SUMITOMO
CARBIDE - CBN - DIAMOND

Sumitomo Multi-Drills
with Replaceable and Regrindable Heads

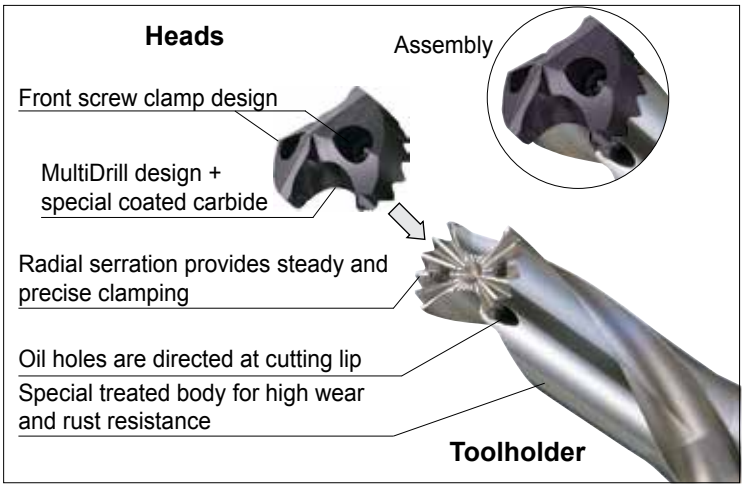
Multi-Drill Type SMD

Programme Expansion: 12 x D

P M K N S H

SUMITOMO ELECTRIC GROUP

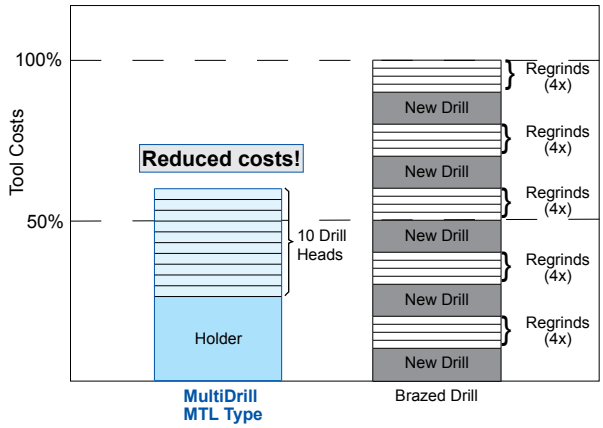
SMD Type



Characteristics

Detachable head type drill using a radial serrated connection design for high precision and strength.
The exchangeable drill head provides a new cutting edge, higher productivity and cost efficiency with easy tool management.
Regrinding allowance of 1,5mm to 3,0mm makes further tool cost reductions possible.

Cost Comparison

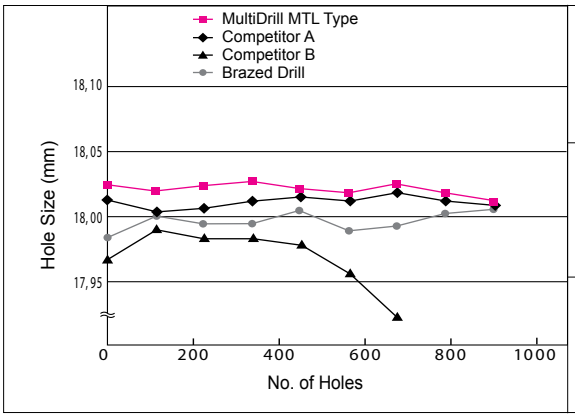


Series

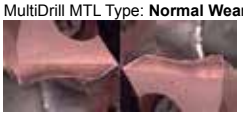
Heads	Toolholder (L/D)	Applications	øD range
MTL Type	M3 Type (3D)	General Steel	Ø12,0 ~ Ø42,5
	M5 Type (5D)		Ø12,0 ~ Ø42,5
	M8 Type (8D)		Ø13,5 ~ Ø42,5
	M12 Type (12D)		Ø13,5 ~ Ø25,8
MEL Type	M3 Type (3D)	Soft Steel, Stainless Steel, Grey Cast Iron	Ø12,0 ~ Ø30,5
	M5 Type (5D)		Ø12,0 ~ Ø30,5
	M8 Type (8D)		Ø13,5 ~ Ø30,5
	M12 Type (12D)		Ø13,5 ~ Ø25,8
MB Type	B3 Type (3D)	Structural Steel	Ø24,5 ~ Ø26,7

Drilling Precision

Work Material: C50
External Diameter: Ø18,0mm
Cutting Conditions: v_c=70m/min,
f=0,25mm/rev
Hole Depth 38mm,
Wet



MultiDrill MTL Type: **Normal Wear**



After 900 holes (equivalent to 34m)

Competitor's A: **Large Wear**

After 900 holes (equivalent to 34m)

Competitor's B: **Edge Chipping**

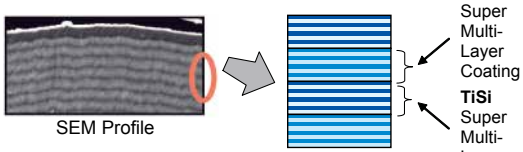
After 670 holes (equivalent to 34m)

Characteristics of DEX Coating

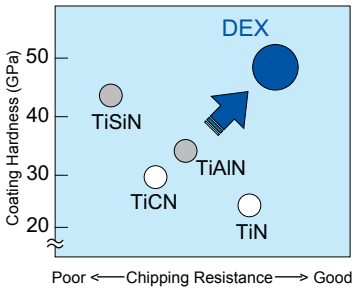
Sumitomo Electric Hardmetal's next-generation drill coating utilises nano-coating technology to provide more than double the tool life of conventional coatings.
Silicon and chrome improve wear, heat and adhesion resistance.
New super multi-layered structure offers significantly improved chip resistance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

Coating Design

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



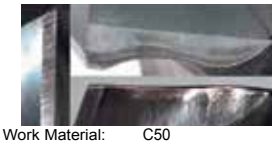
Characteristics of Films



Drastically Reduced Rake Face Wear

DEX Coating (ACX70)

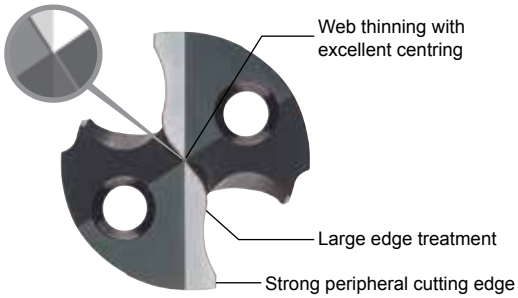
Conventional Coating (ACZ70S)



Work Material: C50
Cutting Conditions: v_c=80m/min
f=0,25mm/rev
Hole Depth: 38mm, Wet
Cutting Length: 32,8m

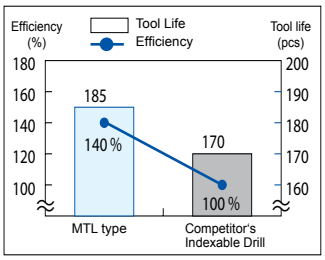
MTL Type - Suitable for High Efficiency Drilling in General Steel

X-Type Thinning **DEX Coating**



Application Examples (MTL Type)

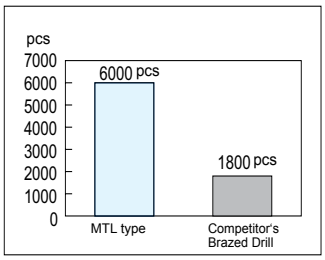
Performance Comparison



Improved tool life and efficiency

Work Material:	C22 (Housing)
Drill Size:	Ø15x5D
Cutting Conditions:	v_c=107m/min, f=0,3mm/rev
Hole Depth:	32mm x 12holes

Tool Life Comparison

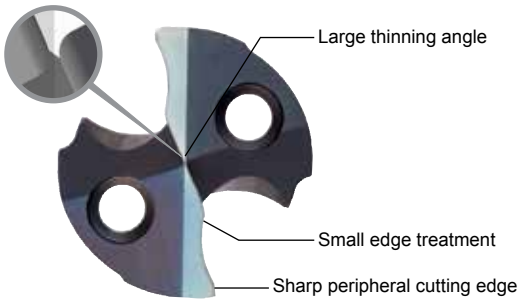


Tool life extended by 3,3x.

Work Material:	C45 (Bracket)
Drill Size:	Ø20x3D
Cutting Conditions:	v_c=98m/min, f=0,18mm/rev
Hole Depth:	17mm

MEL Type - Suitable for Soft Steel, Grey Cast Iron, Exotic Metals and Low Rigidity Setups

Overlap Thinning **DEX Coating**

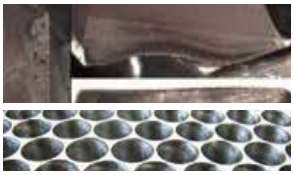


- **Cutting edges perform superbly with SUS and soft steel**
  Large thinning angle solves the convex R part breakages peculiar to soft steel and reduces adhesion breakages with SUS.

- **Improves chipping resistance around hole openings in Cast Iron**
  Edge sharpness improvements in peripheral areas prevent chipping around hole openings in cast iron.

Application Examples (MEL Type)

MEL (Cutting Length 15m)



Multi-Drill MEL type has excellent centring, produces no rifle marks and no edge breakage after 15m.

Competitor's Drill (C/L=11m)

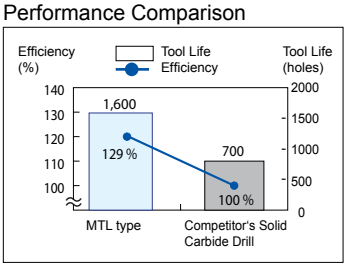
Competitor's indexable drill exhibited poor centring and produced rifle marks. The centre of the drill broke after 11m of drilling.

Work Material:	X5CrNi1810
Drill Size:	Ø 14x5D
Cutting Conditions:	v_c=60m/min, f=0,15mm/rev, Coolant: Emulsion Type

Image of Work Material

Work Material:	Hub (equiv. of C55)
Hole Dia:	Ø14,0 ±0,027
Hole Depth:	10mm (through)
No. of Holes:	4
Coolant:	Emulsion type

Performance Comparison



MTL Type

Cutting Conditions: v_c=60m/min, f=0,3mm/rev (v_f=409mm/min)
Tool Life: 1600 holes

Delivers stable drilling precision with negligible hardening from drilling 1,3x efficient, 2-3 times longer tool life than previous drills.

Competitors's Solid Carbide Drill

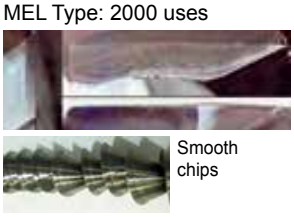
Cutting Conditions: v_c=70m/min, f=0,2mm/rev (v_f=318mm/min)
Tool Life: 700 holes

It becomes unusable after recoated 3 times.

Stable Performance in Low Rigidity Conditions

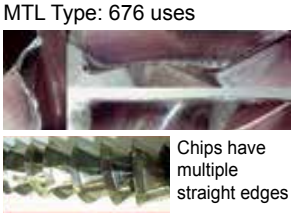
Stable and long tool life even when used with low rigidity work, jigs and equipment

MEL Type: 2000 uses



Smooth chips

MTL Type: 676 uses

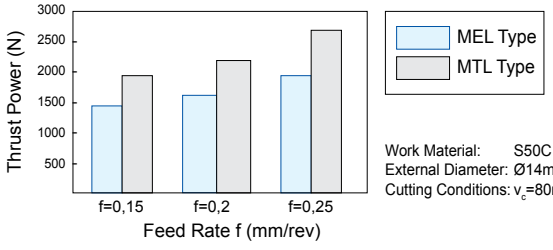


Chips have multiple straight edges

Work Material:	C50 - Vehicle Chassis Component, Vertical Machine (BT40)
External Diameter:	Ø 28mm,
Cutting Conditions:	v_c=80m/min, f=0,23mm/rev, Ø28x30mm (Blind Hole), Wet

25% Reduction in Cutting Resistance (Thrust Force)

MEL type features 25% reduced thrust compared to MTL type!

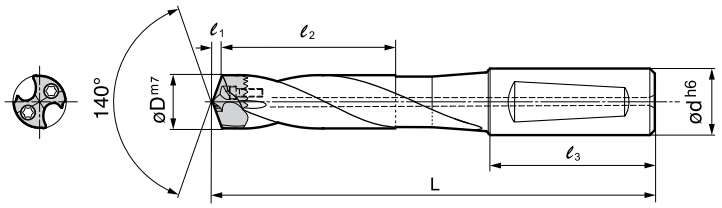


Work Material:	S50C
External Diameter:	Ø14mm
Cutting Conditions:	v_c=80mm/rev

Sharper cutting edge and thinning overlap significantly reduce thrust power and improve chip management, allowing stable drilling in low rigidity setups.

SMDH Type

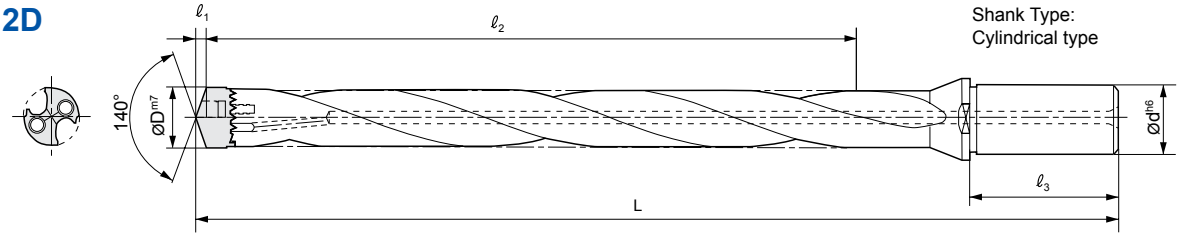
● Holder 3D / 5D / 8D



Shank Type:
Whistle notch type

ℓ_2 = Effective drilling length

● Holder 12D



Shank Type:
Cylindrical type

Fig. shows SMDH220M12

ℓ_2 = Effective drilling length

■ Holder

(mm)

Dimensions				Cat. No.	Short Series (3D)			Long Series (5D)			Deep Hole Series (8D)			Ultra Deep Hole Series (12D)			Applicable Drill Head
Drill Head		Shank			Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		Stock	Dimensions		
Ø D	ℓ_1	Ød	ℓ_3		M3	L	ℓ_2	M5	L	ℓ_2	M8	L	ℓ_2	M12	L	ℓ_2	
12,0	2,2	16	48	SMDH 120 □□	●	107,2	38,0	●	132,2	63,0							SMDT 1200~1249 D M□L
12,5	2,3			SMDH 125 □□	●	107,3	37,8	●	132,3	62,8							SMDT 1250~1299 D M□L
13,0	2,4			SMDH 130 □□	●	112,4	40,5	●	142,4	67,5							SMDT 1300~1349 D M□L
14,0	2,5			SMDH 140 □□□	●	119,0	45,5	●	149,0	74,5	●	194,0	117,5	●	238,5	168,0	SMDT 1350~1450 D M□L
15,0	2,7	20	50	SMDH 150 □□□	●	129,2	48,0	●	159,2	79,0	●	204,2	126,0	●	253,0	180,0	SMDT 1451~1550 D M□L
16,0	2,9			SMDH 160 □□□	●	134,4	51,5	●	169,4	84,5	●	214,4	133,5	●	265,5	192,0	SMDT 1551~1650 D M□L
17,0	3,1			SMDH 170 □□□	●	139,6	54,0	●	174,6	89,0	●	224,6	142,0	●	278,1	204,0	SMDT 1651~1750 D M□L
18,0	3,3			SMDH 180 □□□	●	144,8	57,5	●	179,8	94,5	●	229,8	149,5	●	290,5	216,0	SMDT 1751~1850 D M□L
19,0	3,5	25	56	SMDH 190 □□□	●	160,1	60,0	●	195,0	99,0	●	255,0	158,0	●	309,1	228,0	SMDT 1851~1950 D M□L
20,0	3,6			SMDH 200 □□□	●	160,1	63,5	●	200,1	104,5	●	265,1	165,5	●	321,4	240,0	SMDT 1951~2050 D M□L
21,0	3,8			SMDH 210 □□□	●	160,3	66,0	●	200,3	109,0	●	270,3	174,0	●	333,9	252,0	SMDT 2051~2150 D M□L
22,0	4,0			SMDH 220 □□□	●	165,1	69,1	●	205,1	114,1	●	275,1	181,1	●	347,0	264,0	SMDT 2151~2280 D M□L
23,0	4,2			SMDH 230 □□□	●	164,8	71,0	●	214,8	118,1	●	284,8	189,1	●	359,0	276,0	SMDT 2281~2380 D M□L
24,0	4,4	32	60	SMDH 240 □□□	●	174,6	74,2	●	224,6	123,2	●	299,6	196,2	●	376,1	288,0	SMDT 2381~2480 D M□L
25,0	4,6			SMDH 250 □□□	●	174,6	75,5	●	229,6	127,5	●	304,6	204,5	●	388,4	300,0	SMDT 2481~2580 D M□L
26,0	4,7			SMDH 260 □□	●	179,7	79,0	●	234,7	133,0	●	314,7	212,0				SMDT 2581~2680 D M□L
27,0	4,9			SMDH 270 □□	●	179,9	80,5	●	239,9	137,5	●	324,9	220,5				SMDT 2681~2780 D M□L
28,0	5,1			SMDH 280 □□	●	185,1	83,0	●	245,1	143,0	●	330,1	228,0				SMDT 2781~2880 D M□L
29,0	5,3			SMDH 290 □□	●	190,3	85,5	●	250,3	147,5	●	340,3	236,5				SMDT 2881~2980 D M□L
30,0	5,5			SMDH 300 □□	●	190,5	89,0	●	260,5	152,0	●	350,5	244,0				SMDT 2981~3050 D M□L

Before drilling 8D or 12D holes, a guide hole of similar diameter must be made.

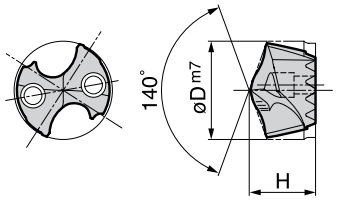
● Euro stock

■ Spare Parts

Applicable Holder	Screw		Wrench	Applicable Insert
		Recommended Tightening Torque (N·m)		
SMDH 120 ~ 150 □□□	BXD 02208 IP	0,8 ~ 1,0	TRDR 08 IP	SMDT 1200 ~ 1550 D M□L
SMDH 160 ~ 180 □□□	BXD 02509 IP	0,9 ~ 1,2	TRDR 10 IP	SMDT 1551 ~ 1850 D M□L
SMDH 190 ~ 210 □□□	BXD 03011 IP	1,8 ~ 2,4	TRDR 15 IP	SMDT 1851 ~ 2150 D M□L
SMDH 220 ~ 240 □□□	BXD 03512 IP	2,8 ~ 3,7	TRDR 15 IP	SMDT 2151 ~ 2480 D M□L
SMDH 250 ~ 270 □□□	BXD 04014 IP	4,1 ~ 5,5	TRDR 20 IP	SMDT 2481 ~ 2780 D M□L
SMDH 280 ~ 300 □□□	BXD 04515 IP	5,0 ~ 6,6	TRDR 25 IP	SMDT 2781 ~ 3050 D M□L

- PVD coated grade:

  MTL - ACX70
  MEL - ACX80



Drill Head (Insert)

øD: 12,00 ~ 15,30mm

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

øD: 15,40 ~ 18,70mm

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

øD: 18,80 ~ 30,50mm

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

● Euro stock

Recommended Cutting Conditions for 3D and 5D Holders

Work Material		Soft Steel (~HB250)	General Steel (HB250~320)	Hardened Steel (HRC45)	Stainless Steel (~HB200)	Grey Cast Iron	Nodular Cast Iron
Recommended Head		**MEL** Type	**MTL** Type / **MEL** Type	**MTL** Type	**MEL** Type	**MTL** Type / **MEL** Type	**MTL** Type
Drill Ø (mm)	Cutt. Conditions						
~ 16,0	v_c	80 - **100** - 120	70 - **100** - 120	40 - **60** - 90	50 - **60** - 80	50 - **70** - 90	50 - **60** - 80
	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
~ 20,0	v_c	80 - **100** - 120	70 - **100** - 120	40 - **60** - 90	60 - **70** - 90	60 - **80** - 100	50 - **70** - 90
	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
~ 30,5	v_c	80 - **100** - 120	70 - **100** - 120	40 - **60** - 90	60 - **70** - 90	60 - **80** - 100	50 - **70** ~ 90
	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	0,20 - **0,30** - 0,35

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

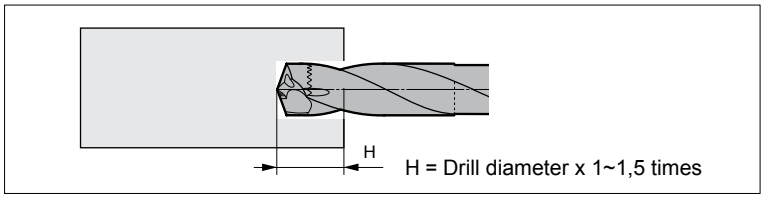
Note: High cutting performance is enhanced when using a high quality machine and rigid set up.

Recommended Drilling Method for 8D and 12D Holders

As for a 12D adaptor, please use a hydraulic, milling or collet chuck.

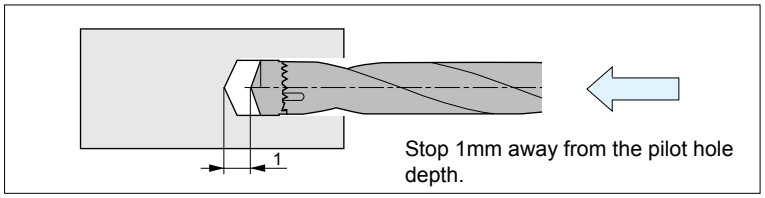
1. Drill a pilot hole using a 3D holder

   Select the same nominal diameter and chip-breaker for SMDH□□□M3 MTL as for MultiDrill SMDH□□□M8 MTL or for MultiDrill SMDH□□□M12 MTL. Check the rotation of the drill. The run-out should not exceed ±0,05mm.



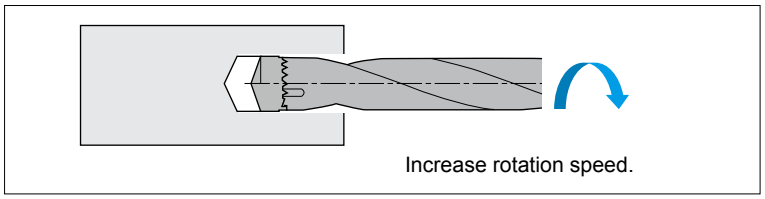
2. Enter the pilot hole with SMDH□□□M8 MTL / SMDH□□□M12 MTL at reduced data.

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



Important:
Entering the hole at full rotation speed is not recommended as damage is likely due to OD run-out.

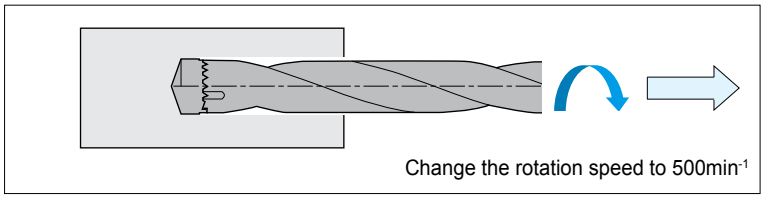
3. Increase rotation speed until the set cutting speed is reached and start normal drilling operation.



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 bis 2.000mm/min



Releasing a drill with higher spindle speed may cause shoulder damage due to OD run-out.

Recommended Cutting Conditions for 8D and 12D Holders

Work Material		Soft Steel (~HB250)	General Steel (HB250~320)	Hardened Steel (HRC45)	Stainless Steel (~HB200)	Grey Cast Iron	Nodular Cast Iron
Recommended Head		**MEL** Type	**MTL** Type / **MEL** Type	**MTL** Type	**MEL** Type	**MTL** Type / **MEL** Type	**MTL** Type
Drill Ø (mm)	Cutt. Conditions						
~ 16,0	v_c	50 - **70** - 80	50 - **70** - 80	30 - **50** - 70	40 - **50** - 60	40 - **60** - 80	40 - **50** - 70
	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
~ 20,0	v_c	50 - **70** - 80	50 - **70** - 80	30 - **50** - 70	40 - **60** - 70	50 - **70** - 90	40 - **60** - 80
	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
~ 25,0 (12D) ~ 30,5 (8D)	v_c	50 - **70** - 80	50 - **70** - 80	30 - **50** - 70	40 - **60** - 90	50 - **70** - 90	40 - **70** ~ 90
	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	0,20 - **0,30** - 0,35

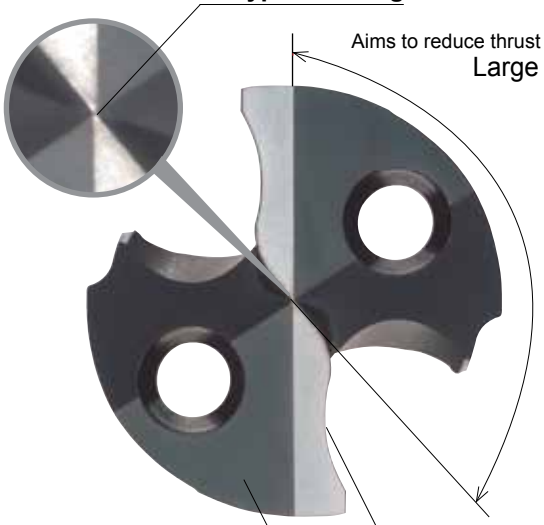
v_c : Cutting Speed (m/min), f : Feed rate (mm/rev)

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

Large Hole **MTL** Type

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

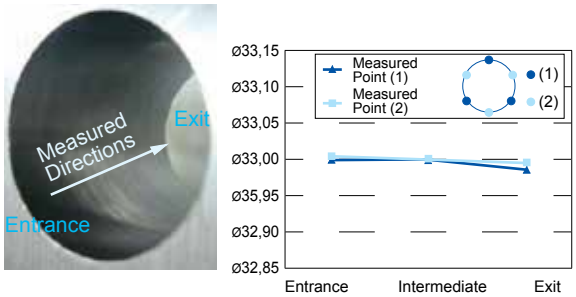
Improved chip management
for highly malleable materials
Large Helix Angle Design



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

Good Chip Control

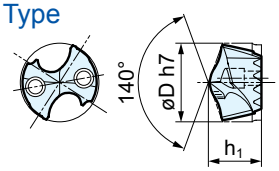
Recommended Cutting Conditions

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

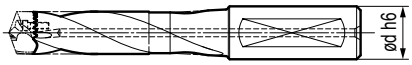
Work Material		Soft Steel (~HB250)	General Steel (HB250~320)	Hardened Steel (HRC45)	Stainless Steel (~HB200)	Grey Cast Iron	Ductil Cast Iron
Recommended Head		**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type	**MTL** Type
Drill Ø (mm)	Cutt. Conditions						
31,0 ~ 42,5	v_c	40 - **60** - 120 (30 - **50** - 80)	60 - **80** - 120 (40 - **50** - 80)	40 - **50** - 80 (30 - **40** - 60)	40 - **60** - 80 (30 - **40** - 60)	50 - **60** - 100 (40 - **60** - 90)	50 - **60** - 90 (40 - **50** - 70)
	f	0,25 - **0,35** - 0,45	0,25 - **0,30** - 0,40	0,15 - **0,25** - 0,30	0,20 - **0,25** - 0,30	0,25 - **0,35** - 0,45	0,25 - **0,30** - 0,35

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.

● Indexable Head MTL Type



● Toolholder



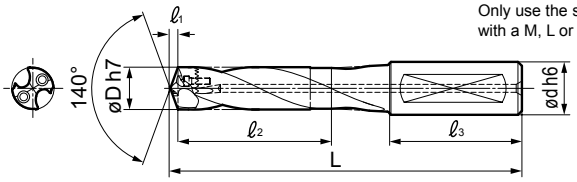
■ Drill Head (Ø31,0 to Ø42,5mm) Grade MTL Type - ACX80

■ Holders M (3D), L (5D), D (8D)

Drill Diameter øD	Heads		h1	Toolholder					
	MTL Type			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**								

❍ Japan stock

● 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	Recommended Tightening Torque
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	BXD04515IP	TRDR25IP	5 ~ 6,6
32,0												
32,5												
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												

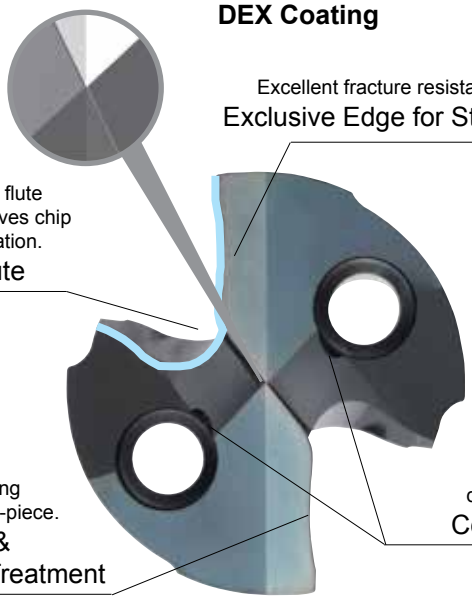
MB Type - Ideal for Drilling Rolled Steels for Structural Weldments (Single Layer and Laminate Material)

X-Type Thinning

DEX Coating

Excellent fracture resistance + chip control
Exclusive Edge for Structural Steel

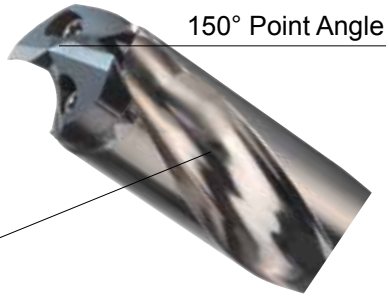
Unique wide and smooth flute shape significantly improves chip management and evacuation.
New J-grooved Flute



Directs coolant to cutting edge even during MQL drilling
Centre Oil Hole

Reduces shoulder chipping caused by unstable work-piece.
Robust Substrate & Reinforced Edge Treatment

150° Point Angle



Improved surface finish of flute greatly improves chip evacuation.
Highly Polished Flute Surface

Application Examples

MB Type
for structural steel — Good Chip Control

Work Material: St 52-3
Cutting Conditions: v_c=87m/min, f=0,29mm/rev

Competitor's Drill — Elongated Chips

Work Material: St 52-3
Cutting Conditions: v_c=87m/min, f=0,29mm/rev

MB Type Cutting Length Comparison

Case	Current Tool	Tool Life Comparison (Cutting Length)		Cutting Conditions
Case: 1	Competitor A Indexable Head Model	Current Tool MB Type	17m **42m** — **2,5 x tool life**	v_c=46m/min f=0,35mm/rev Coolant: MQL
Case: 2	Competitor B Indexable Head	Current Tool MB Type	50m **87m** — **1,7 x tool life**	v_c=56m/min f=0,30mm/rev Coolant: MQL
Case: 3	Competitor C Brazed Head	Current Tool MB Type	32m **95m** — **3,0 x tool life**	v_c=54m/min f=0,30mm/rev Coolant: MQL
Case: 4	Competitor D Indexable Head Model	Current Tool MB Type	70m **120m** — **1,7 x tool life**	v_c=60m/min f=0,30mm/rev Coolant: MQL

Compared to Current Tool Life

1,7 x to 3 x

Longer Tool Life

Tool Cost

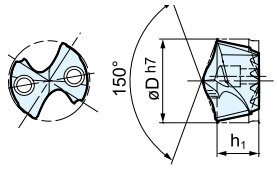
Major Potential Savings

Recommended Cutting Conditions, MB Type

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

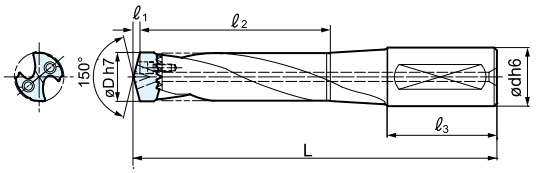
Work Material		Rolled Steel for Welded Structures St 42-2	Rolled Steel for Welded Structures St 52-3	Rolled Steel for Welded Structures SM520	Rolled Steel for Welded Structures St 60-2
Recommended Head		**MB** Type	**MB** Type	**MB** Type	**MB** Type
Drill Ø (mm)	Cutt. Conditions				
24,5~ 26,7	v_c	60 - **70** - 80	55 - **65** - 75	55 - **65** - 75	55 - **65** - 75
	f	0,20 - **0,30** - 0,40	0,20 - **0,30** - 0,40	0,20 - **0,25** - 0,35	0,20 - **0,25** - 0,35

● Drill Head



● Mounted Figure

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



■ Drill Head (Insert)

Material MB Type: ACX80

■ Toolholder B3 (3D)

■ Dimensions of Assembled Drill with SMD Type

■ Spare Parts, Recommended Tightening Torque

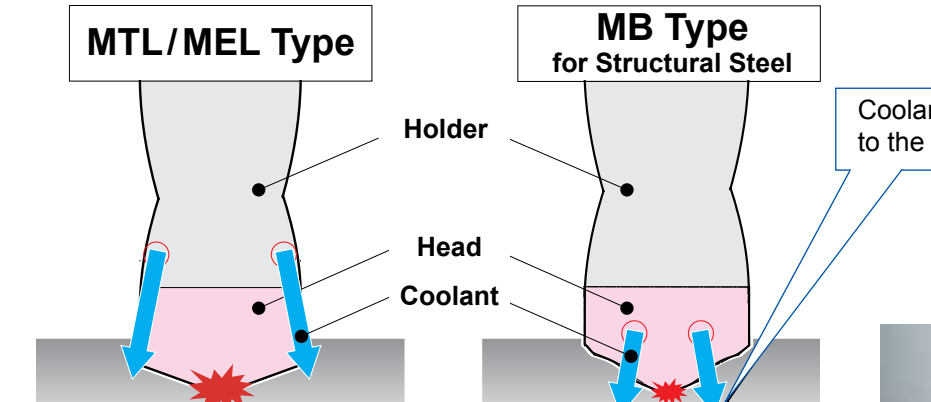
Drill Diameter ØD	Heads			Toolholder					Shank		Cap Screw	Wrench	Recom. Tightening Torque
	MB Type		h_1	B3 (3D)		Dimensions (mm)			Dimensions (mm)				
	Cat. No.	Stock		Cat. No.	Stock	ℓ_1	ℓ_2	L	ℓ_3	Ød			
24,5	SMDT 2450MB	❍	15,4	SMDH 240B3	❍	4,5	86,2	174,7	60	32	BXD03512IP	TRDR15IP	2,8 ~ 3,7
24,7	SMDT 2470MB	❍											
26,5	SMDT 2650MB	❍	16,4	SMDH 260B3	❍	4,9	92	179,9	60	32	BXD04014IP	TRDR20IP	4,1 ~ 5,5
26,7	SMDT 2670MB	❍											

❍ Japan Stock

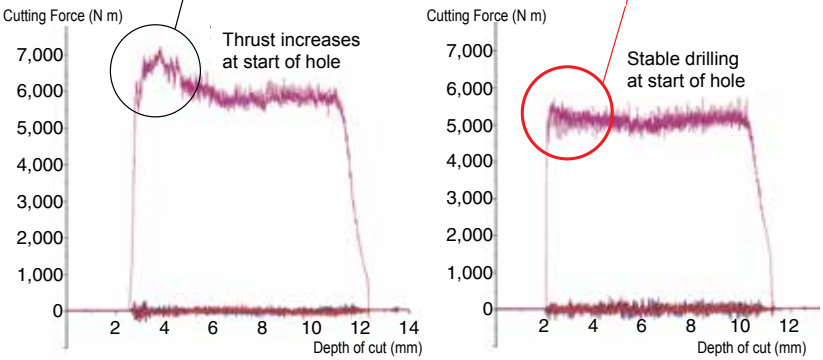
● Improved Lubrication Flow to Edge (Rebinder effect)

Rebinder effect

The rebinder effect causes thinner chips by reducing the surface energy (by increasing the sheer angle) by allowing pressure additives in the coolant to flow into micro cracks that occur in areas of the metal surface that are subject to stress.



■ Comparison of Cutting Resistance (Thrust Force)



Work Material:	St 42-2
Drill Diameter:	Ø24,7
Cutting Conditions:	v_c=70m/min, f=0,35mm/rev
Coolant:	MQL

Note: SMDT...MB heads only to be used with SMDH...B3 holders!

Special Drill Design Check List

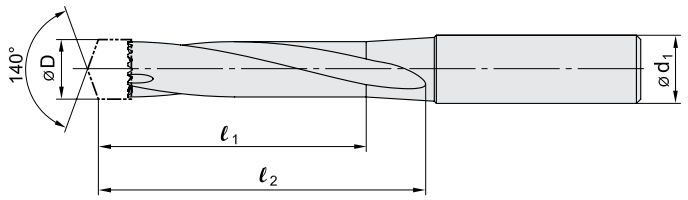
Please fill in the required specifications below.

Please send the completed form to either our sales office or distributor.
For other special drill requirements not stated below, please feel free to consult our staff.

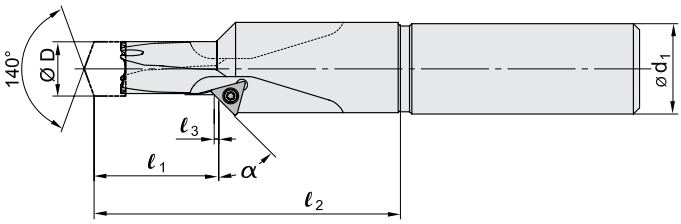
Company / Contact Person:

Drill Type

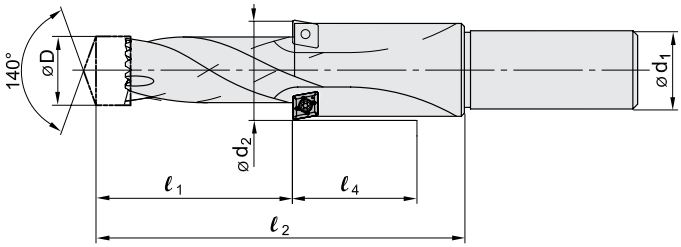
Multi-Drill SMD type



Multi-Drill SMD type with chamfering insert



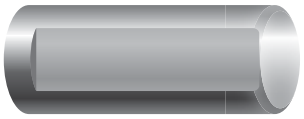
Multi-Drill SMD type with counter boring insert



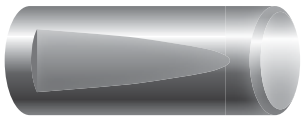
Shank Type

Cylindrical type

Rectangular type



Whistle notch type



Application Insert

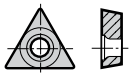
Drilling/counter bore (WDXT□□□□□□-□)


L Type

G Type

H Type

Chamfering (TP□□ □□□□□□□ □□)



D	(Drill diameter) Ø12 ~ Ø30,5mm		mm
d_1	(*) (Shank diameter) Ø16 ~ Ø32,0mm		mm
d_2	(Counter bore diameter) ØD + 2 - 20mm		mm
ℓ_1	(Drilling depth) ≤ ØDx5mm		mm
ℓ_2	(Length from flange)		mm

ℓ_3	(Chamfer width) ≤ 3mm		mm
$\ell_1 + \ell_4$	(Drill. depth + counter bore depth) ≤ ØDx5mm		mm
α	(*) (Chamfer angle) 15 - 60°		°

(*) Please note that some restrictions apply

Additional Requests:

SUMITOMO
CARBIDE - CBN - DIAMOND

(Germany)
SUMITOMO ELECTRIC Hartmetall GmbH
Konrad-Zuse-Straße 9, 47877 Willich

Tel. +49(0)2154 4992-0, Fax +49(0)2154 4992-161
Info@SumitomoTool.com
www.SumitomoTool.com

(UK and Ireland)
SUMITOMO ELECTRIC Hardmetal Ltd.
Summerleys Road, Princes Risborough
Buckinghamshire HP27 9PW, UK

Tel. +44(0)1844 342081, Fax: +44(0)1844 342415
enquiries@sumitomo-hardmetal.co.uk
www.SumitomoTool.com

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