

Flat MULTIDRILL MDF series

Rev.16

**Effective for drilling on inclined
or cylindrical surfaces!
Suppresses burrs at the exits of through holes!**


MDF-S type **P M K** **MDF-L type** **P M K** **MDF-H type** **P M K**

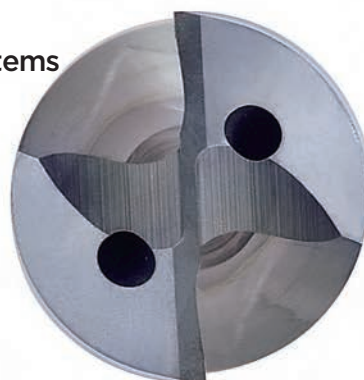
 External Coolant Supply Long Shank type / External Coolant Supply Internal Coolant Supply
 ø0.3 to 20.0mm ø3.0 to 20.0mm ø3.0 to 16.0mm

2D 188 items **2D** 115 items **3D 5D** 198 items

**Lineup includes MDF-A type for
aluminum alloy drilling**

New
MDF-A type **N** *New* **MDF-A type** **N**

 External Coolant Supply Internal Coolant Supply
 ø2.0 to 10.0mm ø3.0 to 10.0mm

2D 12 items **3D** 8 items




■ Features

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



● 180° point angle design supports a variety of drilling applications

Suitable for high-efficiency flat bottom drilling, drilling on non-flat surfaces such as inclined and cylindrical surfaces, and interrupted drilling. Also reduces burrs at the hole exit.

● Improves drilling stability

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

● Excellent chip evacuation

Achieves excellent chip evacuation thanks to the wide chip pocket and high-quality rake face shape.

● Excellent cutting edge strength

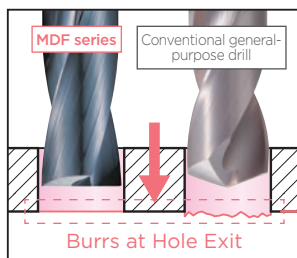
Achieves excellent cutting edge strength through optimized cutting edge design.

● Coolant can now be supplied internally

This enables deeper drilling.



■ Reduction of Burrs at Hole Exit



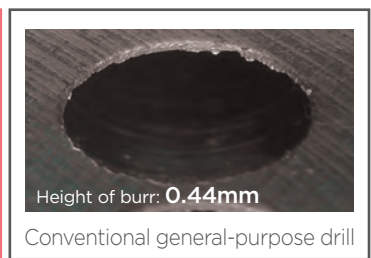
Work Material: SCM415
Tool: MDF 050052D (ø5.0mm 2D)
Cutting Conditions: $VC = 65\text{m/min}$,
 $f = 0.12\text{mm/rev}$,
 $H = 10\text{mm}$,
150 holes, Wet
Machine: Vertical Machining Center
BT40

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



Height of burr: **0.18mm**

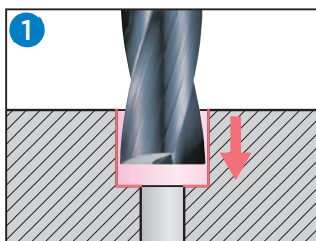
Flat MULTIDRILL MDF series



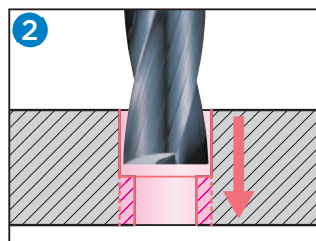
Height of burr: **0.44mm**

Conventional general-purpose drill

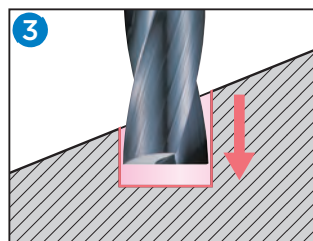
■ Drilling Applications



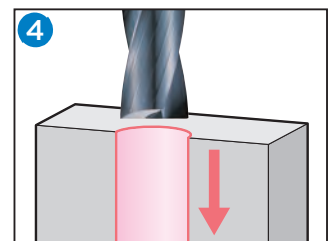
High-efficiency flat bottom drilling



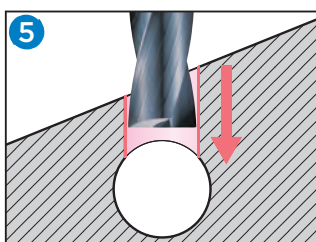
Hole expansion drilling



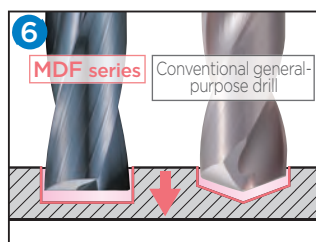
Drilling in non-horizontal surface
(inclined surface, cylindrical surface, etc.)



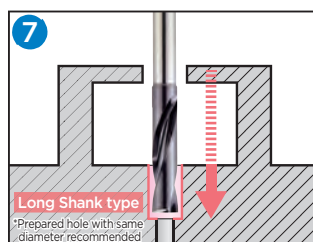
Interrupted drilling



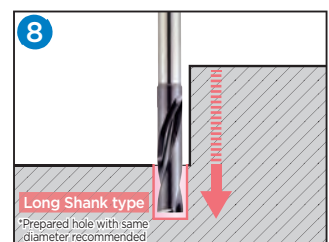
Cross drilling



Pre-tap hole drilling in thin plates



Deep reach flat bottom drilling



Avoids interference with work material

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

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

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

DC < 6mm, stepped shank



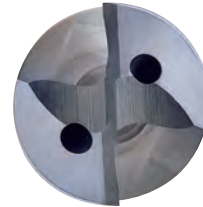
DC ≥ 6mm, relief shank



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

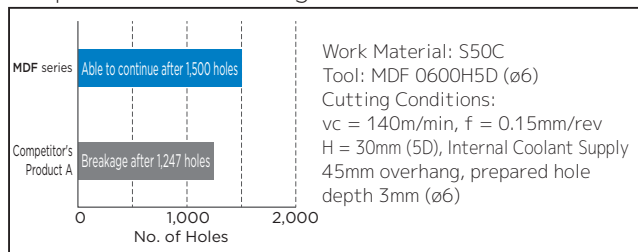
- Internal coolant supply enables deep flat bottom hole drilling.

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

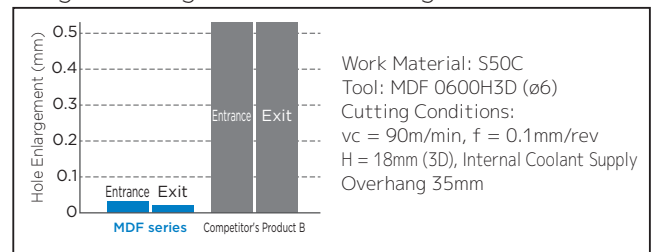


Cutting Performance

Deep Flat Bottom Drilling



Long Overhang Flat Bottom Drilling



Drilling on slanted surfaces



Prevents burrs and conical remnants on tool withdrawal



Distinguishing Flat Drills, General-purpose Drills and Endmills

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

Product Range

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

MDF-A type



■ Features

The Flat MultiDrill MDF-A type, which is suitable for drilling a wide variety of aluminum alloy materials, is a solid carbide drill with dedicated web thinning and AURORA Coat X for excellent adhesion resistance.



AURORA Coat X

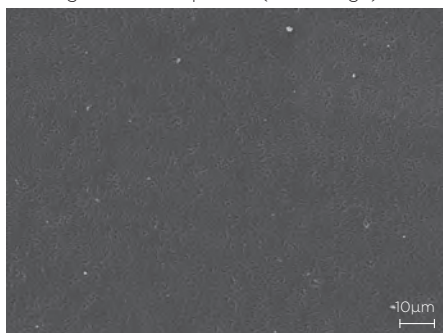


DLX1700

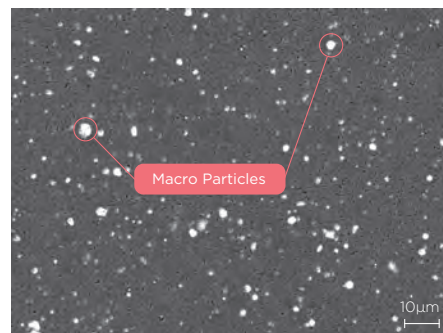
Thin, ultra-smooth DLC coating

Significantly improved adhesion resistance in drilling of aluminum alloy
Significantly reduced cutting force, contributing to long and stable tool life

Coating Surface Properties (SEM image)



AURORA Coat X



Conventional DLC Coat

New technology significantly improves coating smoothness

■ Cutting Performance (Aluminum Alloy)

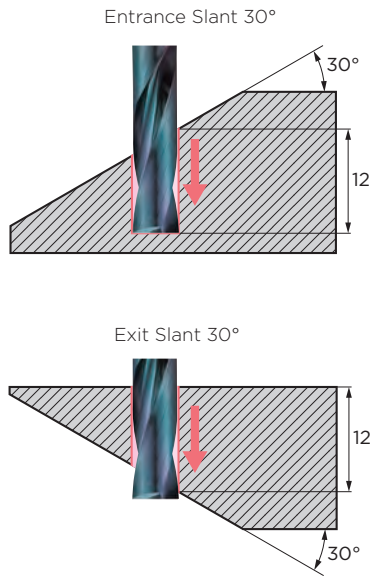
● Comparison of Cutting Edges After Drilling

	MDF-A type		Competitor's Product	
Standard Conditions vc = 120m/min f = 0.1mm/rev 10 holes				
High-efficiency Conditions vc = 200m/min f = 0.3mm/rev 210 holes				

No edge chipping; cutting edge adhesion also mitigated

Machine: Vertical Machining Center BT40
Work Material: A6061 (malleable aluminum alloy)
Tool: MDF0600S2D-A Competitor's Product
Cutting Conditions: H = 12mm, Water-soluble External Coolant Supply

● Comparison of Burrs



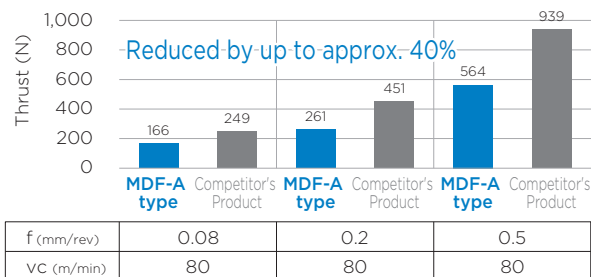
Entrance Slant 30°		vc = 188m/min f = 0.04mm/rev	vc = 188m/min f = 0.08mm/rev	vc = 188m/min f = 0.12mm/rev
MDF-A type				
Competitor's Product				
Exit Slant 30°		vc = 188m/min f = 0.04mm/rev	vc = 188m/min f = 0.08mm/rev	vc = 188m/min f = 0.12mm/rev
MDF-A type				
Competitor's Product				

Burrs reduced even with non-flat surface drilling

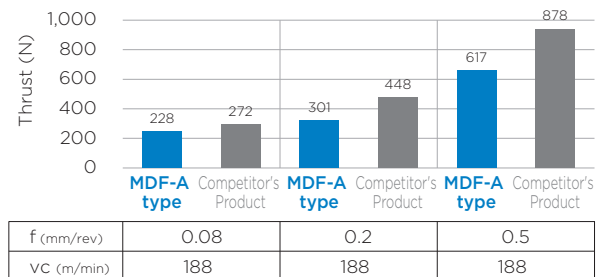
Machine: Vertical Machining Center BT30
Work Material: A6063
Tool: MDF0600S2D-A, Competitor's Product
Cutting Conditions: H = 12mm Blind Hole (Entrance) Through (Exit),
Water-soluble External Coolant Supply

● Comparison of Drilling Load

Reference Conditions (Cutting Force)



High-efficiency Conditions (Cutting Force)



Drilling load reduced

Machine: Vertical Machining Center BT30
Work Material: A6063
Tool: MDF0600S2D-A, Competitor's Product
Cutting Conditions: Water-soluble External Coolant Supply

■ Product Range

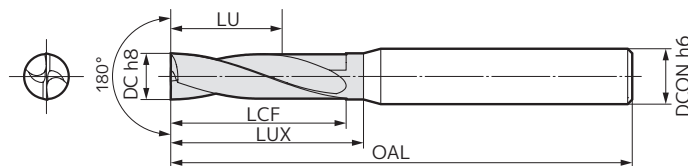
Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Details
External	MDF□□□□S2D-A	ø2.0 to 10.0	up to 2	12 items
Internal	MDF□□□□H3D-A	ø3.0 to 10.0	up to 3	8 items

MDF-S type (External Coolant Supply)



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1

Diameter $\varnothing 0.3$ to 5.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
0.3*	2	●	MDF 0030S2D*	0.7	1.1	1.4	40	3.0	1
0.4*		●	0040S2D*	0.8	1.4	1.7	40	3.0	1
0.5		●	0050S2D	1.3	2.0	2.3	40	3.0	1
0.6		●	0060S2D	1.5	2.4	2.7	40	3.0	1
0.7		●	0070S2D	1.8	2.8	3.1	40	3.0	1
0.8	2	●	0080S2D	2.0	3.2	3.5	40	3.0	1
0.9		●	0090S2D	2.3	3.6	3.9	40	3.0	1
1.0		●	MDF 0100S2D	2.5	4.0	4.3	45	3.0	1
1.1		●	0110S2D	2.8	4.4	4.7	45	3.0	1
1.2		●	0120S2D	3.0	4.8	5.1	45	3.0	1
1.3	2	●	0130S2D	3.3	5.2	5.5	45	3.0	1
1.4		●	0140S2D	3.5	5.6	5.9	45	3.0	1
1.5		●	0150S2D	3.8	6.0	6.3	45	3.0	1
1.6		●	0160S2D	4.0	6.4	6.7	45	3.0	1
1.7		●	0170S2D	4.3	6.8	7.1	45	3.0	1
1.8	2	●	0180S2D	4.5	7.2	7.5	45	3.0	1
1.9		●	0190S2D	4.8	7.6	7.9	45	3.0	1
2.0		●	MDF 0200S2D	5.0	8.0	8.3	50	4.0	1
2.1		●	0210S2D	5.3	8.4	8.7	50	4.0	1
2.2		●	0220S2D	5.5	8.8	9.1	50	4.0	1
2.3	2	●	0230S2D	5.8	9.2	9.5	50	4.0	1
2.4		●	0240S2D	6.0	9.6	9.9	50	4.0	1
2.5		●	0250S2D	6.3	10.0	10.5	50	4.0	1
2.6		●	0260S2D	6.5	10.4	11.1	50	4.0	1
2.7		●	0270S2D	6.8	10.8	11.7	50	4.0	1
2.76	2	●	0276S2D	6.9	11.0	12.0	50	4.0	1
2.78		●	0278S2D	6.9	11.1	12.1	50	4.0	1
2.8		●	0280S2D	7.0	11.2	12.2	50	4.0	1
2.9		●	0290S2D	7.3	11.6	12.8	50	4.0	1
3.0		●	0300S2D	7.5	12.0	12.3	50	6.0	1
3.1	2	●	0310S2D	7.8	12.4	12.7	50	6.0	1
3.2		●	0320S2D	8.0	12.8	13.1	50	6.0	1
3.3		●	0330S2D	8.3	13.2	13.5	50	6.0	1
3.4		●	0340S2D	8.5	13.6	13.9	50	6.0	1
3.5		●	0350S2D	8.8	14.0	14.3	50	6.0	1
3.6	2	●	0360S2D	9.0	14.4	14.9	50	6.0	1
3.66		●	0366S2D	9.1	14.6	15.3	50	6.0	1
3.68		●	0368S2D	9.2	14.7	15.4	50	6.0	1
3.7		●	0370S2D	9.3	14.8	15.5	50	6.0	1
3.8		●	0380S2D	9.5	15.2	16.0	50	6.0	1
3.9	2	●	0390S2D	9.8	15.6	16.6	50	6.0	1
4.0		●	0400S2D	10.0	16.0	17.2	50	6.0	1
4.1		●	MDF 0410S2D	10.3	16.4	17.8	60	6.0	1
4.2		●	0420S2D	10.5	16.8	18.4	60	6.0	1
4.3		●	0430S2D	10.8	17.2	18.9	60	6.0	1
4.4	2	●	0440S2D	11.0	17.6	19.5	60	6.0	1
4.5		●	0450S2D	11.3	18.0	20.1	60	6.0	1
4.6		●	0460S2D	11.5	18.4	20.7	60	6.0	1
4.62		●	0462S2D	11.6	18.5	20.9	60	6.0	1
4.64		●	0464S2D	11.6	18.6	21.0	60	6.0	1
4.7	2	●	0470S2D	11.8	18.8	21.3	60	6.0	1
4.8		●	0480S2D	12.0	19.2	21.8	60	6.0	1
4.9		●	0490S2D	12.3	19.6	22.4	60	6.0	1
5.0		●	0500S2D	12.5	20.0	23.0	60	6.0	1
5.1		●	0510S2D	12.8	20.4	23.6	60	6.0	1

Grade: ACF75

*RS THINNING is used for $\varnothing 0.5$ mm and larger sizes.Diameter $\varnothing 5.2$ to 9.52mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
5.2	2	●	MDF 0520S2D	13.0	20.8	24.2	60	6.0	1
5.3		●	0530S2D	13.3	21.2	24.7	60	6.0	1
5.4		●	0540S2D	13.5	21.6	25.3	60	6.0	1
5.5		●	0550S2D	13.8	22.0	25.9	60	6.0	1
5.52		●	0552S2D	13.8	22.1	26.1	60	6.0	1
5.54	2	●	0554S2D	13.9	22.2	26.2	60	6.0	1
5.6		●	0560S2D	14.0	22.4	26.5	60	6.0	1
5.7		●	0570S2D	14.3	22.8	27.1	60	6.0	1
5.8		●	0580S2D	14.5	23.2	27.6	60	6.0	1
5.9		●	0590S2D	14.8	23.6	28.2	60	6.0	1
6.0	2	●	MDF 0600S2D	15.0	24.0	28.8	60	6.0	1
6.1		●	0610S2D	15.3	24.4	27.4	70	8.0	1
6.2		●	0620S2D	15.5	24.8	28.0	70	8.0	1
6.3		●	0630S2D	15.8	25.2	28.5	70	8.0	1
6.4		●	0640S2D	16.0	25.6	29.1	70	8.0	1
6.5	2	●	0650S2D	16.3	26.0	29.7	70	8.0	1
6.6		●	0660S2D	16.5	26.4	30.3	70	8.0	1
6.7		●	0670S2D	16.8	26.8	30.9	70	8.0	1
6.8		●	0680S2D	17.0	27.2	31.4	70	8.0	1
6.9		●	0690S2D	17.3	27.6	32.0	70	8.0	1
7.0	2	●	0700S2D	17.5	28.0	32.6	70	8.0	1
7.1		●	0710S2D	17.8	28.4	33.2	70	8.0	1
7.2		●	0720S2D	18.0	28.8	33.8	70	8.0	1
7.3		●	0730S2D	18.3	29.2	34.3	70	8.0	1
7.36		●	0736S2D	18.4	29.4	34.7	70	8.0	1
7.38	2	●	0738S2D	18.4	29.5	34.8	70	8.0	1
7.4		●	0740S2D	18.5	29.6	34.9	70	8.0	1
7.5		●	0750S2D	18.8	30.0	35.5	70	8.0	1
7.52		●	0752S2D	18.8	30.1	35.7	70	8.0	1
7.54		●	0754S2D	18.9	30.2	35.8	70	8.0	1
7.6	2	●	0760S2D	19.0	30.4	36.1	70	8.0	1
7.7		●	0770S2D	19.3	30.8	36.7	70	8.0	1
7.8		●	0780S2D	19.5	31.2	37.2	70	8.0	1
7.9		●	0790S2D	19.8	31.6	37.8	70	8.0	1
8.0		●	0800S2D	20.0	32.0	38.4	70	8.0	1
8.1	2	●	MDF 0810S2D	20.3	32.4	37.0	80	10.0	1
8.2		●	0820S2D	20.5	32.8	37.6	80	10.0	1
8.3		●	0830S2D	20.8	33.2	38.1	80	10.0	1
8.4		●	0840S2D	21.0	33.6	38.7	80	10.0	1
8.5		●	0850S2D	21.3	34.0	39.3	80	10.0	1
8.6	2	●	0860S2D	21.5	34.4	39.9	80	10.0	1
8.7		●	0870S2D	21.8	34.8	40.5	80	10.0	1
8.8		●	0880S2D	22.0	35.2	41.0	80	10.0	1
8.9		●	0890S2D	22.3	35.6	41.6	80	10.0	1
9.0		●	0900S2D	22.5	36.0	42.2	80	10.0	1
9.1	2	●	0910S2D	22.8	36.4	42.8	80	10.0	1
9.2		●	0920S2D	23.0	36.8	43.4	80	10.0	1
9.24		●	0924S2D	23.1	37.0	43.6	80	10.0	1
9.26		●	0926S2D	23.1	37.0	43.7	80	10.0	1
9.3		●	0930S2D	23.3	37.2	43.9	80	10.0	1
9.36	2	●	0936S2D	23.4	37.4	44.3	80	10.0	1
9.38		●	0938S2D	23.4	37.5	44.4	80	10.0	1
9.4		●	0940S2D	23.5	37.6	44.5	80	10.0	1
9.5		●	0950S2D	23.8	38.0	45.1	80	10.0	1
9.52		●	0952S2D	23.8	38.1	45.3	80	10.0	1

Grade: ACF75

Caution: Because the calculation method has been changed, the dimensions above (red text) are different from those listed in Tooling News No. 511 Rev. 15, but the specifications have not changed.

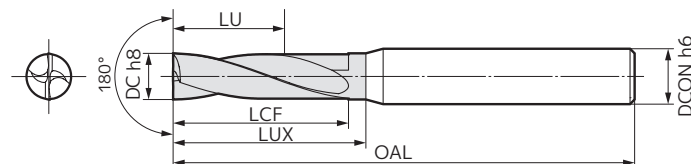
● mark: Standard stocked item

MDF-S type (External Coolant Supply)



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1



Diameter ø9.54 to 14.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DC h8	Fig
9.54	2	●	MDF 0954S2D	23.9	38.2	45.4	80	10.0	1
9.6	2	●	0960S2D	24.0	38.4	45.7	80	10.0	1
9.7	2	●	0970S2D	24.3	38.8	46.3	80	10.0	1
9.8	2	●	0980S2D	24.5	39.2	46.8	80	10.0	1
9.9	2	●	0990S2D	24.8	39.6	47.4	80	10.0	1
10.0	2	●	1000S2D	25.0	40.0	48.0	80	10.0	1
10.1	2	●	MDF 1010S2D	25.3	40.4	46.6	90	12.0	1
10.2	2	●	1020S2D	25.5	40.8	47.2	90	12.0	1
10.3	2	●	1030S2D	25.8	41.2	47.7	90	12.0	1
10.4	2	●	1040S2D	26.0	41.6	48.3	90	12.0	1
10.5	2	●	1050S2D	26.3	42.0	48.9	90	12.0	1
10.6	2	●	1060S2D	26.5	42.4	49.5	90	12.0	1
10.7	2	●	1070S2D	26.8	42.8	50.1	90	12.0	1
10.8	2	●	1080S2D	27.0	43.2	50.6	90	12.0	1
10.9	2	●	1090S2D	27.3	43.6	51.2	90	12.0	1
11.0	2	●	1100S2D	27.5	44.0	51.8	90	12.0	1
11.1	2	●	1110S2D	27.8	44.4	52.4	90	12.0	1
11.2	2	●	1120S2D	28.0	44.8	53.0	90	12.0	1
11.22	2	●	1122S2D	28.1	44.9	53.1	90	12.0	1
11.24	2	●	1124S2D	28.1	45.0	53.2	90	12.0	1
11.3	2	●	1130S2D	28.3	45.2	53.5	90	12.0	1
11.36	2	●	1136S2D	28.4	45.4	53.9	90	12.0	1
11.38	2	●	1138S2D	28.4	45.5	54.0	90	12.0	1
11.4	2	●	1140S2D	28.5	45.6	54.1	90	12.0	1
11.5	2	●	1150S2D	28.8	46.0	54.7	90	12.0	1
11.6	2	●	1160S2D	29.0	46.4	55.3	90	12.0	1
11.7	2	●	1170S2D	29.3	46.8	55.9	90	12.0	1
11.8	2	●	1180S2D	29.5	47.2	56.4	90	12.0	1
11.9	2	●	1190S2D	29.8	47.6	57.0	90	12.0	1
12.0	2	●	1200S2D	30.0	48.0	57.6	90	12.0	1
12.1	2	●	MDF 1210S2D	30.3	48.4	52.3	100	14.0	1
12.2	2	●	1220S2D	30.5	48.8	52.7	100	14.0	1
12.3	2	●	1230S2D	30.8	49.2	53.1	100	14.0	1
12.4	2	●	1240S2D	31.0	49.6	53.6	100	14.0	1
12.5	2	●	1250S2D	31.3	50.0	54.0	100	14.0	1
12.6	2	●	1260S2D	31.5	50.4	55.1	100	14.0	1
12.7	2	●	1270S2D	31.8	50.8	55.5	100	14.0	1
12.8	2	●	1280S2D	32.0	51.2	55.9	100	14.0	1
12.9	2	●	1290S2D	32.3	51.6	56.4	100	14.0	1
13.0	2	●	1300S2D	32.5	52.0	56.8	100	14.0	1
13.1	2	●	1310S2D	32.8	52.4	57.8	110	14.0	1
13.2	2	●	1320S2D	33.0	52.8	58.3	110	14.0	1
13.3	2	●	1330S2D	33.3	53.2	58.7	110	14.0	1
13.4	2	●	1340S2D	33.5	53.6	59.2	110	14.0	1
13.5	2	●	1350S2D	33.8	54.0	59.6	110	14.0	1
13.6	2	●	1360S2D	34.0	54.4	60.6	110	14.0	1
13.7	2	●	1370S2D	34.3	54.8	61.1	110	14.0	1
13.8	2	●	1380S2D	34.5	55.2	61.5	110	14.0	1
13.9	2	●	1390S2D	34.8	55.6	62.0	110	14.0	1
14.0	2	●	1400S2D	35.0	56.0	62.4	110	14.0	1
14.1	2	●	1410S2D	35.3	56.4	63.4	110	16.0	1
14.2	2	●	1420S2D	35.5	56.8	63.9	110	16.0	1
14.3	2	●	1430S2D	35.8	57.2	64.3	110	16.0	1
14.4	2	●	1440S2D	36.0	57.6	64.8	110	16.0	1
14.5	2	●	1450S2D	36.3	58.0	65.2	110	16.0	1

Grade: ACF75

Diameter ø14.6 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DC h8	Fig
14.6	2	●	MDF 1460S2D	36.5	58.4	66.2	110	16.0	1
14.7	2	●	1470S2D	36.8	58.8	66.6	110	16.0	1
14.8	2	●	1480S2D	37.0	59.2	67.1	110	16.0	1
14.9	2	●	1490S2D	37.3	59.6	67.5	110	16.0	1
15.0	2	●	1500S2D	37.5	60.0	68.0	110	16.0	1
15.1	2	●	MDF 1510S2D	37.8	60.4	69.0	115	16.0	1
15.2	2	●	1520S2D	38.0	60.8	69.4	115	16.0	1
15.3	2	●	1530S2D	38.3	61.2	69.9	115	16.0	1
15.4	2	●	1540S2D	38.5	61.6	70.3	115	16.0	1
15.5	2	●	1550S2D	38.8	62.0	70.8	115	16.0	1
15.6	2	●	1560S2D	39.0	62.4	71.8	115	16.0	1
15.7	2	●	1570S2D	39.3	62.8	72.2	115	16.0	1
15.8	2	●	1580S2D	39.5	63.2	72.7	115	16.0	1
15.9	2	●	1590S2D	39.8	63.6	73.1	115	16.0	1
16.0	2	●	1600S2D	40.0	64.0	73.6	115	16.0	1
16.5	2	●	MDF 1650S2D	41.3	66.0	72.4	125	18.0	1
17.0	2	●	1700S2D	42.5	68.0	75.2	125	18.0	1
17.5	2	●	MDF 1750S2D	43.8	70.0	78.0	130	18.0	1
18.0	2	●	1800S2D	45.0	72.0	80.8	130	18.0	1
18.5	2	●	MDF 1850S2D	46.3	74.0	83.6	140	20.0	1
19.0	2	●	1900S2D	47.5	76.0	86.4	140	20.0	1
19.5	2	●	1950S2D	48.8	78.0	89.2	140	20.0	1
20.0	2	●	2000S2D	50.0	80.0	92.0	140	20.0	1

Grade: ACF75

Caution: Because the calculation method has been changed, the dimensions above (red text) are different from those listed in Tooling News No. 511 Rev. 15, but the specifications have not changed.

● mark: Standard stocked item

MDF-S type (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

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

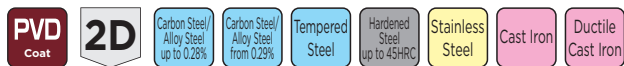
(n: Spindle Speed min⁻¹ vc: Cutting Speed m/min f: Feed Rate mm/rev)

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

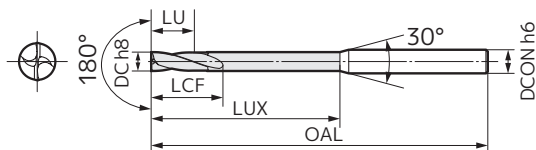
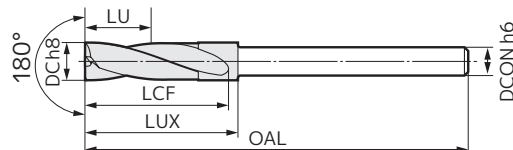
* If the machine cannot achieve the listed cutting speed due to its limitations, use the maximum speed possible.
In this case, tool life may be affected.

Min. - **Optimum** - Max.

MDF-L type Long Shank (External Coolant Supply)



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1 ($DC \leq DCON$)Fig 2 ($DC > DCON$)

Diameter $\varnothing 3.0$ to 8.5mm

Dimensions (mm)

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

Grade: ACF75

Diameter $\varnothing 8.6$ to 20.0mm

Dimensions (mm)

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

Grade: ACF75

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

Caution: Because the calculation method has been changed, the dimensions above (red text) are different from those listed in Tooling News No. 511 Rev. 15, but the specifications have not changed.

● mark: Standard stocked item

MDF-L type Long Shank (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

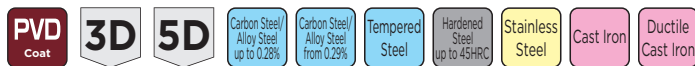
1. A prepared hole with the same diameter is needed for drilling with this tool.
2. The cutting conditions are recommended when there is a prepared hole with the same diameter.
3. The recommended hole depth is 5 x DC. The depth is measured from the highest point of the work material when drilling in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

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

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

Min. - **Optimum** - Max.

MDF-H type (Internal Coolant Supply)



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1 (3D single margin)

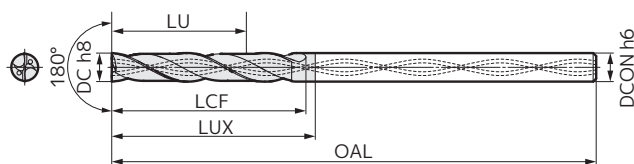
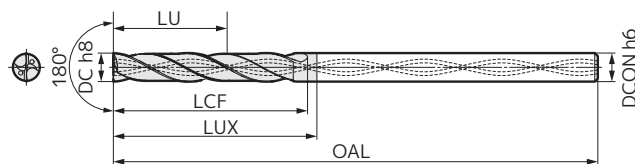


Fig 2 (5D double margin)



Diameter ø3.0 to 5.7mm

Dimensions (mm)

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

Grade: ACF75

Diameter ø5.8 to 8.5mm

Dimensions (mm)

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

Grade: ACF75

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

Caution: Because the calculation method has been changed, the dimensions above (red text) are different from those listed in Tooling News No. 511 Rev. 15, but the specifications have not changed.

● mark: Standard stocked item

MDF-H type (Internal Coolant Supply)



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1 (3D single margin)

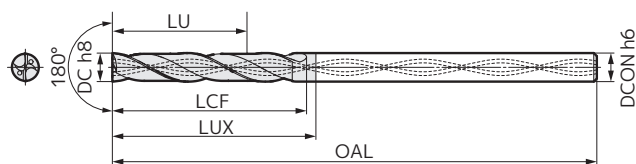
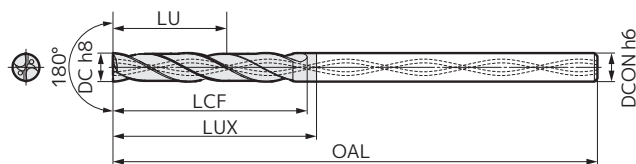


Fig 2 (5D double margin)



Diameter ø8.6 to 11.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
8.6	3	●	MDF 0860H3D	25.8	38.7	41.7	100	9.0	1
	5	●	0860H5D	44.7	57.6	60.6	127	9.0	2
8.7	3	●	MDF 0870H3D	26.2	39.2	42.2	100	9.0	1
	5	●	0870H5D	45.3	58.3	61.3	127	9.0	2
8.8	3	●	MDF 0880H3D	26.4	39.6	42.6	100	9.0	1
	5	●	0880H5D	45.8	59.0	62.0	127	9.0	2
8.9	3	●	MDF 0890H3D	26.8	40.1	43.1	100	9.0	1
	5	●	0890H5D	47.0	59.6	62.6	127	9.0	2
9.0	3	●	MDF 0900H3D	27.0	40.5	43.5	100	9.0	1
	5	●	0900H5D	46.8	60.3	63.3	127	9.0	2
9.1	3	●	MDF 0910H3D	27.4	41.0	44.0	106	10.0	1
	5	●	0910H5D	47.4	61.0	64.0	136	10.0	2
9.2	3	●	MDF 0920H3D	27.6	41.4	44.4	106	10.0	1
	5	●	0920H5D	47.8	61.6	64.6	136	10.0	2
9.3	3	●	MDF 0930H3D	28.0	41.9	44.9	106	10.0	1
	5	●	0930H5D	48.4	62.3	65.3	136	10.0	2
9.4	3	●	MDF 0940H3D	28.2	42.3	45.3	106	10.0	1
	5	●	0940H5D	48.9	63.0	66.0	136	10.0	2
9.5	3	●	MDF 0950H3D	28.6	42.8	45.8	106	10.0	1
	5	●	0950H5D	49.5	63.7	66.7	136	10.0	2
9.6	3	●	MDF 0960H3D	28.8	43.2	46.2	106	10.0	1
	5	●	0960H5D	49.9	64.3	67.3	136	10.0	2
9.7	3	●	MDF 0970H3D	29.2	43.7	46.7	106	10.0	1
	5	●	0970H5D	50.5	65.0	68.0	136	10.0	2
9.8	3	●	MDF 0980H3D	29.4	44.1	47.1	106	10.0	1
	5	●	0980H5D	51.0	65.7	68.7	136	10.0	2
9.9	3	●	MDF 0990H3D	29.8	44.6	47.6	106	10.0	1
	5	●	0990H5D	51.5	66.3	69.3	136	10.0	2
10.0	3	●	MDF 1000H3D	30.0	45.0	48.0	106	10.0	1
	5	●	1000H5D	52.0	67.0	70.0	136	10.0	2
10.1	3	●	MDF 1010H3D	30.4	45.5	48.5	116	11.0	1
	5	●	1010H5D	52.6	67.7	70.7	149	11.0	2
10.2	3	●	MDF 1020H3D	30.6	45.9	48.9	116	11.0	1
	5	●	1020H5D	53.0	68.3	71.3	149	11.0	2
10.3	3	●	MDF 1030H3D	31.0	46.4	49.4	116	11.0	1
	5	●	1030H5D	53.6	69.0	72.0	149	11.0	2
10.4	3	●	MDF 1040H3D	31.2	46.8	49.8	116	11.0	1
	5	●	1040H5D	54.1	69.7	72.7	149	11.0	2
10.5	3	●	MDF 1050H3D	31.6	47.3	50.3	116	11.0	1
	5	●	1050H5D	54.7	70.4	73.4	149	11.0	2
10.6	3	●	MDF 1060H3D	31.8	47.7	50.7	116	11.0	1
	5	●	1060H5D	55.1	71.0	74.0	149	11.0	2
10.7	3	●	MDF 1070H3D	32.2	48.2	51.2	116	11.0	1
	5	●	1070H5D	55.7	71.7	74.7	149	11.0	2
10.8	3	●	MDF 1080H3D	32.4	48.6	51.6	116	11.0	1
	5	●	1080H5D	56.2	72.4	75.4	149	11.0	2
10.9	3	●	MDF 1090H3D	32.8	49.1	52.1	116	11.0	1
	5	●	1090H5D	56.7	73.0	76.0	149	11.0	2
11.0	3	●	MDF 1100H3D	33.0	49.5	52.5	116	11.0	1
	5	●	1100H5D	57.2	73.7	76.7	149	11.0	2
11.1	3	●	MDF 1110H3D	33.4	50.0	53.0	122	12.0	1
	5	●	1110H5D	57.8	74.4	77.4	158	12.0	2
11.2	3	●	MDF 1120H3D	33.6	50.4	53.4	122	12.0	1
	5	●	1120H5D	58.2	75.0	78.0	158	12.0	2
11.3	3	●	MDF 1130H3D	34.0	50.9	53.9	122	12.0	1
	5	●	1130H5D	58.8	75.7	78.7	158	12.0	2

Grade: ACF75

Diameter ø11.4 to 16.0mm

Dimensions (mm)

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

Grade: ACF75

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

Caution: Because the calculation method has been changed, the dimensions above (red text) are different from those listed in Tooling News No. 511 Rev. 15, but the specifications have not changed.

● mark: Standard stocked item

MDF-H type (Internal Coolant Supply)

Recommended Cutting Conditions (for 3D)

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

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

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

Min. - **Optimum** - Max.

Recommended Cutting Conditions (for 5D)

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

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

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

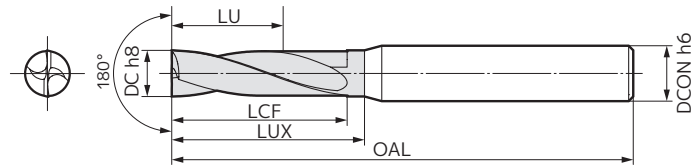
Min. - **Optimum** - Max.

MDF-A type (External Coolant Supply) *New*



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1



Diameter ø2.0 to 10.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
2.0	2	●	MDF 0200S2D-A	5.0	8.0	8.3	50	4.0	1
2.5		●	0250S2D-A	6.3	10.0	10.5	50	4.0	1
3.0		●	0300S2D-A	7.5	12.0	12.3	50	6.0	1
3.5		●	0350S2D-A	8.8	14.0	14.3	50	6.0	1
4.0	2	●	0400S2D-A	10.0	16.0	17.2	50	6.0	1
4.5		●	MDF 0450S2D-A	11.3	18.0	20.1	60	6.0	1
5.0		●	0500S2D-A	12.5	20.0	23.0	60	6.0	1
6.0		●	0600S2D-A	15.0	24.0	28.8	60	6.0	1
7.0	2	●	0700S2D-A	17.5	28.0	32.6	70	8.0	1
8.0		●	0800S2D-A	20.0	32.0	38.4	70	8.0	1
9.0		●	MDF 0900S2D-A	22.5	36.0	42.2	80	10.0	1
10.0		●	1000S2D-A	25.0	40.0	48.0	80	10.0	1

Grade: DLX1700

Recommended Cutting Conditions (for 2D)

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

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

Diameter DC (mm)	Cutting Conditions	Aluminum Alloy Casting ADC/AC	Aluminum-Duralumin based Zn-Mg based (7075)	Wrought Aluminum Alloy Mg-based (5052)
ø2.0	n	9,500	9,500	9,500
	vc	40 - 60 - 80	40 - 60 - 80	40 - 60 - 80
	f	0.03 - 0.06 - 0.10	0.01 - 0.02 - 0.03	0.03 - 0.05 - 0.08
ø4.0	n	7,800	8,000	8,800
	vc	65 - 100 - 130	80 - 100 - 130	90 - 110 - 130
	f	0.06 - 0.13 - 0.20	0.06 - 0.11 - 0.16	0.03 - 0.05 - 0.08
ø6.0	n	7,400	6,400	7,400
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.08 - 0.18 - 0.30	0.08 - 0.14 - 0.20	0.04 - 0.08 - 0.12
ø8.0	n	5,500	4,800	5,500
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.10 - 0.22 - 0.35	0.10 - 0.17 - 0.24	0.04 - 0.09 - 0.14
ø10.0	n	4,500	3,800	4,500
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.12 - 0.26 - 0.40	0.12 - 0.21 - 0.30	0.05 - 0.10 - 0.16

*If the machine cannot achieve the listed cutting speed due its limitations, use the maximum speed possible.

In this case, tool life may be affected.

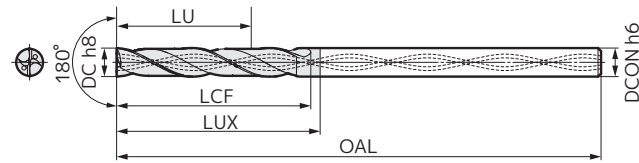
Min. - **Optimum** - Max.

MDF-A type (Internal Coolant Supply) *New*



For fitting tolerances, refer to the General Catalog [Chapter N References].

Fig 1 (3D single margin)



Diameter ø3.0 to 10.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
3.0	3	●	MDF 0300H3D-A	9.0	13.5	16.5	68	3.0	1
4.0		●	0400H3D-A	12.0	18.0	21.0	72	4.0	1
5.0		●	0500H3D-A	15.0	22.5	25.5	80	5.0	1
6.0		●	0600H3D-A	18.0	27.0	30.0	82	6.0	1
7.0		●	0700H3D-A	21.0	31.5	34.5	88	7.0	1
8.0	3	●	MDF 0800H3D-A	24.0	36.0	39.0	94	8.0	1
9.0		●	0900H3D-A	27.0	40.5	43.5	100	9.0	1
10.0		●	1000H3D-A	30.0	45.0	48.0	106	10.0	1

Grade: DLX1700

Recommended Cutting Conditions (for 3D)

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

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

Diameter DC (mm)	Cutting Conditions	Aluminum Alloy Casting ADC/AC	Aluminum-Duralumin based Zn-Mg based (7075)	Wrought Aluminum Alloy Mg-based (5052)
ø4.0	n	7,800	8,000	8,800
	vc	65 - 100 - 130	80 - 100 - 130	90 - 110 - 130
	f	0.06 - 0.13 - 0.20	0.06 - 0.11 - 0.16	0.03 - 0.05 - 0.08
ø6.0	n	7,400	6,400	7,400
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.08 - 0.21 - 0.35	0.08 - 0.15 - 0.22	0.04 - 0.09 - 0.14
ø8.0	n	5,500	4,800	5,500
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.10 - 0.25 - 0.40	0.10 - 0.19 - 0.28	0.04 - 0.10 - 0.16
ø10.0	n	4,500	3,800	4,500
	vc	90 - 140 - 200	80 - 120 - 160	90 - 140 - 200
	f	0.12 - 0.28 - 0.45	0.12 - 0.23 - 0.35	0.05 - 0.11 - 0.18

*If the machine cannot achieve the listed cutting speed due to its limitations, use the maximum speed possible.

In this case, tool life may be affected.

Min. - **Optimum** - Max.

MEMO

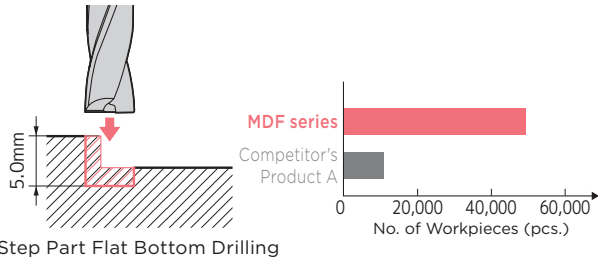
A large rectangular area filled with a uniform grid of small dots, intended for handwritten notes or a drawing.

MEMO

A large rectangular area filled with a uniform grid of small dots, intended for writing or drawing. The grid consists of 20 columns and 30 rows of dots.

Application Examples

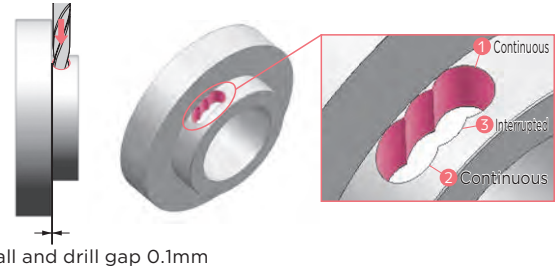
Gear Frame Component (SCM435)



Tool life 4 times that of competitors' products

Tool: MDF0500S2D (ø5.0)
Cutting Conditions: $vc = 65\text{m/min}$ $f = 0.10\text{mm/rev}$
 $vf = 414\text{mm/min}$ $H = 5\text{mm}$ (Blind) External Coolant Supply

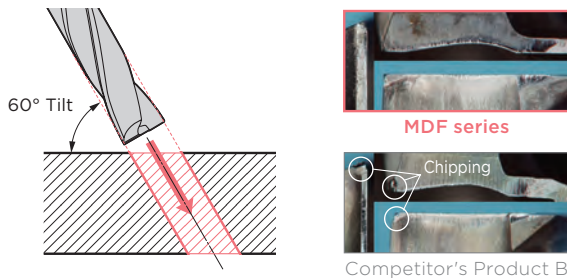
Gear Component (SCM415)



Realizes stable drilling on non-flat surfaces

Tool: MDF0600S2D (ø6.0)
Cutting Conditions: $vc = 65\text{m/min}$ $f = 0.04\text{mm/rev} \rightarrow 0.15\text{mm/rev}$
 $vf = 138 \sim 518\text{mm/min}$ $H = \text{Up to } 15\text{mm}$ (Through) External Coolant Supply

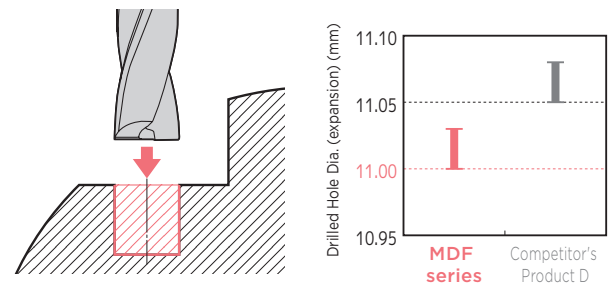
Automotive Component (S35C)



Reduces cutting edge chipping and achieves stable drilling

Tool: MDF0300S2D (ø3.0)
Cutting Conditions: $vc = 80\text{m/min}$ $f = 0.045\text{mm/rev}$
 $vf = 370\text{mm/min}$ $H = 8\text{mm}$ (Through) External Coolant Supply

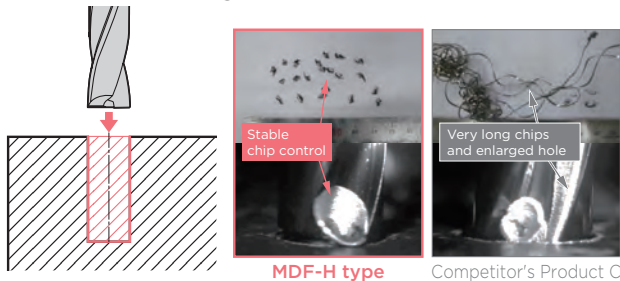
Jig Component (SCM)



Reduces cutting edge chipping and achieves stable drilling

Tool: MDF1100S2D (ø11.0)
Cutting Conditions: $vc = 60\text{m/min}$ $f = 0.20\text{mm/rev}$
 $vf = 347\text{mm/min}$ $H = 11\text{mm}$ (Blind) External Coolant Supply

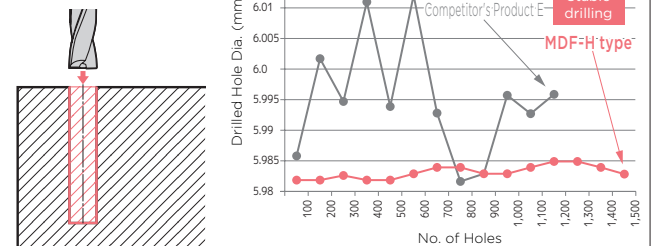
Blind-hole Drilling (S50C)



Stable chip control compared to competitor

Tool: MDF0600H3D (ø6.0)
Cutting Conditions: $vc = 75\text{m/min}$ $f = 0.10\text{mm/rev}$
 $H = 15\text{mm}$ (Blind) Internal Coolant Supply

Blind-hole Drilling (S50C)



Stable hole diameter and long tool life with double margin + internal coolant supply

Tool: MDF0600H5D (ø6.0)
Cutting Conditions: $vc = 140\text{m/min}$ $f = 0.15\text{mm/rev}$
 $H = 30\text{mm}$ (Blind) Internal Coolant Supply (*Prepared Hole: MDW0600GS2)



● Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

< SAFETY NOTES >

● Please handle with care as this product has sharp edges.
● Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

● When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.



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