SUMITOMO
CARBIDE - CBN - DIAMOND

K

2018-2019
Drilling Tools

Multi-Drills // Solid Type Drills // Flat Drills // Deep Hole Drills // Brazed Type Drills //
Replaceable Head Type Drills // Insert Type Drills

SUMITOMO
ELECTRIC
GROUP

Multi-Drills

K

K1 ~ K76

Selection Guide	**MULTI-DRILLs**	K 2 - 5
Solid Type Drills	**SDP …** U3/5/7-**HAK**	K 6 -11
	New **SDM …** U3/5 **-HAK**	K12-17
	MDW … GS 2/4	K18-21
	MDS … S/M **K-HAK**	K22-23
	MDS … S/M **K**	K24-27
	MDS … S/M **G**	K24-27
Flat MultiDrill	New **MDF**	K28-35
Deep Hole Drills	New **MDW… XHG S / PHT**	K36-37
for Steels	New **MDW … XHG S**	K38
for Aluminium	**MDW … XHT A**	K39
Pilot Hole Drills	**MDW … PHT**	K38-39
AURORA COAT Drills	**MDW … NHGS**	K40~41
MINI-Drills	**MLDH …** L/P	K42~43
	MDUS / MDSS	K44
SUMIDIA Coated Drills	MDS … **SDC**	K45
Brazed Type Drills	**KDS**	K47
Series	**KDS … MAK**	K48~49
	KDS … LAK	K50~51
	KDS … DAK	K52~53
	KDS … FA	K54
Replaceable Head Type Drills	**SMD**	K55
Drill Holder	**SMDH** …(D)	K56/61/63
Drill Head for Steels	**SMDT** …D **MTL**	K57
for Stainless Steels	**SMDT** …D **MEL**	K58~59
for Spot Facing	New **SMDT** ….**MFS**	K60~61
Large Holes	**SMDT**…..**MTL**	K62~63
Insert Type Drills	**WDX** (2D, 3D, 4D, 5D)	K64~73
Eccentric Sleeve	**WAS**	K70
Plunge Drills	**PDL** (2D, 3D)	K74~76
Multi-Function Mills	**PCT** (3D, 5D)	K75~76

Multi-Drill Series

General Features

MultiDrill series is Sumitomo's original brand of high performance drills that have a special cutting edge design coupled with an advance carbide substrate.
The series has a comprehensive selection of diameters and drill lengths to cover a wide range of work materials and require-ments, providing high efficiency, high precision and cost effectiveness.

Solid Carbide Type Multi-Drills Selection

	SDP ...	SDM ... (New)	MDW ...	MDS ...		MDF ... (New)		MDW ... ○○○			MLDH	MDUS / MDSS	MDS ...
Type	...U3/5/7 **-HAK** (DIN)	...U3/5 **-HAK** (DIN)	**GS** 2/4	S/M **K-HAK** (DIN)	... **SK/SG**	...S2D, L2D ...H3D, H5D		... **PHT**	... **XHGS** (New) ... **XHTA**	... **NHGS**	... P / L	–	... **SDC**
Page	⇨ K 6~11	⇨ K 12~17	⇨ K18~21	⇨ K22~23	⇨ K24~27	⇨ K28~35		⇨ K36~39		⇨ K40~41	⇨ K42~43	⇨ K44	⇨ K45
								 Pilot drill			 Pilot drill		
Application	P K	P M	P	P M K	K N	P		P M K N		N	P M K	P M K H	N
Form	m7 drill DIN type		h8 drill cylindric	m7 drill DIN type	h8 drill, cylindric	h8 drill cylindric		Extra long DIN type		Super Multi-Drill	Long Micro Drill	Mini Multi-Drill	Diamond Coated
Length (The ratio to øD)	3D/5D/7D	3D / 5D	2 / 4D	3D / 5D	2,5D / 4D	S2D/ L2D	H3D/ H5D	3D	10D ~ 30D	3D / 5D / 10D	5/12/20/30 D	10D	3D
Coolant holes	Yes		No	Yes	No	No	Yes	Yes		Yes	Yes	No	No
Coating	AlCrTiN		DEX (TiAlCr/TiSi)	TiAlN	–	PVD		TiAlN	–	DLC	TiAlN	TiAlN / ZX	SUMIDIA
Diameter range	ø 3,0 ~ ø16,0		ø 2,0 ~ ø16,0	ø 4,0 ~ ø12,0	ø 2,0 ~ ø14,0	ø 0,3 ~ ø20,0	ø 3,0 ~ ø16,0	ø 4,0 ~ ø 8,0	ø 3,0 ~ ø 12,0	ø 3,0 ~ ø 16,0	ø 0,8 ~ ø 2,0	ø 0,03 ~ ø 1,0	ø 2,0 ~ ø 10,0

Advantages

- Unique curved flute design with proven enhanced chip formation and removal, resulting in better hole accuracy.
- High speed and high efficient drilling is made possible with the combination of a special substrate with an advanced PVD coating. (10x tool life of HSS drills, 5x the efficiency)
- Wide selection range (Diameter: 0,03 ~ 65mm, Drilling depths L/D: 2 ~ 30)
- Other diameters and length can be asked and offered

Brazed Carbide Type and Insert Type Multi-Drills Selection

	KDS ... ○○○ ⇨ K47				SMD ... ⇨ K55,K60, K62	WDX ...○○ WAS ....-.. ⇨ K70	PDL ...○○	PCT ...○○
Type	MAK	LAK	DAK	FA	SMDT ...(D) MTL ⇨ K57, K63			
Page	⇨ K48~49	⇨ K50~51	⇨ K52~53	⇨ K54	SMDT ...D MEL ⇨ K58~59	⇨ K64~73	⇨ K74~76	⇨ K75~76
					SMDT ... MFS New ⇨ K61			
					SMDH ...M-3/5/8 ⇨ K56, K60 SMDH ...M / L / D ⇨ K63			
								
Application	P M K S			K N	P M K	P M K N		
Form	h7 drill			h8 drill	SMDT type carbide head	Indexable insert drill	Straight flute insert drill	Insert mill
Length (The ratio to øD)	3D	5D	7D	10D	1.5D / 3D / 5D / 8D / 12D	2D / 3D / 4D / 5D	2D / 3D	3D / 5D
Coolant holes	Yes			Yes	Yes	Yes		
Coating	TiAlN			–	TiAlN	WDXT type insert		
Diameter range	ø 9,5 ~ ø 40,5			ø 8,0 ~ ø 30,5	ø 12,0 ~ ø 42,5	ø 13,0 ~ ø 65,0	ø 16,0 ~ ø 40,0	

Selection Guide

● According to Drill Types / Applications

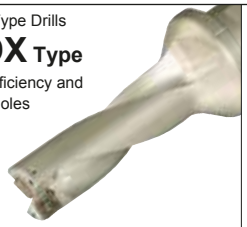
Application	General ⟷ Special		
Solid Type "Super Multi-Drill" MDS / MDW Type	m7 DIN Type "Super Multi-Drill" **SDP...U HAK Type** AlCrTiN coated general purpose drill with coolant holes øD : 3,0 ~ 16mm L/D: 3, 5, 7 ⇨ K6 ~ 11	"Super Multi-Drill" **MDW...GS Type** DEX (TiAlCr/TiSi) coated general purpose drill without coolant holes øD : 2,0 ~ 16mm L/D: ~ 2, ~ 4 ⇨ K18 ~ 21	—
	m7 DIN Type "Super Multi-Drill" **MDS...K-HAK Type** TiAlN coated general purpose drill with coolant holes øD : 2,0 ~ 12mm L/D: ~ 2, ~ 4 ⇨ K22 ~ 23	"Super Multi-Drill" **MDS...G Type** For Cast Iron & Aluminum øD : 2,8 ~ 20mm L/D: ~ 3 ⇨ K24 ~ 27	"Super Multi-Drill" **MDS...D Type** Hardened Steel Exotic Metals øD : 1,0 ~ 16,1mm L/D: ~ 3 (Stock in Japan)
Brazed Type "Super Multi-Drill" KDS Type	"Super Multi-Drill" **KDS... MAK Type** General Purpose Drill øD : 12 ~ 26mm L/D: ~ 3 ⇨ K48 ~ 49	Long Type "Super Multi-Drill" **KDS... LAK Type** Deep Hole Drilling øD : 12 ~ 26mm L/D: ~ 5 ⇨ K50 ~ 51	—
	—	Long Type "Super Multi-Drill" **KDS... DAK Type** Good Chip Removal øD : 9 ~ 22mm L/D: ~ 7 ⇨ K52 ~ 53	Extra Long Typ "Super Multi-Drill" **KDS... FA Type** For Cast Irons and Aluminium Alloys Delivery on request øD : 9 ~ 22mm L/D: ~ 7 ⇨ K54

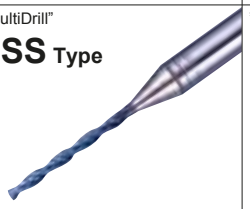
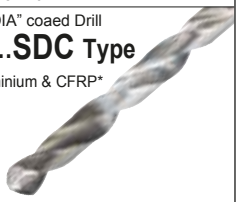
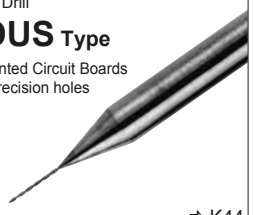
■ Recommended Cutting Conditions by Work Materials

Drill		Steel	Stainless Steel	Cast Iron	Non-ferrous Metalls
Solid Type	**SDP...U HAK** **MDW...GS**	50 | 120 | 0,35 0,2 | 0,35	15 | 70 0,1 | 0,2	50 | 110 | 0,35 0,2 | 0,35	—
	MDS...G	—	—	25 | 80 | 0,4 0,25 | 0,4	80 | 200 | 0,45 0,25 | 0,45
Brazed Type	**KDS...AK** **(MAK / LAK / DAK)**	50 | 90 | 0,35 0,15 | 0,35	35 | 50 0,15 | 0,25	60 | 100 | 0,35 0,2 | 0,35	—
	KDS...FA	—	—	30 | 70 | 0,5 0,2 | 0,5	60 | 150 | 0,5 0,2 | 0,5

Cutting speed v_c (m/min)
Feed f (mm/rev)

● According to Drill Types / Applications

Application	General ⟷ Special		
Indexable Drills	Insert Type Drills **WDX Type** High Efficiency and Deep Holes  øD : 13,0 ~ 65,0mm L/D: 2, 3, 4, 5 ➪ K64 ~ 73	Replaceable Head Type Drills **SMD Type**  øD : 12,0~ 42,5mm L/D: 3, 5, 8 ➪ K55 ~ 63	"Multi-Function" Types **PDL & PCT** Plunge Drills and Plunge Mills  øD : 16,0 ~ 40,0mm L/D: 2, 3, 5 ➪ K74 ~ 76

Application	Deep Hole	Very Small Hole	Precision Hole
Special Purpose Drills	"Super Long Multi-Drill" **MDW...XHGS/XHTA Type** New General Purpose Deep Hole Drill  øD :4,0 ~ 12,0mm L/D: 10/15/20/25/30 ➪ K36 ~ 39	"Long Micro Drill" **MLDH... P/L Type** "P" type for pilot hole  øD : 0,8 ~ 2,0mm L/D: 5/12/20/30 ➪ K42 ~ 43	AURORA-Coat Drill **MDW...NHGS Type** For Aluminium Alloy  øD : 3,0 ~ 16,0mm L/D: 3 / 5 / 10 ➪ K40 ~ 41
	—	"Mini-MultiDrill" **MDSS Type**  øD : 0,20 ~ 1,00mm L/D: 10 ➪ K44	"SUMI-DIA" coaed Drill **MDS...SDC Type** For Aluminium & CFRP*  CFRP* (Carbon FibreReinforced Plastic) øD : 2 ~ 10mm L/D: ~ 3 ➪ K45
	—	"Micro Drill" **MDUS Type** For Printed Circuit Boards High precision holes  øD : 0,05 ~ 0,19mm L/D: ~ 8 ➪ K44	—

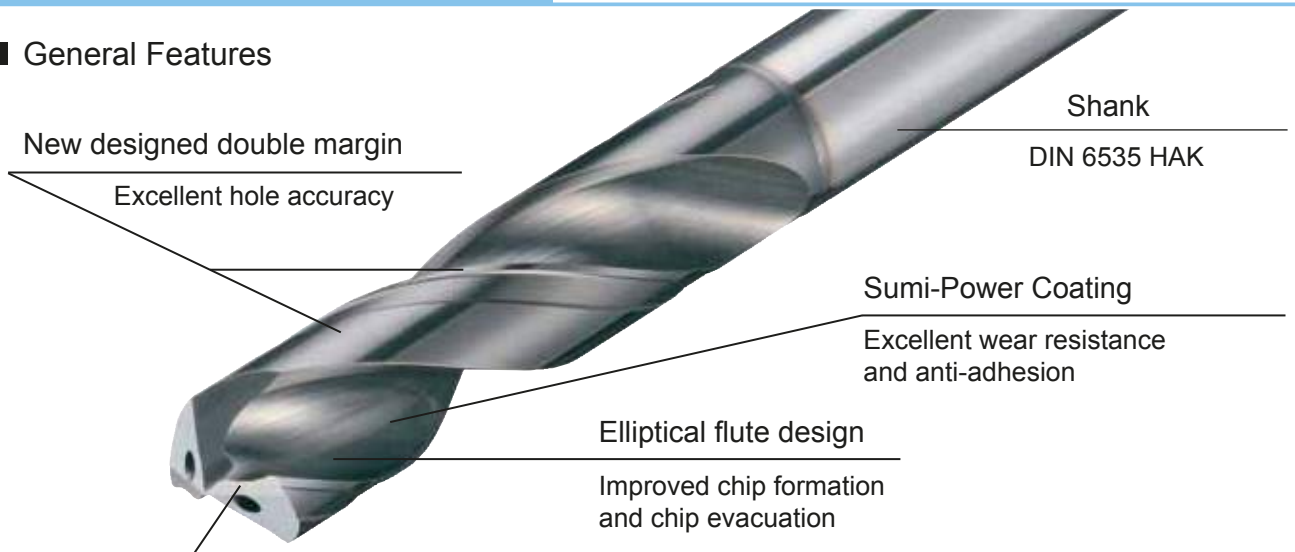
■ Recommended Cutting Conditions by Work Materials

Drill \ Work	Steel	Stainless Steel	Cast Iron	Non-ferrous Metalls
SMD (ø20)	50 ▬ 120 0,12 ⊢ 0,35	50 ▬ 90 0,1 ⊢ 0,25	50 ▬ 100 0,2 ⊢ 0,45	100 ▬ 180 0,2 ⊢ 0,4
WDX (ø18)	100 ▬ 220 0,15 ⊢ 0,25	80 ▬ 180 0,06 ⊢ 0,18	120 ▬ 200 0,1 ⊢ 0,32	100 ▬ 200 0,1 ⊢ 0,25
MDW...XHT (ø5)	80 ▬ 120 0,15 ⊢ 0,25	30 ▬ 60 0,08 ⊢ 0,15	50 ▬ 90 0,15 ⊢ 0,3	80 ▬ 160 0,12 ⊢ 0,35

▬ Cutting speed v_c (m/min)
⊢ Feed f (mm/rev)

SDP Type (DIN)

General Features

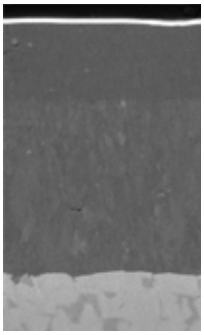


Stock Size

Ø3,0 ~ Ø12,0
Increment 0,1mm

Ø12,1 ~ Ø16,0
Standard diameter

Coating Structure



Improved anti-adhesion AlCrTiN lubricant layer coating with high Al content improves friction condition.

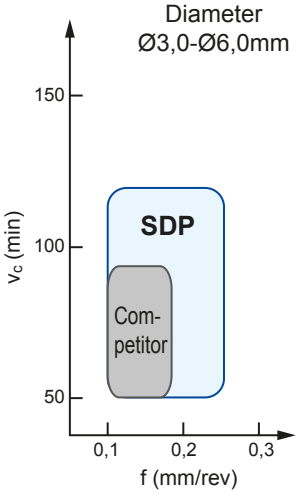
High wear resistance
Tough and hard
AlCrTiN super multilayer

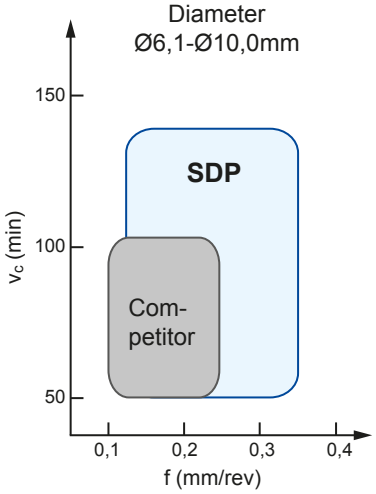
Substrate

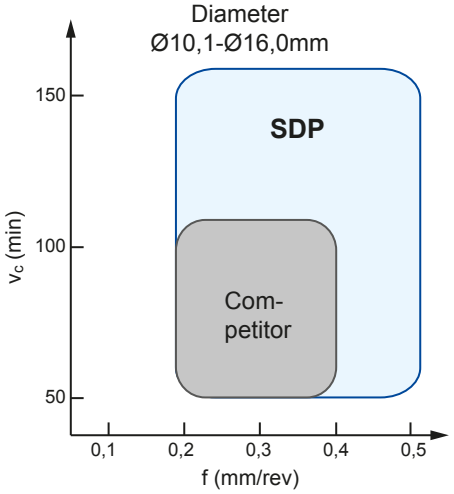
Advantages

- The specific and optimum solution for a wide range of application conditions
- Top performance parameters, maximum feed and stable long tool life
- Double margin design for high-precision holes
- Good balance of high wear resistance and toughness
- Curved cutting edge - ideal for removing chips
- Reliable and high productivity performance

Application Range







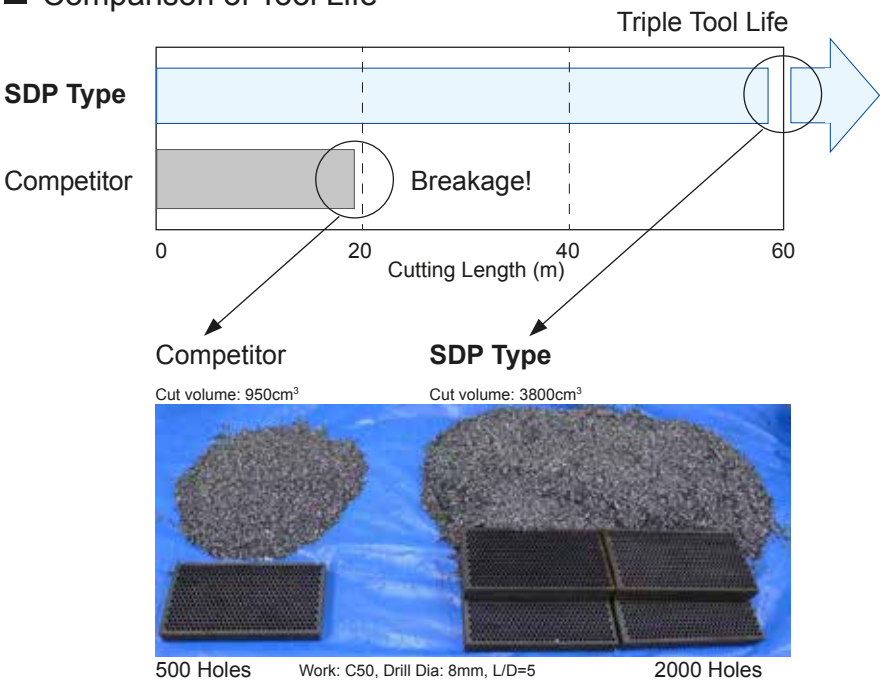
Maximum Feed Rate Result

Feed Rate (mm/rev)	0,30	0,40	0,50	0,55	0,60	0,65	0,70	0,75	0,80
SDP Type	OK	OK	OK	OK	OK	OK	OK	OK	
Competitor	OK	Breakage!							

Internal test conditions

Drill:	Ø 4, L/D=5
Work Material:	Carbon Steel (C50)
Cutting Data:	v_c=80m/rev, a_p=18mm

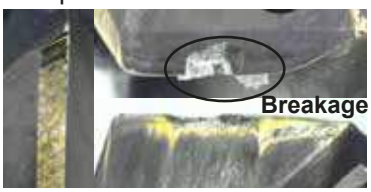
Comparison of Tool Life



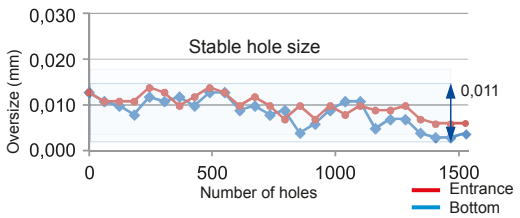
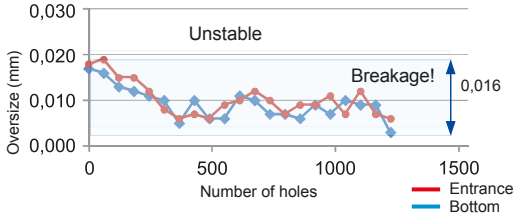
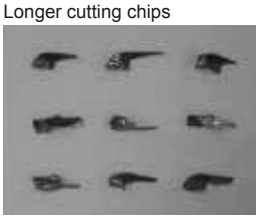
Drill:	Ø 8, L/D=5
Work Material:	Carbon Steel (C50)
Cutting Data:	v_c=80m/min, f=0,15mm/rev, a_p=38mm, Through hole, Internal coolant

SDP Type

Competitor

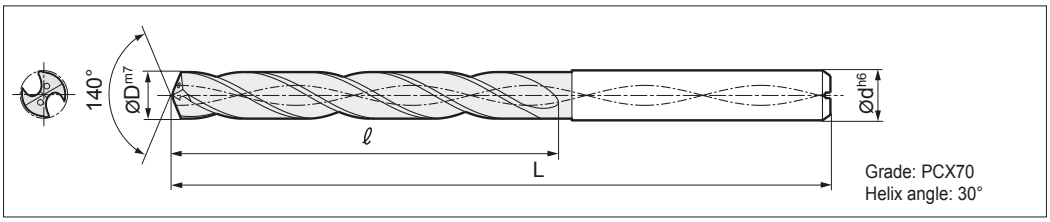


Excellent Hole Accuracy

	Hole Accuracy	Chip Shape
SDP Type	 	Compact cutting chips 
Competitor	 	Longer cutting chips 

Drill:	Ø 8, L/D=5
Workpiece:	Carbon Steel (C50)
Cutting Data:	v_c=80m/min, f=0,25mm/rev, a_p=24mm, Blind-hole, Internal coolant

■ Solid Carbide Drill with Internal Coolant Supply, ØD: 3,0 ~ 7,5mm, 3D / 5D /7D

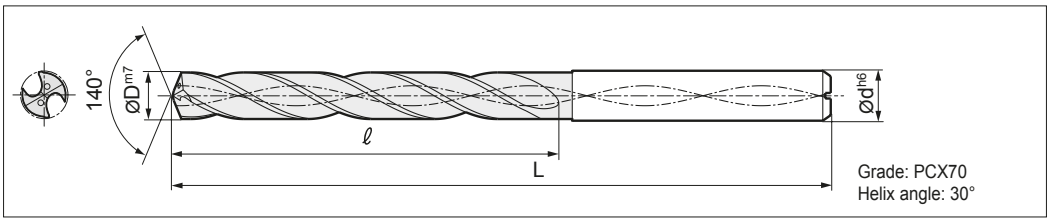


ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3, 5, 7	3D Type			5D Type			7D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ	7	L	ℓ
3,0	6	SDP 0300 U □ HAK	●	62	17	●	66	24	●	70	29
3,1		SDP 0310 U □ HAK	●			●			●		
3,2		SDP 0320 U □ HAK	●			●			●		
3,25		SDP 0325 U □ HAK	●			●			●		
3,3		SDP 0330 U □ HAK	●			●			●		
3,4		SDP 0340 U □ HAK	●			●			●	75	33,5
3,5		SDP 0350 U □ HAK	●			●			●		
3,6		SDP 0360 U □ HAK	●			●			●		
3,7		SDP 0370 U □ HAK	●			●			●		
3,8		SDP 0380 U □ HAK	●		21	●	74	33	●		35,5
3,9		SDP 0390 U □ HAK	●			●			●		
4,0		SDP 0400 U □ HAK	●			●			●		
4,1		SDP 0410 U □ HAK	●			●			●		
4,2		SDP 0420 U □ HAK	●			●			●		
4,3		SDP 0430 U □ HAK	●	66		●			●	85	44
4,4		SDP 0440 U □ HAK	●			●			●		
4,5		SDP 0450 U □ HAK	●			●			●		
4,6		SDP 0460 U □ HAK	●			●			●		
4,65		SDP 0465 U □ HAK	●			●			●		
4,7		SDP 0470 U □ HAK	●			●			●		
4,8		SDP 0480 U □ HAK	●		25	●	82	41	●	90	49
4,9		SDP 0490 U □ HAK	●			●			●		
5,0		SDP 0500 U □ HAK	●			●			●		
5,1		SDP 0510 U □ HAK	●			●			●		
5,2		SDP 0520 U □ HAK	●			●			●		
5,3		SDP 0530 U □ HAK	●			●			●		
5,4		SDP 0540 U □ HAK	●			●			●	97	56
5,5		SDP 0550 U □ HAK	●			●			●		
5,55		SDP 0555 U □ HAK	●			●			●		
5,6		SDP 0560 U □ HAK	●			●			●		
5,7		SDP 0570 U □ HAK	●			●			●		
5,8		SDP 0580 U □ HAK	●			●			●		
5,9		SDP 0590 U □ HAK	●			●			●		
6,0		SDP 0600 U □ HAK	●			●			●		
6,1	8	SDP 0610 U □ HAK	●	79	31	●	91	50	●	106	65
6,2		SDP 0620 U □ HAK	●			●			●		
6,3		SDP 0630 U □ HAK	●			●			●		
6,4		SDP 0640 U □ HAK	●			●			●		
6,5		SDP 0650 U □ HAK	●			●			●		
6,6		SDP 0660 U □ HAK	●			●			●		
6,7		SDP 0670 U □ HAK	●			●			●		
6,8		SDP 0680 U □ HAK	●			●			●		
6,9		SDP 0690 U □ HAK	●			●			●	116	75
7,0		SDP 0700 U □ HAK	●			●			●		
7,1		SDP 0710 U □ HAK	●		37	●			●		
7,2		SDP 0720 U □ HAK	●			●			●		
7,3		SDP 0730 U □ HAK	●			●			●		
7,4		SDP 0740 U □ HAK	●			●			●		
7,5		SDP 0750 U □ HAK	●			●			●		

※ Remarks:
❑ Non-Stock Items will be required minimum order quantity for 30 pcs.

● = Euro stock
❑ = Delivery on request

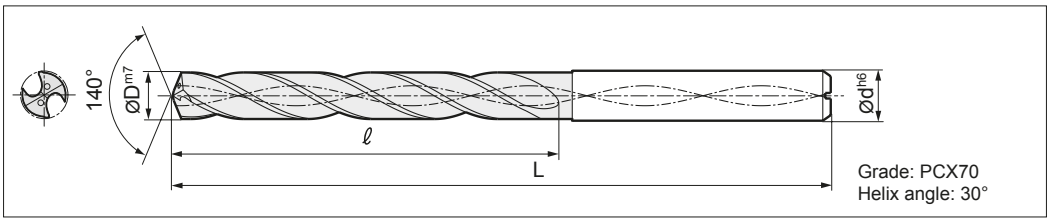
■ Solid Carbide Drill with Internal Coolant Supply, ØD: 7,6 ~ 12,5mm, 3D / 5D / 7D



ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3, 5, 7	3D Type			5D Type			7D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ	7	L	ℓ
7,6	8	SDP 0760 U □ HAK	●	79	37	●	91	50	●	116	75
7,7		SDP 0770 U □ HAK	●			●			●		
7,8		SDP 0780 U □ HAK	●			●			●		
7,9		SDP 0790 U □ HAK	●			●			●		
8,0		SDP 0800 U □ HAK	●			●			●		
8,1	10	SDP 0810 U □ HAK	●	89	43	●	103	57	●	131	85
8,2		SDP 0820 U □ HAK	●			●			●		
8,3		SDP 0830 U □ HAK	●			●			❑		
8,4		SDP 0840 U □ HAK	●			●			●		
8,5		SDP 0850 U □ HAK	●			●			●		
8,6		SDP 0860 U □ HAK	●			●			●		
8,7		SDP 0870 U □ HAK	●			●			●		
8,8		SDP 0880 U □ HAK	●			●			●		
8,9		SDP 0890 U □ HAK	●			●			❑		
9,0		SDP 0900 U □ HAK	●			●			●		
9,1		SDP 0910 U □ HAK	●			●			●	139	93
9,2		SDP 0920 U □ HAK	●			●			●		
9,25		SDP 0925 U □ HAK	●			●			❑		
9,3		SDP 0930 U □ HAK	●			●			●		
9,4		SDP 0940 U □ HAK	●			●			●		
9,5		SDP 0950 U □ HAK	●			●			●		
9,6		SDP 0960 U □ HAK	●			●			❑		
9,7		SDP 0970 U □ HAK	●			●			●		
9,8		SDP 0980 U □ HAK	●			●			●		
9,9		SDP 0990 U □ HAK	●			●			●		
10,0		SDP 1000 U □ HAK	●			●			●		
10,1	12	SDP 1010 U □ HAK	●	102	51	●	118	67	❑	155	104
10,2		SDP 1020 U □ HAK	●			●			●		
10,3		SDP 1030 U □ HAK	●			●			❑		
10,4		SDP 1040 U □ HAK	●			●			❑		
10,5		SDP 1050 U □ HAK	●			●			●		
10,6		SDP 1060 U □ HAK	●			●			❑		
10,7		SDP 1070 U □ HAK	●			●			❑		
10,8		SDP 1080 U □ HAK	●			●			●		
10,9		SDP 1090 U □ HAK	●			●			❑		
11,0		SDP 1100 U □ HAK	●			●			●		
11,1		SDP 1110 U □ HAK	●			●			❑	163	112
11,2		SDP 1120 U □ HAK	●			●			●		
11,3		SDP 1130 U □ HAK	●			●			❑		
11,4		SDP 1140 U □ HAK	●			●			❑		
11,5		SDP 1150 U □ HAK	●			●			●		
11,6		SDP 1160 U □ HAK	●			●			❑		
11,7		SDP 1170 U □ HAK	●			●			❑		
11,8		SDP 1180 U □ HAK	●			●			●		
11,9		SDP 1190 U □ HAK	●			●			❑		
12,0		SDP 1200 U □ HAK	●			●			●		
12,1	14	SDP 1210 U □ HAK	❑	107	56	❑	124	73	❑	182	131
12,2		SDP 1220 U □ HAK	●			●			●		
12,3		SDP 1230 U □ HAK	❑			❑			❑		
12,4		SDP 1240 U □ HAK	❑			❑			❑		
12,5		SDP 1250 U □ HAK	●			●			●		

※ Remarks:
❑ Non-Stock Items will be required minimum order quantity for 30 pcs.

■ Solid Carbide Drill with Internal Coolant Supply, ØD: 12,6 ~ 16,0mm, 3D / 5D / 7D



ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3, 5, 7	3D Type			5D Type			7D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ	7	L	ℓ
12,6	14	SDP 1260 U □ HAK	❑	107	56	❑	124	73	❑	182	131
12,7		SDP 1270 U □ HAK	❑			❑			❑		
12,8		SDP 1280 U □ HAK	❑			❑			❑		
12,9		SDP 1290 U □ HAK	❑			❑			❑		
13,0		SDP 1300 U □ HAK	●			●			●		
13,1		SDP 1310 U □ HAK	❑			❑			❑		
13,2		SDP 1320 U □ HAK	❑			❑			❑		
13,3		SDP 1330 U □ HAK	❑			❑			❑		
13,4		SDP 1340 U □ HAK	❑			❑			❑		
13,5		SDP 1350 U □ HAK	●			●			●		
13,6		SDP 1360 U □ HAK	❑			❑			❑		
13,7		SDP 1370 U □ HAK	●			●			●		
13,8		SDP 1380 U □ HAK	❑			❑			❑		
13,9		SDP 1390 U □ HAK	❑			❑			❑		
14,0		SDP 1400 U □ HAK	●			●			●		
14,1	16	SDP 1410 U □ HAK	❑	115	60	❑	133	78	❑	204	149
14,2		SDP 1420 U □ HAK	●			●			●		
14,3		SDP 1430 U □ HAK	❑			❑			❑		
14,4		SDP 1440 U □ HAK	❑			❑			❑		
14,5		SDP 1450 U □ HAK	●			●			●		
14,6		SDP 1460 U □ HAK	❑			❑			❑		
14,7		SDP 1470 U □ HAK	●			●			●		
14,8		SDP 1480 U □ HAK	❑			❑			❑		
14,9		SDP 1490 U □ HAK	❑			❑			❑		
15,0		SDP 1500 U □ HAK	●			●			●		
15,1		SDP 1510 U □ HAK	❑			❑			❑		
15,2		SDP 1520 U □ HAK	●			●			●		
15,3		SDP 1530 U □ HAK	❑			❑			❑		
15,4		SDP 1540 U □ HAK	❑			❑			❑		
15,5		SDP 1550 U □ HAK	●			●			●		
15,6		SDP 1560 U □ HAK	❑			❑			❑		
15,7		SDP 1570 U □ HAK	●			●			●		
15,8		SDP 1580 U □ HAK	❑			❑			❑		
15,9		SDP 1590 U □ HAK	❑			❑			❑		
16,0		SDP 1600 U □ HAK	●			●			●		

※ Remarks:
❑ Non-Stock Items will be required minimum order quantity for 30 pcs.

● = Euro stock
❑ = Delivery on request

Recommended Cutting Conditions

Material Group						SDP_____U_HAK PCX70					
						ØD: 3,0 - 6,0		ØD: 6,1 - 10,0		ØD: 10,1 - 16,0	
ISO 513	Work Material	Type/ Structure	R_m N/mm²	Hardness HB30	Fitness	v_c=m/min	Feed rate (mm/rev)	v_c=m/min	Feed rate (mm/rev)	v_c=m/min	Feed rate (mm/rev)
P	Carbon steel Cast steel	free cutting steel construction steel case-hardened steel heat-treatable steel spring steel	420	125	◎	50 - **80** - 120	0,15 - **0,20** - 0,31	70 - **110** - 140	0,20 - **0,25** - 0,42	80 - **120** - 160	0,25 - **0,30** - 0,53
			650	190	◎	50 - **80** - 120	0,15 - **0,20** - 0,31	70 - **110** - 140	0,20 - **0,25** - 0,42	80 - **120** - 160	0,25 - **0,30** - 0,53
			850	250	◎	50 - **80** - 120	0,15 - **0,20** - 0,31	70 - **110** - 140	0,20 - **0,25** - 0,42	80 - **120** - 160	0,25 - **0,30** - 0,53
			750	270	◎	50 - **80** - 120	0,15 - **0,20** - 0,31	70 - **110** - 140	0,20 - **0,25** - 0,42	80 - **120** - 160	0,25 - **0,30** - 0,50
			1000	300	◎	10 - **20** - 30	0,05 - **0,06** - 0,11	15 - **22** - 30	0,08 - **0,09** - 0,14	20 - **28** - 35	0,08 - **0,09** - 0,16
	Low alloy steel Cast steel	case-hardened steel heat-treatable steel bearing steel nitriding steel cold work steel	600	180	◎	50 - **70** - 90	0,10 - **0,14** - 0,24	60 - **80** - 110	0,15 - **0,20** - 0,32	70 - **100** - 120	0,20 - **0,25** - 0,40
			930	275	◎	45 - **65** - 85	0,10 - **0,14** - 0,24	60 - **80** - 110	0,15 - **0,22** - 0,34	65 - **95** - 120	0,20 - **0,25** - 0,37
			1000	300	○	40 - **60** - 80	0,10 - **0,15** - 0,26	60 - **80** - 110	0,15 - **0,20** - 0,32	60 - **90** - 120	0,20 - **0,25** - 0,37
			1200	350	◎	35 - **55** - 75	0,10 - **0,15** - 0,26	55 - **75** - 110	0,15 - **0,22** - 0,32	55 - **80** - 110	0,20 - **0,27** - 0,38
	High alloy steel	tool steel hot work steel	680	200	○	30 - **40** - 50	0,10 - **0,15** - 0,25	30 - **40** - 50	0,12 - **0,20** - 0,28	30 - **40** - 50	0,12 - **0,20** - 0,32
			1100	325	○	20 - **30** - 40	0,10 - **0,12** - 0,23	20 - **30** - 40	0,12 - **0,15** - 0,27	20 - **30** - 40	0,14 - **0,18** - 0,32
M	Stainless steel Cast steel	martensitic/ferritic	680	200	○	40 - **55** - 70	0,08 - **0,10** - 0,21	40 - **60** - 75	0,10 - **0,12** - 0,25	50 - **70** - 80	0,10 - **0,12** - 0,25
		martensitic	820	240	⊙	30 - **45** - 60	0,08 - **0,10** - 0,20	40 - **60** - 70	0,10 - **0,12** - 0,24	50 - **60** - 80	0,10 - **0,12** - 0,24
		austenitic	600	180	⊙	30 - **45** - 60	0,08 - **0,10** - 0,20	40 - **60** - 70	0,10 - **0,12** - 0,24	50 - **60** - 80	0,10 - **0,12** - 0,24
		Duplex	740	230	⊙	30 - **45** - 60	0,06 - **0,08** - 0,18	40 - **60** - 70	0,08 - **0,10** - 0,23	50 - **60** - 80	0,10 - **0,10** - 0,23
K	Cast iron GG	ferritic/pearlitic		180	◎	50 - **70** - 90	0,15 - **0,20** - 0,36	60 - **80** - 100	0,20 - **0,25** - 0,40	70 - **100** - 120	0,25 - **0,30** - 0,42
		pearlitic		260	◎	40 - **60** - 80	0,15 - **0,20** - 0,36	50 - **70** - 90	0,20 - **0,25** - 0,40	60 - **80** - 100	0,25 - **0,30** - 0,42
	Cast iron GGG	ferritic		160	◎	50 - **70** - 90	0,15 - **0,18** - 0,31	60 - **80** - 100	0,20 - **0,25** - 0,40	70 - **100** - 120	0,25 - **0,30** - 0,42
		pearlitic		250	◎	40 - **60** - 80	0,15 - **0,18** - 0,31	50 - **70** - 90	0,20 - **0,25** - 0,40	70 - **80** - 100	0,25 - **0,30** - 0,42
S	Heat resisting alloys	Fe-based			○	10 - **20** - 30	0,08 - **0,09** - 0,13	15 - **22** - 32	0,08 - **0,10** - 0,15	20 - **28** - 35	0,10 - **0,12** - 0,19
		Ni / Co-based			○	10 - **20** - 30	0,08 - **0,09** - 0,13	15 - **22** - 32	0,08 - **0,10** - 0,15	20 - **28** - 35	0,10 - **0,12** - 0,19
	Titanium Titanium alloys	pure Titanium	430								
		Ti-Basis			○	10 - **20** - 30	0,05 - **0,06** - 0,12	15 - **22** - 32	0,08 - **0,09** - 0,17	20 - **28** - 35	0,08 - **0,09** - 0,17
N	Aluminium Al-wrought alloys	pure aluminium									
		wrought alloys									
	Aluminium Cast alloys	Si ≤ 12%									
		Si ≥ 12%			⊙	70 - **90** - 100	0,15 - **0,20** - 0,25	80 - **100** - 120	0,20 - **0,25** - 0,30	100 - **120** - 140	0,25 - **0,30** - 0,35
		Al - Mg alloys									
	Zinc die-cast	Zn alloys									
	Copper alloys	Copper									
		Brass			○	80 - **100** - 120	0,15 - **0,20** - 0,25	110 - **130** - 180	0,20 - **0,25** - 0,30	160 - **180** - 200	0,25 - **0,30** - 0,35
		Bronze									
H	Hardened steel	45 HRC			○	10 - **20** - 30	0,08 - **0,09** - 0,10	15 - **22** - 32	0,08 - **0,10** - 0,12	20 - **28** - 35	0,12 - **0,15** - 0,20
		55 HRC									
		60 HRC									
		> 60 HRC									

◎ Preferred choice ○ Suitable ⊙ Possible

SDP-Identification

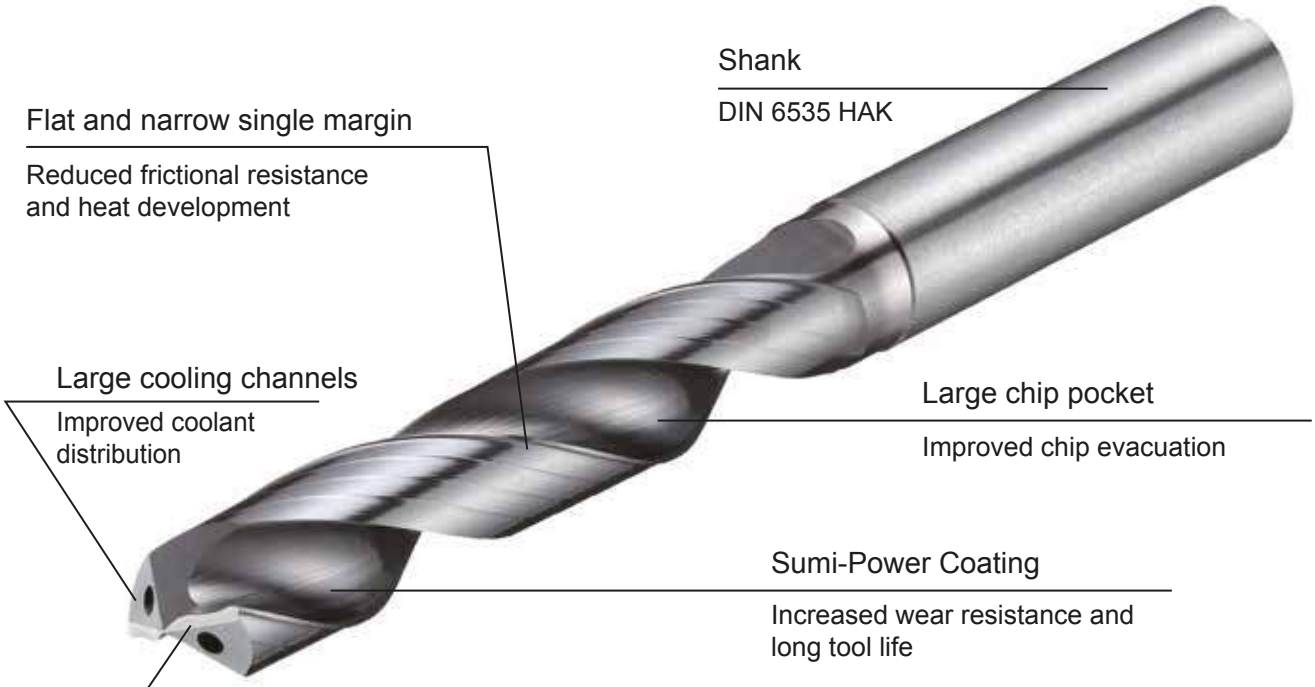
SDP **0800** **U** **3** **HAK** PCX70

- **SDP**: **S**umi-**D**rill **P**ower Type
- **0800**: Drill Diameter 8,0mm
- **U**: Universal
- **3**: Drilling Depth 3D/5D/7D
- **HAK**: DIN 6535 Form HAK
- PCX70: Grade

SDM Type

New

General Features



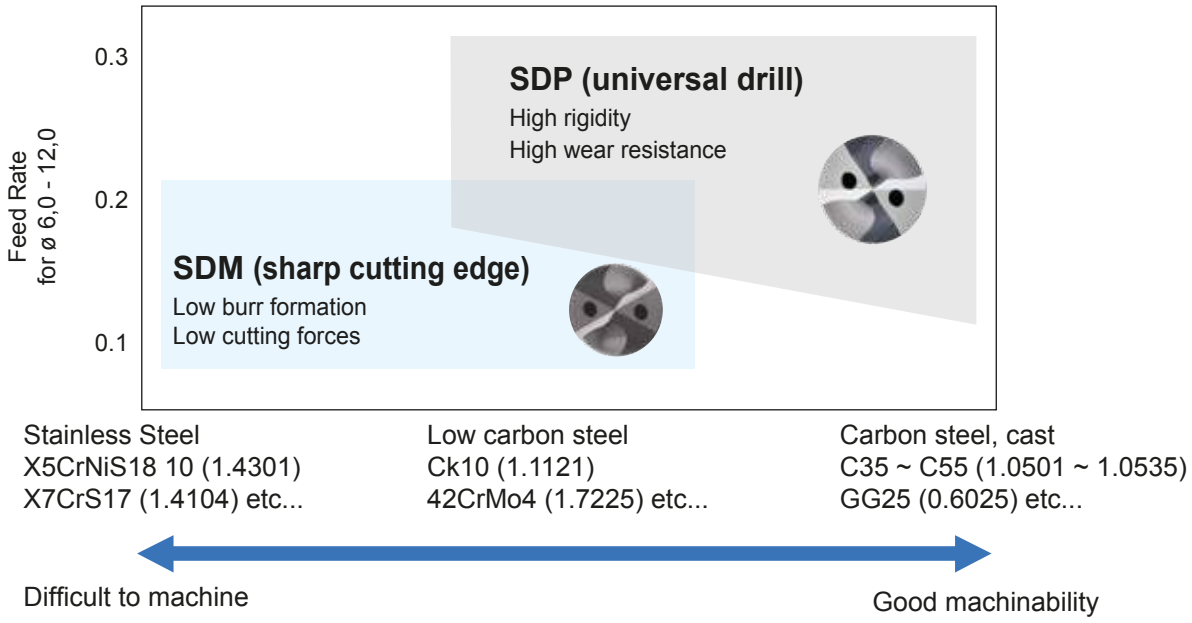
Stock Size

Ø3,0 ~ Ø12,0
Increment 0,1mm

Ø12,1 ~ Ø16,0
Standard diameter

Advantages

- High process reliability in stainless steel and low carbon steel
- Can be used on low-performance machines! (→avoids overload!)
- High surface quality in the bore
- Sharp cutting edge
- High adhesion resistance by Sumi-Power Coating



New

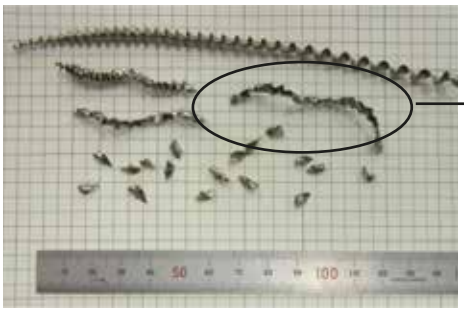
Chip Control

Drill:	Ø 8mm, L/D=5
Work Material:	X5CrNiS18 10 (1.4301)
Cutting D ata:	v_c=60m/min, f=0,10mm/rev, a_p=19mm Internal coolant (2,0MPa)

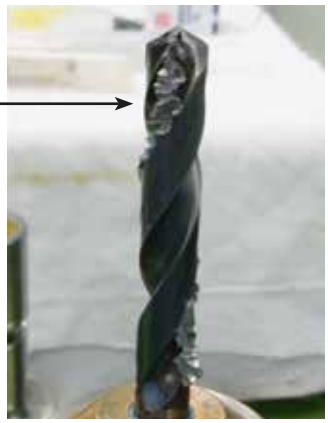
SDM

Short chips,
good chip evacuation

Competitor A



Partial long chips,
risk of tool breakage
by poor chip evacuation

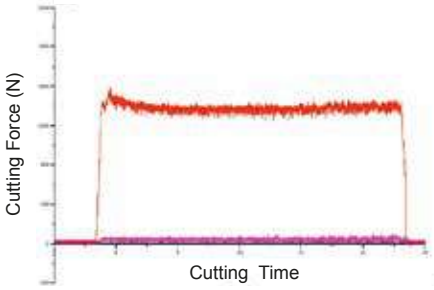


Optimal Cutting Forces

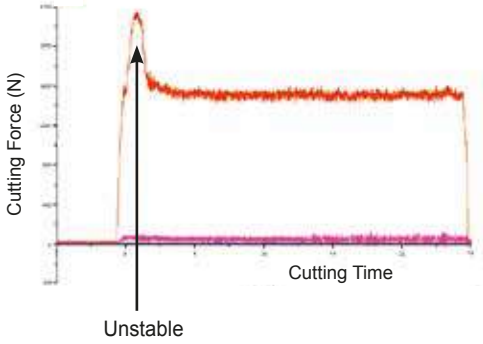
Drill:	Ø 8mm, L/D=5
Work Material:	X5CrNiS18 10 (1.4301)
Cutting Data:	v_c=60m/min, f=0,20mm/rev, a_p=40mm Internal coolant (2,0MPa)

10% lower than competitor A

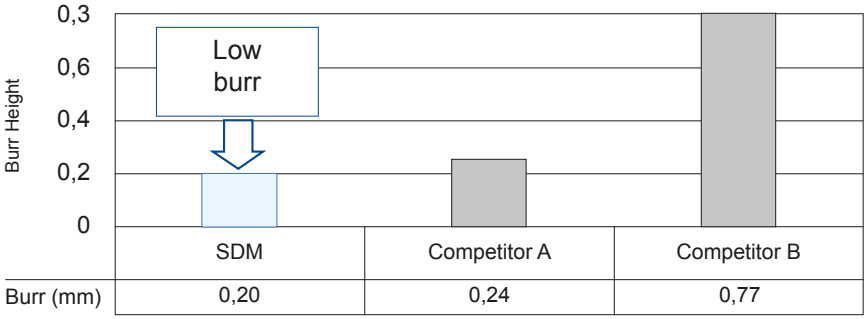
SDM



Competitor



Low Burr Formation



Drill:	Ø 8mm, L/D=5
Work Material:	X5CrNiS18 10 (1.4301)
Cutting Data:	v_c=60m/min, f=0,20mm/rev, a_p=40mm Internal coolant (2,0MPa)

SDM Competitor A Competitor B

SDM Type

New

Recommended Cutting Conditions

Material Group						SDM_____U_HAK PCX70					
ISO 513	Work Material	Type/ Structure	R_m N/mm²	Hardness HB30	Fitness	ØD: 3,0 - 6,0		ØD: 6,1 - 10,0		ØD: 10,1 - 16,0	
						v_c=m/min	Feed rate (mm/rev)	v_c=m/min	Feed rate (mm/rev)	v_c=m/min	Feed rate (mm/rev)
P	Carbon steel Cast steel	free cutting steel construction steel case-hardened steel heat-treatable steel spring steel	420	125	○	80 - **100** - 120	0,08 - **0,11** - 0,14	80 - **100** - 120	0,10 - **0,15** - 0,20	80 - **100** - 120	0,20 - **0,25** - 0,30
			650	190	○	80 - **100** - 120	0,08 - **0,11** - 0,14	80 - **100** - 120	0,10 - **0,15** - 0,20	80 - **100** - 120	0,20 - **0,25** - 0,30
			850	250	○	80 - **100** - 120	0,08 - **0,11** - 0,14	80 - **100** - 120	0,10 - **0,15** - 0,20	80 - **100** - 120	0,20 - **0,25** - 0,30
			750	270	○	40 - **60** - 100	0,08 - **0,10** - 0,12	40 - **60** - 100	0,10 - **0,12** - 0,16	40 - **60** - 100	0,15 - **0,17** - 0,20
			1000	300							
	Low alloy steel Cast steel	case-hardened steel heat-treatable steel bearing steel nitriding steel cold work steel	600	180	○	80 - **100** - 120	0,08 - **0,11** - 0,14	80 - **100** - 120	0,10 - **0,15** - 0,20	80 - **100** - 120	0,20 - **0,25** - 0,30
			930	275	○	40 - **60** - 100	0,08 - **0,10** - 0,12	40 - **60** - 100	0,10 - **0,12** - 0,16	40 - **60** - 100	0,15 - **0,17** - 0,20
			1000	300							
			1200	350							
	High alloy steel / Cast steel	tool steel hot work steel	680	200	○	40 - **60** - 100	0,08 - **0,10** - 0,12	40 - **60** - 100	0,10 - **0,12** - 0,16	40 - **60** - 100	0,15 - **0,17** - 0,20
			1100	325							
M	Stainless steel Cast steel	martensitic/ferritic	680	200	◉	40 - **60** - 100	0,08 - **0,10** - 0,12	40 - **60** - 100	0,10 - **0,14** - 0,18	40 - **60** - 100	0,15 - **0,20** - 0,25
		martensitic/ferritic		> 200	◉	30 - **50** - 80	0,08 - **0,10** - 0,12	30 - **50** - 80	0,10 - **0,14** - 0,18	30 - **50** - 80	0,15 - **0,20** - 0,25
		martensitic	820	240	◉	30 - **50** - 80	0,08 - **0,10** - 0,12	30 - **50** - 80	0,10 - **0,14** - 0,18	30 - **50** - 80	0,15 - **0,20** - 0,25
		austenitic	600	180	◉	40 - **60** - 100	0,08 - **0,10** - 0,12	40 - **60** - 100	0,10 - **0,14** - 0,18	40 - **60** - 100	0,15 - **0,20** - 0,25
		austenitic		> 200	◉	30 - **50** - 80	0,08 - **0,10** - 0,12	30 - **50** - 80	0,10 - **0,14** - 0,18	30 - **50** - 80	0,15 - **0,20** - 0,25
		Duplex	740	230	◉	30 - **45** - 70	0,08 - **0,10** - 0,12	30 - **45** - 70	0,10 - **0,14** - 0,18	30 - **45** - 70	0,15 - **0,20** - 0,25
		Precipation hardened		≤ 450	◉	30 - **45** - 70	0,08 - **0,10** - 0,12	30 - **45** - 70	0,10 - **0,14** - 0,18	30 - **45** - 70	0,15 - **0,20** - 0,25
K	Cast iron GG	ferritic/pearlitic		180							
		pearlitic		260							
	Cast iron GGG	ferritic		160							
		pearlitic		250							
S	Heat resisting alloys	Fe-based			○	20 - **30** - 40	0,06 - **0,08** - 0,10	20 - **30** - 40	0,08 - **0,10** - 0,12	20 - **30** - 40	0,10 - **0,12** - 0,15
		Ni / Co-based			○	20 - **30** - 40	0,06 - **0,08** - 0,10	20 - **30** - 40	0,08 - **0,10** - 0,12	20 - **30** - 40	0,10 - **0,12** - 0,15
	Titanium Titanium alloys	pure Titanium	430								
		Ti-Basis			○	20 - **30** - 40	0,06 - **0,08** - 0,10	20 - **30** - 40	0,08 - **0,10** - 0,12	20 - **30** - 40	0,10 - **0,12** - 0,15
N	Aluminium	pure aluminium									
		wrought alloys									
	Aluminium Cast alloys	Si ≤ 12%									
		Si ≥ 12%									
		Al - Mg alloys									
	Zinc die-cast	Zn alloys									
	Copper alloys	Copper									
		Brass									
		Bronze									
H	Hardened steel	45 HRC									
		55 HRC									
		60 HRC									
		> 60 HRC									

◉ Preferred choice ○ Possible

SDM-Identification

SDM **0800** **U** **3** **HAK** PCX70

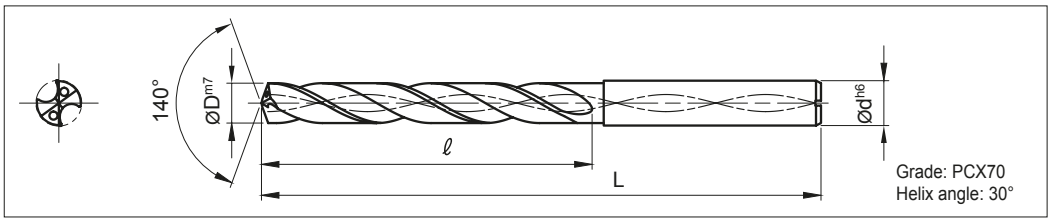
- **SDM**: **S**umi-**D**rill **M** (ISO-Code)
- **0800**: Drill Diameter 8,0mm
- **U**: Universal
- **3**: Drilling Depth 3D/5D
- **HAK**: DIN 6535 Form HAK
- PCX70: Grade

● = Euro stock
❑ = Delivery on request

SDM Type

New

■ Solid Carbide Drill with Internal Coolant Supply, ØD: 3,0 ~ 7,5mm, 3D / 5D

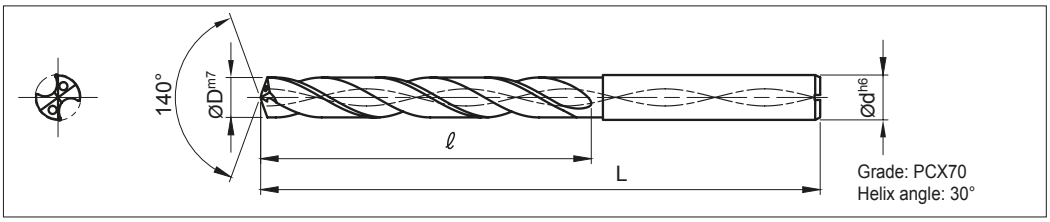


ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3/5	3D Type			5D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ
3,0	6	SDM 0300 U □ HAK	●	62	17	●	66	24
3,1		SDM 0310 U □ HAK	●			●		
3,2		SDM 0320 U □ HAK	●			●		
3,25		SDM 0325 U □ HAK	❑			❑		
3,3		SDM 0330 U □ HAK	●			●		
3,4		SDM 0340 U □ HAK	●			●		
3,5		SDM 0350 U □ HAK	●			●		
3,6		SDM 0360 U □ HAK	●			●		
3,7		SDM 0370 U □ HAK	●			●		
3,8		SDM 0380 U □ HAK	●	66	21	●	74	33
3,9		SDM 0390 U □ HAK	●			●		
4,0		SDM 0400 U □ HAK	●			●		
4,1		SDM 0410 U □ HAK	●			●		
4,2		SDM 0420 U □ HAK	●			●		
4,3		SDM 0430 U □ HAK	●			●		
4,4		SDM 0440 U □ HAK	●			●		
4,5		SDM 0450 U □ HAK	●			●		
4,6		SDM 0460 U □ HAK	●			●		
4,65		SDM 0465 U □ HAK	❑			❑		
4,7		SDM 0470 U □ HAK	●			●		
4,8		SDM 0480 U □ HAK	●		25	●	82	41
4,9		SDM 0490 U □ HAK	●			●		
5,0		SDM 0500 U □ HAK	●			●		
5,1		SDM 0510 U □ HAK	●			●		
5,2		SDM 0520 U □ HAK	●			●		
5,3		SDM 0530 U □ HAK	●			●		
5,4		SDM 0540 U □ HAK	●			●		
5,5		SDM 0550 U □ HAK	●			●		
5,55		SDM 0555 U □ HAK	❑			❑		
5,6		SDM 0560 U □ HAK	●			●		
5,7		SDM 0570 U □ HAK	●			●		
5,8		SDM 0580 U □ HAK	●			●		
5,9		SDM 0590 U □ HAK	●			●		
6,0		SDM 0600 U □ HAK	●			●		
6,1	8	SDM 0610 U □ HAK	●	79	31	●	91	50
6,2		SDM 0620 U □ HAK	●			●		
6,3		SDM 0630 U □ HAK	●			●		
6,4		SDM 0640 U □ HAK	●			●		
6,5		SDM 0650 U □ HAK	●			●		
6,6		SDM 0660 U □ HAK	●			●		
6,7		SDM 0670 U □ HAK	●			●		
6,8		SDM 0680 U □ HAK	●			●		
6,9		SDM 0690 U □ HAK	●			●		
7,0		SDM 0700 U □ HAK	●			●		
7,1		SDM 0710 U □ HAK	●		37	●		
7,2		SDM 0720 U □ HAK	●			●		
7,3		SDM 0730 U □ HAK	●			●		
7,4		SDM 0740 U □ HAK	●			●		
7,5		SDM 0750 U □ HAK	●			●		

SDM Type

New

■ Solid Carbide Drill with Internal Coolant Supply, ØD: 7,6 ~ 12,0mm, 3D / 5D



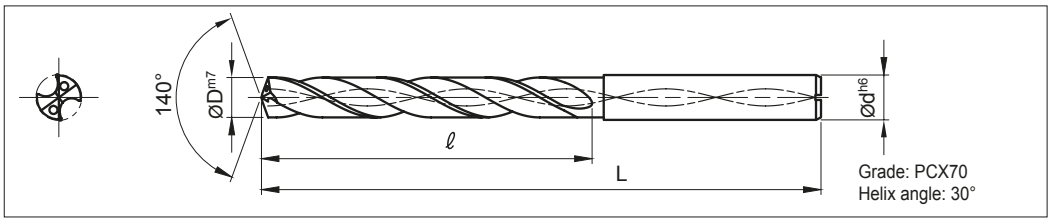
ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3/5	3D Type			5D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ
7,6	8	SDM 0760 U □ HAK	●	79	37	●	91	50
7,7		SDM 0770 U □ HAK	●			●		
7,8		SDM 0780 U □ HAK	●			●		
7,9		SDM 0790 U □ HAK	●			●		
8,0		SDM 0800 U □ HAK	●			●		
8,1	10	SDM 0810 U □ HAK	●	89	43	●	103	57
8,2		SDM 0820 U □ HAK	●			●		
8,3		SDM 0830 U □ HAK	●			●		
8,4		SDM 0840 U □ HAK	●			●		
8,5		SDM 0850 U □ HAK	●			●		
8,6		SDM 0860 U □ HAK	●			●		
8,7		SDM 0870 U □ HAK	●			●		
8,8		SDM 0880 U □ HAK	●			●		
8,9		SDM 0890 U □ HAK	●			●		
9,0		SDM 0900 U □ HAK	●			●		
9,1		SDM 0910 U □ HAK	●			●		
9,2		SDM 0920 U □ HAK	●			●		
9,25		SDM 0925 U □ HAK	❑			❑		
9,3		SDM 0930 U □ HAK	●			●		
9,4		SDM 0940 U □ HAK	●			●		
9,5		SDM 0950 U □ HAK	●			●		
9,6		SDM 0960 U □ HAK	●			●		
9,7		SDM 0970 U □ HAK	●			●		
9,8		SDM 0980 U □ HAK	●			●		
9,9		SDM 0990 U □ HAK	●			●		
10,0		SDM 1000 U □ HAK	●			●		
10,1	12	SDM 1010 U □ HAK	●	102	51	●	118	67
10,2		SDM 1020 U □ HAK	●			●		
10,3		SDM 1030 U □ HAK	●			●		
10,4		SDM 1040 U □ HAK	●			●		
10,5		SDM 1050 U □ HAK	●			●		
10,6		SDM 1060 U □ HAK	●			●		
10,7		SDM 1070 U □ HAK	●			●		
10,8		SDM 1080 U □ HAK	●			●		
10,9		SDM 1090 U □ HAK	●			●		
11,0		SDM 1100 U □ HAK	●			●		
11,1		SDM 1110 U □ HAK	●			●		
11,2		SDM 1120 U □ HAK	●			●		
11,3		SDM 1130 U □ HAK	●			●		
11,4		SDM 1140 U □ HAK	●			●		
11,5		SDM 1150 U □ HAK	●			●		
11,6		SDM 1160 U □ HAK	●			●		
11,7		SDM 1170 U □ HAK	●			●		
11,8		SDM 1180 U □ HAK	●			●		
11,9		SDM 1190 U □ HAK	●			●		
12,0		SDM 1200 U □ HAK	●			●		

● = Euro stock
❑ = Delivery on request

New

SDM Type

■ Solid Carbide Drill with Internal Coolant Supply, ØD: 12,0 ~ 16,0mm, 3D / 5D



ØD (mm)	Shank Ød (mm)	Cat. No. (L/D) 3/5	3D Type			5D Type		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)	
			3	L	ℓ	5	L	ℓ
12,1	14	SDM 1210 U □ HAK	❑	107	56	❑	124	73
12,2		SDM 1220 U □ HAK	❑			❑		
12,3		SDM 1230 U □ HAK	❑			❑		
12,4		SDM 1240 U □ HAK	❑			❑		
12,5		SDM 1250 U □ HAK	●			●		
12,6		SDM 1260 U □ HAK	❑			❑		
12,7		SDM 1270 U □ HAK	❑			❑		
12,8		SDM 1280 U □ HAK	❑			❑		
12,9		SDM 1290 U □ HAK	❑			❑		
13,0		SDM 1300 U □ HAK	●			●		
13,1		SDM 1310 U □ HAK	❑			❑		
13,2		SDM 1320 U □ HAK	❑			❑		
13,3		SDM 1330 U □ HAK	❑			❑		
13,4		SDM 1340 U □ HAK	❑			❑		
13,5		SDM 1350 U □ HAK	●			●		
13,6		SDM 1360 U □ HAK	❑			❑		
13,7		SDM 1370 U □ HAK	❑			❑		
13,8		SDM 1380 U □ HAK	❑			❑		
13,9		SDM 1390 U □ HAK	❑			❑		
14,0		SDM 1400 U □ HAK	●			●		
14,1	16	SDM 1410 U □ HAK	❑	115	60	❑	133	78
14,2		SDM 1420 U □ HAK	❑			❑		
14,3		SDM 1430 U □ HAK	❑			❑		
14,4		SDM 1440 U □ HAK	❑			❑		
14,5		SDM 1450 U □ HAK	●			●		
14,6		SDM 1460 U □ HAK	❑			❑		
14,7		SDM 1470 U □ HAK	❑			❑		
14,8		SDM 1480 U □ HAK	❑			❑		
14,9		SDM 1490 U □ HAK	❑			❑		
15,0		SDM 1500 U □ HAK	●			●		
15,1		SDM 1510 U □ HAK	❑			❑		
15,2		SDM 1520 U □ HAK	❑			❑		
15,3		SDM 1530 U □ HAK	❑			❑		
15,4		SDM 1540 U □ HAK	❑			❑		
15,5		SDM 1550 U □ HAK	●			●		
15,6		SDM 1560 U □ HAK	❑			❑		
15,7		SDM 1570 U □ HAK	❑			❑		
15,8		SDM 1580 U □ HAK	❑			❑		
15,9		SDM 1590 U □ HAK	❑			❑		
16,0		SDM 1600 U □ HAK	●			●		

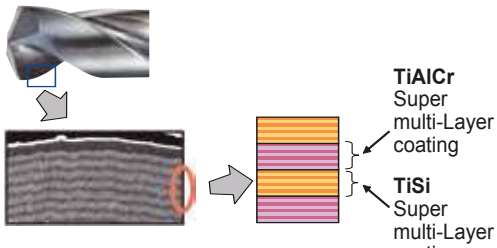
DEX Coating

General Features

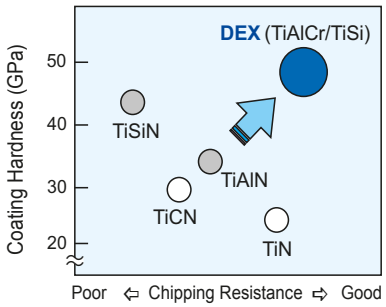
- Sumitomo Electric Hardmetal's next-generation drill coating utilises nano-coating technology to provide more than double the tool life of conventional coatings.
- Silicon and chrome improve usure, heat, and adhesion resistance.
- New super multi-layered structure offers significantly improved chip resistance (coating strength).

Characteristics

- Coating Design
  World's first combined super multi-layered coating is made from alternate layers of super multilayered substrates.



- Characteristics of Films



DEX Coat Application Examples

- MultiDrill GS Type Drilling Examples

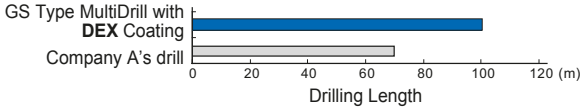
Comparison of Usure Resistance

Edge Usure Comparison for 70m Drilling

Shoulder and rake face feature improved usure resistance enabling long tool life.

DEX Coating MultiDrill GS Type

Concurrent A Dril



Tool: MDW 0800 GS4
Work Material: C50 (HB200)
Cutting Conditions: v_c =70m/min, f=0,25mm/rev, d_{oc} =32mm
External coolant (Water soluble)

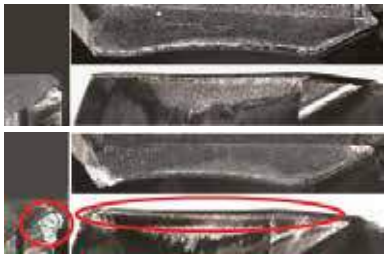
Comparison of Adhesion Resistance

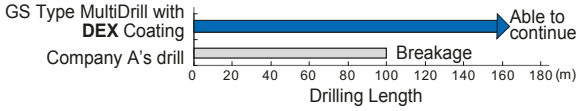
Edge Usure Comparison for 100m Drilling

Offers significantly improved fracture resistance to counter problems caused by shoulder and flute adhesion in soft steel drilling.

DEX Coating MultiDrill GS Type

Competitor B Dril





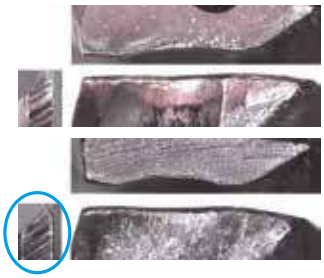
Tool: MDW 0600 GS4
Work Material: 15CrMo5 (HB120)
Cutting Conditions: v_c =60m/min, f=0,18mm/rev, d_{oc} =18mm
External coolant (Water soluble)

- Long MultiDrill XHT Type Drilling Examples

Reduced margin usure during deep hole MQL drilling increases number of regrinds.

DEX Coating

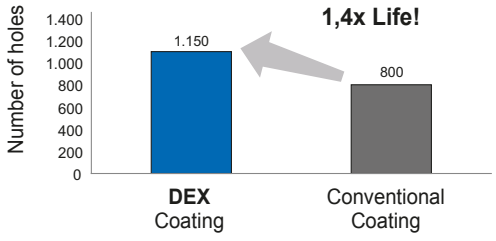
Conventional Coating



Tool: MDW 0497 XHT20 (ø4,97 L/D=29)
Work Material: 42CrMo4 (HB275) Crank Shaft
Cutting Conditions: v_c=70m/min, f=0,23mm/rev, d_{oc} =75mm
MQL

- MultiDrill SMD Type Drilling Examples

Offers longer tool life with SEC MultiDrills as well.



Tool: SMDH 210 M (ø21,0)
Work Material: 36Mn5 (HB350) Construction Mashine Componemt
Cutting Conditions: v_c=60m/min, f=0,25mm/rev, d_{oc} =25mm
Water soluble Coolant

SUPER MULTI-DRILLS
GS Type

General Features

Super MultiDrill GS types are solid carbide drills that employ a new flute design and wide chip pocket to achieve excellent chip management and evacuation.
DEX coating enables stable and long tool life over a wide range of work materials and applications.

Characteristics and Applications

- **Long tool life**
  New cutting edge design and special DEX coating provide long tool life with a wide variety of work materials.
- **Stable chip evacuation**
  New flute shape significantly improves chip management and evacuation.
- **Quiet cutting and stable cutting resistance**
  Stable drilling with little wobble even in small machine applications.
- **Environmentally-friendly**
  Compatible with the MQL (Minimum Quantity Lubrication) system.

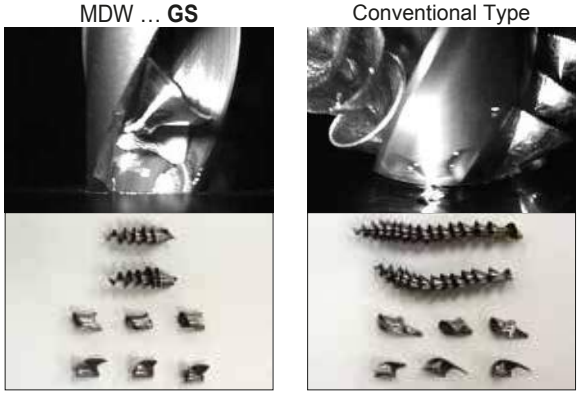
Series

Coolant Supply	Type	Diameter Range (mm)	Hole Depth (L/D)
External (GS Type)	**MDW □□□□GS2**	ø2,0~ø16,0	~ 2
	MDW □□□□GS4		~ 4

Performance

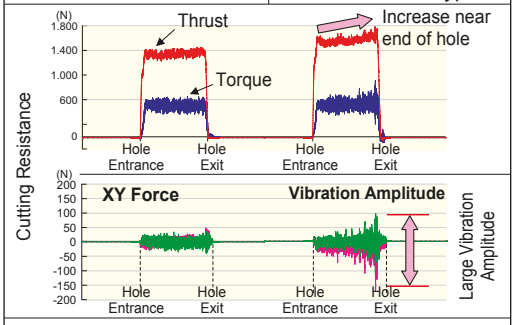
Chip Management

MDW … **GS** | Conventional Type



Performance Comparison

MDW … **GS** | Conventional Type



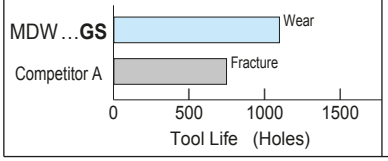
GS type provides stable drill behaviour throughout the drilling process.

Tool: MDW 0800 GS4
Work Material: C50 (HB200)
Cutting Conditions: v_c=80m/min, f=0,25mm/rev, d_{oc}=24mm
External Coolant (Water Soluble)

Application Examples

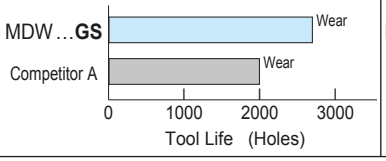
● Automotive Component
C43 (HB250)

Drill: MDW 0970 GS4 (ø9,7mm)
Cutting Data: v_c = 80 m/min, f = 0,25 mm/rev
d_{oc} = 25 mm
External Coolant (Water Soluble)



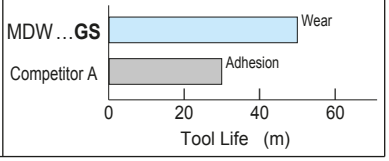
● Boron Steel Machine Component
(HRC30)

Drill: MDW 0980 GS2 (ø9,8mm)
Cutting Data: v_c = 70 m/min, f = 0,15 mm/rev
d_{oc} = 7 mm
External Coolant (Water Soluble)



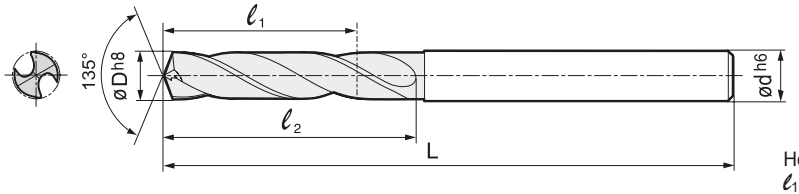
● Machine Component
USt.42-2

Drill: MDW 0800 GS4 (ø8,0mm)
Cutting Data: v_c = 80 m/min, f = 0,25 mm/rev
d_{oc} =25 mm
Internal Coolant (Water Soluble)



MDW ... GS Type

Without Coolant Holes (2D/4D) "Super Multi-Layer" DEX (TiAlCr/TiSi) Coated Solid Carbide Drills



Helix angle: 30°
ℓ_1 = Effective drilling length

● Diameter ø2,0~6,0mm

(mm)

Dimensions		Cat. No.	Short Type (2D)				Long Type (4D)			
			Stock	Dimensions			Stock	Dimensions		
øD	ød	2, 4 ↘	2	L	ℓ_1	ℓ_2	4	L	ℓ_1	ℓ_2
2,0	3,0	MDW 0200 GS□	❍	45,4	6,0	8,4	❍	49,4	13,0	15,4
2,1		MDW 0210 GS□	❍				❍			
2,2		MDW 0220 GS□	❍				❍			
2,3		MDW 0230 GS□	❍		7,3	10,5	❍		14,5	17,5
2,4		MDW 0240 GS□	❍				❍			
2,5		MDW 0250 GS□	●	45,6			❍	49,6		
2,6	3,0	MDW 0260 GS□	●				❍			
2,7		MDW 0270 GS□	❍				❍			
2,8		MDW 0280 GS□	●		9,8	13,6	❍		16,0	19,6
2,9		MDW 0290 GS□	❍				❍			
3,0		MDW 0300 GS□	●				❍			
3,1		MDW 0310 GS□	●				❍			
3,2		MDW 0320 GS□	❍				❍			
3,3		MDW 0330 GS□	●		15,5	19,7	❍		20,5	24,7
3,4		MDW 0340 GS□	●				❍			
3,5		MDW 0350 GS□	●	54,8			❍	60,8		
3,6	4,0	MDW 0360 GS□	❍				❍			
3,7		MDW 0370 GS□	❍				❍			
3,8		MDW 0380 GS□	❍		17,0	21,8	❍		23,0	27,8
3,9		MDW 0390 GS□	❍				❍			
4,0		MDW 0400 GS□	●				❍			
4,1		MDW 0410 GS□	❍				❍			
4,2		MDW 0420 GS□	●				❍			
4,3		MDW 0430 GS□	❍		18,5	23,9	❍		25,5	31,9
4,4		MDW 0440 GS□	❍				❍			
4,5		MDW 0450 GS□	●	62,0			❍	77,0		
4,6	5,0	MDW 0460 GS□	❍				❍			
4,7		MDW 0470 GS□	❍				❍			
4,8		MDW 0480 GS□	❍		20,0	26,0	❍		33,0	39,0
4,9		MDW 0490 GS□	❍				❍			
5,0		MDW 0500 GS□	●				●			
5,1		MDW 0510 GS□	●				●			
5,2		MDW 0520 GS□	●				❍			
5,3		MDW 0530 GS□	❍		19,5	26,1	❍		33,5	40,1
5,4		MDW 0540 GS□	❍				❍			
5,5		MDW 0550 GS□	●	66,2			●	82,2		
5,6	6,0	MDW 0560 GS□	❍				❍			
5,7		MDW 0570 GS□	❍				❍			
5,8		MDW 0580 GS□	❍		21,0	28,2	❍		35,0	42,2
5,9		MDW 0590 GS□	❍				❍			
6,0		MDW 0600 GS□	●				●			

● Diameter ø6,1~10,0mm

(mm)

Dimensions		Cat. No.	Short Type (2D)				Long Type (4D)			
			Stock	Dimensions			Stock	Dimensions		
øD	ød	2, 4 ↘	2	L	ℓ_1	ℓ_2	4	L	ℓ_1	ℓ_2
6,1		MDW 0610 GS□	❍				❍			
6,2		MDW 0620 GS□	❍				❍			
6,3		MDW 0630 GS□	❍		24,5	32,3	❍		35,5	43,3
6,4		MDW 0640 GS□	❍				❍			
6,5	7,0	MDW 0650 GS□	●	74,5			●	84,3		
6,6		MDW 0660 GS□	❍				●			
6,7		MDW 0670 GS□	❍				❍			
6,8		MDW 0680 GS□	●		26,1	34,5	●		36,1	44,5
6,9		MDW 0690 GS□	❍				❍			
7,0		MDW 0700 GS□	●				●			
7,1		MDW 0710 GS□	❍				❍			
7,2		MDW 0720 GS□	❍				❍			
7,3		MDW 0730 GS□	❍		25,6	34,6	❍		37,6	46,6
7,4		MDW 0740 GS□	❍				❍			
7,5	8,0	MDW 0750 GS□	●	79,7			●	91,7		
7,6		MDW 0760 GS□	❍				❍			
7,7		MDW 0770 GS□	❍				❍			
7,8		MDW 0780 GS□	❍		28,1	37,7	❍		40,1	49,7
7,9		MDW 0790 GS□	❍				❍			
8,0		MDW 0800 GS□	●				●			
8,1		MDW 0810 GS□	❍				❍			
8,2		MDW 0820 GS□	❍				❍			
8,3		MDW 0830 GS□	❍		27,4	37,8	❍		34,4	54,8
8,4		MDW 0840 GS□	❍				❍			
8,5	9,0	MDW 0850 GS□	●	83,9			●	99,9		
8,6		MDW 0860 GS□	❍				❍			
8,7		MDW 0870 GS□	❍				❍			
8,8		MDW 0880 GS□	❍		29,1	39,9	❍		46,1	56,9
8,9		MDW 0890 GS□	❍				❍			
9,0		MDW 0900 GS□	●				●			
9,1		MDW 0910 GS□	❍				❍			
9,2		MDW 0920 GS□	❍				❍			
9,3		MDW 0930 GS□	❍		28,6	40,0	❍		48,6	60,0
9,4		MDW 0940 GS□	❍				❍			
9,5	10,0	MDW 0950 GS□	●	89,0			●	107,0		
9,6		MDW 0960 GS□	❍				❍			
9,7		MDW 0970 GS□	❍				❍			
9,8		MDW 0980 GS□			30,0	42,0	❍		50,0	62,0
9,9		MDW 0990 GS□					❍			
10,0		MDW 1000 GS□	●				●			

■ Recommended Cutting Conditions for Multi-Drills GS Type

Diameter (mm)		Soft Steels (~ HB200)	General Steels (~ HB300)	Stainless Steels (~ HB200)	Grey Cast Irons	Ductile Cast Irons
~ ø 3	v_c	30 – **50** – 70	30 – **45** – 60	10 – **30** – 40	40 – **70** – 90	35 – **55** – 75
	f	0,12 – 0,20	0,10 – 0,20	0,06 – 0,12	0,15 – 0,30	0,12 – 0,20
~ ø 5	v_c	40 – **70** – 100	40 – **60** – 80	15 – **40** – 55	40 – **70** – 90	40 – **60** – 80
	f	0,15 – 0,25	0,15 – 0,25	0,08 – 0,15	0,15 – 0,30	0,15 – 0,25
~ ø10	v_c	50 – **80** – 130	50 – **70** – 110	15 – **45** – 60	50 – **80** – 120	50 – **70** – 100
	f	0,20 – 0,35	0,20 – 0,35	0,10 – 0,20	0,20 – 0,35	0,20 – 0,35
~ ø16	v_c	60 – **90** – 140	60 – **80** – 120	20 – **50** – 60	60 – **90** – 120	50 – **70** – 100
	f	0,25 – 0,35	0,25 – 0,35	0,10 – 0,20	0,25 – 0,35	0,25 – 0,35

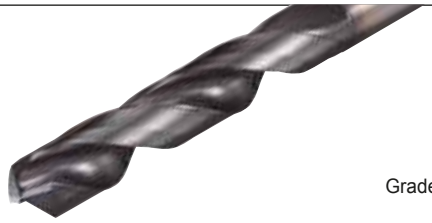
(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

❍ = Japan stock

MDW ... GS Type

GS Type for General Purpose Drilling of Steels

● GS Type



Grade: ACX70

● Diameter ø10,1~13,0mm

(mm)

Dimensions		Cat. No.	Short Type (2D)				Long Type (4D)			
			Stock	Dimensions			Stock	Dimensions		
øD	ød	2, 4 ↘	2	L	ℓ_1	ℓ_2	4	L	ℓ_1	ℓ_2
10,1	11,0	MDW 1010 GS□	●	95,3	30,6	43,2	❍	116,2	55,6	68,2
10,2		MDW 1020 GS□	●				●			
10,3		MDW 1030 GS□	❍				❍			
10,4		MDW 1040 GS□	❍				❍			
10,5		MDW 1050 GS□	●				●			
10,6		MDW 1060 GS□	❍		34,1	47,3	❍		57,1	70,3
10,7		MDW 1070 GS□	❍				❍			
10,8		MDW 1080 GS□	❍				❍			
10,9		MDW 1090 GS□	❍				❍			
11,0		MDW 1100 GS□	●				●			
11,1	12,0	MDW 1110 GS□	❍	102,5	33,6	47,4	❍	123,5	59,6	73,4
11,2		MDW 1120 GS□	❍				❍			
11,3		MDW 1130 GS□	❍				❍			
11,4		MDW 1140 GS□	❍				❍			
11,5		MDW 1150 GS□	●				●			
11,6		MDW 1160 GS□	❍		35,1	49,5	❍		61,1	75,5
11,7		MDW 1170 GS□	❍				❍			
11,8		MDW 1180 GS□	❍				❍			
11,9		MDW 1190 GS□	❍				❍			
12,0		MDW 1200 GS□	●				●			
12,1	13,0	MDW 1210 GS□	❍	102,7	34,6	49,6	❍	139,7	63,6	78,6
12,2		MDW 1220 GS□	❍				❍			
12,3		MDW 1230 GS□	❍				❍			
12,4		MDW 1240 GS□	❍				❍			
12,5		MDW 1250 GS□	❍				❍			
12,6		MDW 1260 GS□	❍		36,1	51,7	❍		65,1	80,7
12,7		MDW 1270 GS□	❍				❍			
12,8		MDW 1280 GS□	❍				❍			
12,9		MDW 1290 GS□	❍				❍			
13,0		MDW 1300 GS□	❍				❍			

● Diameter ø13,1~16,0mm

(mm)

Dimensions		Cat. No.	Short Type (2D)				Long Type (4D)			
			Stock	Dimensions			Stock	Dimensions		
øD	ød	2, 4 ↘	2	L	ℓ_1	ℓ_2	4	L	ℓ_1	ℓ_2
13,1	14,0	MDW 1310 GS□	❑	107,9	36,6	52,8	❍	149,9	70,2	86,8
13,2		MDW 1320 GS□	❑				❍			
13,3		MDW 1330 GS□	❑				❍			
13,4		MDW 1340 GS□	❑				❍			
13,5		MDW 1350 GS□	❑				❍			
13,6		MDW 1360 GS□	❑		38,1	54,9	❍		72,1	88,9
13,7		MDW 1370 GS□	❑				❍			
13,8		MDW 1380 GS□	❑				❍			
13,9		MDW 1390 GS□	❑				❍			
14,0		MDW 1400 GS□	❑				❍			
14,1	15,0	MDW 1410 GS□	❑	111,1	37,6	55,0	❍	156,1	74,6	92,0
14,2		MDW 1420 GS□	❑				❍			
14,3		MDW 1430 GS□	❑				❍			
14,4		MDW 1440 GS□	❑				❍			
14,5		MDW 1450 GS□	❑				❍			
14,6		MDW 1460 GS□	❑		38,1	56,1	❍		76,1	94,1
14,7		MDW 1470 GS□	❑				❍			
14,8		MDW 1480 GS□	❑				❍			
14,9		MDW 1490 GS□	❑				❍			
15,0		MDW 1500 GS□	❑				❍			
15,1	16,0	MDW 1510 GS□	❑	115,5	37,6	56,2	❍	169,3	78,6	97,2
15,2		MDW 1520 GS□	❑				❍			
15,3		MDW 1530 GS□	❑				❍			
15,4		MDW 1540 GS□	❑				❍			
15,5		MDW 1550 GS□	❑				❍			
15,6		MDW 1560 GS□	❑		39,1	58,3	❍		80,1	99,3
15,7		MDW 1570 GS□	❑				❍			
15,8		MDW 1580 GS□	❑				❍			
15,9		MDW 1590 GS□	❑				❍			
16,0		MDW 1600 GS□	❑				❍			

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs.
Please specify the Cat. No. For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

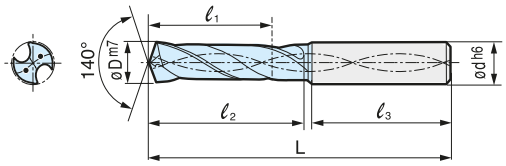
E.g., **MDW 1020 GS 2/4,** ACX70 (Grade)

- MDW: SUPER MULTI-DRILLs
- 1020: Drill diameter **10,2** mm
- GS: **GS** type MULTI-DRILLs
- 2/4: Drilling depth (The ratio to øD): ~2 / ~4

MDS ... SK-HAK Type

Short Type

TiAlN Coated Solid Carbide Drills to DIN6537 (ø-Tolerance: m7)



Helix angle: 30°
ℓ_1 = Effective drilling length
Grade: ACW70

●Diameter ø4,0~8,0mm

Dimensions (mm)			Cat. No.	DIN 6537 K (Short Type)			
øD (mm)	Shank			Stock	Dimensions (mm)		
	ød	ℓ_3		SK-HAK	L	ℓ_1	ℓ_2
4,0	6	36	**MDS 040 SKHAK**	●	66	17	24
4,1			**MDS 041 SKHAK**	●			
4,2			**MDS 042 SKHAK**	●			
4,3			**MDS 043 SKHAK**				
4,4			**MDS 044 SKHAK**				
4,5			**MDS 045 SKHAK**	●			
4,6			**MDS 046 SKHAK**				
4,7			**MDS 047 SKHAK**				
4,8	6	36	**MDS 048 SKHAK**		66	20	28
4,9			**MDS 049 SKHAK**				
5,0			**MDS 050 SKHAK**	●			
5,1			**MDS 051 SKHAK**	●			
5,2			**MDS 052 SKHAK**				
5,3			**MDS 053 SKHAK**				
5,4			**MDS 054 SKHAK**				
5,5			**MDS 055 SKHAK**	●			
5,6			**MDS 056 SKHAK**				
5,7			**MDS 057 SKHAK**				
5,8			**MDS 058 SKHAK**				
5,9			**MDS 059 SKHAK**				
6,0			**MDS 060 SKHAK**	●			
6,1	8	36	**MDS 061 SKHAK**		79	24	34
6,2			**MDS 062 SKHAK**				
6,3			**MDS 063 SKHAK**				
6,4			**MDS 064 SKHAK**				
6,5			**MDS 065 SKHAK**	●			
6,6			**MDS 066 SKHAK**				
6,7			**MDS 067 SKHAK**				
6,8			**MDS 068 SKHAK**	●			
6,9			**MDS 069 SKHAK**				
7,0			**MDS 070 SKHAK**	●			
7,1	8	36	**MDS 071 SKHAK**		79	29	41
7,2			**MDS 072 SKHAK**				
7,3			**MDS 073 SKHAK**				
7,4			**MDS 074 SKHAK**				
7,5			**MDS 075 SKHAK**	●			
7,6			**MDS 076 SKHAK**				
7,7			**MDS 077 SKHAK**				
7,8			**MDS 078 SKHAK**				
7,9			**MDS 079 SKHAK**				
8,0			**MDS 080 SKHAK**	●			

●Diameter ø8,1~12,0mm

Dimensions (mm)			Cat. No.	DIN 6537 K (Short Type)			
øD (mm)	Shank			Stock	Dimensions (mm)		
	ød	ℓ_3		SK-HAK	L	ℓ_1	ℓ_2
8,1	10	40	**MDS 081 SKHAK**		89	35	47
8,2			**MDS 082 SKHAK**				
8,3			**MDS 083 SKHAK**				
8,4			**MDS 084 SKHAK**				
8,5			**MDS 085 SKHAK**	●			
8,6			**MDS 086 SKHAK**				
8,7			**MDS 087 SKHAK**				
8,8			**MDS 088 SKHAK**				
8,9			**MDS 089 SKHAK**				
9,0			**MDS 090 SKHAK**	●			
9,1	10	40	**MDS 091 SKHAK**		89	35	47
9,2			**MDS 092 SKHAK**				
9,3			**MDS 093 SKHAK**				
9,4			**MDS 094 SKHAK**				
9,5			**MDS 095 SKHAK**	●			
9,6			**MDS 096 SKHAK**				
9,7			**MDS 097 SKHAK**				
9,8			**MDS 098 SKHAK**				
9,9			**MDS 099 SKHAK**				
10,0			**MDS 100 SKHAK**	●			
10,1	12	45	**MDS 101 SKHAK**		102	40	55
10,2			**MDS 102 SKHAK**	●			
10,3			**MDS 103 SKHAK**				
10,4			**MDS 104 SKHAK**				
10,5			**MDS 105 SKHAK**	●			
10,6			**MDS 106 SKHAK**				
10,7			**MDS 107 SKHAK**				
10,8			**MDS 108 SKHAK**				
10,9			**MDS 109 SKHAK**				
11,0			**MDS 110 SKHAK**	●			
11,1	12	45	**MDS 111 SKHAK**		102	40	55
11,2			**MDS 112 SKHAK**				
11,3			**MDS 113 SKHAK**				
11,4			**MDS 114 SKHAK**				
11,5			**MDS 115 SKHAK**	●			
11,6			**MDS 116 SKHAK**				
11,7			**MDS 117 SKHAK**				
11,8			**MDS 118 SKHAK**				
11,9			**MDS 119 SKHAK**				
12,0			**MDS 120 SKHAK**	●			

■ Recommended Cutting Conditions for K-HAK Type Multi-Drills

Diameter (mm)		Steels (< HB200)	Steels (HB200~300)	Alloy Steels (> HB300)	Hardened Steels (HRC45)	Stainless Steels (< HB200)	Ductile Cast Irons	Grey Cast Irons	Titanium Alloys (Ti-6Al-4V)	Inconel (Inconel 718)
~ ø 5	v_c	50 – **80** – 120	50 – **75** – 100	40 – **65** – 80	20 – **35** – 50	30 – **45** – 60	40 – **60** – 100	80 – **100** – 120	20 – **30** – 40	10 – **20** – 30
	f	0,15 – 0,25	0,15 – 0,25	0,10 – 0,20	0,08 – 0,10	0,10 – 0,20	0,15 – 0,25	0,15 – 0,30	0,08 – 0,10	0,05 – 0,08
~ ø10	v_c	50 – **120** – 140	70 – **110** – 140	40 – **70** – 80	30 – **40** –60	50 – **70** – 90	70 – **90** – 120	100 – **130** – 140	25 – **30** – 40	15 – **25** – 30
	f	0,20 – 0,35	0,20 – 0,35	0,10 – 0,25	0,10 – 0,15	0,10 – 0,25	0,20 – 0,35	0,20 – 0,35	0,08 – 0,12	0,08 – 0,10
~ ø16	v_c	90 – **140** – 170	80 – **120** – 150	40 – **80** – 100	30 – **45** – 60	50 – **80** – 110	80 – **100** – 130	100 – **150** – 160	25 – **35** – 40	20 – **30**– 35
	f	0,25 – 0,35	0,25 – 0,35	0,15 – 0,30	0,12 – 0,20	0,15 – 0,30	0,25 – 0,35	0,25 – 0,40	0,10 – 0,15	0,08 – 0,10
~ ø20	v_c	100 – **150** – 180	80 – **130** – 160	50 – **90** – 120	30 – **45** – 60	50 – **80** – 110	80 – **110** – 140	100 – **150** – 160	25 – **35** – 40	20 – **30** – 35
	f	0,30 – 0,40	0,25 – 0,40	0,15 – 0,30	0,15 – 0,25	0,15 – 0,30	0,25 – 0,40	0,25 – 0,40	0,10 – 0,15	0,08 – 0,10

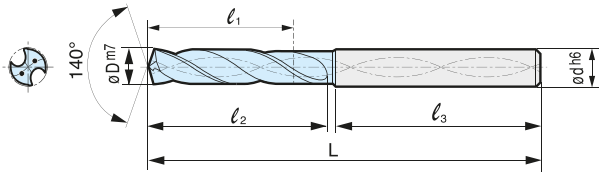
(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

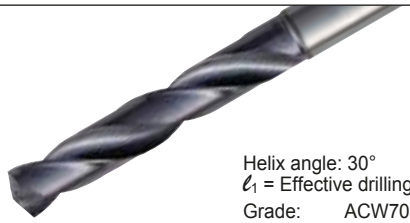
● = Euro stock

MDS ... MK-HAK Type

Long Type

TiAlN Coated Solid Carbide Drills to DIN6537 (ø-Tolerance: m7)





Helix angle: 30°
ℓ_1 = Effective drilling length
Grade: ACW70

●Diameter ø4,0~8,0mm

Dimensions (mm)			Cat. No.	DIN 6537 L (Long Type)			
	Shank			Stock	Dimensions (mm)		
øD (mm)	ød	ℓ_3		MK-HAK	L	ℓ_1	ℓ_2
4,0	6	36	**MDS 040 MKHAK**	●	74	29	36
4,1			**MDS 041 MKHAK**				
4,2			**MDS 042 MKHAK**	●			
4,3			**MDS 043 MKHAK**				
4,4			**MDS 044 MKHAK**				
4,5			**MDS 045 MKHAK**	●			
4,6			**MDS 046 MKHAK**				
4,7			**MDS 047 MKHAK**				
4,8	6	36	**MDS 048 MKHAK**		82	35	44
4,9			**MDS 049 MKHAK**				
5,0			**MDS 050 MKHAK**	●			
5,1			**MDS 051 MKHAK**				
5,2			**MDS 052 MKHAK**				
5,3			**MDS 053 MKHAK**				
5,4			**MDS 054 MKHAK**				
5,5			**MDS 055 MKHAK**	●			
5,6			**MDS 056 MKHAK**				
5,7			**MDS 057 MKHAK**				
5,8			**MDS 058 MKHAK**				
5,9			**MDS 059 MKHAK**				
6,0			**MDS 060 MKHAK**	●			
6,1	8	36	**MDS 061 MKHAK**		91	43	53
6,2			**MDS 062 MKHAK**				
6,3			**MDS 063 MKHAK**				
6,4			**MDS 064 MKHAK**				
6,5			**MDS 065 MKHAK**	●			
6,6			**MDS 066 MKHAK**				
6,7			**MDS 067 MKHAK**				
6,8			**MDS 068 MKHAK**	●			
6,9			**MDS 069 MKHAK**				
7,0			**MDS 070 MKHAK**	●			
7,1	8	36	**MDS 071 MKHAK**		91	43	53
7,2			**MDS 072 MKHAK**				
7,3			**MDS 073 MKHAK**				
7,4			**MDS 074 MKHAK**				
7,5			**MDS 075 MKHAK**				
7,6			**MDS 076 MKHAK**				
7,7			**MDS 077 MKHAK**				
7,8			**MDS 078 MKHAK**				
7,9			**MDS 079 MKHAK**				
8,0			**MDS 080 MKHAK**	●			

●Diameter ø8,1~12,0mm

Dimensions (mm)			Cat. No.	DIN 6537 L (Long Type)			
	Shank			Stock	Dimensions (mm)		
øD (mm)	ød	ℓ_3		MK-HAK	L	ℓ_1	ℓ_2
8,1	10	40	**MDS 081 MKHAK**		103	49	61
8,2			**MDS 082 MKHAK**				
8,3			**MDS 083 MKHAK**				
8,4			**MDS 084 MKHAK**				
8,5			**MDS 085 MKHAK**	●			
8,6			**MDS 086 MKHAK**				
8,7			**MDS 087 MKHAK**				
8,8			**MDS 088 MKHAK**				
8,9			**MDS 089 MKHAK**				
9,0			**MDS 090 MKHAK**	●			
9,1			**MDS 091 MKHAK**		103	49	61
9,2			**MDS 092 MKHAK**				
9,3			**MDS 093 MKHAK**				
9,4			**MDS 094 MKHAK**				
9,5			**MDS 095 MKHAK**	●			
9,6			**MDS 096 MKHAK**				
9,7			**MDS 097 MKHAK**				
9,8			**MDS 098 MKHAK**				
9,9			**MDS 099 MKHAK**				
10,0			**MDS 100 MKHAK**	●			
10,1	12	45	**MDS 101 MKHAK**		118	56	71
10,2			**MDS 102 MKHAK**	●			
10,3			**MDS 103 MKHAK**				
10,4			**MDS 104 MKHAK**				
10,5			**MDS 105 MKHAK**	●			
10,6			**MDS 106 MKHAK**				
10,7			**MDS 107 MKHAK**				
10,8			**MDS 108 MKHAK**				
10,9			**MDS 109 MKHAK**				
11,0			**MDS 110 MKHAK**	●			
11,1			**MDS 111 MKHAK**		118	56	71
11,2			**MDS 112 MKHAK**				
11,3			**MDS 113 MKHAK**				
11,4			**MDS 114 MKHAK**				
11,5			**MDS 115 MKHAK**	●			
11,6			**MDS 116 MKHAK**				
11,7			**MDS 117 MKHAK**				
11,8			**MDS 118 MKHAK**				
11,9			**MDS 119 MKHAK**				
12,0			**MDS 120 MKHAK**	●			

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs.
Please specify the Cat. No.
For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **MDS 102 MK-HAK** , ACW70 (Grade)

Multi-
Drill
Solid type

Drill diameter
10,2 mm

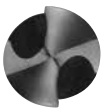
Cylindrical shank and spiral coolant holes to: DIN6535 Form HAK

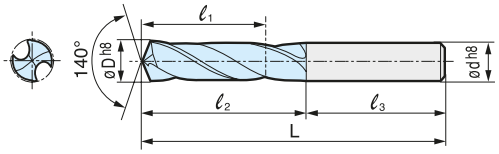
S : 3 ~ 3,5 D
M : ~ 5 D

MDS ... SK/SG Type

Short Type

Cylindrical Solid Carbide Drills without Coolant Holes





Helix angle: 30°
ℓ_1 = Effective drilling length

●Diameter ø2,0~6,0mm

Dimensions (mm)			Cat. No.	Short Type				
	Shank			Stock		Dimensions (mm)		
øD	ød	ℓ_3	SK, SG ▽	SK	SG	L	ℓ_1	ℓ_2
2,0	2,0	30	**MDS 020** □□			42	9,5	12
2,1	2,1		**MDS 021** □□					
2,2	2,2	30	**MDS 022** □□			43	10,2	13
2,3	2,3		**MDS 023** □□					
2,4	2,4	30	**MDS 024** □□			44	10,9	14
2,5	2,5		**MDS 025** □□	▲				
2,6	2,6		**MDS 026** □□	▲				
2,7	2,7	30	**MDS 027** □□			46	12,4	16
2,8	2,8		**MDS 028** □□	▲				
2,9	2,9		**MDS 029** □□					
3,0	3,0		**MDS 030** □□	▲	▲			
3,1	3,1	31	**MDS 031** □□			49	14,0	18
3,2	3,2		**MDS 032** □□					
3,3	3,3		**MDS 033** □□					
3,4	3,4	32	**MDS 034** □□	▲		52	15,6	20
3,5	3,5		**MDS 035** □□	▲	▲			
3,6	3,6		**MDS 036** □□					
3,7	3,7		**MDS 037** □□					
3,8	3,8	33	**MDS 038** □□			55	17,0	22
3,9	3,9		**MDS 039** □□					
4,0	4,0		**MDS 040** □□	▲	▲			
4,1	4,1		**MDS 041** □□					
4,2	4,2		**MDS 042** □□	▲				
4,3	4,3	34	**MDS 043** □□			58	18,4	24
4,4	4,4		**MDS 044** □□					
4,5	4,5		**MDS 045** □□	▲	▲			
4,6	4,6		**MDS 046** □□					
4,7	4,7		**MDS 047** □□					
4,8	4,8	36	**MDS 048** □□			62	19,6	26
4,9	4,9		**MDS 049** □□					
5,0	5,0		**MDS 050** □□	▲	▲			
5,1	5,1		**MDS 051** □□	▲				
5,2	5,2		**MDS 052** □□	▲	▲			
5,3	5,3		**MDS 053** □□					
5,4	5,4	36	**MDS 054** □□			66	22,8	30
5,5	5,5		**MDS 055** □□	▲				
5,6	5,6		**MDS 056** □□					
5,7	5,7		**MDS 057** □□					
5,8	5,8		**MDS 058** □□					
5,9	5,9		**MDS 059** □□					
6,0	6,0		**MDS 060** □□	▲	▲			

●Diameter ø6,1~10,0mm

Dimensions (mm)			Cat. No.	Short Type				
	Shank			Stock		Dimensions (mm)		
øD	ød	ℓ_3	SK, SG ▽	SK	SG	L	ℓ_1	ℓ_2
6,1	6,1	39	**MDS 061** □□			70	23,0	31
6,2	6,2		**MDS 062** □□					
6,3	6,3		**MDS 063** □□					
6,4	6,4		**MDS 064** □□					
6,5	6,5		**MDS 065** □□	▲	▲			
6,6	6,6		**MDS 066** □□					
6,7	6,7		**MDS 067** □□					
6,8	6,8	40	**MDS 068** □□	▲	▲	74	25,0	34
6,9	6,9		**MDS 069** □□					
7,0	7,0		**MDS 070** □□	▲	▲			
7,1	7,1		**MDS 071** □□					
7,2	7,2		**MDS 072** □□					
7,3	7,3		**MDS 073** □□					
7,4	7,4		**MDS 074** □□					
7,5	7,5		**MDS 075** □□	▲				
7,6	7,6	42	**MDS 076** □□			79	26,8	37
7,7	7,7		**MDS 077** □□					
7,8	7,8		**MDS 078** □□					
7,9	7,9		**MDS 079** □□					
8,0	8,0		**MDS 080** □□	▲	▲			
8,1	8,1		**MDS 081** □□					
8,2	8,2		**MDS 082** □□					
8,3	8,3		**MDS 083** □□					
8,4	8,4		**MDS 084** □□					
8,5	8,5		**MDS 085** □□	▲	▲			
8,6	8,6	44	**MDS 086** □□			84	28,6	40
8,7	8,7		**MDS 087** □□					
8,8	8,8		**MDS 088** □□					
8,9	8,9		**MDS 089** □□					
9,0	9,0		**MDS 090** □□	▲	▲			
9,1	9,1		**MDS 091** □□					
9,2	9,2		**MDS 092** □□					
9,3	9,3		**MDS 093** □□					
9,4	9,4		**MDS 094** □□					
9,5	9,5		**MDS 095** □□	▲				
9,6	9,6	46	**MDS 096** □□			89	30,3	43
9,7	9,7		**MDS 097** □□					
9,8	9,8		**MDS 098** □□					
9,9	9,9		**MDS 099** □□					
10,0	10,0		**MDS 100** □□	▲	▲			

■ Recommended Cutting Conditions for K Type Multi-Drills

Diameter (mm)		Soft Steels (under HB250)	General Steels, Alloy Steels	Die Steels (about HB250)	Stainless Steels (< HB200)	Ductile Cast Irons	Grey Cast Irons
~ ø 5	v_c	40 – **60** – 80	40 – **60** – 80	15 – **30** – 45	15 – **40** – 55	40 – **60** – 80	40 – **70** – 90
	f	0,15 – 0,25	0,15 – 0,25	0,10 – 0,20	0,08 – 0,15	0,15 – 0,25	0,15 – 0,30
~ ø10	v_c	50 – **70** – 120	50 – **70** – 110	20 – **40** – 50	15 – **45** – 60	50 – **70** – 100	50 – **80** – 120
	f	0,20 – 0,35	0,20 – 0,35	0,10 – 0,20	0,10 – 0,20	0,20 – 0,35	0,20 – 0,35
~ ø15	v_c	60 – **80** – 120	50 – **70** – 120	20 – **40** – 60	20 – **50** – 70	50 – **70** – 100	60 – **90** – 120
	f	0,25 – 0,35	0,25 – 0,35	0,15 – 0,25	0,10 – 0,20	0,25 – 0,35	0,25 – 0,35
~ ø20	v_c	60 – **90** – 120	60 – **80** – 120	30 – **40** – 60	20 – **50** – 70	60 – **80** – 100	60 – **90** – 120
	f	0,30 – 0,40	0,25 – 0,40	0,15 – 0,25	0,10 – 0,20	0,25 – 0,40	0,25 – 0,45

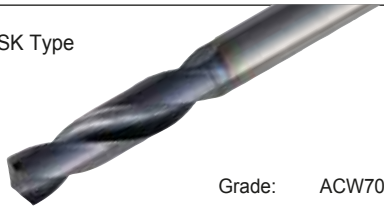
(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

▲ = To be replaced by new item

MDS ... SK/SG Type

K Type: Coated Multi-Drill for General Purpose Drilling of Steels
G Type: Uncoated Multi-Drill for Cast Irons and Aluminium Alloys

● SK Type



Grade: ACW70

● SG Type

Grade: A1

●Diameter ø10,1~12,0mm

Dimensions (mm)			Cat. No.	Short Type				
				Stock		Dimensions (mm)		
øD	Shank							
	ød	ℓ_3	SK, SG	SK	SG	L	ℓ_1	ℓ_2
10,1	10,1	46	MDS 101 □□	▲		89	30,3	43
10,2	10,2		MDS 102 □□					
10,3	10,3		MDS 103 □□					
10,4	10,4		MDS 104 □□					
10,5	10,5		MDS 105 □□	▲				
10,6	10,6		MDS 106 □□					
10,7	10,7	48	MDS 107 □□			95	32,8	47
10,8	10,8		MDS 108 □□					
10,9	10,9		MDS 109 □□					
11,0	11,0		MDS 110 □□	▲	▲			
11,1	11,1		MDS 111 □□					
11,2	11,2		MDS 112 □□					
11,3	11,3		MDS 113 □□					
11,4	11,4		MDS 114 □□					
11,5	11,5		MDS 115 □□	▲				
11,6	11,6		MDS 116 □□					
11,7	11,7		MDS 117 □□					
11,8	11,8		MDS 118 □□					
11,9	11,9	51	MDS 119 □□			102	35,2	51
12,0	12,0		MDS 120 □□	▲	▲			

●Diameter ø12,1~14,0mm

Dimensions (mm)			Cat. No.	Short Type				
				Stock		Dimensions (mm)		
øD	Shank							
	ød	ℓ_3	SK, SG	SK	SG	L	ℓ_1	ℓ_2
12,1	12,1	51	MDS 121 □□			102	35,2	51
12,2	12,2		MDS 122 □□					
12,3	12,3		MDS 123 □□					
12,4	12,4		MDS 124 □□					
12,5	12,5		MDS 125 □□					
12,6	12,6		MDS 126 □□					
12,7	12,7		MDS 127 □□					
12,8	12,8		MDS 128 □□					
12,9	12,9		MDS 129 □□					
13,0	13,0		MDS 130 □□					
13,1	13,1		MDS 131 □□					
13,2	13,2		MDS 132 □□					
13,3	13,3	53	MDS 133 □□			107	37,2	54
13,4	13,4		MDS 134 □□					
13,5	13,5		MDS 135 □□					
13,6	13,6		MDS 136 □□					
13,7	13,7		MDS 137 □□					
13,8	13,8		MDS 138 □□					
13,9	13,9		MDS 139 □□					
14,0	14,0		MDS 140 □□					

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs.
Please specify the Cat. No. For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **MDS** **102** **SK** ACW70 (Grade)

- **M**ulti-**D**rill **S**olid type
- Drill diameter **10,2** mm
- **K** : K-Type drill
- **G** : G-Type drill
- **S** : 2,5 ~ 3D

■ Recommended Cutting Conditions for G Type Multi-Drills

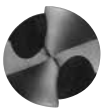
(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

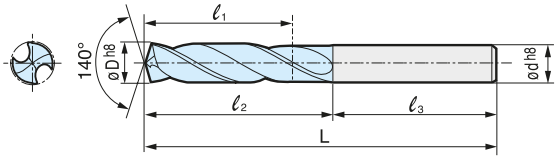
Diameter (mm)		Ductile Cast Irons	Grey Cast Irons	Aluminium Alloys
~ ø 6	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,15 – 0,2 – 0,25	0,2 – 0,25 – 0,3	0,2 – 0,3 – 0,4
~ ø10	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,3 – 0,35	0,25 – 0,35 – 0,4	0,25 – 0,35 – 0,45
~ ø14	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,35 – 0,4	0,25 – 0,4 – 0,5	0,25 – 0,45 – 0,6
~ ø20	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,4 – 0,5	0,25 – 0,4 – 0,6	0,25 – 0,45 – 0,7

MDS ... MK/MG Type

Long Type

Cylindrical Solid Carbide Drills without Coolant Holes





Helix angle: 30°
ℓ_1 = Effective drilling length

●Diameter ø2,0~6,0mm

Dimensions (mm)			Cat. No.	Long Type				
	Shank			Stock		Dimensions (mm)		
øD	ød	ℓ_3	MK, MG	MK	MG	L	ℓ_1	ℓ_2
2,0	2,0	30	**MDS 020** □□			45,4	12,9	15,4
2,1	2,1		**MDS 021** □□					
2,2	2,2	30	**MDS 022** □□			46,4	13,6	16,4
2,3	2,3		**MDS 023** □□					
2,4	2,4	30	**MDS 024** □□			47,5	14,4	17,5
2,5	2,5		**MDS 025** □□					
2,6	2,6		**MDS 026** □□					
2,7	2,7	30	**MDS 027** □□			49,5	15,9	19,5
2,8	2,8		**MDS 028** □□					
2,9	2,9		**MDS 029** □□					
3,0	3,0		**MDS 030** □□					
3,1	3,1	31	**MDS 031** □□			52,6	17,6	21,6
3,2	3,2		**MDS 032** □□					
3,3	3,3		**MDS 033** □□					
3,4	3,4	32	**MDS 034** □□			56,7	20,3	24,7
3,5	3,5		**MDS 035** □□					
3,6	3,6		**MDS 036** □□					
3,7	3,7		**MDS 037** □□					
3,8	3,8	33	**MDS 038** □□			60,8	22,8	27,8
3,9	3,9		**MDS 039** □□					
4,0	4,0		**MDS 040** □□					
4,1	4,1		**MDS 041** □□					
4,2	4,2		**MDS 042** □□					
4,3	4,3	34	**MDS 043** □□			65,9	26,3	31,9
4,4	4,4		**MDS 044** □□					
4,5	4,5		**MDS 045** □□					
4,6	4,6		**MDS 046** □□					
4,7	4,7		**MDS 047** □□					
4,8	4,8	36	**MDS 048** □□			69,9	28,0	33,9
4,9	4,9		**MDS 049** □□					
5,0	5,0	38	**MDS 050** □□	▲	▲	77,0	32,4	39,0
5,1	5,1		**MDS 051** □□	▲				
5,2	5,2		**MDS 052** □□					
5,3	5,3		**MDS 053** □□					
5,4	5,4		**MDS 054** □□					
5,5	5,5		**MDS 055** □□	▲	▲			
5,6	5,6	40	**MDS 056** □□			82,1	34,9	42,1
5,7	5,7		**MDS 057** □□					
5,8	5,8		**MDS 058** □□					
5,9	5,9		**MDS 059** □□					
6,0	6,0		**MDS 060** □□	▲	▲			

●Diameter ø6,1~10,0mm

Dimensions (mm)			Cat. No.	Long Type				
	Shank			Stock		Dimensions (mm)		
øD	ød	ℓ_3	MK, MG	MK	MG	L	ℓ_1	ℓ_2
6,1	6,1	40	**MDS 061** □□			82,1	34,9	42,1
6,2	6,2		**MDS 062** □□					
6,3	6,3		**MDS 063** □□					
6,4	6,4		**MDS 064** □□					
6,5	6,5		**MDS 065** □□	▲	▲			
6,6	6,6	40	**MDS 066** □□			84,2	35,8	44,2
6,7	6,7		**MDS 067** □□					
6,8	6,8		**MDS 068** □□	▲	▲			
6,9	6,9		**MDS 069** □□					
7,0	7,0		**MDS 070** □□	▲	▲			
7,1	7,1	41	**MDS 071** □□			88,3	37,3	46,3
7,2	7,2		**MDS 072** □□					
7,3	7,3		**MDS 073** □□					
7,4	7,4		**MDS 074** □□					
7,5	7,5		**MDS 075** □□	▲	▲			
7,6	7,6	42	**MDS 076** □□			91,4	39,8	49,4
7,7	7,7		**MDS 077** □□					
7,8	7,8		**MDS 078** □□					
7,9	7,9		**MDS 079** □□					
8,0	8,0		**MDS 080** □□	▲	▲			
8,1	8,1	43	**MDS 081** □□			97,5	44,3	54,5
8,2	8,2		**MDS 082** □□					
8,3	8,3		**MDS 083** □□					
8,4	8,4		**MDS 084** □□					
8,5	8,5		**MDS 085** □□	▲	▲			
8,6	8,6	43	**MDS 086** □□			99,6	45,8	56,6
8,7	8,7		**MDS 087** □□					
8,8	8,8		**MDS 088** □□					
8,9	8,9		**MDS 089** □□					
9,0	9,0		**MDS 090** □□	▲	▲			
9,1	9,1	44	**MDS 091** □□			103,7	48,3	59,7
9,2	9,2		**MDS 092** □□					
9,3	9,3		**MDS 093** □□					
9,4	9,4		**MDS 094** □□					
9,5	9,5		**MDS 095** □□	▲	▲			
9,6	9,6	45	**MDS 096** □□			106,8	49,8	61,8
9,7	9,7		**MDS 097** □□					
9,8	9,8		**MDS 098** □□					
9,9	9,9		**MDS 099** □□					
10,0	10,0		**MDS 100** □□	▲	▲			

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs. Please specify the Cat. No. For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **MDS** **102** **MK** , ACW70 (Grade)

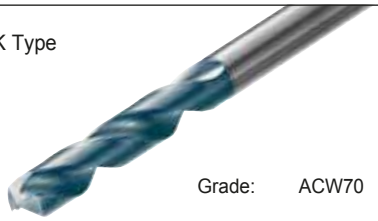
- **MDS**: **M**ulti-**D**rill **S**olid type
- **102**: Drill diameter **10,2** mm
- **MK**: **K** : K-Type drill; **G** : G-Type drill; **M** : ~ 4D

▲ = To be replaced by new item

MDS ... MK/MG Type

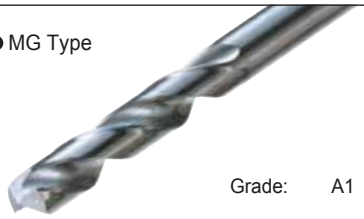
K Type: Coated Multi-Drill for General Purpose Drilling of Steels
G Type: Uncoated Multi-Drill for Cast Irons and Aluminium Alloys

● MK Type



Grade: ACW70

● MG Type



Grade: A1

●Diameter ø10,1~12,0mm

Dimensions (mm)			Cat. No.	Long Type				
	Schaft			Stock		Dimensions (mm)		
øD	ød	ℓ_3	MK, MG	MK	MG	L	ℓ_1	ℓ_2
10,1	10,1		MDS 101 □□					
10,2	10,2		MDS 102 □□			113,9	55,3	67,9
10,3	10,3	46	MDS 103 □□					
10,4	10,4		MDS 104 □□					
10,5	10,5		MDS 105 □□	▲				
10,6	10,6		MDS 106 □□					
10,7	10,7		MDS 107 □□					
10,8	10,8	46	MDS 108 □□			116,0	56,8	70,0
10,9	10,9		MDS 109 □□					
11,0	11,0		MDS 110 □□	▲	▲			
11,1	11,1		MDS 111 □□					
11,2	11,2		MDS 112 □□					
11,3	11,3	47	MDS 113 □□			120,2	59,4	73,2
11,4	11,4		MDS 114 □□					
11,5	11,5		MDS 115 □□	▲	▲			
11,6	11,6		MDS 116 □□					
11,7	11,7		MDS 117 □□					
11,8	11,8	48	MDS 118 □□			123,2	60,8	75,2
11,9	11,9		MDS 119 □□					
12,0	12,0		MDS 120 □□	▲	▲			

●Diameter ø12,1~14,0mm

Dimensions (mm)			Cat. No.	Long Type				
	Schaft			Stock		Dimensions (mm)		
øD	ød	ℓ_3	MK, MG	MK	MG	L	ℓ_1	ℓ_2
12,1	12,1		MDS 121 □□					
12,2	12,2		MDS 122 □□			137,3	73,3	78,3
12,3	12,3	59	MDS 123 □□					
12,4	12,4		MDS 124 □□					
12,5	12,5		MDS 125 □□					
12,6	12,6		MDS 126 □□					
12,7	12,7		MDS 127 □□					
12,8	12,8	59	MDS 128 □□			139,4	84,8	80,4
12,9	12,9		MDS 129 □□					
13,0	13,0		MDS 130 □□					
13,1	13,1		MDS 131 □□					
13,2	13,2		MDS 132 □□					
13,3	13,3	60	MDS 133 □□			146,5	70,3	86,5
13,4	13,4		MDS 134 □□					
13,5	13,5		MDS 135 □□					
13,6	13,6		MDS 136 □□					
13,7	13,7		MDS 137 □□					
13,8	13,8	61	MDS 138 □□			149,6	71,8	88,6
13,9	13,9		MDS 139 □□					
14,0	14,0		MDS 140 □□					

■ Recommended Cutting Conditions for K Type Multi-Drills

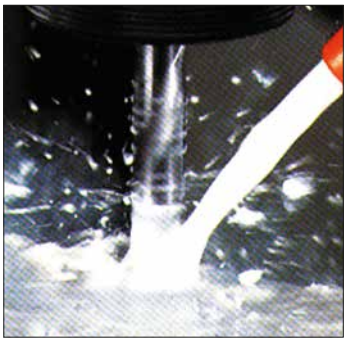
(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Soft Steels (under HB250)	General Steels, Alloy Steels	Die Steels (about HB250)	Stainless Steels	Ductile Cast Irons	Grey Cast Irons
~ ø 5	v_c	40 – **60** – 80	40 – **60** – 80	15 – **30** – 45	15 – **40** – 55	40 – **60** – 80	40 – **70** – 90
	f	0,15 – 0,25	0,15 – 0,25	0,10 – 0,20	0,08 – 0,15	0,15 – 0,25	0,15 – 0,30
~ ø10	v_c	50 – **70** – 120	50 – **70** – 110	20 – **40** – 50	15 – **45** – 60	50 – **70** – 100	50 – **80** – 120
	f	0,20 – 0,35	0,20 – 0,35	0,10 – 0,20	0,10 – 0,20	0,20 – 0,35	0,20 – 0,35
~ ø15	v_c	60 – **80** – 120	50 – **70** – 120	20 – **40** – 60	20 – **50** – 70	50 – **70** – 100	60 – **90** – 120
	f	0,25 – 0,35	0,25 – 0,35	0,15 – 0,25	0,10 – 0,20	0,25 – 0,35	0,25 – 0,35
~ ø20	v_c	60 – **90** – 120	60 – **80** – 120	30 – **40** – 60	20 – **50** – 70	60 – **80** – 100	60 – **90** – 120
	f	0,30 – 0,40	0,25 – 0,40	0,15 – 0,25	0,10 – 0,20	0,25 – 0,40	0,25 – 0,45

■ Recommended Cutting Conditions for G Type Multi-Drills

(v_c : Cutting Speed (m/min), f : Feed Rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Ductile Cast Irons	Grey Cast Irons	Aluminium Alloys
~ ø 6	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,15 – 0,2 – 0,25	0,2 – 0,25 – 0,3	0,2 – 0,3 – 0,4
~ ø10	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,3 – 0,35	0,25 – 0,35 – 0,4	0,25 – 0,35 – 0,45
~ ø14	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,35 – 0,4	0,25 – 0,4 – 0,5	0,25 – 0,45 – 0,6
~ ø20	v_c	25 – **50** – 70	25 – **55** – 80	80 – **120** – 200
	f	0,2 – 0,4 – 0,5	0,25 – 0,4 – 0,6	0,25 – 0,45 – 0,7



New

General Features

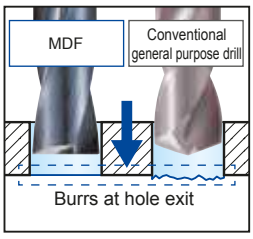
The flat MultiDrill MDF type is a solid carbide drill that can be used for various purposes including high-efficiency spot facing and drilling in inclined and curved surfaces.

Advantages

- **Can be used in a variety of drilling applications thanks to its point angle of 180°**
  Applicable to high-efficiency spot facing, drilling in non-horizontal surfaces such as inclined and cylindrical surfaces and interrupted drilling. It also reduces burrs at hole exits.
- **Improved machining stability**
  Achieves high rigidity by employing RS THINNING, which ensures web thickness on the bottom face.
- **Excellent chip evacuation performance**
  Achieves excellent chip evacuation thanks to its wide chip pocket and high-quality rake face shape.
- **Excellent cutting edge strength**
  Achieves excellent cutting edge strength thanks to optimized cutting edge design.
- **Expanded lineup of long type**
  An expanded lineup of long type drills with diameters between Ø3,0 and Ø20,0mm that are capable of drilling with an overhang length up to L/D=10.
- **Expanded lineup of types with oil hole**
  Supports internal coolant. For deeper drilling (3D, 5D).

Improves drilling stability by ensuring web thickness.

Reduction of Burrs at Hole Exit



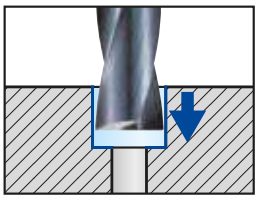
Work Material: 15CrMo5
Drill: MDF0500S2D (Ø5,0mm 2D)
Cutting Conditions: v_c = 65m/min, f = 0,12mm/rev
H = 10mm, 150 holes, wet
Equipment: Vertical machining center

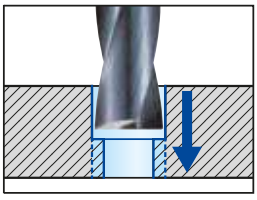
Reduces exit burrs by more than half compared to general-purpose drills

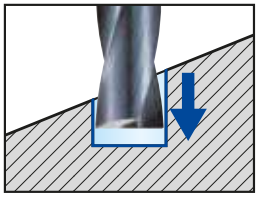

Burr height: 0,18mm
Flat MultiDrill MDF type

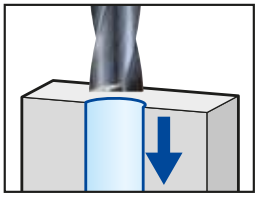

Burr height: 0,44mm
Conventional general type

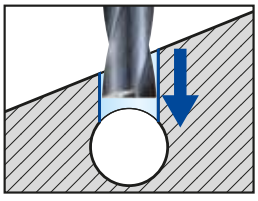
Applications

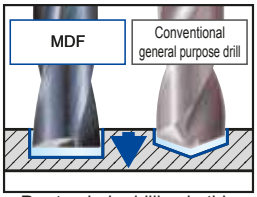

High-efficient spot facing


Hole expansion drilling

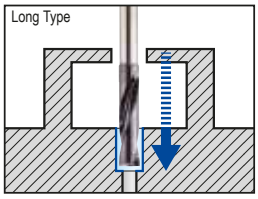

Drilling in non-horizontal surfaces (such as inclined and cylindrical)


Interrupted drilling

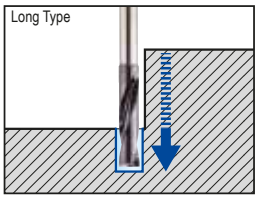

Cross drilling



Pre-tap hole drilling in thin sheets



Deep spot facing



Avoiding interference with work materials

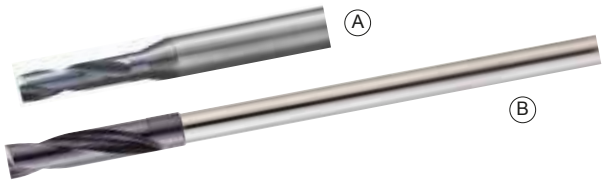
Flat MultiDrill
MDF Type

New

Long Type (L2D)

For flat base drilling in long overhang conditions, hole expansion, burr prevention.
For deep flat base drilling and to avoid interference with workpiece.
Drilling that uses the long shank type requires a guide hole of the same diameter or a centering hole larger than the tool diameter.

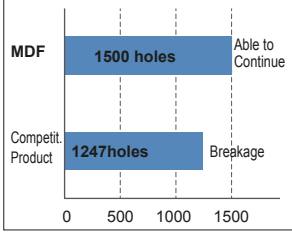
Two types
Ⓐ $ØD_c$ < 6mm Stepped Shank Products
Ⓑ $ØD_c$ ≥ 6mm Relief Shank Products



With Oil Hole (H3D Type / H5D Type)

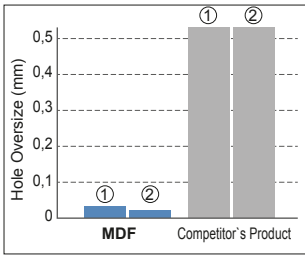
Support for internal coolant allows for deeper flat hole drilling.
Drilling that uses oil hole L/D=5 requires a guide hole of the same diameter or a centering hole larger than the tool diameter.

Deep Spot Facing



Tool: MDF0600H5D
Work Material: C50, Ø6mm
Cutting Conditions: v_c=140m/min, f =0,15mm/rev H=30mm (5D) Internal Coolant Overhang 45mm Prepared Hole 3mm (0,5D)

Long Overhang Spot Facing



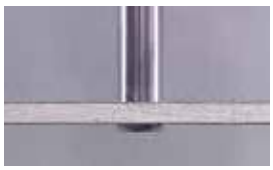
Tool: MDF0600H3D
Work Material: C50,
Cutting Conditions: v_c=90m/min, f =0,1mm/rev H=18mm (3D) Internal Coolant Overhang 35mm

① Entrance ② Hole Bottom

Inclined Surface Drilling

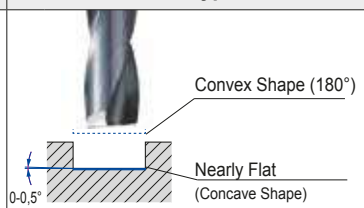
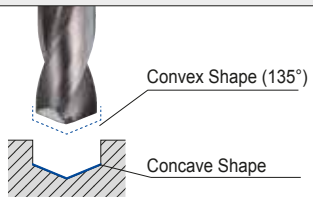
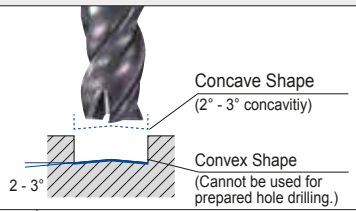
Tool: MDF0500S2D
Work Material: 15CrMo5
Cutting Conditions: v_c=65m/min, f =0,08mm/rev H=10mm External MQL

Controlling Burrs and Chips when Withdrawn



Tool: MDF1000S2D
Work Material: St 42-3
Cutting Conditions: v_c=75m/min, f =0,12mm/rev H=5mm External MQL

Using Flat Drills, General-Purpose Drills and Endmills

Tool	Flat Drill **MDF Type**		General Purpose Drill GS/HGS Type		Endmill for Spot Facing GSX MILL Slot	
Hole Bottom Shape						
Drilling in horizontal surfaces	◎	Feed rate approximately half of a general-purpose drill	○	Optimal	X	Within 1D, limited to low feed rate Feed rate one-fifth or lower of a general-purpose drill
Drilling in non-horizontal surfaces	○	Optimal (within 2D is recommended)	X	Unusable	◎	Within 1D, limited to low feed rate Feed rate half or lower of a flat drill
Traversing	X	Unusable	X	Unusable	○	Optimal

Series

Application	Series	Diameter Range (mm)	Hole Depth (L/D)
External	MDF □□□□ S2D	Ø0,3 - Ø20,0	≤ 2,0
	MDF □□□□ L2D	Ø0,3 - Ø20,0	≤ 2,0
Internal	MDF □□□□ H3D	Ø0,3 - Ø16,0	≤ 3,0
	MDF □□□□ H5D	Ø0,3 - Ø16,0	≤ 5,0

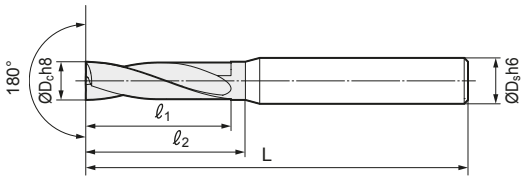
New

Carbon Steel <0,28%	Alloy Steel >0,28%	Tempered Steel	Hardened Steel <45HRC	Hardened Steel >45HRC	Stainless-Steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy
◎	◎	◎	○		○	○	○	○

PVD 2D

External Coolant Supply (MDF S2D Type)

● MDF Type



● Diameter ØDc: 0,3 ~ 7,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
0,3*	3,0	MDF 0030S2D	❍	40	1,0	1,3
0,4*		0040S2D	❍		1,4	1,8
0,5	3,0	MDF 0050S2D	❍	40	2,0	2,2
0,6		0060S2D	❍		2,4	2,6
0,7		0070S2D	❍		2,8	3,1
0,8		0080S2D	❍		3,2	3,5
0,9		0090S2D	❍		3,6	4,0
1,0	3,0	MDF 0100S2D	●	45	4,0	4,4
1,1		0110S2D	❍		4,4	4,8
1,2		0120S2D	❍		4,8	5,3
1,3		0130S2D	❍		5,2	5,7
1,4		0140S2D	❍		5,6	6,2
1,5	3,0	MDF 0150S2D	●	45	6,0	6,6
1,6		0160S2D	❍		6,4	7,0
1,7		0170S2D	❍		6,8	7,5
1,8		0180S2D	❍		7,2	7,9
1,9		0190S2D	❍		7,6	8,4
2,0	4,0	MDF 0200S2D	●	50	8,0	8,8
2,1		0210S2D	●		8,4	9,2
2,2		0220S2D	●		8,8	9,7
2,3		0230S2D	●		9,2	10,1
2,4		0240S2D	●		9,6	10,6
2,5	4,0	MDF 0250S2D	●	50	10,0	11,0
2,6		0260S2D	●		10,4	11,4
2,7		0270S2D	●		10,8	11,9
2,8		0280S2D	●		11,2	12,3
2,9		0290S2D	●		11,6	12,8
3,0	6,0	MDF 0300S2D	●	50	12,0	13,2
3,1		0310S2D	●		12,4	13,6
3,2		0320S2D	●		12,8	14,1
3,3		0330S2D	●		13,2	14,5
3,4		0340S2D	●		13,6	15,0
3,5		0350S2D	●		14,0	15,4
3,6	6,0	MDF 0360S2D	●	50	14,4	15,8
3,7		0370S2D	●		14,8	16,3
3,8		0380S2D	●		15,2	16,7
3,9		0390S2D	●		15,6	17,2
4,0		0400S2D	●		16,0	17,6
4,1	6,0	MDF 0410S2D	●	60	16,4	18,0
4,2		0420S2D	●		16,8	18,5
4,3		0430S2D	●		17,2	18,9
4,4		0440S2D	●		17,6	19,4
4,5		0450S2D	●		18,0	19,8
4,6	6,0	MDF 0460S2D	●	60	18,4	20,2
4,7		0470S2D	●		18,8	20,7
4,8		0480S2D	●		19,2	21,1
4,9		0490S2D	●		19,6	21,6
5,0		0500S2D	●		20,0	22,0
5,1	6,0	MDF 0510S2D	●	60	20,4	22,4
5,2		0520S2D	●		20,8	22,9
5,3		0530S2D	●		21,2	23,3
5,4		0540S2D	●		21,6	23,8
5,5		0550S2D	●		22,0	24,2
5,6	6,0	MDF 0560S2D	●	60	22,4	24,6
5,7		0570S2D	●		22,8	25,1
5,8		0580S2D	●		23,2	25,5
5,9		0590S2D	●		23,6	26,0
6,0		0600S2D	●		24,0	26,4
6,1	8,0	MDF 0610S2D	●	70	24,4	26,8
6,2		0620S2D	●		24,8	27,3
6,3		0630S2D	●		25,2	27,7
6,4		0640S2D	●		25,6	28,2
6,5		0650S2D	●		26,0	28,6
6,6	8,0	MDF 0660S2D	●	70	26,4	29,0
6,7		0670S2D	●		26,8	29,5
6,8		0680S2D	●		27,2	29,9
6,9		0690S2D	●		27,6	30,4
7,0		0700S2D	●		28,0	30,8

● Diameter ØDc: 7,1 ~ 20,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
7,1	8,0	MDF 0710S2D	●	70	28,4	31,2
7,2		0720S2D	●		28,8	31,7
7,3		0730S2D	●		29,2	32,1
7,4		0740S2D	●		29,6	32,6
7,5		0750S2D	●		30,0	33,0
7,6	8,0	MDF 0760S2D	●	70	30,4	33,4
7,7		0770S2D	●		30,8	33,9
7,8		0780S2D	●		31,2	34,3
7,9		0790S2D	●		31,6	34,8
8,0		0800S2D	●		32,0	35,2
8,1	10,0	MDF 0810S2D	❍	80	32,4	35,6
8,2		0820S2D	❍		32,8	36,1
8,3		0830S2D	❍		33,2	36,5
8,4		0840S2D	❍		33,6	37,0
8,5		0850S2D	●		34,0	37,4
8,6	10,0	MDF 0860S2D	❍	80	34,4	37,8
8,7		0870S2D	❍		34,8	38,3
8,8		0880S2D	❍		35,2	38,7
8,9		0890S2D	❍		35,6	39,2
9,0		0900S2D	●		36,0	39,6
9,1	10,0	MDF 0910S2D	❍	80	36,4	40,0
9,2		0920S2D	❍		36,8	40,5
9,3		0930S2D	❍		37,2	40,9
9,4		0940S2D	❍		37,6	41,4
9,5		0950S2D	●		38,0	41,8
9,6	10,0	MDF 0960S2D	❍	80	38,4	42,2
9,7		0970S2D	❍		38,8	42,7
9,8		0980S2D	❍		39,2	43,1
9,9		0990S2D	❍		39,6	43,6
10,0		1000S2D	●		40,0	44,0
10,1	12,0	MDF 1010S2D	❍	90	40,4	44,4
10,2		1020S2D	❍		40,8	44,9
10,3		1030S2D	❍		41,2	45,3
10,4		1040S2D	❍		41,6	45,8
10,5		1050S2D	●		42,0	46,2
10,6	12,0	MDF 1060S2D	❍	90	42,4	46,6
10,7		1070S2D	❍		42,8	47,1
10,8		1080S2D	❍		43,2	47,5
10,9		1090S2D	❍		43,6	48,0
11,0		1100S2D	●		44,0	48,4
11,1	12,0	MDF 1110S2D	❍	90	44,4	48,8
11,2		1120S2D	❍		44,8	49,3
11,3		1130S2D	❍		45,2	49,7
11,4		1140S2D	❍		45,6	50,2
11,5		1150S2D	●		46,0	50,6
11,6	12,0	MDF 1160S2D	❍	90	46,4	51,0
11,7		1170S2D	❍		46,8	51,5
11,8		1180S2D	❍		47,2	51,9
11,9		1190S2D	❍		47,6	52,4
12,0		1200S2D	●		48,0	52,8
12,5	14,0	MDF 1250S2D	❍	100	50,0	54,0
13,0		1300S2D	❍		52,0	56,8
13,5		1350S2D	❍	110	54,0	59,6
14,0		1400S2D	❍		56,0	62,4
14,5	16,0	MDF 1450S2D	❍	110	58,0	65,2
15,0		1500S2D	❍		60,0	68,0
15,5		1550S2D	❍	115	62,0	70,8
16,0		1600S2D	❍		64,0	73,6
16,5	18,0	MDF 1650S2D	❍	125	66,0	72,4
17,0		1700S2D	❍		68,0	75,2
17,5		1750S2D	❍	130	70,0	78,0
18,0		1800S2D	❍		72,0	80,8
18,5	20,0	MDF 1850S2D	❍	140	74,0	83,6
19,0		1900S2D	❍		76,0	86,4
19,5		1950S2D	❍		78,0	89,2
20,0		2000S2D	❍		80,0	92,0

*RS Thinning is used for ØDc ≥ 0,5mm.

Grade: ACF75

● = Euro stock
❍ = Japan stock

Flat MultiDrill
MDF Type

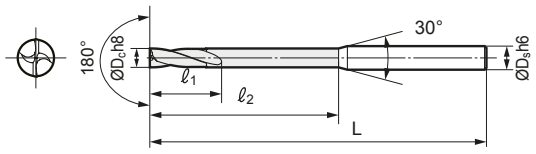
New

External Coolant Supply (L2D Type, Long Type)

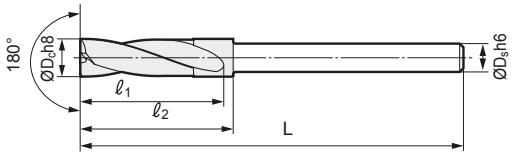
Carbon Steel, Alloy Steel <0,28%	Carbon Steel, Alloy Steel >0,28%	Tempered Steel	Hardened Steel <45HRC	Hardened Steel >45HRC	Stainless-Steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy
◎	◎	◎	○		○	○	○	○

PVD 2D

● $ØD_c \leq ØD_s$



● $ØD_c > ØD_s$



● Diameter $ØD_c$: 3,0 ~ 9,5mm

Diameter ØDc (mm)	Shank ØDs (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
3,0	6,0	MDF 0300L2D	❍	100	13,5	30,0
3,1		0310L2D	❍		14,0	31,0
3,2		0320L2D	❍		14,4	32,0
3,3		0330L2D	❍		14,9	33,0
3,4		0340L2D	❍		15,3	34,0
3,5		0350L2D	❍		15,8	35,0
3,6		MDF 0360L2D	❍		16,2	36,0
3,7		0370L2D	❍		16,7	37,0
3,8		0380L2D	❍		17,1	38,0
3,9		0390L2D	❍		17,6	39,0
4,0		0400L2D	❍		18,0	40,0
4,1		MDF 0410L2D	❍		18,5	41,0
4,2		0420L2D	❍		18,9	42,0
4,3		0430L2D	❍		19,4	43,0
4,4		0440L2D	❍		19,8	44,0
4,5		0450L2D	❍		20,3	45,0
4,6		MDF 0460L2D	❍		20,7	46,0
4,7		0470L2D	❍		21,2	47,0
4,8		0480L2D	❍		21,6	48,0
4,9		0490L2D	❍		22,1	49,0
5,0		0500L2D	❍		22,5	50,0
5,1		MDF 0510L2D	❍	110	23,0	51,0
5,2		0520L2D	❍		23,4	52,0
5,3		0530L2D	❍		23,9	53,0
5,4		0540L2D	❍		24,3	54,0
5,5		0550L2D	❍		24,8	55,0
5,6		MDF 0560L2D	❍		25,2	56,0
5,7		0570L2D	❍		25,7	57,0
5,8		0580L2D	❍		26,1	58,0
5,9		0590L2D	❍		26,6	59,0
6,0	5,0	MDF 0600L2DS5	❍	110	27,0	30,0
6,0	6,0	MDF 0600L2D	❍	110	27,0	60,0
6,1	6,0	MDF 0610L2D	❍	120	27,5	30,5
6,2		0620L2D	❍		27,9	30,9
6,3		0630L2D	❍		28,4	31,4
6,4		0640L2D	❍		28,8	31,8
6,5		0650L2D	❍		29,3	32,3
6,6		MDF 0660L2D	❍		29,7	32,7
6,7		0670L2D	❍		30,2	33,2
6,8		0680L2D	❍		30,6	33,6
6,9		0690L2D	❍		31,1	34,1
7,0		0700L2D	❍		31,5	34,5
7,1		MDF 0710L2D	❍	130	32,0	35,0
7,2		0720L2D	❍		32,4	35,4
7,3		0730L2D	❍		32,9	35,9
7,4		0740L2D	❍		33,3	36,3
7,5		0750L2D	❍		33,8	36,8
7,6		MDF 0760L2D	❍		34,2	37,2
7,7		0770L2D	❍		34,7	37,7
7,8		0780L2D	❍		35,1	38,1
7,9		0790L2D	❍		35,6	38,6
8,0	6,0	MDF 0800L2DS6	❍	130	36,0	39,0
8,0	8,0	MDF 0800L2D	❍	130	36,0	80,0
8,1	8,0	MDF 0810L2D	❍	140	36,5	39,5
8,2		0820L2D	❍		36,9	39,9
8,3		0830L2D	❍		37,4	40,4
8,4		0840L2D	❍		37,8	40,8
8,5		0850L2D	❍		38,3	41,3
8,6		MDF 0860L2D	❍		38,7	41,7
8,7		0870L2D	❍		39,2	42,2
8,8		0880L2D	❍		39,6	42,6
8,9		0890L2D	❍		40,1	43,1
9,0		0900L2D	❍		40,5	43,5
9,1		MDF 0910L2D	❍	150	41,0	41,0
9,2		0920L2D	❍		41,4	41,4
9,3		0930L2D	❍		41,9	41,9
9,4		0940L2D	❍		42,3	42,3
9,5		0950L2D	❍		42,8	42,8

● Diameter $ØD_c$: 9,6 ~ 20,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
9,6	8,0	MDF 0960L2D	❍	150	43,2	46,2
9,7		0970L2D	❍		43,7	46,7
9,8		0980L2D	❍		44,1	47,1
9,9		0990L2D	❍		44,6	47,6
10,0	8,0	MDF 1000L2DS8	❍	150	45,0	48,0
10,0	10,0	MDF 1000L2D	❍	150	45,0	100,0
10,1	10,0	MDF 1010L2D	❍	160	45,5	48,5
10,2		1020L2D	❍		45,9	48,9
10,3		1030L2D	❍		46,4	49,4
10,4		1040L2D	❍		46,8	49,8
10,5		1050L2D	❍		47,3	50,3
10,6		MDF 1060L2D	❍		47,7	50,7
10,7		1070L2D	❍		48,2	51,2
10,8		1080L2D	❍		48,6	51,6
10,9		1090L2D	❍		49,1	52,1
11,0		1100L2D	❍		49,5	52,5
11,1		MDF 1110L2D	❍	170	50,0	53,0
11,2		1120L2D	❍		50,4	53,4
11,3		1130L2D	❍		50,9	53,9
11,4		1140L2D	❍		51,3	54,3
11,5		1150L2D	❍		51,8	54,8
11,6		MDF 1160L2D	❍		52,2	55,2
11,7		1170L2D	❍		52,7	55,7
11,8		1180L2D	❍		53,1	56,1
11,9		1190L2D	❍		53,6	56,6
12,0	10,0	MDF 1200L2DS10	❍	170	54,0	57,0
12,0	12,0	MDF 1200L2D	❍	170	54,0	120,0
12,5	12,0	MDF 1250L2D	❍	180	56,3	59,3
13,0		1300L2D	❍		58,5	61,5
13,5		1350L2D	❍	190	60,8	63,8
14,0	12,0	MDF 1400L2DS12	❍	190	63,0	66,0
14,0	14,0	MDF 1400L2D	❍	190	63,0	140,0
14,5	14,0	MDF 1450L2D	❍	200	65,3	68,3
15,0		1500L2D	❍		67,5	70,5
15,5		1550L2D	❍	210	69,8	72,8
16,0	14,0	MDF 1600L2DS14	❍	210	72,0	75,0
16,0	16,0	MDF 1600L2D	❍	210	72,0	160,0
16,5	16,0	MDF 1650L2D	❍	220	74,3	77,3
17,0		1700L2D	❍		76,5	79,5
17,5		1750L2D	❍	230	78,8	81,8
18,0	16,0	MDF 1800L2DS16	❍	230	81,0	84,0
18,0	18,0	MDF 1800L2D	❍	230	81,0	180,0
18,5	18,0	MDF 1850L2D	❍	240	83,3	86,3
19,0		1900L2D	❍		85,5	88,5
19,5		1950L2D	❍	250	87,8	90,8
20,0	18,0	MDF 2000L2DS18	❍	250	90,0	93,0
20,0	20,0	MDF 2000L2D	❍	250	90,0	200,0

Grade: ACF75

Drilling that uses this tool requires a guide hole of the same diameter or a centering hole larger than the tool diameter.

New

■ Recommended Cutting Conditions

● MDF S2D Type

1. The recommended hole depth is 2 x D_c. The depth shall be the depth from the highest point of the hole when drilling 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.
3.1 Set the feed rate at ≤ 70% when the inclination angle is ≤ 30°
3.2 Set the feed rate at ≤ 50% when the inclination angle is:> 30°
4. This product is a drilling tool. Do not use it for traversing or helical milling

(v_c: Cutting Speed m/min f: Feed Rate mm/rev)

Drill Diam. ØDc (mm)	Cutting Conditions	Soft Steel / General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~50HRC)	Stainless Steel (~200HB)	Gray Cast Iron FC250	Ductile Cast Iron	Aluminium Alloy
~ Ø0,5	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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

Min. - **Optimum** - Max.

● MDF L2D Type, Long Type

1. Drilling that uses this tool requires a guide hole of the same diameter.
2. The cutting conditions are the recommended conditions with a guide hole.
3. The recommended hole depth is 5 x D_c. The depth is measured from the highest point of the hole on drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traversing or helical milling.

(v_c: Cutting Speed m/min f: Feed Rate mm/rev)

Drill Diam. ØDc (mm)	Cutting Conditions	Soft Steel / General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~50HRC)	Stainless Steel (~200HB)	Gray Cast Iron FC250	Ductile Cast Iron	Aluminium Alloy
~ Ø4,0	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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.

● = Euro stock
❍ = Japan stock

Flat MultiDrill
MDF Type

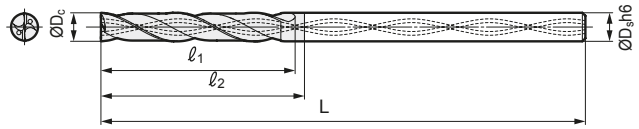
New

■ Internal Coolant Supply (MDF H3D/H5D Type)

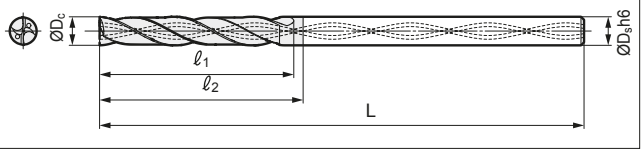
Carbon Steel <0,28%	Alloy Steel >0,28%	Tempered Steel	Hardened Steel <45HRC	Hardened Steel >45HRC	Stainless-Steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy
◎	◎	◎	○		○	○	○	○

PVD 3D 5D

● MDF Type 3D Single Margin



● MDF Type 5D Double Margin



● Diameter ØDc: 3,0 ~ 6,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Hole Depth (L/D)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
3,0	3	3	MDF 0300H3D	●	68	13,5	16,5
		5	0300H5D	●	78	20,1	23,1
3,1	4	3	MDF 0310H3D	❍	72	14,0	17,0
		5	0310H5D	❍	86	20,8	23,8
3,2	4	3	0320H3D	❍	72	14,4	17,4
		5	0320H5D	❍	86	21,4	24,4
3,3	4	3	0330H3D	❍	72	14,9	17,9
		5	0330H5D	❍	86	22,1	25,1
3,4	4	3	0340H3D	❍	72	15,3	18,3
		5	0340H5D	❍	86	22,8	25,8
3,5	4	3	0350H3D	●	72	15,8	18,8
		5	0350H5D	●	86	23,5	26,5
3,6	4	3	MDF 0360H3D	❍	72	16,2	19,2
		5	0360H5D	❍	86	24,1	27,1
3,7	4	3	0370H3D	❍	72	16,7	19,7
		5	0370H5D	❍	86	24,8	27,8
3,8	4	3	0380H3D	❍	72	17,1	20,1
		5	0380H5D	❍	86	25,5	28,5
3,9	4	3	0390H3D	❍	72	17,6	20,6
		5	0390H5D	❍	86	26,1	29,1
4,0	4	3	0400H3D	●	72	18,0	21,0
		5	0400H5D	●	86	26,8	29,8
4,1	5	3	MDF 0410H3D	❍	80	18,5	21,5
		5	0410H5D	❍	98	27,5	30,5
4,2	5	3	0420H3D	❍	80	18,9	21,9
		5	0420H5D	❍	98	28,1	31,1
4,3	5	3	0430H3D	❍	80	19,4	22,4
		5	0430H5D	❍	98	28,8	31,8
4,4	5	3	0440H3D	❍	80	19,8	22,8
		5	0440H5D	❍	98	29,5	32,5
4,5	5	3	0450H3D	●	80	20,3	23,3
		5	0450H5D	●	98	30,2	33,2
4,6	5	3	MDF 0460H3D	❍	80	20,7	23,7
		5	0460H5D	❍	98	30,8	33,8
4,7	5	3	0470H3D	❍	80	21,2	24,2
		5	0470H5D	❍	98	31,5	34,5
4,8	5	3	0480H3D	❍	80	21,6	24,6
		5	0480H5D	❍	98	32,2	35,2
4,9	5	3	0490H3D	❍	80	22,1	25,1
		5	0490H5D	❍	98	32,8	35,8
5,0	5	3	0500H3D	●	80	22,5	25,5
		5	0500H5D	●	98	33,5	36,5
5,1	6	3	MDF 0510H3D	❍	82	23,0	26,0
		5	0510H5D	❍	100	34,2	37,2
5,2	6	3	0520H3D	❍	82	23,4	26,4
		5	0520H5D	❍	100	34,8	37,8
5,3	6	3	0530H3D	❍	82	23,9	26,9
		5	0530H5D	❍	100	35,5	38,5
5,4	6	3	0540H3D	❍	82	24,3	27,3
		5	0540H5D	❍	100	36,2	39,2
5,5	6	3	0550H3D	●	82	24,8	27,8
		5	0550H5D	●	100	36,9	39,9
5,6	6	3	MDF 0560H3D	❍	82	25,2	28,2
		5	0560H5D	❍	100	37,5	40,5
5,7	6	3	0570H3D	❍	82	25,7	28,7
		5	0570H5D	❍	100	38,2	41,2
5,8	6	3	0580H3D	❍	82	26,1	29,1
		5	0580H5D	❍	100	38,9	41,9
5,9	6	3	0590H3D	❍	82	26,6	29,6
		5	0590H5D	❍	100	39,5	42,5
6,0	6	3	0600H3D	●	82	27,0	30,0
		5	0600H5D	●	100	40,2	43,2

● Diameter ØDc: 6,1 ~ 9,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Hole Depth (L/D)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
6,1	7	3	MDF 0610H3D	❍	88	27,5	30,5
		5	0610H5D	❍	109	40,9	43,9
6,2	7	3	0620H3D	❍	88	27,9	30,9
		5	0620H5D	❍	109	41,5	44,5
6,3	7	3	0630H3D	❍	88	28,4	31,4
		5	0630H5D	❍	109	42,2	45,2
6,4	7	3	0640H3D	❍	88	28,8	31,8
		5	0640H5D	❍	109	42,9	45,9
6,5	7	3	0650H3D	●	88	29,3	32,3
		5	0650H5D	●	109	43,6	46,6
6,6	7	3	MDF 0660H3D	❍	88	29,7	32,7
		5	0660H5D	❍	109	44,2	47,2
6,7	7	3	0670H3D	❍	88	30,2	33,2
		5	0670H5D	❍	109	44,9	47,9
6,8	7	3	0680H3D	❍	88	30,6	33,6
		5	0680H5D	❍	109	45,6	48,6
6,9	7	3	0690H3D	❍	88	31,1	34,1
		5	0690H5D	❍	109	46,2	49,2
7,0	7	3	0700H3D	●	88	31,5	34,5
		5	0700H5D	●	109	46,9	49,9
7,1	8	3	MDF 0710H3D	❍	94	32,0	35,0
		5	0710H5D	❍	118	47,6	50,6
7,2	8	3	0720H3D	❍	94	32,4	35,4
		5	0720H5D	❍	118	48,2	51,2
7,3	8	3	0730H3D	❍	94	32,9	35,9
		5	0730H5D	❍	118	48,9	51,9
7,4	8	3	0740H3D	❍	94	33,3	36,3
		5	0740H5D	❍	118	49,6	52,6
7,5	8	3	0750H3D	●	94	33,8	36,8
		5	0750H5D	●	118	50,3	53,3
7,6	8	3	MDF 0760H3D	❍	94	34,2	37,2
		5	0760H5D	❍	118	50,9	53,9
7,7	8	3	0770H3D	❍	94	34,7	37,7
		5	0770H5D	❍	118	51,6	54,6
7,8	8	3	0780H3D	❍	94	35,1	38,1
		5	0780H5D	❍	118	52,3	55,3
7,9	8	3	0790H3D	❍	94	35,6	38,6
		5	0790H5D	❍	118	52,9	55,9
8,0	8	3	0800H3D	●	94	36,0	39,0
		5	0800H5D	●	118	53,6	56,6
8,1	9	3	MDF 0810H3D	❍	100	36,5	39,5
		5	0810H5D	❍	127	54,3	57,3
8,2	9	3	0820H3D	❍	100	36,9	39,9
		5	0820H5D	❍	127	54,9	57,9
8,3	9	3	0830H3D	❍	100	37,4	40,4
		5	0830H5D	❍	127	55,6	58,6
8,4	9	3	0840H3D	❍	100	37,8	40,8
		5	0840H5D	❍	127	56,3	59,3
8,5	9	3	0850H3D	●	100	38,3	41,3
		5	0850H5D	●	127	57,0	60,0
8,6	9	3	MDF 0860H3D	❍	100	38,7	41,7
		5	0860H5D	❍	127	57,6	60,6
8,7	9	3	0870H3D	❍	100	39,2	42,2
		5	0870H5D	❍	127	58,3	61,3
8,8	9	3	0880H3D	❍	100	39,6	42,6
		5	0880H5D	❍	127	59,0	62,0
8,9	9	3	0890H3D	❍	100	40,1	43,1
		5	0890H5D	❍	127	59,6	62,6
9,0	9	3	0900H3D	●	100	40,5	43,5
		5	0900H5D	●	127	60,3	63,3

Grade: ACF75

MDF Type

MDF Type with Oil Hole - H3D / H5D

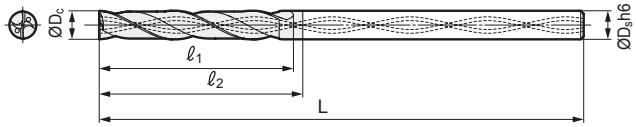
New

Internal Coolant Supply (MDF H3D/H5D Type)

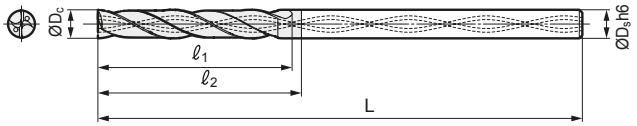
Carbon Steel, Alloy Steel <0,28%	Carbon Steel, Alloy Steel >0,28%	Tempered Steel	Hardened Steel <45HRC	Hardened Steel >45HRC	Stainless-Steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy
◎	◎	◎	○		○	○	○	○

PVD 3D 5D

● MDF Type 3D Single Margin



● MDF Type 5D Double Margin



● Diameter ØDc: 9,1 ~ 12,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Hole Depth (L/D)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
9,1	10	3	MDF 0910H3D	❍	106	41,0	44,0
		5	0910H5D	❍	136	61,0	64,0
9,2	10	3	0920H3D	❍	106	41,4	44,4
		5	0920H5D	❍	136	61,6	64,6
9,3	10	3	0930H3D	❍	106	41,9	44,9
		5	0930H5D	❍	136	62,3	65,3
9,4	10	3	0940H3D	❍	106	42,3	45,3
		5	0940H5D	❍	136	63,0	66,0
9,5	10	3	0950H3D	●	106	42,8	45,8
		5	0950H5D	●	136	63,7	66,7
9,6	10	3	MDF 0960H3D	❍	106	43,2	46,2
		5	0960H5D	❍	136	64,3	67,3
9,7	10	3	0970H3D	❍	106	43,7	46,7
		5	0970H5D	❍	136	65,0	68,0
9,8	10	3	0980H3D	❍	106	44,1	47,1
		5	0980H5D	❍	136	65,7	68,7
9,9	10	3	0990H3D	❍	106	44,6	47,6
		5	0990H5D	❍	136	66,3	69,3
10,0	10	3	1000H3D	●	106	45,0	48,0
		5	1000H5D	●	136	67,0	70,0
10,1	11	3	MDF 1010H3D	❍	116	45,5	48,5
		5	1010H5D	❍	149	67,7	70,7
10,2	11	3	1020H3D	❍	116	45,9	48,9
		5	1020H5D	❍	149	68,3	71,3
10,3	11	3	1030H3D	❍	116	46,4	49,4
		5	1030H5D	❍	149	69,0	72,0
10,4	11	3	1040H3D	❍	116	46,8	49,8
		5	1040H5D	❍	149	69,7	72,7
10,5	11	3	1050H3D	●	116	47,3	50,3
		5	1050H5D	●	149	70,4	73,4
10,6	11	3	MDF 1060H3D	❍	116	47,7	50,7
		5	1060H5D	❍	149	71,0	74,0
10,7	11	3	1070H3D	❍	116	48,2	51,2
		5	1070H5D	❍	149	71,7	74,7
10,8	11	3	1080H3D	❍	116	48,6	51,6
		5	1080H5D	❍	149	72,4	75,4
10,9	11	3	1090H3D	❍	116	49,1	52,1
		5	1090H5D	❍	149	73,0	76,0
11,0	11	3	1100H3D	●	116	49,5	52,5
		5	1100H5D	●	149	73,7	76,7
11,1	12	3	MDF 1110H3D	❍	122	50,0	53,0
		5	1110H5D	❍	158	74,4	77,4
11,2	12	3	1120H3D	❍	122	50,4	53,4
		5	1120H5D	❍	158	75,0	78,0
11,3	12	3	1130H3D	❍	122	50,9	53,9
		5	1130H5D	❍	158	75,7	78,7
11,4	12	3	1140H3D	❍	122	51,3	54,3
		5	1140H5D	❍	158	76,4	79,4
11,5	12	3	1150H3D	●	122	51,8	54,8
		5	1150H5D	●	158	77,1	80,1
11,6	12	3	MDF 1160H3D	❍	122	52,2	55,2
		5	1160H5D	❍	158	77,7	80,7
11,7	12	3	1170H3D	❍	122	52,7	55,7
		5	1170H5D	❍	158	78,4	81,4
11,8	12	3	1180H3D	❍	122	53,1	56,1
		5	1180H5D	❍	158	79,1	82,1
11,9	12	3	1190H3D	❍	122	53,6	56,6
		5	1190H5D	❍	158	79,7	82,7
12,0	12	3	1200H3D	●	122	54,0	57,0
		5	1200H5D	●	158	80,4	83,4

● Diameter ØDc: 12,5 ~ 16,0mm

Diameter ØDc (mm)	Shank ØDs (mm)	Hole Depth (L/D)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2
12,5	13	3	MDF 1250H3D	❍	128	56,3	59,3
		5	1250H5D	❍	167	83,8	86,8
13,0	13	3	1300H3D	❍	128	58,5	61,5
		5	1300H5D	❍	167	87,1	90,1
13,5	14	3	MDF 1350H3D	❍	134	60,8	63,8
		5	1350H5D	❍	176	90,5	93,5
14,0	14	3	1400H3D	❍	134	63,0	66,0
		5	1400H5D	❍	176	93,8	96,8
14,5	15	3	MDF 1450H3D	❍	140	65,3	68,3
		5	1450H5D	❍	185	97,2	100,2
15,0	15	3	1500H3D	❍	140	67,5	70,5
		5	1500H5D	❍	185	100,5	103,5
15,5	16	3	MDF 1550H3D	❍	146	69,8	72,8
		5	1550H5D	❍	194	103,9	106,9
16,0	16	3	1600H3D	❍	146	72,0	75,0
		5	1600H5D	❍	194	107,2	110,2

Grade: ACF75

● = Euro stock
❍ = Japan stock

Flat MultiDrill
MDF Type

New

■ Recommended Cutting Conditions

● MDF H3D Type with Oil Hole

1. The recommended hole depth is 3 x D_c. The depth is measured from the highest point of the hole on drilling in inclined surfaces.
2. The recommended cutting conditions are those for drilling on flat horizontal surfaces.
3. Adjust the feed rate according to the inclination angle when drilling in an inclined surface.
3.1 Set the feed rate at ≤ 70% when the inclination angle is ≤ 30°.
3.2 Set the feed rate at ≤ 50% when the inclination angle is > 30°.
4. This product is a drilling tool. Do not use it for traversing or helical milling.
5. A guide hole of the same diameter is recommended when drilling stainless steel.

(v_c: Cutting Speed m/min f: Feed Rate mm/rev)

Drill Diam. ØDc(mm)	Cutting Conditions	Soft Steel / General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~50HRC)	Stainless Steel (~200HB)	Gray Cast Iron FC250	Ductile Cast Iron	Aluminium Alloy
~ Ø4,0	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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.

● MDF H5D Type with Oil Hole

1. Drilling that uses this tool requires a guide hole of the same diameter.
2. The cutting conditions are the recommended conditions with a guide hole.
3. The recommended hole depth is 5 x D_c. The depth is measured from the highest point of the hole on drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traversing or helical milling.

(v_c: Cutting Speed m/min f: Feed Rate mm/rev)

Drill Diam. ØDc(mm)	Cutting Conditions	Soft Steel / General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~50HRC)	Stainless Steel (~200HB)	Gray Cast Iron FC250	Ductile Cast Iron	Aluminium Alloy
~ Ø4,0	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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	v_c	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.

MDW ... XHGS/PHT

New

XGHS Series

Applications	Series	Diameter Range (mm)	Hole Depth (L/D)
Deep Hole Drilling	MDW□□□□XHGS12	Ø3,0 ~ 12,0	~12
	MDW□□□□XHGS15	Ø3,0 ~ 12,0	~15
	MDW□□□□XHGS20	Ø3,0 ~ 12,0	~20
	MDW□□□□XHGS25	Ø3,0 ~ 12,0	~25
	MDW□□□□XHGS30	Ø3,0 ~ 10,0	~30
Pilot Hole Drilling	MDW□□□□PHT	Ø3,0 ~ 12,0	~2

General Features

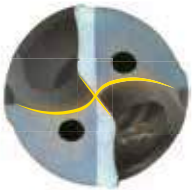
Super MultiDrill XHGS series is a next-generation drill for deep hole drilling, features stable chip control and improved strength to further enhance efficiency of deep hole drilling.

Characteristics and Applications

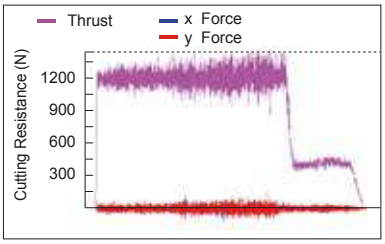
Low Cutting Resistance

The application of a new special thinning shape „RX thinning“ reduces cutting resistance during high efficiency drilling.

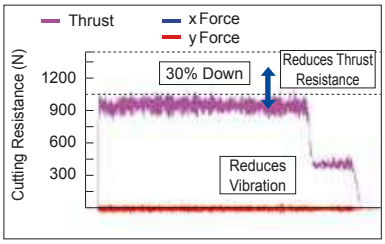
RX THINNING



Conventional Drill



XHGS Series



Work Material:	C45
Tools:	MDW050XHT20 (conventional), MDW0500XHGS20 (Ø5,0mm, 20D)
Cutting Cond.:	v_c=80m/min, f=0,35mm/rev, (⇨ at the time of entry penetration f=0,08mm/rev), H=90mm
Coolant:	MQL

Chip Control

New groove shape „J flute“ with improved chip control stability when drilling deep holes.

***J*-flute**

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

Consistant Chips

XHGS Series

Conv. Drill

f = 0,35mm/rev f = 0,40mm/rev f = 0,45mm/rev

Work Material:	C45
Tools:	MDW050XHT20 (conventional), MDW0500XHGS20 (Ø5,0mm, 20D)
Cutting Cond.:	v_c=80m/min, H=90mm
Coolant:	MQL

High Precision & Stability

The XHGS series provides excellent guide performance due to the unique design when compared to the conventional drill.

Excellent Guide Performance

Conventional Drill

XHGS Series

Extra Long SUPER MULTI-DRILLs
MDW ... XHG/XHT/PHT

Recommended Cutting Conditions

Min. - **Optimum** - Max.

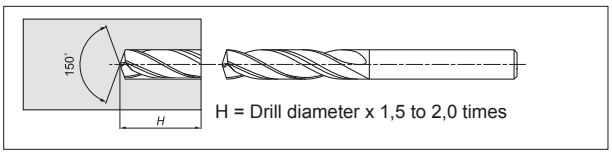
Drill Diameter ØD (mm)	Cutting Conditions	Soft Steel (~200HB)	General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~40HRC)	Cast Iron FC FCD
~Ø3,0	v_c	50 - **60** - 80	60 - **80** - 100	40 - **55** - 70	30 - **40** - 50	40 - **55** - 70
	f	0,12 - **0,15** - 0,20	0,12 - **0,15** - 0,20	0,10 - **0,13** - 0,16	0,06 - **0,08** - 0,12	0,15 - **0,18** - 0,23
~Ø5,0	v_c	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	v_c	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
~Ø12,0	v_c	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. Vc: Cutting speed (m/min), f: Feed Rate (mm/rev)

Recommended Drilling Method

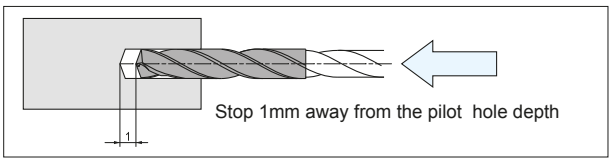
1. Drill a pilot hole using the dedicated PHT

Select the same nominal diameter for the dedicated pilot hole drill PHT type as the deep hole drill XHGS type. (The pilot drill diameter is designed +0,02mm to +0,05mm larger than the long drill diameter)



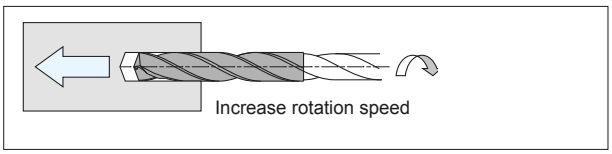
2Enter the pilot hole at reduced cutting data

Rotation speed: 500min^{-1},
Feed rate: 1000 to 2000mm/min



Important:
DO NOT enter pilot hole at higher cutting data, this will cause damage to the drill.

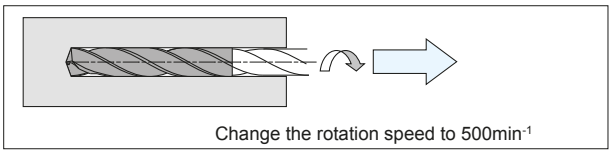
3. Increase rotation speed until the set cutting speed is reached, and start normal drilling operation



When using a NC machine, only begin drilling operation once full rotation speed is reached.

4. After drilling rotation speed is reduced and the drill is retracted from the work material

Rotation speed: 500min^{-1}
Feed rate: 1.000 to 2.000mm/min



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

5. Other Notes

A flat base should be prepared when the surface for the pilot tool is slanted. Spot face using:

☑ MultiDrill MDF type

☑ Flat endmill

When the deep hole drill exits through an angle surface, decrease the feed rate to f=0,05mm/rev just before drilling through.

Coolant

1. Internal coolant supply

Use suitable coolant / emulsion

Pump pressure: Steel: 1,5 to 2,0MPa (cooling effect increases at higher pressure, affecting chips/wear)
Cast iron & aluminium alloy: 4,0 to 6,0MPa (priority on cooling)

2. Internal MQL

Airpressure: 0,5MPa or higher

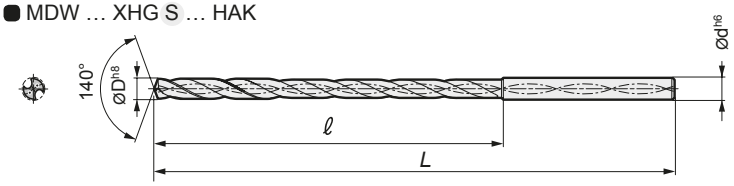
Discharge volume: It is recommended to set the maximum discharge volume possible on the machine.
*Consult the manufacturer before using with aluminium alloy.

Extra Long SUPER MULTI-DRILLs
MDW … XHGS/PHT Type

Solid Carbide Drills for Deep Hole Drilling

New

● MDW … XHG S … HAK



Coated grade: ACX70

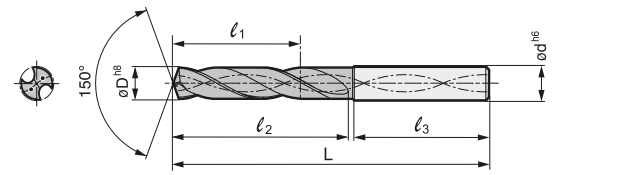
P ●MDW…XHG S Type for Deep Hole Drilling, Diameter ØD: 3,0 ~ 12,0mm

(mm)

Dimensions		Cat. No. 12, 15, 20, 25, 30 →	For 12 x D			For 15 x D			For 20 x D			For 25 x D			For 30 x D		
			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions	
				L	ℓ		L	ℓ		L	ℓ		L	ℓ		L	ℓ
3,0	4,0	MDW 0300XHGS □□ HAK	●	85	57	●	94	66	●	109	81	●	124	96	●	139	111
3,5		0350XHGS □□ HAK	●	89	61	●	100	72	●	117	89	●	135	107	●	152	124
4,0		0400XHGS □□ HAK	●	95	67	●	107	79	●	127	99	●	147	119	●	167	139
4,5	5,0	MDW 0450XHGS □□ HAK	●	104	76	●	118	90	●	140	112	●	163	135	●	184	156
5,0		0500XHGS □□ HAK5*	●	108	80	●	123	95	●	148	120	●	173	145	●	198	170
5,0	6,0	MDW 0500XHGS □□ HAK	●	116	80	●	131	95	●	156	120	●	181	145	●	206	170
5,5		0550XHGS □□ HAK	●	124	88	●	141	105	●	168	132	●	196	160	●	223	187
6,0		0600XHGS □□ HAK	●	130	94	●	148	112	●	178	142	●	208	172	●	238	202
6,5	8,0	MDW 0650XHGS □□ HAK	●	138	102	●	158	122	●	190	154	●	223	187	●	255	219
6,8		0680XHGS □□ HAK	●	144	108	●	164	128	●	198	162	●	236	200	●	266	230
7,0		0700XHGS □□ HAK	●	145	109	●	166	130	●	201	165	●	236	200	●	271	235
7,5		0750XHGS □□ HAK	●	151	115	●	174	138	●	211	175	●	249	213	●	286	250
8,0		0800XHGS □□ HAK	●	157	121	●	181	145	●	221	185	●	261	225	●	301	265
8,5	10,0	MDW 0850XHGS □□ HAK	●	171	131	●	197	157	●	239	199	●	282	242	●	324	284
9,0		0900XHGS □□ HAK	●	177	137	●	204	164	●	249	209	●	294	254	●	339	299
9,5		0950XHGS □□ HAK	●	183	143	●	212	172	●	259	219	●	305	265	●	352	312
10,0		1000XHGS □□ HAK	●	187	147	●	217	177	●	267	227	●	317	277	●	367	327
10,5	12,0	MDW 1050XHGS □□ HAK	●	202	157	●	234	189	●	286	241	●	339	294	–	–	–
11,0		1100XHGS □□ HAK	●	208	163	●	241	196	●	296	251	●	351	306	–	–	–
11,5		1150XHGS □□ HAK	●	213	168	●	248	203	●	305	260	●	363	318	–	–	–
12,0		1200XHGS □□ HAK	●	219	174	●	255	210	●	315	270	●	375	330	–	–	–

(*) Cat. No. description: Drill-Ø = 5mm, shank-Ø = 5mm (E.g. for 20xD: MDW050XHGS20HAK5)
Non-standard diamters and lengths on request (Ø2,5 ~ Ø16,0 possible)

● MDW…PHT Type for Pilot Hole



Dimensions		Cat. No.	For Pilot Hole				
øD (mm)	ød (mm)		Stock	L	ℓ1	ℓ2	ℓ3
3,03	4,0	MDW 0303 PHT	●	52	9	22	28
3,53		0353 PHT	●	52	9	22	28
4,03	5,0	MDW 0403 PHT	●	59	12	29	28
4,53		0453 PHT	●	59	12	29	28
5,03	6,0	MDW 0503 PHT	●	71	15	33	36
5,53		0553 PHT	●	71	15	33	36
6,03	8,0	MDW 0603 PHT	●	76	18	38	36
6,53		0653 PHT	●	76	18	38	36
6,83		0683 PHT	●	76	18	38	36
7,03		0703 PHT	●	82	21	43	36
7,53		0753 PHT	●	82	21	43	36
8,03	10,0	MDW 0803 PHT	●	88	24	46	40
8,53		0853 PHT	●	88	24	46	40
9,03		0903 PHT	●	88	24	46	40
9,53		0953 PHT	●	88	24	46	40
10,03	12,0	MDW 1003 PHT	●	104	30	55	45
10,53		1053 PHT	●	104	30	55	45
11,03		1103 PHT	●	104	30	55	45
11,53		1153 PHT	●	104	30	55	45
12,03	14,0	MDW 1203 PHT	●	117	42	68	45

■ How to Order

Non stock items – minimum order 6 pieces
Always specify the catalogue number and drill diameter as shown
- eg drill diameter 5,0mm = MDW 050

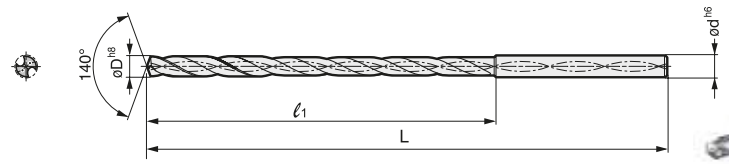
E.g., **MDW 050 X H G S 30 HAK ACX70** (Grade)

- Super MULTI-DRILL
- øD=5,0 mm
- Extra long type
- With spiral coolant holes
- Special shape (RX thinning) + J flute
- Cutting edges for steel with double margin
- Drilling depth (L/D ratio)
- Shank type to DIN6535

● = Euro stock

Extra Long SUPER MULTI-DRILLs
MDW ... XHTA/PHT Type

● MDW ... XHT A ... HAK



Helix angle: 30°
Uncoated grade: KH03

N ●MDW...XHT A Type for Aluminium and Copper Alloys

(mm)

Dimensions		Cat. No.	For 20 x D			For 30 x D		
			Stock	Dimensions		Stock	Dimensions	
øD (mm)	ød (mm)	20, 30 ↓	20	L	ℓ_1	30	L	ℓ_1
4,0	4,0	MDW 040XHT A□□ HAK	●	127	97	●	167	137
5,0	6,0	MDW 050XHT A□□ HAK	●	156	118	●	206	168
6,0		060XHT A□□ HAK	●	178	138	●	238	198
7,0	8,0	MDW 070XHT A□□ HAK	●	201	162	●	271	232
8,0		080XHT A□□ HAK	●	221	182	●	301	262
9,0	10,0	MDW 090XHT A□□ HAK	●	249	205	●	339	295
10,5		100XHT A□□ HAK	●	267	225	●	367	325

⇨ All Long Drill series include an allowance to accomodate regrinding!
⇨ Uncoated carbide grade: KH03

■ How to Order

Non stock items – minimum order 6 pieces
Always specify the catalogue number and drill diameter as shown
- eg drill diameter 5,0mm = MDW 050

E.g.,

MDW 050 X H T A 30 HAK , KH03 (Grade)

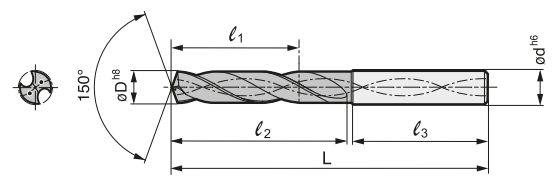
- Super MULTI-DRILL
- øD=5,0 mm
- Extra long type
- with spiral coolant holes
- Shank type to DIN6535
- Drilling depth (L/D ratio)
- Cutting edges for Al and Cu alloys
- Special shape of clearance face

■ Recommended Cutting Conditions

Vc: Cutting speed (m/min), f: Feed Rate (mm/rev)

Drill Ø (mm) \ Work material		Aluminium Alloy
~ Ø5,0	v_c	80 ~ 160
	f	0,08 ~ 0,30
~ Ø6,0	v_c	80 ~ 160
	f	0,12 ~ 0,35
~ Ø8,0	v_c	80 ~ 180
	f	0,15 ~ 0,40
~ Ø10,0	v_c	80 ~ 180
	f	0,20 ~ 0,50
~ Ø12,0	v_c	80 ~ 180
	f	0,20 ~ 0,45

● MDW...PHT Type for Pilot Hole



Helix angle: 30°
ℓ_1 = Effective drilling length
Coated grade: ACW70

Dimensions		Cat. No.	For Pilot Hole				
			Stock	Dimensions (mm)			
øD (mm)	ød (mm)			L	ℓ_1	ℓ_2	ℓ_3
3,03	4,0	MDW 0303 PHT	●	52	9	22	28
3,53		0353 PHT	●	52	9	22	28
4,03	5,0	MDW 0403 PHT	●	59	12	29	28
4,53		0453 PHT	●	59	12	29	28
5,03	6,0	MDW 0503 PHT	●	71	15	33	36
5,53		0553 PHT	●	71	15	33	36
6,03	8,0	MDW 0603 PHT	●	76	18	38	36
6,53		0653 PHT	●	76	18	38	36
6,83		0683 PHT	●	76	18	38	36
7,03		0703 PHT	●	82	21	43	36
7,53		0753 PHT	●	82	21	43	36
8,03	10,0	MDW 0803 PHT	●	88	24	46	40
8,53		0853 PHT	●	88	24	46	40
9,03		0903 PHT	●	88	24	46	40
9,53		0953 PHT	●	88	24	46	40
10,03	12,0	MDW 1003 PHT	●	104	30	55	45
10,53		1053 PHT	●	104	30	55	45
11,03		1103 PHT	●	104	30	55	45
11,53		1153 PHT	●	104	30	55	45
12,03	14,0	MDW 1203 PHT	●	117	42	68	45

■ How to Order

Non stock items – minimum order 6 pieces
Always specify the catalogue number and drill diameter as shown -
eg. drill diameter 5,03mm = MDW 0503

E.g.,

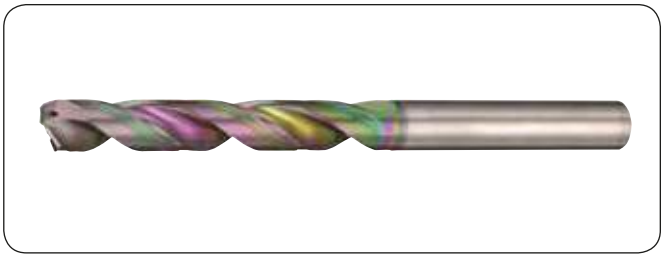
MDW 0503 PHT , ACW70

- Super MULTI-DRILL
- øD = 5,03 mm
- Pilot drill with spiral coolant holes
- TiAlN coated grade

MDW ... NHGS Type

DLC (Diamond Like Carbon) Coated Multi-Drills

With Coolant Holes (3D/5D/10D)



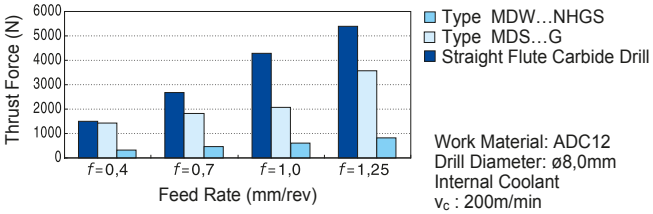
Characteristics

- **High efficiency drilling**
  AURORA COAT and strong helix design reduces cutting forces and improves edge sharpness.
- **Precision drilling**
  Special cutting edge design improves hole precision and quality.
- **Longer tool life**
  With AURORA COAT coupled with the cutting edge design, long and stable tool life can be achieved.
- **Deep hole (L/D=20) drilling**
  Drills for deep hole drilling can be custom-made.
  Production range: ø3,0~ø16,0mm
  total length: 50 times drill diameter (max. 290mm)

Applicable Work Materials

- Aluminium Die Casting
- Aluminium Alloy
- Aluminium Alloy Casting
- Brass Casting
- Bronze Casting

Comparison of Cutting Force (Thrust Force)



Recommended Cutting Conditions

ø D (mm)		Aluminium Alloy	Aluminium Die Casting	Copper Alloy
~ ø 5	v_c	80 ~ 160	80 ~ 180	80 ~ 160
	f	0,08 ~ 0,3	0,1 ~ 0,3	0,08 ~ 0,15
~ ø10	v_c	80 ~ 180	80 ~ 200	60 ~ 180
	f	0,1 ~ 0,3	0,1 ~ 0,35	0,1 ~ 0,2
~ ø16	v_c	80 ~ 200	80 ~ 200	80 ~ 200
	f	0,15 ~ 0,4	0,1 ~ 0,4	0,1 ~ 0,25

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min ~ Max)

●Diameter ø3,0~8,0mm

(mm)

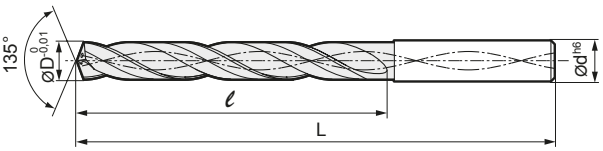
Dimensions		Cat. No.	3D Type			5D Type			10D Type		
			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions	
øD	ød	3, 5, 10 ↘	3	L	ℓ	5	L	ℓ	10	L	ℓ
3,0	3,0	MDW 0300 NHGS□□	❍	68,6	18,1	❍	78,6	28,6	❍	92,6	42,6
3,1		MDW 0310 NHGS□□				❍					
3,2		MDW 0320 NHGS□□	❍			❍			❍		
3,3		MDW 0330 NHGS□□	❍		20,7	❍		32,7			49,7
3,4		MDW 0340 NHGS□□				❍			❍		
3,5		MDW 0350 NHGS□□	❍			❍			❍		
3,6		MDW 0360 NHGS□□				❍			❍		
3,65	4,0	MDW 0365 NHGS□□	❍	72,8		❍	86,8			106,8	
3,66		MDW 0366 NHGS□□				❍					
3,7		MDW 0370 NHGS□□			23,3	❍		36,8			56,8
3,8		MDW 0380 NHGS□□				❍					
3,9		MDW 0390 NHGS□□				❍			❍		
4,0		MDW 0400 NHGS□□	❍			❍			❍		
4,1		MDW 0410 NHGS□□	❍			❍					
4,2		MDW 0420 NHGS□□	❍			❍					
4,3		MDW 0430 NHGS□□			25,9	❍		40,9			63,9
4,4		MDW 0440 NHGS□□				❍					
4,5	5,0	MDW 0450 NHGS□□	❍	81,0		❍	99,0		❍	125,0	
4,6		MDW 0460 NHGS□□	❍			❍					
4,7		MDW 0470 NHGS□□				❍					
4,8		MDW 0480 NHGS□□			28,5	❍		45,0			71,0
4,9		MDW 0490 NHGS□□				❍			❍		
5,0		MDW 0500 NHGS□□	❍			❍			❍		
5,1		MDW 0510 NHGS□□				❍			❍		
5,2		MDW 0520 NHGS□□	❍			❍					
5,3		MDW 0530 NHGS□□	❍		28,6	❍		45,1			88,1
5,4		MDW 0540 NHGS□□				❍					
5,5	6,0	MDW 0550 NHGS□□	❍	83,2		❍	101,2		❍	137,2	
5,6		MDW 0560 NHGS□□				❍					
5,7		MDW 0570 NHGS□□				❍					
5,8		MDW 0580 NHGS□□			31,2	❍		49,2			85,2
5,9		MDW 0590 NHGS□□	❍			❍					
6,0		MDW 0600 NHGS□□	❍			❍			❍		
6,1		MDW 0610 NHGS□□				❍			❍		
6,2		MDW 0620 NHGS□□				❍					
6,3		MDW 0630 NHGS□□			33,8	❍		53,3			92,3
6,4		MDW 0640 NHGS□□				❍					
6,5	7,0	MDW 0650 NHGS□□	❍	89,5		❍	110,5		❍	152,5	
6,6		MDW 0660 NHGS□□				❍					
6,7		MDW 0670 NHGS□□	❍			❍			❍		
6,8		MDW 0680 NHGS□□	❍		36,5	❍		57,5	❍		99,5
6,9		MDW 0690 NHGS□□				❍					
7,0		MDW 0700 NHGS□□	❍			❍			❍		
7,1		MDW 0710 NHGS□□				❍					
7,2		MDW 0720 NHGS□□				❍			❍		
7,3		MDW 0730 NHGS□□			39,1	❍		61,6			116,6
7,35		MDW 0735 NHGS□□	❍			❍					
7,4		MDW 0740 NHGS□□	❍			❍					
7,5	8,0	MDW 0750 NHGS□□	❍	95,7		❍	119,7		❍	167,7	
7,6		MDW 0760 NHGS□□				❍					
7,7		MDW 0770 NHGS□□				❍					
7,8		MDW 0780 NHGS□□	❍		41,7	❍		65,7	❍		113,7
7,9		MDW 0790 NHGS□□				❍					
8,0		MDW 0800 NHGS□□	❍			❍			❍		

AURORA Coated NHGS Type, Grade: DL1300

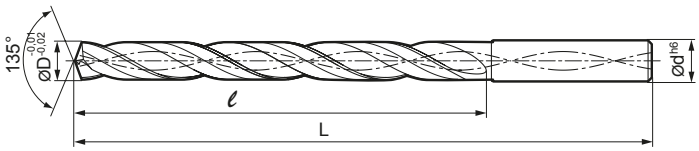
❍ = Japan stock

AURORA COAT SERIES
MDW ... NHGS Type

● NHGS 3/5 Type (ø3,0 ~ ø16,0mm)



● NHGS 10 Type (ø3,0 ~ ø16,0mm)



●Diameter ø8,1~13,0mm

(mm)

Dimensions		Cat. No.	3D Type			5D Type			10D Type		
			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions	
øD	ød	3, 5, 10 ↘	3	L	ℓ	5	L	ℓ	10	L	ℓ
8,1	9,0	MDW 0810 NHGS□□		101,9	44,3	❍	128,9	69,8		182,9	118,8
8,2		MDW 0820 NHGS□□				❍					
8,3		MDW 0830 NHGS□□				❍					
8,4		MDW 0840 NHGS□□				❍					
8,5		MDW 0850 NHGS□□	❍			❍			❍		
8,6		MDW 0860 NHGS□□	❍		46,9	❍		73,9			127,9
8,7		MDW 0870 NHGS□□				❍					
8,8		MDW 0880 NHGS□□	❍			❍					
8,9		MDW 0890 NHGS□□				❍					
9,0		MDW 0900 NHGS□□	❍			❍			❍		
9,1	10,0	MDW 0910 NHGS□□		108,0	49,5	❍	138,0	78,0		198,0	135,0
9,2		MDW 0920 NHGS□□				❍					
9,21		MDW 0921 NHGS□□	❍			❍					
9,3		MDW 0930 NHGS□□				❍					
9,4		MDW 0940 NHGS□□	❍			❍					
9,5		MDW 0950 NHGS□□	❍			❍			❍		
9,6		MDW 0960 NHGS□□			52,0	❍		82,0			142,0
9,7		MDW 0970 NHGS□□				❍					
9,8		MDW 0980 NHGS□□				❍			❍		
9,9		MDW 0990 NHGS□□				❍					
10,0		MDW 1000 NHGS□□	❍			❍			❍		
10,1	11,0	MDW 1010 NHGS□□	❍	168,3	54,7		151,3	86,2		217,3	149,2
10,2		MDW 1020 NHGS□□									
10,3		MDW 1030 NHGS□□	❍			❍					
10,4		MDW 1040 NHGS□□				❍					
10,5		MDW 1050 NHGS□□	❍			❍			❍		
10,6		MDW 1060 NHGS□□	❍		57,3	❍		90,3			156,3
10,7		MDW 1070 NHGS□□									
10,8		MDW 1080 NHGS□□									
10,9		MDW 1090 NHGS□□									
11,0		MDW 1100 NHGS□□	❍			❍			❍		
11,08	12,0	MDW 1108 NHGS□□	❍	124,5	59,9	❍	160,5	94,4		232,5	163,4
11,1		MDW 1110 NHGS□□	❍			❍					
11,2		MDW 1120 NHGS□□	❍			❍					
11,3		MDW 1130 NHGS□□									
11,4		MDW 1140 NHGS□□	❍			❍					
11,5		MDW 1150 NHGS□□	❍			❍			❍		
11,6		MDW 1160 NHGS□□			62,5			98,5			170,5
11,7		MDW 1170 NHGS□□									
11,8		MDW 1180 NHGS□□									
11,9		MDW 1190 NHGS□□									
12,0		MDW 1200 NHGS□□	❍			❍			❍		
12,1	13,0	MDW 1210 NHGS□□	❍	130,7	65,1	❍	169,7	102,6		247,7	177,6
12,2		MDW 1220 NHGS□□									
12,3		MDW 1230 NHGS□□	❍			❍					
12,4		MDW 1240 NHGS□□									
12,5		MDW 1250 NHGS□□	❍			❍			❍		
12,6		MDW 1260 NHGS□□			67,7			106,7			184,7
12,7		MDW 1270 NHGS□□									
12,8		MDW 1280 NHGS□□									
12,9		MDW 1290 NHGS□□									
12,96		MDW 1296 NHGS□□	❍			❍					
13,0		MDW 1300 NHGS□□	❍			❍			❍		

●Diameter ø13,1~16,0mm

(mm)

Dimensions		Cat. No.	3D Type			5D Type			10D Type		
			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions	
øD	ød	3, 5, 10 ↘	3	L	ℓ	5	L	ℓ	10	L	ℓ
13,1	14,0	MDW 1310 NHGS□□		136,9	70,8		178,9	110,8		262,9	191,8
13,2		MDW 1320 NHGS□□									
13,3		MDW 1330 NHGS□□									
13,4		MDW 1340 NHGS□□									
13,5		MDW 1350 NHGS□□	❍			❍					
13,6		MDW 1360 NHGS□□			72,9			114,9			198,9
13,7		MDW 1370 NHGS□□									
13,8		MDW 1380 NHGS□□									
13,9		MDW 1390 NHGS□□									
14,0		MDW 1400 NHGS□□	❍			❍					
14,1	15,0	MDW 1410 NHGS□□	❍	141,1	75,5	❍	188,1	119,0		278,1	206
14,2		MDW 1420 NHGS□□									
14,3		MDW 1430 NHGS□□									
14,4		MDW 1440 NHGS□□									
14,5		MDW 1450 NHGS□□	❍			❍					
14,6		MDW 1460 NHGS□□			78,1			123,1			213,1
14,7		MDW 1470 NHGS□□									
14,8		MDW 1480 NHGS□□									
14,9		MDW 1490 NHGS□□	❍			❍					
14,96		MDW 1496 NHGS□□	❍			❍					
15,0		MDW 1500 NHGS□□	❍			❍					
15,1	16,0	MDW 1510 NHGS□□		149,3	80,7		197,3	127,2		293,3	220,2
15,2		MDW 1520 NHGS□□									
15,3		MDW 1530 NHGS□□									
15,4		MDW 1540 NHGS□□									
15,5		MDW 1550 NHGS□□	❍			❍					
15,6		MDW 1560 NHGS□□			83,3			131,3			227,3
15,7		MDW 1570 NHGS□□									
15,8		MDW 1580 NHGS□□									
15,9		MDW 1590 NHGS□□									
16,0		MDW 1600 NHGS□□	❍			❍					

AURORA Coated NHGS Type, Grade: DL1300

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs.
Please specify the Cat. No.
For example, if the diameter of the drill is 10,3mm and the ratio to øD is 5, please indicate as follow.

E.g.,

MDW 1030 NHGS 5 , DL1300 (Grade)

- MDW: Super MULTI-DRILL
- 1030: øD=10,3 mm
- NH: Applicable work materials with spiral coolant holes
- GS: NHGS type Multi-Drills
- 5: Drilling depth (The ratio to øD): ~3 / ~**5** / ~10

Multi-Drills

Micro Long Drills
MLDH ....L/P Type

■ General Features

Micro Long Drills are oil-hole drills for high efficiency drilling that were developed for drilling deep, small-diameter holes. These next-generation, small-diameter hole drills feature improved strength - often a problem area with small-diameter drills.

■ Characteristics and Applications

● Deep-hole drilling
New groove shape ensures good drill rigidity and chip evacuation.
High efficiency drilling to depths of over 20x drill diameter at over v_f = 500mm/min (drill diameter 1,3mm, X12CrS13 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.

■ Series

Application	Type	Diameter range (mm)	Hole depth (L/D)
Guide Hole Drilling	**MLDH □□□□ P**	ø 0,8 ~ 2,0	~ 2
Deep Hole Drilling	**MLDH □□□□ L5**	ø 0,8 ~ 2,0	~ 5
	MLDH □□□□ L12	ø 0,8 ~ 2,0	~ 12
	MLDH □□□□ L20	ø 0,8 ~ 2,0	~ 20
	MLDH □□□□ L30	ø 0,8 ~ 2,0	~ 30

■ Recommended Cutting Conditions

● MLDH .... P / L5

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min - **Optimum** - Max)

Drill-ø (mm)	Cutting Cond.	Soft Steel (~ HB200)	General Steel (HB200~250)	Alloy Steel (HB250~300)	Stainless Steel (~ HB200)	Cast Iron	Aluminium Alloy	Heat-Resistant Steels
~ 1,0	v_c	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
~ 1,5	v_c	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
~ 2,0	v_c	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

● MLDH .... L12 / L20 / L30

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min - **Optimum** - Max)

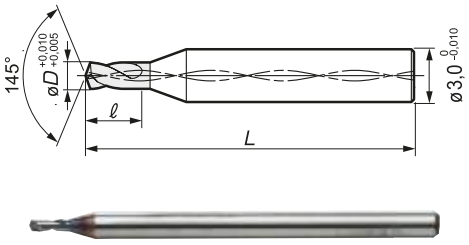
Drill-ø (mm)	Cutting Cond.	Soft Steel (~ HB200)	General Steel (HB200~250)	Alloy Steel (HB250~300)	Stainless Steel (~ HB200)	Cast Iron	Aluminium Alloy	Heat-Resistant Steels
~ 1,0	v_c	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 -**30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	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
~ 1,5	v_c	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
~ 2,0	v_c	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

○ = Japan stock

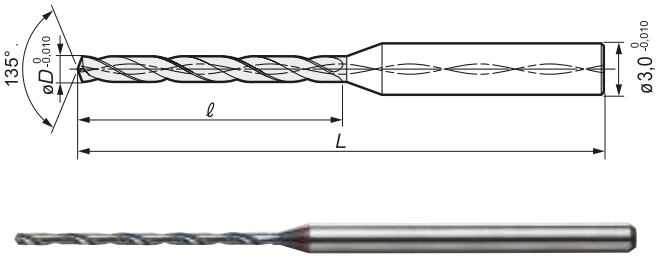
Micro Long Drills
MLDH ....L/P Type

Internal Coolant Supply

● MLDH-P For Pilot Hole Drilling



● MLDH-L For Deep Hole Drilling



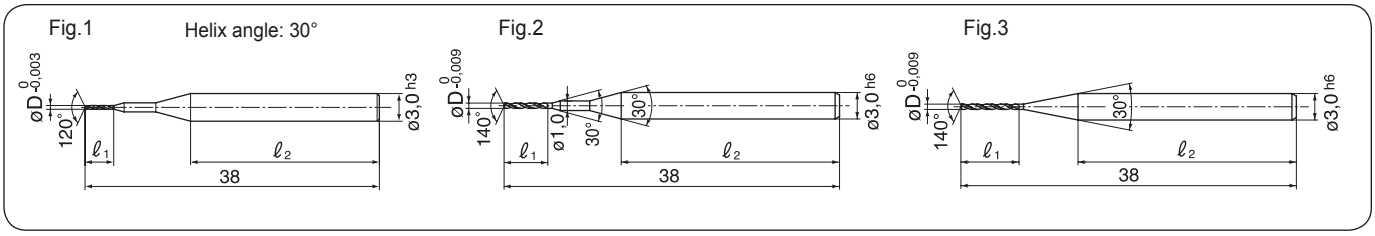
Stock

(mm)

øD (mm)	P Type for Pilot Hole Drilling				L Type for Deep Hole Drilling											
	Cat. No.	Stock	Dimensions		Cat. No. 5,12,20,30	5x D			12x D			20x D			30x D		
						Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions	
			L	ℓ		5	L	ℓ	1 2	L	ℓ	2 0	L	ℓ	3 0	L	ℓ
0,80	MLDH 0800P	❍	45	3,2	MLDH 0800L□□	❍	50	8	❍	55	14	❍	60	19	❍	70	28
0,81	0810P	❍			0810L□□	❍		9	❍			❍		20	❍		
0,82	MLDH 0820P	❍		3,3	MLDH 0820L□□	❍			❍			❍			❍		
0,83	0830P	❍			0830L□□	❍			❍			❍			❍		
0,84	MLDH 0840P	❍		3,4	MLDH 0840L□□	❍			❍			❍			❍		29
0,85	0850P	❍			0850L□□	❍			❍			❍			❍		
0,86	0860P	❍			0860L□□	❍			❍		15	❍	65	21	❍		30
0,87	MLDH 0870P	❍		3,5	MLDH 0870L□□	❍			❍			❍			❍		
0,88	0880P	❍			0880L□□	❍			❍			❍			❍		
0,89	MLDH 0890P	❍		3,6	MLDH 0890L□□	❍			❍			❍			❍		
0,90	0900P	❍			0900L□□	❍			❍			❍		22	❍	75	31
0,91	0910P	❍			0910L□□	❍		10	❍	60	16	❍			❍		
0,92	MLDH 0920P	❍		3,7	MLDH 0920L□□	❍			❍			❍			❍		
0,93	0930P	❍			0930L□□	❍			❍			❍			❍		32
0,94	MLDH 0940P	❍		3,8	MLDH 0940L□□	❍			❍			❍		23	❍		
0,95	0950P	❍			0950L□□	❍			❍			❍			❍		
0,96	0960P	❍			0960L□□	❍			❍			❍			❍		33
0,97	MLDH 0970P	❍		3,9	MLDH 0970L□□	❍			❍			❍			❍		
0,98	0980P	❍			0980L□□	❍			❍		17	❍		24	❍		
0,99	MLDH 0990P	❍		4,0	MLDH 0990L□□	❍			❍			❍			❍		34
1,00	1000P	❍			1000L□□	❍			❍			❍			❍		
1,05	MLDH 1050P	❍		4,2	MLDH 1050L□□	❍	55	12	❍	65	18	❍	70	25	❍	80	36
1,10	MLDH 1100P	❍		4,4	MLDH 1100L□□	❍			❍		19	❍		26	❍		37
1,15	MLDH 1150P	❍		4,6	MLDH 1150L□□	❍			❍		20	❍		28	❍		39
1,20	MLDH 1200P	❍		4,8	MLDH 1200L□□	❍			❍			❍		29	❍	85	41
1,25	MLDH 1250P	❍		5,0	MLDH 1250L□□	❍		14	❍		21	❍		30	❍		43
1,30	MLDH 1300P	❍		5,2	MLDH 1300L□□	❍			❍		22	❍	75	31	❍		44
1,35	MLDH 1350P	❍		5,4	MLDH 1350L□□	❍			❍		23	❍		32	❍	90	46
1,40	MLDH 1400P	❍		5,6	MLDH 1400L□□	❍			❍		24	❍		34	❍		48
1,45	MLDH 1450P	❍		5,8	MLDH 1450L□□	❍			❍		25	❍		35	❍		49
1,50	MLDH 1500P	❍		6,0	MLDH 1500L□□	❍		16	❍		26	❍		36	❍		51
1,55	MLDH 1550P	❍		6,2	MLDH 1550L□□	❍			❍			❍	80	37	❍	95	53
1,60	MLDH 1600P	❍		6,4	MLDH 1600L□□	❍			❍	70	27	❍		38	❍		54
1,65	MLDH 1650P	❍	50	6,6	MLDH 1650L□□	❍	60	18	❍		28	❍		40	❍		56
1,70	MLDH 1700P	❍		6,8	MLDH 1700L□□	❍			❍		29	❍		41	❍	100	58
1,75	MLDH 1750P	❍		7,0	MLDH 1750L□□	❍			❍		30	❍		42	❍		60
1,80	MLDH 1800P	❍		7,2	MLDH 1800L□□	❍			❍		31	❍	85	43	❍		61
1,85	MLDH 1850P	❍		7,4	MLDH 1850L□□	❍		20	❍			❍		44	❍	103	63
1,90	MLDH 1900P	❍		7,6	MLDH 1900L□□	❍			❍	75	32	❍		46	❍		65
1,95	MLDH 1950P	❍		7,8	MLDH 1950L□□	❍			❍		33	❍		47	❍		66
2,00	MLDH 2000P	❍		8,0	MLDH 2000L□□	❍			❍		34	❍	90	48	❍		68

PVD Coated Grade: ACV70

MDUS / MDSS Type



●Diameter ø0,03~0,19mm

øD (mm)	Cat. No.	Stock	Dimensions ℓ_1	Dimensions ℓ_2	Fig.	Pcs./Packing
0,030	**MDUS 0030-30C**	❍	0,3	28	1	5
0,035	**MDUS 0035-30C**		0,4			
0,040	**MDUS 0040-30C**	❍				
0,045	**MDUS 0045-30C**		0,5			
0,050	**MDUS 0050-30C**	❍				
0,055	**MDUS 0055-30C**		0,6			
0,060	**MDUS 0060-30C**					
0,065	**MDUS 0065-30C**		0,7			
0,070	**MDUS 0070-30C**					
0,075	**MDUS 0075-30C**	❍	0,8			
0,080	**MDUS 0080-30C**					
0,085	**MDUS 0085-30C**		1,0			
0,090	**MDUS 0090-30C**					
0,095	**MDUS 0095-30C**	❍				
0,100	**MDUS 0100-30C**					
0,110	**MDUS 0110-30C**	❍	1,2			1
0,120	**MDUS 0120-30C**					
0,120	**MDUS 0130-30C**	❍	1,5			
0,140	**MDUS 0140-30C**					
0,150	**MDUS 0150-30C**					
0,160	**MDUS 0160-30C**	❍	1,8			
0,170	**MDUS 0170-30C**					
0,180	**MDUS 0180-30C**					
0,190	**MDUS 0190-30C**		1,9			

●Diameter ø0,20~0,59mm

øD (mm)	Cat. No.	Stock	Dimensions ℓ_1	Dimensions ℓ_2	Fig.	Pcs./Packing
0,20	**MDSS 0020**	❍	2,5	28	2	1
0,21	**MDSS 0021**	❍				
0,22	**MDSS 0022**	❍				
0,23	**MDSS 0023**	❍				
0,24	**MDSS 0024**	❍				
0,25	**MDSS 0025**	❍				
0,26	**MDSS 0026**	❍				
0,27	**MDSS 0027**	❍				
0,28	**MDSS 0028**	❍				
0,29	**MDSS 0029**	❍				
0,30	**MDSS 0030**	❍	3			
0,31	**MDSS 0031**	❍				
0,32	**MDSS 0032**	❍				
0,33	**MDSS 0033**	❍				
0,34	**MDSS 0034**	❍				
0,35	**MDSS 0035**	❍	4		3	
0,36	**MDSS 0036**	❍				
0,37	**MDSS 0037**	❍				
0,38	**MDSS 0038**	❍				
0,39	**MDSS 0039**	❍				
0,40	**MDSS 0040**	❍	5			
0,41	**MDSS 0041**	❍				
0,42	**MDSS 0042**	❍				
0,43	**MDSS 0043**	❍				
0,44	**MDSS 0044**	❍				
0,45	**MDSS 0045**	❍				
0,46	**MDSS 0046**	❍				
0,47	**MDSS 0047**	❍				
0,48	**MDSS 0048**	❍				
0,49	**MDSS 0049**	❍				
0,50	**MDSS 0050**	❍	6	27		
0,51	**MDSS 0051**	❍				
0,52	**MDSS 0052**	❍				
0,53	**MDSS 0053**	❍				
0,54	**MDSS 0054**	❍				
0,55	**MDSS 0055**	❍				
0,56	**MDSS 0056**	❍				
0,57	**MDSS 0057**	❍				
0,58	**MDSS 0058**	❍				
0,59	**MDSS 0059**	❍				

●Diameter ø0,60~1,00mm

øD (mm)	Cat. No.	Stock	Dimensions ℓ_1	Dimensions ℓ_2	Fig.	Pcs./Packing
0,60	**MDSS 0060**	❍	7	26	3	1
0,61	**MDSS 0061**	❍				
0,62	**MDSS 0062**	❍				
0,63	**MDSS 0063**	❍				
0,64	**MDSS 0064**	❍				
0,65	**MDSS 0065**	❍				
0,66	**MDSS 0066**	❍				
0,67	**MDSS 0067**	❍				
0,68	**MDSS 0068**	❍				
0,69	**MDSS 0069**	❍				
0,70	**MDSS 0070**	❍	9	24		
0,71	**MDSS 0071**	❍				
0,72	**MDSS 0072**	❍				
0,73	**MDSS 0073**	❍				
0,74	**MDSS 0074**	❍				
0,75	**MDSS 0075**	❍				
0,76	**MDSS 0076**	❍				
0,77	**MDSS 0077**	❍				
0,78	**MDSS 0078**	❍				
0,79	**MDSS 0079**	❍				
0,80	**MDSS 0080**	❍	10	23		
0,81	**MDSS 0081**	❍				
0,82	**MDSS 0082**	❍				
0,83	**MDSS 0083**	❍				
0,84	**MDSS 0084**	❍				
0,85	**MDSS 0085**	❍				
0,86	**MDSS 0086**	❍				
0,87	**MDSS 0087**	❍				
0,88	**MDSS 0088**	❍				
0,89	**MDSS 0089**	❍				
0,90	**MDSS 0090**	❍	11	22		
0,91	**MDSS 0091**	❍				
0,92	**MDSS 0092**	❍				
0,93	**MDSS 0093**	❍				
0,94	**MDSS 0094**	❍				
0,95	**MDSS 0095**	❍				
0,96	**MDSS 0096**	❍				
0,97	**MDSS 0097**	❍				
0,98	**MDSS 0098**	❍				
0,99	**MDSS 0099**	❍				
1,00	**MDSS 0100**	❍	12	21		

■ MDSS Recommended Cutting Conditions (Wet)

Work / Cond. / Drill-ø (mm)	Alloy Steel, Pre-hardened Steel: Spindle (rpm)	Feed rate (mm/min)	Step-feed (mm)	Die Steel, Tempered Steel (H_RC30~40): Spindle (rpm)	Feed rate (mm/min)	Step-feed (mm)	Stainless Steel: Spindle (rpm)	Feed rate (mm/min)	Step-feed (mm)
0,2	26500	50	0,1D	21200	40	0,1D	10600	20	0,1D
0,3	26500	80		21200	60		10600	30	
0,4	25900	100		19900	80		9500	40	
0,5	25500	150		19100	110		9500	50	
1,0	15900	240	0,2D~0,5D※	12700	190	0,2D~0,5D※	5600	80	

1. The above conditions are recommended under wet conditions, using water-soluble coolant.
2. If machine noises and vibrations are present, please adjust the cutting conditions accordingly.
3. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

※ Step feed is recommended for drilling of holes deeper than 3xD.

❍ = Japan stock

SUMIDIA Coated Drills
SDC Type

General Features

SUMIDIA Coated SDC type drills for Carbon Fibre Reinforced Plastic (CFRP) employ Sumitomo Electric Hardmetal's proprietary multi-step point angle.
Combined with a diamond coating, this technology improves the quality of machined surfaces and extends tool life.

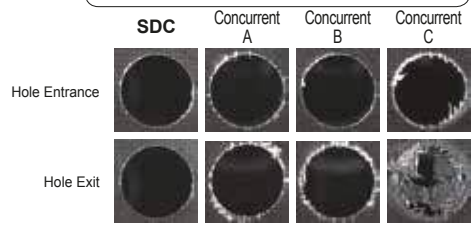
Characteristics and Applications

- Excellent drilled-hole quality
  - Sharp cutting edge shape reduces delamination of fibre layers and burrs.
  - Continuously changing point angle disperses load placed on cutting edge and prevents breakage.
- Long tool life
  - Use of high-strength diamond coating with excellent adhesion delivers high quality and long tool life.

Performance

Comparison of Machined Surface Finish

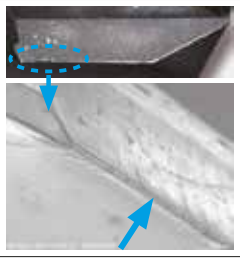
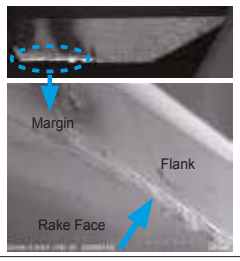
Excellent Machined Face Quality
(Prevents Delamination And Burrs)



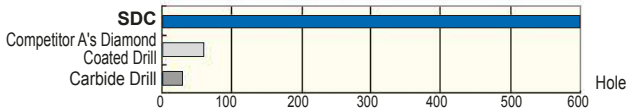
Tool:	SUMIDIA coated drill SDC type, øD=6,375 Competitor A B C´s drill øD=6,35 & øD=6,5
Work Material:	CFRP
Cutting Conditions:	n = 6.000rpm, f=0,1mm/rev, d_{oc} =28mm (Through) Dry

Tool Life Comparison

Effects of Diamond Coating

SDC type (After drilling 600 holes)	Competitor's product (After drilling 50 holes)
	
No delamination Low flank wear	More delamination from cutting edge to flank

Stable diamond layer adhesion prevents delamination.
Excellent wear resistance enables high-quality drilling with long tool life.



Tool:	SUMIDIA coated drill SDC type, øD=6,375 Competitor A B C´s drill øD=6,35 & øD=6,5
Work Material:	CFRP
Cutting Conditions:	n = 6.000rpm, f=0,1mm/rev, d_{oc} =28mm (Through) Dry

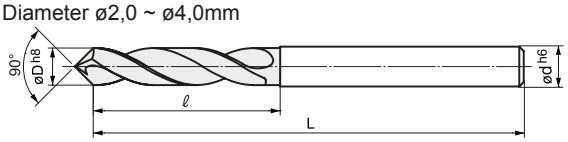
Series

Type	Diameter Range (mm)	Point angle	Hole Depth ($^{L}/_{D}$)
MDS□□□□□**SDC**3	ø2,0 ~ ø4,0	90°	~ 3
	ø4,851 ~ ø10,0	130°	

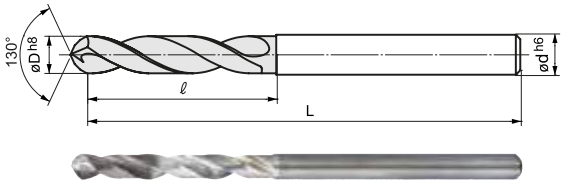
DCX20	SUMI-DIA	Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	CFRP *
Grade	Coating												○		◎

* CFRP (Carbon Fibre Reinforced Plastic)

● Diameter ø2,0 ~ ø4,0mm



● Diameter ø4,851 ~ ø10,0mm



●Diameter ø2,0~10,0mm

(mm)

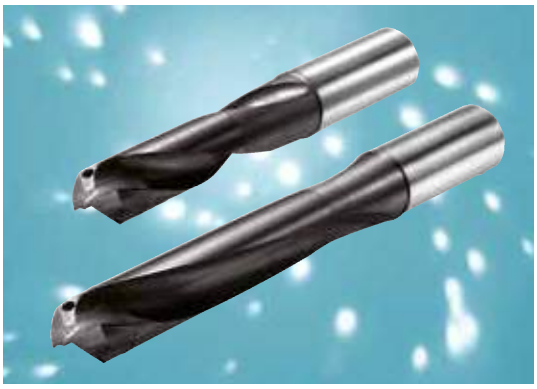
Dimensions øD (mm)	Dimensions ød (mm)	Cat. No.	3D Type Stock	3D Type Dimensions L	3D Type Dimensions ℓ
2,0	3,0	**MDS 02000SDC3**	❍	49	12,5
2,489		**02489SDC3**	❍		15,0
3,0		**03000SDC3**	❍		17,5
3,3	3,3	**MDS 03300SDC3**	❍	60	20,0
4,0	4,0	**04000SDC3**	❍		22,5
4,851	4,851	**MDS 04851SDC3**	❍	76	27,5
5,0	5,0	**05000SDC3**	❍		
5,6	5,6	**MDS 05600SDC3**	❍	81	30,0
6,0	6,0	**06000SDC3**	❍		
6,375	6,375	**MDS 06375SDC3**	❍	83	32,5
7,0	7,0	**07000SDC3**	❍		35,0
7,938	7,938	**MDS 07938SDC3**	❍	90	40,0
8,0	8,0	**08000SDC3**	❍		
9,0	9,0	**MDS 09000SDC3**	❍	98	45,0
9,550	9,550	**MDS 09550SDC3**	❍	105	50,0
10,0	10,0	**10000SDC3**	❍		

Recommended Cutting Conditions

øD \ Work Cond.		CFRP Only (Dry Machining)	Stacked Plates of CFRP, Aluminium Alloys (Dry Machining)
~ ø 6,0	v_c	80 - **120** - 150	40 - **60** - 80
	f	0,05 - **0,08** - 0,10	0,05 - **0,05** - 0,10
~ ø10,0	v_c	80 - **100** - 120	40 - **60** - 80
	f	0,05 - **0,08** - 0,10	0,05 - **0,05** - 0,10

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min - **Optimum** - Max)

KDS Type



Description

The new AK type drill features an extra long carbide drill head, new cutting geometry, coolant holes and ultra hard TiAlN coating for reliable high productivity drilling.

Advantages

- General purpose drill for steels, stainless steels, cast irons
- High productivity drilling even on deep holes up to 7 x D
- Twice the tool life of conventionally coated drills
- Self centering
- Surface finish and tolerances comparable to solid carbide
- Regrindable extra long carbide head halves drill replacement costs

Series

Type	Diameter range (mm)	Hole depth (L/D)	Remark
Short type (MAK Type)	ø9,5~ø40,5	~ 3	First choice general purpose drill
Long type (LAK Type)	ø9,5~ø40,5	~ 5	
Extra long type (DAK Type)	ø9,5~ø40,5	~ 7	Helix angle: 25° ---> 0°

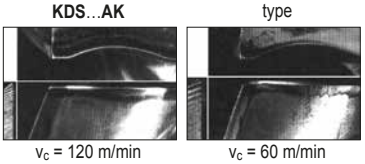
Series

Performance

● High efficiency drilling

Comparison of coating damage when high speed drilling

TiAlN coated **KDS...AK** | TiN coated type



v_c = 120 m/min | v_c = 60 m/min

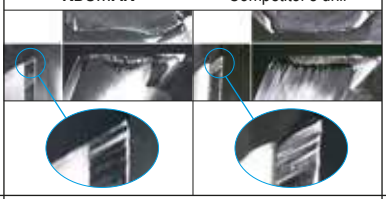
After 30 m cut length (600 holes)

Drill dia.: 18,0 mm
Work material: C50 (HB230)
f = 0,3 mm/rev
d_{oc} = 50 mm

● Optimized drill geometry

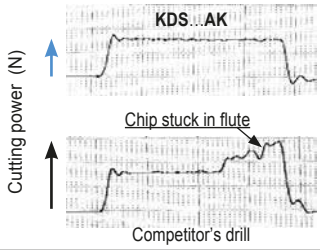
Comparison of damage to drill margin After 40 min. cut length

KDS...AK | Competitor's drill



Drill dia.: 18,0 mm
Work material: C50 (HB230)
v_c = 50 m/min
f = 0,25 mm/rev
d_{oc} = 38 mm

● Comparison of cutting power (chip removal capability)



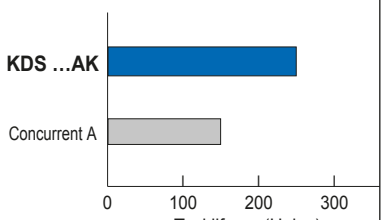
Drill dia.: 18,0 mm
Work material: C50 (HB230)
v_c = 50 m/min
f = 0,3 mm/rev
d_{oc} = 90 mm (L/D=5)

Application examples

● Workpiece material

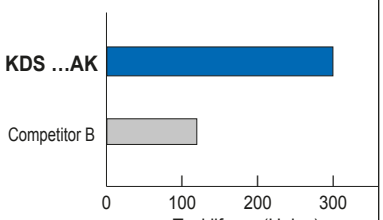
- General steel and alloy steel
- Low carbon steel
- Die steel
- Stainless steel
- Ductile cast iron
- Grey cast iron

● Automotive parts
Work material: C50 (HB250)



Drill:
Conditions: KDS 180 LAK (ø18,0mm)
v_c = 55 m/min, f = 0,25 mm/rev
d_{oc} = 70 mm

● Automotive parts
Work material: 42CrMo4 (HB250)

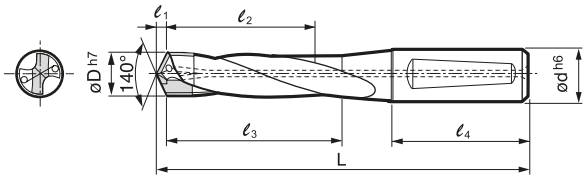


Drill:
Conditions: KDS 250 MAK (ø25,0mm)
v_c = 60 m/min, f = 0,25 mm/rev
d_{oc} = 65 mm

KDS ... MAK Type

Short Type (3 x D)

Brazed Carbide Drills with Coolant Holes



Helix angle: 20°
ℓ_2 = Effective drilling length

●Diameter ø9,5~15,5mm

Dimensions (mm)				Cat. No.	Short Series (3D)			
	Shank		Drill Head		Stock	Dimensions (mm)		
øD (mm)	ød	ℓ_4	ℓ_1		MAK	L	ℓ_2	ℓ_3
9,5~				**KDS 095 MAK**				
10,0	16	48	1,8	**KDS 100 MAK**		96,8	32	37
~10,5				**KDS 105 MAK**				
10,6~				**KDS 106 MAK**				
11,0	16	48	2	**KDS 110 MAK**		102,0	35	40
~11,5				**KDS 115 MAK**				
11,6				**KDS 116 MAK**				
11,7				**KDS 117 MAK**				
11,8				**KDS 118 MAK**				
11,9				**KDS 119 MAK**				
12,0	16	48	2,2	**KDS 120 MAK**	●	107,2	38	44
12,1				**KDS 121 MAK**				
12,2				**KDS 122 MAK**				
12,3				**KDS 123 MAK**				
12,4				**KDS 124 MAK**				
12,5				**KDS 125 MAK**	●			
12,6				**KDS 126 MAK**				
12,7				**KDS 127 MAK**				
12,8				**KDS 128 MAK**				
12,9				**KDS 129 MAK**				
13,0	16	48	2,4	**KDS 130 MAK**	●	112,4	41	47
13,1				**KDS 131 MAK**				
13,2				**KDS 132 MAK**				
13,3				**KDS 133 MAK**				
13,4				**KDS 134 MAK**				
13,5				**KDS 135 MAK**	●			
13,6				**KDS 136 MAK**				
13,7				**KDS 137 MAK**	●			
13,8				**KDS 138 MAK**				
13,9				**KDS 139 MAK**				
14,0	16	48	2,5	**KDS 140 MAK**	●	117,5	44	51
14,1				**KDS 141 MAK**				
14,2				**KDS 142 MAK**				
14,3				**KDS 143 MAK**				
14,4				**KDS 144 MAK**				
14,5				**KDS 145 MAK**	●			
14,6				**KDS 146 MAK**	●			
14,7				**KDS 147 MAK**				
14,8				**KDS 148 MAK**				
14,9				**KDS 149 MAK**				
15,0	20	50	2,7	**KDS 150 MAK**	●	127,7	47	54
15,1				**KDS 151 MAK**				
15,2				**KDS 152 MAK**				
15,3				**KDS 153 MAK**				
15,4				**KDS 154 MAK**				
15,5				**KDS 155 MAK**	●			

●Diameter ø15,6~20,0mm

Dimensions (mm)				Cat. No.	Short Series (3D)			
	Shank		Drill Head		Stock	Dimensions (mm)		
øD (mm)	ød	ℓ_4	ℓ_1		MAK	L	ℓ_2	ℓ_3
15,6				**KDS 156 MAK**				
15,7				**KDS 157 MAK**				
15,8				**KDS 158 MAK**				
15,9				**KDS 159 MAK**				
16,0	20	50	2,9	**KDS 160 MAK**	●	132,9	50	58
16,1				**KDS 161 MAK**				
16,2				**KDS 162 MAK**				
16,3				**KDS 163 MAK**				
16,4				**KDS 164 MAK**	●			
16,5				**KDS 165 MAK**	●			
16,6				**KDS 166 MAK**				
16,7				**KDS 167 MAK**				
16,8				**KDS 168 MAK**				
16,9				**KDS 169 MAK**				
17,0	20	50	3,1	**KDS 170 MAK**	●	138,1	53	61
17,1				**KDS 171 MAK**				
17,2				**KDS 172 MAK**				
17,3				**KDS 173 MAK**				
17,4				**KDS 174 MAK**				
17,5				**KDS 175 MAK**	●			
17,6				**KDS 176 MAK**				
17,7				**KDS 177 MAK**	●			
17,8				**KDS 178 MAK**				
17,9				**KDS 179 MAK**				
18,0	20	50	3,3	**KDS 180 MAK**	●	143,3	56	65
18,1				**KDS 181 MAK**				
18,2				**KDS 182 MAK**				
18,3				**KDS 183 MAK**				
18,4				**KDS 184 MAK**				
18,5				**KDS 185 MAK**	●			
18,6				**KDS 186 MAK**				
18,7				**KDS 187 MAK**	●			
18,8				**KDS 188 MAK**				
18,9				**KDS 189 MAK**				
19,0	25	56	3,5	**KDS 190 MAK**	●	158,5	59	68
19,1				**KDS 191 MAK**				
19,2				**KDS 192 MAK**				
19,3				**KDS 193 MAK**				
19,4				**KDS 194 MAK**				
19,5				**KDS 195 MAK**	●			
19,6				**KDS 196 MAK**				
19,7				**KDS 197 MAK**				
19,8	25	56	3,6	**KDS 198 MAK**		158,6	62	72
19,9				**KDS 199 MAK**				
20,0				**KDS 200 MAK**	●			

■ Recommended Cutting Conditions

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Steels (under HB250)	Steels (HB250~320)	Hardened Steels (HRC45)	Stainless Steels (< HB200)	Ductile Cast Irons	Cast Irons	Aluminium Alloys	Titanium Alloys (Ti-6Al-4V)	Inconel (Inconel 718)
~ ø15	v_c	50 – **65** – 75	50 – **60** – 70	30 – **35** – 45	35 – **45** – 50	55 – **65** – 75	60 – **80** – 100	70 – **85** – 100	20 – **25** – 35	10 – **20** – 30
	f	0,15 – 0,3	0,15 – 0,3	0,1 – 0,2	0,1 – 0,2	0,15 – 0,3	0,2 – 0,3	0,25 – 0,35	0,1 – 0,15	0,08 – 0,1
~ ø20	v_c	50 – **65** – 75	50 – **60** – 70	35 – **40** – 50	35 – **45** – 50	60 – **70** – 80	60 – **80** – 100	70 – **90** – 110	20 – **30** – 40	10 – **20** – 30
	f	0,15 – 0,35	0,15 – 0,35	0,15 – 0,25	0,15 – 0,25	0,15 – 0,35	0,2 – 0,35	0,25 – 0,4	0,1 – 0,15	0,08 – 0,1
~ ø30,5	v_c	55 – **70** – 90	55 – **65** – 90	35 – **40** – 50	35 – **45** – 50	60 – **70** – 90	60 – **90** – 110	75 – **100** – 120	25 – **35** – 40	15 – **25** – 35
	f	0,2 – 0,4	0,2 – 0,4	0,15 – 0,25	0,15 – 0,25	0,2 – 0,4	0,25 – 0,4	0,3 – 0,4	0,1 – 0,2	0,08 – 0,12

If the drilling operation is completely satisfactory with the above condition and the rigidity of the machine is sufficient, the cutting data can be raised. For more guidance, please contact our technical representative.

● = Euro stock

KDS ... MAK Type

TiAIN Coated Brazed Carbide Multi-Drills for General Steels, Cast Iron & Ductile Cast Iron

Specification:
- Brazed carbide drill TiAIN coated (Grade: ACW30) with coolant holes
- Shank with whistle notch

●Diameter ø20,1~24,5mm

Dimensions (mm)				Cat. No.	Short Series (3D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		MAK	L	ℓ_2	ℓ_3
20,1				**KDS 201 MAK**				
20,2				**KDS 202 MAK**				
20,3	25	56	3,6	**KDS 203 MAK**		158,6	62	72
20,4				**KDS 204 MAK**				
20,5				**KDS 205 MAK**	●			
20,6				**KDS 206 MAK**				
20,7				**KDS 207 MAK**				
20,8				**KDS 208 MAK**				
20,9				**KDS 209 MAK**				
21,0	25	56	3,8	**KDS 210 MAK**	●	158,8	65	75
21,1				**KDS 211 MAK**				
21,2				**KDS 212 MAK**				
21,3				**KDS 213 MAK**				
21,4				**KDS 214 MAK**				
21,5				**KDS 215 MAK**	●			
21,6				**KDS 216 MAK**				
21,7				**KDS 217 MAK**				
21,8				**KDS 218 MAK**				
21,9				**KDS 219 MAK**				
22,0	25	56	4,0	**KDS 220 MAK**	●	164,0	68	79
22,1				**KDS 221 MAK**				
22,2				**KDS 222 MAK**				
22,3				**KDS 223 MAK**				
22,4				**KDS 224 MAK**				
22,5				**KDS 225 MAK**	●			
22,6				**KDS 226 MAK**				
22,7				**KDS 227 MAK**				
22,8				**KDS 228 MAK**				
22,9				**KDS 229 MAK**				
23,0	25	56	4,2	**KDS 230 MAK**	●	164,2	71	82
23,1				**KDS 231 MAK**				
23,2				**KDS 232 MAK**				
23,3				**KDS 233 MAK**				
23,4				**KDS 234 MAK**				
23,5				**KDS 235 MAK**				
23,6				**KDS 236 MAK**				
23,7				**KDS 237 MAK**				
23,8				**KDS 238 MAK**				
23,9				**KDS 239 MAK**				
24,0	32	60	4,4	**KDS 240 MAK**	●	174,4	74	86
24,1				**KDS 241 MAK**				
24,2				**KDS 242 MAK**				
24,3				**KDS 243 MAK**				
24,4				**KDS 244 MAK**				
24,5				**KDS 245 MAK**	●			

●Diameter ø24,6~40,5mm

Dimensions (mm)				Cat. No.	Short Series (3D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		MAK	L	ℓ_2	ℓ_3
24,6				**KDS 246 MAK**				
24,7				**KDS 247 MAK**				
24,8				**KDS 248 MAK**				
24,9				**KDS 249 MAK**				
25,0	32	60	4,5	**KDS 250 MAK**	●	174,5	76	88
25,1				**KDS 251 MAK**				
25,2				**KDS 252 MAK**				
25,3				**KDS 253 MAK**				
25,4				**KDS 254 MAK**				
25,5				**KDS 255 MAK**				
25,6				**KDS 256 MAK**				
25,7				**KDS 257 MAK**				
25,8				**KDS 258 MAK**				
25,9	32	60	4,7	**KDS 259 MAK**		179,7	79	92
26,0				**KDS 260 MAK**	●			
26,1 ~26,5				**KDS 261 MAK ~265 MAK**				
26,6 ~27,5	32	60	4,9	**KDS 266 MAK ~275 MAK**		179,9	81	94
27,6 ~28,5	32	60	5,1	**KDS 276 MAK ~285 MAK**		185,1	83	97
28,6 ~29,5	32	60	5,3	**KDS 286 MAK ~295 MAK**		190,3	86	100
29,6 ~30,5	32	60	5,5	**KDS 296 MAK ~305 MAK**		190,5	89	104
30,6 ~31,5	40	70	5,6	**KDS 306 MAK ~315 MAK**		210,6	95	112
31,6 ~32,5	40	70	5,8	**KDS 316 MAK ~325 MAK**		215,8	98	115
32,6 ~33,5	40	70	6,0	**KDS 326 MAK ~335 MAK**		221,0	101	119
33,6 ~34,5	40	70	6,2	**KDS 336 MAK ~345 MAK**		226,2	104	122
34,6 ~35,5	40	70	6,4	**KDS 346 MAK ~355 MAK**		231,4	107	125
35,6 ~36,5	40	70	6,6	**KDS 356 MAK ~365 MAK**		231,6	110	128
36,6 ~37,5	40	70	6,7	**KDS 366 MAK ~375 MAK**		236,7	113	132
37,6 ~38,5	40	70	6,9	**KDS 376 MAK ~385 MAK**		241,9	116	163
38,6 ~39,5	40	70	7,1	**KDS 386 MAK ~395 MAK**		247,1	119	168
39,6 ~40,5	40	70	7,3	**KDS 396 MAK ~405 MAK**		252,3	122	173

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs. Please specify the Cat. No.
For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **KDS 102 M AK** , ACW30 (Grade)

KDS series: Brazed carbide drill with coolant holes

Drill diameter **10,2** mm

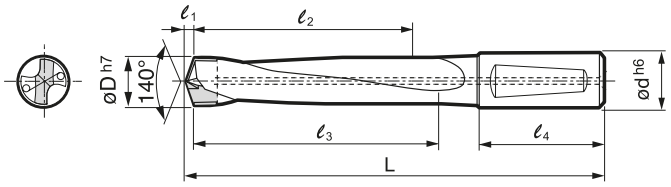
M : 3 x D

AK: Brazed carbide and TiAIN coated drill

KDS ... LAK Type

Long Type (5 x D)

Brazed Carbide Drills with Coolant Holes



Helix angle: 20° ---> 6°
ℓ_2 = Effective drilling length

●Diameter ø9,5~15,5mm

Dimensions (mm)				Cat. No.	Long Series (5D)			
øD (mm)	Shank ød	Shank ℓ_4	Drill Head ℓ_1		Stock LAK	Dimensions (mm) L	ℓ_2	ℓ_3
9,5~				**KDS 095 LAK**				
10,0	16	48	1,8	**KDS 100 LAK**		116,8	52	57
~10,5				**KDS 105 LAK**				
10,6~				**KDS 106 LAK**				
11,0	16	48	2	**KDS 110 LAK**		127,0	57	63
~11,5				**KDS 115 LAK**				
11,6				**KDS 116 LAK**				
11,7				**KDS 117 LAK**				
11,8				**KDS 118 LAK**				
11,9				**KDS 119 LAK**				
12,0	16	48	2,2	**KDS 120 LAK**	●	132,2	63	69
12,1				**KDS 121 LAK**				
12,2				**KDS 122 LAK**				
12,3				**KDS 123 LAK**				
12,4				**KDS 124 LAK**				
12,5				**KDS 125 LAK**	●			
12,6				**KDS 126 LAK**				
12,7				**KDS 127 LAK**				
12,8				**KDS 128 LAK**				
12,9				**KDS 129 LAK**				
13,0	16	48	2,4	**KDS 130 LAK**	●	142,4	67	74
13,1				**KDS 131 LAK**				
13,2				**KDS 132 LAK**				
13,3				**KDS 133 LAK**				
13,4				**KDS 134 LAK**				
13,5				**KDS 135 LAK**	●			
13,6				**KDS 136 LAK**				
13,7				**KDS 137 LAK**				
13,8				**KDS 138 LAK**				
13,9				**KDS 139 LAK**				
14,0	16	48	2,5	**KDS 140 LAK**	●	147,5	73	80
14,1				**KDS 141 LAK**	●			
14,2				**KDS 142 LAK**				
14,3				**KDS 143 LAK**				
14,4				**KDS 144 LAK**				
14,5				**KDS 145 LAK**	●			
14,6				**KDS 146 LAK**				
14,7				**KDS 147 LAK**				
14,8				**KDS 148 LAK**				
14,9				**KDS 149 LAK**				
15,0	20	50	2,7	**KDS 150 LAK**	●	157,7	77	85
15,1				**KDS 151 LAK**				
15,2				**KDS 152 LAK**				
15,3				**KDS 153 LAK**				
15,4				**KDS 154 LAK**				
15,5				**KDS 155 LAK**	●			

●Diameter ø15,6~20,0mm

Dimensions (mm)				Cat. No.	Long Series (5D)			
øD (mm)	Shank ød	Shank ℓ_4	Drill Head ℓ_1		Stock LAK	Dimensions (mm) L	ℓ_2	ℓ_3
15,6				**KDS 156 LAK**				
15,7				**KDS 157 LAK**				
15,8				**KDS 158 LAK**				
15,9				**KDS 159 LAK**				
16,0	20	50	2,9	**KDS 160 LAK**	●	167,9	83	91
16,1				**KDS 161 LAK**				
16,2				**KDS 162 LAK**				
16,3				**KDS 163 LAK**				
16,4				**KDS 164 LAK**				
16,5				**KDS 165 LAK**	●			
16,6				**KDS 166 LAK**				
16,7				**KDS 167 LAK**				
16,8				**KDS 168 LAK**				
16,9				**KDS 169 LAK**				
17,0	20	50	3,1	**KDS 170 LAK**	●	173,1	87	96
17,1				**KDS 171 LAK**				
17,2				**KDS 172 LAK**				
17,3				**KDS 173 LAK**				
17,4				**KDS 174 LAK**				
17,5				**KDS 175 LAK**	●			
17,6				**KDS 176 LAK**				
17,7				**KDS 177 LAK**				
17,8				**KDS 178 LAK**				
17,9				**KDS 179 LAK**				
18,0	20	50	3,3	**KDS 180 LAK**	●	178,3	93	102
18,1				**KDS 181 LAK**				
18,2				**KDS 182 LAK**				
18,3				**KDS 183 LAK**				
18,4				**KDS 184 LAK**				
18,5				**KDS 185 LAK**	●			
18,6				**KDS 186 LAK**				
18,7				**KDS 187 LAK**				
18,8				**KDS 188 LAK**				
18,9				**KDS 189 LAK**				
19,0	25	56	3,5	**KDS 190 LAK**	●	193,5	97	107
19,1				**KDS 191 LAK**				
19,2				**KDS 192 LAK**				
19,3				**KDS 193 LAK**				
19,4				**KDS 194 LAK**				
19,5				**KDS 195 LAK**	●			
19,6				**KDS 196 LAK**				
19,7				**KDS 197 LAK**				
19,8	25	56	3,6	**KDS 198 LAK**		198,6	103	113
19,9				**KDS 199 LAK**				
20,0				**KDS 200 LAK**	●			

■ Recommended Cutting Conditions

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Steels (under HB250)	Steels (HB250~320)	Hardened Steels (HRC45)	Stainless Steels (< HB200)	Ductile Cast Irons	Cast Irons	Aluminium Alloys	Titanium Alloys (Ti-6Al-4V)	Inconel (Inconel 718)
~ ø15	v_c	50 – **65** – 75	50 – **60** – 70	30 – **35** – 45	35 – **45** – 50	55 – **65** – 75	60 – **80** – 100	70 – **85** – 100	20 – **25** – 35	10 – **20** – 30
	f	0,15 – 0,3	0,15 – 0,3	0,1 – 0,2	0,1 – 0,2	0,15 – 0,3	0,2 – 0,3	0,25 – 0,35	0,1 – 0,15	0,08 – 0,1
~ ø20	v_c	50 – **65** – 75	50 – **60** – 70	35 – **40** – 50	35 – **45** – 50	60 – **70** – 80	60 – **80** – 100	70 – **90** – 110	20 – **30** – 40	10 – **20** – 30
	f	0,15 – 0,35	0,15 – 0,35	0,15 – 0,25	0,15 – 0,25	0,15 – 0,35	0,2 – 0,35	0,25 – 0,4	0,1 – 0,15	0,08 – 0,1
~ ø30,5	v_c	55 – **70** – 90	55 – **65** – 90	35 – **40** – 50	35 – **45** – 50	60 – **70** – 90	60 – **90** – 110	75 – **100** – 120	25 – **35** – 40	15 – **25** – 35
	f	0,2 – 0,4	0,2 – 0,4	0,15 – 0,25	0,15 – 0,25	0,2 – 0,4	0,25 – 0,4	0,3 – 0,4	0,1 – 0,2	0,08 – 0,12

If the drilling operation is completely satisfactory with the above condition and the rigidity of the machine is sufficient, the cutting data can be raised. For more guidance, please contact our technical representative.

● = Euro stock

KDS ... LAK Type

TiAIN Coated Brazed Carbide Multi-Drills for General Steels, Cast Iron & Ductile Cast Iron

Specification:
- Brazed carbide drill TiAIN coated (Grade: ACW30) with coolant holes
- Shank with whistle notch

●Diameter ø20,1~24,5mm

Dimensions (mm)				Cat. No.	Long Series (5D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		LAK	L	ℓ_2	ℓ_3
20,1				KDS 201 LAK				
20,2				KDS 202 LAK				
20,3	25	56	3,6	KDS 203 LAK		198,6	103	113
20,4				KDS 204 LAK				
20,5				KDS 205 LAK	●			
20,6				KDS 206 LAK				
20,7				KDS 207 LAK				
20,8				KDS 208 LAK				
20,9				KDS 209 LAK				
21,0	25	56	3,8	KDS 210 LAK	●	198,8	107	118
21,1				KDS 211 LAK				
21,2				KDS 212 LAK				
21,3				KDS 213 LAK				
21,4				KDS 214 LAK				
21,5				KDS 215 LAK	●			
21,6				KDS 216 LAK				
21,7				KDS 217 LAK				
21,8				KDS 218 LAK				
21,9				KDS 219 LAK				
22,0	25	56	4,0	KDS 220 LAK	●	204,0	113	124
22,1				KDS 221 LAK				
22,2				KDS 222 LAK				
22,3				KDS 223 LAK				
22,4				KDS 224 LAK				
22,5				KDS 225 LAK				
22,6				KDS 226 LAK				
22,7				KDS 227 LAK				
22,8				KDS 228 LAK				
22,9				KDS 229 LAK				
23,0	25	56	4,2	KDS 230 LAK	●	214,2	117	129
23,1				KDS 231 LAK				
23,2				KDS 232 LAK				
23,3				KDS 233 LAK				
23,4				KDS 234 LAK				
23,5				KDS 235 LAK				
23,6				KDS 236 LAK				
23,7				KDS 237 LAK				
23,8				KDS 238 LAK				
23,9				KDS 239 LAK				
24,0	32	60	4,4	KDS 240 LAK	●	224,4	123	135
24,1				KDS 241 LAK				
24,2				KDS 242 LAK				
24,3				KDS 243 LAK				
24,4				KDS 244 LAK				
24,5				KDS 245 LAK				

●Diameter ø24,6~40,5mm

Dimensions (mm)				Cat. No.	Long Series (5D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		LAK	L	ℓ_2	ℓ_3
24,6				KDS 246 LAK				
24,7				KDS 247 LAK				
24,8				KDS 248 LAK				
24,9				KDS 249 LAK				
25,0	32	60	4,5	KDS 250 LAK	●	229,5	127	140
25,1				KDS 251 LAK				
25,2				KDS 252 LAK				
25,3				KDS 253 LAK				
25,4				KDS 254 LAK				
25,5				KDS 255 LAK				
25,6				KDS 256 LAK				
25,7				KDS 257 LAK				
25,8				KDS 258 LAK				
25,9	32	60	4,7	KDS 259 LAK				
26,0				KDS 260 LAK	●	234,7	133	146
26,1 ~26,5				KDS 261 LAK ~265 LAK				
26,6 ~27,5	32	60	4,9	KDS 266 LAK ~275 LAK		239,9	137	151
27,6 ~28,5	32	60	5,1	KDS 276 LAK ~285 LAK		245,1	143	157
28,6 ~29,5	32	60	5,3	KDS 286 LAK ~295 LAK		250,3	147	162
29,6 ~30,5	32	60	5,5	KDS 296 LAK ~305 LAK		260,5	152	167
30,6 ~31,5	40	70	5,6	KDS 306 LAK ~315 LAK		280,6	166	187
31,6 ~32,5	40	70	5,8	KDS 316 LAK ~325 LAK		285,8	172	190
32,6 ~33,5	40	70	6,0	KDS 326 LAK ~335 LAK		291,0	175	194
33,6 ~34,5	40	70	6,2	KDS 336 LAK ~345 LAK		296,2	177	197
34,6 ~35,5	40	70	6,4	KDS 346 LAK ~355 LAK		301,4	180	200
35,6 ~36,5	40	70	6,6	KDS 356 LAK ~365 LAK		306,6	183	203
36,6 ~37,5	40	70	6,7	KDS 366 LAK ~375 LAK		311,7	188	207
37,6 ~38,5	40	70	6,9	KDS 376 LAK ~385 LAK		321,9	193	243
38,6 ~39,5	40	70	7,1	KDS 386 LAK ~395 LAK		327,1	198	248
39,6 ~40,5	40	70	7,3	KDS 396 LAK ~405 LAK		332,3	203	253

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs. Please specify the Cat. No.
For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **KDS 102 L AK** , ACW30 (Grade)

KDS series: Brazed carbide drill with coolant holes

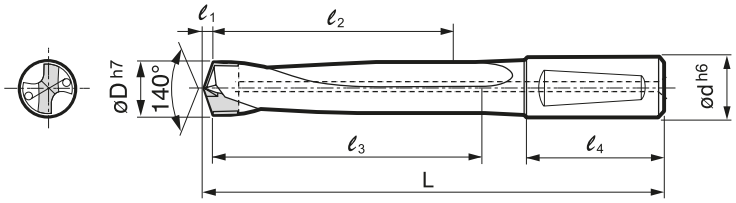
Drill diameter **10,2** mm

L : 5 x D

AK: Brazed carbide and TiAIN coated drill

KDS ... DAK Type

Extra Long Type (7 x D) Brazed Carbide Drills with Coolant Holes



Helix angle: 20° ---> 0°
ℓ_2 = Effective drilling length

●Diameter ø9,5~15,5mm

Dimensions (mm)				Cat. No.	Extra Long Series (7D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		DAK	L	ℓ_2	ℓ_3
9,5~				**KDS 095 DAK**				
10,0	16	48	1,8	**KDS 100 DAK**		141,8	75	80
~10,5				**KDS 105 DAK**				
10,6~				**KDS 106 DAK**				
11,0	16	48	2	**KDS 110 DAK**		152,0	81	87
~11,5				**KDS 115 DAK**				
11,6				**KDS 116 DAK**				
11,7				**KDS 117 DAK**				
11,8				**KDS 118 DAK**				
11,9				**KDS 119 DAK**				
12,0	16	48	2,2	**KDS 120 DAK**	●	162,2	91	97
12,1				**KDS 121 DAK**				
12,2				**KDS 122 DAK**				
12,3				**KDS 123 DAK**				
12,4				**KDS 124 DAK**				
12,5				**KDS 125 DAK**	●			
12,6				**KDS 126 DAK**				
12,7				**KDS 127 DAK**				
12,8				**KDS 128 DAK**				
12,9				**KDS 129 DAK**				
13,0	16	48	2,4	**KDS 130 DAK**	●	177,4	99	106
13,1				**KDS 131 DAK**				
13,2				**KDS 132 DAK**				
13,3				**KDS 133 DAK**				
13,4				**KDS 134 DAK**				
13,5				**KDS 135 DAK**				
13,6				**KDS 136 DAK**				
13,7				**KDS 137 DAK**				
13,8				**KDS 138 DAK**				
13,9				**KDS 139 DAK**				
14,0	16	48	2,5	**KDS 140 DAK**	●	182,5	106	113
14,1				**KDS 141 DAK**				
14,2				**KDS 142 DAK**				
14,3				**KDS 143 DAK**				
14,4				**KDS 144 DAK**				
14,5				**KDS 145 DAK**				
14,6				**KDS 146 DAK**				
14,7				**KDS 147 DAK**				
14,8				**KDS 148 DAK**				
14,9				**KDS 149 DAK**				
15,0	20	50	2,7	**KDS 150 DAK**	●	197,7	114	122
15,1				**KDS 151 DAK**				
15,2				**KDS 152 DAK**				
15,3				**KDS 153 DAK**				
15,4				**KDS 154 DAK**				
15,5				**KDS 155 DAK**				

●Diameter ø15,6~20,0mm

Dimensions (mm)				Cat. No.	Extra Long Series (7D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		DAK	L	ℓ_2	ℓ_3
15,6				**KDS 156 DAK**				
15,7				**KDS 157 DAK**				
15,8				**KDS 158 DAK**				
15,9				**KDS 159 DAK**				
16,0	20	50	2,9	**KDS 160 DAK**	●	207,9	121	129
16,1				**KDS 161 DAK**				
16,2				**KDS 162 DAK**				
16,3				**KDS 163 DAK**				
16,4				**KDS 164 DAK**				
16,5				**KDS 165 DAK**				
16,6				**KDS 166 DAK**				
16,7				**KDS 167 DAK**				
16,8				**KDS 168 DAK**				
16,9				**KDS 169 DAK**				
17,0	20	50	3,1	**KDS 170 DAK**	●	218,1	129	138
17,1				**KDS 171 DAK**				
17,2				**KDS 172 DAK**				
17,3				**KDS 173 DAK**				
17,4				**KDS 174 DAK**				
17,5				**KDS 175 DAK**	●			
17,6				**KDS 176 DAK**				
17,7				**KDS 177 DAK**				
17,8				**KDS 178 DAK**				
17,9				**KDS 179 DAK**				
18,0	20	50	3,3	**KDS 180 DAK**	●	223,3	136	145
18,1				**KDS 181 DAK**				
18,2				**KDS 182 DAK**				
18,3				**KDS 183 DAK**				
18,4				**KDS 184 DAK**				
18,5				**KDS 185 DAK**				
18,6				**KDS 186 DAK**				
18,7				**KDS 187 DAK**				
18,8				**KDS 188 DAK**				
18,9				**KDS 189 DAK**				
19,0	25	56	3,5	**KDS 190 DAK**	●	243,5	144	154
19,1				**KDS 191 DAK**				
19,2				**KDS 192 DAK**				
19,3				**KDS 193 DAK**				
19,4				**KDS 194 DAK**				
19,5				**KDS 195 DAK**				
19,6				**KDS 196 DAK**				
19,7				**KDS 197 DAK**				
19,8	25	56	3,6	**KDS 198 DAK**		248,6	151	161
19,9				**KDS 199 DAK**				
20,0				**KDS 200 DAK**	●			

■ Recommended Cutting Conditions

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Steels (under HB250)	Steels (HB250~320)	Die Steels (about HB250)	Ductile Cast Irons	Remarks
~ ø15		40 – **65** – 90	40 – **60** – 90	40 – **50** – 70	50 – **70** – 100	To avoid the drill bending, which can cause breakage, please pre-drill or reduce the cutting conditions at the entrance of hole: RPM: 100~300 f: 0,05~0,08 mm/rev
		0,15 – **0,2** – 0,3	0,1 – **0,2** – 0,25	0,1 – **0,2** – 0,25	0,2 – **0,3** – 0,35	
~ ø20		40 – **65** – 90	40 – **60** – 90	40 – **50** – 70	50 – **70** – 100	
		0,2 – **0,3** – 0,4	0,15 – **0,25** – 0,35	0,15 – **0,25** – 0,3	0,2 – **0,35** – 0,4	
~ ø40,5		40 – **70** – 90	40 – **65** – 90	40 – **55** – 70	50 – **70** – 100	
		0,2 – **0,35** – 0,45	0,2 – **0,3** – 0,4	0,2 – **0,3** – 0,35	0,25 – **0,4** – 0,5	

● = Euro stock

KDS ... DAK Type

TiAlN Coated Brazed Carbide Multi-Drills for General Steels & Ductile Cast Iron

Specification:
- Brazed carbide drill TiAlN coated (Grade: ACW30) with coolant holes
- Shank with whistle notch

●Diameter ø20,1~24,5mm

Dimensions (mm)				Cat. No.	Extra Long Series (7D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ	ℓ		DAK	L	ℓ_2	ℓ_3
20,1				**KDS 201 DAK**				
20,2				**KDS 202 DAK**				
20,3	25	56	3,6	**KDS 203 DAK**		248,6	151	161
20,4				**KDS 204 DAK**				
20,5				**KDS 205 DAK**				
20,6				**KDS 206 DAK**				
20,7				**KDS 207 DAK**				
20,8				**KDS 208 DAK**				
20,9				**KDS 209 DAK**				
21,0	25	56	3,8	**KDS 210 DAK**	●	248,8	155	166
21,1				**KDS 211 DAK**				
21,2				**KDS 212 DAK**				
21,3				**KDS 213 DAK**				
21,4				**KDS 214 DAK**				
21,5				**KDS 215 DAK**				
21,6				**KDS 216 DAK**				
21,7				**KDS 217 DAK**				
21,8				**KDS 218 DAK**				
21,9				**KDS 219 DAK**				
22,0	25	56	4,0	**KDS 220 DAK**	●	259,0	166	177
22,1				**KDS 221 DAK**				
22,2				**KDS 222 DAK**				
22,3				**KDS 223 DAK**				
22,4				**KDS 224 DAK**				
22,5				**KDS 225 DAK**				
22,6				**KDS 226 DAK**				
22,7				**KDS 227 DAK**				
22,8				**KDS 228 DAK**				
22,9				**KDS 229 DAK**				
23,0	25	56	4,2	**KDS 230 DAK**		274,2	174	186
23,1				**KDS 231 DAK**				
23,2				**KDS 232 DAK**				
23,3				**KDS 233 DAK**				
23,4				**KDS 234 DAK**				
23,5				**KDS 235 DAK**				
23,6				**KDS 236 DAK**				
23,7				**KDS 237 DAK**				
23,8				**KDS 238 DAK**				
23,9				**KDS 239 DAK**				
24,0	32	60	4,4	**KDS 240 DAK**		284,4	178	190
24,1				**KDS 241 DAK**				
24,2				**KDS 242 DAK**				
24,3				**KDS 243 DAK**				
24,4				**KDS 244 DAK**				
24,5				**KDS 245 DAK**	●			

●Diameter ø24,6~40,5mm

Dimensions (mm)				Cat. No.	Extra Long Series (7D)			
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)		
	ød	ℓ_4	ℓ_1		DAK	L	ℓ_2	ℓ_3
24,6				**KDS 246 DAK**				
24,7				**KDS 247 DAK**				
24,8				**KDS 248 DAK**				
24,9				**KDS 249 DAK**				
25,0	32	60	4,5	**KDS 250 DAK**		294,5	187	200
25,1				**KDS 251 DAK**				
25,2				**KDS 252 DAK**				
25,3				**KDS 253 DAK**				
25,4				**KDS 254 DAK**				
25,5				**KDS 255 DAK**				
25,6				**KDS 256 DAK**				
25,7				**KDS 257 DAK**				
25,8				**KDS 258 DAK**				
25,9	32	60	4,7	**KDS 259 DAK**		304,7	197	210
26,0				**KDS 260 DAK**				
26,1 ~26,5				**KDS 261 DAK ~265 DAK**				
26,6 ~27,5	32	60	4,9	**KDS 266 DAK ~275 DAK**		309,9	201	215
27,6 ~28,5	32	60	5,1	**KDS 276 DAK ~285 DAK**		315,1	206	220
28,6 ~29,5	32	60	5,3	**KDS 286 DAK ~295 DAK**		325,3	215	230
29,6 ~30,5	32	60	5,5	**KDS 296 DAK ~305 DAK**		335,5	225	240
30,6 ~31,5	40	70	5,6	**KDS 306 DAK ~315 DAK**		350,6	229	245
31,6 ~32,5	40	70	5,8	**KDS 316 DAK ~325 DAK**		360,8	234	250
32,6 ~33,5	40	70	6,0	**KDS 326 DAK ~335 DAK**		371,0	243	260
33,6 ~34,5	40	70	6,2	**KDS 336 DAK ~345 DAK**		381,2	253	270
34,6 ~35,5	40	70	6,4	**KDS 346 DAK ~355 DAK**		391,4	257	275
35,6 ~36,5	40	70	6,6	**KDS 356 DAK ~365 DAK**		396,6	262	280
36,6 ~37,5	40	70	6,7	**KDS 366 DAK ~375 DAK**		406,7	271	290
37,6 ~38,5	40	70	6,9	**KDS 376 DAK ~385 DAK**		416,9	292	338
38,6 ~39,5	40	70	7,1	**KDS 386 DAK ~395 DAK**		422,1	296	343
39,6 ~40,5	40	70	7,3	**KDS 396 DAK ~405 DAK**		427,3	300	348

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs. Please specify the Cat. No.
For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **KDS 102 D AK** , ACW30 (Grade)

KDS series: Brazed carbide drill with coolant holes

Drill diameter **10,2** mm

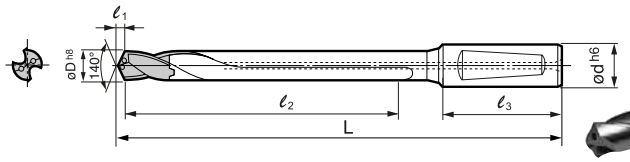
AK: Brazed carbide and TiAlN coated drill

D : 7 x D

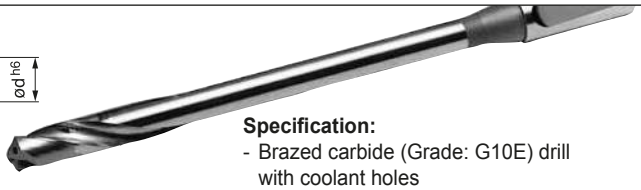
Brazed Carbide MULTI-DRILLs
KDS ... FA Type

(Available on Request)

Extra Long Type (10 x D) Brazed Carbide Drills with Coolant Holes



Helix angle: 25° ---> 0°
ℓ_2 = Effective drilling length



Specification:
- Brazed carbide (Grade: G10E) drill with coolant holes
- Shank with whistle notch

●Diameter ø8.0~15,0mm

Dimensions (mm)				Cat. No.	Extra Long Series (10D)		
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)	
	ød	ℓ_3	ℓ_1		FA10	L	ℓ_2
8,0 ~8,5	16	48	1,5	**KDS 080 FA10 ~085 FA10**		156,5	93
8,6 ~9,5	16	48	1,6	**KDS 086 FA10 ~095 FA10**		171,6	104
9,6 ~10,5	16	48	1,8	**KDS 096 FA10 ~105 FA10**		181,8	115
10,6 ~11,5	16	48	2,0	**KDS 106 FA10 ~115 FA10**		197,0	126
11,6 ~12,5	16	48	2,2	**KDS 116 FA10 ~125 FA10**		207,2	137
12,6 ~13,5	16	48	2,4	**KDS 126 FA10 ~135 FA10**		222,4	148
13,6 ~14,5	16	48	2,5	**KDS 136 FA10 ~145 FA10**		232,5	159
14,6 ~15,5	20	50	2,7	**KDS 146 FA10 ~155 FA10**		247,7	170
15,6 ~16,5	20	50	2,9	**KDS 156 FA10 ~165 FA10**		262,9	181
16,6 ~17,5	20	50	3,1	**KDS 166 FA10 ~175 FA10**		273,1	192
17,6 ~18,5	20	50	3,3	**KDS 176 FA10 ~185 FA10**		288,3	203
18,6 ~19,5	25	56	3,5	**KDS 186 FA10 ~195 FA10**		303,5	214

●Diameter ø15,1~19,5mm

Dimensions (mm)				Cat. No.	Extra Long Series (10D)		
øD (mm)	Shank		Drill Head		Stock	Dimensions (mm)	
	ød	ℓ_3	ℓ_1		FA10	L	ℓ_2
19,6 ~20,5	25	56	3,6	**KDS 196 FA10 ~205 FA10**		318,6	225
20,6 ~21,5	25	56	3,8	**KDS 206 FA10 ~215 FA10**		328,8	236
21,6 ~22,5	25	56	4,0	**KDS 216 FA10 ~225 FA10**		344,0	247
22,6 ~23,5	25	56	4,2	**KDS 226 FA10 ~235 FA10**		354,2	258
23,6 ~24,5	32	60	4,4	**KDS 236 FA10 ~245 FA10**		374,4	269
24,6 ~25,5	32	60	4,5	**KDS 246 FA10 ~255 FA10**		384,5	280
25,6 ~26,5	32	60	4,7	**KDS 256 FA10 ~265 FA10**		399,7	291
26,6 ~27,5	32	60	4,9	**KDS 266 FA10 ~275 FA10**		409,9	302
27,6 ~28,5	32	60	5,1	**KDS 276 FA10 ~285 FA10**		425,1	313
28,6 ~29,5	32	60	5,3	**KDS 286 FA10 ~295 FA10**		435,3	324
29,6 ~30,5	32	60	5,5	**KDS 296 FA10 ~305 FA10**		450,5	335

Brazed Carbide Multi-Drills for Cast Irons and Aluminium Alloys

■ How to Order

Non-Stock Items will be required minimum order quantity for 6 pcs. Please specify the Cat. No.
For example, if the diameter of the drill is 10,2 mm, please indicate as follow.

E.g., **KDS 102 FA 10** ,G10E (Grade)

KDS series: Brazed carbide drill with coolant holes

Drill diameter **10,2** mm

10: Effective drilling length

FA: Extra long type brazed carbide drill with special flutes (Helix angle: 25° ⇨ 0°)

■ Recommended Cutting Conditions

(v_c : Cutting Speed (m/min), f : Feed rate (mm/rev)) (Min – **Standard** – Max)

Diameter (mm)		Cast Irons	Aluminium Alloys	Remarks
~ ø12	v_c	30 – **55** – 60	50 – **70** – 90	To avoid the drill bending, which can cause breakage, please pre-drill or reduce the cutting conditions at the entrance of hole; RPM: 100 ~ 300, f : 0,05 ~ 0,08 mm/rev. Higher feed rates and deep holes require high coolant pressure. Cutting fluid : Water soluble oil Cutting fluid pressure : 4 ~ 10 bar
	f	0,1 – **0,2** – 0,25	0,1 – **0,2** – 0,3	
~ ø20	v_c	40 – **60** – 70	60 – **70** – 100	
	f	0,2 – **0,3** – 0,4	0,3 – **0,35** – 0,5	
~ ø30	v_c	40 – **60** – 70	70 – **100** – 150	
	f	0,3 – **0,4** – 0,5	0,3 – **0,4** – 0,5	

SMD Type

General Features

Fast accurate and ideal for drilling steels, this newly developed drill from SUMITOMO gives similar hole accuracy to that of regrindable drills renowned within the industry as being the ultimate hole making tool.

Advantages

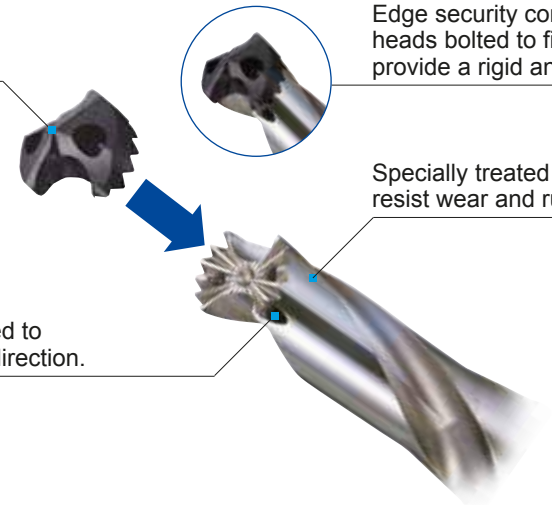
- Available in diameters ranging from 12,0~42,5mm
- New Drilling Depths 1,5 ~ 12 x Diameter
- Optimised heat dissipation via precisely located coolant holes
- Maximised rigidity from newly developed clamping system
- High performance drilling of precision holes from solid
- New 3 different types of head for general and smooth cutting (MTL type, MEL type) and new MFS type for drilling in non-flat surfaces.

The newly developed tungsten carbide substrate with it's ultra hard smooth coating proved that against competition users can expect to see holes with tolerances similar to that of reaming and tool life almost doubled.

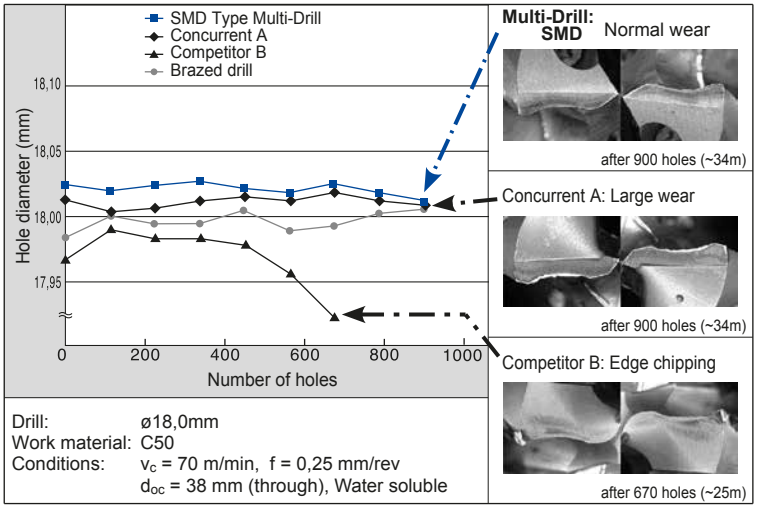
Edge security comes from replaceable drilling heads bolted to fixed radial serrations which provide a rigid and precise clamping platform.

Specially treated toughened steel body to resist wear and rust

Through coolant holes positioned to optimise coolant pressure and direction.

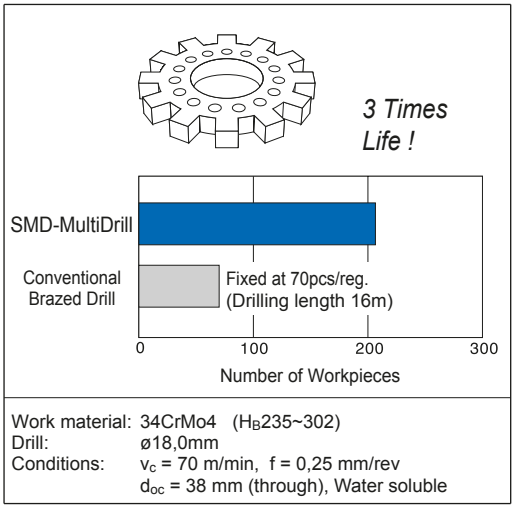


Drilling Precision



Drill: ø18,0mm
Work material: C50
Conditions: v_c = 70 m/min, f = 0,25 mm/rev
d_{oc} = 38 mm (through), Water soluble

Application Example

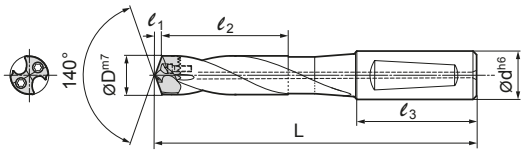


Work material: 34CrMo4 (H_B235~302)
Drill: ø18,0mm
Conditions: v_c = 70 m/min, f = 0,25 mm/rev
d_{oc} = 38 mm (through), Water soluble

SMDH Type

● Holder 3D / 5D / 8D

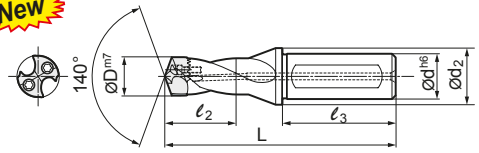
Shank Type:
Whistle notch type



● Holder **1,5D**

New

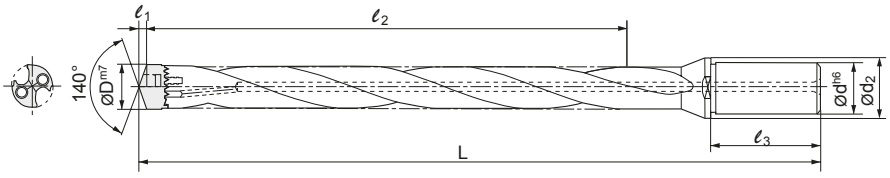
Shank Type:
Weldon type



● Holder **12D**

New

Shank Type:
Cylindrical type



ℓ_2 = Effective drilling length

■ Holder

(mm)

Dimensions				Cat. No.	Series (1,5D)				Series (3D)			Series (5D)			Series (8D)			Series (12D)				Related Drill Heads DMTL / DMEL
Drill Head		Shank			Stock	Dimensions			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions			
ø D	ℓ_1	Ød	ℓ_3		S	L	ℓ_2	Ød2	M3	L	ℓ_2	M5	L	ℓ_2	M8	L	ℓ_2	12D	L	ℓ_2	Ød2	
12,0	2,2	16	48	SMDH 120□□	❍	91	25,5	20	●	107,2	43,5	●	132,2	68,5								1200~1249
12,5	2,3			SMDH 125□□	❍	91	25,5	20	●	107,3	43,5	●	132,3	68,5								1250~1299
13,0	2,4			SMDH 130□□	❍	92	27,5	20	●	112,4	46,5	●	142,4	73,5								1300~1349
14,0	2,5			SMDH 140□□□	❍	96	31,5	20	●	119,0	52,5	●	149,0	81,5	●	194,0	124,5	●	238,5	168,5	20	1350~1450
15,0	2,7	20	50	SMDH 150□□□	❍	100	32,0	25	●	129,2	55,0	●	159,2	86,0	●	204,2	133,0	●	253,0	180,0	25	1451~1550
16,0	2,9			SMDH 160□□□	❍	103	35,0	25	●	134,4	59,0	●	169,4	92,0	●	214,4	141,0	●	265,5	192,0	25	1551~1650
17,0	3,1			SMDH 170□□□	❍	105	35,5	25	●	139,6	62,5	●	174,6	97,5	●	224,6	150,5	●	278,1	203,5	25	1651~1750
18,0	3,3			SMDH 180□□□	❍	107	39,7	25	●	144,8	66,5	●	179,8	103,5	●	229,8	158,5	●	290,5	215,5	25	1751~1850
19,0	3,5	25	56	SMDH 190□□□	❍	115	40,5	30	●	160,1	69,5	●	195,0	108,5	●	255,0	167,5	●	309,1	228,5	30	1851~1950
20,0	3,6			SMDH 200□□□	❍	118	43,0	30	●	160,1	73,0	●	200,1	114,0	●	265,1	175,0	●	321,4	240,0	30	1951~2050
21,0	3,8			SMDH 210□□□	❍	119	44,0	30	●	160,3	76,0	●	200,3	119,0	●	270,3	184,0	●	333,9	252,0	30	2051~2150
22,0	4,0			SMDH 220□□□	❍	121	47,0	30	●	165,1	80,0	●	205,1	125,0	●	275,1	192,0	●	347,0	264,0	30	2151~2280
23,0	4,2			SMDH 230□□□	❍	122	46,5	30	●	164,8	82,5	●	214,8	129,5	●	284,8	200,5	●	359,0	275,5	30	2281~2380
24,0	4,4	32	60	SMDH 240□□□	❍	129	49,5	37	●	174,6	86,5	●	224,6	135,5	●	299,6	208,5	●	376,1	284,5	37	2381~2480
25,0	4,6			SMDH 250□□□	❍	129	49,0	37	●	174,6	88,0	●	229,6	140,0	●	304,6	217,0	●	388,4	300,0	37	2481~2580
26,0	4,7			SMDH 260□□	❍	132	52,0	37	●	179,7	92,0	●	234,7	146,0	●	314,7	225,0					2581~2680
27,0	4,9			SMDH 270□□	❍	133	53,0	37	●	179,9	94,0	●	239,9	151,0	●	324,9	234,0					2681~2780
28,0	5,1			SMDH 280□□	❍	135	54,5	37	●	185,1	96,5	●	245,1	156,5	●	330,1	241,5					2781~2880
29,0	5,3			SMDH 290□□	❍	136	55,5	37	●	190,3	99,5	●	250,3	161,5	●	340,3	250,5					2881~2980
30,0	5,5			SMDH 300□□	❍	139	58,5	37	●	190,5	104,5	●	260,5	167,5	●	350,5	259,5					2981~3050

Drill order description example: SMDH210M3, drill heads ➪ K59/H60

■ Recommended Torque

Screw		Applicable Insert
	N·m	
BXD 02208 IP	0,8 ~ 1,0	SMDT 1200 ~ 1550 D M□L
BXD 02509 IP	0,9 ~ 1,2	SMDT 1551 ~ 1850 D M□L
BXD 03011 IP	1,8 ~ 2,4	SMDT 1851 ~ 2150 D M□L
BXD 03512 IP	2,8 ~ 3,7	SMDT 2151 ~ 2480 D M□L
BXD 04014 IP	4,1 ~ 5,5	SMDT 2481 ~ 2780 D M□L
BXD 04515 IP	5,0 ~ 6,6	SMDT 2781 ~ 3050 D M□L

■ Spare Parts

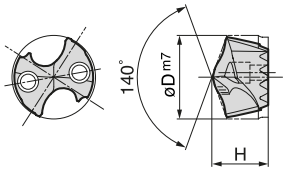
Screw	Wrench	Applicable Holder
BXD 02208 IP	TRDR 08 IP	SMDH 120 ~ 150 M□
BXD 02509 IP	TRDR 10 IP	SMDH 160 ~ 180 M□
BXD 03011 IP	TRDR 15 IP	SMDH 190 ~ 210 M□
BXD 03512 IP	TRDR 15 IP	SMDH 220 ~ 240 M□
BXD 04014 IP	TRDR 20 IP	SMDH 250 ~ 270 M□
BXD 04515 IP	TRDR 25 IP	SMDH 280 ~ 300 M□

● = Euro stock
○ = Japan stock

Regrindable Drill Head Insert
SMDT... D MTL Type

PVD coated grade: **ACX70**

Type MTL



Drill Head (Insert)

● øD: 12,0~15,3mm

øD (mm)	Cat. No.	Stock	H (mm)
12,0	**SMDT 1200 D MTL**	●	9,1
12,1	**SMDT 1210 D MTL**	●	9,1
12,2	**SMDT 1220 D MTL**	●	9,1
12,3	**SMDT 1230 D MTL**	●	9,1
12,4	**SMDT 1240 D MTL**	●	9,1
12,5	**SMDT 1250 D MTL**	●	9,4
12,6	**SMDT 1260 D MTL**	●	9,4
12,7	**SMDT 1270 D MTL**	●	9,4
12,8	**SMDT 1280 D MTL**	●	9,4
12,9	**SMDT 1290 D MTL**	●	9,4
13,0	**SMDT 1300 D MTL**	●	9,7
13,1	**SMDT 1310 D MTL**	●	9,7
13,2	**SMDT 1320 D MTL**	●	9,7
13,3	**SMDT 1330 D MTL**	●	9,7
13,4	**SMDT 1340 D MTL**	●	9,7
13,5	**SMDT 1350 D MTL**	●	10,3
13,6	**SMDT 1360 D MTL**	●	10,3
13,7	**SMDT 1370 D MTL**	●	10,3
13,8	**SMDT 1380 D MTL**	●	10,3
13,9	**SMDT 1390 D MTL**	●	10,3
14,0	**SMDT 1400 D MTL**	●	10,3
14,1	**SMDT 1410 D MTL**	●	10,3
14,2	**SMDT 1420 D MTL**	●	10,3
14,3	**SMDT 1430 D MTL**	●	10,3
14,4	**SMDT 1440 D MTL**	●	10,3
14,5	**SMDT 1450 D MTL**	●	10,3
14,6	**SMDT 1460 D MTL**	●	10,3
14,7	**SMDT 1470 D MTL**	●	10,3
14,8	**SMDT 1480 D MTL**	●	10,3
14,9	**SMDT 1490 D MTL**	●	10,3
15,0	**SMDT 1500 D MTL**	●	11,0
15,1	**SMDT 1510 D MTL**	●	11,0
15,2	**SMDT 1520 D MTL**	●	11,0
15,3	**SMDT 1530 D MTL**	●	11,0

● øD: 15,4~18,7mm

øD (mm)	Cat. No.	Stock	H (mm)
15,4	**SMDT 1540 D MTL**	●	11,0
15,5	**SMDT 1550 D MTL**	●	11,0
15,6	**SMDT 1560 D MTL**	●	11,0
15,7	**SMDT 1570 D MTL**	●	11,0
15,8	**SMDT 1580 D MTL**	●	11,0
15,9	**SMDT 1590 D MTL**	●	11,0
16,0	**SMDT 1600 D MTL**	●	11,6
16,1	**SMDT 1610 D MTL**	●	11,6
16,2	**SMDT 1620 D MTL**	●	11,6
16,3	**SMDT 1630 D MTL**	●	11,6
16,4	**SMDT 1640 D MTL**	●	11,6
16,5	**SMDT 1650 D MTL**	●	11,6
16,6	**SMDT 1660 D MTL**	●	11,6
16,7	**SMDT 1670 D MTL**	●	11,6
16,8	**SMDT 1680 D MTL**	●	11,6
16,9	**SMDT 1690 D MTL**	●	11,6
17,0	**SMDT 1700 D MTL**	●	12,2
17,1	**SMDT 1710 D MTL**	●	12,2
17,2	**SMDT 1720 D MTL**	●	12,2
17,3	**SMDT 1730 D MTL**	●	12,2
17,4	**SMDT 1740 D MTL**	●	12,2
17,5	**SMDT 1750 D MTL**	●	12,2
17,6	**SMDT 1760 D MTL**	●	12,2
17,7	**SMDT 1770 D MTL**	●	12,2
17,8	**SMDT 1780 D MTL**	●	12,2
17,9	**SMDT 1790 D MTL**	●	12,2
18,0	**SMDT 1800 D MTL**	●	12,9
18,1	**SMDT 1810 D MTL**	●	12,9
18,2	**SMDT 1820 D MTL**	●	12,9
18,3	**SMDT 1830 D MTL**	●	12,9
18,4	**SMDT 1840 D MTL**	●	12,9
18,5	**SMDT 1850 D MTL**	●	12,9
18,6	**SMDT 1860 D MTL**	●	12,9
18,7	**SMDT 1870 D MTL**	●	12,9

● øD: 18,8~30,5mm

øD (mm)	Cat. No.	Stock	H (mm)
18,8	**SMDT 1880 D MTL**	●	12,9
18,9	**SMDT 1890 D MTL**	●	12,9
19,0	**SMDT 1900 D MTL**	●	13,5
19,1	**SMDT 1910 D MTL**	●	13,5
19,2	**SMDT 1920 D MTL**	●	13,5
19,3	**SMDT 1930 D MTL**	●	13,5
19,4	**SMDT 1940 D MTL**	●	13,5
19,5	**SMDT 1950 D MTL**	●	13,5
19,6	**SMDT 1960 D MTL**	●	13,5
19,7	**SMDT 1970 D MTL**	●	13,5
19,8	**SMDT 1980 D MTL**	●	13,5
19,9	**SMDT 1990 D MTL**	●	13,5
20,0	**SMDT 2000 D MTL**	●	14,1
20,5	**SMDT 2050 D MTL**	●	14,1
21,0	**SMDT 2100 D MTL**	●	14,8
21,5	**SMDT 2150 D MTL**	●	14,8
22,0	**SMDT 2200 D MTL**	●	15,0
22,5	**SMDT 2250 D MTL**	●	15,0
23,0	**SMDT 2300 D MTL**	●	15,1
23,5	**SMDT 2350 D MTL**	●	15,1
24,0	**SMDT 2400 D MTL**	●	15,4
24,5	**SMDT 2450 D MTL**	●	15,4
25,0	**SMDT 2500 D MTL**	●	15,8
25,5	**SMDT 2550 D MTL**	●	15,8
26,0	**SMDT 2600 D MTL**	●	16,4
26,5	**SMDT 2650 D MTL**	●	16,4
27,0	**SMDT 2700 D MTL**	●	17,1
27,5	**SMDT 2750 D MTL**	●	17,1
28,0	**SMDT 2800 D MTL**	●	17,7
28,5	**SMDT 2850 D MTL**	●	17,7
29,0	**SMDT 2900 D MTL**	●	18,3
29,5	**SMDT 2950 D MTL**	●	18,3
30,0	**SMDT 3000 D MTL**	●	19,0
30,5	**SMDT 3050 D MTL**	●	19,0

Recommended Cutting Conditions

● For using **3xD** and **5xD** type drills

Drill Ø (mm) \ Work material		General steel (HB250~320)	Harden steel (HRC45)	Nodular cast iron
~ 16,0	v_c	70 – **100** – 120	40 – **60** – 90	50 – **60** – 80
	f	0,15 – **0,2** – 0,3	0,1 – **0,15** – 0,2	0,2 – **0,25** – 0,3
~ 20,0	v_c	70 – **100** – 120	40 – **70** – 90	50 – **70** – 90
	f	0,15 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,2 – **0,25** – 0,35
~ 30,8	v_c	70 – **100** – 120	40 – **60** – 90	50 – **70** – 90
	f	0,2 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,25 – **0,3** – 0,35

Note: High cutting performance is enhanced when using a high quality machine and rigid set up.

New

● For using **8xD** and **12xD** type drills

Drill Ø (mm) \ Work material		General steel (HB250~320)	Harden steel (HRC45)	Nodular cast iron
~16,0	v_c	50 – **70** – 80	30 – **50** – 70	40 – **50** – 70
	f	0,15 – **0,2** – 0,3	0,1 – **0,15** – 0,2	0,2 – **0,25** – 0,3
~20,0	v_c	50 – **70** – 80	30 – **50** – 70	40 – **60** – 80
	f	0,15 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,2 – **0,25** – 0,35
~25,0 (12D) ~30,5 (8D)	v_c	50 – **70** – 80	30 – **50** – 70	40 – **60** – 80
	f	0,2 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,25 – **0,3** – 0,35

[v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min - **Optimum** - Max]

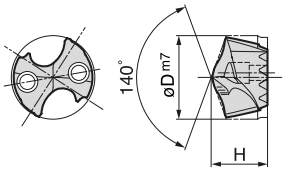
Regrindable Drill Head Insert
SMDT... D MEL Type

MEL Type for Smooth Cutting

(Soft Steel, Stainless Steel, Grey Cast Iron)

PVD coated grade: **ACX80**

Type MEL



Drill Head (Insert)

● øD: 12,0~15,3mm

øD (mm)	Cat. No.	Stock	H (mm)
12,0	**SMDT 1200 D MEL**	●	9,1
12,1	**SMDT 1210 D MEL**	●	9,1
12,2	**SMDT 1220 D MEL**	●	9,1
12,3	**SMDT 1230 D MEL**	●	9,1
12,4	**SMDT 1240 D MEL**	●	9,1
12,5	**SMDT 1250 D MEL**	●	9,4
12,6	**SMDT 1260 D MEL**	●	9,4
12,7	**SMDT 1270 D MEL**	●	9,4
12,8	**SMDT 1280 D MEL**	●	9,4
12,9	**SMDT 1290 D MEL**	●	9,4
13,0	**SMDT 1300 D MEL**	●	9,7
13,1	**SMDT 1310 D MEL**	●	9,7
13,2	**SMDT 1320 D MEL**	●	9,7
13,3	**SMDT 1330 D MEL**	●	9,7
13,4	**SMDT 1340 D MEL**	●	9,7
13,5	**SMDT 1350 D MEL**	●	10,3
13,6	**SMDT 1360 D MEL**	●	10,3
13,7	**SMDT 1370 D MEL**	●	10,3
13,8	**SMDT 1380 D MEL**	●	10,3
13,9	**SMDT 1390 D MEL**	●	10,3
14,0	**SMDT 1400 D MEL**	●	10,3
14,1	**SMDT 1410 D MEL**	●	10,3
14,2	**SMDT 1420 D MEL**	●	10,3
14,3	**SMDT 1430 D MEL**	●	10,3
14,4	**SMDT 1440 D MEL**	●	10,3
14,5	**SMDT 1450 D MEL**	●	10,3
14,6	**SMDT 1460 D MEL**	●	10,3
14,7	**SMDT 1470 D MEL**	●	10,3
14,8	**SMDT 1480 D MEL**	●	10,3
14,9	**SMDT 1490 D MEL**	●	10,3
15,0	**SMDT 1500 D MEL**	●	11,0
15,1	**SMDT 1510 D MEL**	●	11,0
15,2	**SMDT 1520 D MEL**	●	11,0
15,3	**SMDT 1530 D MEL**	●	11,0

● øD: 15,4~18,7mm

øD (mm)	Cat. No.	Stock	H (mm)
15,4	**SMDT 1540 D MEL**	●	11,0
15,5	**SMDT 1550 D MEL**	●	11,0
15,6	**SMDT 1560 D MEL**	●	11,0
15,7	**SMDT 1570 D MEL**	●	11,0
15,8	**SMDT 1580 D MEL**	●	11,0
15,9	**SMDT 1590 D MEL**	●	11,0
16,0	**SMDT 1600 D MEL**	●	11,6
16,1	**SMDT 1610 D MEL**	●	11,6
16,2	**SMDT 1620 D MEL**	●	11,6
16,3	**SMDT 1630 D MEL**	●	11,6
16,4	**SMDT 1640 D MEL**	●	11,6
16,5	**SMDT 1650 D MEL**	●	11,6
16,6	**SMDT 1660 D MEL**	●	11,6
16,7	**SMDT 1670 D MEL**	●	11,6
16,8	**SMDT 1680 D MEL**	●	11,6
16,9	**SMDT 1690 D MEL**	●	11,6
17,0	**SMDT 1700 D MEL**	●	12,2
17,1	**SMDT 1710 D MEL**	●	12,2
17,2	**SMDT 1720 D MEL**	●	12,2
17,3	**SMDT 1730 D MEL**	●	12,2
17,4	**SMDT 1740 D MEL**	●	12,2
17,5	**SMDT 1750 D MEL**	●	12,2
17,6	**SMDT 1760 D MEL**	●	12,2
17,7	**SMDT 1770 D MEL**	●	12,2
17,8	**SMDT 1780 D MEL**	●	12,2
17,9	**SMDT 1790 D MEL**	●	12,2
18,0	**SMDT 1800 D MEL**	●	12,9
18,1	**SMDT 1810 D MEL**	●	12,9
18,2	**SMDT 1820 D MEL**	●	12,9
18,3	**SMDT 1830 D MEL**	●	12,9
18,4	**SMDT 1840 D MEL**	●	12,9
18,5	**SMDT 1850 D MEL**	●	12,9
18,6	**SMDT 1860 D MEL**	●	12,9
18,7	**SMDT 1870 D MEL**	●	12,9

● øD: 18,8~30,5mm

øD (mm)	Cat. No.	Stock	H (mm)
18,8	**SMDT 1880 D MEL**	●	12,9
18,9	**SMDT 1890 D MEL**	●	12,9
19,0	**SMDT 1900 D MEL**	●	13,5
19,1	**SMDT 1910 D MEL**	●	13,5
19,2	**SMDT 1920 D MEL**	●	13,5
19,3	**SMDT 1930 D MEL**	●	13,5
19,4	**SMDT 1940 D MEL**	●	13,5
19,5	**SMDT 1950 D MEL**	●	13,5
19,6	**SMDT 1960 D MEL**	●	13,5
19,7	**SMDT 1970 D MEL**	●	13,5
19,8	**SMDT 1980 D MEL**	●	13,5
19,9	**SMDT 1990 D MEL**	●	13,5
20,0	**SMDT 2000 D MEL**	●	14,1
20,5	**SMDT 2050 D MEL**	●	14,1
21,0	**SMDT 2100 D MEL**	●	14,8
21,5	**SMDT 2150 D MEL**	●	14,8
22,0	**SMDT 2200 D MEL**	●	15,0
22,5	**SMDT 2250 D MEL**	●	15,0
23,0	**SMDT 2300 D MEL**	●	15,1
23,5	**SMDT 2350 D MEL**	●	15,1
24,0	**SMDT 2400 D MEL**	●	15,4
24,5	**SMDT 2450 D MEL**	●	15,4
25,0	**SMDT 2500 D MEL**	●	15,8
25,5	**SMDT 2550 D MEL**	●	15,8
26,0	**SMDT 2600 D MEL**	●	16,4
26,5	**SMDT 2650 D MEL**	●	16,4
27,0	**SMDT 2700 D MEL**	●	17,1
27,5	**SMDT 2750 D MEL**	●	17,1
28,0	**SMDT 2800 D MEL**	●	17,7
28,5	**SMDT 2850 D MEL**	●	17,7
29,0	**SMDT 2900 D MEL**	●	18,3
29,5	**SMDT 2950 D MEL**	●	18,3
30,0	**SMDT 3000 D MEL**	●	19,0
30,5	**SMDT 3050 D MEL**	●	19,0

Recommended Cutting Conditions

New

● For using **3xD** and **5xD** type drills

Drill Ø (mm) \ Work material		Soft steel (~HB250)	Stainless steel (~HB200)	Grey cast iron
~ 16,0	v_c	80 – **100** – 120	50 – **60** – 80	50 – **70** – 90
	f	0,15 – **0,2** – 0,35	0,1 – **0,15** – 0,2	0,2 – **0,25** – 0,3
~ 20,0	v_c	80 – **100** – 120	60 – **70** – 90	60 – **80** – 100
	f	0,15 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,25 – **0,3** – 0,35
~ 30,8	v_c	80 – **100** – 120	60 – **70** – 90	60 – **80** – 100
	f	0,2 – **0,3** – 0,35	0,15 – **0,2** – 0,25	0,2 – **0,35** – 0,40

Note: High cutting performance is enhanced when using a high quality machine and rigid set up.

● For using **8xD** and **12xD** type drills

Drill Ø (mm) \ Work material		Soft steel (~HB250)	Stainless steel (~HB200)	Grey cast iron
~16,0	v_c	50 – **70** – 80	40 – **50** – 60	40 – **60** – 80
	f	0,15 – **0,2** – 0,35	0,1 – **0,15** – 0,2	0,2 – **0,25** – 0,3
~20,0	v_c	50 – **70** – 80	40 – **60** – 70	50 – **70** – 90
	f	0,15 – **0,25** – 0,35	0,15 – **0,2** – 0,25	0,25 – **0,3** – 0,35
~25,0 (12D) ~30,5 (8D)	v_c	60 – **70** – 80	40 – **60** – 70	50 – **70** – 90
	f	0,2 – **0,3** – 0,35	0,15 – **0,2** – 0,25	0,2 – **0,35** – 0,4

[v_c : Cutting Speed (m/min), f : Feed rate (mm/rev), Min - **Optimum** - Max]

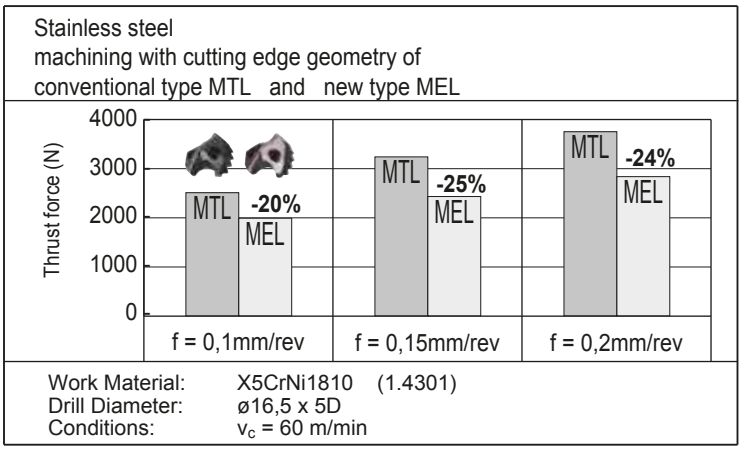
● = Euro stock

Advantages

- Replaceable and regrindable drill head
- New design decreases cutting force by 25%
- Ideal for stainless steels - soft steels etc
- Excellent tool life when drilling cast iron
- Improves drilling performance on low powered machines
- Increases productivity

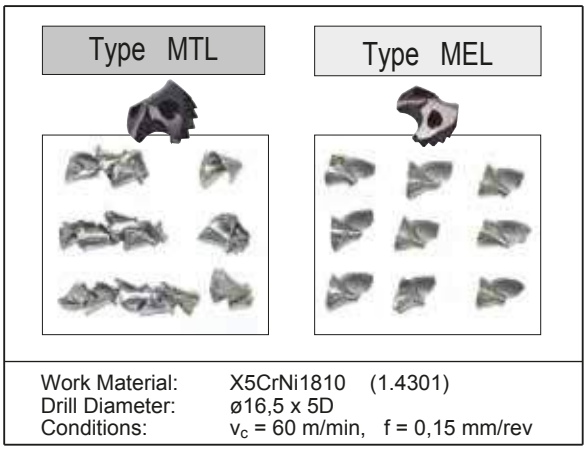
Performance (Stainless steel machinig)

Comparison of cutting force



Work Material: X5CrNi1810 (1.4301)
Drill Diameter: ø16,5 x 5D
Conditions: v_c = 60 m/min

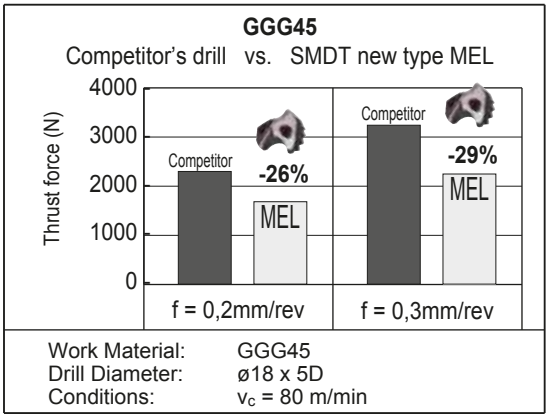
Chip comparison



Work Material: X5CrNi1810 (1.4301)
Drill Diameter: ø16,5 x 5D
Conditions: v_c = 60 m/min, f = 0,15 mm/rev

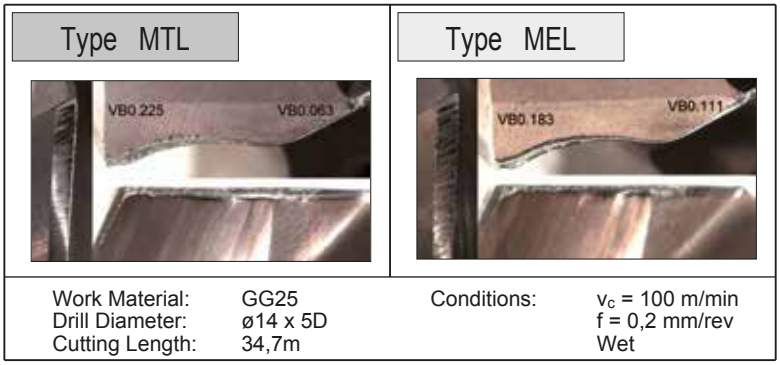
Performance (Cast iron machinig)

Comparison of cutting force



Work Material: GGG45
Drill Diameter: ø18 x 5D
Conditions: v_c = 80 m/min

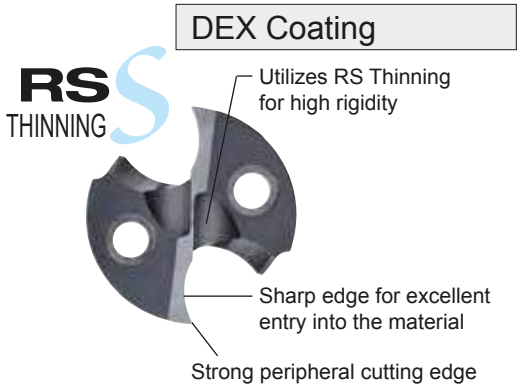
Comparison of wear resistance



Work Material: GG25
Drill Diameter: ø14 x 5D
Cutting Length: 34,7m
Conditions: v_c = 100 m/min
f = 0,2 mm/rev
Wet

New

MFS Type Ideal for Drilling in Non-Flat Surfaces and Less Burr

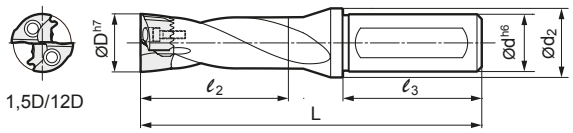


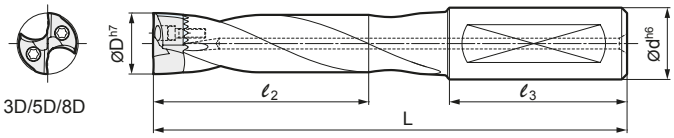
Advantages

- **Various Drilling Operations Thanks to a Point Angle of 180°**
  Applicable to high-efficiency spot facing, drilling in non-flat surfaces such as inclined and cylindrical surfaces and interrupted drilling.
  Also reduces burrs st the hole exit.

- **Improves Machining Stability**
  Achieves high rigidity by employing RS Thinning, which ensures thick web at the bottom.

Holder





No flat face for side lock clamping on the shank of 12D holders.

Holder

Dimensions				Cat. No.	Series (1,5D)				Series (3D)			Series (5D)			Series (8D)			Series (12D)				Related Drill Heads MFS
Drill Head		Shank			Stock	Dimensions			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions			
ø D	ℓ_1	ød	ℓ_3		S	L	ℓ_2	ød2	M3	L	ℓ_2	M5	L	ℓ_2	M8	L	ℓ_2	12D	L	ℓ_2	ød2	
12,0	2,2	16	48	SMDH 120 □□	❍	91	25,5	20	●	107,2	43,5	●	132,2	68,5								1200~1249
12,5	2,3			SMDH 125 □□	❍	91	25,5	20	●	107,3	43,5	●	132,3	68,5								1250~1299
13,0	2,4			SMDH 130 □□	❍	92	27,5	20	●	112,4	46,5	●	142,4	73,5								1300~1349
14,0	2,5			SMDH 140 □□□	❍	96	31,5	20	●	119,0	52,5	●	149,0	81,5	●	194,0	124,5	●	238,5	168,5	20	1350~1450
15,0	2,7	20	50	SMDH 150 □□□	❍	100	32,0	25	●	129,2	55,0	●	159,2	86,0	●	204,2	133,0	●	253,0	180,0	25	1451~1550
16,0	2,9			SMDH 160 □□□	❍	103	35,0	25	●	134,4	59,0	●	169,4	92,0	●	214,4	141,0	●	265,5	192,0	25	1551~1650
17,0	3,1			SMDH 170 □□□	❍	105	35,5	25	●	139,6	62,5	●	174,6	97,5	●	224,6	150,5	●	278,1	203,5	25	1651~1750
18,0	3,3			SMDH 180 □□□	❍	107	39,7	25	●	144,8	66,5	●	179,8	103,5	●	229,8	158,5	●	290,5	215,5	25	1751~1850
19,0	3,5	25	56	SMDH 190 □□□	❍	115	40,5	30	●	160,1	69,5	●	195,0	108,5	●	255,0	167,5	●	309,1	228,5	30	1851~1950
20,0	3,6			SMDH 200 □□□	❍	118	43,0	30	●	160,1	73,0	●	200,1	114,0	●	265,1	175,0	●	321,4	240,0	30	1951~2050
21,0	3,8			SMDH 210 □□□	❍	119	44,0	30	●	160,3	76,0	●	200,3	119,0	●	270,3	184,0	●	333,9	252,0	30	2051~2150
22,0	4,0			SMDH 220 □□□	❍	121	47,0	30	●	165,1	80,0	●	205,1	125,0	●	275,1	192,0	●	347,0	264,0	30	2151~2280
23,0	4,2			SMDH 230 □□□	❍	122	46,5	30	●	164,8	82,5	●	214,8	129,5	●	284,8	200,5	●	359,0	275,5	30	2281~2380
24,0	4,4	32	60	SMDH 240 □□□	❍	129	49,5	37	●	174,6	86,5	●	224,6	135,5	●	299,6	208,5	●	376,1	284,5	37	2381~2480
25,0	4,6			SMDH 250 □□□	❍	129	49,0	37	●	174,6	88,0	●	229,6	140,0	●	304,6	217,0	●	388,4	300,0	37	2481~2580
26,0	4,7			SMDH 260 □□	❍	132	52,0	37	●	179,7	92,0	●	234,7	146,0	●	314,7	225,0					2581~2680
27,0	4,9			SMDH 270 □□	❍	133	53,0	37	●	179,9	94,0	●	239,9	151,0	●	324,9	234,0					2681~2780
28,0	5,1			SMDH 280 □□	❍	135	54,5	37	●	185,1	96,5	●	245,1	156,5	●	330,1	241,5					2781~2880
29,0	5,3			SMDH 290 □□	❍	136	55,5	37	●	190,3	99,5	●	250,3	161,5	●	340,3	250,5					2881~2980
30,0	5,5			SMDH 300 □□	❍	139	58,5	37	●	190,5	104,5	●	260,5	167,5	●	350,5	259,5					2981~3050

Drill order description example: SMDH210M3, drill heads ⇨ K63

Recommended Torque

Screw		Applicable Insert
	N·m	
BXD 02208 IP	0,8 ~ 1,0	SMDT 1200 ~ 1550 MFS
BXD 02509 IP	0,9 ~ 1,2	SMDT 1551 ~ 1850 MFS
BXD 03011 IP	1,8 ~ 2,4	SMDT 1851 ~ 2150 MFS
BXD 03512 IP	2,8 ~ 3,7	SMDT 2151 ~ 2480 MFS
BXD 04014 IP	4,1 ~ 5,5	SMDT 2481 ~ 2780 MFS
BXD 04515 IP	5,0 ~ 6,6	SMDT 2781 ~ 3050 MFS

Spare Parts

Screw	Wrench	Applicable Holder
		
BXD 02208 IP	TRDR 08 IP	SMDH 120 ~ 150 □□
BXD 02509 IP	TRDR 10 IP	SMDH 160 ~ 180 □□
BXD 03011 IP	TRDR 15 IP	SMDH 190 ~ 210 □□
BXD 03512 IP	TRDR 15 IP	SMDH 220 ~ 240 □□
BXD 04014 IP	TRDR 20 IP	SMDH 250 ~ 270 □□
BXD 04515 IP	TRDR 25 IP	SMDH 280 ~ 300 □□

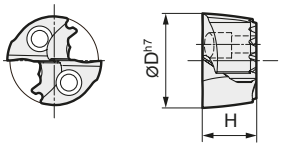
● = Euro stock
○ = Japan stock

N·m Recommended Tightening Torque (N·m)

Drill Head Insert
SMDT... MFS Type

New

Type MFS



PVD coated grade: **ACX70**

■ Drill Head (Insert)

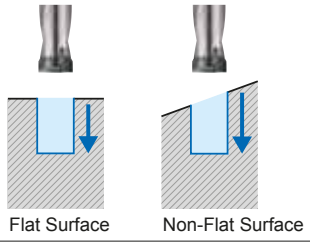
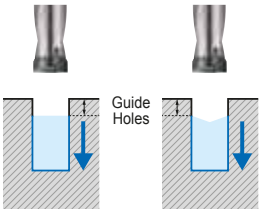
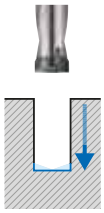
● øD: 12,0~21,5mm

øD (mm)	Cat. No.	Stock	H (mm)	Applicable Holders
12,0	**SMDT 1200 MFS**	❍	7,1	SMDH120 □□
12,5	**SMDT 1250 MFS**	❍	7,2	SMDH125 □□
13,0	**SMDT 1300 MFS**	❍	7,5	SMDH130 □□
13,5	**SMDT 1350 MFS**	❍	7,9	SMDH140 □□
14,0	**SMDT 1400 MFS**	❍		
14,5	**SMDT 1450 MFS**	❍		
15,0	**SMDT 1500 MFS**	❍	8,3	SMDH150 □□
15,5	**SMDT 1550 MFS**	❍		
16,0	**SMDT 1600 MFS**	❍	8,8	SMDH160 □□
16,5	**SMDT 1650 MFS**	❍		
17,0	**SMDT 1700 MFS**	❍	9,3	SMDH170 □□
17,5	**SMDT 1750 MFS**	❍		
18,0	**SMDT 1800 MFS**	❍	9,8	SMDH180 □□
18,5	**SMDT 1850 MFS**	❍		
19,0	**SMDT 1900 MFS**	❍	10,2	SMDH190 □□
19,5	**SMDT 1950 MFS**	❍		
20,0	**SMDT 2000 MFS**	❍	10,7	SMDH200 □□
20,5	**SMDT 2050 MFS**	❍		
21,0	**SMDT 2100 MFS**	❍	11,2	SMDH210 □□
21,5	**SMDT 2150 MFS**	❍		

● øD: 22,0~30,0mm

øD (mm)	Cat. No.	Stock	H (mm)	Applicable Holders
22,0	**SMDT 2200 MFS**	❍	11,2	SMDH220 □□
22,5	**SMDT 2250 MFS**	❍		
23,0	**SMDT 2300 MFS**	❍	11,2	SMDH230 □□
23,5	**SMDT 2350 MFS**	❍		
24,0	**SMDT 2400 MFS**	❍	11,3	SMDH240 □□
24,5	**SMDT 2450 MFS**	❍		
25,0	**SMDT 2500 MFS**	❍	11,7	SMDH250 □□
25,5	**SMDT 2550 MFS**	❍		
26,0	**SMDT 2600 MFS**	❍	12,2	SMDH260 □□
26,5	**SMDT 2650 MFS**	❍		
27,0	**SMDT 2700 MFS**	❍	12,7	SMDH270 □□
27,5	**SMDT 2750 MFS**	❍		
28,0	**SMDT 2800 MFS**	❍	13,2	SMDH280 □□
28,5	**SMDT 2850 MFS**	❍		
29,0	**SMDT 2900 MFS**	❍	13,6	SMDH290 □□
29,5	**SMDT 2950 MFS**	❍		
30,0	**SMDT 3000 MFS**	❍	14,1	SMDH300 □□

■ MFS Type Head Important Notes

	No Guide Hole (Solid Workpiece Hole Drilling)	With Guide Hole	Flat Finishing of Hole Bottom
Application			
1,5D Holder	○	○ (Guide Hole not required)	○
3D ~ 12D Holder	X	X	○

■ Recommended Cutting Conditions

v_c: Cutting speed (m/min)
f: Feed rate (mm/rev)

Work Material		Soft Steel (up to 250HB)	General Steel (250 to 320HB)	Hardened Steel (45HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron	Ductile Cast Iron	Aluminum Alloy (*)
Drill 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 Ø16,0	v_c	60 - **100** - 120	70 - **100** - 120	40 - **60** - 90	50 - **60** - 80	50 - **70** - 90	50 - **60** - 80	200 - **240** - 260
	f	0,15 - **0,20** - 0,35	0,15 - **0,20** - 0,30	0,10 - **0,15** - 0,20	0,10 - **0,15** - 0,20	0,20 - **0,25** - 0,30	0,20 - **0,25** - 0,30	0,35 - **0,45** - 0,55
Up to Ø20,0	v_c	80 - **100** - 120	70 - **100** - 120	40 - **60** - 90	60 - **70** - 90	60 - **80** - 100	50 - **70** - 90	200 - **240** - 260
	f	0,15 - **0,25** - 0,35	0,15 - **0,25** - 0,35	0,15 - **0,20** - 0,25	0,15 - **0,20** - 0,25	0,20 - **0,30** - 0,35	0,20 - **0,25** - 0,35	0,35 - **0,50** - 0,60
Up to Ø30,8	v_c	80 - **100** - 120	70 - **100** - 120	40 - **60** - 90	60 - **70** - 90	60 - **80** - 100	50 - **70** - 90	200 - **240** - 260
	f	0,20 - **0,30** - 0,35	0,20 - **0,25** - 0,35	0,15 - **0,20** - 0,25	0,15 - **0,20** - 0,25	0,20 - **0,30** - 0,40	0,25 - **0,30** - 0,35	0,35 - **0,50** - 0,60

Note: The recommended hole depth is 2xDC. The depth is measured from the highest point of the hole when drilling on inclined surfaces. The recommended cutting conditions above are for drilling on flat horizontal surfaces.
Adjust the feed rate according to the inclination angle when drilling on an inclined surface. Set the feed rate at 70% ot lower when 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 or helical milling.

(*) Inquire about drills specifically for aluminum alloy.

SMD Type

Large Hole MTL Type

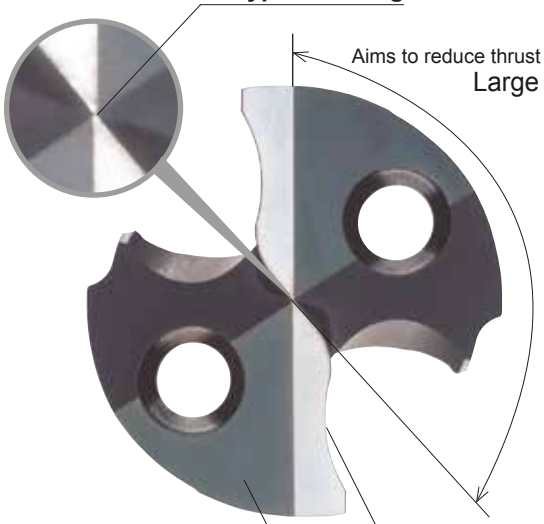
For Large Holes

Tool edge design ideal for malleable material used for large casings, etc.
Edge design suitable for malleable material commonly used for large hole drilling.

Improved chip management
for highly malleable materials
Large Helix Angle Design

Reduces movement when starting the hole
X-Type Thinning

Aims to reduce thrust under heavy cutting
Large Thinning Angle



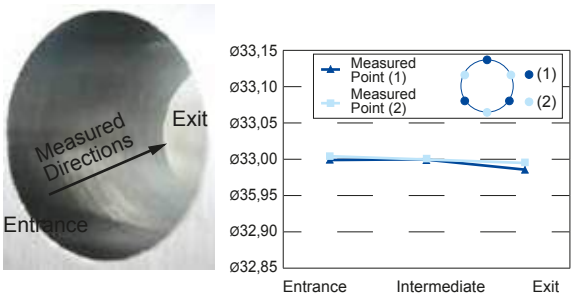
Designed to handle low
machine and clamp rigidity
Edge Treatment Exclusively for Large Diameters

Prevents unexpected breakage
when working with expensive materials
Robust Substrate

Machined Surface Accuracy

Work Material: St 52-3 (Base substrate for construction use)
Drill Size: Ø33,0mm x 5D
Cutting Conditions: v_c=120m/min, f=0,25mm/rev
Cutting Environment: Emulsion Type

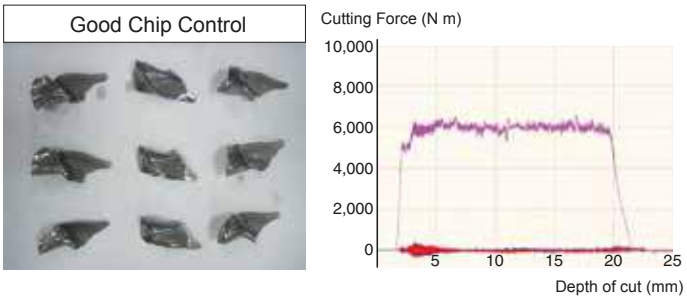
High drilling accuracy with large diameters



Cutting Force Comparison (Thrust)

Work Material: St 42-2 (Laminated plates)
Drill Size: Ø37,5mm x 5D
Cutting Conditions: v_c=90m/min, f=0,35mm/rev
Cutting Environment: Emulsion Type

Stable even when machining laminated plates



Recommended Cutting Conditions

v_C=Cutting Speed (m/min) f=Feed Rate (mm/rev)

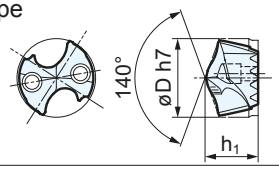
Work Material		Soft Steel (~HB250)	General Steel (HB250~320)	Hardened Steel (HRC45)	Stainless Steel (~HB200)	Grey Cast Iron	Ductil Cast Iron
Recommended Head		**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type
Drill Ø (mm)	Cutt. Conditions						
~ 36,5	v_c	**60 ~ 120** (40 ~ 80)	**60 ~ 120** (40 ~ 80)	**40 ~ 80** (30 ~ 60)	**40 ~ 80** (30 ~ 60)	**50 ~ 100** (40 ~ 90)	**50 ~ 90** (40 ~ 70)
	f	0,25 ~ 0,4	0,2 ~ 0,35	0,15 ~ 0,3	0,15 ~ 0,25	0,25 ~ 0,45	0,25 ~ 0,35
~ 42,5	v_c	**60 ~ 120** (40 ~ 80)	**60 ~ 120** (40 ~ 80)	**40 ~ 80** (30 ~ 60)	**40 ~ 80** (30 ~ 60)	**50 ~ 100** (40 ~ 90)	**50 ~ 90** (40 ~ 70)
	f	0,25 ~ 0,4	0,2 ~ 0,35	0,15 ~ 0,3	0,15 ~ 0,25	0,25~ 0,45	0,25 ~ 0,35

Note: Where machining and work clamp rigidity are good, conditions may be increased up to the maximum.
For 8D drills, please use feed rates stated within the ( ). Before drilling 8D holes, a guide hole of similar diameter must be made.

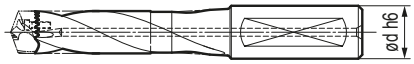
○ = Japan stock

Regrindable Drill Head Insert
SMDT... MTL Type

● Indexable Head MTL Type



● Toolholder

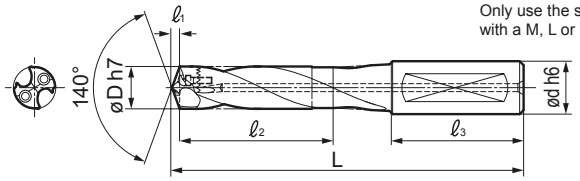


■ Drill Head (Ø31,0 to Ø42,5mm) Grade MTL Type - ACX80

■ Holders M (3D), L (5D), D (8D)

Drill Diameter ØD	Heads			Toolholder					
	MTL Type		h1	M (3D)		L (5D)		D (8D)	
	Cat. No.	Stock		Cat. No.	Stock	Cat. No.	Stock	Cat. No.	Stock
31,0	**SMDT 3100 MTL**	❍							
31,5	**SMDT 3150 MTL**		15,2	**SMDH 320 M**	❍	**SMDH 320 L**	❍	**SMDH 320 D**	❍
32,0	**SMDT 3200 MTL**	❍							
32,5	**SMDT 3250 MTL**								
33,0	**SMDT 3300 MTL**	❍	15,2	**SMDH 335 M**	❍	**SMDH 335 L**	❍	**SMDH 335 D**	❍
33,5	**SMDT 3350 MTL**								
34,0	**SMDT 3400 MTL**	❍							
34,5	**SMDT 3450 MTL**		16,6	**SMDH 350 M**	❍	**SMDH 350 L**	❍	**SMDH 350 D**	❍
35,0	**SMDT 3500 MTL**	❍							
35,5	**SMDT 3550 MTL**								
36,0	**SMDT 3600 MTL**	❍	16,4	**SMDH 365 M**	❍	**SMDH 365 L**	❍	**SMDH 365 D**	❍
36,5	**SMDT 3650 MTL**								
37,0	**SMDT 3700 MTL**	❍							
37,5	**SMDT 3750 MTL**	❍	18,1	**SMDH 380 M**	❍	**SMDH 380 L**	❍	**SMDH 380 D**	❍
38,0	**SMDT 3800 MTL**	❍							
38,5	**SMDT 3850 MTL**								
39,0	**SMDT 3900 MTL**	❍	17,8	**SMDH 395 M**	❍	**SMDH 395 L**	❍	**SMDH 395 D**	❍
39,5	**SMDT 3950 MTL**								
40,0	**SMDT 4000 MTL**	❍							
40,5	**SMDT 4050 MTL**	❍	19,5	**SMDH 410 M**	❍	**SMDH 410 L**	❍	**SMDH 410 D**	❍
41,0	**SMDT 4100 MTL**	❍							
41,5	**SMDT 4150 MTL**								
42,0	**SMDT 4200 MTL**	❍	19,3	**SMDH 425 M**	❍	**SMDH 425 L**	❍	**SMDH 425 D**	❍
42,5	**SMDT 4250 MTL**								

● Mounted Figure



Only use the special MTL Type head with a M, L or D type holder

Dimensions (mm)		M (3D)		L (5D)		D (8D)		Shank		Cap Screw	Wrench	N·m
Drill Head		Dimensions (mm)		Dimensions (mm)		Dimensions (mm)		Dimensions (mm)				
øD	ℓ1	ℓ2	L	ℓ2	L	ℓ2	L	ℓ3	ød			
31,0												
31,5	5,7	97,9	200,7	163	265,7	257,9	360,7	60	32,0			
32,0												
32,5										BXD04515IP	TRDR25IP	5 ~ 6,6
33,0	6,0	103,3	206,0	171,5	276,0	273,3	376,0	60	32,0			
33,5												
34,0												
34,5	6,3	106,8	221,3	182	296,3	287	401,3	70	40,0			
35,0												
35,5												
36,0	6,6	112,3	226,6	187,5	301,6	297,3	411,6	70	40,0			
36,5												
37,0												
37,5	6,8	115,8	231,8	195,8	311,8	310,8	426,8	70	40,0			
38,0												
38,5										BX0515	HD040	7,2
39,0	7,1	121,3	237,1	206,3	322,1	321,3	437,1	70	40,0			
39,5												
40,0												
40,5	7,4	129,8	252,4	209,8	332,4	334,8	457,4	70	40,0			
41,0												
41,5												
42,0	7,6	135,3	257,6	220,3	342,6	345,3	467,6	70	40,0			
42,5												

WDX Type

ECONOMICAL - FAST - ACCURATE - RIGID

High Feed Drilling - 4 Edge Inserts

General Features

The newly designed WDX drill features indexable inserts with 4 cutting edges and a range of optimised chipbreakers;
light (L) - general purpose (G) - heavy (H) for rapid chip removal.

The balanced cut design maximises feed rates and accuracy whilst the super ZX ultra hard coated inserts double the tool life.

Advantages

● Rigid - Economical - Multi-function

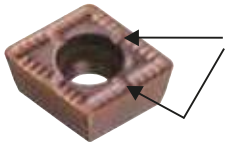
Drills - Bores - External Turns
Diameter range 13,0 ~ 55,0 mm
Drilling depth ~ 2D, ~ 3D, ~ 4D, ~ 5D

● Excellent chip control

Wide application suitability - choose from 3 styles of chipbreaker

L Type
- Excellent chip control under low feed rate conditions
- Excellent hole accuracy
- Excellent surface finish

G Type
- General purpose chipbreaker
- Excellent chip control
- Low cutting force
- Low / medium feed rates



H Type
- Strong cutting edge at higher feed rates
- Stable machining ~ eliminates vibration and noise

● One insert style for both pockets

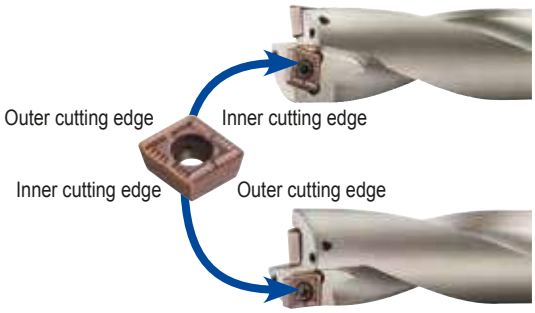
4 Edge insert provides both Inner and Outer cutting edges
Newly designed insert style simplifies insert management.

● Ultra hard Super ZX inserts double tool life

ACP300 for steels - stainless steels - difficult to cut materials
ACK300 for cast irons

● Excellent hole accuracy

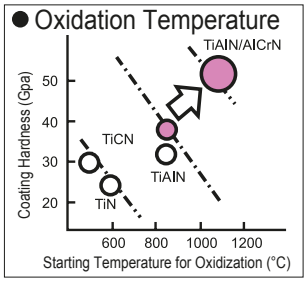
Improved cutting force balance and insert design for optimum performance



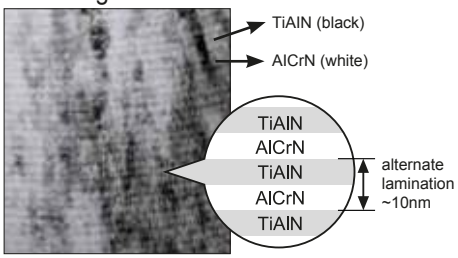
Features of Super ZX Coating

- Super-multi layered coating with ultra-thin (nanometer) layers of TiAlN and AlCrN, alternately stacked up to 1.000 layers.
- 40% increase in coating hardness and 200% increase in oxidation temperature as compared with conventional grades

● Oxidation Temperature



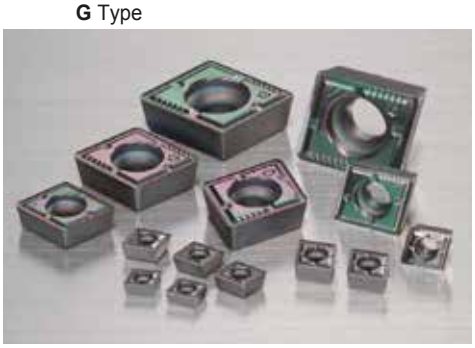
● Coating Structure



"AURORA" Coating DLC (Diamond Like Carbon)

Coated Grade **DL1500** for Aluminium

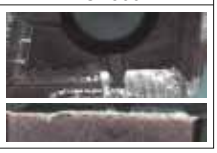
G Type



● Super smooth surface and low coefficient of friction

Achieving beautiful finishing on Aluminium and non-ferrous metalls with its high resistance to build-up edge.

Peripheral Insert	
DL1500	ACK300
	

Central Insert	
DL1500	ACK300
	

● = Euro stock
○ = Japan stock

Recommended Tightening Torque (N·m)

WDX Type (2D)

Max. Depth : 2 x øD

Fig. 1

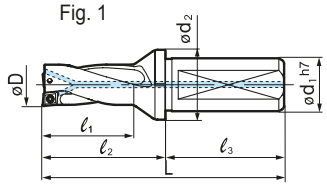


Fig. 2

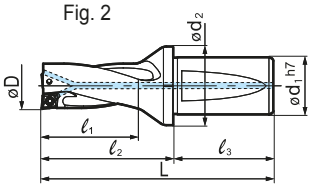
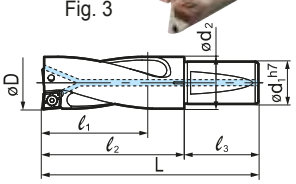


Fig. 3



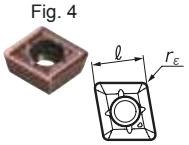
Holder

øD (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2	ød1	ød2	ℓ3	Applicable Insert	Fig.
13,0	**WDX 130D2S20**	●	88	29	44					
13,5	**WDX 135D2S20**	●	89	30	45					
14,0	**WDX 140D2S20**	●	90	31	46	20	28	44	WDXT 042004	
14,5	**WDX 145D2S20**	●	91	32	47					
15,0	**WDX 150D2S20**	●	92	33	48					
15,5	**WDX 155D2S20**	●	93	34	49					
16,0	**WDX 160D2S20**	●	94	35	50	20	30	44		
16,5	**WDX 165D2S20**	●	95	36	51				WDXT 052504	
17,0	**WDX 170D2S20**	●	96	37	52					
17,5	**WDX 175D2S25**	●	109	38	53	25	32	56		
18,0	**WDX 180D2S25**	●	110	39	54					
18,5	**WDX 185D2S25**	●	111	40	55					
19,0	**WDX 190D2S25**	●	112	41	56					
19,5	**WDX 195D2S25**	●	113	42	57					
20,0	**WDX 200D2S25**	●	114	43	58					
20,5	**WDX 205D2S25**	●	115	44	59	25	33	56	WDXT 063006	1
21,0	**WDX 210D2S25**	●	116	45	60					
21,5	**WDX 215D2S25**	●	117	46	61					
22,0	**WDX 220D2S25**	●	118	47	62					
22,5	**WDX 225D2S25**	●	119	48	63					
23,0	**WDX 230D2S25**	●	123	49	67					
23,5	**WDX 235D2S25**	●	124	50	68					
24,0	**WDX 240D2S25**	●	125	51	69	25	37	56		
24,5	**WDX 245D2S25**	●	126	52	70					
25,0	**WDX 250D2S25**	●	127	53	71					
25,5	**WDX 255D2S32**	●	134	54	74				WDXT 073506	
26,0	**WDX 260D2S32**	●	135	55	75					
26,5	**WDX 265D2S32**	●	136	56	76					
27,0	**WDX 270D2S32**	●	137	57	77	32	41	60		
27,5	**WDX 275D2S32**	●	138	58	78					
28,0	**WDX 280D2S32**	●	139	59	79					
28,5	**WDX 285D2S32**	●	140	60	80					
29,0	**WDX 290D2S32**	●	143	62	83	32	50	60		
29,5	**WDX 295D2S32**	●	144	63	84					
30,0	**WDX 300D2S40**	●	158	64	88					
31,0	**WDX 310D2S40**	●	160	66	90					
32,0	**WDX 320D2S40**	●	162	68	92					
33,0	**WDX 330D2S40**	●	164	70	94	40	54	70	WDXT 094008	
34,0	**WDX 340D2S40**	●	166	72	96					
35,0	**WDX 350D2S40**	●	168	74	98					
36,0	**WDX 360D2S40**	●	170	76	100					2
37,0	**WDX 370D2S40**	●	179	79	109					
38,0	**WDX 380D2S40**	●	181	81	111					
39,0	**WDX 390D2S40**	●	183	83	113					
40,0	**WDX 400D2S40**	●	185	85	115					
41,0	**WDX 410D2S40**	●	187	87	117	40	49,5	70	WDXT 125012	
42,0	**WDX 420D2S40**	●	189	89	119					
43,0	**WDX 430D2S40**	●	191	91	121					
44,0	**WDX 440D2S40**	●	193	93	123					
45,0	**WDX 450D2S40**	●	195	95	125					
46,0	**WDX 460D2S40**	●	197	97	127					
47,0	**WDX 470D2S40**	●	199	99	129					
48,0	**WDX 480D2S40**	●	201	101	131		49,5			
49,0	**WDX 490D2S40**	●	203	103	133					
50,0	**WDX 500D2S40**	●	205	105	135	40		70	WDXT 156012	
51,0	**WDX 510D2S40**	●	207	107	137					
52,0	**WDX 520D2S40**	●	209	109	139		50,5			
53,0	**WDX 530D2S40**	●	211	111	141		51,5			
54,0	**WDX 540D2S40**	●	213	113	143		52,5			
55,0	**WDX 550D2S40**	●	215	115	145		53,5			
56,0	**WDX 560D2S40**	❍	222	120	152		54			3
57,0	**WDX 570D2S40**	❍	224	122	154		55			
58,0	**WDX 580D2S40**	❍	226	124	156		56			
59,0	**WDX 590D2S40**	❍	228	126	158		57			
60,0	**WDX 600D2S40**	❍	230	128	160	40	58	70	WDXT 186012	
61,0	**WDX 610D2S40**	❍	232	130	162		59			
62,0	**WDX 620D2S40**	❍	234	132	164		60			
63,0	**WDX 630D2S40**	❍	236	134	166		61			
64,0	**WDX 640D2S40**	❍	238	136	168		62			
65,0	**WDX 650D2S40**	❍	240	138	170		63			

Inserts

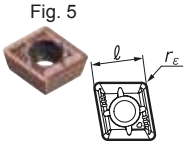
(mm)

Fig. 4



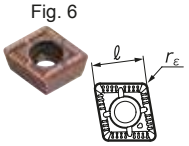
L Type
Excellent chip control at low feed rates

Fig. 5



G Type
General purpose chipbreaker

Fig. 6



H Type
Strong cutting edge at higher feed rates

Cat. No.	Coated ACP100	ACP300	ACK300	DL1500	Fig.	Dimensions (mm) ℓ	Thickness	rε	Applicable Holder
WDXT 042004-L	●	●	●		4				
WDXT 042004-G	●	●	●	●	5	4,2	2,0	0,4	WDX 130 ~ 150
WDXT 042004-H	●	●	●		6				
WDXT 052504-L	●	●	●		4				
WDXT 052504-G	●	●	●	●	5	5,0	2,5	0,4	WDX 155 ~ 180
WDXT 052504-H	●	●	●		6				
WDXT 063006-L	●	●	●		4				
WDXT 063006-G	●	●	●	●	5	6,0	3,0	0,6	WDX 185 ~ 225
WDXT 063006-H	●	●	●		6				
WDXT 073506-L	●	●	●		4				
WDXT 073506-G	●	●	●	●	5	7,5	3,5	0,6	WDX 230 ~ 285
WDXT 073506-H	●	●	●		6				
WDXT 094008-L	●	●	●		4				
WDXT 094008-G	●	●	●	●	5	9,6	4,0	0,8	WDX 290 ~ 360
WDXT 094008-H	●	●	●		6				
WDXT 125012-L	●	●	●		4				
WDXT 125012-G	●	●	●	●	5	12,4	5,0	1,2	WDX 370 ~ 450
WDXT 125012-H	●	●	●		6				
WDXT 156012-L	●	●	●		4				
WDXT 156012-G	●	●	●	●	5	15,2	6,0	1,2	WDX 460 ~ 550
WDXT 156012-H	●	●	●		6				
WDXT 186012-G	❍	❍	❍		5	18,0	6,0	1,2	WDX 560 ~ 650

Spare Parts

Screw	Wrench	Wrench	Applicable Holders	N·m
BFTX 01604 N	TRX 06	–	WDX 130D○S20 ~ 150D○S20	0,3
BFTX 0204 N	TRX 06	–	WDX 155D○S20 ~ 180D○S25	0,5
BFTY 02206	–	TRD 07	WDX 185D○S25 ~ 225D○S25	1,0
BFTX 02506 N	–	TRD 08	WDX 230D○S25 ~ 285D○S32	1,5
BFTX 03584	–	TRD 15	WDX 290D○S32 ~ 360D○S40	3,5
BFTX 0511 N	–	TRD 20	WDX 370D○S40 ~ 450D○S40	5,0
BFTX 0615 N	–	TRD 25	WDX 460D○S40 ~ 650D○S40	7,5

Identification of Drill Body

WDX 200 D2 S25

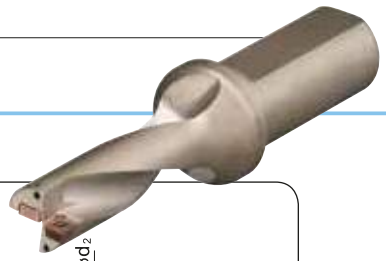
- 200 — Drill Diameter (ø20,0 mm)
- D2 — Flute Length L/D (2 x D)
- S25 — Shank Size (ø25,0 mm)

Identification of Indexable Insert

WDXT 06 30 06 -G

- 06 — Width Across Flats (6,0 mm)
- 30 — Thickness (3,0 mm)
- 06 — Corner Radius (0,6 mm)
- -G — Breaker Type

WDX Type (3D)



Max. Depth : 3 x øD

Fig. 1

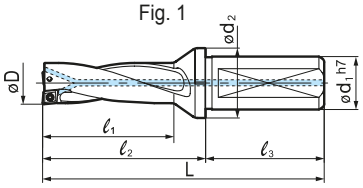


Fig. 2

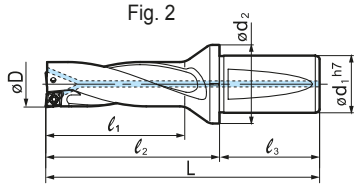
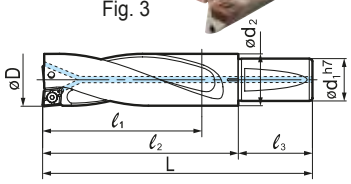


Fig. 3



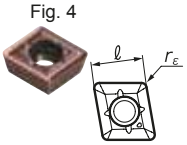
Holder

øD (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2	ød1	ød2	ℓ3	Applicable Insert	Fig.
13,0	**WDX 130D3S20**	●	101,0	42,0	57,0					
13,5	**WDX 135D3S20**	●	102,5	43,5	58,5					
14,0	**WDX 140D3S20**	●	104,0	45,0	60,0	20	28	44	WDXT 042004	
14,5	**WDX 145D3S20**	●	105,5	46,5	61,5					
15,0	**WDX 150D3S20**	●	107,0	58,0	63,0					
15,5	**WDX 155D3S20**	●	108,5	49,5	64,5					
16,0	**WDX 160D3S20**	●	110,0	51,0	66,0	20	30	44		
16,5	**WDX 165D3S20**	●	111,5	52,5	67,5				WDXT 052504	
17,0	**WDX 170D3S20**	●	113,0	54,0	69,0					
17,5	**WDX 175D3S25**	●	126,5	55,5	70,5	25	32	56		
18,0	**WDX 180D3S25**	●	128,0	57,0	72,0					
18,5	**WDX 185D3S25**	●	129,5	58,5	73,5					
19,0	**WDX 190D3S25**	●	131,0	60,0	75,0					
19,5	**WDX 195D3S25**	●	132,5	61,5	76,5					
20,0	**WDX 200D3S25**	●	134,0	63,0	78,0					
20,5	**WDX 205D3S25**	●	135,5	64,5	79,5	25	33	56	WDXT 063006	1
21,0	**WDX 210D3S25**	●	137,0	66,0	81,0					
21,5	**WDX 215D3S25**	●	138,5	67,5	82,5					
22,0	**WDX 220D3S25**	●	140,0	69,0	84,0					
22,5	**WDX 225D3S25**	●	141,5	70,5	85,5					
23,0	**WDX 230D3S25**	●	146,0	72,0	90,0					
23,5	**WDX 235D3S25**	●	147,5	73,5	91,5					
24,0	**WDX 240D3S25**	●	149,0	75,0	93,0	25	37	56		
24,5	**WDX 245D3S25**	●	150,5	76,5	94,5					
25,0	**WDX 250D3S25**	●	152,0	78,0	96,0					
25,5	**WDX 255D3S32**	●	159,5	79,5	97,5				WDXT 073506	
26,0	**WDX 260D3S32**	●	161,0	81,0	101,0					
26,5	**WDX 265D3S32**	●	162,5	82,5	102,5					
27,0	**WDX 270D3S32**	●	164,0	84,0	104,0	32	41	60		
27,5	**WDX 275D3S32**	●	165,5	85,5	105,5					
28,0	**WDX 280D3S32**	●	167,0	87,0	107,0					
28,5	**WDX 285D3S32**	●	168,5	88,5	108,5					
29,0	**WDX 290D3S32**	●	172,0	91,0	112,0	32	50	60		
29,5	**WDX 295D3S32**	●	173,5	92,5	113,5					
30,0	**WDX 300D3S40**	●	188,0	94,0	118,0					
31,0	**WDX 310D3S40**	●	191,0	97,0	121,0					
32,0	**WDX 320D3S40**	●	194,0	100,0	124,0					
33,0	**WDX 330D3S40**	●	197,0	103,0	127,0	40	54	70	WDXT 094008	
34,0	**WDX 340D3S40**	●	200,0	106,0	130,0					
35,0	**WDX 350D3S40**	●	203,0	109,0	133,0					
36,0	**WDX 360D3S40**	●	206,0	112,0	136,0					2
37,0	**WDX 370D3S40**	●	216,0	116,0	146,0					
38,0	**WDX 380D3S40**	●	219,0	119,0	149,0					
39,0	**WDX 390D3S40**	●	222,0	122,0	152,0					
40,0	**WDX 400D3S40**	●	225,0	125,0	155,0					
41,0	**WDX 410D3S40**	●	228,0	128,0	158,0	40	49,5	70	WDXT 125012	
42,0	**WDX 420D3S40**	●	231,0	131,0	161,0					
43,0	**WDX 430D3S40**	●	234,0	134,0	164,0					
44,0	**WDX 440D3S40**	●	237,0	137,0	167,0					
45,0	**WDX 450D3S40**	●	240,0	140,0	170,0					
46,0	**WDX 460D3S40**	●	243,0	143,0	173,0					
47,0	**WDX 470D3S40**	●	246,0	146,0	176,0					
48,0	**WDX 480D3S40**	●	249,0	149,0	179,0		49,5			
49,0	**WDX 490D3S40**	●	252,0	152,0	182,0					
50,0	**WDX 500D3S40**	●	255,0	155,0	185,0	40		70	WDXT 156012	
51,0	**WDX 510D3S40**	●	258,0	158,0	188,0					
52,0	**WDX 520D3S40**	●	261,0	161,0	191,0		50,5			
53,0	**WDX 530D3S40**	●	264,0	164,0	194,0		51,5			
54,0	**WDX 540D3S40**	●	267,0	167,0	197,0		52,5			
55,0	**WDX 550D3S40**	●	270,0	170,0	200,0		53,5			
56,0	**WDX 560D3S40**	❍	278,0	176,0	208,0		54			
57,0	**WDX 570D3S40**	❍	281,0	179,0	211,0		55			
58,0	**WDX 580D3S40**	❍	284,0	182,0	214,0		56			3
59,0	**WDX 590D3S40**	❍	287,0	185,0	217,0		57			
60,0	**WDX 600D3S40**	❍	290,0	188,0	220,0	40	58	70	WDXT 186012	
61,0	**WDX 610D3S40**	❍	293,0	191,0	223,0		59			
62,0	**WDX 620D3S40**	❍	296,0	194,0	226,0		60			
63,0	**WDX 630D3S40**	❍	299,0	197,0	229,0		61			
64,0	**WDX 640D3S40**	❍	302,0	200,0	232,0		62			
65,0	**WDX 650D3S40**	❍	305,0	203,0	235,0		63			

Inserts

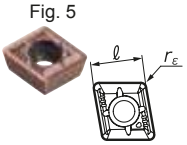
(mm)

Fig. 4



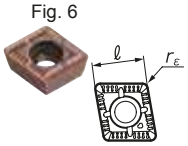
L Type
Excellent chip control at low feed rates

Fig. 5



G Type
General purpose chipbreaker

Fig. 6



H Type
Strong cutting edge at higher feed rates

Cat. No.	Coated ACP100	ACP300	ACK300	DL1500	Fig.	Dimensions (mm) ℓ	Thickness	rε	Applicable Holder
WDXT 042004-L	●	●	●		4				
WDXT 042004-G	●	●	●	●	5	4,2	2,0	0,4	WDX 130 ~ 150
WDXT 042004-H	●	●	●		6				
WDXT 052504-L	●	●	●		4				
WDXT 052504-G	●	●	●	●	5	5,0	2,5	0,4	WDX 155 ~ 180
WDXT 052504-H	●	●	●		6				
WDXT 063006-L	●	●	●		4				
WDXT 063006-G	●	●	●	●	5	6,0	3,0	0,6	WDX 185 ~ 225
WDXT 063006-H	●	●	●		6				
WDXT 073506-L	●	●	●		4				
WDXT 073506-G	●	●	●	●	5	7,5	3,5	0,6	WDX 230 ~ 285
WDXT 073506-H	●	●	●		6				
WDXT 094008-L	●	●	●		4				
WDXT 094008-G	●	●	●	●	5	9,6	4,0	0,8	WDX 290 ~ 360
WDXT 094008-H	●	●	●		6				
WDXT 125012-L	●	●	●		4				
WDXT 125012-G	●	●	●	●	5	12,4	5,0	1,2	WDX 370 ~ 450
WDXT 125012-H	●	●	●		6				
WDXT 156012-L	●	●	●		4				
WDXT 156012-G	●	●	●	●	5	15,2	6,0	1,2	WDX 460 ~ 550
WDXT 156012-H	●	●	●		6				
WDXT 186012-G	❍	❍	❍		5	18,0	6,0	1,2	WDX 560 ~ 650

Spare Parts

Screw	Wrench	Wrench	Applicable Holders	N·m
				
BFTX 01604 N	TRX 06	–	WDX 130D○S20 ~ 150D○S20	0,3
BFTX 0204 N	TRX 06	–	WDX 155D○S20 ~ 180D○S25	0,5
BFTY 02206	–	TRD 07	WDX 185D○S25 ~ 225D○S25	1,0
BFTX 02506 N	–	TRD 08	WDX 230D○S25 ~ 285D○S32	1,5
BFTX 03584	–	TRD 15	WDX 290D○S32 ~ 360D○S40	3,5
BFTX 0511 N	–	TRD 20	WDX 370D○S40 ~ 450D○S40	5,0
BFTX 0615 N	–	TRD 25	WDX 460D○S40 ~ 650D○S40	7,5

Identification of Drill Body

WDX 200 D3 S25

- 200 — Drill Diameter (ø20,0 mm)
- D3 — Flute Length L/D (3 x D)
- S25 — Shank Size (ø25,0 mm)

Identification of Indexable Insert

WDXT 06 30 06 -G

- 06 — Width Across Flats (6,0 mm)
- 30 — Thickness (3,0 mm)
- 06 — Corner Radius (0,6 mm)
- -G — Breaker Type

N·m Recommended Tightening Torque (N·m)

● = Euro stock
○ = Japan stock

WDX Type (4D)

Max. Depth : 4 x øD

Fig. 1

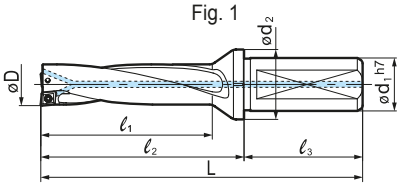


Fig. 2

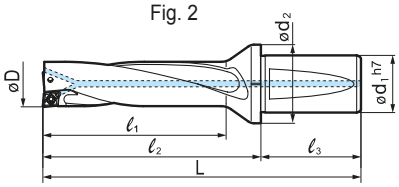
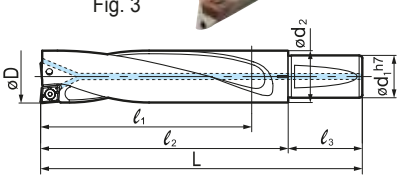


Fig. 3



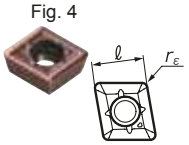
Holder

øD (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2	ød1	ød2	ℓ3	Applicable Insert	Fig.
13,0	**WDX 130D4S20**	●	114	55	70					
13,5	**WDX 135D4S20**	●	116	57	72					
14,0	**WDX 140D4S20**	●	118	59	74	20	28	44	WDXT 042004	
14,5	**WDX 145D4S20**	●	120	61	76					
15,0	**WDX 150D4S20**	●	122	63	78					
15,5	**WDX 155D4S20**	●	124	65	80					
16,0	**WDX 160D4S20**	●	126	67	82	20	30	44		
16,5	**WDX 165D4S20**	●	128	69	84				WDXT 052504	
17,0	**WDX 170D4S20**	●	130	71	86					
17,5	**WDX 175D4S25**	●	144	73	88	25	32	56		
18,0	**WDX 180D4S25**	●	146	75	90					
18,5	**WDX 185D4S25**	●	148	77	92					
19,0	**WDX 190D4S25**	●	150	79	94					
19,5	**WDX 195D4S25**	●	152	81	96					
20,0	**WDX 200D4S25**	●	154	83	98					
20,5	**WDX 205D4S25**	●	156	85	100	25	33	56	WDXT 063006	1
21,0	**WDX 210D4S25**	●	158	87	102					
21,5	**WDX 215D4S25**	●	160	89	104					
22,0	**WDX 220D4S25**	●	162	91	106					
22,5	**WDX 225D4S25**	●	164	93	108					
23,0	**WDX 230D4S25**	●	169	95	113					
23,5	**WDX 235D4S25**	●	171	97	115					
24,0	**WDX 240D4S25**	●	173	99	117	25	37	56		
24,5	**WDX 245D4S25**	●	175	101	119					
25,0	**WDX 250D4S25**	●	177	103	121					
25,5	**WDX 255D4S32**	●	185	105	125				WDXT 073506	
26,0	**WDX 260D4S32**	●	187	107	127					
26,5	**WDX 265D4S32**	●	189	109	129					
27,0	**WDX 270D4S32**	●	191	111	131	32	41	60		
27,5	**WDX 275D4S32**	●	193	113	133					
28,0	**WDX 280D4S32**	●	195	115	135					
28,5	**WDX 285D4S32**	●	197	117	137					
29,0	**WDX 290D4S32**	●	201	120	141	32	50	60		
29,5	**WDX 295D4S32**	●	203	122	143					
30,0	**WDX 300D4S40**	●	218	124	148					
31,0	**WDX 310D4S40**	●	222	128	152					
32,0	**WDX 320D4S40**	●	226	132	156					
33,0	**WDX 330D4S40**	●	230	136	160	40	54	70	WDXT 094008	
34,0	**WDX 340D4S40**	●	234	140	164					
35,0	**WDX 350D4S40**	●	238	144	168					
36,0	**WDX 360D4S40**	●	242	148	172					2
37,0	**WDX 370D4S40**	●	253	153	183					
38,0	**WDX 380D4S40**	●	257	157	187					
39,0	**WDX 390D4S40**	●	261	161	191					
40,0	**WDX 400D4S40**	●	265	165	195					
41,0	**WDX 410D4S40**	●	269	169	199	40	49,5	70	WDXT 125012	
42,0	**WDX 420D4S40**	●	273	173	203					
43,0	**WDX 430D4S40**	●	277	177	207					
44,0	**WDX 440D4S40**	●	281	181	211					
45,0	**WDX 450D4S40**	●	285	185	215					
46,0	**WDX 460D4S40**	●	289	189	219					
47,0	**WDX 470D4S40**	●	293	193	223					
48,0	**WDX 480D4S40**	●	297	197	227					
49,0	**WDX 490D4S40**	●	301	201	231		49,5			
50,0	**WDX 500D4S40**	●	305	205	235	40		70	WDXT 156012	
51,0	**WDX 510D4S40**	●	309	209	239					
52,0	**WDX 520D4S40**	●	313	213	243		50,5			
53,0	**WDX 530D4S40**	●	317	217	247		51,5			
54,0	**WDX 540D4S40**	●	321	221	251		52,5			
55,0	**WDX 550D4S40**	●	325	225	255		53,5			3
56,0	**WDX 560D4S40**	❍	334	232	264		54			
57,0	**WDX 570D4S40**	❍	338	236	268		55			
58,0	**WDX 580D4S40**	❍	342	240	272	40	56	70	WDXT 186012	
59,0	**WDX 590D4S40**	❍	346	244	276		57			
60,0	**WDX 600D4S40**	❍	350	248	280		58			

Inserts

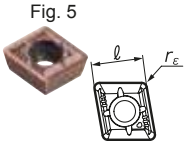
(mm)

Fig. 4



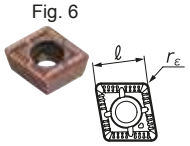
L Type
Excellent chip control at low feed rates

Fig. 5



G Type
General purpose chipbreaker

Fig. 6



H Type
Strong cutting edge at higher feed rates

Cat. No.	Coated ACP100	ACP300	ACK300	DL1500	Fig.	Dimensions (mm) ℓ	Thickness	rε	Applicable Holder
WDXT 042004-L	●	●	●		4				
WDXT 042004-G	●	●	●	●	5	4,2	2,0	0,4	WDX 130 ~ 150
WDXT 042004-H	●	●	●		6				
WDXT 052504-L	●	●	●		4				
WDXT 052504-G	●	●	●	●	5	5,0	2,5	0,4	WDX 155 ~ 180
WDXT 052504-H	●	●	●		6				
WDXT 063006-L	●	●	●		4				
WDXT 063006-G	●	●	●	●	5	6,0	3,0	0,6	WDX 185 ~ 225
WDXT 063006-H	●	●	●		6				
WDXT 073506-L	●	●	●		4				
WDXT 073506-G	●	●	●	●	5	7,5	3,5	0,6	WDX 230 ~ 285
WDXT 073506-H	●	●	●		6				
WDXT 094008-L	●	●	●		4				
WDXT 094008-G	●	●	●	●	5	9,6	4,0	0,8	WDX 290 ~ 360
WDXT 094008-H	●	●	●		6				
WDXT 125012-L	●	●	●		4				
WDXT 125012-G	●	●	●	●	5	12,4	5,0	1,2	WDX 370 ~ 450
WDXT 125012-H	●	●	●		6				
WDXT 156012-L	●	●	●		4				
WDXT 156012-G	●	●	●	●	5	15,2	6,0	1,2	WDX 460 ~ 550
WDXT 156012-H	●	●	●		6				
WDXT 186012-G	❍	❍	❍		5	18,0	6,0	1,2	WDX 560 ~ 650

Spare Parts

Screw	Wrench	Wrench	Applicable Holders	Recommended Torque (Nm)
				
BFTX 01604 N	TRX 06	–	WDX 130D○S20 ~ 150D○S20	0,3
BFTX 0204 N	TRX 06	–	WDX 155D○S20 ~ 180D○S25	0,5
BFTY 02206	–	TRD 07	WDX 185D○S25 ~ 225D○S25	1,0
BFTX 02506 N	–	TRD 08	WDX 230D○S25 ~ 285D○S32	1,5
BFTX 03584	–	TRD 15	WDX 290D○S32 ~ 360D○S40	3,5
BFTX 0511 N	–	TRD 20	WDX 370D○S40 ~ 450D○S40	5,0
BFTX 0615 N	–	TRD 25	WDX 460D○S40 ~ 600D○S40	7,5

Identification of Drill Body

WDX 200 D4 S25

- 200 — Drill Diameter (ø20,0 mm)
- D4 — Flute Length L/D (4 x D)
- S25 — Shank Size (ø25,0 mm)

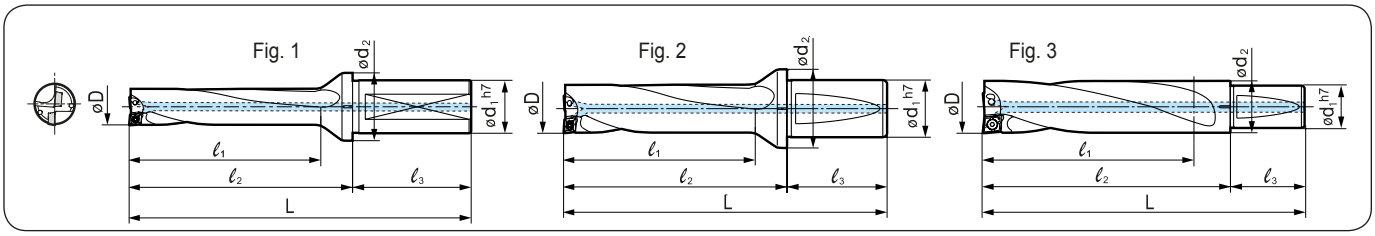
Identification of Indexable Insert

WDXT 06 30 06 -G

- 06 — Width Across Flats (6,0 mm)
- 30 — Thickness (3,0 mm)
- 06 — Corner Radius (0,6 mm)
- -G — Breaker Type

WDX Type (5D)

Max. Depth : 5 x øD

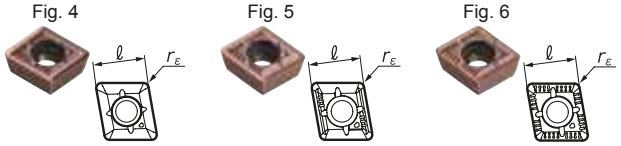


Holder

øD (mm)	Cat. No.	Stock	Dimensions (mm) L	ℓ1	ℓ2	ød1	ød2	ℓ3	Applicable Insert	Fig.
13,0	**WDX 130D5S20**	●	127,0	68,0	83,0	20	28	44	WDXT 042004	1
13,5	**WDX 135D5S20**	●	129,5	70,5	85,5					
14,0	**WDX 140D5S20**	●	132,0	73,0	88,0					
14,5	**WDX 145D5S20**	●	134,5	75,5	90,5					
15,0	**WDX 150D5S20**	●	137,0	78,0	93,0					
15,5	**WDX 155D5S20**	●	139,5	80,5	95,5	20	30	44	WDXT 052504	
16,0	**WDX 160D5S20**	●	142,0	83,0	98,0					
16,5	**WDX 165D5S20**	●	144,5	85,5	100,5					
17,0	**WDX 170D5S20**	●	147,0	88,0	103,0					
17,5	**WDX 175D5S25**	●	161,5	90,5	105,5	25	32	56		
18,0	**WDX 180D5S25**	●	164,0	93,0	108,0					
18,5	**WDX 185D5S25**	●	166,5	95,5	110,5	25	33	56	WDXT 063006	
19,0	**WDX 190D5S25**	●	169,0	98,0	113,0					
19,5	**WDX 195D5S25**	●	171,5	100,5	115,5					
20,0	**WDX 200D5S25**	●	174,0	103,0	118,0					
20,5	**WDX 205D5S25**	●	176,5	105,5	120,5					
21,0	**WDX 210D5S25**	●	179,0	108,0	123,0					
21,5	**WDX 215D5S25**	●	181,5	110,5	125,5					
22,0	**WDX 220D5S25**	●	184,0	113,0	128,0					
22,5	**WDX 225D5S25**	●	186,5	115,5	130,5					
23,0	**WDX 230D5S25**	●	192,0	118,0	136,0	25	37	56	WDXT 073506	
23,5	**WDX 235D5S25**	●	194,5	120,5	138,5					
24,0	**WDX 240D5S25**	●	197,0	123,0	141,0					
24,5	**WDX 245D5S25**	●	199,5	125,5	143,5					
25,0	**WDX 250D5S25**	●	202,0	128,0	146,0					
26,0	**WDX 260D5S32**	●	213,0	133,0	153,0	32	41	60		2
27,0	**WDX 270D5S32**	●	218,0	138,0	158,0					
28,0	**WDX 280D5S32**	●	223,0	143,0	163,0					
29,0	**WDX 290D5S32**	●	230,0	149,0	170,0	32	50	60		
30,0	**WDX 300D5S40**	●	248,0	154,0	178,0	40	54	70	WDXT 094008	
31,0	**WDX 310D5S40**	●	253,0	159,0	183,0					
32,0	**WDX 320D5S40**	●	258,0	164,0	188,0					
33,0	**WDX 330D5S40**	●	263,0	169,0	193,0					
34,0	**WDX 340D5S40**	●	268,0	174,0	198,0					
35,0	**WDX 350D5S40**	●	273,0	179,0	203,0					
36,0	**WDX 360D5S40**	●	278,0	184,0	208,0					

Inserts

(mm)



L Type
Excellent chip control at low feed rates

G Type
General purpose chipbreaker

H Type
Strong cutting edge at higher feed rates

Cat. No.	Coated ACP100	ACP300	ACK300	DL1500	Fig.	Dimensions (mm) ℓ	Thickness	rε	Applicable Holder
WDXT 042004-L	●	●	●		4	4,2	2,0	0,4	WDX 130 ~ 150
WDXT 042004-G	●	●	●	●	5				
WDXT 042004-H	●	●	●		6				
WDXT 052504-L	●	●	●		4	5,0	2,5	0,4	WDX 155 ~ 180
WDXT 052504-G	●	●	●	●	5				
WDXT 052504-H	●	●	●		6				
WDXT 063006-L	●	●	●		4	6,0	3,0	0,6	WDX 185 ~ 225
WDXT 063006-G	●	●	●	●	5				
WDXT 063006-H	●	●	●		6				
WDXT 073506-L	●	●	●		4	7,5	3,5	0,6	WDX 230 ~ 285
WDXT 073506-G	●	●	●	●	5				
WDXT 073506-H	●	●	●		6				
WDXT 094008-L	●	●	●		4	9,6	4,0	0,8	WDX 290 ~ 360
WDXT 094008-G	●	●	●	●	5				
WDXT 094008-H	●	●	●		6				
WDXT 125012-L	●	●	●		4	12,4	5,0	1,2	WDX 370 ~ 450
WDXT 125012-G	●	●	●	●	5				
WDXT 125012-H	●	●	●		6				
WDXT 156012-L	●	●	●		4	15,2	6,0	1,2	WDX 460 ~ 550
WDXT 156012-G	●	●	●	●	5				
WDXT 156012-H	●	●	●		6				

Spare Parts

Screw	Wrench	Wrench	Applicable Holders	N·m
BFTX 01604 N	TRX 06	–	WDX 130D○S20 ~ 150D○S20	0,3
BFTX 0204 N	TRX 06	–	WDX 155D○S20 ~ 180D○S25	0,5
BFTY 02206	–	TRD 07	WDX 185D○S25 ~ 225D○S25	1,0
BFTX 02506 N	–	TRD 08	WDX 230D○S25 ~ 285D○S32	1,5
BFTX 03584	–	TRD 15	WDX 290D○S32 ~ 360D○S40	3,5
BFTX 0511 N	–	TRD 20	WDX 370D○S40 ~ 450D○S40	5,0
BFTX 0615 N	–	TRD 25	WDX 460D○S40 ~ 550D○S40	7,5

Identification of Drill Body

WDX 200 D5 S25

- WDX 200: Drill Diameter (ø20,0 mm)
- D5: Flute Length L/D (5 x D)
- S25: Shank Size (ø25,0 mm)

Identification of Indexable Insert

WDXT 06 30 06 -G

- 06: Width Across Flats (6,0 mm)
- 30: Thickness (3,0 mm)
- 06: Corner Radius (0,6 mm)
- -G: Breaker Type

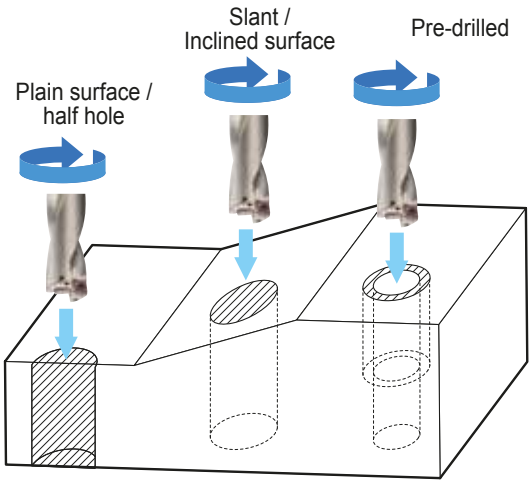
● = Euro stock
○ = Japan stock

N·m Recommended Tightening Torque (N·m)

Indexable Insert Type "SumiDrill"
WDX Type

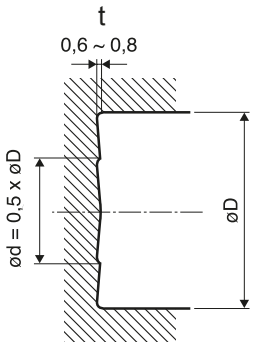
Multi-Purpose Functionality

Applications for machining centre



Recommended conditions - reduce feed rate to 70%

Hole profile

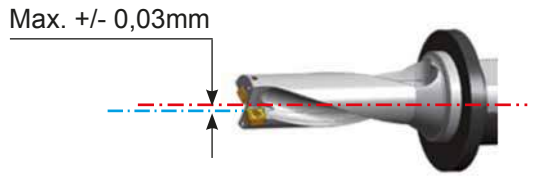


Drill Diameter	t (mm)
13,0 - 18,0	0,4
18,5 - 28,5	0,6
29,0 - 36,0	0,8
37,0 - 55,0	1,2

Applications for Lathes

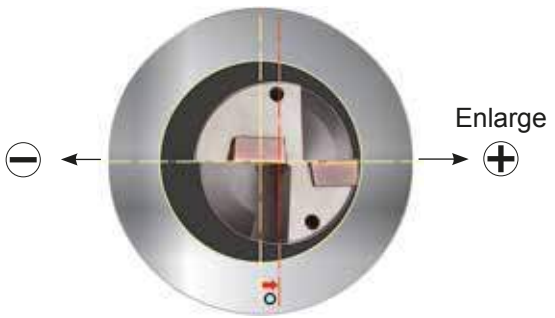
Setting Instruction

Ensure the face of the drill flange is hard against the face of the tool holder.
Align the centreline of the drill to the centreline of the lathes Y axis



Drilling Over Holes

Offset the lathes X axis within the maximum amount stated in the table



Drill description	Max. Offset (mm)	Drill description	Max. Offset (mm)
WDX130...	0,35	WDX280...	0,15
WDX135...	0,30	WDX285...	0,10
WDX140...	0,25	WDX290...	1,00
WDX145...	0,20	WDX295...	0,95
WDX150...	0,15	WDX300...	0,90
WDX155...	0,40	WDX310...	0,80
WDX160...	0,40	WDX320...	0,70
WDX165...	0,35	WDX330...	0,55
WDX170...	0,30	WDX340...	0,45
WDX175...	0,25	WDX350...	0,35
WDX180...	0,20	WDX360...	0,20
WDX185...	0,50	WDX370...	1,00
WDX190...	0,45	WDX380...	1,00
WDX195...	0,40	WDX390...	0,90
WDX200...	0,30	WDX400...	0,80
WDX205...	0,30	WDX410...	0,70
WDX210...	0,20	WDX420...	0,60
WDX215...	0,15	WDX430...	0,50
WDX220...	0,10	WDX440...	0,50
WDX225...	0,06	WDX450...	0,40
WDX230...	0,70	WDX460...	1,50
WDX235...	0,70	WDX470...	1,40
WDX240...	0,60	WDX480...	1,30
WDX245...	0,50	WDX490...	1,20
WDX250...	0,50	WDX500...	1,10
WDX255...	0,45	WDX510...	1,00
WDX260...	0,40	WDX520...	0,90
WDX265...	0,35	WDX530...	0,80
WDX270...	0,25	WDX540...	0,60
WDX275...	0,20	WDX550...	0,50

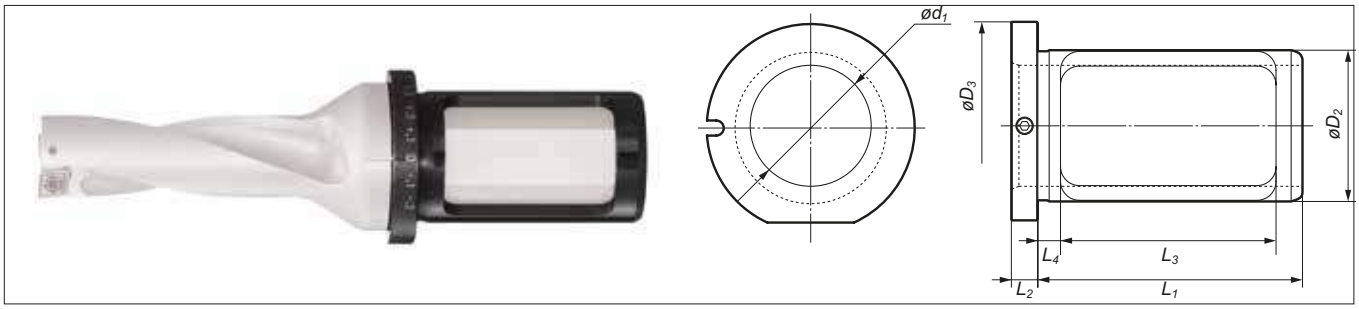
Recommended conditions - reduce feed rate to 30%

Turning by lathes

Recommended conditions - reduce feed rate to 50%

Eccentric Sleeve WAS Type

The Eccentric Sleeve WAS Type, exclusively designed for "SumiDrill" WDX Type, provides up to ±0,3mm of hole size adjustment.

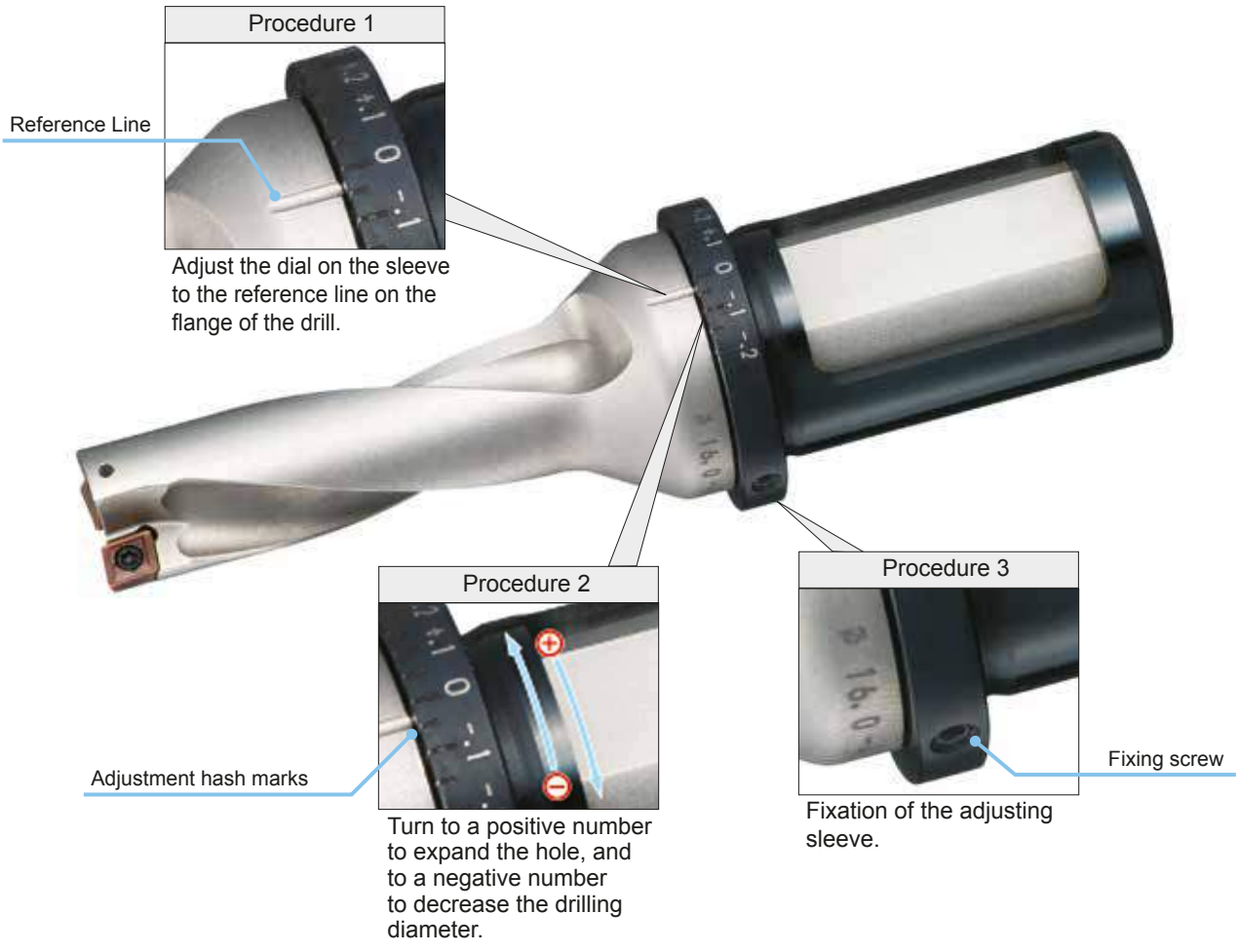


■ Dimensions

(mm)

Cat. No.	Stock	Ød1	ØD2	ØD3	L1	L2	L3	L4	Diameter Adjustment Range (max.)
WAS 2025-48	●	20	25	33	43	5	32	5	+0,3 ~ -0,2
WAS 2532-60	●	25	32	42	60	7	46	6	+0,3 ~ -0,3
WAS 3240-70	●	32	40	55	70	7	57	6	+0,3 ~ -0,3
WAS 4050-85	●	40	50	60	80	7	64	6	+0,3 ~ -0,3

■ Diameter Adjustment



Note 1: The dial is for reference purposes. Always measure the actual drilling diameter and adjust accordingly.
Note 2: Not usable with collet chuck type holders. Only use with a side-locking holder like Weldon.

● = Euro stock

■ Application Examples

"SumiDrill" WDX type — Normal wear / Good chip control

Competitor — Breakage / Long chips

Automotive Component (SUS304)
Drill Body: WDX220D2S25
Drill Insert: WDXT063006-L(ACP300)
Conditions: v_c=125m/min, f=0,07mm/rev, H=5mm, through, Wet

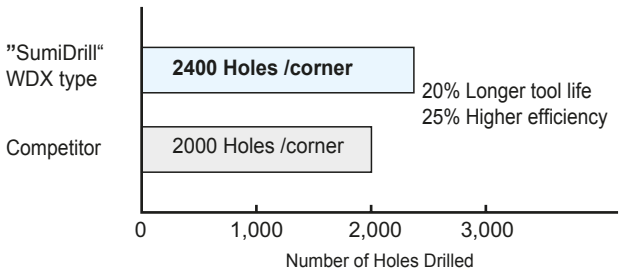
Insert breakage was eliminated with improved chip control and better surface finish.

"SumiDrill" WDX type — Good chip form

Competitor — Entangled chips

Structural Steel
Drill Body: WDX190D4S25
Drill Insert: WDXT063006-L(ACP300)
Conditions: v_c=100m/min, f=0,06mm/rev, H=40mm, through, Wet

Eliminated the problem of entangled chips.



Machine Component (SCM440)
Drill Body: WDX220D3S25
Drill Insert: WDXT063006-G(ACP300)
Conditions (Sumitomo): v_c=157m/min, f=0,19mm/rev, H=19mm, through, Wet
Conditions (Comp.): v_c=157m/min, f=0,15mm/rev, H=19mm, through, Wet

Good chip control even under high efficiency conditions.
Better stability through lower cutting force, resulting in 25% higher efficiency and 20% higher tool life.

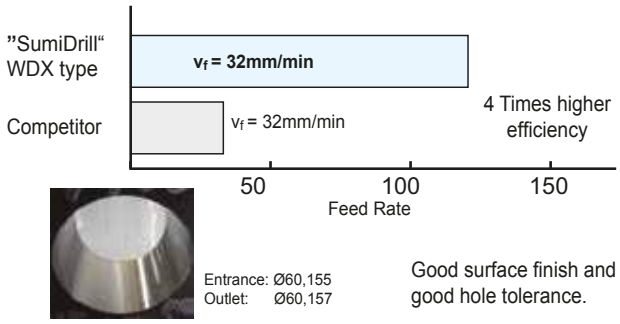
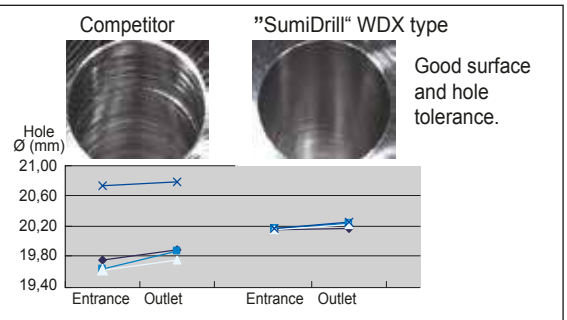


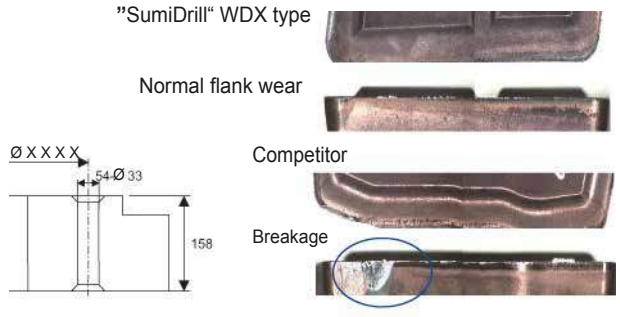
Plate (S48C)
Drill Body: WDX600D3S40
Drill Insert: WDXT186012-G(ACP300)
Conditions (Sumitomo): v_c=150m/min, f=0,16mm/rev, H=60mm, through, Wet
Conditions (Comp.): v_c=30m/min, f=0,20mm/rev, H=60mm, through, Wet

Stable drilling performance.
4 times higher efficiency.



Automotive Component (SCM415)
Drill Body: WDX200D5S25
Drill Insert: WDXT063006-G(ACP300)
Conditions: v_c=185m/min, f=0,12mm/rev, H=87mm, through, Wet

Good surface roughness.
Stable hole diameter.



Bearing Component for Windmill (42CrMo)
Drill Body: WDX330D5S40
Drill Insert: WDXT094008-L(ACP300)
Conditions: v_c=146m/min, f=0,10mm/rev, H=158mm, through, Wet

WDX shows stable drilling performance, no cutting edge breakage.

Recommended Cutting Conditions (2D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade	Cutting Speed Vc (m/min)	Feed rate (mm/rev) ø13,0 ~ ø18,0	ø18,5 ~ ø29,0	ø29,5 ~ ø36,0	ø37,0 ~ ø55,0	ø56,0 ~ ø65,0
P	Carbon steel	125	L ACP300	150 - **220** - 250	0,04 - **0,08** - 0,12	0,04 - **0,08** - 0,12	0,04 - **0,08** - 0,13	0,05 - **0,10** - 0,15	0,06 - **0,11** - 0,17
		190	G ACP300	150 - **220** - 250	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
		250	G ACP300	125 - **170** - 230	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
		270	G ACP300	125 - **170** - 230	0,08 - **0,13** - 0,22	0,08 - **0,14** - 0,24	0,08 - **0,14** - 0,23	0,09 - **0,16** - 0,26	0,10 - **0,17** - 0,29
		300	G ACP300	100 - **130** - 170	0,06 - **0,11** - 0,17	0,06 - **0,12** - 0,18	0,06 - **0,12** - 0,18	0,07 - **0,13** - 0,20	0,08 - **0,14** - 0,22
	Low alloyed steel	180	L ACP300	150 - **180** - 220	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
		275	G ACP300	125 - **150** - 200	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
		300	G ACP300	100 - **140** - 170	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
		350	G ACP300	80 - **120** - 150	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
	High alloyed steel	200	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
		325	G ACP300	80 - **120** - 160	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
M	Stainless steel, martensitic / ferritic	200	L/G ACP300	100 - **150** - 200	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
	Stainless steel, martensitic / tempered	240	L/G ACP300	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	0,08 - **0,14** - 0,24
	Stainless steel, austenitic / quenched	180	L/G ACP300	100 - **150** - 200	0,04 - **0,08** - 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
	Stainless steel, austenitic / ferritic (Duplex)	230	L/G ACP300	80 - **120** - 150	0,04 - **0,08** - 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
K	Cast iron (GG)	180	H 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
		260	H 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
	Nodular cast iron (GGG)	160	H ACK300	90 - **120** - 250	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
		250	H 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	0,13 - **0,29** - 0,48
S	Heat resistant alloy	200	L/G 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
N	Aluminium 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

Recommended Cutting Conditions (3D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade	Cutting Speed Vc (m/min)	Feed rate (mm/rev) ø13,0 ~ ø18,0	ø18,5 ~ ø29,0	ø29,5 ~ ø36,0	ø37,0 ~ ø55,0	ø56,0 ~ ø65,0
P	Carbon steel	125	L ACP300	150 - **220** - 250	0,04 - **0,07** - 0,1	0,04 - **0,07** - 0,10	0,04 - **0,08** - 0,11	0,05 - **0,09** - 0,12	0,06 - **0,10** - 0,13
		190	G ACP300	150 - **220** - 250	0,08 - **0,12** - 0,2	0,08 - **0,12** - 0,20	0,08 - **0,13** - 0,22	0,09 - **0,14** - 0,24	0,10 - **0,16** - 0,27
		250	G ACP300	125 - **170** - 230	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
		270	G ACP300	125 - **170** - 230	0,08 - **0,12** - 0,18	0,08 - **0,12** - 0,18	0,08 - **0,13** - 0,19	0,09 - **0,14** - 0,22	0,10 - **0,16** - 0,24
		300	G ACP300	100 - **130** - 170	0,06 - **0,10** - 0,14	0,06 - **0,10** - 0,14	0,06 - **0,11** - 0,15	0,07 - **0,12** - 0,17	0,08 - **0,13** - 0,19
	Low alloyed steel	180	L ACP300	150 - **180** - 220	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
		275	G ACP300	125 - **150** - 200	0,06 - **0,10** - 0,14	0,06 - **0,10** - 0,14	0,06 - **0,11** - 0,15	0,07 - **0,12** - 0,17	0,08 - **0,13** - 0,19
		300	G ACP300	100 - **140** - 170	0,06 - **0,10** - 0,14	0,06 - **0,10** - 0,14	0,06 - **0,11** - 0,15	0,07 - **0,12** - 0,17	0,08 - **0,13** - 0,19
		350	G ACP300	80 - **120** - 150	0,06 - **0,10** - 0,14	0,06 - **0,10** - 0,14	0,06 - **0,11** - 0,15	0,07 - **0,12** - 0,17	0,08 - **0,13** - 0,19
	High alloyed steel	200	G ACP300	100 - **150** - 200	0,08 - **0,12** - 0,2	0,08 - **0,12** - 0,20	0,08 - **0,13** - 0,22	0,09 - **0,14** - 0,24	0,10 - **0,16** - 0,27
		325	G ACP300	80 - **120** - 160	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
M	Stainless steel, martensitic / ferritic	200	L/G ACP300	100 - **150** - 200	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
	Stainless steel, martensitic / tempered	240	L/G ACP300	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	0,08 - **0,13** - 0,20
	Stainless steel, austenitic / quenched	180	L/G ACP300	100 - **150** - 200	0,04 - **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
	Stainless steel, austenitic / ferritic (Duplex)	230	L/G ACP300	80 - **120** - 150	0,04 - **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
K	Cast iron (GG)	180	H 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
		260	H 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
	Nodular cast iron (GGG)	160	H ACK300	90 - **120** - 250	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
		250	H 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	Heat resistant alloy	200	L/G 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	Aluminium 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

Indexable Insert Type "SumiDrill"
WDX Type

Recommended Cutting Conditions (4D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade		Cutting Speed Vc (m/min)	Feed rate (mm/rev) ø13,0 ~ ø18,0	ø18,5 ~ ø29,0	ø29,5 ~ ø36,0	ø37,0 ~ ø55,0	ø56,0 ~ ø65,0
P	Carbon steel	125	L	ACP300	150 - **220** - 250	0,04 - **0,07** - 0,09	0,04 - **0,07** - 0,09	0,04 - **0,07** - 0,09	0,05 - **0,08** - 0,10	0,05 - **0,08** - 0,10
		190	G	ACP300	150 - **220** - 250	0,08 - **0,11** - 0,17	0,08 - **0,11** - 0,17	0,08 - **0,12** - 0,18	0,09 - **0,14** - 0,21	0,09 - **0,14** - 0,21
		250	G	ACP300	125 - **170** - 230	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,14	0,07 - **0,11** - 0,15	0,07 - **0,11** - 0,15
		270	G	ACP300	125 - **170** - 230	0,08 - **0,11** - 0,15	0,08 - **0,11** - 0,15	0,08 - **0,12** - 0,17	0,09 - **0,14** - 0,19	0,09 - **0,14** - 0,19
		300	G	ACP300	100 - **130** - 170	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,13	0,07 - **0,11** - 0,14	0,07 - **0,11** - 0,14
	Low alloyed steel	180	L	ACP300	150 - **180** - 220	0,05 - **0,07** - 0,10	0,05 - **0,07** - 0,10	0,05 - **0,07** - 0,11	0,06 - **0,08** - 0,12	0,06 - **0,08** - 0,12
		275	G	ACP300	125 - **150** - 200	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,13	0,07 - **0,11** - 0,14	0,07 - **0,11** - 0,14
		300	G	ACP300	100 - **140** - 170	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,13	0,07 - **0,11** - 0,14	0,07 - **0,11** - 0,14
		350	G	ACP300	80 - **120** - 150	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,12	0,06 - **0,10** - 0,13	0,07 - **0,11** - 0,14	0,07 - **0,11** - 0,14
	High alloyed steel	200	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	0,09 - **0,14** - 0,21
		325	G	ACP300	80 - **120** - 160	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,14	0,07 - **0,11** - 0,15	0,07 - **0,11** - 0,15
M	Stainless steel, martensitic / ferritic	200	L/G	ACP300	100 - **150** - 200	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,14	0,07 - **0,11** - 0,15	0,07 - **0,11** - 0,15
	Stainless steel, martensitic / tempered	240	L/G	ACP300	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	0,07 - **0,11** - 0,15
	Stainless steel, austenitic / quenched	180	L/G	ACP300	100 - **150** - 200	0,04 - **0,10** - 0,13	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,14	0,07 - **0,11** - 0,15	0,07 - **0,11** - 0,15
	Stainless steel, austenitic / ferritic (Duplex)	230	L/G	ACP300	80 - **120** - 150	0,04 - **0,10** - 0,13	0,06 - **0,10** - 0,13	0,06 - **0,10** - 0,14	0,07 - **0,11** - 0,15	0,07 - **0,11** - 0,15
K	Cast iron (GG)	180	H	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	0,12 - **0,23** - 0,31
		260	H	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	0,12 - **0,23** - 0,31
	Nodular cast iron (GGG)	160	H	ACK300	90 - **120** - 250	0,09 - **0,17** - 0,23	0,10 - **0,19** - 0,26	0,11 - **0,21** - 0,28	0,12 - **0,23** - 0,31	0,12 - **0,23** - 0,31
		250	H	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	0,12 - **0,23** - 0,31
S	Heat resistant alloy	200	L/G	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	0,07 - **0,11** - 0,15
N	Aluminium 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
	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

Recommended Cutting Conditions (5D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade		Cutting Speed Vc (m/min)	Feed rate (mm/rev) ø13,0 ~ ø18,0	ø18,5 ~ ø29,0	ø29,5 ~ ø36,0	ø37,0 ~ ø55,0	ø56,0 ~ ø65,0
P	Carbon steel	125	L	ACP300	150 - **220** - 250	0,04 - **0,06** - 0,09	0,04 - **0,06** - 0,08	0,04 - **0,06** - 0,08	0,05 - **0,07** - 0,09	
		190	G	ACP300	150 - **220** - 250	0,07 - **0,10** - 0,15	0,07 - **0,10** - 0,15	0,08 - **0,11** - 0,17	0,09 - **0,12** - 0,19	
		250	G	ACP300	125 - **170** - 230	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,14	
		270	G	ACP300	125 - **170** - 230	0,07 - **0,10** - 0,14	0,07 - **0,10** - 0,14	0,08 - **0,11** - 0,15	0,09 - **0,12** - 0,17	
		300	G	ACP300	100 - **130** - 170	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,13	
	Low alloyed steel	180	L	ACP300	150 - **180** - 220	0,05 - **0,06** - 0,09	0,05 - **0,06** - 0,09	0,05 - **0,06** - 0,10	0,05 - **0,07** - 0,11	
		275	G	ACP300	125 - **150** - 200	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,13	
		300	G	ACP300	100 - **140** - 170	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,13	
		350	G	ACP300	80 - **120** - 150	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,13	
	High alloyed steel	200	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	
		325	G	ACP300	80 - **120** - 160	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,14	
M	Stainless steel, martensitic / ferritic	200	L/G	ACP300	100 - **150** - 200	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,14	
	Stainless steel, martensitic / tempered	240	L/G	ACP300	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	
	Stainless steel, austenitic / quenched	180	L/G	ACP300	100 - **150** - 200	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,06 - **0,10** - 0,14	
	Stainless steel, austenitic / ferritic (Duplex)	230	L/G	ACP300	80 - **120** - 150	0,05 - **0,09** - 0,11	0,05 - **0,09** - 0,11	0,06 - **0,09** - 0,12	0,07 - **0,12** - 0,18	
K	Cast iron (GG)	180	H	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	
		260	H	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	
	Nodular cast iron (GGG)	160	H	ACK300	90 - **120** - 250	0,08 - **0,15** - 0,21	0,09 - **0,17** - 0,23	0,09 - **0,18** - 0,25	0,11 - **0,20** - 0,28	
		250	H	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	Heat resistant alloy	200	L/G	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	Aluminium 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	

PDL Type / PCT Type

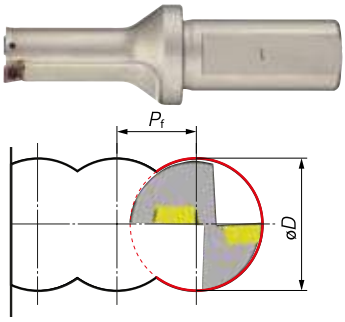
Description

The tool cuts in the Z axis direction where tool rigidity is highest, allowing high efficiency roughing for aeronautic components and dies with long tool overhang must be used to machine deep holes and pockets.

Characteristics

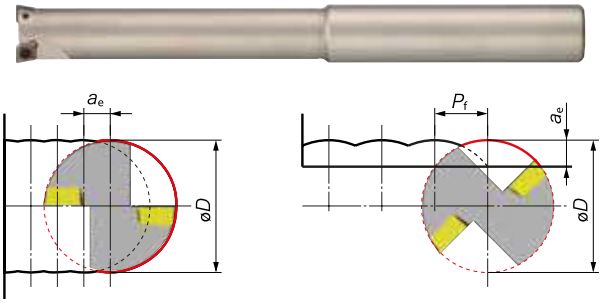
- The flat cutting edge design produces near-flat bottom profiles to reduce depth of cut variation during finishing.
- All sizes come with an air hole for supplying coolant internally to improve chip evacuation.
- Durable body with special surface treatment offers improved tool life and reliability.
- The tools use SumiDrill WDX type inserts for handling a wide range of work materials, from steel to non-ferrous metals and exotic alloys.

- The PDL type has a central insert making it possible to make radial cuts beyond the tool's radius, pitch feed cutting, and drilling. (Pocket milling, etc.)



Keep the value of P_f for PDL type tools to less than 70% of the tool diameter (øD).

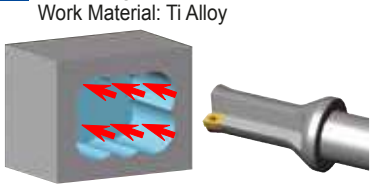
- Although the PCT type has limited radial cutting ability, the tool has many effective teeth enabling it to perform high feed cutting. (Medium finishing of corners, hole expansion, deep grooving, etc.)



Keep the value of P_f for PCT type tools to less than 50% of the tool diameter (ø*D*).
For a_e (w_{oc}), refer to the dimension under "a_e max" in the stock / dimensions tables titled "Holders Max, Depth: 3D/5D".

Application examples

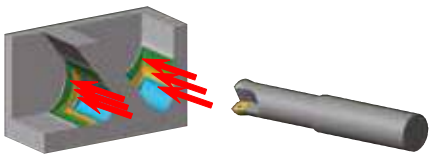
PDL Pocketing
Work Material: Ti Alloy



Tool: PDL400D2S40 (ø40)
Insert: WDXT125012-G
Grade: ACK300

Cutting Conditions:
v_c = 40 m/min
f = 0,07 mm/rev
(v_f = 22,3 mm/min)
P_f = 25 mm

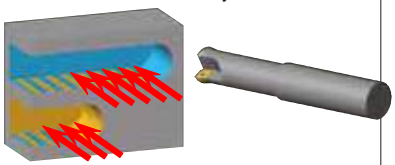
PCT Corner Finishing
Work Material: Ti Alloy



Tool: PCT320D3S32 (ø32), PCT250D3S25 (ø25), PCT200D3S20 (ø20)
Insert: WDXT094008-G, WDXT073506-G, WDXT063006-G
Grade: ACK300

Cutting Conditions:
v_c = 50 m/min
f_t = 0,08 mm/tooth
(v_f = 80~127 mm/min)
a_e (w_{oc}) = 3,2 ~ 6,5 mm

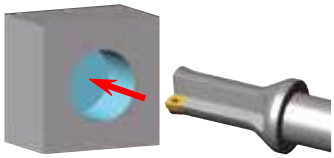
PCT Grooving
Work Material: Ti Alloy



Tool: PCT320D5S32 (ø32)
Insert: WDXT094008-G
Grade: ACK300

Cutting Conditions:
v_c = 40 m/min
f_t = 0,07 mm/tooth
(v_f = 56 mm/min)
a_e (P_f) = 5,0 mm

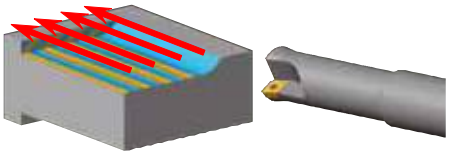
PDL Drilling
Work Material: X4 CrNiMo 17 12 2



Tool: PDL200D3S25 (ø20)
Insert: WDXT063006-G
Grade: ACP300

Cutting Conditions:
v_c = 180 m/min
f = 0,10 mm/rev
(v_f = 286 mm/min)
øD = 20 mm

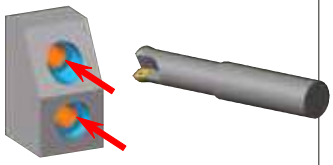
PCT Aeronautic Components
Work Material: X5 CrNi 18 10



Tool: PCT320D3S32 (ø32)
Insert: WDXT094008-G
Grade: ACP300

Cutting Conditions:
v_c = 180 m/min
f_t = 0,15 mm/tooth
(v_f = 537 mm/min)
a_e (w_{oc}) = 7,0 mm, P_f = 5,0 mm

PCT Machine Components
Work Material: 34 Cr Ni 4



Tool: PCT200D5S20 (ø20)
Insert: WDXT063006-G
Grade: ACK300

Cutting Conditions:
v_c = 150 m/min
f_t = 0,15 mm/tooth
(v_f = 716 mm/min)
a_e (w_{oc}) = 3,5 mm

● = Euro stock

Recommended Tightening Torque (N·m)

Indexable Plunge Drill
PDL Type (2D, 3D)

2D	3D	Carbon Steel, Alloy Steel C≤0,28%	Carbon Steel, Alloy Steel C>0,28%	Tempered Steel	Hardened Steel HRC≤45	Hardened Steel HRC>45	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast iron	Ductile Cast Iron	Al Alloy	Cu Alloy	Composite CFRP *
W														

Fig 1

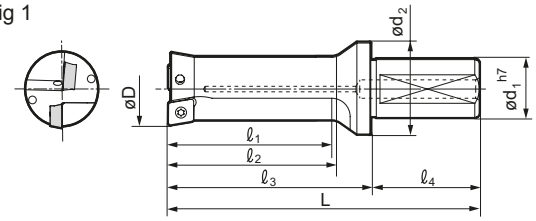
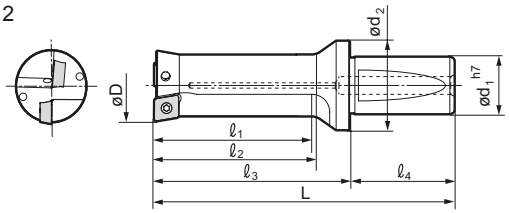


Fig 2



Holder (Max D_{oc} : 2 D)

Cat. No.	Stock	Dimensions (mm) øD	L	ℓ1	ℓ2	ℓ3	ℓ4	ød1	ød2	Applicable Insert	Fig.
PDL 160D2S20	●	**16,0**	94	32	35	50	44	**20**	20	WDXT052504	
200D2S25	●	**20,0**	114	40	43	58	56	**25**	25	WDXT063006	1
250D2S25	●	**25,0**	127	50	53	71	56	**25**	25	WDXT073506	
PDL 320D2S40	●	**32,0**	162	64	68	92	70	**40**	40	WDXT094008	2
400D2S40	●	**40,0**	185	80	85	115	70	**40**	40	WDXT125012	

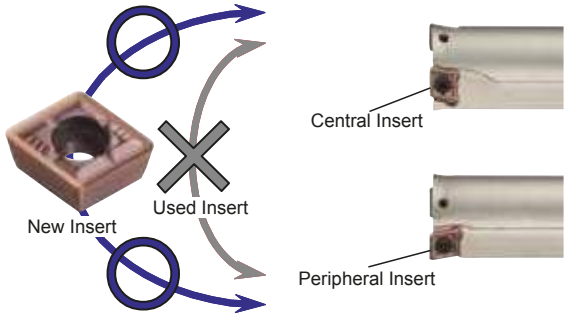
Holder (Max D_{oc} : 3 D)

Cat. No.	Stock	Dimensions (mm) øD	L	ℓ1	ℓ2	ℓ3	ℓ4	ød1	ød2	Applicable Insert	Fig.
PDL 160D3S20	●	**16,0**	110	48	51	66	44	**20**	20	WDXT052504	
200D3S25	●	**20,0**	134	60	63	78	56	**25**	25	WDXT063006	1
250D3S25	●	**25,0**	152	75	78	96	56	**25**	25	WDXT073506	
PDL 320D3S40	●	**32,0**	194	96	100	124	70	**40**	40	WDXT094008	2
400D3S40	●	**40,0**	225	120	125	155	70	**40**	40	WDXT125012	

Spare Parts

Screw	Wrench	Wrench	N·m	Applicable Holders
BFTX0204N	TRX06	–	**0,5**	PDL 160 D2 S20 160 D3 S20 PCT 160 D3 S16 160 D5 S16
BFTY02206	–	TRD07	**1,0**	PDL 200 D2 S25 200 D3 S25 PCT 200 D3 S20 200 D5 S20
BFTX02506N	–	TRD08	**1,5**	PDL 250 D2 S25 250 D3 S25 PCT 250 D3 S25 250 D5 S25
BFTX03584	–	TRD15	**3,5**	PDL 320 D2 S40 320 D3 S40 PCT 320 D3 S32 320 D5 S32
BFTX0511N	–	TRD20	**5,0**	PDL 400 D2 S40 400 D3 S40 PCT 400 D3 S42 400 D5 S42

Notes About Mounting Inserts



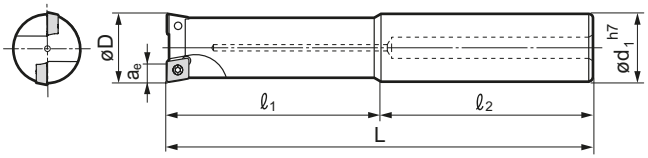
PDL type: Inserts can be used on either the centre or the outside.
Inserts used on the outside cannot be used in the centre,. Similarly, inserts used in the centre cannot be used on the outside.
PCT type: 2 corners can be used only for the outer inserts.

Indexable Plunge Mill
PCT Type (3D, 5D)

3D	5D	Carbon Steel, Alloy Steel C≤0,28%	Carbon Steel, Alloy Steel C>0,28%	Tempered Steel	Hardened Steel HRC≤45	Hardened Steel HRC>45	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast iron	Ductile Cast Iron	Al Alloy	Cu Alloy	Composite CFRP *
◎	◎			○		○	◎		◎	◎	◎	○		

* CFRP (Carbon Fibre Reinforced Plastic)

Fig 3



Holder (Max D_{oc} : 3 D)

Cat. No.	Stock	Dimensions (mm) øD	ae max	L	ℓ1	ℓ2	ød1	No. of teeth	Applicable Insert	Fig.
PCT 160D3S16	●	**16,0**	*4,0*	123	53	70	**16**	**2**	WDXT052504	
200D3S20	●	**20,0**	*5,0*	145	65	80	**20**	**2**	WDXT063006	
250D3S25	●	**25,0**	*6,5*	160	80	80	**25**	**2**	WDXT073506	3
320D3S32	●	**32,0**	*8,5*	191	101	90	**32**	**2**	WDXT094008	
400D3S42	●	**40,0**	*11,0*	225	125	100	**42**	**3**	WDXT125012	

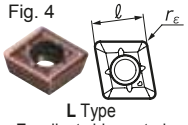
Holder (Max D_{oc} : 5 D)

Cat. No.	Stock	Dimensions (mm) øD	ae max	L	ℓ1	ℓ2	ød1	No. of teeth	Applicable Insert	Fig.
PCT 160D5S16	●	**16,0**	*4,0*	155	85	70	**16**	**2**	WDXT052504	
200D5S20	●	**20,0**	*5,0*	185	105	80	**20**	**2**	WDXT063006	
250D5S25	●	**25,0**	*6,5*	210	130	80	**25**	**2**	WDXT073506	3
320D5S32	●	**32,0**	*8,5*	255	165	90	**32**	**2**	WDXT094008	
400D5S42	●	**40,0**	*11,0*	305	205	100	**42**	**3**	WDXT125012	

Inserts

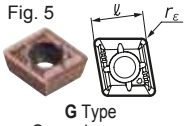
(mm)

Fig. 4



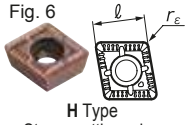
L Type
Excellent chip control at low feed rates

Fig. 5



G Type
General purpose chipbreaker

Fig. 6



H Type
Strong cutting edge at higher feed rates

Application	Grade	Coated			
					DL1500
	High Speed / Light Cutting				N
	General Purpose		M		
	Roughing		PM	K	

Cat. No.	ACP100	ACP300	ACK300	DL1500	Fig.	Dimensions (mm) ℓ	Thickness	rε	Applicable Holder
WDXT 052504-L	●	●	●		4				PDL160D2S20 PDL160D3S20 PCT160D3S16 PCT160D5S16
052504-G	●	●	●	●	5	5,0	2,5	0,4	
052504-H	●	●	●		6				
WDXT 063006-L	●	●	●		4				PDL200D2S25 PDL200D3S25 PCT200D3S20 PCT200D5S20
063006-G	●	●	●	●	5	6,0	3,0	0,6	
063006-H	●	●	●		6				
WDXT 073506-L	●	●	●		4				PDL250D2S25 PDL250D3S25 PCT250D3S25 PCT250D5S25
073506-G	●	●	●	●	5	7,5	3,5	0,6	
073506-H	●	●	●		6				
WDXT 094008-L	●	●	●		4				PDL320D2S40 PDL320D3S40 PCT320D3S32 PCT320D5S32
094008-G	●	●	●	●	5	9,6	4,0	0,8	
094008-H	●	●	●		6				
WDXT 125012-L	●	●	●		4				PDL400D2S40 PDL400D3S40 PCT400D3S42 PCT400D5S42
125012-G	●	●	●	●	5	12,4	5,0	1,2	
125012-H	●	●	●		6				

PCT, PDL Type Identification

PCT 250 D3 S25

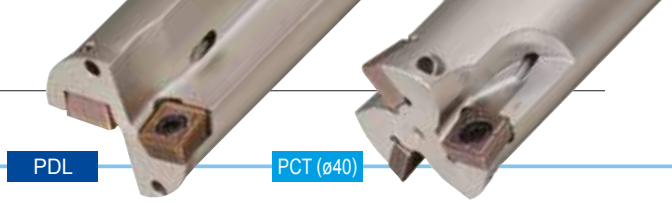
- 250: Tool Diameter (ø25,0)
- D3: Max Depth L/D (3D)
- S25: Shank Size (ø25,0)

PCT, PDL Type Insert Identification

WDXT 07 35 06 -G

- 07: Width Across Flats (7,5)
- 35: Thickness x 10 (3,5)
- 06: Corner Radius x 10 (R0,6)
- -G: Breaker Type

Recommended Cutting Conditions
PDL Type / PCT Type



Recommended Cutting Conditions (2D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade		Cutting Speed Vc (m/min)	PDL Type: f (mm/rev) ø16,0	ø20,0 ~ ø25,0	ø32,0	ø40,0
P	Carbon steel	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
		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
		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
		250	G	ACP300	80-**120**-160	0,06-**0,11**-0,18	0,06-**0,11**-0,18	0,06-**0,12**-0,19	0,07-**0,13**-0,22
		270	G	ACP300	100-**130**-160	0,08-**0,13**-0,22	0,08-**0,13**-0,22	0,08-**0,14**-0,23	0,09-**0,16**-0,26
		300	G	ACP300	70-**100**-140	0,06-**0,11**-0,17	0,06-**0,11**-0,17	0,06-**0,12**-0,18	0,07-**0,13**-0,20
	Low alloyed 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
		275	G	ACP300	80-**120**-160	0,06-**0,11**-0,17	0,06-**0,11**-0,17	0,06-**0,12**-0,18	0,07-**0,13**-0,20
		300	G	ACP300	75-**110**-140	0,06-**0,11**-0,17	0,06-**0,11**-0,17	0,06-**0,12**-0,18	0,07-**0,13**-0,20
		350	G	ACP300	60-**85**-110	0,06-**0,11**-0,17	0,06-**0,11**-0,17	0,06-**0,12**-0,18	0,07-**0,13**-0,20
	High alloyed steel	200	G	ACP300	100-**130**-160	0,08-**0,13**-0,24	0,08-**0,13**-0,24	0,08-**0,14**-0,26	0,09-**0,16**-0,29
		325	G	ACP300	80-**100**-120	0,06-**0,11**-0,18	0,06-**0,11**-0,18	0,06-**0,12**-0,19	0,07-**0,13**-0,22
M	Stainless steel, martensitic / ferritic	200	G	ACP300	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
	Stainless steel, martensitic / tempered	240	G	ACP300	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
	Stainless steel, austenitic / quenched	180	G	ACP300	100-**140**-180	0,06-**0,08**-0,18	0,06-**0,11**-0,18	0,06-**0,12**-0,19	0,07-**0,13**-0,22
	Stainless steel, austenitic / ferritic (Duplex)	230	G	ACP300	80-**120**-150	0,04-**0,08**-0,18	0,06-**0,11**-0,18	0,06-**0,12**-0,19	0,07-**0,13**-0,22
K	Cast iron (GG)	180	H	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
	Nodular cast iron (GGG)	260	H	ACP300	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	Heat resistant alloy	200	G	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	Aluminium 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

Recommended Cutting Conditions (3D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade		Cutting Speed Vc (m/min)	PDL Type: f (mm/rev) / PCT Type: f_t (mm/tooth) ø16,0	ø20,0 ~ ø25,0	ø32,0	ø40,0
P	Carbon steel	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
		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
		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
		250	G	ACP300	80-**120**-160	0,06-**0,10**-0,15	0,06-**0,10**-0,15	0,06-**0,11**-0,16	0,07-**0,12**-0,18
		270	G	ACP300	100-**130**-160	0,08-**0,12**-0,18	0,08-**0,12**-0,18	0,08-**0,13**-0,19	0,09-**0,14**-0,22
		300	G	ACP300	70-**100**-140	0,06-**0,10**-0,14	0,06-**0,10**-0,14	0,06-**0,11**-0,15	0,07-**0,12**-0,17
	Low alloyed steel	180	L	ACP300	100-**140**-180	0,05-**0,07**-0,12	0,05-**0,07**-0,12	0,05-**0,07**-0,13	0,06-**0,07**-0,15
		275	G	ACP300	80-**120**-160	0,06-**0,10**-0,14	0,06-**0,10**-0,14	0,06-**0,11**-0,15	0,07-**0,12**-0,17
		300	G	ACP300	75-**110**-140	0,06-**0,10**-0,14	0,06-**0,10**-0,14	0,06-**0,11**-0,15	0,07-**0,12**-0,17
		350	G	ACP300	60-**85**-110	0,06-**0,10**-0,14	0,06-**0,10**-0,14	0,06-**0,11**-0,15	0,07-**0,12**-0,17
	High alloyed steel	200	G	ACP300	100-**130**-160	0,08-**0,12**-0,20	0,08-**0,12**-0,20	0,08-**0,13**-0,22	0,09-**0,14**-0,24
		325	G	ACP300	80-**100**-120	0,06-**0,10**-0,15	0,06-**0,10**-0,15	0,06-**0,11**-0,16	0,07-**0,12**-0,18
M	Stainless steel, martensitic / ferritic	200	G	ACP300	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
	Stainless steel, martensitic / tempered	240	G	ACP300	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
	Stainless steel, austenitic / quenched	180	G	ACP300	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
	Stainless steel, austenitic / ferritic (Duplex)	230	G	ACP300	80-**120**-150	0,04-**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 (GG)	180	H	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
	Nodular cast iron (GGG)	260	H	ACP300	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	Heat resistant alloy	200	G	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	Aluminium 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

Recommended Cutting Conditions (5D)

[min. - **optimal** - max.]

ISO	Work material	Hardness (HB)	Chip breaker & Grade		Cutting Speed Vc (m/min)	PCT Type: f_t (mm/tooth) ø16,0	ø20,0 ~ ø25,0	ø32,0	ø40,0
P	Carbon steel	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
		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
		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
		250	G	ACP300	80-**120**-160	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,14
		270	G	ACP300	100-**130**-160	0,07-**0,10**-0,14	0,07-**0,10**-0,14	0,08-**0,11**-0,15	0,09-**0,12**-0,17
		300	G	ACP300	70-**100**-140	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,13
	Low alloyed steel	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
		275	G	ACP300	80-**120**-160	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,13
		300	G	ACP300	75-**110**-140	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,13
		350	G	ACP300	60-**85**-110	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,13
	High alloyed steel	200	G	ACP300	100-**130**-160	0,07-**0,10**-0,15	0,07-**0,10**-0,15	0,08-**0,11**-0,17	0,09-**0,12**-0,19
		325	G	ACP300	80-**100**-120	0,05-**0,09**-0,11	0,05-**0,09**-0,11	0,06-**0,09**-0,12	0,06-**0,10**-0,14
M	Stainless steel, martensitic / ferritic	200	G	ACP300	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
	Stainless steel, martensitic / tempered	240	G	ACP300	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
	Stainless steel, austenitic / quenched	180	G	ACP300	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
	Stainless steel, austenitic / ferritic (Duplex)	230	G	ACP300	80-**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
K	Cast iron (GG)	180	H	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
	Nodular cast iron (GGG)	260	H	ACP300	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	Heat resistant alloy	200	G	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	Aluminium 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

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