96.00	151.00	55.0	32.0	25.0	0.10			1
18.5	●	GDXH 185D4S25-06	79.0	98.25	153.25	55.0	32.0	25.0	0.55			1
19.0	●	190D4S25-06	81.0	100.50	155.50	55.0	32.0	25.0	0.50			1
19.5	●	195D4S25-06	83.0	102.75	157.75	55.0	32.0	25.0	0.45			1
20.0	●	200D4S25-06	85.0	105.00	160.00	55.0	32.0	25.0	0.40			1
20.5	●	205D4S25-06	87.0	107.25	162.25	55.0	32.0	25.0	0.35			1
21.0	●	210D4S25-06	89.0	109.50	164.50	55.0	32.0	25.0	0.30			1
21.5	●	215D4S25-06	91.0	111.75	166.75	55.0	32.0	25.0	0.20	GDXT070305P	GDXT070308C	1
22.0	●	220D4S25-06	93.0	114.00	169.00	55.0	32.0	25.0	0.15			1
22.5	○	GDXH 225D4S25-07	95.0	116.25	171.25	55.0	32.0	25.0	0.70			1
23.0	○	230D4S25-07	97.0	118.50	173.50	55.0	32.0	25.0	0.65			1
23.5	○	235D4S25-07	99.0	120.75	175.75	55.0	32.0	25.0	0.60			1
24.0	○	240D4S25-07	101.0	123.00	178.00	55.0	32.0	25.0	0.55			1
24.5	○	245D4S25-07	103.0	125.25	180.25	55.0	32.0	25.0	0.50			1
25.0	○	250D4S25-07	105.0	127.50	182.50	55.0	32.0	25.0	0.45			1
25.5	○	255D4S25-07	107.0	129.75	184.75	55.0	32.0	25.0	0.35	GDXT070305P	GDXT070308C	1
26.0	○	GDXH 260D4S32-07	109.0	132.00	191.00	59.0	40.0	32.0	0.30			1
26.5	○	265D4S32-07	111.0	134.25	193.25	59.0	40.0	32.0	0.25			1
27.0	○	270D4S32-07	113.0	136.50	195.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions **J142**

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D4S20-05 to GDHX180D4S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D4S25-06 to GDHX220D4S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D4S25-07 to GDHX270D4S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D4 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(4D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting								
	Medium Cutting								
	Roughing								
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L	○	○	○	5.1	2.58	0.3	1	GDXH155D4S20-05
	050203P-G	○	○	○	5.1	2.51	0.3	2	to GDXH180D4S25-05
	GDXT 06T204P-L	●	●	●	6.3	2.98	0.4	1	GDXH185D4S25-06
	06T204P-G	●	●	●	6.3	2.93	0.4	2	to GDXH220D4S25-06
	GDXT 070305P-L	○	○	○	7.7	3.43	0.5	1	GDXH225D4S25-07
	070305P-G	○	○	○	7.7	3.38	0.5	2	to GDXH270D4S32-07
Central Insert	GDXT 050205C-L	○	—	—	5.6	2.38	0.5	3	GDXH155D4S20-05
	050205C-G	○	—	—	5.6	2.38	0.5	4	to GDXH180D4S25-05
	GDXT 06T206C-L	●	—	—	6.9	2.78	0.6	3	GDXH185D4S25-06
	06T206C-G	●	—	—	6.9	2.88	0.6	4	to GDXH220D4S25-06
	GDXT 070308C-L	○	—	—	8.6	3.18	0.8	3	GDXH225D4S25-07
	070308C-G	○	—	—	8.6	3.18	0.8	4	to GDXH270D4S32-07

Fig 1 Peripheral insert L type

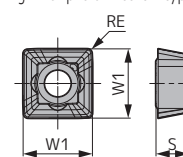


Fig 2 Peripheral insert G type

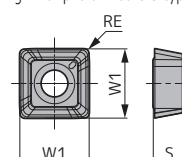


Fig 3 Central insert L type

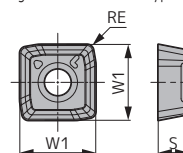
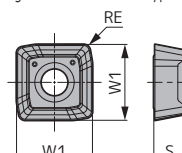


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert

New

CVD
CoatPVD
Coat

Coolant Hole

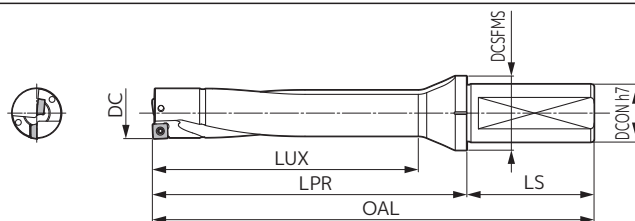
5D

Indexable
insert type

Drilling tolerance: 0 to +0.25mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D5S20-05	82.5	100.25	149.25	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D5S20-05	85.0	103.00	152.00	49.0	25.0	20.0	0.35			1
16.5	○	165D5S20-05	87.5	105.75	154.75	49.0	25.0	20.0	0.30			1
17.0	○	170D5S20-05	90.0	108.50	157.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D5S25-05	92.5	111.25	166.25	55.0	32.0	25.0	0.15	GDXT06T204P	GDXT06T206C	1
18.0	○	180D5S25-05	95.0	114.00	169.00	55.0	32.0	25.0	0.10			1
18.5	●	GDXH 185D5S25-06	97.5	116.75	171.75	55.0	32.0	25.0	0.55			1
19.0	●	190D5S25-06	100.0	119.50	174.50	55.0	32.0	25.0	0.50			1
19.5	●	195D5S25-06	102.5	122.25	177.25	55.0	32.0	25.0	0.45			1
20.0	●	200D5S25-06	105.0	125.00	180.00	55.0	32.0	25.0	0.40			1
20.5	●	205D5S25-06	107.5	127.75	182.75	55.0	32.0	25.0	0.35			1
21.0	●	210D5S25-06	110.0	130.50	185.50	55.0	32.0	25.0	0.30			1
21.5	●	215D5S25-06	112.5	133.25	188.25	55.0	32.0	25.0	0.20	GDXT070305P	GDXT070308C	1
22.0	●	220D5S25-06	115.0	136.00	191.00	55.0	32.0	25.0	0.15			1
22.5	○	GDXH 225D5S25-07	117.5	138.75	193.75	55.0	32.0	25.0	0.70			1
23.0	○	230D5S25-07	120.0	141.50	196.50	55.0	32.0	25.0	0.65			1
23.5	○	235D5S25-07	122.5	144.25	199.25	55.0	32.0	25.0	0.60			1
24.0	○	240D5S25-07	125.0	147.00	202.00	55.0	32.0	25.0	0.55			1
24.5	○	245D5S25-07	127.5	149.75	204.75	55.0	32.0	25.0	0.50			1
25.0	○	250D5S25-07	130.0	152.50	207.50	55.0	32.0	25.0	0.45			1
25.5	○	255D5S25-07	132.5	155.25	210.25	55.0	32.0	25.0	0.35	GDXT070305P	GDXT070308C	1
26.0	○	GDXH 260D5S32-07	135.0	158.00	217.00	59.0	40.0	32.0	0.30			1
26.5	○	265D5S32-07	137.5	160.75	219.75	59.0	40.0	32.0	0.25			1
27.0	○	270D5S32-07	140.0	163.50	222.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions **J143**

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D5S20-05 to GDHX180D5S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D5S25-06 to GDHX220D5S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D5S25-07 to GDHX270D5S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D5 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(5D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting								
	Medium Cutting								
	Roughing								
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L	○	○	○	5.1	2.58	0.3	1	GDXH155D5S20-05
	050203P-G	○	○	○	5.1	2.51	0.3	2	to GDXH180D5S25-05
	GDXT 06T204P-L	●	●	●	6.3	2.98	0.4	1	GDXH185D5S25-06
	06T204P-G	●	●	●	6.3	2.93	0.4	2	to GDXH220D5S25-06
	GDXT 070305P-L	○	○	○	7.7	3.43	0.5	1	GDXH225D5S25-07
	070305P-G	○	○	○	7.7	3.38	0.5	2	to GDXH270D5S32-07
Central Insert	GDXT 050205C-L	○	—	—	5.6	2.38	0.5	3	GDXH155D5S20-05
	050205C-G	○	—	—	5.6	2.38	0.5	4	to GDXH180D5S25-05
	GDXT 06T206C-L	●	—	—	6.9	2.78	0.6	3	GDXH185D5S25-06
	06T206C-G	●	—	—	6.9	2.88	0.6	4	to GDXH220D5S25-06
	GDXT 070308C-L	○	—	—	8.6	3.18	0.8	3	GDXH225D5S25-07
	070308C-G	○	—	—	8.6	3.18	0.8	4	to GDXH270D5S32-07

Fig 1 Peripheral insert L type

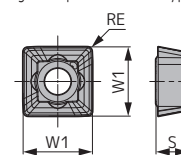


Fig 2 Peripheral insert G type

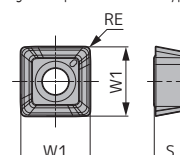


Fig 3 Central insert L type

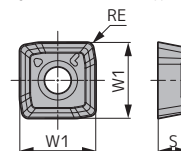
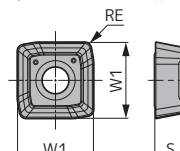


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert

New

CVD
CoatPVD
Coat

Coolant Hole

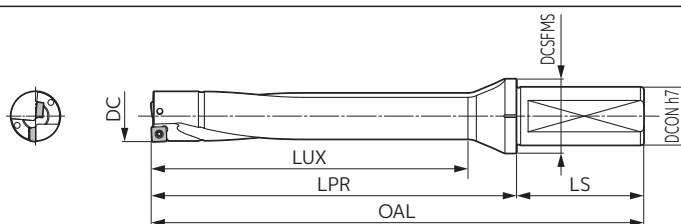
6D

Indexable
insert type

Drilling tolerance: 0 to +0.40mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D6S20-05	98.0	115.75	164.75	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D6S20-05	101.0	119.00	168.00	49.0	25.0	20.0	0.35			1
16.5	○	165D6S20-05	104.0	122.25	171.25	49.0	25.0	20.0	0.30			1
17.0	○	170D6S20-05	107.0	125.50	174.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D6S25-05	110.0	128.75	183.75	55.0	32.0	25.0	0.15			1
18.0	○	180D6S25-05	113.0	132.00	187.00	55.0	32.0	25.0	0.10	GDXT06T204P	GDXT06T206C	1
18.5	●	GDXH 185D6S25-06	116.0	135.25	190.25	55.0	32.0	25.0	0.55			1
19.0	●	190D6S25-06	119.0	138.50	193.50	55.0	32.0	25.0	0.50			1
19.5	●	195D6S25-06	122.0	141.75	196.75	55.0	32.0	25.0	0.45			1
20.0	●	200D6S25-06	125.0	145.00	200.00	55.0	32.0	25.0	0.40			1
20.5	●	205D6S25-06	128.0	148.25	203.25	55.0	32.0	25.0	0.35			1
21.0	●	210D6S25-06	131.0	151.50	206.50	55.0	32.0	25.0	0.30			1
21.5	●	215D6S25-06	134.0	154.75	209.75	55.0	32.0	25.0	0.20			1
22.0	●	220D6S25-06	137.0	158.00	213.00	55.0	32.0	25.0	0.15	GDXT070305P	GDXT070308C	1
22.5	○	GDXH 225D6S25-07	140.0	161.25	216.25	55.0	32.0	25.0	0.70			1
23.0	○	230D6S25-07	143.0	164.50	219.50	55.0	32.0	25.0	0.65			1
23.5	○	235D6S25-07	146.0	167.75	222.75	55.0	32.0	25.0	0.60			1
24.0	○	240D6S25-07	149.0	171.00	226.00	55.0	32.0	25.0	0.55			1
24.5	○	245D6S25-07	152.0	174.25	229.25	55.0	32.0	25.0	0.50			1
25.0	○	250D6S25-07	155.0	177.50	232.50	55.0	32.0	25.0	0.45			1
25.5	○	255D6S25-07	158.0	180.75	235.75	55.0	32.0	25.0	0.35			1
26.0	○	GDXH 260D6S32-07	161.0	184.00	243.00	59.0	40.0	32.0	0.30			1
26.5	○	265D6S32-07	164.0	187.25	246.25	59.0	40.0	32.0	0.25			1
27.0	○	270D6S32-07	167.0	190.50	249.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions **J143**

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D6S20-05 to GDHX180D6S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D6S25-06 to GDHX220D6S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D6S25-07 to GDHX270D6S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D6 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(6D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting								
	Medium Cutting								
	Roughing								
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L				5.1	2.58	0.3	1	GDXH155D6S20-05
	050203P-G				5.1	2.51	0.3	2	to GDXH180D6S25-05
	GDXT 06T204P-L				6.3	2.98	0.4	1	GDXH185D6S25-06
	06T204P-G				6.3	2.93	0.4	2	to GDXH220D6S25-06
	GDXT 070305P-L				7.7	3.43	0.5	1	GDXH225D6S25-07
	070305P-G				7.7	3.38	0.5	2	to GDXH270D6S32-07
Central Insert	GDXT 050205C-L				5.6	2.38	0.5	3	GDXH155D6S20-05
	050205C-G				5.6	2.38	0.5	4	to GDXH180D6S25-05
	GDXT 06T206C-L				6.9	2.78	0.6	3	GDXH185D6S25-06
	06T206C-G				6.9	2.88	0.6	4	to GDXH220D6S25-06
	GDXT 070308C-L				8.6	3.18	0.8	3	GDXH225D6S25-07
	070308C-G				8.6	3.18	0.8	4	to GDXH270D6S32-07

Fig 1 Peripheral insert L type

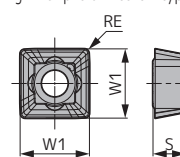


Fig 2 Peripheral insert G type

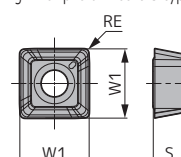


Fig 3 Central insert L type

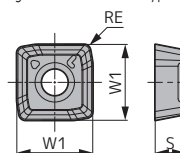
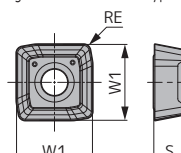


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

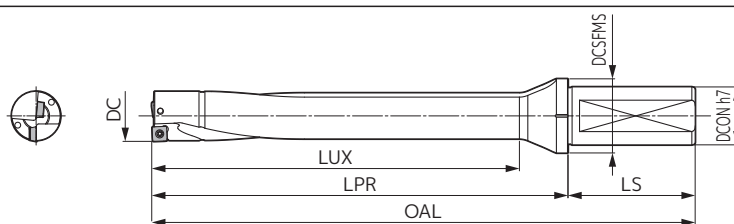
Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert



Drilling tolerance: 0 to +0.05mm

*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø15.5 to 27.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Boss DCSFMS	Shank Dia. DCON	Radial Offset (Max)	Applicable Insert (Peripheral Insert)	Applicable Insert (Central Insert)	Fig
15.5	○	GDXH 155D7S20-05	113.5	131.25	180.25	49.0	25.0	20.0	0.40	GDXT050203P	GDXT050205C	1
16.0	○	160D7S20-05	117.0	135.00	184.00	49.0	25.0	20.0	0.35			1
16.5	○	165D7S20-05	120.5	138.75	187.75	49.0	25.0	20.0	0.30			1
17.0	○	170D7S20-05	124.0	142.50	191.50	49.0	25.0	20.0	0.25			1
17.5	○	GDXH 175D7S25-05	127.5	146.25	201.25	55.0	32.0	25.0	0.15	GDXT06T204P	GDXT06T206C	1
18.0	○	180D7S25-05	131.0	150.00	205.00	55.0	32.0	25.0	0.10			1
18.5	●	GDXH 185D7S25-06	134.5	153.75	208.75	55.0	32.0	25.0	0.55			1
19.0	●	190D7S25-06	138.0	157.50	212.50	55.0	32.0	25.0	0.50			1
19.5	●	195D7S25-06	141.5	161.25	216.25	55.0	32.0	25.0	0.45			1
20.0	●	200D7S25-06	145.0	165.00	220.00	55.0	32.0	25.0	0.40			1
20.5	●	205D7S25-06	148.5	168.75	223.75	55.0	32.0	25.0	0.35			1
21.0	●	210D7S25-06	152.0	172.50	227.50	55.0	32.0	25.0	0.30			1
21.5	●	215D7S25-06	155.5	176.25	231.25	55.0	32.0	25.0	0.20	GDXT070305P	GDXT070308C	1
22.0	●	220D7S25-06	159.0	180.00	235.00	55.0	32.0	25.0	0.15			1
22.5	○	GDXH 225D7S25-07	162.5	183.75	238.75	55.0	32.0	25.0	0.70			1
23.0	○	230D7S25-07	166.0	187.50	242.50	55.0	32.0	25.0	0.65			1
23.5	○	235D7S25-07	169.5	191.25	246.25	55.0	32.0	25.0	0.60			1
24.0	○	240D7S25-07	173.0	195.00	250.00	55.0	32.0	25.0	0.55			1
24.5	○	245D7S25-07	176.5	198.75	253.75	55.0	32.0	25.0	0.50			1
25.0	○	250D7S25-07	180.0	202.50	257.50	55.0	32.0	25.0	0.45			1
25.5	○	255D7S25-07	183.5	206.25	261.25	55.0	32.0	25.0	0.35	GDXT070305P	GDXT070308C	1
26.0	○	GDXH 260D7S32-07	187.0	210.00	269.00	59.0	40.0	32.0	0.30			1
26.5	○	265D7S32-07	190.5	213.75	272.75	59.0	40.0	32.0	0.25			1
27.0	○	270D7S32-07	194.0	217.50	276.50	59.0	40.0	32.0	0.20			1

Recommended Cutting Conditions **J143**

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
GDHX155D7S20-05 to GDHX180D7S25-05	BFTX0204IP	0.5	TRX06IP	—
GDHX185D7S25-06 to GDHX220D7S25-06	BFTX02205IP	1.0	—	TRDR07IP
GDHX225D7S25-07 to GDHX270D7S32-07	BFTX02506IP	1.5	—	TRDR08IP

Identification Code

GDXH 200 D7 S25 - 06

Series Code

Diameter
(ø20.0)L/D
(7D)Shank Dia
(ø25.0)Insert
Size

New**Insert**

Dimensions (mm)

Grade Classification		Coated Carbide							
Process	High-speed/Light Cutting	 							
	Medium Cutting	 							
	Roughing	 							
Cat. No.		ACU2500	ACP2000	ACS3000	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Holder
Peripheral Insert	GDXT 050203P-L	○	○	○	5.1	2.58	0.3	1	GDXH155D7S20-05
	050203P-G	○	○	○	5.1	2.51	0.3	2	to GDXH180D7S25-05
	GDXT 06T204P-L	●	●	●	6.3	2.98	0.4	1	GDXH185D7S25-06
	06T204P-G	●	●	●	6.3	2.93	0.4	2	to GDXH220D7S25-06
	GDXT 070305P-L	○	○	○	7.7	3.43	0.5	1	GDXH225D7S25-07
	070305P-G	○	○	○	7.7	3.38	0.5	2	to GDXH270D7S32-07
Central Insert	GDXT 050205C-L	○	—	—	5.6	2.38	0.5	3	GDXH155D7S20-05
	050205C-G	○	—	—	5.6	2.38	0.5	4	to GDXH180D7S25-05
	GDXT 06T206C-L	●	—	—	6.9	2.78	0.6	3	GDXH185D7S25-06
	06T206C-G	●	—	—	6.9	2.88	0.6	4	to GDXH220D7S25-06
	GDXT 070308C-L	○	—	—	8.6	3.18	0.8	3	GDXH225D7S25-07
	070308C-G	○	—	—	8.6	3.18	0.8	4	to GDXH270D7S32-07

Fig 1 Peripheral insert L type

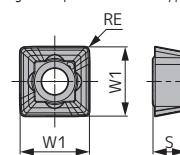


Fig 2 Peripheral insert G type

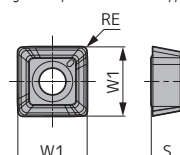


Fig 3 Central insert L type

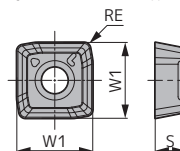
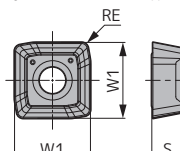


Fig 4 Central insert G type

Precautions for Mounting and Removing Inserts **J157****Identification Code****GDXT 06 T2 04 P - G**

Series Code

Insert
Size

Thickness

Corner
RadiusChipbreaker
typeP: Peripheral Insert
C: Central Insert

■ Application Examples

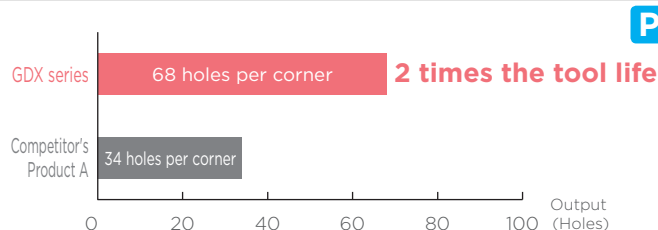
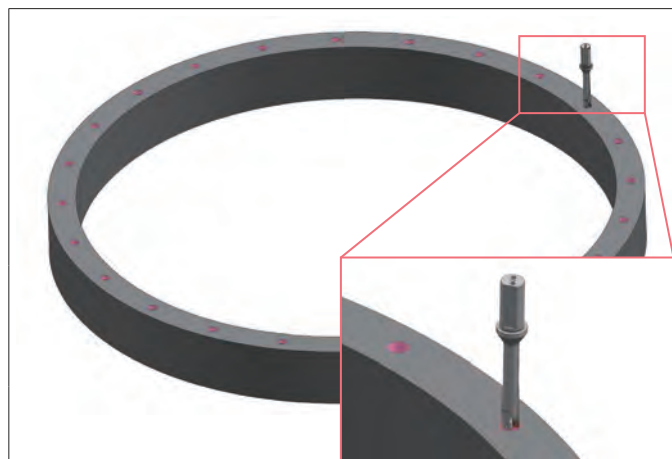
Drilling

Solid

Indexable
Head type

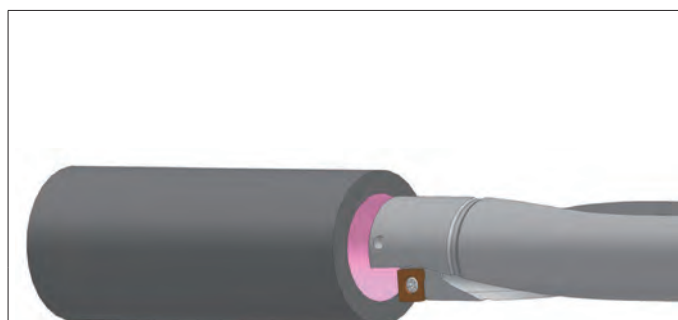
Indexable
Insert type

Reamers



Work Material: Bearing (S48C [230HB])
Tool : GDXH190D5S25-06 (ø19, 5D)
Insert : Peripheral Insert GDXT06T204P-G (ACU2500)
Central Insert: GDXT06T206C-G (ACU2500)
Cutting Conditions: $vc = 120\text{m/min}$, $f = 0.085\text{mm/rev}$, $H = 76\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Realises stable drilling and double the tool life compared to competitor's products



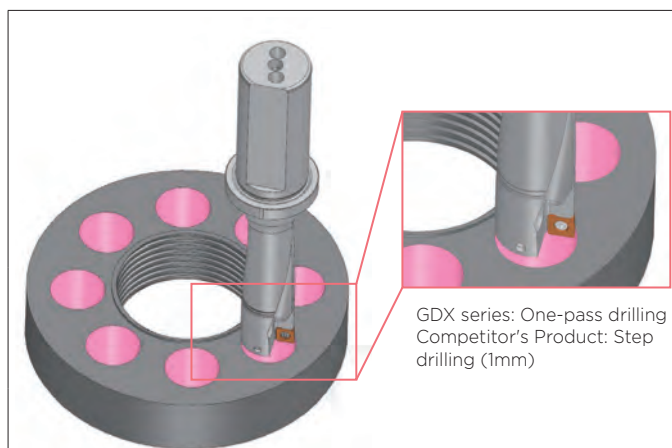
Deep hole drilling of H75mm from both ends



P

Work Material: Nut (SS400)
Tool : GDXH210D6S25-06 (ø21, 6D)
Insert : Peripheral Insert GDXT06T204P-L (ACU2500)
Central Insert: GDXT06T206C-L (ACU2500)
Cutting Conditions: $vc = 80\text{m/min}$, $f = 0.03\sim0.05\text{mm/rev}$, $H = 75\text{mm} \times 2$ (Flipped Drilling, Through), Internal Coolant Supply (Water-soluble)

Compared to competitor's product, stable drilling was realised with short chips

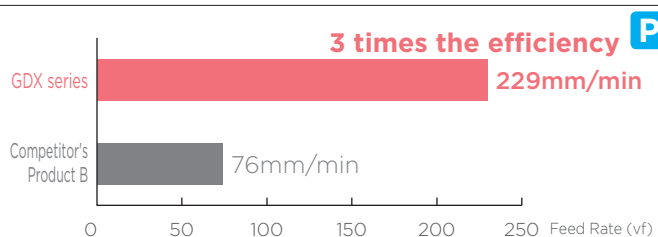
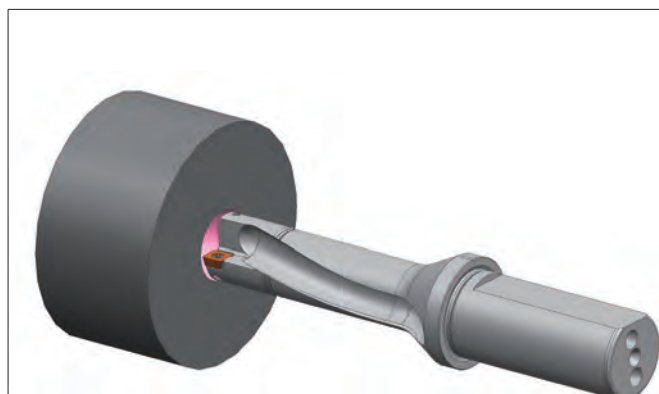


GDX series: One-pass drilling
Competitor's Product: Step drilling (1mm)

P

Work Material: Flange (SS400)
Tool : GDXH190D3S25-06 (ø19, 3D)
Insert : Peripheral Insert GDXT06T204P-L (ACU2500)
Central Insert: GDXT06T206C-L (ACU2500)
Cutting Conditions: $vc = 240\text{m/min}$, $f = 0.055\text{mm/rev}$, $H = 22\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

While competitor's product performs step drilling (1mm per step), the GDX series breaks chips into small pieces even with one-pass drilling, achieving stable high-efficiency drilling.



Work Material: Flange (S25C, S45C)
Tool : GDXH200D3S25-06 (ø20, 3D)
Insert : Peripheral Insert GDXT06T204P-G (ACU2500)
Central Insert: GDXT06T206C-G (ACU2500)
Cutting Conditions: $vc = 180\text{m/min}$, $f = 0.08\text{mm/rev}$, $H = 38\text{mm}$ (Through), Internal Coolant Supply (Water-soluble)

Significantly improved chip control as compared to competitor's product, with 3 times higher efficiency

Lathe Drilling Guidelines

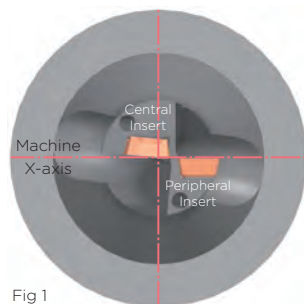


Fig 1



Fig 2

Drill installation

- Set the drill so that the peripheral insert is parallel to the X-axis of the machine. (Fig 1)
- We also recommend mounting in an orientation such that the worker can see the peripheral insert. (although usage is possible even at 180° in reverse orientation)

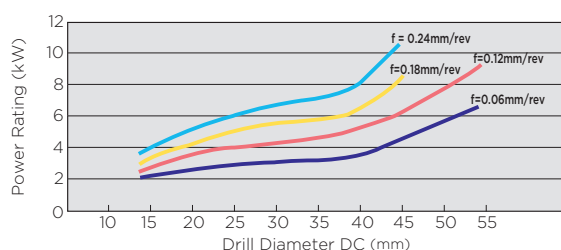
Other notes

- When the drill is mounted on a lathe, the centre of the central insert is designed to be 0.1 to 0.2mm below the centre of the spindle.
- If the spindle deviates so far off centre that the centre of the central insert lies above the spindle centre, the central insert will break.
- Also take note that, if the off-centre amount is larger than the normal value, the pip at the bottom of the hole will become larger (ø1mm or more) and wall precision will suffer.
- Install a cover to prevent injury from possible chip fly-out (see disc-shaped chip in Fig 2) when through drilling on a lathe.
- If your machine has no cover, attach a cover or similar part for your safety.
- Set the depth of cut for external turning or internal boring work to 20% or less of the drill diameter. (Ex.: For ø20.0mm, depth of cut 4mm or below)
- Also, use a feed rate 30% to 70% lower than the recommended rate.

Adjusting Work Diameter (offset)

- When used on a lathe, the work diameter is adjustable by moving the machine X-axis.
- Make the adjustment by moving in the positive direction of the X-axis (enlarging the bore diameter). Moving the X-axis in the negative direction (to reduce the bore diameter) is not recommended as the holder may interfere with the hole.
- Refer to Radial Offset (Max) in the body dimension tables on pages J144 to J154.

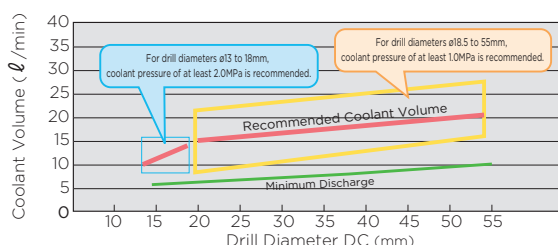
Typical Power Ratings



<CAUTIONS>

- Power ratings are subject to change based on conditions such as work material and cutting speed, and should only be used for reference.
- Cutting Conditions (Reference)
Work Material: S50C (230HB)
Cutting Speed: vc = 150m/min

Typical Coolant Volume



<CAUTIONS>

- Coolant volume is a factor that affects drilling performance, particularly with respect to chip evacuation and lubricity.
- Coolant pressure should be set higher for small drills. (Below ø18.0mm)
- Coolant volume is usually adjusted by changing the coolant pressure provided on most CNC machine tools.
- This table provides guideline values only. More coolant may be required depending on the machine, coolant and work material.
- Internal coolant supply is recommended.
- Dry machining and external coolant supply are not recommended, as chips will not be evacuated.



Precautions for Attaching and Removing Inserts

- Before mounting the insert, remove all traces of foreign matter on the insert seat surface using air blow or other means.
- When using the wrench, align it to the axis of the screw and press while turning. (Fig 3)
- If the wrench is not aligned with the screw, the insert will be insufficiently clamped and the tip of the wrench and/or the Torx hole of the screw may become deformed.
- Do not allow clearance between the insert seat and drill when mounting the insert. (Fig 4, A)
- Figure 4 shows a properly attached insert.

*It is normal for the outer side of the central insert to have clearance as the insert retaining surfaces are on the inside and back.

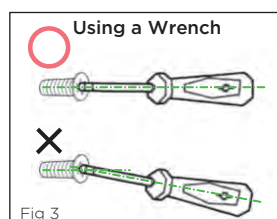


Fig 3

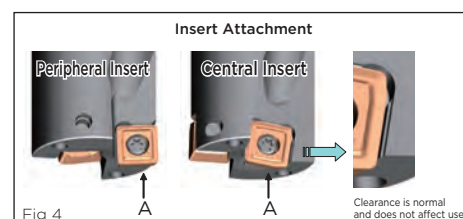


Fig 4

Troubleshooting

Problem	Phenomenon	Cause	Countermeasures
Too much variation in hole diameter	Drilled hole diameter is larger than desired	Deflection of the holder due to high cutting force	Decrease the feed speed to decrease cutting force
	Drilled hole diameter is smaller than desired	The cutting edge backs off and does not enter the workpiece	When using the drill on a lathe, adjust by moving in the X-axis direction
	Significant difference in hole diameter at entrance and bottom	Packing of chips	Increase the feed rate Use an L type chipbreaker for chip control
Poor quality machined hole surface	Poor machined surface from entrance to bottom of hole	High cutting force	Decrease cutting speed
	Poor machined surface at bottom of hole	Low rigidity of workpiece	Review tooling to improve rigidity
	Scratches around hole exit	Machined surfaces damaged by chips	Increase the feed rate to improve chip evacuation
	Return scratches are generated	Holder is vibrating during through cutting	Use an L type chipbreaker for chip control
Insert is broken	Fracture on central insert (centre)	Drilled diameter has shrunk	Drop cutting speed at hole exit to vc = 50m/min
	Fracture on peripheral insert	Central insert is off centre	Drop feed rate at hole exit to 0.05mm/rev
		Insert is not strong enough	Increase feed rate
		High cutting load on cutting edge	Reconfirm and adjust centre height
			When using with a lathe, rotate the drill 180° to mount
			Decrease the feed rate to decrease cutting load
			Decrease the feed rate to decrease cutting load



General Features

The SumiDrill WDX series has excellent cutting balance that provides stable drilling in a wide range of work materials from general steel to stainless steel and aluminum alloy.

Available in four original chipbreaker styles, the inserts feature improved chip evacuation and reduced cutting force for use in low-rigidity contexts.

Features and Applications

Balanced Design

Cutting force during drilling is balanced between central insert and peripheral insert. The relative position of each insert is optimised to provide stable drilling.

Excellent Chip Control

The chip evacuation direction can be controlled with the chip control groove at the centre of the chipbreaker, enabling good chip control.

Versatile Tool for a Variety of Drilling Applications

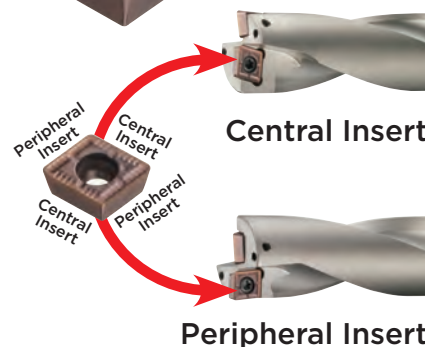
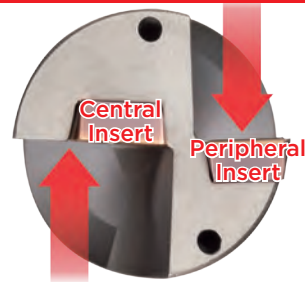
Select among four types of chipbreakers for different applications, allowing optimal drilling for a variety of work materials and conditions. Suitable for a wide range of applications including hole expansion, flat bottom drilling, external turning and internal boring.

Economical Four-Cornered Insert

This product has an extremely economical design where a single insert type can be used for the central insert or peripheral insert, with two corners for each position - a total of four corners.

Chipbreaker	L type	G type		H type	M type
Features	For Low Feed with Chip Control	General-purpose	For Non-Ferrous Metal	Strong Edged	For Stainless Steel
Appearance					
Cross Section					

Balanced design
Cutting force of central insert $\approx$ that of peripheral insert

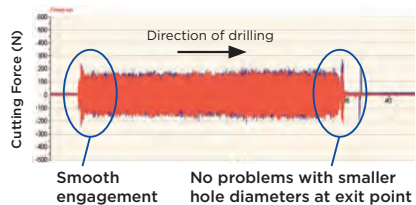


Cutting Performance

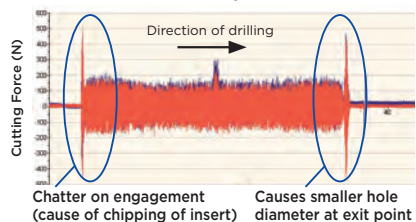
Balanced Design

(Comparison of Horizontal Component Values)
Balance is maintained from the hole entry through to the hole exit for stable drilling.

WDX series



Conventional and Competitor's Products



Improved chip control

Tool : WDX 200D3S25 ($\phi 20.0$)
Work Material : SUS304
Cutting Conditions: $vc = 130\text{m/min}$,
 $f = 0.06\text{mm/rev}$
 $H = 50\text{mm Wet}$

WDX series

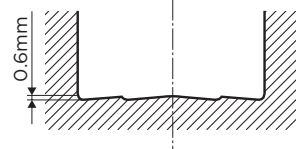


Conventional and Competitor's Products

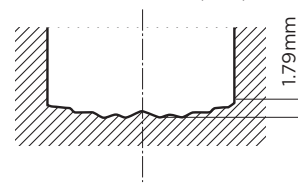


Finishing is easy because the hole bottom is almost flat.

Bottom of hole after drilling with WDX200D3S25



Bottom of hole after drilling with conventional tool ($\phi 20$)



M type Chipbreaker Dedicated for Stainless Steel Drilling + ACM300 Grade

■ Features

Newly developed M type chipbreaker dedicated for stainless steel drilling achieves stable hole quality through chip control.

Tool	WDX series M type + ACM300	WDX series G type + ACP300	Competitor's Product For Stainless Steel Drilling
Hole Quality			
Chip			

Tool: WDX200D3S25
Insert: WDXT063006-M (ACM300)
Work Material: SUS316L
Cutting Conditions: $vc = 150\text{m/min}$, $f = 0.08\text{mm/rev}$,
 $H = 60\text{mm Wet}$

For High-speed Drilling of Steel and Cast Iron ACP100

■ Features

Our proprietary technology for "Super FF Coat", with its ultra-fine crystal grain structure and coating stress control technology, provides excellent wear resistance and high reliability.

	ACP100	Competitor's Product
Peripheral Insert		
Rake Face		
Flank		
Central Insert		
Rake Face		
Flank		

Tool: WDX250D3S25
Insert: WDXT063006-G (ACP100)
Work Material: S50C
Cutting Conditions: $vc = 200\text{m/min}$, $f = 0.12\text{mm/rev}$,
 $H = 50\text{mm (Through Hole) Wet}$

Drills for Deep Hole Drilling $L/D = 5$ (In stock from $\phi 13.0$ to $\phi 55.0\text{mm}$)

■ Features

The SumiDrill WDX series for 5D drilling features a specially designed flute shape and large coolant holes for excellent chip evacuation even during deep hole drilling.

Large coolant hole



Coolant supply guide

$L/D = 5$ Special Flute Shape



■ Performance

Tool Holder Features	Cross Section	Cutting Force	Drilled Hole Surface (Exit)
WDX 260D5S32 Special Flute Shape for $L/D=5$ * Designed with emphasis on chip evacuation Expanded flute design improves chip evacuation for stable drilling performance even with holes up to $L/D = 5$.		Amplitude in the thrust direction is larger than flutes designed for up to $L/D = 4$, but drilling performance is stable even when drilling deep holes of $L/D = 5$.	Good drilled hole surface down to end of hole
Comparison Tool Flute Shape for $L/D=4$ * Designed with emphasis on drill rigidity Flute design enables greater rigidity of the drill, achieving stable drilling of shallow holes up to $L/D = 4$.		Chip blockage at bottom of hole However, stable drilling up to $L/D = 4$ Strong rigidity allows only minute amplitude in the thrust direction	Poor drilled hole surface due to chip blockage at bottom of hole (near $L/D = 5$)

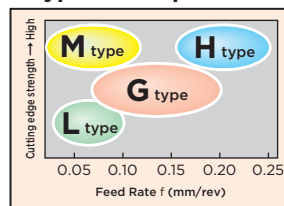
Work Material: SUS304 Tool: WDX260D5S32 Insert: WDXT 073506-G
Cutting Conditions: $vc = 150\text{m/min}$, $f = 0.05\text{mm/rev}$, $H = 130\text{mm (Through Hole) Wet}$

Insert Selection Guide — The WDX insert series has a variety of options

5 grades

Grade	ACP100	ACP300	ACS3000 ACM300	ACK300	DL1500
P Steel (High-speed Drilling)	○				
P Steel (General Drilling)		○			
M Stainless Steel		○	○		
K Cast Iron (High-speed Drilling)	○				
K Cast Iron (General Drilling)				○	
N Non-Ferrous Metal					○

4 types of chipbreakers



11 combinations are possible!

Grade	ACP100	ACP300	ACS3000 ACM300	ACK300	DL1500
P Steel	L type	L type		L type	
P Steel	G type	G type		G type	
P Steel	H type	H type		H type	
M Stainless Steel			M type		

2nd Recommendation

P Steel

L type **ACP300**

For Low Feed with Chip Control

- For drilling of SS400, SCM415, SCM420, etc.
- High speed and low feed are recommended if there are issues with chip control.
- Decrease the feed if vibration occurs due to burnt chips.

P Steel

G type **ACP100**

General-purpose

- For drilling of general steel and alloy steel, when prone to significantly large flank wear

L type **ACP100**

For Low Feed with Chip Control

- For low-feed conditions

P Steel

H type **ACP300**

Strong Edged

- For drilling with interruptions (entry/exit) due to slanted entry, reduce the feed rate at the interrupted part (around $f = 0.05$ mm/rev).
- For insufficient cutting edge strength due to drilling of hardened steel (heat treated)

P Steel

Improved chip control (low carbon steel, etc.)

P Steel

Insufficient wear resistance

P Steel

Initial chipping measures (interruption, high hardness, etc.)

1st Recommendation

G type

General-purpose

- P** Steel: For general steel and alloy steel drilling
- K** Cast Iron: For cast iron drilling
- N** Non-Ferrous Metal: For non-ferrous metal drilling

ACP300

ACK300

DL1500

M Stainless Steel

M type

For stainless steel drilling

ACS3000

ACM300

Stainless Steel Dedicated

K Cast Iron

Insufficient wear resistance (high-speed drilling)

K Cast Iron

Initial chipping measures (interruption, high feed, etc.)

M Stainless Steel

Lack of chip evacuation (long chips)

2nd Recommendation

K Cast Iron

G type **ACP100**

General-purpose

- When heavy flank wear occurs in cast iron drilling
- To limit wear in high-speed, low to medium feed conditions

K Cast Iron

H type **ACK300**

Strong Edged

- When interrupted drilling is performed due to slanted entry, etc. as with steel drilling.
- For insufficient cutting edge strength due to high-feed drilling

M Stainless Steel

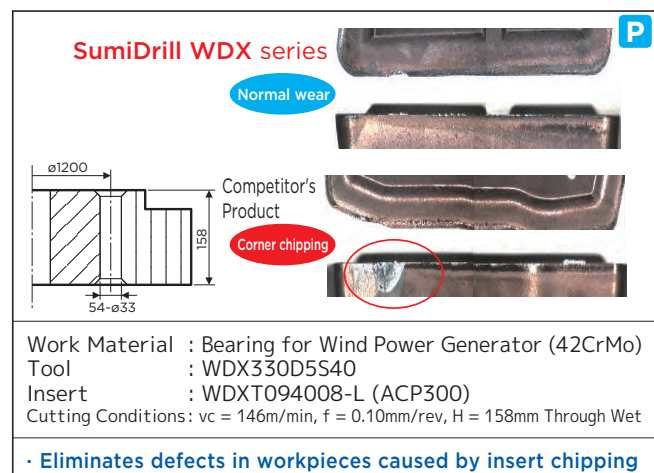
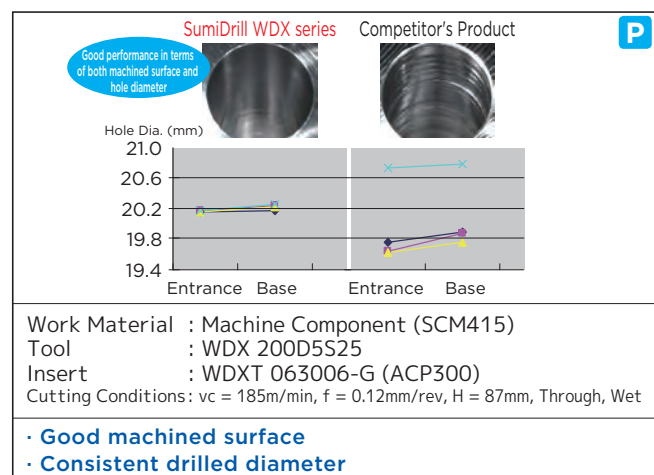
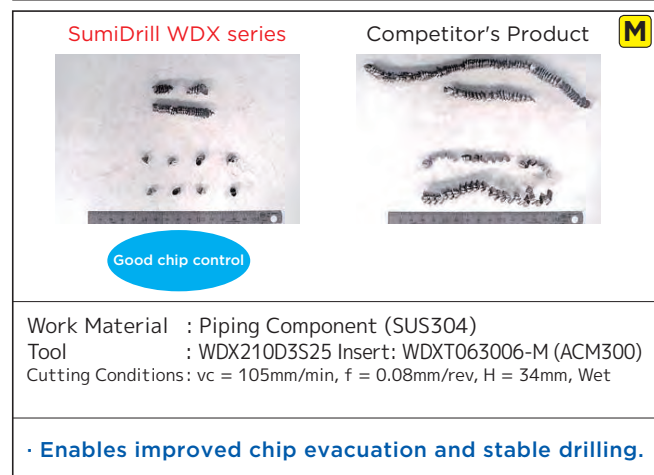
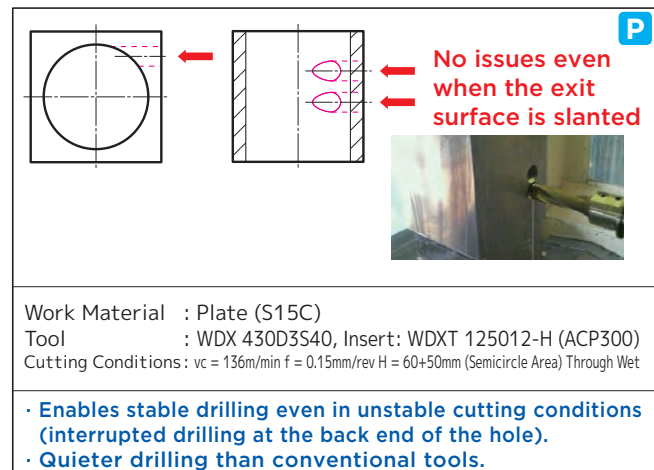
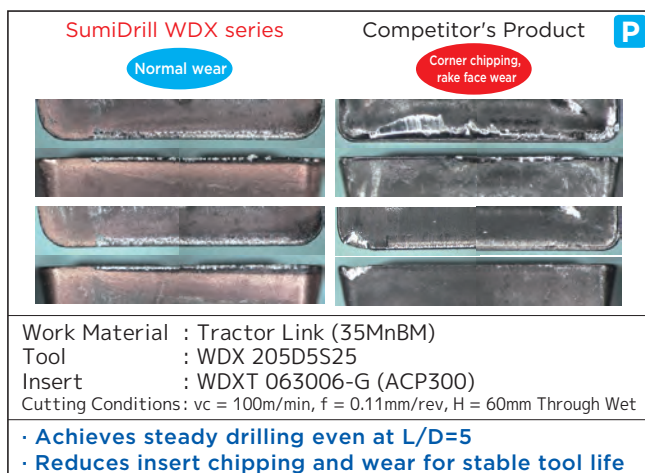
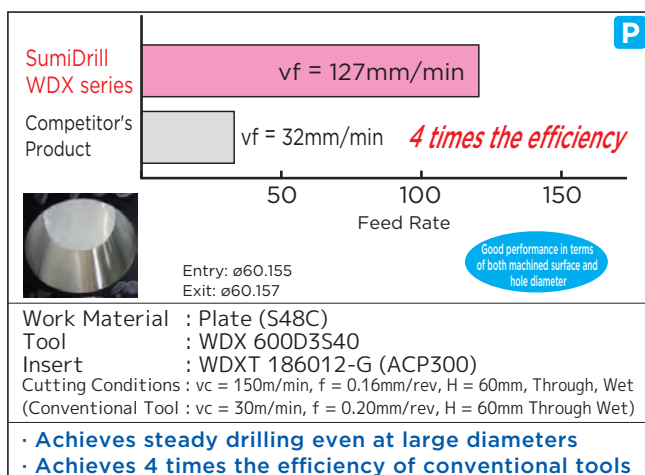
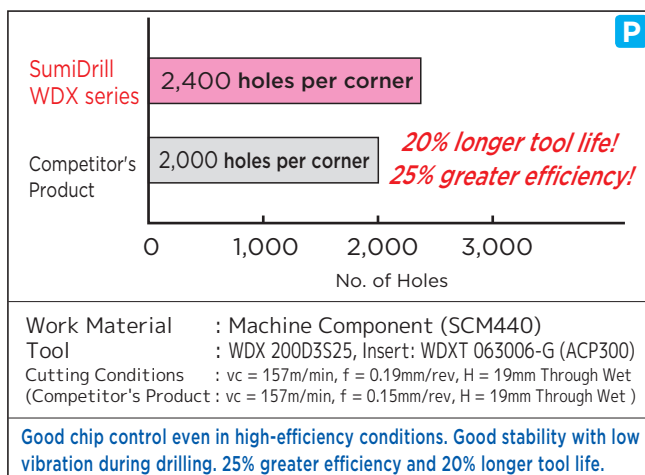
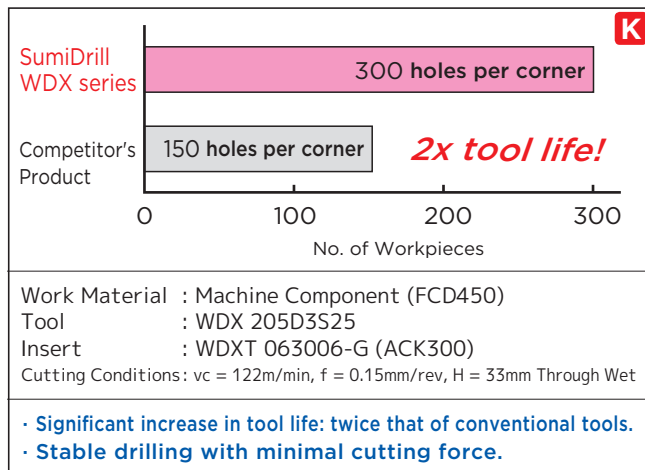
G type **ACP300**

General-purpose

- When chips becomes long and tangled

*ACP100 is the first recommendation for steel with a hardness of 200HB or greater, or for high-speed drilling of steel.

Application Examples



WDX series for 2D (Internal Coolant Supply)



Drilling tolerance: -0.05 to +0.15mm

*For tolerances, refer to Chapter N - References.

Fig 1

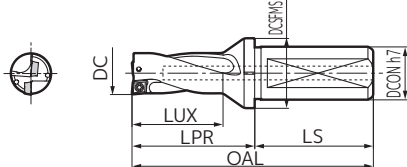


Fig 2

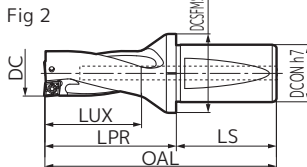
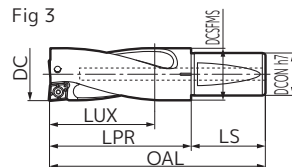


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Length LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D2S20	29	44	88	44	28.0	20	0.35	WDX 042004	1
13.5	●	135D2S20	30	45	89	44	28.0	20	0.30		1
14.0	●	140D2S20	31	46	90	44	28.0	20	0.25		1
14.5	●	145D2S20	32	47	91	44	28.0	20	0.20		1
15.0	●	150D2S20	33	48	92	44	28.0	20	0.15		1
15.5	●	WDX 155D2S20	34	49	93	44	30.0	20	0.40	WDX 052504	1
16.0	●	160D2S20	35	50	94	44	30.0	20	0.35		1
16.5	●	165D2S20	36	51	95	44	30.0	20	0.30		1
17.0	●	170D2S20	37	52	96	44	30.0	20	0.25		1
17.5	●	WDX 175D2S25	38	53	109	56	32.0	25	0.25		1
18.0	●	180D2S25	39	54	110	56	32.0	25	0.20		1
18.5	●	WDX 185D2S25	40	55	111	56	33.0	25	0.50		1
19.0	●	190D2S25	41	56	112	56	33.0	25	0.45		1
19.5	●	195D2S25	42	57	113	56	33.0	25	0.40		1
20.0	●	200D2S25	43	58	114	56	33.0	25	0.30	WDX 063006	1
20.5	●	205D2S25	44	59	115	56	33.0	25	0.25		1
21.0	●	210D2S25	45	60	116	56	33.0	25	0.20		1
21.5	●	215D2S25	46	61	117	56	33.0	25	0.15		1
22.0	●	220D2S25	47	62	118	56	33.0	25	0.10		1
22.5	●	225D2S25	48	63	119	56	33.0	25	0.05		1
23.0	●	WDX 230D2S25	49	67	123	56	37.0	25	0.70		1
23.5	●	235D2S25	50	68	124	56	37.0	25	0.60		1
24.0	●	240D2S25	51	69	125	56	37.0	25	0.50		1
24.5	●	245D2S25	52	70	126	56	37.0	25	0.40		1
25.0	●	250D2S25	53	71	127	56	37.0	25	0.30		1
25.5	●	WDX 255D2S32	54	74	134	60	41.0	32	0.45	WDX 073506	2
26.0	●	260D2S32	55	75	135	60	41.0	32	0.40		2
26.5	●	265D2S32	56	76	136	60	41.0	32	0.35		2
27.0	●	270D2S32	57	77	137	60	41.0	32	0.25		2
27.5	●	275D2S32	58	78	138	60	41.0	32	0.20		2
28.0	●	280D2S32	59	79	139	60	41.0	32	0.15		2
28.5	●	285D2S32	60	80	140	60	41.0	32	0.10		2
29.0	●	WDX 290D2S32	62	83	143	60	50.0	32	1.00		2
29.5	●	295D2S32	63	84	144	60	50.0	32	0.95		2
30.0*	●	300D2S32	64	88	148	60	54.0	32	0.90		2
31.0*	●	310D2S32	66	90	150	60	54.0	32	0.80		2
32.0*	●	320D2S32	68	92	152	60	54.0	32	0.70		2
30.0*	●	WDX 300D2S40	64	88	158	70	54.0	40	0.90	WDX 094008	2
31.0*	●	310D2S40	66	90	160	70	54.0	40	0.80		2
32.0*	●	320D2S40	68	92	162	70	54.0	40	0.70		2
33.0	●	330D2S40	70	94	164	70	54.0	40	0.55		2
34.0	●	340D2S40	72	96	166	70	54.0	40	0.45		2
35.0	●	350D2S40	74	98	168	70	54.0	40	0.35		2
36.0	●	360D2S40	76	100	170	70	54.0	40	0.20		2
37.0	●	WDX 370D2S40	79	109	179	70	49.5	40	1.00		2
38.0	●	380D2S40	81	111	181	70	49.5	40	0.90		2
39.0	●	390D2S40	83	113	183	70	49.5	40	0.80		2
40.0	●	400D2S40	85	115	185	70	49.5	40	0.70		2
41.0	●	410D2S40	87	117	187	70	49.5	40	0.60	WDX 125012	2
42.0	●	420D2S40	89	119	189	70	49.5	40	0.50		2
43.0	●	430D2S40	91	121	191	70	49.5	40	0.40		2
44.0	●	440D2S40	93	123	193	70	49.5	40	0.30		2
45.0	●	450D2S40	95	125	195	70	49.5	40	0.20		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J170

Diameter ø46.0 to 68.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Length LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D2S40	97	127	197	70	49.5	40	1.50		2
47.0	●	470D2S40	99	129	199	70	49.5	40	1.40		2
48.0	●	480D2S40	101	131	201	70	49.5	40	1.30		2
49.0	●	490D2S40	103	133	203	70	49.5	40	1.20		2
50.0	●	500D2S40	105	135	205	70	49.5	40	1.10	WDX 156012	2
51.0	●	510D2S40	107	137	207	70	49.5	40	1.00		3
52.0	●	520D2S40	109	139	209	70	50.5	40	0.90		3
53.0	●	530D2S40	111	141	211	70	51.5	40	0.80		3
54.0	●	540D2S40	113	143	213	70	52.5	40	0.60		3
55.0	●	550D2S40	115	145	215	70	53.5	40	0.50		3
56.0	●	WDX 560D2S40	120	152	222	70	54.0	40	2.00		3
57.0	●	570D2S40	122	154	224	70	55.0	40	1.80		3
58.0	●	580D2S40	124	156	226	70	56.0	40	1.70		3
59.0	●	590D2S40	126	158	228	70	57.0	40	1.60		3
60.0	●	600D2S40	128	160	230	70	58.0	40	1.50		3
61.0	●	610D2S40	130	162	232	70	59.0	40	1.40		3
62.0	●	620D2S40	132	164	234	70	60.0	40	1.30	WDX 186012	3
63.0	●	630D2S40	134	166	236	70	61.0	40	1.20		3
64.0	●	640D2S40	136	168	238	70	62.0	40	1.00		3
65.0	●	650D2S40	138	170	240	70	63.0	40	0.90		3
66.0	●	660D2S40	140	172	242	70	64.0	40	0.70		3
67.0	●	670D2S40	142	174	244	70	65.0	40	0.60		3
68.0	●	680D2S40	144	176	246	70	66.0	40	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
WDX130D2S20 to WDX150D2S20	BFTX01604N	0.3	TRX06	—
WDX155D2S20 to WDX180D2S25	BFTX0204N	0.5	TRX06	—
WDX185D2S25 to WDX225D2S25	BFTY02206	1.0	—	TRD07
WDX230D2S25 to WDX285D2S32	BFTX02506N	1.5	—	TRD08
WDX290D2S32 to WDX360D2S40	BFTX03584	3.5	—	TRD15
WDX370D2S40 to WDX450D2S40	BFTX0511N	5.0	—	TRD20
WDX460D2S40 to WDX680D2S40	BFTX0615N	5.0	—	TRD25

Identification Code

WDX 200 D2 S25

Dia. DC (ø20.0) Flute Length L/D (2D) Shank Dia. DCON (ø25.0)

Expansion

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting												
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder
WDXT 042004-L		●	●			●		1	4.2	2.0	0.4	0.4	WDX130D2S20 to WDX150D2S20
042004-G		●	●			●	●	2	4.2	2.0	0.4	0.4	
042004-H		●	●			●		3	4.2	2.0	0.4	0.4	
042004-M				●	▲			4	4.2	2.0	0.4	0.8	
WDXT 052504-L		●	●			●		1	5.0	2.5	0.4	0.4	WDX155D2S20 to WDX180D2S25
052504-G		●	●			●	●	2	5.0	2.5	0.4	0.4	
052504-H		●	●			●		3	5.0	2.5	0.4	0.4	
052504-M				●	▲			4	5.0	2.5	0.4	1.0	
WDXT 063006-L		●	●			●		1	6.0	3.0	0.6	0.6	WDX185D2S25 to WDX225D2S25
063006-G		●	●			●	●	2	6.0	3.0	0.6	0.6	
063006-H		●	●			●		3	6.0	3.0	0.6	0.6	
063006-M				●	▲			4	6.0	3.0	0.6	1.4	
WDXT 073506-L		●	●			●		1	7.5	3.5	0.6	0.6	WDX230D2S25 to WDX285D2S32
073506-G		●	●			●	●	2	7.5	3.5	0.6	0.6	
073506-H		●	●			●		3	7.5	3.5	0.6	0.6	
073506-M				●	▲			4	7.5	3.5	0.6	1.6	
WDXT 094008-L		●	●			●		1	9.6	4.0	0.8	0.8	WDX290D2S32 to WDX360D2S40
094008-G		●	●			●	●	2	9.6	4.0	0.8	0.8	
094008-H		●	●			●		3	9.6	4.0	0.8	0.8	
094008-M				●	▲			4	9.6	4.0	0.8	2.4	
WDXT 125012-L		●	●			●		1	12.4	5.0	1.2	1.2	WDX370D2S40 to WDX450D2S40
125012-G		●	●			●	●	2	12.4	5.0	1.2	1.2	
125012-H		●	●			●		3	12.4	5.0	1.2	1.2	
125012-M				●	▲			4	12.4	5.0	1.2	3.2	
WDXT 156012-L		●	●			●		1	15.2	6.0	1.2	1.2	WDX460D2S40 to WDX550D2S40
156012-G		●	●			●	●	2	15.2	6.0	1.2	1.2	
156012-H		●	●			●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L		●	●			●		1	18.0	6.0	1.2	1.2	WDX560D2S40 to WDX680D2S40
186012-G		●	●			●		2	18.0	6.0	1.2	1.2	
186012-H		●	●			●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control

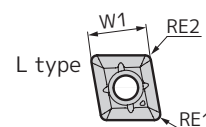


Fig 2 General-purpose

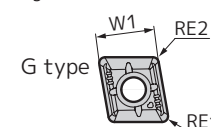


Fig 3 Strong-edged type

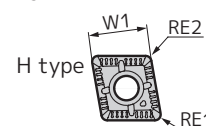
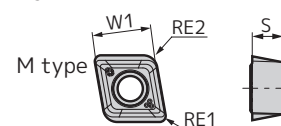


Fig 4 For stainless steel drilling



Identification Code

WDXT 06 30 06 -G

Width across Flats (6.0) Thickness x 10 (3.0) Corner Radius x 10 (0.6) Chipbreaker type

Recommended Cutting Conditions (for 2D)

	Work Material	Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>				
						ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø68.0
2D	P Steel, Carbon Steel	SS400	125	G ACP300	120-180-240	0.05-0.06-0.10	0.05-0.06-0.10	0.05-0.06-0.11	0.05-0.07-0.12	0.06-0.08-0.13
		S15C	125	L ACP300	130-170-220	0.04-0.06-0.12	0.04-0.06-0.12	0.04-0.06-0.13	0.05-0.07-0.15	0.06-0.08-0.17
		S45C	190	G ACP300	100-150-200	0.08-0.13-0.24	0.08-0.13-0.24	0.08-0.14-0.26	0.09-0.16-0.29	0.10-0.17-0.32
		S45C Hardened	250	G ACP100	100-170-240	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.10-0.17	0.06-0.11-0.18
		S75C	270	G ACP100	120-180-240	0.06-0.10-0.17	0.06-0.10-0.17	0.06-0.10-0.17	0.07-0.12-0.19	0.08-0.13-0.21
		S75C Hardened	300	G ACP100	85-150-210	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.10-0.15	0.06-0.11-0.17
		Low-alloy Steel	180	L ACP300	100-140-180	0.05-0.08-0.14	0.05-0.08-0.14	0.05-0.08-0.16	0.06-0.09-0.17	0.07-0.10-0.19
		SCM, SNCM Hardened	275	G ACP100	100-170-240	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16	0.08-0.11-0.17
		SCM, SNCM Hardened	300	G ACP100	90-150-210	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16	0.08-0.11-0.17
		SCM, SNCM Hardened	350	G ACP100	75-120-165	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16	0.08-0.11-0.17
	High-alloy Steel	SKD, SKT, SKH	200	G ACP100	120-180-240	0.08-0.12-0.17	0.08-0.12-0.17	0.08-0.12-0.18	0.09-0.12-0.21	0.10-0.13-0.22
		SKD, SKT, SKH (Sintered)	325	G ACP100	100-140-180	0.06-0.10-0.15	0.06-0.10-0.15	0.06-0.11-0.15	0.07-0.11-0.16	0.08-0.11-0.17
	M Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M ACS3000/ACM300	120-150-180	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
		SUS403/Others (Martensitic (hardened))	240	M ACS3000/ACM300	90-120-150	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
		SUS304, SUS316 (Austenitic)	180	M ACS3000/ACM300	120-150-180	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
	K Cast Iron	Ductile Cast Iron		G ACK300	120-160-200	0.09-0.20-0.32	0.10-0.22-0.36	0.11-0.24-0.39	0.12-0.26-0.44	0.13-0.29-0.48
		Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G ACS3000/ACP300	25-50-70	0.06-0.11-0.18	0.06-0.11-0.18	0.06-0.12-0.19	0.07-0.13-0.22	0.08-0.14-0.24
	S Aluminum Alloy			G DL1500	200-260-320	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	0.08-0.14-0.22
	N Copper Alloy			G DL1500	180-230-280	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	0.08-0.14-0.22

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

Note: The values in red have been changed from the 2023-2024 General Catalogue.

● mark: Standard stocked item (new product/expanded item) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

WDX series for 3D (Internal Coolant Supply)



Drilling tolerance: 0 to +0.20mm

*For tolerances, refer to Chapter N - References.

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

Fig 1

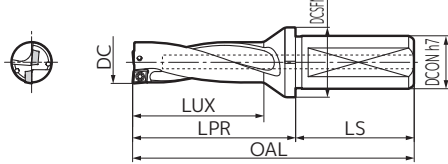


Fig 2

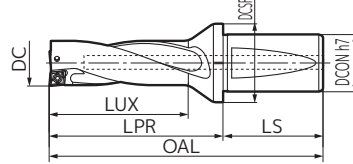
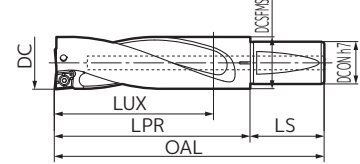


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Dia. LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D3S20	42.0	57.0	101.0	44	28.0	20	0.35	WDX 042004	1
13.5	●	135D3S20	43.5	58.5	102.5	44	28.0	20	0.30		1
14.0	●	140D3S20	45.0	60.0	104.0	44	28.0	20	0.25		1
14.5	●	145D3S20	46.5	61.5	105.5	44	28.0	20	0.20		1
15.0	●	150D3S20	48.0	63.0	107.0	44	28.0	20	0.15		1
15.5	●	WDX 155D3S20	49.5	64.5	108.5	44	30.0	20	0.40		1
16.0	●	160D3S20	51.0	66.0	110.0	44	30.0	20		WDX 052504	1
16.5	●	165D3S20	52.5	67.5	111.5	44	30.0	20	0.35		1
17.0	●	170D3S20	54.0	69.0	113.0	44	30.0	20	0.30		1
17.5	●	WDX 175D3S25	55.5	70.5	126.5	56	32.0	25	0.25		1
18.0	●	180D3S25	57.0	72.0	128.0	56	32.0	25	0.20		1
18.5	●	WDX 185D3S25	58.5	73.5	129.5	56	33.0	25	0.50		1
19.0	●	190D3S25	60.0	75.0	131.0	56	33.0	25	0.45		1
19.5	●	195D3S25	61.5	76.5	132.5	56	33.0	25	0.40		1
20.0	●	200D3S25	63.0	78.0	134.0	56	33.0	25		WDX 063006	1
20.5	●	205D3S25	64.5	79.5	135.5	56	33.0	25	0.30		1
21.0	●	210D3S25	66.0	81.0	137.0	56	33.0	25	0.20		1
21.5	●	215D3S25	67.5	82.5	138.5	56	33.0	25	0.15		1
22.0	●	220D3S25	69.0	84.0	140.0	56	33.0	25	0.10		1
22.5	●	225D3S25	70.5	85.5	141.5	56	33.0	25	0.05		1
23.0	●	WDX 230D3S25	72.0	90.0	146.0	56	37.0	25	0.70		1
23.5	●	235D3S25	73.5	91.5	147.5	56	37.0	25			1
24.0	●	240D3S25	75.0	93.0	149.0	56	37.0	25	0.60		1
24.5	●	245D3S25	76.5	94.5	150.5	56	37.0	25	0.50		1
25.0	●	250D3S25	78.0	96.0	152.0	56	37.0	25			1
25.5	●	WDX 255D3S32	79.5	99.5	159.5	60	41.0	32	0.45	WDX 073506	2
26.0	●	260D3S32	81.0	101.0	161.0	60	41.0	32	0.40		2
26.5	●	265D3S32	82.5	102.5	162.5	60	41.0	32	0.35		2
27.0	●	270D3S32	84.0	104.0	164.0	60	41.0	32	0.25		2
27.5	●	275D3S32	85.5	105.5	165.5	60	41.0	32	0.20		2
28.0	●	280D3S32	87.0	107.0	167.0	60	41.0	32	0.15		2
28.5	●	285D3S32	88.5	108.5	168.5	60	41.0	32	0.10		2
29.0	●	WDX 290D3S32	91.0	112.0	172.0	60	50.0	32	1.00		2
29.5	●	295D3S32	92.5	113.5	173.5	60	50.0	32	0.95		2
30.0*	●	300D3S32	94.0	118.0	178.0	60	54.0	32	0.90		2
31.0*	●	310D3S32	97.0	121.0	181.0	60	54.0	32	0.80		2
32.0*	●	320D3S32	100.0	124.0	184.0	60	54.0	32	0.70		2
30.0*	●	WDX 300D3S40	94.0	118.0	188.0	70	54.0	40	0.90	WDX 094008	2
31.0*	●	310D3S40	97.0	121.0	191.0	70	54.0	40	0.80		2
32.0*	●	320D3S40	100.0	124.0	194.0	70	54.0	40	0.70		2
33.0	●	330D3S40	103.0	127.0	197.0	70	54.0	40	0.55		2
34.0	●	340D3S40	106.0	130.0	200.0	70	54.0	40	0.45		2
35.0	●	350D3S40	109.0	133.0	203.0	70	54.0	40	0.35		2
36.0	●	360D3S40	112.0	136.0	206.0	70	54.0	40	0.20		2
37.0	●	WDX 370D3S40	116.0	146.0	216.0	70	49.5	40	1.00		2
38.0	●	380D3S40	119.0	149.0	219.0	70	49.5	40			2
39.0	●	390D3S40	122.0	152.0	222.0	70	49.5	40	0.90		2
40.0	●	400D3S40	125.0	155.0	225.0	70	49.5	40	0.80		2
41.0	●	410D3S40	128.0	158.0	228.0	70	49.5	40	0.70	WDX 125012	2
42.0	●	420D3S40	131.0	161.0	231.0	70	49.5	40	0.60		2
43.0	●	430D3S40	134.0	164.0	234.0	70	49.5	40			2
44.0	●	440D3S40	137.0	167.0	237.0	70	49.5	40	0.50		2
45.0	●	450D3S40	140.0	170.0	240.0	70	49.5	40	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J170

Diameter ø46.0 to 68.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Dia. LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D3S40	143.0	173.0	243.0	70	49.5	40	1.50		2
47.0	●	470D3S40	146.0	176.0	246.0	70	49.5	40	1.40		2
48.0	●	480D3S40	149.0	179.0	249.0	70	49.5	40	1.30		2
49.0	●	490D3S40	152.0	182.0	252.0	70	49.5	40	1.20		2
50.0	●	500D3S40	155.0	185.0	255.0	70	49.5	40	1.10	WDX 156012	2
51.0	●	510D3S40	158.0	188.0	258.0	70	49.5	40	1.00		3
52.0	●	520D3S40	161.0	191.0	261.0	70	50.5	40	0.90		3
53.0	●	530D3S40	164.0	194.0	264.0	70	51.5	40	0.80		3
54.0	●	540D3S40	167.0	197.0	267.0	70	52.5	40	0.60		3
55.0	●	550D3S40	170.0	200.0	270.0	70	53.5	40	0.50		3
56.0	●	WDX 560D3S40	176.0	208.0	278.0	70	54.0	40	2.00		3
57.0	●	570D3S40	179.0	211.0	281.0	70	55.0	40	1.80		3
58.0	●	580D3S40	182.0	214.0	284.0	70	56.0	40	1.70		3
59.0	●	590D3S40	185.0	217.0	287.0	70	57.0	40	1.60		3
60.0	●	600D3S40	188.0	220.0	290.0	70	58.0	40	1.50		3
61.0	●	610D3S40	191.0	223.0	293.0	70	59.0	40	1.40		3
62.0	●	620D3S40	194.0	226.0	296.0	70	60.0	40	1.30	WDX 186012	3
63.0	●	630D3S40	197.0	229.0	299.0	70	61.0	40	1.20		3
64.0	●	640D3S40	200.0	232.0	302.0	70	62.0	40	1.00		3
65.0	●	650D3S40	203.0	235.0	305.0	70	63.0	40	0.90		3
66.0	●	660D3S40	206.0	238.0	308.0	70	64.0	40	0.70		3
67.0	●	670D3S40	209.0	241.0	311.0	70	65.0	40	0.60		3
68.0	●	680D3S40	212.0	244.0	314.0	70	66.0	40	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
WDX130D3S20 to WDX150D3S20	BFTX01604N	0.3	TRX06	—
WDX155D3S20 to WDX180D3S25	BFTX0204N	0.5	TRX06	—
WDX185D3S25 to WDX225D3S25	BFTY02206	1.0	—	TRD07
WDX230D3S25 to WDX285D3S32	BFTX02506N	1.5	—	TRD08
WDX290D3S32 to WDX360D3S40	BFTX03584	3.5	—	TRD15
WDX370D3S40 to WDX450D3S40	BFTX0511N	5.0	—	TRD20
WDX460D3S40 to WDX680D3S40	BFTX0615N	5.0	—	TRD25

Identification Code

WDX 200 D3 S25

Dia. DC (ø20.0) Shank Dia. DCON (ø25.0)

Flute Length L/D (3D)

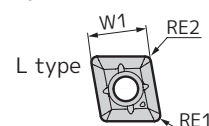
Expansion

Insert

Dimensions (mm)

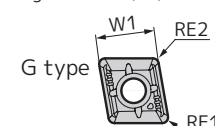
Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting												
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder
WDXT 042004-L		●	●			●		1	4.2	2.0	0.4	0.4	WDX130D3S20 to WDX150D3S20
042004-G		●	●			●	●	2	4.2	2.0	0.4	0.4	
042004-H		●	●			●		3	4.2	2.0	0.4	0.4	
042004-M				●	▲			4	4.2	2.0	0.4	0.8	
WDXT 052504-L		●	●			●		1	5.0	2.5	0.4	0.4	WDX155D3S20 to WDX180D3S25
052504-G		●	●			●	●	2	5.0	2.5	0.4	0.4	
052504-H		●	●			●		3	5.0	2.5	0.4	0.4	
052504-M				●	▲			4	5.0	2.5	0.4	1.0	
WDXT 063006-L		●	●			●		1	6.0	3.0	0.6	0.6	WDX185D3S25 to WDX225D3S25
063006-G		●	●			●	●	2	6.0	3.0	0.6	0.6	
063006-H		●	●			●		3	6.0	3.0	0.6	0.6	
063006-M				●	▲			4	6.0	3.0	0.6	1.4	
WDXT 073506-L		●	●			●		1	7.5	3.5	0.6	0.6	WDX230D3S25 to WDX285D3S32
073506-G		●	●			●	●	2	7.5	3.5	0.6	0.6	
073506-H		●	●			●		3	7.5	3.5	0.6	0.6	
073506-M				●	▲			4	7.5	3.5	0.6	1.6	
WDXT 094008-L		●	●			●		1	9.6	4.0	0.8	0.8	WDX290D3S32 to WDX360D3S40
094008-G		●	●			●	●	2	9.6	4.0	0.8	0.8	
094008-H		●	●			●		3	9.6	4.0	0.8	0.8	
094008-M				●	▲			4	9.6	4.0	0.8	2.4	
WDXT 125012-L		●	●			●		1	12.4	5.0	1.2	1.2	WDX370D3S40 to WDX450D3S40
125012-G		●	●			●	●	2	12.4	5.0	1.2	1.2	
125012-H		●	●			●		3	12.4	5.0	1.2	1.2	
125012-M				●	▲			4	12.4	5.0	1.2	3.2	
WDXT 156012-L		●	●			●		1	15.2	6.0	1.2	1.2	WDX460D3S40 to WDX550D3S40
156012-G		●	●			●	●	2	15.2	6.0	1.2	1.2	
156012-H		●	●			●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L		●	●			●		1	18.0	6.0	1.2	1.2	WDX560D3S40 to WDX680D3S40
186012-G		●	●			●		2	18.0	6.0	1.2	1.2	
186012-H		●	●			●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control



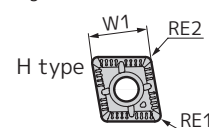
L type

Fig 2 General-purpose



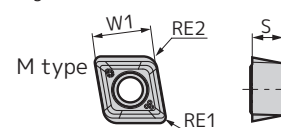
G type

Fig 3 Strong-edged type



H type

Fig 4 For stainless steel drilling



M type

Identification Code

WDXT 06 30 06 -G

Width across Flats (6.0) Thickness x 10 (3.0) Corner Radius x 10 (0.6) Chipbreaker type

Recommended Cutting Conditions (for 3D)

	Work Material	Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>					
						ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø68.0	
3D	P Steel, Carbon Steel	SS400	125	G	ACP300	120-180-240	0.05-0.06-0.10	0.05-0.06-0.10	0.05-0.06-0.11	0.05-0.07-0.12	0.06-0.08-0.13
		S15C	125	L	ACP300	130-170-220	0.04-0.06-0.10	0.04-0.06-0.10	0.04-0.06-0.11	0.05-0.07-0.12	0.06-0.08-0.13
		S45C	190	G	ACP300	100-150-200	0.08-0.12-0.20	0.08-0.12-0.20	0.08-0.13-0.22	0.09-0.14-0.24	0.10-0.16-0.27
		S45C Hardened	250	G	ACP100	100-170-240	0.05-0.08-0.11	0.05-0.08-0.11	0.05-0.08-0.12	0.05-0.09-0.14	0.06-0.10-0.15
		S75C	270	G	ACP100	120-180-240	0.06-0.09-0.14	0.06-0.09-0.14	0.06-0.10-0.14	0.07-0.11-0.17	0.08-0.12-0.18
		S75C Hardened	300	G	ACP100	85-150-210	0.05-0.08-0.11	0.05-0.08-0.11	0.05-0.08-0.11	0.05-0.09-0.14	0.06-0.10-0.14
		Low-alloy Steel	180	L	ACP300	100-140-180	0.05-0.07-0.12	0.05-0.07-0.12	0.05-0.08-0.13	0.06-0.08-0.15	0.07-0.09-0.16
		SCM, SNCM Hardened	275	G	ACP100	100-170-240	0.06-0.08-0.11	0.06-0.08-0.11	0.06-0.08-0.11	0.07-0.10-0.12	0.08-0.10-0.13
		SCM, SNCM Hardened	300	G	ACP100	90-150-210	0.06-0.08-0.11	0.06-0.08-0.11	0.06-0.08-0.11	0.07-0.10-0.12	0.08-0.10-0.13
		SCM, SNCM Hardened	350	G	ACP100	75-120-165	0.06-0.08-0.11	0.06-0.08-0.11	0.06-0.08-0.11	0.07-0.10-0.12	0.08-0.10-0.13
	High-alloy Steel	SKD, SKT, SKH	200	G	ACP100	120-180-240	0.08-0.11-0.14	0.08-0.12-0.15	0.08-0.12-0.16	0.09-0.14-0.18	0.10-0.14-0.19
		SKD, SKT, SKH (Sintered)	325	G	ACP100	100-140-180	0.06-0.09-0.11	0.06-0.09-0.11	0.06-0.09-0.11	0.07-0.10-0.12	0.08-0.10-0.13
	M Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	120-150-180	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120-150	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
		SUS304, SUS316 (Austenitic)	180	M	ACS3000/ACM300	120-150-180	0.06-0.08-0.15	0.06-0.08-0.15	0.06-0.08-0.15	0.07-0.10-0.16	0.08-0.12-0.16
	K Cast Iron	Cast Iron		G	ACK300	120-160-200	0.09-0.18-0.27	0.10-0.20-0.30	0.11-0.22-0.32	0.12-0.24-0.36	0.13-0.26-0.40
		Ductile Cast Iron		G	ACK300	90-120-150	0.09-0.18-0.27	0.10-0.20-0.30	0.11-0.22-0.32	0.12-0.24-0.36	0.13-0.26-0.40
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25-50-70	0.06-0.10-0.15	0.06-0.10-0.15	0.06-0.11-0.16	0.07-0.12-0.18	0.08-0.13-0.20
	N Aluminum Alloy			G	DL1500	200-260-320	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	0.08-0.14-0.22
		Copper Alloy		G	DL1500	180-230-280	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	0.08-0.14-0.22

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

Note: The values in red have been changed from the 2023-2024 General Catalogue.

● mark: Standard stocked item (new product/expanded item) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

WDX series for 4D (Internal Coolant Supply)



Drilling tolerance: 0 to +0.25mm

*For tolerances, refer to Chapter N - References.

Fig 1

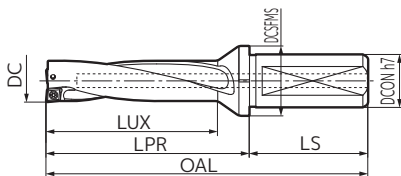


Fig 2

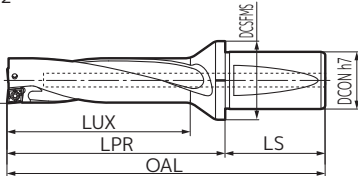
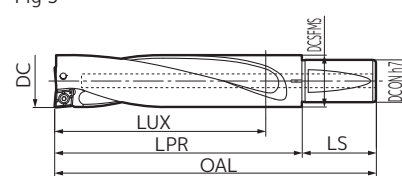


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Length LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D4S20	55	70	114	44	28.0	20	0.35		1
13.5	●	135D4S20	57	72	116	44	28.0	20	0.30	WDX 042004	1
14.0	●	140D4S20	59	74	118	44	28.0	20	0.25		1
14.5	●	145D4S20	61	76	120	44	28.0	20	0.20		1
15.0	●	150D4S20	63	78	122	44	28.0	20	0.15		1
15.5	●	WDX 155D4S20	65	80	124	44	30.0	20	0.40		1
16.0	●	160D4S20	67	82	126	44	30.0	20		WDX 052504	1
16.5	●	165D4S20	69	84	128	44	30.0	20	0.35		1
17.0	●	170D4S20	71	86	130	44	30.0	20	0.30		1
17.5	●	WDX 175D4S25	73	88	144	56	32.0	25	0.52		1
18.0	●	180D4S25	75	90	146	56	32.0	25	0.20		1
18.5	●	WDX 185D4S25	77	92	148	56	33.0	25	0.50		1
19.0	●	190D4S25	79	94	150	56	33.0	25	0.45		1
19.5	●	195D4S25	81	96	152	56	33.0	25	0.40		1
20.0	●	200D4S25	83	98	154	56	33.0	25		WDX 063006	1
20.5	●	205D4S25	85	100	156	56	33.0	25	0.30		1
21.0	●	210D4S25	87	102	158	56	33.0	25	0.20		1
21.5	●	215D4S25	89	104	160	56	33.0	25	0.15		1
22.0	●	220D4S25	91	106	162	56	33.0	25	0.10		1
22.5	●	225D4S25	93	108	164	56	33.0	25	0.05		1
23.0	●	WDX 230D4S25	95	113	169	56	37.0	25	0.70		1
23.5	●	235D4S25	97	115	171	56	37.0	25			1
24.0	●	240D4S25	99	117	173	56	37.0	25	0.60		1
24.5	●	245D4S25	101	119	175	56	37.0	25	0.50		1
25.0	●	250D4S25	103	121	177	56	37.0	25			1
25.5	●	WDX 255D4S32	105	125	185	60	41.0	32	0.45	WDX 073506	2
26.0	●	260D4S32	107	127	187	60	41.0	32	0.40		2
26.5	●	265D4S32	109	129	189	60	41.0	32	0.35		2
27.0	●	270D4S32	111	131	191	60	41.0	32	0.25		2
27.5	●	275D4S32	113	133	193	60	41.0	32	0.20		2
28.0	●	280D4S32	115	135	195	60	41.0	32	0.15		2
28.5	●	285D4S32	117	137	197	60	41.0	32	0.10		2
29.0	●	WDX 290D4S32	120	141	201	60	50.0	32	1.00		2
29.5	●	295D4S32	122	143	203	60	50.0	32	0.95		2
30.0	●	300D4S32	124	148	208	60	54.0	32	0.90		2
31.0	●	310D4S32	128	152	212	60	54.0	32	0.80		2
32.0	●	320D4S32	132	156	216	60	54.0	32	0.70		2
30.0	●	WDX 300D4S40	124	148	218	70	54.0	40	0.90	WDX 094008	2
31.0	●	310D4S40	128	152	222	70	54.0	40	0.80		2
32.0	●	320D4S40	132	156	226	70	54.0	40	0.70		2
33.0	●	330D4S40	136	160	230	70	54.0	40	0.55		2
34.0	●	340D4S40	140	164	234	70	54.0	40	0.45		2
35.0	●	350D4S40	144	168	238	70	54.0	40	0.35		2
36.0	●	360D4S40	148	172	242	70	54.0	40	0.20		2
37.0	●	WDX 370D4S40	153	183	253	70	49.5	40	1.00		2
38.0	●	380D4S40	157	187	257	70	49.5	40			2
39.0	●	390D4S40	161	191	261	70	49.5	40	0.90		2
40.0	●	400D4S40	165	195	265	70	49.5	40	0.80		2
41.0	●	410D4S40	169	199	269	70	49.5	40	0.70		2
42.0	●	420D4S40	173	203	273	70	49.5	40	0.60	WDX 125012	2
43.0	●	430D4S40	177	207	277	70	49.5	40			2
44.0	●	440D4S40	181	211	281	70	49.5	40	0.50		2
45.0	●	450D4S40	185	215	285	70	49.5	40	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J170

Diameter ø46.0 to 63.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Length LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D4S40	189	219	289	70	49.5	40	1.50		2
47.0	●	470D4S40	193	223	293	70	49.5	40	1.40		2
48.0	●	480D4S40	197	227	297	70	49.5	40	1.30		2
49.0	●	490D4S40	201	231	301	70	49.5	40	1.20		2
50.0	●	500D4S40	205	235	305	70	49.5	40	1.10	WDX 156012	2
51.0	●	510D4S40	209	239	309	70	49.5	40	1.00		3
52.0	●	520D4S40	213	243	313	70	50.5	40	0.90		3
53.0	●	530D4S40	217	247	317	70	51.5	40	0.80		3
54.0	●	540D4S40	221	251	321	70	52.5	40	0.60		3
55.0	●	550D4S40	225	255	325	70	53.5	40	0.50		3
56.0	●	WDX 560D4S40	232	264	334	70	54.0	40	2.00		3
57.0	●	570D4S40	236	268	338	70	55.0	40	1.80		3
58.0	●	580D4S40	240	272	342	70	56.0	40	1.70		3
59.0	●	590D4S40	244	276	346	70	57.0	40	1.60	WDX 186012	3
60.0	●	600D4S40	248	280	350	70	58.0	40	1.50		3
61.0	●	610D4S40	252	284	354	70	59.0	40	1.40		3
62.0	●	620D4S40	256	288	358	70	60.0	40	1.30		3
63.0	●	630D4S40	260	292	362	70	61.0	40	1.20		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
WDX130D4S20 to WDX150D4S20	BFTX01604N	0.3	TRX06	—
WDX155D4S20 to WDX180D4S25	BFTX0204N	0.5	TRX06	—
WDX185D4S25 to WDX225D4S25	BFTY02206	1.0	—	TRD07
WDX230D4S25 to WDX285D4S32	BFTX02506N	1.5	—	TRD08
WDX290D4S32 to WDX360D4S40	BFTX03584	3.5	—	TRD15
WDX370D4S40 to WDX450D4S40	BFTX0511N	5.0	—	TRD20
WDX460D4S40 to WDX630D4S40	BFTX0615N	5.0	—	TRD25

Identification Code

WDX 200 D4 S25

Dia. DC (ø20.0) | Shank Dia. DCON (ø25.0)

Flute Length L/D (4D)

WDX series for 4D (Internal Coolant Supply)

Expansion

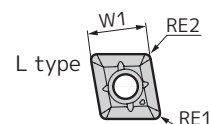
Insert

Dimensions (mm)

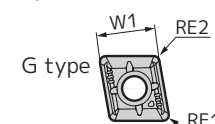
Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting												
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder
WDXT 042004-L		●	●			●		1	4.2	2.0	0.4	0.4	WDX130D4S20 to WDX150D4S20
042004-G		●	●			●	●	2	4.2	2.0	0.4	0.4	
042004-H		●	●			●		3	4.2	2.0	0.4	0.4	
042004-M				●	▲			4	4.2	2.0	0.4	0.8	
WDXT 052504-L		●	●			●		1	5.0	2.5	0.4	0.4	WDX155D4S20 to WDX180D4S25
052504-G		●	●			●	●	2	5.0	2.5	0.4	0.4	
052504-H		●	●			●		3	5.0	2.5	0.4	0.4	
052504-M				●	▲			4	5.0	2.5	0.4	1.0	
WDXT 063006-L		●	●			●		1	6.0	3.0	0.6	0.6	WDX185D4S25 to WDX225D4S25
063006-G		●	●			●	●	2	6.0	3.0	0.6	0.6	
063006-H		●	●			●		3	6.0	3.0	0.6	0.6	
063006-M				●	▲			4	6.0	3.0	0.6	1.4	
WDXT 073506-L		●	●			●		1	7.5	3.5	0.6	0.6	WDX230D4S25 to WDX285D4S32
073506-G		●	●			●	●	2	7.5	3.5	0.6	0.6	
073506-H		●	●			●		3	7.5	3.5	0.6	0.6	
073506-M				●	▲			4	7.5	3.5	0.6	1.6	
WDXT 094008-L		●	●			●		1	9.6	4.0	0.8	0.8	WDX290D4S32 to WDX360D4S40
094008-G		●	●			●	●	2	9.6	4.0	0.8	0.8	
094008-H		●	●			●		3	9.6	4.0	0.8	0.8	
094008-M				●	▲			4	9.6	4.0	0.8	2.4	
WDXT 125012-L		●	●			●		1	12.4	5.0	1.2	1.2	WDX370D4S40 to WDX450D4S40
125012-G		●	●			●	●	2	12.4	5.0	1.2	1.2	
125012-H		●	●			●		3	12.4	5.0	1.2	1.2	
125012-M				●	▲			4	12.4	5.0	1.2	3.2	
WDXT 156012-L		●	●			●		1	15.2	6.0	1.2	1.2	WDX460D4S40 to WDX550D4S40
156012-G		●	●			●	●	2	15.2	6.0	1.2	1.2	
156012-H		●	●			●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L		●	●			●		1	18.0	6.0	1.2	1.2	WDX560D4S40 to WDX630D4S40
186012-G		●	●			●		2	18.0	6.0	1.2	1.2	
186012-H		●	●			●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control

Fig 2 General-purpose

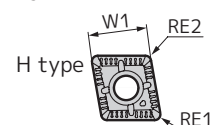


L type



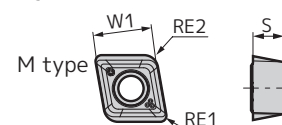
G type

Fig 3 Strong-edged type



H type

Fig 4 For stainless steel drilling



M type

Identification Code

WDXT 06 30 06 -G

Width across Flats (6.0) Thickness x 10 (3.0) Corner Radius x 10 (0.6) Chipbreaker type

Recommended Cutting Conditions (for 4D)

	Work Material	Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>					
						ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø63.0	
4D	P Steel, Carbon Steel	SS400	125	G	ACP300	120-180-240	0.05-0.06-0.10	0.05-0.06-0.10	0.05-0.06-0.10	0.05-0.07-0.10	0.06-0.08-0.11
		S15C	125	L	ACP300	130-170-220	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09	0.05-0.07-0.10	0.06-0.08-0.11
		S45C	190	G	ACP300	100-150-200	0.08-0.11-0.17	0.08-0.11-0.17	0.08-0.12-0.18	0.09-0.14-0.21	0.10-0.15-0.23
		S45C Hardened	250	G	ACP100	100-170-240	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.05-0.08-0.11	0.06-0.09-0.13
		S75C	270	G	ACP100	120-180-240	0.06-0.08-0.11	0.06-0.08-0.11	0.06-0.09-0.13	0.07-0.11-0.14	0.08-0.11-0.15
		S75C Hardened	300	G	ACP100	85-150-210	0.05-0.07-0.09	0.05-0.07-0.09	0.05-0.08-0.10	0.05-0.08-0.11	0.06-0.09-0.12
		Low-alloy Steel	180	L	ACP300	100-140-180	0.05-0.07-0.10	0.05-0.07-0.10	0.05-0.07-0.11	0.06-0.08-0.12	0.07-0.09-0.14
		SCM, SNCM Hardened	275	G	ACP100	100-170-240	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.06-0.08-0.11
		SCM, SNCM Hardened	300	G	ACP100	90-150-210	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.06-0.08-0.11
		SCM, SNCM Hardened	350	G	ACP100	75-120-165	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.06-0.08-0.11
	High-alloy Steel	SKD, SKT, SKH	200	G	ACP100	120-180-240	0.06-0.10-0.13	0.07-0.11-0.14	0.07-0.11-0.15	0.08-0.12-0.16	0.09-0.13-0.17
		SKD, SKT, SKH (Sintered)	325	G	ACP100	100-140-180	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.06-0.08-0.11
	M Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	120-150-180	0.06-0.08-0.13	0.06-0.08-0.13	0.06-0.08-0.14	0.07-0.09-0.14	0.08-0.11-0.14
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120-150	0.06-0.08-0.13	0.06-0.08-0.13	0.06-0.08-0.14	0.07-0.09-0.14	0.08-0.11-0.14
		SUS304, SUS316 (Austenitic)	180	M	ACS3000/ACM300	120-150-180	0.06-0.08-0.13	0.06-0.08-0.13	0.06-0.08-0.14	0.07-0.09-0.14	0.08-0.11-0.14
	K Cast Iron	Ductile Cast Iron		G	ACK300	120-160-200	0.09-0.17-0.23	0.10-0.19-0.26	0.11-0.21-0.28	0.12-0.23-0.31	0.13-0.25-0.34
		Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25-50-70	0.06-0.10-0.13	0.06-0.10-0.13	0.06-0.10-0.14	0.07-0.11-0.15	0.08-0.12-0.17
	S Aluminum Alloy			G	DL1500	200-260-320	0.05-0.10-0.15	0.05-0.10-0.15	0.06-0.11-0.16	0.06-0.12-0.18	0.07-0.13-0.20
	N Copper Alloy			G	DL1500	180-230-280	0.05-0.10-0.15	0.05-0.10-0.15	0.06-0.11-0.16	0.06-0.12-0.18	0.07-0.13-0.20

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

Note: The values in red have been changed from the 2023-2024 General Catalogue.

● mark: Standard stocked item (new product/expanded item) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

Drilling

Solid

Indexable Head type

Indexable Insert type

Reamers

WDX series for 5D (Internal Coolant Supply)



Drilling tolerance: 0 to +0.25mm

*For tolerances, refer to Chapter N - References.

Fig 1

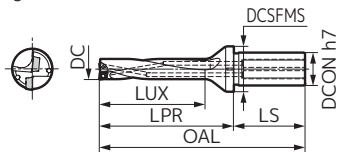


Fig 2

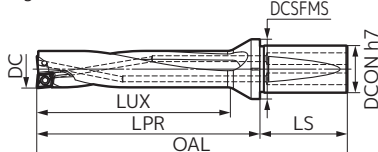
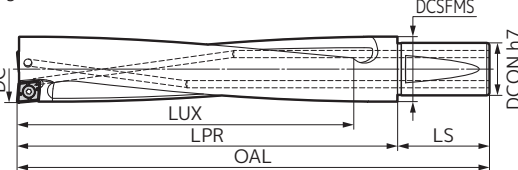


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Dia. LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D5S20	68.0	83.0	127.0	44	28.0	20.0	0.35	WDXT 042004	1
13.5	●	135D5S20	70.5	85.5	129.5	44	28.0	20.0	0.30		1
14.0	●	140D5S20	73.0	88.0	132.0	44	28.0	20.0	0.25		1
14.5	●	145D5S20	75.5	90.5	134.5	44	28.0	20.0	0.20		1
15.0	●	150D5S20	78.0	93.0	137.0	44	28.0	20.0	0.15		1
15.5	●	WDX 155D5S20	80.5	95.5	139.5	44	30.0	20.0	0.40	WDXT 052504	1
16.0	●	160D5S20	83.0	98.0	142.0	44	30.0	20.0			1
16.5	●	165D5S20	85.5	100.5	144.5	44	30.0	20.0	0.35		1
17.0	●	170D5S20	88.0	103.0	147.0	44	30.0	20.0	0.30		1
17.5	●	WDX 175D5S25	90.5	105.5	161.5	56	32.0	25.0	0.25		1
18.0	●	180D5S25	93.0	108.0	164.0	56	32.0	25.0	0.20		1
18.5	●	WDX 185D5S25	95.5	110.5	166.5	56	33.0	25.0	0.50		1
19.0	●	190D5S25	98.0	113.0	169.0	56	33.0	25.0	0.45		1
19.5	●	195D5S25	100.5	115.5	171.5	56	33.0	25.0	0.40		1
20.0	●	200D5S25	103.0	118.0	174.0	56	33.0	25.0	0.30	WDXT 063006	1
20.5	●	205D5S25	105.5	120.5	176.5	56	33.0	25.0			1
21.0	●	210D5S25	108.0	123.0	179.0	56	33.0	25.0	0.20		1
21.5	●	215D5S25	110.5	125.5	181.5	56	33.0	25.0	0.15		1
22.0	●	220D5S25	113.0	128.0	184.0	56	33.0	25.0	0.10		1
22.5	●	225D5S25	115.5	130.5	186.5	56	33.0	25.0	0.05		1
23.0	●	WDX 230D5S25	118.0	136.0	192.0	56	37.0	25.0	0.70	WDXT 073506	1
23.5	●	235D5S25	120.5	138.5	194.5	56	37.0	25.0			1
24.0	●	240D5S25	123.0	141.0	197.0	56	37.0	25.0	0.60		1
24.5	●	245D5S25	125.5	143.5	199.5	56	37.0	25.0	0.50		1
25.0	●	250D5S25	128.0	146.0	202.0	56	37.0	25.0			1
26.0	●	WDX 260D5S32	133.0	153.0	213.0	60	41.0	32.0	0.40		2
27.0	●	270D5S32	138.0	158.0	218.0	60	41.0	32.0	0.25		2
28.0	●	280D5S32	143.0	163.0	223.0	60	41.0	32.0	0.15		2
29.0	●	WDX 290D5S32	149.0	170.0	230.0	60	50.0	32.0	1.00		2
30.0'	●	300D5S32	154.0	178.0	238.0	60	54.0	32.0	0.90		2
31.0'	●	310D5S32	159.0	183.0	243.0	60	54.0	32.0	0.80		2
32.0'	●	320D5S32	164.0	188.0	248.0	60	54.0	32.0	0.70		2
30.0'	●	WDX 300D5S40	154.0	178.0	248.0	70	54.0	40.0	0.90	WDXT 094008	2
31.0'	●	310D5S40	159.0	183.0	253.0	70	54.0	40.0	0.80		2
32.0'	●	320D5S40	164.0	188.0	258.0	70	54.0	40.0	0.70		2
33.0	●	330D5S40	169.0	193.0	263.0	70	54.0	40.0	0.55		2
34.0	●	340D5S40	174.0	198.0	268.0	70	54.0	40.0	0.45		2
35.0	●	350D5S40	179.0	203.0	273.0	70	54.0	40.0	0.35		2
36.0	●	360D5S40	184.0	208.0	278.0	70	54.0	40.0	0.20		2
37.0	●	WDX 370D5S40	190.0	220.0	290.0	70	49.5	40.0	1.00	WDXT 125012	2
38.0	●	380D5S40	195.0	225.0	295.0	70	49.5	40.0			2
39.0	●	390D5S40	200.0	230.0	300.0	70	49.5	40.0	0.90		2
40.0	●	400D5S40	205.0	235.0	305.0	70	49.5	40.0	0.80		2
41.0	●	410D5S40	210.0	240.0	310.0	70	49.5	40.0	0.70		2
42.0	●	420D5S40	215.0	245.0	315.0	70	49.5	40.0	0.60		2
43.0	●	430D5S40	220.0	250.0	320.0	70	49.5	40.0			2
44.0	●	440D5S40	225.0	255.0	325.0	70	49.5	40.0	0.50		2
45.0	●	450D5S40	230.0	260.0	330.0	70	49.5	40.0	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J170

Diameter ø46.0 to 55.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank Dia. LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D5S40	235.0	265.0	335.0	70	49.5	40.0	1.50		2
47.0	●	470D5S40	240.0	270.0	340.0	70	49.5	40.0	1.40		2
48.0	●	480D5S40	245.0	275.0	345.0	70	49.5	40.0	1.30		2
49.0	●	490D5S40	250.0	280.0	350.0	70	49.5	40.0	1.20		2
50.0	●	500D5S40	255.0	285.0	355.0	70	49.5	40.0	1.10	WDXT 156012	2
51.0	●	510D5S40	260.0	290.0	360.0	70	49.5	40.0	1.00		3
52.0	●	520D5S40	265.0	295.0	365.0	70	50.5	40.0	0.90		3
53.0	●	530D5S40	270.0	300.0	370.0	70	51.5	40.0	0.80		3
54.0	●	540D5S40	275.0	305.0	375.0	70	52.5	40.0	0.60		3
55.0	●	550D5S40	280.0	310.0	380.0	70	53.5	40.0	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holder	Flat Insert Screw	Wrench	Wrench	Anti-seizure Cream
WDX130D5S20 to WDX150D5S20	BFTX01604N	0.3	TRX06	—
WDX155D5S20 to WDX180D5S25	BFTX0204N	0.5	TRX06	—
WDX185D5S25 to WDX225D5S25	BFTY02206	1.0	—	TRD07
WDX230D5S25 to WDX280D5S32	BFTX02506N	1.5	—	TRD08
WDX290D5S32 to WDX360D5S40	BFTX03584	3.5	—	TRD15
WDX370D5S40 to WDX450D5S40	BFTX0511N	5.0	—	TRD20
WDX460D5S40 to WDX550D5S40	BFTX0615N	5.0	—	TRD25

Identification Code

WDX 200 D5 S25

Dia. DC (ø20.0) Shank Dia. DCON (ø25.0)

Flute Length L/D (5D)

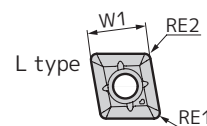
Expansion

Insert

Dimensions (mm)

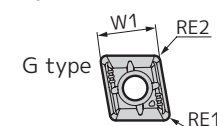
Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting												
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder
WDXT 042004-L		●	●			●		1	4.2	2.0	0.4	0.4	WDX130D5S20 to WDX150D5S20
042004-G		●	●			●		2	4.2	2.0	0.4	0.4	
042004-H		●	●			●		3	4.2	2.0	0.4	0.4	
042004-M				●	▲			4	4.2	2.0	0.4	0.8	
WDXT 052504-L		●	●			●		1	5.0	2.5	0.4	0.4	WDX155D5S20 to WDX180D5S25
052504-G		●	●			●		2	5.0	2.5	0.4	0.4	
052504-H		●	●			●		3	5.0	2.5	0.4	0.4	
052504-M				●	▲			4	5.0	2.5	0.4	1.0	
WDXT 063006-L		●	●			●		1	6.0	3.0	0.6	0.6	WDX185D5S25 to WDX225D5S25
063006-G		●	●			●		2	6.0	3.0	0.6	0.6	
063006-H		●	●			●		3	6.0	3.0	0.6	0.6	
063006-M				●	▲			4	6.0	3.0	0.6	1.4	
WDXT 073506-L		●	●			●		1	7.5	3.5	0.6	0.6	WDX230D5S25 to WDX280D5S32
073506-G		●	●			●		2	7.5	3.5	0.6	0.6	
073506-H		●	●			●		3	7.5	3.5	0.6	0.6	
073506-M				●	▲			4	7.5	3.5	0.6	1.6	
WDXT 094008-L		●	●			●		1	9.6	4.0	0.8	0.8	WDX290D5S32 to WDX360D5S40
094008-G		●	●			●		2	9.6	4.0	0.8	0.8	
094008-H		●	●			●		3	9.6	4.0	0.8	0.8	
094008-M				●	▲			4	9.6	4.0	0.8	2.4	
WDXT 125012-L		●	●			●		1	12.4	5.0	1.2	1.2	WDX370D5S40 to WDX450D5S40
125012-G		●	●			●		2	12.4	5.0	1.2	1.2	
125012-H		●	●			●		3	12.4	5.0	1.2	1.2	
125012-M				●	▲			4	12.4	5.0	1.2	3.2	
WDXT 156012-L		●	●			●		1	15.2	6.0	1.2	1.2	WDX460D5S40 to WDX550D5S40
156012-G		●	●			●		2	15.2	6.0	1.2	1.2	
156012-H		●	●			●		3	15.2	6.0	1.2	1.2	

Fig 1 For low feed with chip control



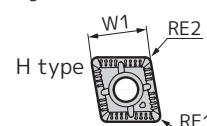
L type

Fig 2 General-purpose



G type

Fig 3 Strong-edged type



H type

Fig 4 For stainless steel drilling



M type

Identification Code

WDXT 06 30 06 -G

Width across Flats (6.0) Thickness x 10 (3.0) Corner Radius x 10 (0.6) Chipbreaker type

Recommended Cutting Conditions (for 5D)

		Work Material	Workpiece Hardness	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>				
			HB				ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	
5D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-180-240	0.05-0.06-0.09	0.05-0.06-0.09	0.05-0.06-0.09	0.05-0.07-0.09
		S15C	125	L	ACP300	130-170-220	0.04-0.06-0.08	0.04-0.06-0.08	0.04-0.06-0.08	0.05-0.07-0.09	
		S45C	190	G	ACP300	100-150-200	0.07-0.10-0.15	0.07-0.10-0.15	0.08-0.11-0.17	0.09-0.12-0.19	
		S45C Hardened	250	G	ACP100	100-170-240	0.04-0.07-0.08	0.04-0.07-0.08	0.05-0.07-0.09	0.05-0.08-0.11	
		S75C	270	G	ACP100	120-180-240	0.05-0.08-0.11	0.05-0.08-0.11	0.06-0.08-0.11	0.07-0.09-0.13	
		S75C Hardened	300	G	ACP100	85-150-210	0.04-0.07-0.08	0.04-0.07-0.08	0.05-0.07-0.09	0.05-0.08-0.10	
		Low-alloy Steel	SCM, SNCM	180	L	ACP300	100-140-180	0.05-0.06-0.09	0.05-0.06-0.09	0.05-0.06-0.10	0.05-0.07-0.11
		SCM, SNCM Hardened	275	G	ACP100	100-170-240	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09	0.05-0.07-0.10	
		SCM, SNCM Hardened	300	G	ACP100	90-150-210	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09	0.05-0.07-0.10	
		SCM, SNCM Hardened	350	G	ACP100	75-120-165	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09	0.05-0.07-0.10	
	High-alloy Steel	SKD, SKT, SKH	200	G	ACP100	120-180-240	0.05-0.08-0.12	0.06-0.09-0.12	0.06-0.09-0.13	0.07-0.10-0.14	
	SKD, SKT, SKH (Sintered)	325	G	ACP100	100-140-180	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09	0.04-0.06-0.09		
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	120-150-180	0.05-0.08-0.11	0.05-0.08-0.12	0.05-0.08-0.12	0.06-0.09-0.12
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120-150	0.05-0.08-0.11	0.05-0.08-0.12	0.05-0.08-0.12	0.06-0.09-0.12	
		SUS304, SUS316 (Austenitic)	180	M	ACS3000/ACM300	120-150-180	0.05-0.08-0.11	0.05-0.08-0.12	0.05-0.08-0.12	0.06-0.09-0.12	
	K	Cast Iron			G	ACK300	120-160-200	0.08-0.15-0.21	0.09-0.17-0.23	0.09-0.18-0.25	0.11-0.20-0.28
		Ductile Cast Iron			G	ACK300	90-120-150	0.08-0.15-0.21	0.09-0.17-0.23	0.09-0.18-0.25	0.11-0.20-0.28
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25-50-70	0.05-0.09-0.11	0.05-0.09-0.11	0.06-0.09-0.12	0.06-0.10-0.14	
	N	Aluminum Alloy			G	DL1500	200-260-320	0.05-0.10-0.15	0.05-0.10-0.15	0.06-0.11-0.16	0.06-0.12-0.18
		Copper Alloy			G	DL1500	180-230-280	0.05-0.10-0.15	0.05-0.10-0.15	0.06-0.11-0.16	0.06-0.12-0.18

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

● mark: Standard stocked item (new product/expanded item) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

Drilling

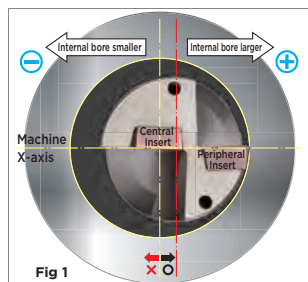
Solid

Indexable Head type

Indexable Insert type

Reamers

Lathe Drilling Guidelines



Drill Mounting

- Set the drill so that the peripheral insert is parallel to the X-axis of the machine. (Fig 1)
- Press the end of the flange of the drill tightly against the face of the holder before tightening the bolt.

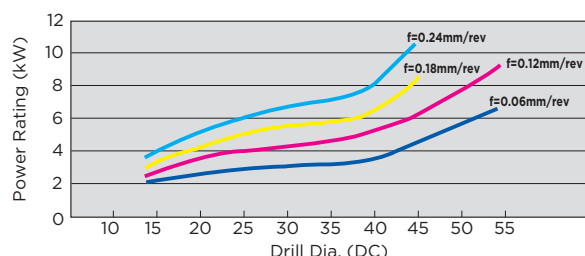
Adjusting Work Diameter (offset)

- The work diameter is adjustable by moving the machine X-axis.
- Make the adjustment by moving in the positive direction of the X-axis (enlarging the bore diameter). Moving the X-axis in the negative direction (to reduce the bore diameter) is not recommended as the holder may interfere with the hole. (Fig 1)
- The maximum allowable adjustment (offset) differs depending on the diameter. Refer to **Radial Offset (Max)** in the body dimension tables on pages J162 to J168.

Other Notes

- When the drill is mounted on a lathe, the centre of the central insert is designed to be 0.15 to 0.2mm below the centre of the spindle.
- If the spindle deviates so far off centre that the centre of the central insert lies above the spindle centre, the central insert will break.
- Set the depth of cut for external turning or internal boring work to 1/5 or less of the drill diameter (max. 5mm or less). (Example: Set depth of cut to 4mm or less for diameter of $\phi 20\text{mm}$)
- Install a cover to prevent injury from possible chip fly-out (see disc-shaped chip in Fig 2) when through boring on a lathe.
- If your machine has no cover, attach a cover or similar part for your safety.
- Cannot drill stacked plates because the disc-shaped chips will not be evacuated and will damage the drill.
- Milling chucks are not recommended due to the risk of shank slipping.

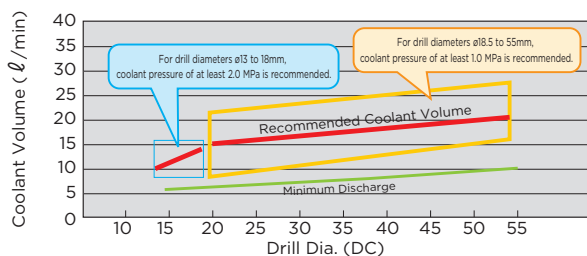
Typical Power Ratings



<CAUTIONS>

- Power ratings are subject to change based on conditions such as work material and cutting speed, and should only be used for reference.
- Cutting Conditions (Reference)
Work Material: S50C (230HB)
Cutting Speed: $v_c = 150\text{m/min}$

Typical Coolant Volume



<CAUTIONS>

- Coolant volume is a factor that affects drilling performance, particularly with respect to chip evacuation and lubricity.
- Coolant pressure should be set higher for small drills. ($\phi 18.0\text{mm}$ or below)
- Coolant volume is usually adjusted by changing the coolant pressure provided on most CNC machine tools.
- This table provides guideline values only. More coolant may be required depending on the machine, coolant and work material.

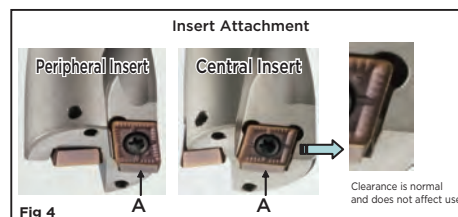
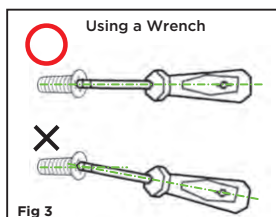


Precautions for Attaching and Removing Inserts

- Before mounting the insert, remove all traces of foreign matter on the insert seat surface using air blow or other means.
- When using the wrench, align it to the axis of the screw and press while turning. (Fig 3) If the wrench is not aligned with the screw, the insert will be insufficiently clamped and the tip of the wrench and/or the Torx hole of the screw may become deformed.
- Do not allow clearance between the insert seat and drill when mounting the insert. (Fig 4, Part A)

Figure 4 shows a properly mounted insert.

* It is normal for the outer sides of the central insert to have clearance because it is clamped at its centre and pushed to the rear.



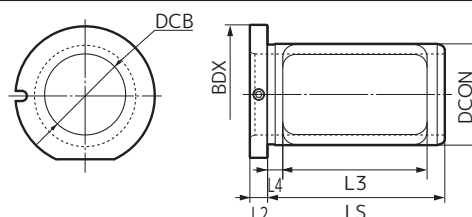
Troubleshooting

Problem	Symptom	Cause	Countermeasures
Too much variation in hole diameter	Drilled hole diameter is larger than desired	Deflection of the holder due to high thrust force	Decrease the feed rate to decrease the thrust force. Make an adjustment on the X-axis.
	Drilled hole diameter is smaller than desired	The cutting edge backs off and does not enter the workpiece	Increase the feed rate. Make an adjustment on the X-axis.
	Significant difference in hole diameter at entrance and bottom	Packing of chips	Increase the feed rate to improve chip evacuation. Use an L type chipbreaker for chip control.
Poor quality machined hole surface	Poor machined surface from entrance to bottom of hole	High cutting force Low rigidity of workpiece	Decrease the feed rate. Review tooling to improve rigidity.
	Poor machined surface at bottom of hole	Machined surfaces damaged by chips	Increase the feed rate to improve chip evacuation. Use an L type chipbreaker for chip control.
Insert is broken	Fracture on central insert (centre)	Improper adjustment of centre height Insert is not strong enough	Check the centre height again. If the drill is being used on a lathe, try rotating the drill 180°. Use a strong edged chipbreaker (H type).
	Fracture on peripheral insert	High cutting load on cutting edge	Decrease the feed rate to decrease cutting load. Use a strong edged chipbreaker (H type).

Eccentric Sleeve for WDX series



Fig 1



Body (WAS type)

Parts

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Shank Dia. DCON	Diameter BDX	Shank LS	Length L2	Length L3	Length L4	Diameter Adjustable Range	Fig	Dimensions (mm)	
											Screw	Wrench
WAS 2025-48	●	20	25	33	43	5	32	5	+0.3 to -0.2	1	BT0306	LH015
2532-60	●	25	32	42	60	7	46	6	+0.3 to -0.3	1	BT0406	LH020
3240-70	●	32	40	55	70	7	57	6	+0.3 to -0.3	1	BT0408	LH020
4050-85	●	40	50	60	70	7	54	6	+0.5 to -0.5	1	BT0408	LH020

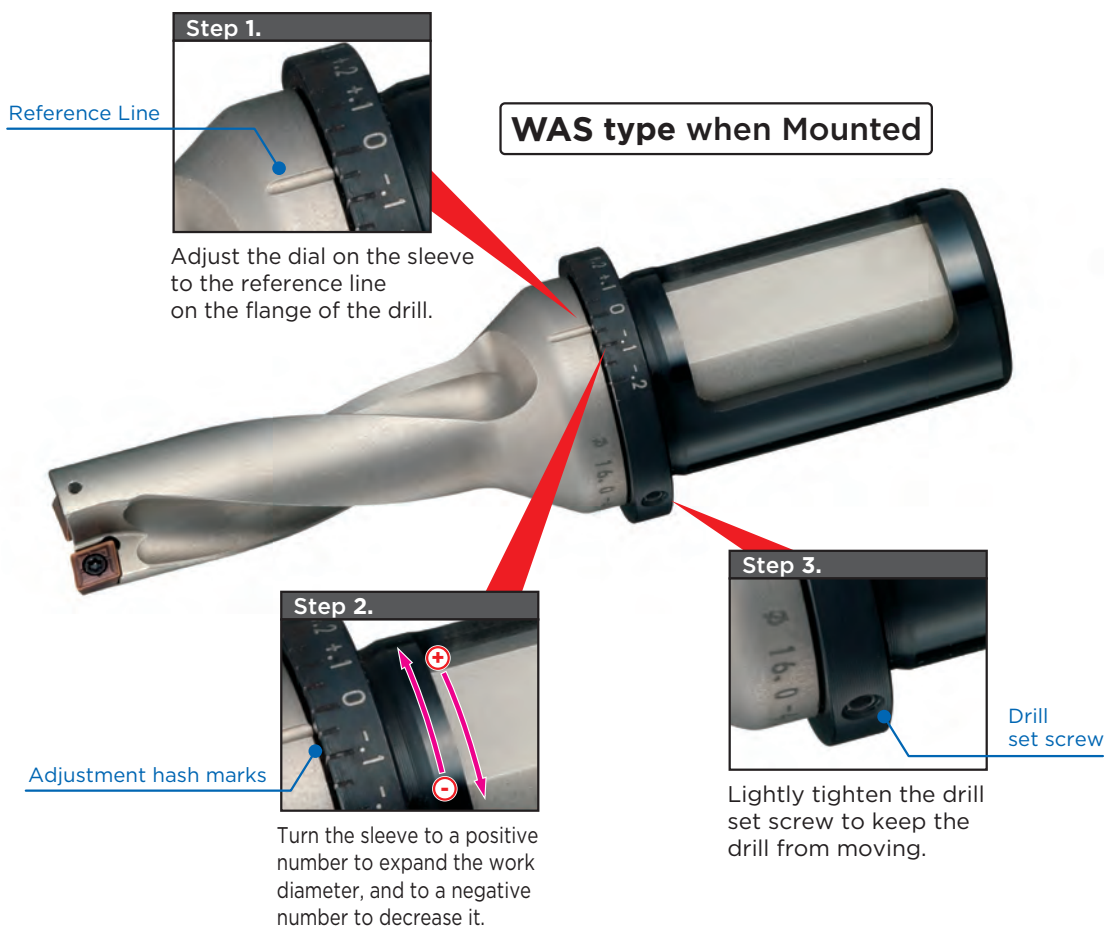
Diameter Adjustment Range indicates the range in which the diameter can be adjusted.

The dedicated Eccentric Sleeve WAS type for the SumiDrill WDX series provides $\pm 0.3\text{mm}$ of adjustment when drilling holes.

Cautions for Use

1. The dial is for reference purposes. Always measure the actual work diameter and adjust accordingly.
2. Not usable with collet chuck type holders. Use a side-locking type holder.
3. Use this product under high-rigidity conditions. This product is not recommended for deep hole drilling such as 5D and low-rigidity conditions.

Directions (Adjusting the Work Diameter)



PDL series/PCT series

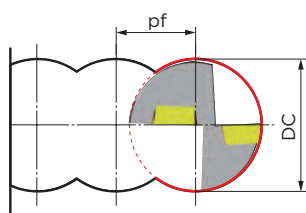


General Features

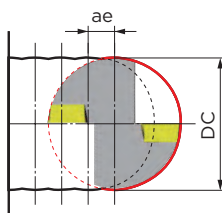
High efficiency and stable roughing can be achieved through Z-axis cutting feed, where tool rigidity is high, for machining deep profiles and pockets in applications where efficiency cannot be increased due to long tool overhang, such as in aerospace and die mold components.

Features

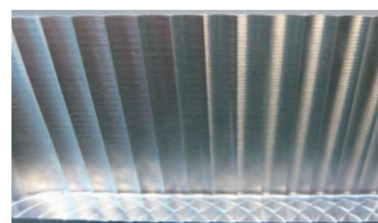
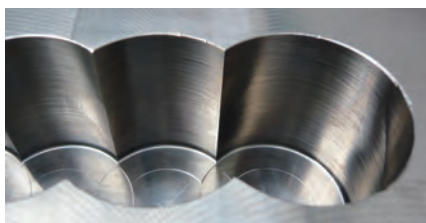
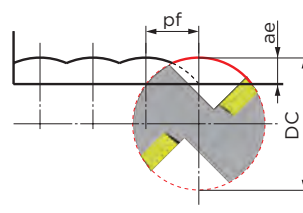
- The flat cutting edge design produces near-flat bottom profiles to reduce depth of cut variation for subsequent process.
- All sizes come with oil holes for internal coolant supply to improve chip evacuation performance.
- Durable body with special surface treatment offers improved tool life and reliability.
- Utilising SumiDrill WDX series inserts for handling a wide range of work materials, from steel to non-ferrous metals and exotic alloys.
- The PDL series has a central insert, enabling radial depth of cut beyond the tool's radius, such as pick feed machining and drilling. (pocketing etc.) (Pocketing, etc.)
- Although the PCT series has limited radial depth of cut, the tool has a high effective number of teeth enabling it to perform high feed cutting. (Medium finishing of corners, hole expansion, deep groove milling, etc.)



Keep the value of pf for PDL series tools to less than 70% of the tool diameter (DC).



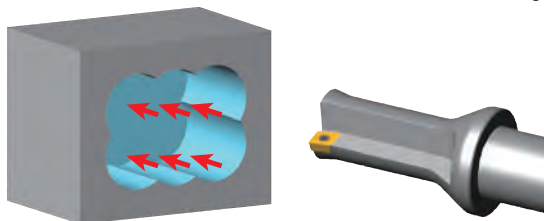
Keep the value of pf for PCT series tools to less than 50% of the tool diameter (DC).
For ae , refer to the dimension under "ae max" in the stock/dimensions tables titled "Holders Max. Depth of Cut: 3D/5D".



PDL series/PCT series

Application Examples

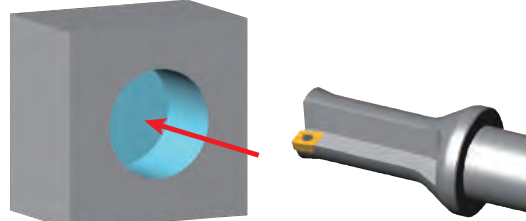
Pocketing **PDL series** Work Material: Titanium alloy



Tool : PDL 400D2S40 (ø40)
 Insert: WDX T125012-G
 Grade: ACK300

Cutting Speed: $vc = 40\text{m/min}$
 Feed Rate : $f = 0.07\text{mm/rev}$
 ($vf = 22.3\text{mm/min}$)
 Depth of Cut : $ae (pf) = 25\text{mm}$

Drilling **PDL series** Work Material: SUS316



Tool : PDL 200D3S25 (ø20)
 Insert: WDX T063006-G
 Grade: ACP300

Cutting Speed: $vc = 180\text{m/min}$
 Feed Rate : $f = 0.10\text{mm/rev}$
 ($vf = 286\text{mm/min}$)
 Depth of Cut : $ae(pf) = 20\text{mm}$

Drilling

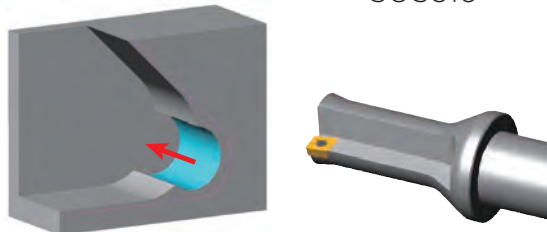


Solid

Indexable
Head typeIndexable
Insert type

Reamers

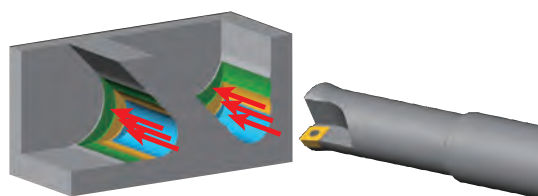
Corner Fillet Removal **PDL series** Work Material: SUS316



Tool : PDL 250D2S25 (ø25)
 Insert: WDX T073506-G
 Grade: ACP300

Cutting Speed: $vc = 140\text{m/min}$
 Feed Rate : $f = 0.10\text{mm/rev}$
 ($vf = 178\text{mm/min}$)
 Depth of Cut : $ae (pf) = 15\text{mm}$

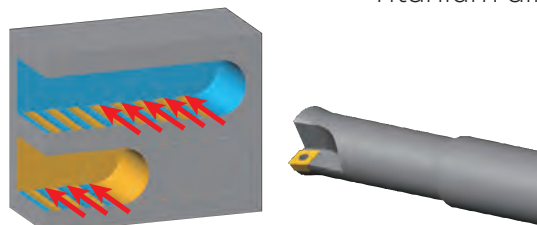
Corner Machining **PCT series** Work Material: Titanium alloy



Tool: PCT 320D3S32 (ø32)
 Insert: WDX T094008-G
 Grade: ACK300

Cutting Speed: $vc = 50\text{m/min}$
 Feed Rate : $fz = 0.04\text{mm/t}$
 ($vf = 80 \text{ to } 127\text{mm/min}$)
 Depth of Cut : $ae (pf) = 3.2 \text{ to } 6.5\text{mm}$

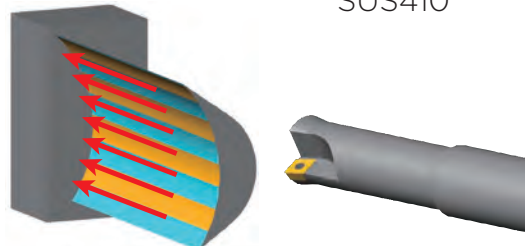
Groove Milling **PCT series** Work Material: Titanium alloy



Tool : PCT 320D5S32 (ø32)
 Insert: WDX T094008-G
 Grade: ACK300

Cutting Speed: $vc = 40\text{m/min}$
 Feed Rate : $fz = 0.035\text{mm/t}$
 ($vf = 56\text{mm/min}$)
 Depth of Cut : $ae (pf) = 5.0\text{mm}$

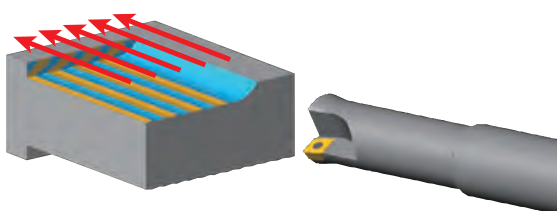
Contouring **PCT series** Work Material: SUS410



Tool : PCT 250D5S25 (ø25)
 Insert: WDX T073506-G
 Grade: ACP300

Cutting Speed: $vc = 150\text{m/min}$
 Feed Rate : $fz = 0.05\text{mm/t}$
 ($vf = 382\text{mm/min}$)
 Depth of Cut : $ae (pf) = 3.0\text{mm}$

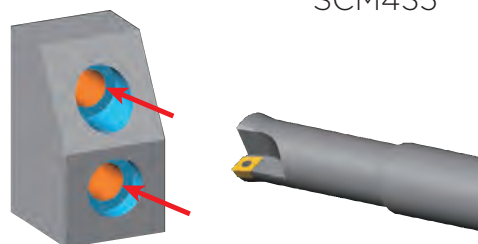
Shoulder Plunging **PCT series** Work Material: SUS304



Tool : PCT 320D3S32 (ø32)
 Insert: WDX T094008-G
 Grade: ACP300

Cutting Speed: $vc = 180\text{m/min}$
 Feed Rate : $fz = 0.075\text{mm/t}$
 ($vf = 537\text{mm/min}$)
 Depth of Cut : $ae = 7.0\text{mm}$
 $pf = 5.0\text{mm}$

Counterboring **PCT series** Work Material: SCM435



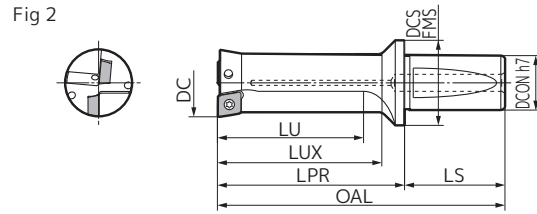
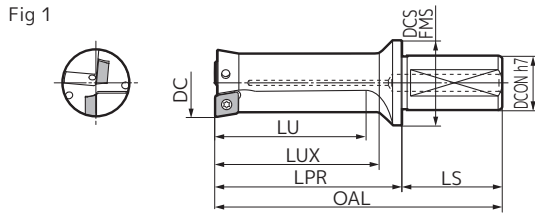
Tool : PCT 200D5S20 (ø20)
 Insert: WDX T063006-G
 Grade: ACP300

Cutting Speed: $vc = 150\text{m/min}$
 Feed Rate : $fz = 0.075\text{mm/t}$
 ($vf = 716\text{mm/min}$)
 Depth of Cut : $ae = 3.5\text{mm}$

PDL series for 2D/3D (Internal Coolant Supply)



*For tolerances, refer to Chapter N - References.



Holder 2D Length Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Applicable Insert	Fig
16.0	●	PDL 160D2S20	32	35	50	94	44	28	20	WDXT052504	1
20.0	●	200D2S25	40	43	58	114	56	33	25	WDXT063006	1
25.0	●	250D2S25	50	53	71	127	56	37	25	WDXT073506	1
32.0	●	320D2S40	64	68	92	162	70	54	40	WDXT094008	2
40.0	●	400D2S40	80	85	115	185	70	54	40	WDXT125012	2

Holder 3D Length Diameter ø16.0 to 40.0mm

Dimensions (mm)

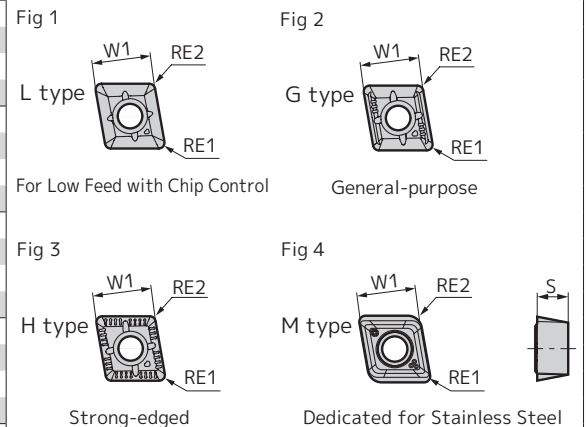
Dia. DC	Stock	Cat. No.	Effective Length LU	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Applicable Insert	Fig
16.0	●	PDL 160D3S20	48	51	66	110	44	28	20	WDXT052504	1
20.0	●	200D3S25	60	63	78	134	56	33	25	WDXT063006	1
25.0	●	250D3S25	75	78	96	152	56	37	25	WDXT073506	1
32.0	●	320D3S40	96	100	124	194	70	54	40	WDXT094008	2
40.0	●	400D3S40	120	125	155	225	70	54	40	WDXT125012	2

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting						Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder	Fig.	
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500						
WDXT	052504-L	●	●			●		5.0	2.5	0.4	0.4	PDL160D2S20 / PDL160D3S20	1
	052504-G	●	●			●	●	5.0	2.5	0.4			2
	052504-H	●	●			●		5.0	2.5	0.4			3
	052504-M			●	▲			5.0	2.5	0.4			4
WDXT	063006-L	●	●			●		6.0	3.0	0.6	0.6	PDL200D2S25 / PDL200D3S25	1
	063006-G	●	●			●	●	6.0	3.0	0.6			2
	063006-H	●	●			●		6.0	3.0	0.6			3
	063006-M			●	▲			6.0	3.0	0.6			4
WDXT	073506-L	●	●			●		7.5	3.5	0.6	0.6	PDL250D2S25 / PDL250D3S25	1
	073506-G	●	●			●	●	7.5	3.5	0.6			2
	073506-H	●	●			●		7.5	3.5	0.6			3
	073506-M			●	▲			7.5	3.5	0.6			4
WDXT	094008-L	●	●			●		9.6	4.0	0.8	0.8	PDL320D2S40 / PDL320D3S40	1
	094008-G	●	●			●	●	9.6	4.0	0.8			2
	094008-H	●	●			●		9.6	4.0	0.8			3
	094008-M			●	▲			9.6	4.0	0.8			4
WDXT	125012-L	●	●			●		12.4	5.0	1.2	1.2	PDL400D2S40 / PDL400D3S40	1
	125012-G	●	●			●	●	12.4	5.0	1.2			2
	125012-H	●	●			●		12.4	5.0	1.2			3
	125012-M			●	▲			12.4	5.0	1.2			4

(Insert is the same as the WDX series)



Identification Code

PDL 250 D2 S25

Dia. DC (ø25.0) Shank Dia. DCON (ø25.0)
Flute Length (L/D) (2D)

WDXT 07 35 06 -G

Width across Flats (7.5) Thickness x 10 (3.5) Chipbreaker type

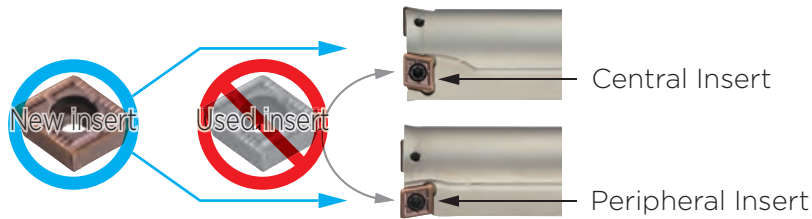
Corner Radius x 10 (0.6)

Parts

Applicable Holder	Flat Insert Screw		Wrench	Wrench	Anti-seizure Cream
					
PDL160D2S20 / PDL160D3S20	BFTX0204N	0.5	TRX06	—	SUMI-P
PDL200D2S25 / PDL200D3S25	BFTY02206	1.0	—	TRD07	
PDL250D2S25 / PDL250D3S25	BFTX02506N	1.5	—	TRD08	
PDL320D2S40 / PDL320D3S40	BFTX03584	3.5	—	TRD15	
PDL400D2S40 / PDL400D3S40	BFTX0511N	5.0	—	TRD20	

PDL series for 2D/3D (Internal Coolant Supply)

● Precautions for Mounting Inserts



PDL series: Inserts can be used on either the central or peripheral insert, but only 2 corners are used.

Used peripheral inserts cannot be used as central inserts.

Similarly, used central inserts cannot be used as peripheral inserts.

Recommended Cutting Conditions for 2D (PDL series)

		Work Material	Workpiece Hardness	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>			
			HB				ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
2D	P	Steel, Carbon Steel SS400	125	G	ACP300	120-180-240	0.05-0.08-0.10	0.05-0.08-0.10	0.05-0.08-0.11	0.05-0.08-0.12
		S15C	125	L	ACP300	130-170-220	0.04-0.08-0.12	0.04-0.08-0.12	0.04-0.08-0.13	0.05-0.10-0.15
		S45C	190	G	ACP300	100-150-200	0.08-0.13-0.24	0.08-0.13-0.24	0.08-0.14-0.26	0.09-0.16-0.29
		S45C Hardened	250	G	ACP100	100-170-240	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.10-0.17
		S75C	270	G	ACP100	120-180-240	0.06-0.10-0.17	0.06-0.10-0.17	0.06-0.10-0.17	0.07-0.12-0.19
		S75C Hardened	300	G	ACP100	85-150-210	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.09-0.14	0.05-0.10-0.15
		Low-alloy Steel SCM, SNCM	180	L	ACP300	100-140-180	0.05-0.08-0.14	0.05-0.08-0.14	0.05-0.08-0.16	0.06-0.09-0.17
		SCM, SNCM Hardened	275	G	ACP100	100-170-240	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16
		SCM, SNCM Hardened	300	G	ACP100	90-150-210	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16
	SCM, SNCM Hardened	350	G	ACP100	75-120-165	0.06-0.10-0.14	0.06-0.10-0.14	0.06-0.10-0.14	0.07-0.11-0.16	
	High-alloy Steel SKD, SKT, SKH	200	G	ACP100	120-180-240	0.08-0.12-0.17	0.08-0.12-0.17	0.08-0.12-0.18	0.09-0.12-0.21	
	SKD, SKT, SKH (Sintered)	325	G	ACP100	100-140-180	0.06-0.10-0.15	0.06-0.10-0.15	0.06-0.11-0.15	0.07-0.11-0.16	
	M	Stainless Steel SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	100-140-180	0.06-0.11-0.18	0.06-0.11-0.18	0.06-0.12-0.19	0.07-0.13-0.22
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120-150	0.06-0.11-0.18	0.06-0.11-0.18	0.06-0.12-0.19	0.07-0.13-0.22
SUS304, SUS316 (Austenitic)		180	M	ACS3000/ACM300	100-140-180	0.06-0.11-0.18	0.06-0.11-0.18	0.06-0.12-0.19	0.07-0.13-0.22	
K	Cast Iron		G	ACK300	120-160-200	0.09-0.20-0.32	0.10-0.22-0.36	0.11-0.24-0.39	0.12-0.26-0.44	
	Ductile Cast Iron		G	ACK300	90-120-150	0.09-0.20-0.32	0.10-0.22-0.36	0.11-0.24-0.39	0.12-0.26-0.44	
S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25- 50- 70	0.06-0.11-0.18	0.06-0.11-0.18	0.06-0.12-0.19	0.07-0.13-0.22	
N	Aluminum Alloy		G	DL1500	200-260-320	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	
	Copper Alloy		G	DL1500	180-230-280	0.06-0.11-0.17	0.06-0.11-0.17	0.06-0.12-0.18	0.07-0.13-0.20	

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

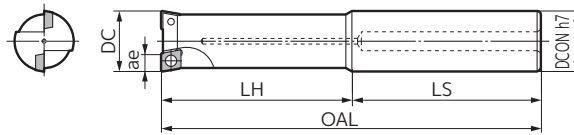
Recommended Cutting Conditions for 3D (PDL series)

		Work Material	Workpiece Hardness	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f Feed Rate (mm/rev) <Min. - Optimum - Max.>			
			HB				ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
3D	P	Steel, Carbon Steel SS400	125	G	ACP300	120- 180 -240	0.05- 0.07 -0.10	0.05- 0.07 -0.10	0.05- 0.08 -0.11	0.05- 0.08 -0.12
		S15C	125	L	ACP300	130- 170 -220	0.04- 0.07 -0.10	0.04- 0.07 -0.10	0.04- 0.08 -0.11	0.05- 0.09 -0.12
		S45C	190	G	ACP300	100- 150 -200	0.08- 0.12 -0.20	0.08- 0.12 -0.20	0.08- 0.13 -0.22	0.09- 0.14 -0.24
		S45C Hardened	250	G	ACP100	100- 170 -240	0.05- 0.08 -0.11	0.05- 0.08 -0.11	0.05- 0.08 -0.12	0.05- 0.09 -0.14
		S75C	270	G	ACP100	120- 180 -240	0.06- 0.09 -0.14	0.06- 0.09 -0.14	0.06- 0.10 -0.14	0.07- 0.11 -0.17
		S75C Hardened	300	G	ACP100	85- 150 -210	0.05- 0.08 -0.11	0.05- 0.08 -0.11	0.05- 0.08 -0.11	0.05- 0.09 -0.14
		Low-alloy Steel SCM, SNCM	180	L	ACP300	100- 140 -180	0.05- 0.07 -0.12	0.05- 0.07 -0.12	0.05- 0.08 -0.13	0.06- 0.08 -0.15
		SCM, SNCM Hardened	275	G	ACP100	100- 170 -240	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.07- 0.10 -0.12
		SCM, SNCM Hardened	300	G	ACP100	90- 150 -210	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.07- 0.10 -0.12
		SCM, SNCM Hardened	350	G	ACP100	75- 120 -165	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.07- 0.10 -0.12
	High-alloy Steel SKD, SKT, SKH	200	G	ACP100	120- 180 -240	0.08- 0.11 -0.14	0.08- 0.12 -0.15	0.08- 0.12 -0.16	0.09- 0.14 -0.18	
	SKD, SKT, SKH (Sintered)	325	G	ACP100	100- 140 -180	0.06- 0.09 -0.11	0.06- 0.09 -0.11	0.06- 0.09 -0.11	0.07- 0.10 -0.12	
	M	Stainless Steel SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	100- 140 -180	0.06- 0.10 -0.15	0.06- 0.10 -0.15	0.06- 0.11 -0.16	0.07- 0.12 -0.18
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120-150	0.06- 0.10 -0.15	0.06- 0.10 -0.15	0.06- 0.11 -0.16	0.07- 0.12 -0.18
SUS304, SUS316 (Austenitic)		180	M	ACS3000/ACM300	100- 140 -180	0.06- 0.10 -0.15	0.06- 0.10 -0.15	0.06- 0.11 -0.16	0.07- 0.12 -0.18	
K	Cast Iron		G	ACK300	120- 160 -200	0.09- 0.18 -0.27	0.10- 0.20 -0.30	0.11- 0.22 -0.32	0.12- 0.24 -0.36	
	Ductile Cast Iron		G	ACK300	90- 120 -150	0.09- 0.18 -0.27	0.10- 0.20 -0.30	0.11- 0.22 -0.32	0.12- 0.24 -0.36	
S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25- 50- 70	0.06- 0.10 -0.15	0.06- 0.10 -0.15	0.06- 0.11 -0.16	0.07- 0.12 -0.18	
N	Aluminum Alloy		G	DL1500	200- 260 -320	0.06- 0.11 -0.17	0.06- 0.11 -0.17	0.06- 0.12 -0.18	0.07- 0.13 -0.20	
	Copper Alloy		G	DL1500	180- 230 -280	0.06- 0.11 -0.17	0.06- 0.11 -0.17	0.06- 0.12 -0.18	0.07- 0.13 -0.20	

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

Fig 1



Holder 3D Length Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	ae max	Neck Length LH	Overall Length OAL	Shank LS	Shank Dia. DCON	Number of Teeth	Applicable Insert	Fig
16.0	●	PCT 160D3S16	4.0	53	123	70	16	2	WDXT052504	1
20.0	●	200D3S20	5.0	65	145	80	20	2	WDXT063006	1
25.0	●	250D3S25	6.5	80	160	80	25	2	WDXT073506	1
32.0	●	320D3S32	8.5	101	191	90	32	2	WDXT094008	1
40.0	●	400D3S42	11.0	125	225	100	42	3	WDXT125012	1

Holder 5D Length Diameter ø16.0 to 40.0mm

Dimensions (mm)

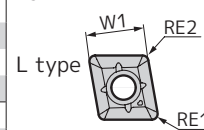
Dia. DC	Stock	Cat. No.	ae max	Neck Length LH	Overall Length OAL	Shank LS	Shank Dia. DCON	Number of Teeth	Applicable Insert	Fig
16.0	●	PCT 160D5S16	4.0	85	155	70	16	2	WDXT052504	1
20.0	●	200D5S20	5.0	105	185	80	20	2	WDXT063006	1
25.0	●	250D5S25	6.5	130	210	80	25	2	WDXT073506	1
32.0	●	320D5S32	8.5	165	255	90	32	2	WDXT094008	1
40.0	●	400D5S42	11.0	205	305	100	42	3	WDXT125012	1

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting												
	Medium Cutting												
	Roughing												
Cat. No.		ACP100	ACP300	ACS3000	ACM300	ACK300	DL1500	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder	File
WDXT	052504-L	●	●			●		5.0	2.5	0.4	0.4	PCT160D3S16 / PCT160D5S16	1 2 3 4
	052504-G	●	●			●		5.0	2.5	0.4	0.4		
	052504-H	●	●			●		5.0	2.5	0.4	0.4		
	052504-M			●	▲			5.0	2.5	0.4	1.0		
WDXT	063006-L	●	●			●		6.0	3.0	0.6	0.6	PCT200D3S20 / PCT200D5S20	1 2 3 4
	063006-G	●	●			●	●	6.0	3.0	0.6	0.6		
	063006-H	●	●			●		6.0	3.0	0.6	0.6		
	063006-M			●	▲			6.0	3.0	0.6	1.4		
WDXT	073506-L	●	●			●		7.5	3.5	0.6	0.6	PCT250D3S25 / PCT250D5S25	1 2 3 4
	073506-G	●	●			●	●	7.5	3.5	0.6	0.6		
	073506-H	●	●			●		7.5	3.5	0.6	0.6		
	073506-M			●	▲			7.5	3.5	0.6	1.6		
WDXT	094008-L	●	●			●		9.6	4.0	0.8	0.8	PCT320D3S32 / PCT320D5S32	1 2 3 4
	094008-G	●	●			●	●	9.6	4.0	0.8	0.8		
	094008-H	●	●			●		9.6	4.0	0.8	0.8		
	094008-M			●	▲			9.6	4.0	0.8	2.4		
WDXT	125012-L	●	●			●		12.4	5.0	1.2	1.2	PCT400D3S42 / PCT400D5S42	1 2 3 4
	125012-G	●	●			●	●	12.4	5.0	1.2	1.2		
	125012-H	●	●			●		12.4	5.0	1.2	1.2		
	125012-M			●	▲			12.4	5.0	1.2	3.2		

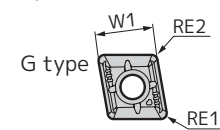
Fig 1



L type

For Low Feed with Chip Control

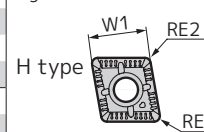
Fig 2



G type

General-purpose

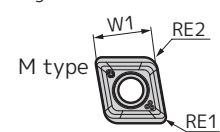
Fig 3



H type

Strong-edged

Fig 4



M type

Dedicated for Stainless Steel

PCT series: 2 corners can be used for the peripheral inserts only. When using the M type chipbreaker, the ae max is 20% shorter.
(Insert is the same as the WDX series)

Identification Code

PCT 250 D3 S25

Dia. DC (ø25.0) Flute Length L/D (3D) Shank Dia. DCON (ø25.0)

WDXT 07 35 06 -G

Width across Flats (7.5) Thickness x 10 (3.5) Chipbreaker type

Corner Radius x 10 (0.6)

Parts

Applicable Holder	Flat Insert Screw		Wrench	Wrench	Anti-seizure Cream
					
PCT160D3S16 / PCT160D5S16	BFTX0204N	0.5	TRX06	—	SUMI-P
PCT200D3S20 / PCT200D5S20	BFTY02206	1.0	—	TRD07	
PCT250D3S25 / PCT250D5S25	BFTX02506N	1.5	—	TRD08	
PCT320D3S32 / PCT320D5S32	BFTX03584	3.5	—	TRD15	
PCT400D3S42 / PCT400D5S42	BFTX0511N	5.0	—	TRD20	

PCT series for 3D/5D (Internal Coolant Supply)

Recommended Cutting Conditions for 3D (PCT series)

		Work Material	Workpiece Hardness	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	fz Feed Rate (mm/t) <Min. - Optimum - Max.>			
			HB							
							ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
3D	P	Steel, Carbon Steel SS400	125	G	ACP300	120- 180 -240	0.05- 0.07 -0.10	0.05- 0.07 -0.10	0.05- 0.07 -0.10	0.05- 0.08 -0.10
		S15C	125	L	ACP300	130- 170 -220	0.04- 0.07 -0.09	0.04- 0.07 -0.09	0.04- 0.07 -0.09	0.05- 0.08 -0.10
		S45C	190	G	ACP300	100- 150 -200	0.08- 0.11 -0.17	0.08- 0.11 -0.17	0.08- 0.12 -0.18	0.09- 0.14 -0.21
		S45C Hardened	250	G	ACP100	100- 170 -240	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.11	0.05- 0.08 -0.11
		S75C	270	G	ACP100	120- 180 -240	0.06- 0.08 -0.11	0.06- 0.08 -0.11	0.06- 0.09 -0.13	0.07- 0.11 -0.14
		S75C Hardened	300	G	ACP100	85-150 -210	0.05- 0.07 -0.09	0.05- 0.07 -0.09	0.05- 0.08 -0.10	0.05- 0.08 -0.11
		Low-alloy Steel SCM, SNCM	180	L	ACP300	100- 140 -180	0.05- 0.07 -0.10	0.05- 0.07 -0.10	0.05- 0.07 -0.11	0.06- 0.08 -0.12
		SCM, SNCM Hardened	275	G	ACP100	100- 170 -240	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.11
		SCM, SNCM Hardened	300	G	ACP100	90-150 -210	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.11
		SCM, SNCM Hardened	350	G	ACP100	75-120 -165	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.11
	High-alloy Steel SKD, SKT, SKH	200	G	ACP100	120- 180 -240	0.06- 0.10 -0.13	0.07- 0.11 -0.14	0.07- 0.11 -0.15	0.08- 0.12 -0.16	
	SKD, SKT, SKH (Sintered)	325	G	ACP100	100- 140 -180	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.11	
	M	Stainless Steel SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	100- 140 -180	0.06- 0.10 -0.13	0.06- 0.10 -0.13	0.06- 0.10 -0.14	0.07- 0.11 -0.15
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90-120 -150	0.06- 0.10 -0.13	0.06- 0.10 -0.13	0.06- 0.10 -0.14	0.07- 0.11 -0.15
		SUS304, SUS316 (Austenitic)	180	M	ACS3000/ACM300	100- 140 -180	0.06- 0.10 -0.13	0.06- 0.10 -0.13	0.06- 0.10 -0.14	0.07- 0.11 -0.15
	K	Cast Iron		G	ACK300	120- 160 -200	0.09- 0.17 -0.23	0.10- 0.19 -0.26	0.11- 0.21 -0.28	0.12- 0.23 -0.31
		Ductile Cast Iron		G	ACK300	90-120 -150	0.09- 0.17 -0.23	0.10- 0.19 -0.26	0.11- 0.21 -0.28	0.12- 0.23 -0.31
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25- 50 -70	0.06- 0.10 -0.13	0.06- 0.10 -0.13	0.06- 0.10 -0.14	0.07- 0.11 -0.15
	N	Aluminum Alloy		G	DL1500	200-260 -320	0.05- 0.10 -0.15	0.05- 0.10 -0.15	0.06- 0.11 -0.16	0.06- 0.12 -0.18
		Copper Alloy		G	DL1500	180-230 -280	0.05- 0.10 -0.15	0.05- 0.10 -0.15	0.06- 0.11 -0.16	0.06- 0.12 -0.18

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate fz to 75% of the figures in the table above.

Recommended Cutting Conditions for 5D (PCT series)

		Work Material	Workpiece Hardness	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	fz Feed Rate (mm/t) <Min. - Optimum - Max.>			
			HB				ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
5D	P	Steel, Carbon Steel SS400	125	G	ACP300	120- 180 -240	0.05- 0.06 -0.09	0.05- 0.06 -0.09	0.05- 0.06 -0.09	0.05- 0.07 -0.09
		S15C	125	L	ACP300	130- 170 -220	0.04- 0.06 -0.08	0.04- 0.06 -0.08	0.04- 0.06 -0.08	0.05- 0.07 -0.09
		S45C	190	G	ACP300	100- 150 -200	0.07- 0.10 -0.15	0.07- 0.10 -0.15	0.08- 0.11 -0.17	0.09- 0.12 -0.19
		S45C Hardened	250	G	ACP100	100- 170 -240	0.04- 0.07 -0.08	0.04- 0.07 -0.08	0.05- 0.07 -0.09	0.05- 0.08 -0.11
		S75C	270	G	ACP100	120- 180 -240	0.05- 0.08 -0.11	0.05- 0.08 -0.11	0.06- 0.08 -0.11	0.07- 0.09 -0.13
		S75C Hardened	300	G	ACP100	85- 150 -210	0.04- 0.07 -0.08	0.04- 0.07 -0.08	0.05- 0.07 -0.09	0.05- 0.08 -0.10
		Low-alloy Steel SCM, SNCM	180	L	ACP300	100- 140 -180	0.05- 0.06 -0.09	0.05- 0.06 -0.09	0.05- 0.06 -0.10	0.05- 0.07 -0.11
		SCM, SNCM Hardened	275	G	ACP100	100- 170 -240	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.05- 0.07 -0.10
		SCM, SNCM Hardened	300	G	ACP100	90- 150 -210	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.05- 0.07 -0.10
		SCM, SNCM Hardened	350	G	ACP100	75- 120 -165	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.05- 0.07 -0.10
	High-alloy Steel SKD, SKT, SKH	200	G	ACP100	120- 180 -240	0.05- 0.08 -0.12	0.06- 0.09 -0.12	0.06- 0.09 -0.13	0.07- 0.10 -0.14	
	SKD, SKT, SKH (Sintered)	325	G	ACP100	100- 140 -180	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.04- 0.06 -0.09	0.04- 0.06 -0.09	
	M	Stainless Steel SUS403/Others (Martensitic/Ferritic)	200	M	ACS3000/ACM300	100- 140 -180	0.05- 0.09 -0.11	0.05- 0.09 -0.11	0.06- 0.09 -0.12	0.06- 0.10 -0.14
		SUS403/Others (Martensitic (hardened))	240	M	ACS3000/ACM300	90- 120 -150	0.05- 0.09 -0.11	0.05- 0.09 -0.11	0.06- 0.09 -0.12	0.06- 0.10 -0.14
		SUS304, SUS316 (Austenitic)	180	M	ACS3000/ACM300	100- 140 -180	0.05- 0.09 -0.11	0.05- 0.09 -0.11	0.06- 0.09 -0.12	0.06- 0.10 -0.14
	K	Cast Iron		G	ACK300	120- 160 -200	0.08- 0.15 -0.21	0.09- 0.17 -0.23	0.09- 0.18 -0.25	0.11- 0.20 -0.28
		Ductile Cast Iron		G	ACK300	90- 120 -150	0.08- 0.15 -0.21	0.09- 0.17 -0.23	0.09- 0.18 -0.25	0.11- 0.20 -0.28
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)	200	G	ACS3000/ACP300	25- 50 - 70	0.05- 0.09 -0.11	0.05- 0.09 -0.11	0.06- 0.09 -0.12	0.06- 0.10 -0.14
	N	Aluminum Alloy		G	DL1500	200- 260 -320	0.05- 0.10 -0.15	0.05- 0.10 -0.15	0.06- 0.11 -0.16	0.06- 0.12 -0.18
		Copper Alloy		G	DL1500	180- 230 -280	0.05- 0.10 -0.15	0.05- 0.10 -0.15	0.06- 0.11 -0.16	0.06- 0.12 -0.18

For P and K class grades, if ACP300 and ACK300 are the first recommendations, ACP100 is the second recommendation.

In that case, it is recommended to set the cutting speed vc to 130% and the feed rate fz to 75% of the figures in the table above.

Drilling

Solid

Solid

Indexable Head type

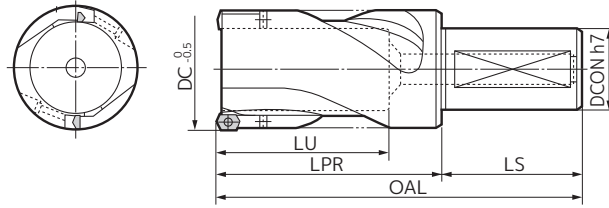
Indexable Insert type

Reamers



*For tolerances, refer to Chapter N - References.

Fig 1



Holder

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Overhang Length LPR	Overall Length OAL	Shank LS	Shank Dia. DCON	Fig
50 to 65		TCS 050 to 065	115 to 145	140 to 180	205 to 245	65	40	1
66 to 80		066 to 080	145 to 175	180 to 215	245 to 280	65	40	1
81 to 85		081 to 085	175 to 185	215 to 230	290 to 305	75	50	1
86 to 95		086 to 095	185 to 205	230 to 255	305 to 330	75	50	1
96 to 105		096 to 105	205 to 225	255 to 280	330 to 355	75	50	1
106 to 110		106 to 110	225 to 235	280 to 290	355 to 365	75	50	1

Other than the above, manufacturing up to DC = 200mm is possible.
Specify all dimensions and the mounting part shape when ordering.

Insert

Dimensions (mm)

Grade Classification		Cemented Carbide	
Process	High-speed/Light Cutting		
	Medium Cutting	P	
	Roughing		
Cat. No.	A30N	Applicable Holder	Fig
WPG 10R		For outer blade	1
10L		For inner blade	1

Fig 1

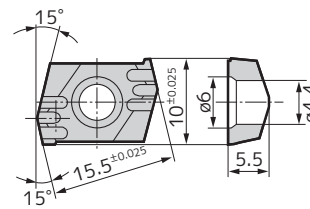


Figure shows WPG10R

Parts

Applicable Holders	Cartridges		Cap Screw	Set Screw	Cartridges		Cap Screw	Axial Adjustment Screw	Flat Insert Screw		Wrench
	Stock	For outer blade			Stock	For inner blade					
TCS 050 to 055		TU050055K1	BX0408	BT0306		TU050055K2	BX0408	AJM4FT	BFTX0409N	3.0	TRX15
TCS 056 to 065		TU055065K1	BX0410	BT0306		TU055065K2	BX0410	AJM4FT	BFTX0409N	3.0	TRX15
TCS 066 to 075		TU065075K1	BX0414	BT0306		TU065075K2	BX0414	AJM4FT	BFTX0409N	3.0	TRX15
TCS 076 to 085		TU075085K1	BX0418	BT0306		TU075085K2	BX0418	AJM4FT	BFTX0409N	3.0	TRX15
TCS 086 to 095		TU085095K1	BX0418	BT0306		TU085105K2	BX0425	AJM4FT	BFTX0409N	3.0	TRX15
TCS 096 to 105		TU095105K1	BX0425	BT0306		TU085105K2	BX0425	AJM4FT	BFTX0409N	3.0	TRX15
TCS 106 to 115		TU105135K1	BX0430	BT0306		TU105125K2	BX0425	AJM4FT	BFTX0409N	3.0	TRX15

Recommended Cutting Conditions

(vc: Cutting Speed m/min, f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel Alloy Steel (Below 320HB)	Mild Steel Alloy Steel General Steel (Below 250HB)	Die Steel (250HB)	Ductile Cast Iron	Cast Iron
ø110	vc	70 - 90 - 110	90 - 110 - 130	50 - 70 - 80	100 - 120 - 140	100 - 120 - 140
	f	0.05 - 0.1 - 0.15	0.05 - 0.1 - 0.15	0.05 - 0.1 - 0.15	0.1 - 0.15 - 0.2	0.15 - 0.2 - 0.25

Min. - **Optimum** - Max.

MEMO



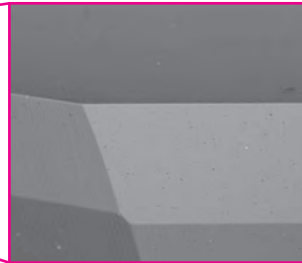


■ Features

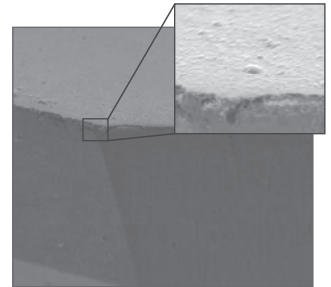
- High efficiency and high-precision reaming achieved through excellent cutting edge quality and gradual right-hand helix flutes
- Dedicated coating for reamers enables machining with long, stable tool life

● Stable Hole Diameter

- Optimised back taper reduces frictional resistance and hole diameter is stable due to machined finish



SSR series



Conventional Tool A

● Smooth Chip Evacuation

- A balanced design combining sharpness and cutting edge strength with gradual right-hand helix flutes



SSR series



Competitor's Product A

Work Material : S50C Chips
Tool : Diameter $\phi 8\text{mm}$
Cutting Conditions : $vc = 120\text{m/min}$
 $f = 1.2\text{mm/rev}$
 $ap = 0.1\text{mm}$

Work Material : S50C Chips
Tool : Diameter $\phi 8\text{mm}$
Cutting Conditions : $vc = 20\text{m/min}$
 $f = 0.09\text{mm/rev}$
 $ap = 0.1\text{mm}$

● High-precision Reaming

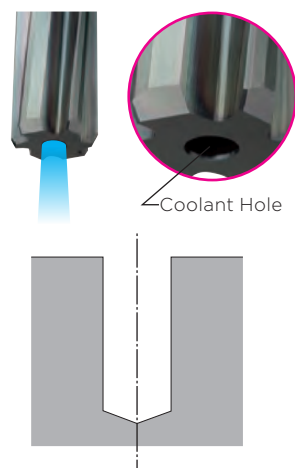
- Excellent cutting edge quality free of microchipping realizes good hole surface quality

● Long, Stable Tool Life: Dedicated Coating for Reamers

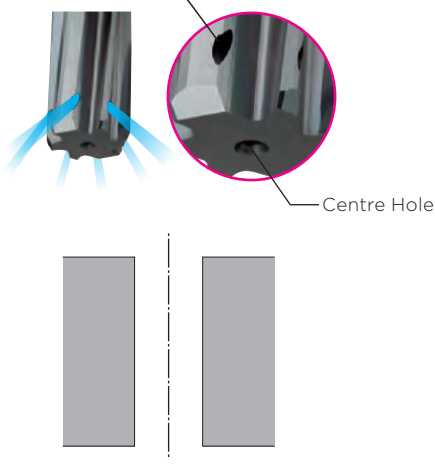
- High quality, high hardness and high strength coating layer for excellent wear resistance and thermal resistance

● Coolant Mechanism by Application

For Blind Holes (Centre Coolant)

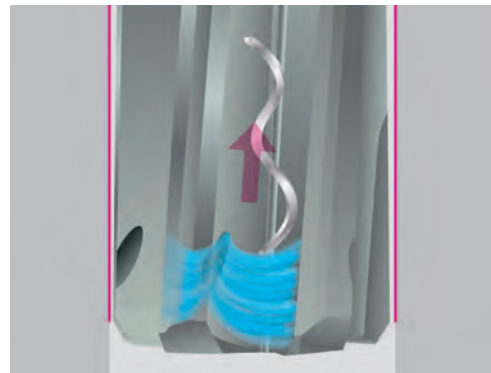


For Through Holes



Unique coolant supply mechanism which does not hamper chip evacuation

(for through hole)



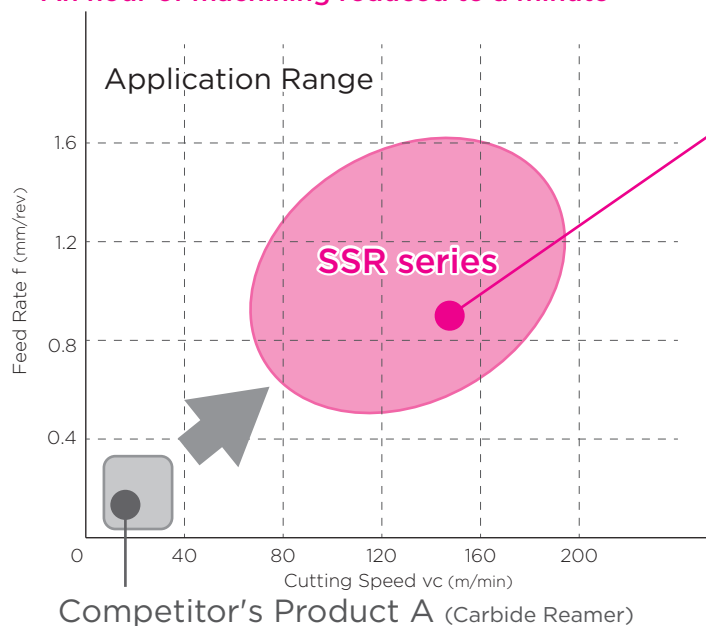
Coolant is supplied to the cutting edge from the flank side through the inner wall of the hole, achieving smooth chip evacuation without obstruction

■ Cutting Performance

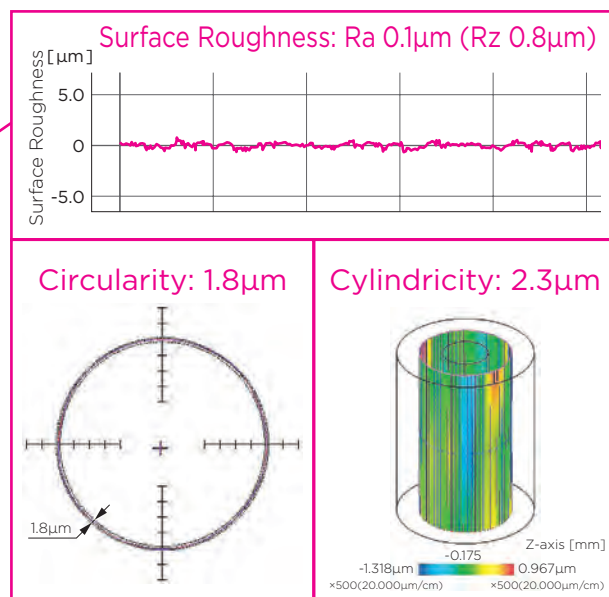
● Machining Efficiency Comparison

Realises 60 times or higher machining efficiency

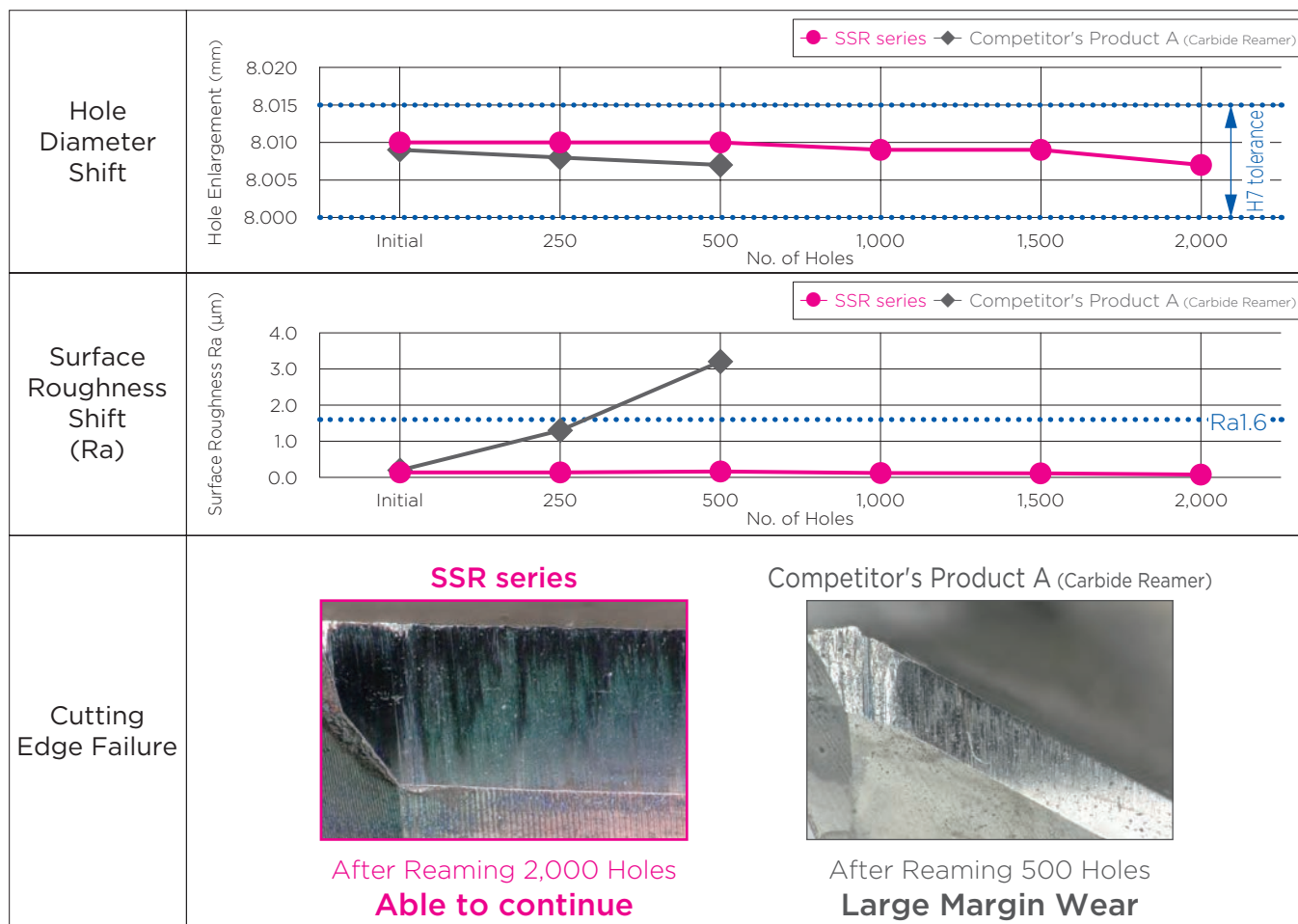
An hour of machining reduced to a minute



● Reaming Precision



● Tool Life Comparison



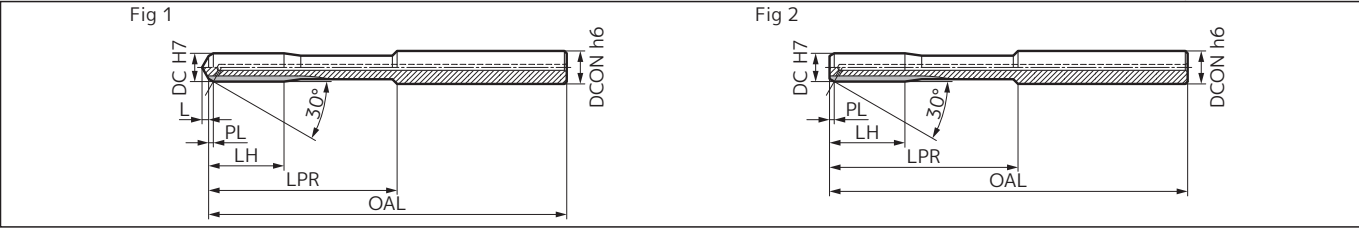
Machine : BT30 (Internal Coolant Supply) Work Material: S50C Tool: SSR08000H7S ($\phi 8$ mm H7 tolerance holes) $H = 16$ mm
 Cutting Conditions: SSR series $vc = 150$ m/min $f = 0.90$ mm/rev $vf = 5,374$ mm/min $ap = 0.1$ mm (Depth of Cut/Radius)
 Competitor's Product A $vc = 15$ m/min $f = 0.15$ mm/rev $vf = 89.6$ mm/min $ap = 0.1$ mm (Depth of Cut/Radius)

SSR series For H7 Tolerance Hole (Through Hole)

- Carbon Steel
Alloy Steel
up to 0.28%
- Carbon Steel
Alloy Steel
from 0.29%
- Tempered
Steel
- Hardened
Steel
up to 45HRC
- Cast Iron
- Ductile
Cast Iron



*For tolerances, refer to Chapter N - References.



Diameter ø3.0 to 12.0mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
3.0	+0.008 +0.004	●	SSR 03000H7T	68	4	40	12	0.5	0.7	4	1
3.5		●	SSR 03500H7T	68	4	40	12	0.5	0.9	4	1
4.0		●	04000H7T	76	5	40	12	0.5	1.0	4	1
4.5		●	04500H7T	76	5	40	12	0.5	1.2	4	1
5.0	+0.010 +0.005	●	05000H7T	76	6	40	12	0.5	1.3	4	1
5.5		●	05500H7T	76	6	40	12	0.5	1.5	4	1
6.0		●	06000H7T	76	7	40	16	1.0	—	4	2
6.5		●	SSR 06500H7T	76	7	40	16	1.0	—	4	2
7.0		●	07000H7T	101	8	65	16	1.0	—	6	2
7.5		●	07500H7T	101	8	65	16	1.0	—	6	2
8.0	+0.012	●	08000H7T	101	9	65	19	1.0	—	6	2
8.5	+0.006	●	08500H7T	101	9	65	19	1.0	—	6	2
9.0		●	09000H7T	101	10	65	19	1.0	—	6	2
9.5		●	09500H7T	101	10	65	19	1.0	—	6	2
10.0		●	10000H7T	130	11	85	22	1.0	—	6	2
10.5		●	SSR 10500H7T	130	11	85	22	1.0	—	6	2
11.0	+0.015	●	11000H7T	130	12	85	22	1.0	—	6	2
11.5	+0.008	●	11500H7T	130	12	85	22	1.0	—	6	2
12.0		●	12000H7T	130	13	85	22	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J186

Identification Code

SSR 03500 H7T

Series Code Dia. Hole Tolerance for Through Holes

Drilling

Solid

Indexable
Head type

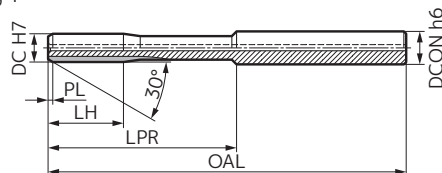
Indexable
Insert type

Reamers



*For tolerances, refer to Chapter N - References.

Fig 1



Diameter ø3.0 to 12.0mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Number of Flutes	Fig
3.0	+0.008 +0.004	●	SSR 03000H7S	68	4	40	12	0.5	4	1
3.5		●	SSR 03500H7S	68	4	40	12	0.5	4	1
4.0		●	04000H7S	76	5	40	12	0.5	4	1
4.5	+0.010	●	04500H7S	76	5	40	12	0.5	4	1
5.0	+0.005	●	05000H7S	76	6	40	12	0.5	4	1
5.5		●	05500H7S	76	6	40	12	0.5	4	1
6.0		●	06000H7S	76	7	40	16	1.0	4	1
6.5		●	SSR 06500H7S	76	7	40	16	1.0	4	1
7.0		●	07000H7S	101	8	65	16	1.0	6	1
7.5		●	07500H7S	101	8	65	16	1.0	6	1
8.0	+0.012	●	08000H7S	101	9	65	19	1.0	6	1
8.5	+0.006	●	08500H7S	101	9	65	19	1.0	6	1
9.0		●	09000H7S	101	10	65	19	1.0	6	1
9.5		●	09500H7S	101	10	65	19	1.0	6	1
10.0		●	10000H7S	130	11	85	22	1.0	6	1
10.5		●	SSR 10500H7S	130	11	85	22	1.0	6	1
11.0	+0.015	●	11000H7S	130	12	85	22	1.0	6	1
11.5	+0.008	●	11500H7S	130	12	85	22	1.0	6	1
12.0		●	12000H7S	130	13	85	22	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J186

Identification Code

SSR 03500 H7S

Series Code

Dia.

Hole Tolerance for
Blind Holes

SSR series (Through Hole)

Carbon Steel Alloy Steel up to 0.28%
Carbon Steel Alloy Steel from 0.29%
Tempered Steel
Hardened Steel up to 45HRC
Cast Iron
Ductile Cast Iron



*For tolerances, refer to Chapter N - References.

Fig 1

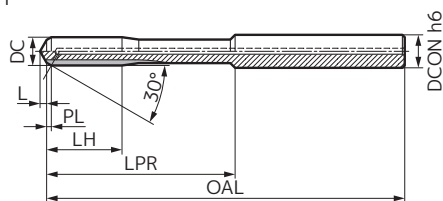
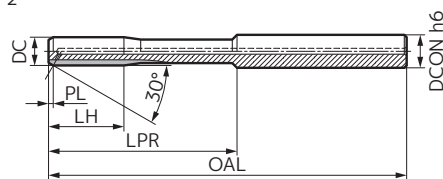


Fig 2



Diameter ø2.97 to 8.99mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
2.97	+0.005 0	●	SSR 02970JT	68	4	40	12	0.5	0.7	4	1
2.98		●	02980JT	68	4	40	12	0.5	0.7	4	1
2.99		●	02990JT	68	4	40	12	0.5	0.7	4	1
3.00	+0.005 0	●	SSR 03000JT	68	4	40	12	0.5	0.7	4	1
3.01		●	03010JT	68	4	40	12	0.5	0.8	4	1
3.02		●	03020JT	68	4	40	12	0.5	0.8	4	1
3.03		●	03030JT	68	4	40	12	0.5	0.8	4	1
3.97		●	03970JT	76	5	40	12	0.5	1.0	4	1
3.98		●	03980JT	76	5	40	12	0.5	1.0	4	1
3.99		●	03990JT	76	5	40	12	0.5	1.0	4	1
4.00	+0.005 0	●	SSR 04000JT	76	5	40	12	0.5	1.0	4	1
4.01		●	04010JT	76	5	40	12	0.5	1.0	4	1
4.02		●	04020JT	76	5	40	12	0.5	1.0	4	1
4.03		●	04030JT	76	5	40	12	0.5	1.0	4	1
4.97		●	04970JT	76	6	40	12	0.5	1.3	4	1
4.98		●	04980JT	76	6	40	12	0.5	1.3	4	1
4.99		●	04990JT	76	6	40	12	0.5	1.3	4	1
5.00	+0.005 0	●	SSR 05000JT	76	6	40	12	0.5	1.3	4	1
5.01		●	05010JT	76	6	40	12	0.5	1.3	4	1
5.02		●	05020JT	76	6	40	12	0.5	1.3	4	1
5.03		●	05030JT	76	6	40	12	0.5	1.3	4	1
5.97		●	05970JT	76	7	40	16	1.0	—	4	2
5.98		●	05980JT	76	7	40	16	1.0	—	4	2
5.99		●	05990JT	76	7	40	16	1.0	—	4	2
6.00	+0.005 0	●	SSR 06000JT	76	7	40	16	1.0	—	4	2
6.01		●	06010JT	76	7	40	16	1.0	—	4	2
6.02		●	06020JT	76	7	40	16	1.0	—	4	2
6.03		●	06030JT	76	7	40	16	1.0	—	4	2
6.97		●	06970JT	101	8	65	16	1.0	—	6	2
6.98		●	06980JT	101	8	65	16	1.0	—	6	2
6.99		●	06990JT	101	8	65	16	1.0	—	6	2
7.00	+0.005 0	●	SSR 07000JT	101	8	65	16	1.0	—	6	2
7.01		●	07010JT	101	8	65	16	1.0	—	6	2
7.02		●	07020JT	101	8	65	16	1.0	—	6	2
7.03		●	07030JT	101	8	65	16	1.0	—	6	2
7.97		●	07970JT	101	9	65	19	1.0	—	6	2
7.98		●	07980JT	101	9	65	19	1.0	—	6	2
7.99		●	07990JT	101	9	65	19	1.0	—	6	2
8.00	+0.005 0	●	SSR 08000JT	101	9	65	19	1.0	—	6	2
8.01		●	08010JT	101	9	65	19	1.0	—	6	2
8.02		●	08020JT	101	9	65	19	1.0	—	6	2
8.03		●	08030JT	101	9	65	19	1.0	—	6	2
8.97		●	08970JT	101	10	65	19	1.0	—	6	2
8.98		●	08980JT	101	10	65	19	1.0	—	6	2
8.99		●	08990JT	101	10	65	19	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J186

Diameter ø9.00 to 12.00mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
9.00	+0.005 0	●	SSR 09000JT	101	10	65	19	1.0	—	6	2
9.01		●	09010JT	101	10	65	19	1.0	—	6	2
9.02		●	09020JT	101	10	65	19	1.0	—	6	2
9.03		●	09030JT	101	10	65	19	1.0	—	6	2
9.97		●	09970JT	130	11	85	22	1.0	—	6	2
9.98		●	09980JT	130	11	85	22	1.0	—	6	2
9.99		●	09990JT	130	11	85	22	1.0	—	6	2
10.00	+0.005 0	●	SSR 10000JT	130	11	85	22	1.0	—	6	2
10.01		●	10010JT	130	11	85	22	1.0	—	6	2
10.02		●	10020JT	130	11	85	22	1.0	—	6	2
10.03		●	10030JT	130	11	85	22	1.0	—	6	2
10.97		●	10970JT	130	12	85	22	1.0	—	6	2
10.98		●	10980JT	130	12	85	22	1.0	—	6	2
10.99		●	10990JT	130	12	85	22	1.0	—	6	2
11.00	+0.005 0	●	SSR 11000JT	130	12	85	22	1.0	—	6	2
11.01		●	11010JT	130	12	85	22	1.0	—	6	2
11.02		●	11020JT	130	12	85	22	1.0	—	6	2
11.03		●	11030JT	130	12	85	22	1.0	—	6	2
11.97		●	11970JT	130	13	85	22	1.0	—	6	2
11.98		●	11980JT	130	13	85	22	1.0	—	6	2
11.99		●	11990JT	130	13	85	22	1.0	—	6	2
12.00		●	12000JT	130	13	85	22	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J186

Identification Code

SSR 03000 JT

Series Code

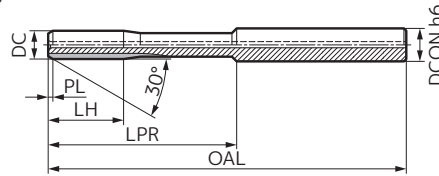
Dia.

For Through Holes



*For tolerances, refer to Chapter N - References.

Fig 1

Diameter $\varnothing 2.97$ to 8.99mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagemnt Length PL	Number of Flutes	Fig
2.97	+0.005 0	●	SSR 02970JS	68	4	40	12	0.5	4	1
2.98		●	02980JS	68	4	40	12	0.5	4	1
2.99		●	02990JS	68	4	40	12	0.5	4	1
3.00	+0.005 0	●	SSR 03000JS	68	4	40	12	0.5	4	1
3.01		●	03010JS	68	4	40	12	0.5	4	1
3.02		●	03020JS	68	4	40	12	0.5	4	1
3.03		●	03030JS	68	4	40	12	0.5	4	1
3.97		●	03970JS	76	5	40	12	0.5	4	1
3.98		●	03980JS	76	5	40	12	0.5	4	1
3.99		●	03990JS	76	5	40	12	0.5	4	1
4.00	+0.005 0	●	SSR 04000JS	76	5	40	12	0.5	4	1
4.01		●	04010JS	76	5	40	12	0.5	4	1
4.02		●	04020JS	76	5	40	12	0.5	4	1
4.03		●	04030JS	76	5	40	12	0.5	4	1
4.97		●	04970JS	76	6	40	12	0.5	4	1
4.98		●	04980JS	76	6	40	12	0.5	4	1
4.99		●	04990JS	76	6	40	12	0.5	4	1
5.00	+0.005 0	●	SSR 05000JS	76	6	40	12	0.5	4	1
5.01		●	05010JS	76	6	40	12	0.5	4	1
5.02		●	05020JS	76	6	40	12	0.5	4	1
5.03		●	05030JS	76	6	40	12	0.5	4	1
5.97		●	05970JS	76	7	40	16	1.0	4	1
5.98		●	05980JS	76	7	40	16	1.0	4	1
5.99		●	05990JS	76	7	40	16	1.0	4	1
6.00	+0.005 0	●	SSR 06000JS	76	7	40	16	1.0	4	1
6.01		●	06010JS	76	7	40	16	1.0	4	1
6.02		●	06020JS	76	7	40	16	1.0	4	1
6.03		●	06030JS	76	7	40	16	1.0	4	1
6.97		●	06970JS	101	8	65	16	1.0	6	1
6.98		●	06980JS	101	8	65	16	1.0	6	1
6.99		●	06990JS	101	8	65	16	1.0	6	1
7.00	+0.005 0	●	SSR 07000JS	101	8	65	16	1.0	6	1
7.01		●	07010JS	101	8	65	16	1.0	6	1
7.02		●	07020JS	101	8	65	16	1.0	6	1
7.03		●	07030JS	101	8	65	16	1.0	6	1
7.97		●	07970JS	101	9	65	19	1.0	6	1
7.98		●	07980JS	101	9	65	19	1.0	6	1
7.99		●	07990JS	101	9	65	19	1.0	6	1
8.00	+0.005 0	●	SSR 08000JS	101	9	65	19	1.0	6	1
8.01		●	08010JS	101	9	65	19	1.0	6	1
8.02		●	08020JS	101	9	65	19	1.0	6	1
8.03		●	08030JS	101	9	65	19	1.0	6	1
8.97		●	08970JS	101	10	65	19	1.0	6	1
8.98		●	08980JS	101	10	65	19	1.0	6	1
8.99		●	08990JS	101	10	65	19	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J186

Diameter $\varnothing 9.00$ to 12.00mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Number of Flutes	Fig
9.00	+0.005 0	●	SSR 09000JS	101	10	65	19	1.0	6	1
9.01		●	09010JS	101	10	65	19	1.0	6	1
9.02		●	09020JS	101	10	65	19	1.0	6	1
9.03		●	09030JS	101	10	65	19	1.0	6	1
9.97		●	09970JS	130	11	85	22	1.0	6	1
9.98		●	09980JS	130	11	85	22	1.0	6	1
9.99		●	09990JS	130	11	85	22	1.0	6	1
10.00	+0.005 0	●	SSR 10000JS	130	11	85	22	1.0	6	1
10.01		●	10010JS	130	11	85	22	1.0	6	1
10.02		●	10020JS	130	11	85	22	1.0	6	1
10.03		●	10030JS	130	11	85	22	1.0	6	1
10.97		●	10970JS	130	12	85	22	1.0	6	1
10.98		●	10980JS	130	12	85	22	1.0	6	1
10.99		●	10990JS	130	12	85	22	1.0	6	1
11.00	+0.005 0	●	SSR 11000JS	130	12	85	22	1.0	6	1
11.01		●	11010JS	130	12	85	22	1.0	6	1
11.02		●	11020JS	130	12	85	22	1.0	6	1
11.03		●	11030JS	130	12	85	22	1.0	6	1
11.97		●	11970JS	130	13	85	22	1.0	6	1
11.98		●	11980JS	130	13	85	22	1.0	6	1
11.99		●	11990JS	130	13	85	22	1.0	6	1
12.00		●	12000JS	130	13	85	22	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J186

Identification Code

SSR **03000** **JS**

Series Code Dia. For Blind Holes

Recommended Cutting Conditions

Work Material		Carbon Steel for Mechanical Structures Alloy Steel for Mechanical Structures General Structural Steel		Cast Iron		Ductile Cast Iron		Hardened Steel Up to 45HRC		Depth of Cut ap (mm/radius)
Cutting Speed		80 to 180m/min		60 to 140m/min		60 to 180m/min		20 to 60m/min		
Diameter DC (mm)	Number of Flutes	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	
ø3	4	8,400-19,100	0.5-0.8	6,300-14,800	0.5-0.8	6,300-19,100	0.5-0.8	2,100-6,300	0.12-0.3	0.05-0.075
ø4	4	6,300-14,300	0.5-1.0	4,700-11,100	0.5-1.0	4,700-14,300	0.5-1.0	1,500-4,700	0.16-0.3	
ø5	4	5,000-11,400	0.6-1.0	3,800-8,900	0.6-1.0	3,800-11,400	0.6-1.0	1,200-3,800	0.16-0.4	
ø6	4	4,200-9,500	0.6-1.0	3,100-7,400	0.6-1.0	3,100-9,500	0.6-1.0	1,000-3,100	0.2-0.4	
ø7	6	3,600-8,100	0.6-1.8	2,700-6,300	0.6-1.8	2,700-8,100	0.6-1.8	900-2,700	0.25-0.6	0.05-0.10
ø8	6	3,100-7,100	0.6-1.8	2,300-5,500	0.6-1.8	2,300-7,100	0.6-1.8	800-2,300	0.25-0.6	
ø9	6	2,800-6,300	0.6-1.8	2,100-4,900	0.6-1.8	2,100-6,300	0.6-1.8	700-2,100	0.3-0.6	
ø10	6	2,500-5,700	0.6-1.8	1,900-4,400	0.6-1.8	1,900-5,700	0.6-1.8	630-1,900	0.3-0.6	
ø11	6	2,300-5,200	0.6-2.0	1,700-4,000	0.6-2.0	1,700-5,200	0.6-2.0	570-1,700	0.3-0.8	0.10-0.15
ø12	6	2,100-4,700	0.6-2.0	1,500-3,700	0.6-2.0	1,500-4,700	0.6-2.0	530-1,500	0.3-0.8	

1. The recommended conditions above are for cases where a water soluble coolant is used.

2. Supply sufficient water soluble coolant to the blade.

3. When performing interrupted reaming, reduce the feed rate for the interrupted part by about 30%.

4. Use of external coolant supply is also possible, but chip evacuation may suffer.

5. For machining with oil-based coolant or oil-based MQL, use low speed setting.

Precautions for Use

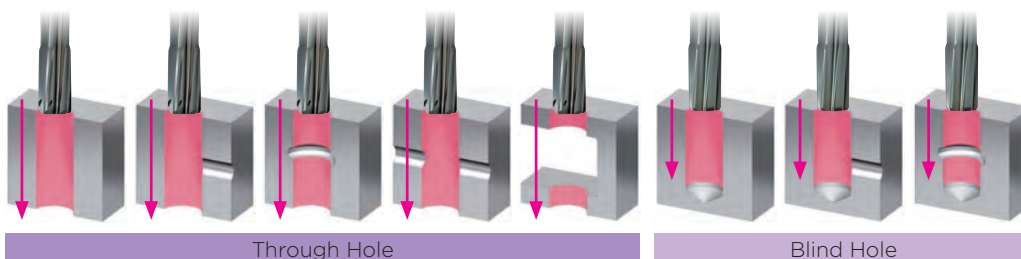
● Runout

Reaming with poor runout negatively affects hole accuracy and tool life.

Mount on a high-accuracy tool holder and collet, etc., in order to minimize cutting edge runout as far as possible. (10μm or less is required.)

Tool holders with hydraulic chuck, shrink-fit, or runout adjustment mechanism are recommended.

● Applicable Hole Shapes



*There is no bottom cutting edge, so bottom finishing is not possible.

● Coolant

Internal coolant supply is recommended.

We recommend coolant pressure of 1.5MPa or higher for chip evacuation purposes.

Use of external coolant supply may reduce chip evacuation performance and damage machined surface quality.

● Blind Hole with Escape Hole

When reaming blind holes connected to through holes, use through hole type reamers. (Not usable for blind holes)

Also check that the process does not create problems for chip evacuation performance.



Not usable for blind holes

Troubleshooting

Failure	Countermeasures
Enlarged hole diameter	- Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) - Decrease cutting speed. - Increase feed rate. - Reduce stock removal. - Check cutting edge for damage. - Change reamer diameter. - Increase coolant concentration.
Tapered hole	- Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) - Decrease cutting speed. - Reduce feed rate. - Review pre-reaming process. (Prepared hole deviation) - Review workpiece clamping method. - Compare hole diameters when the workpiece is clamped and unclamped. - Correct chip evacuation. (Increase coolant supply pressure) - Adjust coolant concentration.
Chatter marks on reamed surface	- Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) - Decrease cutting speed. - Increase feed rate. - Review workpiece clamping method. - Change cutting edge approach angle to a made-to-order design.
Poor finished surface roughness	- Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) - Increase cutting speed. - Check cutting edge for damage. - Check whether cutting conditions are within the recommended range. - Increase coolant concentration.

Failure	Countermeasures
Return marks	- Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) - Check cutting edge for damage. - Reduce stock removal. - Decrease return rate after reaming.
Irregular cutting noise	- Check cutting edge for damage. - Increase the stock removal. - Decrease the coolant concentration. - Change cutting edge approach angle to a made-to-order design.
Smaller hole diameter	- Increase cutting speed. - Reduce feed rate. - Check cutting edge for damage. - Increase the stock removal. - Decrease the coolant concentration.

Application Examples

Steel S45C Automotive Component	Sumitomo	Competitor's Product
 Horizontal Machining Centre Required Precision Hole Dia.: $\phi 7^{+0.020}_0$ (Drilled hole depth: 23mm) Surface Roughness: Ra 1.0μm	Diameter (mm)	7
	Number of Flutes	3
	vc (m/min)	110
	f (mm/rev)	0.55
	vf (mm/min)	2,752
	ap (mm)	0.05
	Coolant	Wet
Results	3x or more machining efficiency, 4x tool life achieved	

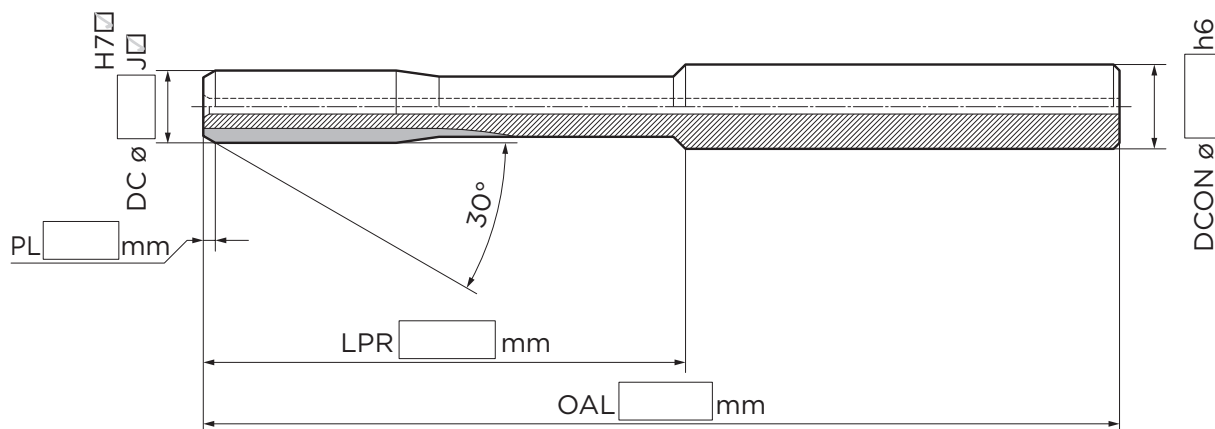
Cast Iron FCV420 Hydraulic Component	Sumitomo	Competitor's Product
 Vertical Machining Centre Required Precision Hole Dia.: $\phi 11^{+0.018}_0$ (Drilled hole depth: 15mm) Surface Roughness: Ra 1.6μm	Diameter (mm)	11
	Number of Flutes	6
	vc (m/min)	110
	f (mm/rev)	0.66
	vf (mm/min)	2,101
	ap (mm)	0.1
	Coolant	Wet
Results	40x or more machining efficiency, 2.3x tool life achieved Machining cycle time reduced from 17.3 seconds to 0.4 seconds	

Steel S45C Automotive Component	Sumitomo	Competitor's Product
 NC Lathe Required Precision Hole Dia.: $\phi 5.5^{+0.030}_0$ (Drilled hole depth: 35mm) Surface Roughness: Rz 6.3μm	Diameter (mm)	5.5
	Number of Flutes	4
	vc (m/min)	90
	f (mm/rev)	1.0
	vf (mm/min)	5,211
	ap (mm)	0.1
	Coolant	Wet
Results	Tool life doubled	

Steel SCM440 (45HRC) Automotive Component	Sumitomo	Competitor's Product
 NC Lathe Required Precision Hole Dia.: $\phi 8^{+0.030}_0$ (Drilled hole depth: 33mm) Surface Roughness: Ra 1.6μm	Diameter (mm)	8
	Number of Flutes	6
	vc (m/min)	40
	f (mm/rev)	0.14
	vf (mm/min)	223
	ap (mm)	0.15
	Coolant	Wet
Results	3x or more machining efficiency, 2.9x tool life achieved	

*For diameters of $\phi 12$ mm or larger, use the SumiReamer SR series.

SumiReamer SSR series Made-to-Order Request Sheet



Machine Information

Manufacturer : _____
 Type : ☐ MC ☐ NC Lathe ☐ Multi-tasking Machine
 Tool Holder : ☐ BT ☐ HSK ☐ Other
 Coolant : ☐ Water-soluble ☐ Oil-based ☐ MQL
 Coolant Supply : ☐ Internal Coolant Supply ☐ External Coolant Supply

Workpiece Shape

Workpiece Information

Part Name : _____
 Work Material : _____
 Work Material Hardness : _____
 Hole type : ☐ Through Hole ☒ Blind Hole
 Interrupted Cutting : ☐ Yes ☒ No
 Hole Depth : _____

Required Precision

Hole Dia. tolerance : _____
 Surface Roughness : _____
 Circularity : _____
 Cylindricity : _____
 Other : _____

Current Tool

Number of Flutes : _____
 Cutting Conditions : $vc =$ _____ m/min $f =$ _____ mm/rev $ap =$ _____ mm
 Tool Life : _____
 Tool Life Criteria : _____

Remarks

After filling in the required dimensions and other information, contact our nearest sales office or distributor.

Feel free to contact us with other requests as well.

Company Name/Contact

MEMO



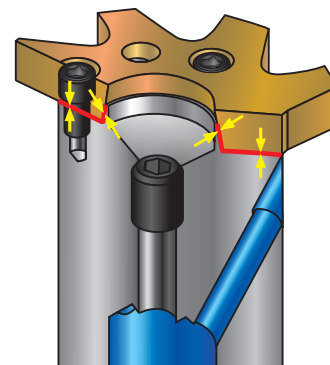
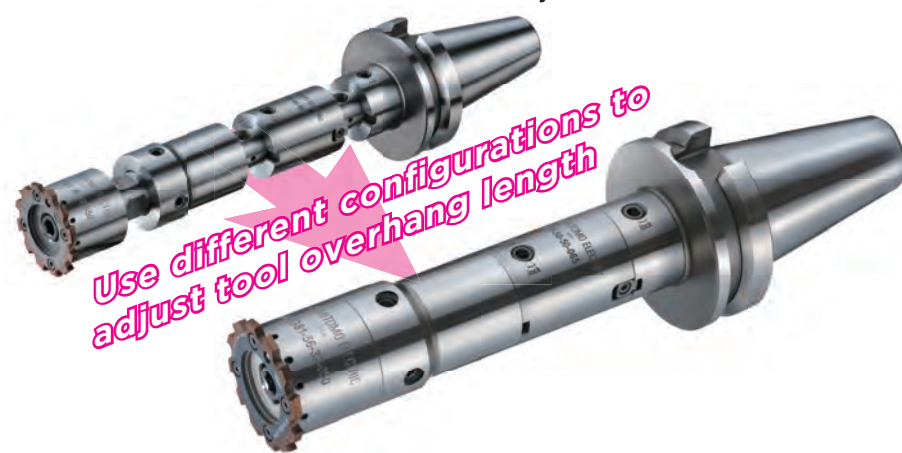


■ Features

- Achieving high efficiency with high speed and high feed capabilities
($v_c = 50$ to 320m/min , $f = 0.4$ to 1.2mm/rev)
- Compatible with a wide range of cutting conditions, allowing management of cutting conditions and coolant supply
- Designed with minimal cutting edge length, eliminating galling and blemishes for improved quality
- Indexable insert design improves quality and reliability of tool life, eliminating the trouble of inconsistent tool life caused by re-grinding.
- Reaming diameters from $\varnothing 11.9$ to $\varnothing 140.6\text{mm}$ available

● Easy insert replacement

- Flexible tool overhang lengths possible by combining the modular extension/ arbor and shank with insert runout adjustment mechanism



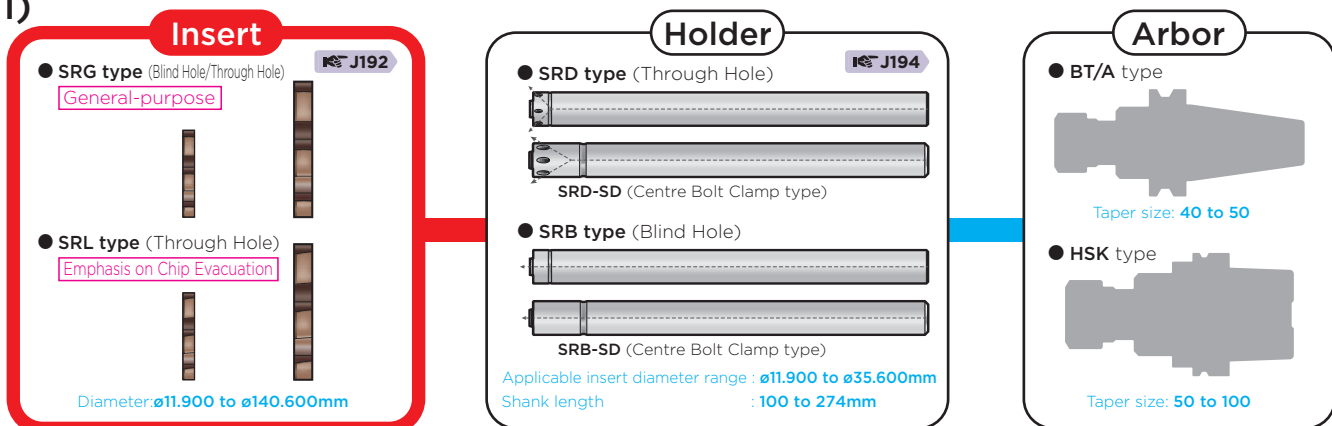
A taper supports the insert on two faces (based on the HSK standard) for repeatability within $4\text{ }\mu\text{m}$ using random inserts

■ Application Examples

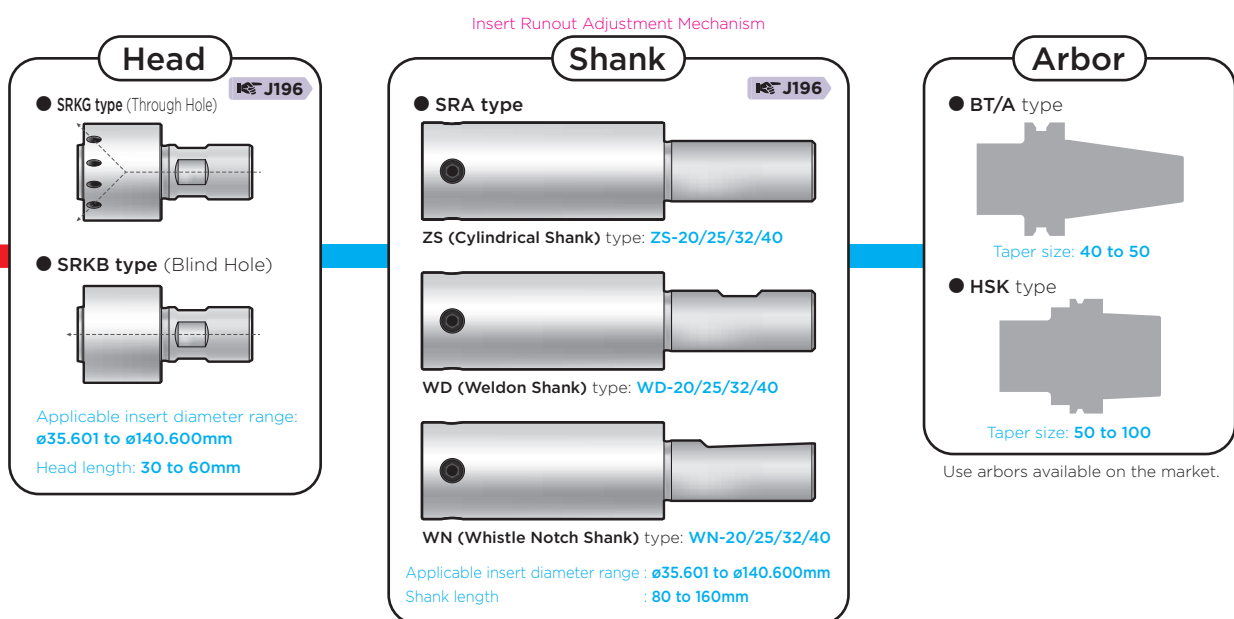
Workpiece					
	Cylinder barrel	Connecting rod	Sliding yoke	Front axle	Control valve
Work Material	FCD600	Forged S55C	S45C	Forged S58C	Forged S55C
Holder Cat. No. Insert Cat. No.	SRD19-12-115 SRG17.0H7-A01-T1212R1	SRD36-25-170 SRG29.0H7-A01-F0512R1	SRD19-12-115 SRG16.02Q+3-3-C01-F0512R1	SRD29-20-240 SRL28.0H7-B01-F0512R1	Special holder with guide pads SRL14.0H7-B01-F0512R1
Work Diameter (mm)	$\varnothing 17.0$	$\varnothing 29.0$	$\varnothing 16.02$	$\varnothing 28.0$	$\varnothing 14.0$
Hole Dia. Tolerance	H7	H7	H7	H7	H7
Surface Roughness (μm)	Rz10.0	Ra0.8	Ra3.2	Ra3.2	Ra1.6
Circularity (μm)	5	2	—	5	5
Cylindricity (μm)	5	4	—	5	5
Number of Teeth	6	8	6	8	6
v_c (m/min)	148	120	150	60	100
n (min^{-1})	2,772	1,318	2,982	682	2,230
f_z (mm/t)	0.20	0.15	0.10	0.075	0.10
v_f (m/min)	3,326	1,582	1,789	409	1,368
a_p (mm)	0.10	0.15	0.15	0.15	0.15
Wet / Dry	Wet	Wet	Wet	Wet	Wet
Tool Life, etc.	57.9m	30.52m	—	15.8m	—

■ SumiReamer SR series Configurations

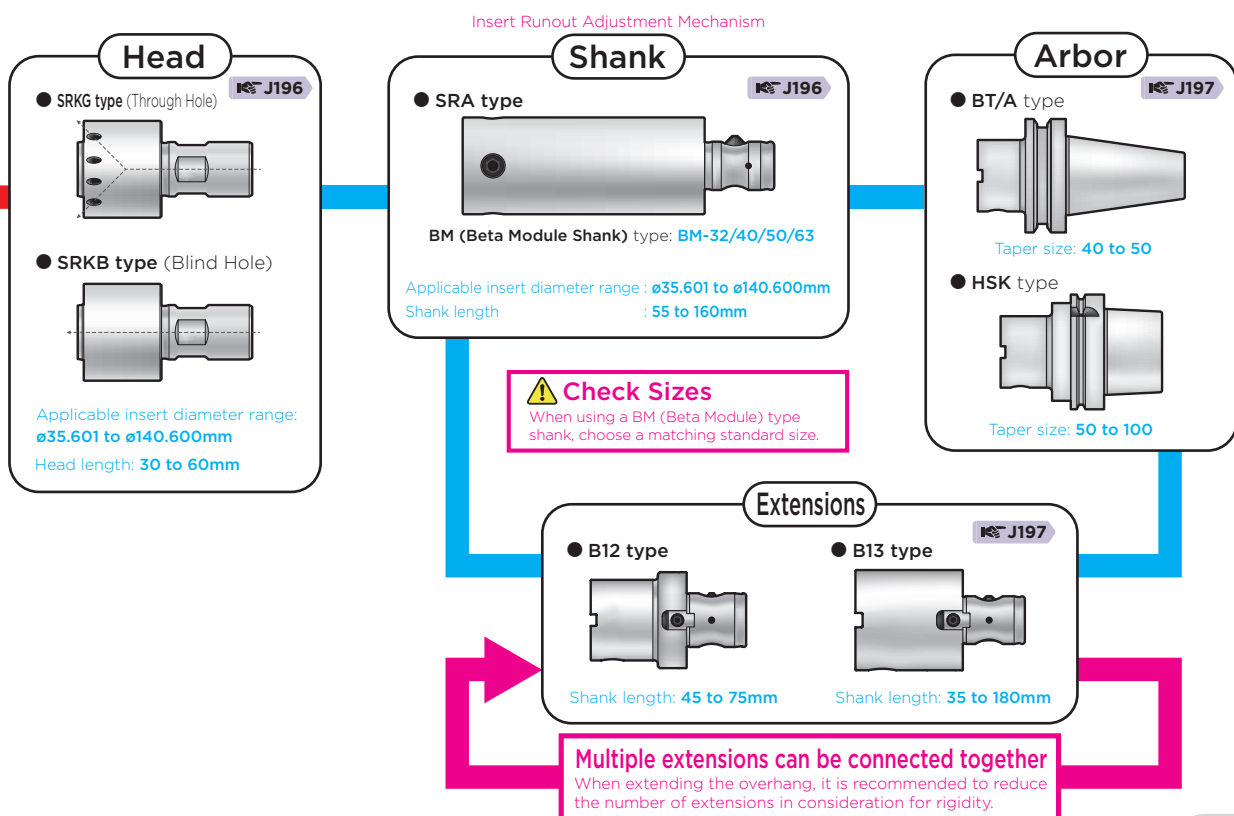
(1)



(2)



(3)



Drilling

Solid

Indexable
Head typeIndexable
Insert type

Reamers

Insert for SumiReamer SR series

● SRG type General-purpose Straight Flutes: Blind and Through Holes

Fig 1

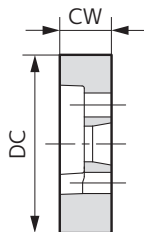
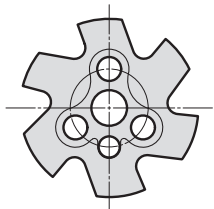
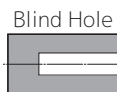
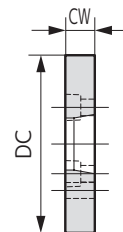
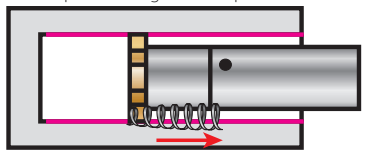


Fig 2

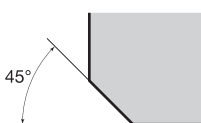


Conceptual Image of Chip Evacuation



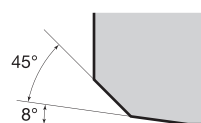
Chips Evacuated Toward Front

A01 type



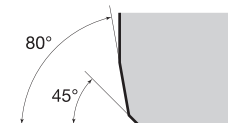
Standard type

C01 type



Surface Finish Emphasised

S02 type



Good Straightness

Insert (SRG type)

Dimensions (mm)

Diameter DC	Diameter Tolerance	Stock	Cat. No. (A01 type) F05,T12	Stock	Cat. No. (C01 type) F05,T12	Stock	Cat. No. (S02 type) F05,T12	Hole Dia. Tolerance	CW	Number of Teeth	Fig
12.0		●	SRG 12.0H7-A01-□□□ 12R1	●	SRG 12.0H7-C01-□□□ 12R1	●	SRG 12.0H7-S02-□□□ 12R1		4.3	6	1
13.0		●	SRG 13.0H7-A01-□□□ 12R1	●	SRG 13.0H7-C01-□□□ 12R1	●	SRG 13.0H7-S02-□□□ 12R1		4.3	6	1
14.0		●	SRG 14.0H7-A01-□□□ 12R1	●	SRG 14.0H7-C01-□□□ 12R1	●	SRG 14.0H7-S02-□□□ 12R1		4.3	6	1
15.0	+0.017	●	SRG 15.0H7-A01-□□□ 12R1	●	SRG 15.0H7-C01-□□□ 12R1	●	SRG 15.0H7-S02-□□□ 12R1	H7	4.3	6	1
16.0	+0.011	●	SRG 16.0H7-A01-□□□ 12R1	●	SRG 16.0H7-C01-□□□ 12R1	●	SRG 16.0H7-S02-□□□ 12R1	0	4.3	6	1
17.0		●	SRG 17.0H7-A01-□□□ 12R1	●	SRG 17.0H7-C01-□□□ 12R1	●	SRG 17.0H7-S02-□□□ 12R1		4.3	6	1
18.0		●	SRG 18.0H7-A01-□□□ 12R1	●	SRG 18.0H7-C01-□□□ 12R1	●	SRG 18.0H7-S02-□□□ 12R1		4.3	6	1
19.0		●	SRG 19.0H7-A01-□□□ 12R1	●	SRG 19.0H7-C01-□□□ 12R1	●	SRG 19.0H7-S02-□□□ 12R1		4.3	6	1
20.0		●	SRG 20.0H7-A01-□□□ 12R1	●	SRG 20.0H7-C01-□□□ 12R1	●	SRG 20.0H7-S02-□□□ 12R1		4.3	6	1
21.0		●	SRG 21.0H7-A01-□□□ 12R1	●	SRG 21.0H7-C01-□□□ 12R1	●	SRG 21.0H7-S02-□□□ 12R1		4.3	6	1
22.0		●	SRG 22.0H7-A01-□□□ 12R1	●	SRG 22.0H7-C01-□□□ 12R1	●	SRG 22.0H7-S02-□□□ 12R1		4.3	6	1
23.0		●	SRG 23.0H7-A01-□□□ 12R1	●	SRG 23.0H7-C01-□□□ 12R1	●	SRG 23.0H7-S02-□□□ 12R1		4.3	6	1
24.0	+0.019	●	SRG 24.0H7-A01-□□□ 12R1	●	SRG 24.0H7-C01-□□□ 12R1	●	SRG 24.0H7-S02-□□□ 12R1	H7	4.3	8	2
25.0	+0.013	●	SRG 25.0H7-A01-□□□ 12R1	●	SRG 25.0H7-C01-□□□ 12R1	●	SRG 25.0H7-S02-□□□ 12R1	+0.021	4.3	8	2
26.0		●	SRG 26.0H7-A01-□□□ 12R1	●	SRG 26.0H7-C01-□□□ 12R1	●	SRG 26.0H7-S02-□□□ 12R1	0	4.3	8	2
27.0		●	SRG 27.0H7-A01-□□□ 12R1	●	SRG 27.0H7-C01-□□□ 12R1	●	SRG 27.0H7-S02-□□□ 12R1		4.3	8	2
28.0		●	SRG 28.0H7-A01-□□□ 12R1	●	SRG 28.0H7-C01-□□□ 12R1	●	SRG 28.0H7-S02-□□□ 12R1		4.3	8	2
29.0		●	SRG 29.0H7-A01-□□□ 12R1	●	SRG 29.0H7-C01-□□□ 12R1	●	SRG 29.0H7-S02-□□□ 12R1		4.3	8	2
30.0		●	SRG 30.0H7-A01-□□□ 12R1	●	SRG 30.0H7-C01-□□□ 12R1	●	SRG 30.0H7-S02-□□□ 12R1		4.3	8	2

Ordering Method: For the catalogue number, please indicate **F05** (PVD grade) or **T12** (Coated Cermet) in the □□□ when ordering. (e.g. SRG12.0H7-A01-F0512R1).
(It is also possible to order uncoated cermet/DLC grades.)

*Actual reamed hole diameter is near the upper limit of H7 tolerance.

SumiReamer SR series Insert Cat. No. Identification Code

Specifying Inserts Using Hole Diameter Tolerance

The actual desired diameter will be on the upper limit side of the median hole diameter tolerance, and will differ depending on diameter/tolerance range/grade. Contact us for more details.

SR G 18.2 + 20 - 10 - A01 - F05 12R 1

(1) (2) (3) (4) (5) (6) (7)

- | | |
|--|-------------------------|
| (1) SR series | (5) Approach Angle Code |
| (2) G = Straight, L = Left-hand helix | (6) Grade Symbol |
| (3) Workpiece Hole Diameter (mm) | (7) Coating Code |
| (4) Tolerance (μm) +/- or standard (e.g. H7) | |

Specifying Inserts Using Desired Diameter

By adding a "Q" after the diameter, it is possible to specify exact desired reamer dimensions. Uncoated items are available within ±2 μm, and coated items within ±3 μm.

SR L 18.2 Q + 3 - 3 - A01 - F05 12R 1

(1) (2) (3) (4) (5) (6) (7)

- | | |
|---|-------------------------|
| (1) SR series | (4) Tolerance (μm) +/- |
| (2) G = Straight, L = Left-hand helix | (5) Approach Angle Code |
| (3) Median Target Reaming Diameter (mm) | (6) Grade Symbol |
| | (7) Coating Code |

Insert for SumiReamer SR series

● SRL type Emphasis on Chip Evacuation Left-hand Helix: For Through Holes



Fig 1

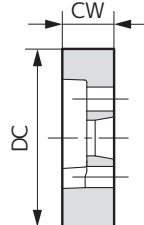
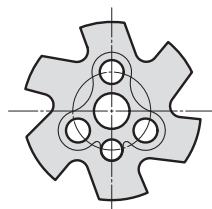
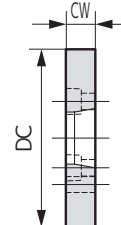
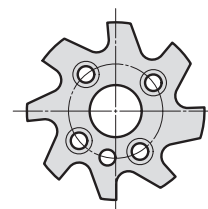
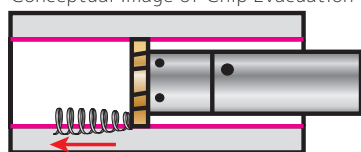


Fig 2

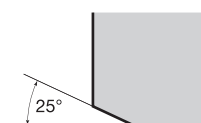


Conceptual Image of Chip Evacuation



Chips Evacuated Toward Back

B01 type



For Steel Through Hole

Insert (SRL type)

Dimensions (mm)

Diameter DC	Diameter Tolerance	Stock	Cat. No. (B01 type) F05,T12	Hole Dia. Tolerance	CW	Number of Teeth	Fig
12.0		●	SRL 12.0H7-B01-□□□ 12R1		4.3	6	1
13.0		●	13.0H7-B01-□□□ 12R1		4.3	6	1
14.0		●	14.0H7-B01-□□□ 12R1		4.3	6	1
15.0	+0.017	●	15.0H7-B01-□□□ 12R1	H7	4.3	6	1
16.0	+0.011	●	16.0H7-B01-□□□ 12R1	+0.018 0	4.3	6	1
17.0		●	17.0H7-B01-□□□ 12R1		4.3	6	1
18.0		●	18.0H7-B01-□□□ 12R1		4.3	6	1
19.0		●	SRL 19.0H7-B01-□□□ 12R1		4.3	6	1
20.0		●	20.0H7-B01-□□□ 12R1		4.3	6	1
21.0		●	21.0H7-B01-□□□ 12R1		4.3	6	1
22.0		●	22.0H7-B01-□□□ 12R1		4.3	6	1
23.0		●	23.0H7-B01-□□□ 12R1		4.3	6	1
24.0	+0.019	●	SRL 24.0H7-B01-□□□ 12R1	H7	4.3	8	2
25.0	+0.013	●	25.0H7-B01-□□□ 12R1	+0.021 0	4.3	8	2
26.0		●	26.0H7-B01-□□□ 12R1		4.3	8	2
27.0		●	27.0H7-B01-□□□ 12R1		4.3	8	2
28.0		●	28.0H7-B01-□□□ 12R1		4.3	8	2
29.0		●	29.0H7-B01-□□□ 12R1		4.3	8	2
30.0		●	30.0H7-B01-□□□ 12R1		4.3	8	2

Ordering Method: For the catalogue number, please indicate **F05** (PVD grade) or **T12** (Coated Cermet) in the □□□ when ordering. (e.g. SRG12.0H7-A01-F0512R1).
(It is also possible to order uncoated cermet/DLC grades.)

*Actual reamed hole diameter is near the upper limit of H7 tolerance.

● Made-to-order items

Dimensions (mm)

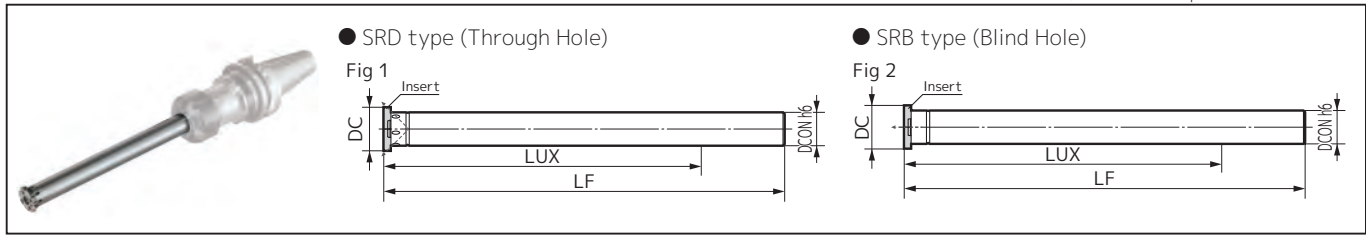
Diameter DC	CW	Number of Teeth
ø11.900to ø15.600	4.3	6
ø15.601to ø18.600	4.3	6
ø18.601to ø23.600	4.3	6
ø23.601to ø28.600	4.3	8
ø28.601to ø35.600	4.3	8
ø35.601to ø43.600	4.3	8
ø43.601to ø51.600	4.3	10
ø51.601to ø60.600	4.3	10
ø60.601to ø80.600	4.3	12
ø80.601to ø100.600	4.3	12
ø100.601to ø120.600	5.3	12
ø120.601to ø140.600	5.3	12

SRG type (Special) and SRL type (Special) are made-to-order items.

When ordering, refer to "SR series Insert Cat. No. Identification Code" on page J192.

* Cermet grades (T1200A and T1212R1) are only available up to ø100.600mm.

*For tolerances, refer to Chapter N - References.

**Steel Shank Holder (ø11.900 to 35.600mm)**Dimensions (mm) **Parts**

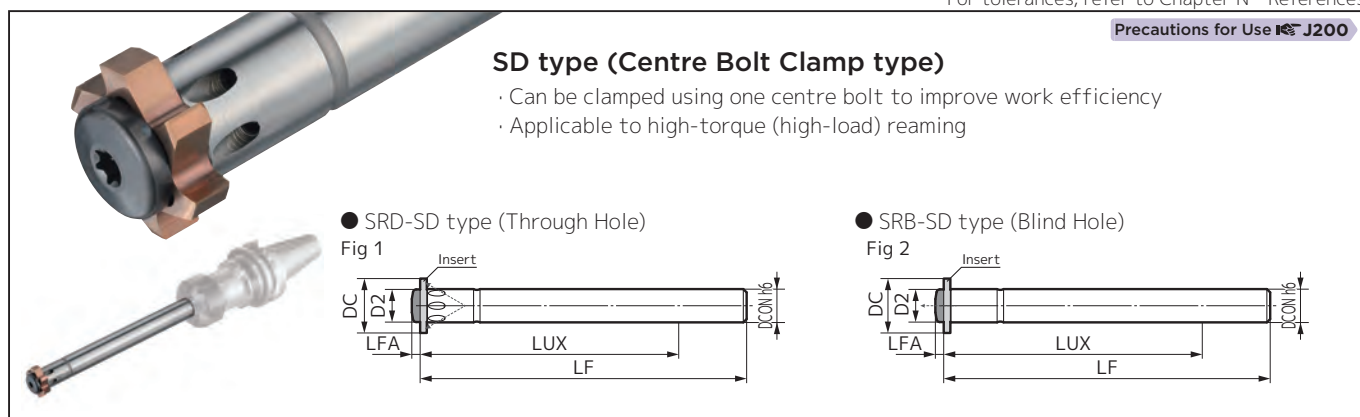
Diameter DC Range		Holder Cat. No.						Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Group No.	
		SRD			SRB							
		Stock	Cat. No.	Fig	Stock	Cat. No.	Fig					
Short	ø11.900 to ø15.600	●	SRD 16-10-100	1	●	SRB 16-10-100	2	10	100	60	(1)	0.9
	ø15.601 to ø18.600	●	19-12-115	1	●	19-12-115	2	12	115	70	(1)	0.9
	ø18.601 to ø23.600	●	24-16-128	1	●	24-16-128	2	16	128	80	(2)	1.5
	ø23.601 to ø28.600	●	29-20-145	1	●	29-20-145	2	20	145	95	(2)	1.5
	ø28.601 to ø35.600	●	36-25-170	1	●	36-25-170	2	25	170	110	(2)	1.5
Long	ø11.900 to ø15.600		SRD 16-10-160	1		SRB 16-10-160	2	10	160	120	(1)	0.9
	ø15.601 to ø18.600		19-12-185	1		19-12-185	2	12	185	140	(1)	0.9
	ø18.601 to ø23.600		24-16-208	1		24-16-208	2	16	208	160	(2)	1.5
	ø23.601 to ø28.600		29-20-240	1		29-20-240	2	20	240	190	(2)	1.5
	ø28.601 to ø35.600		36-25-274	1		36-25-274	2	25	274	214	(2)	1.5

*Refer to the table at the bottom of page J197 for the catalogue numbers of cap screws and wrenches applicable for each product.

Carbide Shank Holder (ø11.900 to 35.600mm)Dimensions (mm) **Parts**

Diameter DC Range		Holder Cat. No.						Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Group No.	
		SRD			SRB							
		Stock	Cat. No.	Fig	Stock	Cat. No.	Fig					
Long	ø11.900 to ø15.600		SRD 16-10-160HM	1		SRB 16-10-160HM	2	10	160	120	(1)	0.9
	ø15.601 to ø18.600		19-12-185HM	1		19-12-185HM	2	12	185	140	(1)	0.9
	ø18.601 to ø23.600		24-16-208HM	1		24-16-208HM	2	16	208	160	(2)	1.5
	ø23.601 to ø28.600		29-20-240HM	1		29-20-240HM	2	20	240	190	(2)	1.5
	ø28.601 to ø35.600		36-25-274HM	1		36-25-274HM	2	25	274	214	(2)	1.5

*Refer to the table at the bottom of page J197 for the catalogue numbers of cap screws and wrenches applicable for each product.



Steel Shank Holder SRD-SD type /SRB-SD type (Centre Bolt Clamp type)

Dimensions (mm) **Parts**

Diameter DC Range		Holder Cat. No.						Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Bolt D2	Bolt LFA	Group No.		
		SRD type (Through Hole)			SRB type (Blind Hole)								SRD	SRB	
		Stock	Cat. No.	Fig	Stock	Cat. No.	Fig								
Short	ø11.900 to ø15.600	●	SRD 16-10-100SD	1	●	SRB 16-10-100SD	2	10	100	60	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600	●	19-12-115SD	1	●	19-12-115SD	2	12	115	70	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600	●	24-16-128SD	1	●	24-16-128SD	2	16	128	80	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600	●	29-20-145SD	1	●	29-20-145SD	2	20	145	95	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600	●	36-25-170SD	1	●	36-25-170SD	2	25	170	110	24.5	4.0	(6)	(9)	18.0
Long	ø11.900 to ø15.600	●	SRD 16-10-160SD	1	●	SRB 16-10-160SD	2	10	160	120	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600	●	19-12-185SD	1	●	19-12-185SD	2	12	185	140	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600	●	24-16-208SD	1	●	24-16-208SD	2	16	208	160	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600	●	29-20-240SD	1	●	29-20-240SD	2	20	240	190	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600	●	36-25-274SD	1	●	36-25-274SD	2	25	274	214	24.5	4.0	(6)	(9)	18.0

*Refer to the table at the bottom of page J197 for the catalogue numbers of cap screws and wrenches applicable for each product.

Carbide Shank Holder SRD-SD type /SRB-SD type (Centre Bolt Clamp type)

Dimensions (mm) **Parts**

Diameter DC Range		Holder Cat. No.						Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Bolt D2	Bolt LFA	Group No.		
		SRD type (Through Hole)			SRB type (Blind Hole)								SRD	SRB	
		Stock	Cat. No.	Fig	Stock	Cat. No.	Fig								
Long	ø11.900 to ø15.600		SRD 16-10-160HMSD	1		SRB 16-10-160HMSD	2	10	160	120	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600		19-12-185HMSD	1		19-12-185HMSD	2	12	185	140	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600		24-16-208HMSD	1		24-16-208HMSD	2	16	208	160	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600		29-20-240HMSD	1		29-20-240HMSD	2	20	240	190	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600		36-25-274HMSD	1		36-25-274HMSD	2	25	274	214	24.5	4.0	(6)	(9)	18.0

*Refer to the table at the bottom of page J197 for the catalogue numbers of cap screws and wrenches applicable for each product.



Torque Wrench

Wrench Cat. No.	Applicable Holder Cat. No.	Torx	Torque Setting
G00-40-11	SR□ 16 / SR□ 19	T 6	0.9N·m
G00-40-12	SR□ 24 to SR□ 61	T 8	1.5N·m
G00-40-13	SR□ 81 / SR□ 101	T 15	3.5N·m

All in stock.

D,B,KG,A

Fig 1

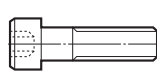


Fig 2

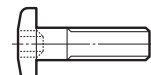


Fig 3

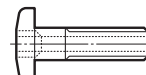


Fig 4

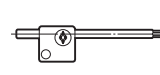
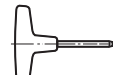
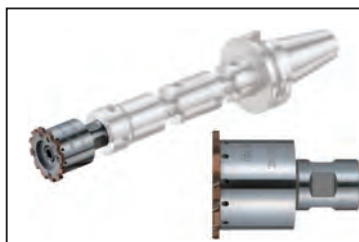


Fig 5



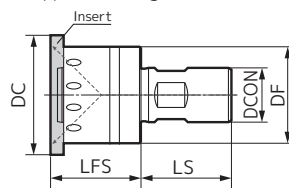
Cap Screws and Wrench

Group No.	Cat. No.			Torx	N-m
	Cap Screw	Fig	Wrench		
(1)	C00-90-00	1	G00-02-01	T 6	0.9
(2)	C00-90-01	1	G00-02-02	T 8	1.5
(3)	C00-90-22	2	G00-20-27	T15	4.0
(4)	C00-90-23	2	G00-20-28	T20	6.0
(5)	C00-90-24	2	G00-20-29	T30	16.0
(6)	C00-90-25	2	G00-20-29	T30	18.0
(7)	C00-90-23B	3	G00-20-28	T20	6.0
(8)	C00-90-24B	3	G00-20-29	T30	16.0
(9)	C00-90-25B	3	G00-20-29	T30	18.0



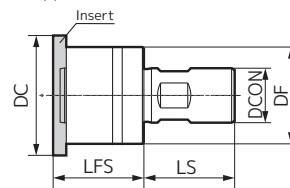
● SRKG type (Through Hole)

Fig 1



● SRKB type (Blind Hole)

Fig 2



Head (ø35.601 to 140.6mm)

Dimensions (mm) Parts

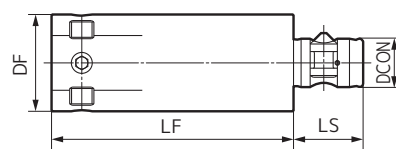
Diameter DC Range	Head Cat. No.						Diameter	Shank Dia.	Length	Shank	For Insert Mounting		For centre locking			
	Stock	SRKG	Fig	Stock	SRKB	Fig	DF	DCON	LFS	LS	Group No.	N·m	Group No. SRKG	N·m	Group No. SRKB	N·m
ø35.601 to ø43.600		SRKG 44-32-18-030	1		SRKB 44-32-18-030	2	32	18	30	30	(1)	1.5	(3)	35.0	(8)	35.0
ø43.601 to ø51.600		52-39-20-035	1		52-39-20-035	2	39	20	35	30	(1)	1.5	(4)	35.0	(9)	35.0
ø51.601 to ø60.600		61-46-25-040	1		61-46-25-040	2	46	25	40	35	(1)	1.5	(5)	55.0	(10)	55.0
ø60.601 to ø80.600		81-56-32-050	1		81-56-32-050	2	56	32	50	40	(2)	3.5	(6)	85.0	(11)	85.0
ø80.601 to ø100.600		101-76-40-060	1		101-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0
ø100.601 to ø120.600		SRKG 121-76-40-060	1		SRKB 121-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0
ø120.601 to ø140.600		141-76-40-060	1		141-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0

*Refer to the table at the bottom of page J197 for the catalogue numbers of cap screws and wrenches applicable for each product.

● SRA type

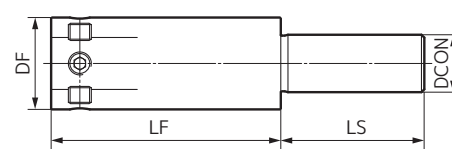
BM (Beta Module Shank) type

Fig 1



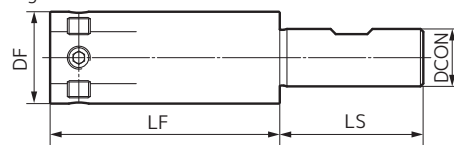
ZS (Cylindrical Shank) type

Fig 2



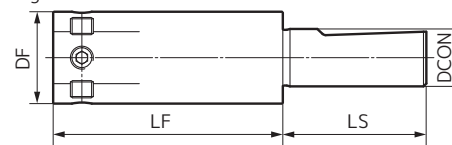
WD (Weldon Shank) type

Fig 3



WN (Whistle Notch Shank) type

Fig 4

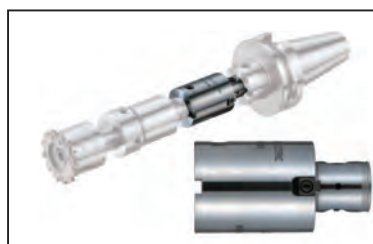


Shank (with Insert Runout Adjustment Mechanism)

Dimensions (mm) Parts

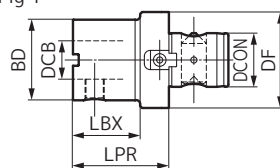
Shank type	Diameter DC Range	Shank Cat. No.						Diameter	Shank Dia.	Length	Shank	Fig	Cap Screw	Wrench	Clamp	Bolt
		Stock	SRA			DF	DCON	LF	LS							
BM	ø35.601 to ø43.600		SRA 44-32-BM32-055	32	BM-32	55	8.5	1					C00-90-08	G00-02-05	Z00-32-21	Z00-32-23
			44-32-BM32-080	32	BM-32	80	8.5	1					C00-90-08	G00-02-05	Z00-32-21	Z00-32-23
	ø43.601 to ø51.600		SRA 52-39-BM40-060	39	BM-40	60	26.0	1					C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
			52-39-BM40-100	39	BM-40	100	26.0	1					C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
	ø51.601 to ø60.600		SRA 61-46-BM50-070	46	BM-50	70	31.0	1					C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
			61-46-BM50-120	46	BM-50	120	31.0	1					C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
	ø60.601 to ø80.600		SRA 81-56-BM50-080	56	BM-50	80	31.0	1					C00-90-12	G00-02-07	Z00-50-21	Z00-50-23
ZS			81-56-BM50-140	56	BM-50	140	31.0	1					C00-90-12	G00-02-07	Z00-50-21	Z00-50-23
	ø80.601 to ø140.600		SRA 101-76-BM63-100	76	BM-63	100	38.0	1					C00-90-16	G00-02-08	Z00-63-21	Z00-63-23
			101-76-BM63-160	76	BM-63	160	38.0	1					C00-90-16	G00-02-08	Z00-63-21	Z00-63-23
	ø35.601 to ø43.600		SRA 44-32-ZS20-080	32	ZS-20	80	50.0	2					C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-ZS25-100	39	ZS-25	100	56.0	2					C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-ZS32-120	46	ZS-32	120	60.0	2					C00-90-10	G00-02-06	—	—
	ø60.601 to ø80.600		SRA 81-56-ZS40-080	56	ZS-40	80	70.0	2					C00-90-12	G00-02-07	—	—
WD			81-56-ZS40-140	56	ZS-40	140	70.0	2					C00-90-12	G00-02-07	—	—
	ø80.601 to ø140.600		SRA 101-76-ZS40-100	76	ZS-40	100	70.0	2					C00-90-16	G00-02-08	—	—
			101-76-ZS40-160	76	ZS-40	160	70.0	2					C00-90-16	G00-02-08	—	—
	ø35.601 to ø43.600		SRA 44-32-WD20-080	32	WD-20	80	50.0	3					C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-WD25-100	39	WD-25	100	56.0	3					C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-WD32-120	46	WD-32	120	60.0	3					C00-90-10	G00-02-06	—	—
	ø60.601 to ø80.600		SRA 81-56-WD40-080	56	WD-40	80	70.0	3					C00-90-12	G00-02-07	—	—
WN			81-56-WD40-140	56	WD-40	140	70.0	3					C00-90-12	G00-02-07	—	—
	ø80.601 to ø140.600		SRA 101-76-WD40-100	76	WD-40	100	70.0	3					C00-90-16	G00-02-08	—	—
			101-76-WD40-160	76	WD-40	160	70.0	3					C00-90-16	G00-02-08	—	—
	ø35.601 to ø43.600		SRA 44-32-WN20-080	32	WN-20	80	50.0	4					C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-WN25-100	39	WN-25	100	56.0	4					C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-WN32-120	46	WN-32	120	60.0	4					C00-90-10	G00-02-06	—	—
	ø60.601 to ø80.600		SRA 81-56-WN40-080	56	WN-40	80	70.0	4					C00-90-12	G00-02-07	—	—
WN			81-56-WN40-140	56	WN-40	140	70.0	4					C00-90-12	G00-02-07	—	—
	ø80.601 to ø140.600		SRA 101-76-WN40-100	76	WN-40	100	70.0	4					C00-90-16	G00-02-08	—	—
			101-76-WN40-160	76	WN-40	160	70.0	4					C00-90-16	G00-02-08	—	—





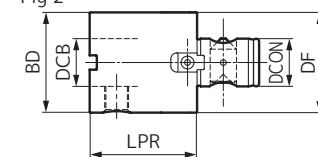
● B12 type

Fig 1



● B13 type

Fig 2



Extension B12 type

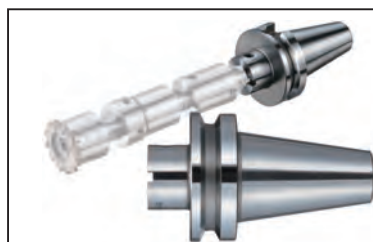
Dimensions (mm)

Cat. No.	Stock	Diameter BD	Hole Diameter DCB	Diameter DF	Shank Dia. DCON	Overhang Length LPR	Body LBX	Weight (kg)	Fig
B12-40-32-045		32	BM-32	42	BM-40	45	30	0.3	1
B12-50-40-050		42	BM-40	50	BM-50	50	35	0.5	1
B12-63-32-050		32	BM-32	63	BM-63	50	30	0.9	1
40-055		42	BM-40	63	BM-63	55	35	1.1	1
B12-80-40-060		42	BM-40	80	BM-80	60	35	2.2	1
63-060		63	BM-63	80	BM-80	60	35	2.4	1
B12-100-40-060		42	BM-40	100	BM-100	60	35	3.1	1
63-060		63	BM-63	100	BM-100	60	35	3.3	1
80-075		80	BM-80	100	BM-100	75	50	3.5	1

B13 type

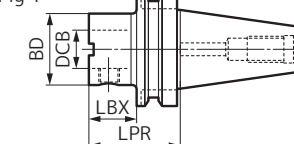
Dimensions (mm)

Cat. No.	Stock	Diameter BD	Hole Diameter DCB	Diameter DF	Shank Dia. DCON	Overhang Length LPR	Body LBX	Weight (kg)	Fig
B13-32-32-035		32	BM-32	32	BM-32	35	—	0.2	2
070		32	BM-32	32	BM-32	70	—	0.4	2
B13-40-40-045		42	BM-40	42	BM-40	45	—	0.4	2
070		42	BM-40	42	BM-40	70	—	0.7	2
B13-50-50-065		50	BM-50	50	BM-50	65	—	1.0	2
100		50	BM-50	50	BM-50	100	—	1.5	2
B13-63-63-060		63	BM-63	63	BM-63	60	—	1.3	2
125		63	BM-63	63	BM-63	100	—	2.9	2
B13-80-80-080		80	BM-80	80	BM-80	80	—	2.9	2
160		80	BM-80	80	BM-80	160	—	4.9	2
B13-100-100-080		100	BM-100	100	BM-100	80	—	4.9	2
180		100	BM-100	100	BM-100	180	—	10.9	2



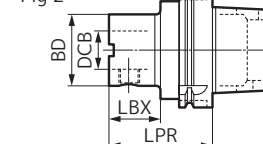
● BT/A type

Fig 1



● HSK type

Fig 2



Arbor (BETA Module)

BT/A type

Dimensions (mm)

Cat. No.	Stock	Taper Size	Diameter BD	Hole Diameter DCB	Overhang Length LPR	Body LBX	Weight (kg)	Fig
BT10-40A-32-060		40	32	BM-32	60	33	0.9	1
40-028		40	42	BM-40	28	1	0.9	1
40-060		40	42	BM-40	60	33	1.2	1
50-060		40	50	BM-50	60	33	1.3	1
63-055		40	63	BM-63	55	28	1.4	1
BT10-50A-32-070		50	32	BM-32	70	32	3.7	1
40-070		50	42	BM-40	70	32	3.9	1
50-070		50	50	BM-50	70	32	4.1	1
63-080		50	63	BM-63	80	42	4.3	1
80-100		50	80	BM-80	100	62	5.5	1
100-110		50	100	BM-100	110	72	7.0	1

HSK type (Coolant tube sold separately)

Dimensions (mm)

Cat. No.	Stock	Taper Size	Diameter BD	Hole Diameter DCB	Overhang Length LPR	Body LBX	Weight (kg)	Fig
BH10-50A-40-065		50	42	BM-40	65	39	0.7	2
BH10-63A-32-060		63	32	BM-32	60	34	1.0	2
40-065		63	42	BM-40	65	23	1.1	2
50-070		63	50	BM-50	70	44	1.5	2
63-080		63	63	BM-63	80	38	1.5	2
BH10-100A-40-080		100	42	BM-40	80	35	2.3	2
50-080		100	50	BM-50	80	35	2.5	2
63-080		100	63	BM-63	80	35	2.8	2
80-090		100	80	BM-80	90	45	3.8	2
100-100		100	100	BM-100	100	55	4.0	2

Parts

Fig 1



Fig 2

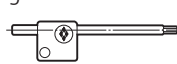
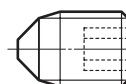
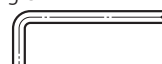
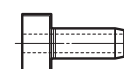


Fig 3



Clamp Screw

Size	Cat. No.
25	Z00-25-24
32	Z00-32-24
40	Z00-40-24
63	Z00-63-24
80	Z00-80-24
100	Z00-100-24



Coolant Tubes

Taper Size	Cat. No.
50	H00-50-01
63	H00-63-01
100	H00-100-01

For the HSK type arbor.

Group No.	Cat. No.	Fig	Torx/Hex	Weight (kg)
(1)	C00-90-02	1	G00-20-02	2
(2)	C00-90-04	1	G00-20-03	2
(3)	C00-26-23G	1	G00-02-07	3
(4)	C00-26-38G	1	G00-02-07	3
(5)	C00-24-26G	1	G00-02-08	3
(6)	C00-26-37G	1	G00-02-09	3
(7)	C00-24-31G	1	G00-02-16	3
(8)	C00-26-23B	1	G00-02-07	3
(9)	C00-26-38B	1	G00-02-07	3
(10)	C00-24-26B	1	G00-02-08	3
(11)	C00-26-37B	1	G00-02-09	3
(12)	C00-24-31B	1	G00-20-16	3

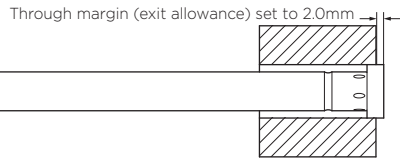


Recommended Tightening Torque (N·m)

■ Precautionary Notes When Using SR Reamers

For through holes, be sure the insert ($t = 4.3\text{mm}$) does not exit the hole completely.

*If it exits completely, the back end of the insert may be chipped upon return.



■ Recommended Cutting Conditions

The recommended conditions differ depending on the tool diameter and overhang length.

· $< \phi 35.600$ Tool overhang 6D or below (black text conditions), **above 6D (red text conditions)**

· $> \phi 35.601$ Tool overhang 5D or below (black text conditions), **above 5D (red text conditions)**

In addition, use with the red text conditions is recommended for low machine rigidity or clamp rigidity.

ISO	Work Material	Insert	Recommended Grades () indicates 2nd recommendation	Cutting Speed vc (m/min)	Feed Rate fz (mm/t)	Depth of Cut ap (mm/radius)			
						ø11.900 to ø23.600	ø23.601 to ø35.600	ø35.601 to ø140.600	
P	Mild Steel/Low Carbon Steel SS400/S15C	SRG type	F0512R1 (T1200A) F0512R1	140- 180 -220 80- 110 -140	0.16- 0.20 -0.25 0.08- 0.12 -0.18	0.05- 0.08 -0.12	0.08- 0.10 -0.15	0.08- 0.10 -0.15	
		SRL type	F0512R1 (T1200A) F0512R1	160- 200 -240 80- 110 -140	0.18- 0.25 -0.35 0.12- 0.16 -0.20	0.08- 0.10 -0.15	0.08- 0.10 -0.15	0.08- 0.10 -0.20	
	Carbon Steel / Alloy Steel S50C/SCM/SCr	SRG type	F0512R1 (T1200A) F0512R1	140- 160 -200 80- 100 -120	0.15- 0.18 -0.22 0.08- 0.12 -0.18	0.05- 0.08 -0.12	0.05- 0.10 -0.15	0.08- 0.10 -0.15	
		SRL type	F0512R1 (T1200A) F0512R1	140- 180 -220 80- 100 -120	0.18- 0.22 -0.30 0.10- 0.14 -0.18	0.08- 0.10 -0.15	0.08- 0.10 -0.15	0.08- 0.10 -0.15	
	Die Steel SKD	SRG type	F0512R1	50- 80 -100 25- 50 -70	0.10- 0.15 -0.18 0.06- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12	
		SRL type		50- 80 -100 25- 50 -70	0.10- 0.14 -0.16 0.06- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12	
	M	Austenitic Stainless Steel SUS304	SRG type	F0512R1	40- 60 -80 25- 40 -70	0.10- 0.12 -0.16 0.06- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12
			SRL type		40- 60 -80 25- 40 -70	0.10- 0.14 -0.16 0.06- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12
Precipitation Hardened Stainless Steel SUS631		SRG type	15- 20 -30 15- 20 -30		0.05- 0.08 -0.12 0.05- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12	
		SRL type	15- 20 -30 10- 18 -30		0.05- 0.08 -0.12 0.05- 0.08 -0.12	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12	
K	Cast Iron FC250	SRG type	T1212R1 (F0512R1) F0512R1	90- 120 -160 70- 90 -120	0.16- 0.22 -0.30 0.10- 0.15 -0.20	0.10- 0.15 -0.20	0.10- 0.15 -0.20	0.10- 0.15 -0.25	
	Ductile Cast Iron FCD450/FCD600		T1212R1 (F0512R1) F0512R1	120- 140 -180 80- 100 -120	0.16- 0.22 -0.30 0.10- 0.15 -0.20	0.08- 0.10 -0.15	0.10- 0.15 -0.20	0.10- 0.15 -0.20	
N	Aluminum Alloy ADC/AC	SRG type	F0510C	180- 250 -320 140- 160 -200	0.18- 0.25 -0.35 0.12- 0.16 -0.20	0.05- 0.10 -0.12	0.05- 0.10 -0.12	0.08- 0.10 -0.15	
		SRL type		180- 250 -320 140- 180 -200	0.18- 0.25 -0.35 0.15- 0.18 -0.22	0.05- 0.10 -0.12	0.05- 0.10 -0.15	0.08- 0.10 -0.15	
H	Hardened Steel up to 52HRC	SRG type	F0512R1	15- 25 -30 8- 15 -20	0.04- 0.06 -0.08 0.04- 0.06 -0.08	0.04- 0.05 -0.08	0.05- 0.08 -0.10	0.05- 0.08 -0.10	
S	Titanium Alloy Ti	SRG type	F0512R1	20- 30 -45 10- 18 -30	0.06- 0.10 -0.14 0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.10 -0.12	
		SRL type		20- 30 -45 10- 18 -30	0.06- 0.10 -0.14 0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.10 -0.12	0.05- 0.10 -0.12	
	Heat-Resistant Alloy Inconel	SRG type		12- 18 -25 5- 12 -20	0.05- 0.08 -0.10 0.05- 0.08 -0.10	0.04- 0.05 -0.08	0.05- 0.08 -0.10	0.05- 0.08 -0.10	
		SRL type		12- 18 -25 5- 12 -20	0.05- 0.08 -0.10 0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	0.05- 0.08 -0.10	

SR series Usage Instructions (Adjusting Runout)

The runout at the cutting edge of a reamer should be zero (0.005mm or less recommended) to obtain optimum reaming precision. To correct runout in the holder or the machine's spindle, use of holders with a runout adjustment mechanism, hydraulic chucks or shrink-fit is recommended. Various methods can be used to measure runout on a SumiReamer SR series reamer. With good runout repeatability, it is recommended that inserts be replaced without removing the shank holder from the spindle.

Runout Adjustment

A. Simple measurement method (measure holder short taper)

The short taper on the holder where the insert is mounted provides the easiest and most accurate measurement before mounting the insert.



B. Precise method for measuring runout (measure insert arc-shaped land)

Measuring the land immediately after the outer diameter of the insert eliminates all mounting error. This allows the most accurate runout measurement.



C. Simple measurement method (measure holder outer diameter)

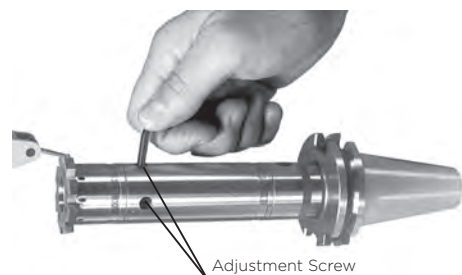
The high-precision machined outer diameter of the shank holder provides a good estimate of the runout measurement.



*A has the greatest runout accuracy, followed by B and then C.

Runout adjustment using shank with runout adjustment mechanism (>φ35.6mm)

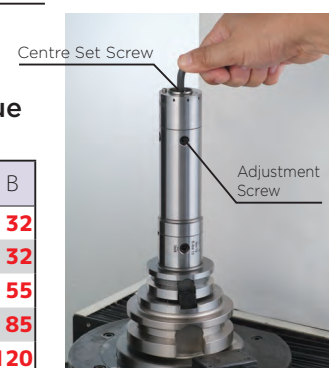
- (1) Tighten the centre set screw to torque value A in the table below, then attach the insert and measure the runout of the cutting edge.
- (2) Verify the cutting edge where runout peaks and adjust with the adjustment screw.
- (3) Repeat this adjustment for each tooth as necessary.
- (4) Remove the adjusted insert, tighten the centre set screw to torque value B in the table below and then re-attach the insert.



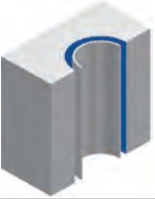
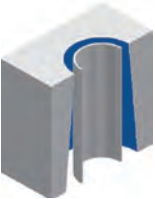
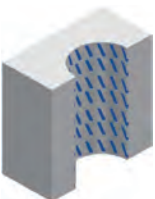
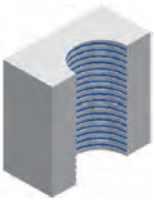
Recommended Tightening Torque for Centre Set Screw (N·m)

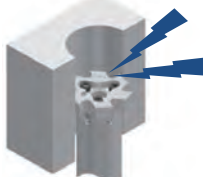
Head Size	Cap Screw	Size	A	B
SRK □ 44	C00-26-23G/B	M8 × 60	25	32
SRK □ 52	C00-26-38G/B	M8 × 70	25	32
SRK □ 61	C00-24-26G/B	M10 × 80	40	55
SRK □ 81	C00-26-37G/B	M12 × 100	65	85
SRK □ 101	C00-24-31G/B	M16 × 100	95	120

↑ G, B



■ Troubleshooting

Failure	Countermeasures
Enlarged hole diameter 	- Reduce runout as much as possible. (use a holder with a diameter correction mechanism). - Decrease cutting speed - Increase the feed rate. - Increase coolant concentration. - Reduce stock removal. - Check cutting edge for damage. (whether there are built-up edges) - Change insert diameter.
Tapered hole 	- Reduce runout as much as possible. (use a holder with a diameter correction mechanism). - Decrease cutting speed - Decrease the feed rate. - Adjust coolant concentration. - Review pre-machining process. - Review workpiece clamping method. - Compare the hole diameters when the workpiece is clamped and when it is unclamped. - Check and correct the direction of chip evacuation.
Chatter marks on machined surface 	- Reduce runout as much as possible. (use a holder with a diameter correction mechanism). - Change the approach angle of the insert cutting edge. - Review workpiece clamping method. - Decrease cutting speed. - Increase the feed rate.
Poor finished surface roughness 	- Check cutting edge for damage. - Reduce runout as much as possible. (use a holder with a diameter correction mechanism). - Check whether cutting conditions are within the recommended range. - Change to internal coolant supply. - Increase coolant concentration.

Failure	Countermeasures
Return marks 	- Reduce runout as much as possible. (use a holder with a diameter correction mechanism). - Check cutting edge for damage. (whether there are built-up edges) - Reduce stock removal. - Change to an insert with a sharper cutting edge shape. - Decrease the return (lifting) feed.
Irregular cutting noise 	- Decrease the coolant concentration. - Increase the stock removal. - Check cutting edge for damage. - Change the approach angle of the insert cutting edge.
Smaller hole diameter 	- Replace the insert. - Decrease the coolant concentration. - Increase the stock removal. - Increase cutting speed. - Decrease the feed rate.

● Precautions for SD series (Centre Bolt Clamp type)

This product can be used for both through-hole and stop-hole reaming. However, the head of the centre bolt protrudes from the end of the body, so ensure clearance by referring to the protrusion of the centre bolt (LFA) shown in the dimension table.

