

超硬コーティングドリル
Coated Carbide Drills

フラットマルチドリル **MDF**型

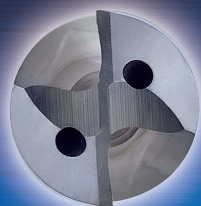
Flat MULTIDRILL MDF series 第8版

傾斜面や円筒面への 穴あけに効果的! 貫通穴出口部 バリの抑制に!

Effective for drilling in inclined and cylindrical surfaces!
Reduces burrs at hole exits



**ロングシャンク
72型番
拡充**
Long shank type
72 items expansion
ø3.0~20.0mm



内部給油式 新登場!!

198
items

Internal Coolant Supply type is Newly available!!

Size:ø0.3~16.0mm [3D][5D]





■ 概要 General Features

フラットマルチドリルMDF型は座ぐり加工の高能率化をはじめ、傾斜面や曲面への穴あけ加工などさまざまな用途でご使用いただける超硬ソリッドドリルです。

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



■ 特長・用途 Characteristics and Applications

- **先端角180°設計で様々な穴あけに対応** Applicable to various types of drilling thanks to a point angle of 180°

高能率座ぐり加工、傾斜面や円筒面などの非平面への穴あけ、断続穴あけなどに対応可能。出口側バリの抑制にも効果を発揮。
Applicable to high-efficiency spot facing, drilling in non-horizontal surfaces such as inclined and cylindrical surfaces, and interrupted drilling. Also reduces burrs at the hole exit.

- **加工の安定性向上** Improves machining stability

底面に肉厚を持たせたRSシンニングを採用し、高剛性を実現。
Achieves high rigidity by employing RS Thinning, which ensures thick web at the bottom.

- **優れた切りくず排出性能** Excellent chip evacuation

広い切りくずポケット・高品位なすくい面形状により、優れた切りくず排出性能を実現。

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

- **高い刃先強度** Excellent cutting edge strength

最適な刃先設計により高い刃先強度を実現。

Achieves excellent cutting edge strength through optimized cutting edge design.

- **ロングシャンク拡充** 拡充 Expanded lineup of long type

刃径φ3.0~20.0mmにロングシャンクを拡充、突出し長さL/D=10までの加工に対応。
Drills with long shank capable with an over hang up to L/D=10 are expanded in diameters between φ3.0 and 20.0mm.

- **内部給油対応** New New line up of drills with oil hole

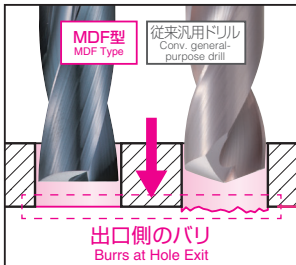
より深い穴加工を実現。

For deeper drilling.



RS THINNING
RSシンニング

■ 出口側バリの抑制 Reduction of Burrs at Hole Exit



被削材: SCM415
Work Material
使用工具: MDF0500S2D (φ5.0mm 2D)
Tool
切削条件: $v_c=65\text{m/min}$, $f=0.12\text{mm/rev}$,
Cutting Conditions
 $H=10\text{mm}$, 150穴 150 Units, Wet
設備: 立形M/C (BT40)
Equipment: Vertical Machining Centre (BT40)

抜けバリは汎用ドリルとの対比で1/2以下に抑制
Reduces exit burrs by half compared with general-purpose drills



バリ高さ Burr height: 0.18mm

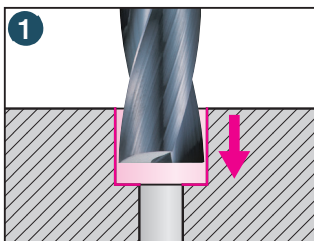
フラットマルチドリル MDF型
Flat MultiDrill MDF Type



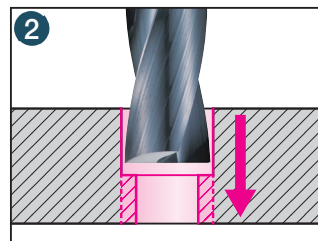
バリ高さ Burr height: 0.44mm

従来汎用ドリル
Conv. general-purpose drill

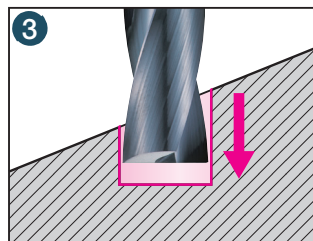
■ 加工用途 Applications



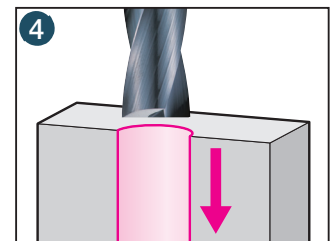
1 高能率座ぐり加工
High-efficiency spot facing



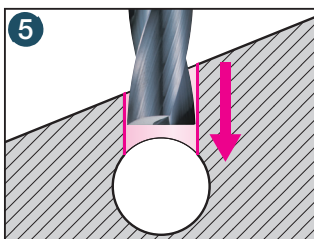
2 穴拡げ加工
Hole expansion drilling



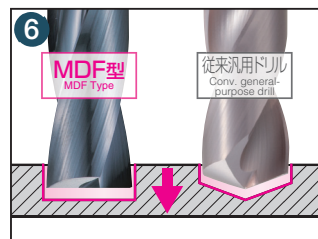
3 非平面への穴あけ加工
(傾斜面・円筒面など)
Drilling in non-horizontal surface
(inclined surface, cylindrical surface, etc.)



4 断続穴あけ加工
Interrupted drilling



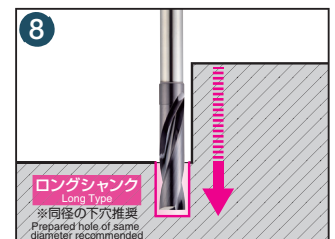
5 クロス穴加工
Cross drilling



6 薄板のタップ下穴加工
Pre-tap hole drilling in thin sheets



7 深位置への座ぐり加工
Deep spot facing



8 被削材との干渉回避
Avoiding interference with work materials

ロングシャンクタイプ(MDF-L型 2D) 長突き出し条件下でのフラット座加工、穴拡げ、バリ対策に!
Long Type (MDF-L Type 2D) For flat base drilling, hole expansion, and burr prevention in long overhang conditions!

- 深い位置のフラット座加工、ワークとの干渉回避に。
- ※ロングシャンクタイプを用いた加工には、同径の下穴、または工具径より大きいセンタリング穴が必要です。

For deep flat base drilling and to avoid interference with workpiece. Drilling that uses the long type requires a prepared hole of the same diameter or a centering hole larger than the tool diameter.

DC<6mm 段付きシャンク品
Stepped Shank Products



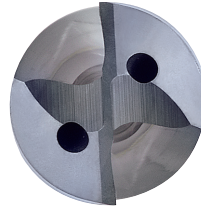
DC≥6mm 逆段付きシャンク品
Relief Shank Products



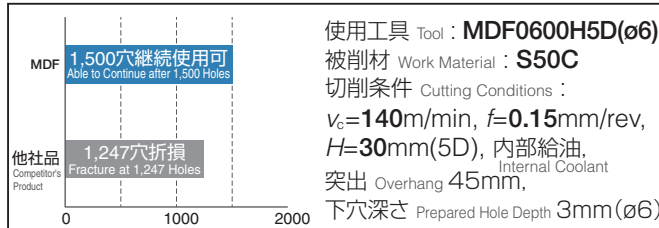
油穴付(MDF-H型 3D/5D) ~5Dの深穴用途に!
With Oil Hole (MDF-H Type 3D/5D) Up to 5D deep hole drilling!

- 内部給油対応でより深いフラット穴加工に対応。
- ※オイルホールL/D=5を用いた加工には、同径の下穴、または工具径より大きいセンタリング穴が必要です。

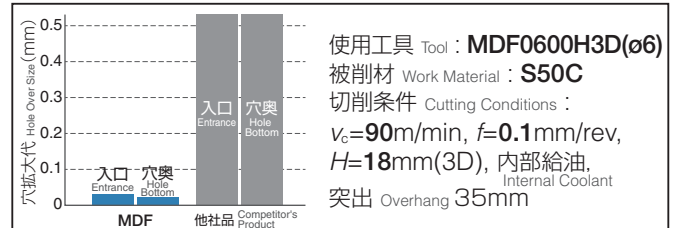
Support for internal coolant allows for deeper flat hole drilling. Drilling that uses L/D=5 oil holes requires a prepared hole of the same diameter or a centering hole larger than the tool diameter.



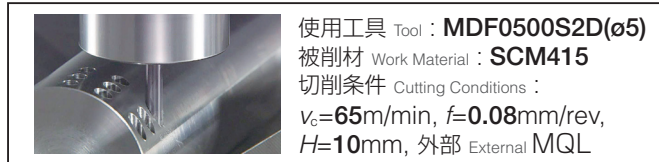
深穴座ぐり加工 Deep Spot Facing



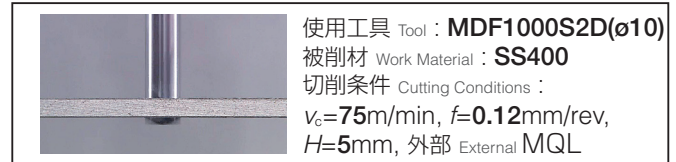
長突き出し座ぐり加工 Long Overhang Spot Facing



傾斜面の穴あけ Inclined Surface Drilling



抜け際のバリ・陣笠残り抑制 Controlling Burrs and Chips When Withdrawn



■ フラットドリル/汎用ドリル/エンドミルの使い分け Usage of Flat Drills, General-Purpose Drills and Endmills

工具 Tool	フラットドリル Using Flat Drills MDF型 MDF Type	汎用ドリル General-Purpose Drill GS/HGS型 GS/HGS Types	座ぐり加工用エンドミル Endmill for Spot Facing GSXMILLスロット GSX MILL Slot
穴底形状 Hole Bottom Shape	凸形状(180°) Convex Shape (180°) ほぼフラット(凹形状) Nearly Flat (Concave Shape) 0-0.5°	凸形状(135°) Convex Shape (135°) 凹形状 Concave Shape	凹形状(中低2~3°) Concave Shape (2° to 3° concavity) 凸形状(下穴加工への使用不可) Convex Shape (Cannot be used for prepared hole drilling) 2-3°
平面への穴あけ Drilling in Horizontal Surfaces	汎用ドリル比 1/2 程度の送り Feed rate approximately half of a general-purpose drill	最適 Best	1D以内 低送りに限る 汎用ドリル比 1/5 以下の送り Within 1D, limited to low feed rate Feed rate one-fifth or lower of a general-purpose drill
非平面への穴あけ Drilling in Non-Horizontal Surfaces	最適(2D以内を推奨) Optimal (Within 2D is recommended)	不可 Unusable	1D以内 低送りに限る フラットドリル比 1/2 以下の送り Within 1D, limited to low feed rate Feed rate one-two or lower of a Flat Drill
横送り Traversing	不可 Unusable	不可 Unusable	最適 Best

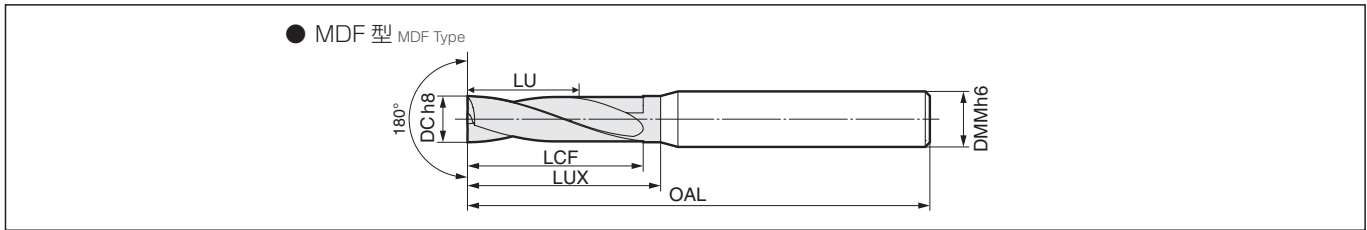
■ シリーズ構成 Series

給油方法 Coolant Supply	型式 Type	刃径範囲(mm) Diameter Range	穴深さ(L/D) Hole Depth (L/D)	内容 Remarks
外部 External	MDF□□□□S2D	φ0.3~20.0	~2	132型番在庫 132 items in stock
	MDF□□□□L2D	φ3.0~20.0	~2	107型番在庫 107 items in stock
内部 Internal	MDF□□□□H3D	φ3.0~16.0	~3	99型番在庫 99 items in stock
	MDF□□□□H5D	φ3.0~16.0	~5	99型番在庫 99 items in stock

外部給油式
External Coolant Supply

(MDF型)
MDF Type

炭素鋼 Carbon Steel ~0.2%	合金鋼 Alloy Steel 0.2%	調質鋼 Tempered Steel	高硬度鋼 High Speed Steel ~45HRC-48HRC	ステン レス鋼 Stainless Steel	Ti合金 Ti Alloy	耐熱鋼 Heat Resistant Steel	鋳鉄 Cast Iron	タタイル 鋳鉄 Cast Iron	アルミ 合金 Aluminum Alloy	銅合金 Copper Alloy	複合材 CFRP Composite
◎	◎	◎	○	○	○	○	○	○	○	○	○



■本体 刃径 φ0.3 ~ 5.5mm
Body Diameter

刃径 Diameter DC (mm)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク Shank DMM (mm)
			有効長 Effective Length LU	フルート長 Flute Length LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
0.3*	●	MDF 0030S2D*	0.9	1.0	1.3	40	3.0
0.4*	●	0040S2D*	1.2	1.4	1.8	40	3.0
0.5	●	MDF 0050S2D	1.5	2.0	2.2	40	3.0
0.6	●	0060S2D	1.8	2.4	2.6	40	3.0
0.7	●	0070S2D	2.1	2.8	3.1	40	3.0
0.8	●	0080S2D	2.4	3.2	3.5	40	3.0
0.9	●	0090S2D	2.7	3.6	4.0	40	3.0
1.0	●	MDF 0100S2D	3.0	4.0	4.4	45	3.0
1.1	●	0110S2D	3.3	4.4	4.8	45	3.0
1.2	●	0120S2D	3.6	4.8	5.3	45	3.0
1.3	●	0130S2D	3.9	5.2	5.7	45	3.0
1.4	●	0140S2D	4.2	5.6	6.2	45	3.0
1.5	●	MDF 0150S2D	4.5	6.0	6.6	45	3.0
1.6	●	0160S2D	4.8	6.4	7.0	45	3.0
1.7	●	0170S2D	5.1	6.8	7.5	45	3.0
1.8	●	0180S2D	5.4	7.2	7.9	45	3.0
1.9	●	0190S2D	5.7	7.6	8.4	45	3.0
2.0	●	MDF 0200S2D	6.0	8.0	8.8	50	4.0
2.1	●	0210S2D	6.3	8.4	9.2	50	4.0
2.2	●	0220S2D	6.6	8.8	9.7	50	4.0
2.3	●	0230S2D	6.9	9.2	10.1	50	4.0
2.4	●	0240S2D	7.2	9.6	10.6	50	4.0
2.5	●	MDF 0250S2D	7.5	10.0	11.0	50	4.0
2.6	●	0260S2D	7.8	10.4	11.4	50	4.0
2.7	●	0270S2D	8.1	10.8	11.9	50	4.0
2.8	●	0280S2D	8.4	11.2	12.3	50	4.0
2.9	●	0290S2D	8.7	11.6	12.8	50	4.0
3.0	●	MDF 0300S2D	9.0	12.0	13.2	50	6.0
3.1	●	0310S2D	9.3	12.4	13.6	50	6.0
3.2	●	0320S2D	9.6	12.8	14.1	50	6.0
3.3	●	0330S2D	9.9	13.2	14.5	50	6.0
3.4	●	0340S2D	10.2	13.6	15.0	50	6.0
3.5	●	0350S2D	10.5	14.0	15.4	50	6.0
3.6	●	MDF 0360S2D	10.8	14.4	15.8	50	6.0
3.7	●	0370S2D	11.1	14.8	16.3	50	6.0
3.8	●	0380S2D	11.4	15.2	16.7	50	6.0
3.9	●	0390S2D	11.7	15.6	17.2	50	6.0
4.0	●	0400S2D	12.0	16.0	17.6	50	6.0
4.1	●	MDF 0410S2D	12.3	16.4	18.0	60	6.0
4.2	●	0420S2D	12.6	16.8	18.5	60	6.0
4.3	●	0430S2D	12.9	17.2	18.9	60	6.0
4.4	●	0440S2D	13.2	17.6	19.4	60	6.0
4.5	●	0450S2D	13.5	18.0	19.8	60	6.0
4.6	●	MDF 0460S2D	13.8	18.4	20.2	60	6.0
4.7	●	0470S2D	14.1	18.8	20.7	60	6.0
4.8	●	0480S2D	14.4	19.2	21.1	60	6.0
4.9	●	0490S2D	14.7	19.6	21.6	60	6.0
5.0	●	0500S2D	15.0	20.0	22.0	60	6.0
5.1	●	MDF 0510S2D	15.3	20.4	22.4	60	6.0
5.2	●	0520S2D	15.6	20.8	22.9	60	6.0
5.3	●	0530S2D	15.9	21.2	23.3	60	6.0
5.4	●	0540S2D	16.2	21.6	23.8	60	6.0
5.5	●	0550S2D	16.5	22.0	24.2	60	6.0

■本体 刃径 φ5.6 ~ 11.0mm
Body Diameter

刃径 Diameter DC (mm)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク Shank DMM (mm)
			有効長 Effective Length LU	フルート長 Flute Length LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
5.6	●	MDF 0560S2D	16.8	22.4	24.6	60	6.0
5.7	●	0570S2D	17.1	22.8	25.1	60	6.0
5.8	●	0580S2D	17.4	23.2	25.5	60	6.0
5.9	●	0590S2D	17.7	23.6	26.0	60	6.0
6.0	●	0600S2D	18.0	24.0	26.4	60	6.0
6.1	●	MDF 0610S2D	18.3	24.4	26.8	70	8.0
6.2	●	0620S2D	18.6	24.8	27.3	70	8.0
6.3	●	0630S2D	18.9	25.2	27.7	70	8.0
6.4	●	0640S2D	19.2	25.6	28.2	70	8.0
6.5	●	0650S2D	19.5	26.0	28.6	70	8.0
6.6	●	MDF 0660S2D	19.8	26.4	29.0	70	8.0
6.7	●	0670S2D	20.1	26.8	29.5	70	8.0
6.8	●	0680S2D	20.4	27.2	29.9	70	8.0
6.9	●	0690S2D	20.7	27.6	30.4	70	8.0
7.0	●	0700S2D	21.0	28.0	30.8	70	8.0
7.1	●	MDF 0710S2D	21.3	28.4	31.2	70	8.0
7.2	●	0720S2D	21.6	28.8	31.7	70	8.0
7.3	●	0730S2D	21.9	29.2	32.1	70	8.0
7.4	●	0740S2D	22.2	29.6	32.6	70	8.0
7.5	●	0750S2D	22.5	30.0	33.0	70	8.0
7.6	●	MDF 0760S2D	22.8	30.4	33.4	70	8.0
7.7	●	0770S2D	23.1	30.8	33.9	70	8.0
7.8	●	0780S2D	23.4	31.2	34.3	70	8.0
7.9	●	0790S2D	23.7	31.6	34.8	70	8.0
8.0	●	0800S2D	24.0	32.0	35.2	70	8.0
8.1	●	MDF 0810S2D	24.3	32.4	35.6	80	10.0
8.2	●	0820S2D	24.6	32.8	36.1	80	10.0
8.3	●	0830S2D	24.9	33.2	36.5	80	10.0
8.4	●	0840S2D	25.2	33.6	37.0	80	10.0
8.5	●	0850S2D	25.5	34.0	37.4	80	10.0
8.6	●	MDF 0860S2D	25.8	34.4	37.8	80	10.0
8.7	●	0870S2D	26.1	34.8	38.3	80	10.0
8.8	●	0880S2D	26.4	35.2	38.7	80	10.0
8.9	●	0890S2D	26.7	35.6	39.2	80	10.0
9.0	●	0900S2D	27.0	36.0	39.6	80	10.0
9.1	●	MDF 0910S2D	27.3	36.4	40.0	80	10.0
9.2	●	0920S2D	27.6	36.8	40.5	80	10.0
9.3	●	0930S2D	27.9	37.2	40.9	80	10.0
9.4	●	0940S2D	28.2	37.6	41.4	80	10.0
9.5	●	0950S2D	28.5	38.0	41.8	80	10.0
9.6	●	MDF 0960S2D	28.8	38.4	42.2	80	10.0
9.7	●	0970S2D	29.1	38.8	42.7	80	10.0
9.8	●	0980S2D	29.4	39.2	43.1	80	10.0
9.9	●	0990S2D	29.7	39.6	43.6	80	10.0
10.0	●	1000S2D	30.0	40.0	44.0	80	10.0
10.1	●	MDF 1010S2D	30.3	40.4	44.4	90	12.0
10.2	●	1020S2D	30.6	40.8	44.9	90	12.0
10.3	●	1030S2D	30.9	41.2	45.3	90	12.0
10.4	●	1040S2D	31.2	41.6	45.8	90	12.0
10.5	●	1050S2D	31.5	42.0	46.2	90	12.0
10.6	●	MDF 1060S2D	31.8	42.4	46.6	90	12.0
10.7	●	1070S2D	32.1	42.8	47.1	90	12.0
10.8	●	1080S2D	32.4	43.2	47.5	90	12.0
10.9	●	1090S2D	32.7	43.6	48.0	90	12.0
11.0	●	1100S2D	33.0	44.0	48.4	90	12.0

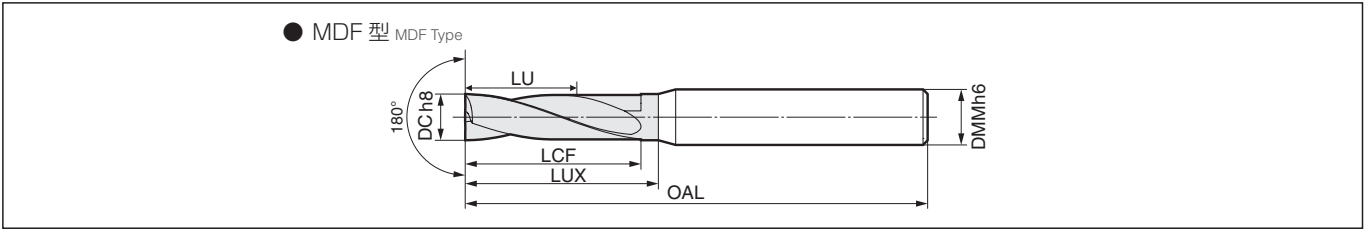
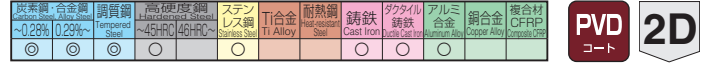
* RS シンニングはφ0.5mm以上に採用しております。
RS Thinning is used for φ0.5mm and larger.

材種 ACF75
Grade

材種 ACF75
Grade

外部給油式
External Coolant Supply

(MDF型)
MDF Type



本体 刃径 ϕ 11.1 ~ 20.0mm
Body Diameter

刃径 Diameter DC (mm)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク Shank DMM (mm)
			有効長 Effective Length LU	フルート長 Flute Length LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
11.1	●	MDF 1110S2D	33.3	44.4	48.8	90	12.0
11.2	●	1120S2D	33.6	44.8	49.3		
11.3	●	1130S2D	33.9	45.2	49.7		
11.4	●	1140S2D	34.2	45.6	50.2		
11.5	●	1150S2D	34.5	46.0	50.6		
11.6	●	MDF 1160S2D	34.8	46.4	51.0	90	12.0
11.7	●	1170S2D	35.1	46.8	51.5		
11.8	●	1180S2D	35.4	47.2	51.9		
11.9	●	1190S2D	35.7	47.6	52.4		
12.0	●	1200S2D	36.0	48.0	52.8		
12.5	●	MDF 1250S2D	37.5	50.0	54.0	100	14.0
13.0	●	1300S2D	39.0	52.0	56.8		
13.5	●	1350S2D	40.5	54.0	59.6		
14.0	●	1400S2D	42.0	56.0	62.4		
14.5	●	MDF 1450S2D	43.5	58.0	65.2	110	16.0
15.0	●	1500S2D	45.0	60.0	68.0		
15.5	●	1550S2D	46.5	62.0	70.8		
16.0	●	1600S2D	48.0	64.0	73.6	115	18.0
16.5	●	MDF 1650S2D	49.5	66.0	72.4		
17.0	●	1700S2D	51.0	68.0	75.2		
17.5	●	1750S2D	52.5	70.0	78.0	130	20.0
18.0	●	1800S2D	54.0	72.0	80.8		
18.5	●	MDF 1850S2D	55.5	74.0	83.6		
19.0	●	1900S2D	57.0	76.0	86.4	140	20.0
19.5	●	1950S2D	58.5	78.0	89.2		
20.0	●	2000S2D	60.0	80.0	92.0		

材種 ACF75
Grade

推奨切削条件 Recommended Cutting Conditions

1. 推奨穴深さは2×DCです。傾斜面加工時はワーク最上部からの深さです。
2. 切削条件は平面への穴あけ時の推奨です。
3. 傾斜面に対する穴加工時は、傾斜角度により送り速度を調整してください。
4. 傾斜角度が30°以下の場合、送り速度を70%以下に設定してください。
5. 傾斜角度が30°を超える場合は、送り速度を50%以下に設定してください。
6. 本製品は穴あけ加工用工具です。横送りやヘリカル等の加工はできません。

1. The recommended hole depth is 2 x DC. The depth is measured from the highest point of the work when 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 on 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 traversing or helical milling.

(v_c : 切削速度 Cutting Speed m/min f : 送り量 Feed Rate mm/rev)

刃径 Diameter DC (mm)	切削 条件 Cutting Conditions	軟鋼/一般鋼 Soft Steel/General Steel (~250HB)	合金鋼 Alloy Steel (~300HB)	高硬度材 Hardened Steel (~50HRC)	ステンレス鋼 Stainless Steel (~200HB)	ねずみ鋳鉄 Gray Cast Iron FC250	ダクタイル鋳鉄 Ductile Cast Iron FCD450	アルミニウム 合金 Aluminum Alloy
~ ϕ 0.5	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
~ ϕ 1.0	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
~ ϕ 2.0	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
~ ϕ 4.0	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
~ ϕ 6.0	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
~ ϕ 8.0	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
~ ϕ 10.0	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
~ ϕ 12.0	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
~ ϕ 16.0	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
~ ϕ 20.0	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

下限值—推奨値—上限値
Min. - Optimum - Max.

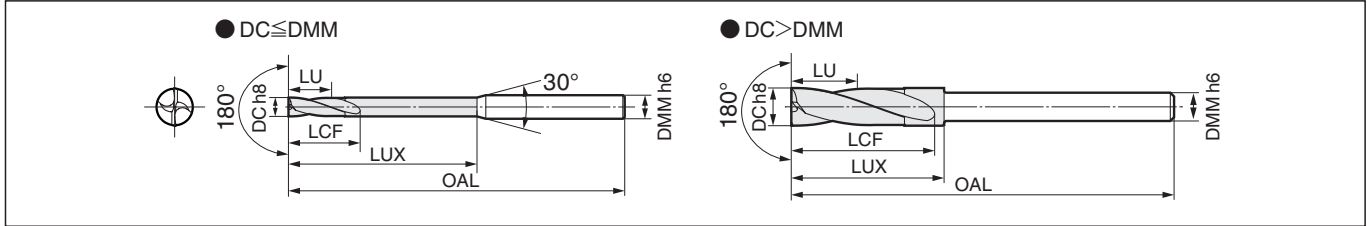
外部給油式 (MDF-L型)

External Coolant Supply

(MDF-L型)

MDF-L Type

炭素鋼 Carbon Steel	合金鋼 Alloy Steel	調質鋼 Tempered Steel	高硬度鋼 High Speed Steel ~45HRC ~48HRC	ステンレス鋼 Stainless Steel	Ti合金 Ti Alloy	耐熱鋼 Heat Resistant Steel	鋳鉄 Cast Iron	タタイル タタイル Cast Iron	アルミ Aluminum Alloy	銅合金 Copper Alloy	複合材 CFRP Composite
◎	◎	◎	○	○	○	○	○	○	○	○	○



■本体 刃径φ3.0 ~ 8.5mm

Body Diameter

刃径 Diameter DC (mm)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク Shank DMM (mm)
			有効長 LU	フルート長 LCF	首下長 LUX	全長 OAL	
3.0	●	MDF 0300L2D	9.0	13.5	30.0	100	6.0
3.1	●	0310L2D	9.3	14.0	31.0		
3.2	●	0320L2D	9.6	14.4	32.0		
3.3	●	0330L2D	9.9	14.9	33.0		
3.4	●	0340L2D	10.2	15.3	34.0		
3.5	●	0350L2D	10.5	15.8	35.0		
3.6	●	MDF 0360L2D	10.8	16.2	36.0	100	6.0
3.7	●	0370L2D	11.1	16.7	37.0		
3.8	●	0380L2D	11.4	17.1	38.0		
3.9	●	0390L2D	11.7	17.6	39.0		
4.0	●	0400L2D	12.0	18.0	40.0		
4.1	●	MDF 0410L2D	12.3	18.5	41.0	100	6.0
4.2	●	0420L2D	12.6	18.9	42.0		
4.3	●	0430L2D	12.9	19.4	43.0		
4.4	●	0440L2D	13.2	19.8	44.0		
4.5	●	0450L2D	13.5	20.3	45.0		
4.6	●	MDF 0460L2D	13.8	20.7	46.0	100	6.0
4.7	●	0470L2D	14.1	21.2	47.0		
4.8	●	0480L2D	14.4	21.6	48.0		
4.9	●	0490L2D	14.7	22.1	49.0		
5.0	●	0500L2D	15.0	22.5	50.0		
5.1	●	MDF 0510L2D	15.3	23.0	51.0	110	6.0
5.2	●	0520L2D	15.6	23.4	52.0		
5.3	●	0530L2D	15.9	23.9	53.0		
5.4	●	0540L2D	16.2	24.3	54.0		
5.5	●	0550L2D	16.5	24.8	55.0		
5.6	●	MDF 0560L2D	16.8	25.2	56.0	110	6.0
5.7	●	0570L2D	17.1	25.7	57.0		
5.8	●	0580L2D	17.4	26.1	58.0		
5.9	●	0590L2D	17.7	26.6	59.0		
6.0	●	MDF 0600L2D-S5	18.0	27.0	30.0		
6.0	●	0600L2D	18.0	27.0	60.0	110	6.0
6.1	●	MDF 0610L2D	18.3	27.5	30.5	120	6.0
6.2	●	0620L2D	18.6	27.9	30.9		
6.3	●	0630L2D	18.9	28.4	31.4		
6.4	●	0640L2D	19.2	28.8	31.8		
6.5	●	0650L2D	19.5	29.3	32.3		
6.6	●	MDF 0660L2D	19.8	29.7	32.7	120	6.0
6.7	●	0670L2D	20.1	30.2	33.2		
6.8	●	0680L2D	20.4	30.6	33.6		
6.9	●	0690L2D	20.7	31.1	34.1		
7.0	●	0700L2D	21.0	31.5	34.5		
7.1	●	MDF 0710L2D	21.3	32.0	35.0	130	6.0
7.2	●	0720L2D	21.6	32.4	35.4		
7.3	●	0730L2D	21.9	32.9	35.9		
7.4	●	0740L2D	22.2	33.3	36.3		
7.5	●	0750L2D	22.5	33.8	36.8		
7.6	●	MDF 0760L2D	22.8	34.2	37.2	130	6.0
7.7	●	0770L2D	23.1	34.7	37.7		
7.8	●	0780L2D	23.4	35.1	38.1		
7.9	●	0790L2D	23.7	35.6	38.6		
8.0	●	MDF 0800L2D-S6	24.0	36.0	39.0		
8.0	●	MDF 0800L2D	24.0	36.0	80.0	130	8.0
8.1	●	MDF 0810L2D	24.3	36.5	39.5	140	8.0
8.2	●	0820L2D	24.6	36.9	39.9		
8.3	●	0830L2D	24.9	37.4	40.4		
8.4	●	0840L2D	25.2	37.8	40.8		
8.5	●	0850L2D	25.5	38.3	41.3		

材種 ACF75
Grade

■本体 刃径φ8.6 ~ 20.0mm

Body Diameter

刃径 Diameter DC (mm)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク Shank DMM (mm)		
			有効長 LU	フルート長 LCF	首下長 LUX	全長 OAL			
8.6	●	MDF 0860L2D	25.8	38.7	41.7	140	8.0		
8.7	●	0870L2D	26.1	39.2	42.2				
8.8	●	0880L2D	26.4	39.6	42.6				
8.9	●	0890L2D	26.7	40.1	43.1				
9.0	●	0900L2D	27.0	40.5	43.5				
9.1	●	MDF 0910L2D	27.3	41.0	44.0	150	8.0		
9.2	●	0920L2D	27.6	41.4	44.4				
9.3	●	0930L2D	27.9	41.9	44.9				
9.4	●	0940L2D	28.2	42.3	45.3				
9.5	●	0950L2D	28.5	42.8	45.8				
9.6	●	MDF 0960L2D	28.8	43.2	46.2	150	8.0		
9.7	●	0970L2D	29.1	43.7	46.7				
9.8	●	0980L2D	29.4	44.1	47.1				
9.9	●	0990L2D	29.7	44.6	47.6				
10.0	●	MDF 1000L2D-S8	30.0	45.0	48.0			150	8.0
10.0	●	MDF 1000L2D	30.0	45.0	100.0	150	10.0		
10.1	●	MDF 1010L2D	30.3	45.5	48.5	160	10.0		
10.2	●	1020L2D	30.6	45.9	48.9				
10.3	●	1030L2D	30.9	46.4	49.4				
10.4	●	1040L2D	31.2	46.8	49.8				
10.5	●	1050L2D	31.5	47.3	50.3				
10.6	●	MDF 1060L2D	31.8	47.7	50.7	160	10.0		
10.7	●	1070L2D	32.1	48.2	51.2				
10.8	●	1080L2D	32.4	48.6	51.6				
10.9	●	1090L2D	32.7	49.1	52.1				
11.0	●	1100L2D	33.0	49.5	52.5				
11.1	●	MDF 1110L2D	33.3	50.0	53.0	170	10.0		
11.2	●	1120L2D	33.6	50.4	53.4				
11.3	●	1130L2D	33.9	50.9	53.9				
11.4	●	1140L2D	34.2	51.3	54.3				
11.5	●	1150L2D	34.5	51.8	54.8				
11.6	●	MDF 1160L2D	34.8	52.2	55.2	170	10.0		
11.7	●	1170L2D	35.1	52.7	55.7				
11.8	●	1180L2D	35.4	53.1	56.1				
11.9	●	1190L2D	35.7	53.6	56.6				
12.0	●	MDF 1200L2D-S10	36.0	54.0	57.0			170	10.0
12.0	●	MDF 1200L2D	36.0	54.0	120.0	170	12.0		
12.5	●	MDF 1250L2D	37.5	56.3	59.3	180	12.0		
13.0	●	1300L2D	39.0	58.5	61.5				
13.5	●	1350L2D	40.5	60.8	63.8				
14.0	●	MDF 1400L2D-S12	42.0	63.0	66.0			190	12.0
14.0	●	MDF 1400L2D	42.0	63.0	140.0			190	14.0
14.5	●	MDF 1450L2D	43.5	65.3	68.3	200	14.0		
15.0	●	1500L2D	45.0	67.5	70.5				
15.5	●	1550L2D	46.5	69.8	72.8				
16.0	●	MDF 1600L2D-S14	48.0	72.0	75.0			210	14.0
16.0	●	MDF 1600L2D	48.0	72.0	160.0			210	16.0
16.5	●	MDF 1650L2D	49.5	74.3	77.3	220	16.0		
17.0	●	1700L2D	51.0	76.5	79.5				
17.5	●	1750L2D	52.5	78.8	81.8				
18.0	●	MDF 1800L2D-S16	54.0	81.0	84.0			230	16.0
18.0	●	MDF 1800L2D	54.0	81.0	180.0			230	18.0
18.5	●	MDF 1850L2D	55.5	83.3	86.3	240	18.0		
19.0	●	1900L2D	57.0	85.5	88.5				
19.5	●	1950L2D	58.5	87.8	90.8				
20.0	●	MDF 2000L2D-S18	60.0	90.0	93.0			250	18.0
20.0	●	MDF 2000L2D	60.0	90.0	200.0			250	20.0

材種 ACF75
Grade

●印：標準在庫品（拡充品） ●mark: Standard stocked item (expanded item)

本工具を用いた加工には、同径の下穴、又は工具径より大きいセンタリング穴が必要です。
Drilling that uses this tool requires a prepared hole of the same diameter or a centering hole larger than the tool diameter.



■ 推奨切削条件 (MDF-L型 2D用) Recommended Cutting Conditions (MDF-L Type 2D)

1. 本工具を用いた加工には、同径の下穴が必要です。
2. 切削条件は同径の下穴がある場合の推奨です。
3. 推奨穴深さは5×DCです。傾斜面加工時はワーク最上部からの深さです。
4. 本製品は穴あけ加工用工具です。横送りやヘリカル等の加工はできません。

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

(v_c : 切削速度 Cutting Speed m/min f : 送り量 Feed Rate mm/rev)

刃径 Diameter DC (mm)	切削 条件 Cutting Conditions	軟鋼/一般鋼 Soft Steel/General Steel (~250HB)	合金鋼 Alloy Steel (~300HB)	高硬度材 Hardened Steel (~50HRC)	ステンレス鋼 Stainless Steel (~200HB)	ねずみ鋳鉄 Gray Cast Iron FC250	ダクタイル鋳鉄 Ductile Cast Iron FCD450	アルミニウム 合金 Aluminum Alloy
~φ4.0	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
~φ6.0	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
~φ8.0	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
~φ10.0	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
~φ12.0	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
~φ16.0	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
~φ20.0	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

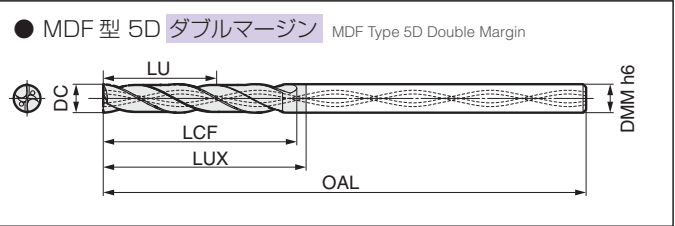
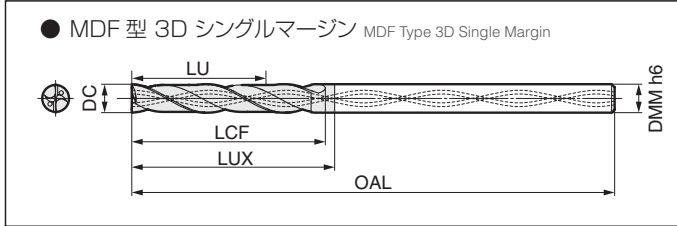
下限値—推奨値—上限値
Min. - Optimum - Max.

内部給油式
Internal Coolant Supply

(MDF-H型)
MDF-H Type

軟鋼・合金鋼 Mild Steel, Alloy Steel	調質鋼 Tempered Steel	高硬度鋼 High Hardness Steel	ステンレス鋼 Stainless Steel	Ti合金 Ti Alloy	耐熱鋼 Heat Resistant Steel	鋳鉄 Cast Iron	ダクタイル鋳鉄 Ductile Cast Iron	アルミ合金 Aluminum Alloy	銅合金 Copper Alloy	複合材 CFRP (Carbon Fiber Reinforced Plastic)
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

PVD コート **3D** **5D**



■本体 刃径 φ3.0 ~ 5.7mm
Body Diameter

刃径 Diameter DC (mm)	穴深さ Hole Depth (L/D)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク径 Shank DMM (mm)
				有効長 Effective Length LU	フルート長 Flute Length LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
3.0	3	●	MDF 0300H3D	12.0	13.5	16.5	68	3
	5	●	0300H5D	18.0	20.1	23.1	78	
3.1	3	●	MDF 0310H3D	12.4	14.0	17.0	72	4
	5	●	0310H5D	18.6	20.8	23.8	86	
3.2	3	●	0320H3D	12.8	14.4	17.4	72	4
	5	●	0320H5D	19.2	21.4	24.4	86	
3.3	3	●	0330H3D	13.2	14.9	17.9	72	4
	5	●	0330H5D	19.8	22.1	25.1	86	
3.4	3	●	0340H3D	13.6	15.3	18.3	72	4
	5	●	0340H5D	20.4	22.8	25.8	86	
3.5	3	●	0350H3D	14.0	15.8	18.8	72	4
	5	●	0350H5D	21.0	23.5	26.5	86	
3.6	3	●	MDF 0360H3D	14.4	16.2	19.2	72	4
	5	●	0360H5D	21.6	24.1	27.1	86	
3.7	3	●	0370H3D	14.8	16.7	19.7	72	4
	5	●	0370H5D	22.2	24.8	27.8	86	
3.8	3	●	0380H3D	15.2	17.1	20.1	72	4
	5	●	0380H5D	22.8	25.5	28.5	86	
3.9	3	●	0390H3D	15.6	17.6	20.6	72	4
	5	●	0390H5D	23.4	26.1	29.1	86	
4.0	3	●	0400H3D	16.0	18.0	21.0	72	4
	5	●	0400H5D	24.0	26.8	29.8	86	
4.1	3	●	MDF 0410H3D	16.4	18.5	21.5	80	5
	5	●	0410H5D	24.6	27.5	30.5	98	
4.2	3	●	0420H3D	16.8	18.9	21.9	80	5
	5	●	0420H5D	25.2	28.1	31.1	98	
4.3	3	●	0430H3D	17.2	19.4	22.4	80	5
	5	●	0430H5D	25.8	28.8	31.8	98	
4.4	3	●	0440H3D	17.6	19.8	22.8	80	5
	5	●	0440H5D	26.4	29.5	32.5	98	
4.5	3	●	0450H3D	18.0	20.3	23.3	80	5
	5	●	0450H5D	27.0	30.2	33.2	98	
4.6	3	●	MDF 0460H3D	18.4	20.7	23.7	80	5
	5	●	0460H5D	27.6	30.8	33.8	98	
4.7	3	●	0470H3D	18.8	21.2	24.2	80	5
	5	●	0470H5D	28.2	31.5	34.5	98	
4.8	3	●	0480H3D	19.2	21.6	24.6	80	5
	5	●	0480H5D	28.8	32.2	35.2	98	
4.9	3	●	0490H3D	19.6	22.1	25.1	80	5
	5	●	0490H5D	29.4	32.8	35.8	98	
5.0	3	●	0500H3D	20.0	22.5	25.5	80	5
	5	●	0500H5D	30.0	33.5	36.5	98	
5.1	3	●	MDF 0510H3D	20.4	23.0	26.0	82	6
	5	●	0510H5D	30.6	34.2	37.2	100	
5.2	3	●	0520H3D	20.8	23.4	26.4	82	6
	5	●	0520H5D	31.2	34.8	37.8	100	
5.3	3	●	0530H3D	21.2	23.9	26.9	82	6
	5	●	0530H5D	31.8	35.5	38.5	100	
5.4	3	●	0540H3D	21.6	24.3	27.3	82	6
	5	●	0540H5D	32.4	36.2	39.2	100	
5.5	3	●	0550H3D	22.0	24.8	27.8	82	6
	5	●	0550H5D	33.0	36.9	39.9	100	
5.6	3	●	MDF 0560H3D	22.4	25.2	28.2	82	6
	5	●	0560H5D	33.6	37.5	40.5	100	
5.7	3	●	0570H3D	22.8	25.7	28.7	82	6
	5	●	0570H5D	34.2	38.2	41.2	100	

材種 ACF75
Grade

■本体 刃径 φ5.8 ~ 8.5mm
Body Diameter

刃径 Diameter DC (mm)	穴深さ Hole Depth (L/D)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク径 Shank DMM (mm)
				有効長 Effective Length LU	フルート長 Flute Length LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
5.8	3	●	MDF 0580H3D	23.2	26.1	29.1	82	6
	5	●	0580H5D	34.8	38.9	41.9	100	
5.9	3	●	0590H3D	23.6	26.6	29.6	82	6
	5	●	0590H5D	35.4	39.5	42.5	100	
6.0	3	●	0600H3D	24.0	27.0	30.0	82	6
	5	●	0600H5D	36.0	40.2	43.2	100	
6.1	3	●	MDF 0610H3D	24.4	27.5	30.5	88	7
	5	●	0610H5D	36.6	40.9	43.9	109	
6.2	3	●	0620H3D	24.8	27.9	30.9	88	7
	5	●	0620H5D	37.2	41.5	44.5	109	
6.3	3	●	0630H3D	25.2	28.4	31.4	88	7
	5	●	0630H5D	37.8	42.2	45.2	109	
6.4	3	●	0640H3D	25.6	28.8	31.8	88	7
	5	●	0640H5D	38.4	42.9	45.9	109	
6.5	3	●	0650H3D	26.0	29.3	32.3	88	7
	5	●	0650H5D	39.0	43.6	46.6	109	
6.6	3	●	MDF 0660H3D	26.4	29.7	32.7	88	7
	5	●	0660H5D	39.6	44.2	47.2	109	
6.7	3	●	0670H3D	26.8	30.2	33.2	88	7
	5	●	0670H5D	40.2	44.9	47.9	109	
6.8	3	●	0680H3D	27.2	30.6	33.6	88	7
	5	●	0680H5D	40.8	45.6	48.6	109	
6.9	3	●	0690H3D	27.6	31.1	34.1	88	7
	5	●	0690H5D	41.4	46.2	49.2	109	
7.0	3	●	0700H3D	28.0	31.5	34.5	88	7
	5	●	0700H5D	42.0	46.9	49.9	109	
7.1	3	●	MDF 0710H3D	28.4	32.0	35.0	94	8
	5	●	0710H5D	42.6	47.6	50.6	118	
7.2	3	●	0720H3D	28.8	32.4	35.4	94	8
	5	●	0720H5D	43.2	48.2	51.2	118	
7.3	3	●	0730H3D	29.2	32.9	35.9	94	8
	5	●	0730H5D	43.8	48.9	51.9	118	
7.4	3	●	0740H3D	29.6	33.3	36.3	94	8
	5	●	0740H5D	44.4	49.6	52.6	118	
7.5	3	●	0750H3D	30.0	33.8	36.8	94	8
	5	●	0750H5D	45.0	50.3	53.3	118	
7.6	3	●	MDF 0760H3D	30.4	34.2	37.2	94	8
	5	●	0760H5D	45.6	50.9	53.9	118	
7.7	3	●	0770H3D	30.8	34.7	37.7	94	8
	5	●	0770H5D	46.2	51.6	54.6	118	
7.8	3	●	0780H3D	31.2	35.1	38.1	94	8
	5	●	0780H5D	46.8	52.3	55.3	118	
7.9	3	●	0790H3D	31.6	35.6	38.6	94	8
	5	●	0790H5D	47.4	52.9	55.9	118	
8.0	3	●	0800H3D	32.0	36.0	39.0	94	8
	5	●	0800H5D	48.0	53.6	56.6	118	
8.1	3	●	MDF 0810H3D	32.4	36.5	39.5	100	9
	5	●	0810H5D	48.6	54.3	57.3	127	
8.2	3	●	0820H3D	32.8	36.9	39.9	100	9
	5	●	0820H5D	49.2	54.9	57.9	127	
8.3	3	●	0830H3D	33.2	37.4	40.4	100	9
	5	●	0830H5D	49.8	55.6	58.6	127	
8.4	3	●	0840H3D	33.6	37.8	40.8	100	9
	5	●	0840H5D	50.4	56.3	59.3	127	
8.5	3	●	0850H3D	34.0	38.3	41.3	100	9
	5	●	0850H5D	51.0	57.0	60.0	127	

材種 ACF75
Grade

New

超硬コーティングドリル
フラットマルチドリル

MDF型

Coated Carbide Drills
Flat MultiDrill MDF series

内部給油式
Internal Coolant Supply

(MDF-H型)
MDF-H Type

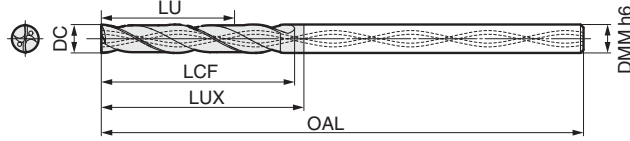
超硬鋼 Cobalt Steel ~0.28%	合金鋼 Alloy Steel 0.23%	鋼鋼鋼 Sintered Steel	高硬度鋼 High Speed Steel ~45HRC	45HRC	ステン レス鋼 Stainless Steel	Ti合金 Ti Alloy	耐熱鋼 Heat Resistant Steel	鋳鉄 Cast Iron	タタリ 鋳鉄 Ductile Cast Iron	アルミ 合金 Aluminum Alloy	銅合金 Copper Alloy	複合材 CFRP Composite
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PVD
コート

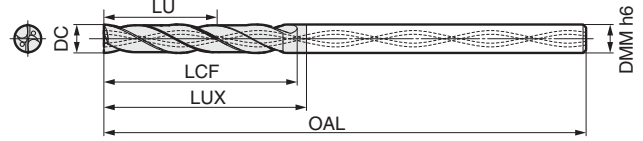
3D

5D

● MDF型 3D シングルマージン MDF Type 3D Single Margin



● MDF型 5D ダブルマージン MDF Type 5D Double Margin



■本体 刃径 ϕ 8.6 ~ 11.3mm
Body Diameter

刃径 Diameter DC (mm)	穴深さ Hole Depth (L/D)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク径 Shank DMM (mm)
				有効長 LU	フルート長 LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
8.6	3	●	MDF 0860H3D	34.4	38.7	41.7	100	9
	5	●	0860H5D	51.6	57.6	60.6	127	
8.7	3	●	0870H3D	34.8	39.2	42.2	100	9
	5	●	0870H5D	52.2	58.3	61.3	127	
8.8	3	●	0880H3D	35.2	39.6	42.6	100	9
	5	●	0880H5D	52.8	59.0	62.0	127	
8.9	3	●	0890H3D	35.6	40.1	43.1	100	9
	5	●	0890H5D	53.4	59.6	62.6	127	
9.0	3	●	0900H3D	36.0	40.5	43.5	100	9
	5	●	0900H5D	54.0	60.3	63.3	127	
9.1	3	●	MDF 0910H3D	36.4	41.0	44.0	106	10
	5	●	0910H5D	54.6	61.0	64.0	136	
9.2	3	●	0920H3D	36.8	41.4	44.4	106	10
	5	●	0920H5D	55.2	61.6	64.6	136	
9.3	3	●	0930H3D	37.2	41.9	44.9	106	10
	5	●	0930H5D	55.8	62.3	65.3	136	
9.4	3	●	0940H3D	37.6	42.3	45.3	106	10
	5	●	0940H5D	56.4	63.0	66.0	136	
9.5	3	●	0950H3D	38.0	42.8	45.8	106	10
	5	●	0950H5D	57.0	63.7	66.7	136	
9.6	3	●	MDF 0960H3D	38.4	43.2	46.2	106	10
	5	●	0960H5D	57.6	64.3	67.3	136	
9.7	3	●	0970H3D	38.8	43.7	46.7	106	10
	5	●	0970H5D	58.2	65.0	68.0	136	
9.8	3	●	0980H3D	39.2	44.1	47.1	106	10
	5	●	0980H5D	58.8	65.7	68.7	136	
9.9	3	●	0990H3D	39.6	44.6	47.6	106	10
	5	●	0990H5D	59.4	66.3	69.3	136	
10.0	3	●	1000H3D	40.0	45.0	48.0	106	10
	5	●	1000H5D	60.0	67.0	70.0	136	
10.1	3	●	MDF 1010H3D	40.4	45.5	48.5	116	11
	5	●	1010H5D	60.6	67.7	70.7	149	
10.2	3	●	1020H3D	40.8	45.9	48.9	116	11
	5	●	1020H5D	61.2	68.3	71.3	149	
10.3	3	●	1030H3D	41.2	46.4	49.4	116	11
	5	●	1030H5D	61.8	69.0	72.0	149	
10.4	3	●	1040H3D	41.6	46.8	49.8	116	11
	5	●	1040H5D	62.4	69.7	72.7	149	
10.5	3	●	1050H3D	42.0	47.3	50.3	116	11
	5	●	1050H5D	63.0	70.4	73.4	149	
10.6	3	●	MDF 1060H3D	42.4	47.7	50.7	116	11
	5	●	1060H5D	63.6	71.0	74.0	149	
10.7	3	●	1070H3D	42.8	48.2	51.2	116	11
	5	●	1070H5D	64.2	71.7	74.7	149	
10.8	3	●	1080H3D	43.2	48.6	51.6	116	11
	5	●	1080H5D	64.8	72.4	75.4	149	
10.9	3	●	1090H3D	43.6	49.1	52.1	116	11
	5	●	1090H5D	65.4	73.0	76.0	149	
11.0	3	●	1100H3D	44.0	49.5	52.5	116	11
	5	●	1100H5D	66.0	73.7	76.7	149	
11.1	3	●	MDF 1110H3D	44.4	50.0	53.0	122	12
	5	●	1110H5D	66.6	74.4	77.4	158	
11.2	3	●	1120H3D	44.8	50.4	53.4	122	12
	5	●	1120H5D	67.2	75.0	78.0	158	
11.3	3	●	1130H3D	45.2	50.9	53.9	122	12
	5	●	1130H5D	67.8	75.7	78.7	158	

■本体 刃径 ϕ 11.4 ~ 16.0mm
Body Diameter

刃径 Diameter DC (mm)	穴深さ Hole Depth (L/D)	在庫 Stock	型番 Cat. No.	寸法 Dimensions (mm)				シャンク径 Shank DMM (mm)
				有効長 LU	フルート長 LCF	首下長 Length Below Neck LUX	全長 Total Length OAL	
11.4	3	●	MDF 1140H3D	45.6	51.3	54.3	122	12
	5	●	1140H5D	68.4	76.4	79.4	158	
11.5	3	●	1150H3D	46.0	51.8	54.8	122	12
	5	●	1150H5D	69.0	77.1	80.1	158	
11.6	3	●	MDF 1160H3D	46.4	52.2	55.2	122	12
	5	●	1160H5D	69.6	77.7	80.7	158	
11.7	3	●	1170H3D	46.8	52.7	55.7	122	12
	5	●	1170H5D	70.2	78.4	81.4	158	
11.8	3	●	1180H3D	47.2	53.1	56.1	122	12
	5	●	1180H5D	70.8	79.1	82.1	158	
11.9	3	●	1190H3D	47.6	53.6	56.6	122	12
	5	●	1190H5D	71.4	79.7	82.7	158	
12.0	3	●	1200H3D	48.0	54.0	57.0	122	12
	5	●	1200H5D	72.0	80.4	83.4	158	
12.5	3	●	MDF 1250H3D	50.0	56.3	59.3	128	13
	5	●	1250H5D	75.0	83.8	86.8	167	
13.0	3	●	1300H3D	52.0	58.5	61.5	128	13
	5	●	1300H5D	78.0	87.1	90.1	167	
13.5	3	●	MDF 1350H3D	54.0	60.8	63.8	134	14
	5	●	1350H5D	81.0	90.5	93.5	176	
14.0	3	●	1400H3D	56.0	63.0	66.0	134	14
	5	●	1400H5D	84.0	93.8	96.8	176	
14.5	3	●	MDF 1450H3D	58.0	65.3	68.3	140	15
	5	●	1450H5D	87.0	97.2	100.2	185	
15.0	3	●	1500H3D	60.0	67.5	70.5	140	15
	5	●	1500H5D	90.0	100.5	103.5	185	
15.5	3	●	MDF 1550H3D	62.0	69.8	72.8	146	16
	5	●	1550H5D	93.0	103.9	106.9	194	
16.0	3	●	1600H3D	64.0	72.0	75.0	146	16
	5	●	1600H5D	96.0	107.2	110.2	194	

材種 ACF75
Grade

材種 ACF75
Grade

■ 推奨切削条件 (MDF-H型 3D用) Recommended Cutting Conditions (For MDF-H Type 3D)

1. 推奨穴深さは3×DCです。傾斜面加工時はワーク最上部分からの深さです。
2. 切削条件は平面への穴あけ時の推奨です。
3. 傾斜面に対する穴加工時は、傾斜角度により送り速度を調整してください。
4. 傾斜角度が30°以下の場合は、送り速度を70%以下に設定してください。
5. 傾斜角度が30°を超える場合は、送り速度を50%以下に設定してください。
6. 本製品は穴あけ加工用工具です。横送りやヘリカル等の加工はできません。
7. ステンレス加工時は同径の下穴を推奨します。

- 1.The recommended hole depth is 3 x DC. The depth is measured from the highest point of the work when 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 on 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 traversing or helical milling.
- 7.A prepared hole of the same diameter is recommended when drilling stainless steel.

(v_c : 切削速度 Cutting Speed m/min f : 送り量 Feed Rate mm/rev)

刃径 Diameter DC (mm)	切削 条件 Cutting Conditions	軟鋼/一般鋼 Soft Steel/General Steel (~250HB)	合金鋼 Alloy Steel (~300HB)	高硬度材 Hardened Steel (~50HRC)	ステンレス鋼 Stainless Steel (~200HB)	ねずみ鋳鉄 Gray Cast Iron FC250	ダクタイル鋳鉄 Ductile Cast Iron FCD450	アルミニウム 合金 Aluminum Alloy
~φ4	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
~φ6	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
~φ8	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
~φ10	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
~φ12	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
~φ16	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

下限値—推奨値—上限値
Min. - Optimum - Max.

■ 推奨切削条件 (MDF-H型 5D用) Recommended Cutting Conditions (For MDF-H Type 5D)

1. 本工具を用いた加工には、同径の下穴が必要です。
2. 切削条件は同径の下穴がある場合の推奨です。
3. 推奨穴深さは5×DCです。傾斜面加工時はワーク最上部分からの深さです。
4. 本製品は穴あけ加工用工具です。横送りやヘリカル等の加工はできません。

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

(v_c : 切削速度 Cutting Speed m/min f : 送り量 Feed Rate mm/rev)

刃径 Diameter DC (mm)	切削 条件 Cutting Conditions	軟鋼/一般鋼 Soft Steel/General Steel (~250HB)	合金鋼 Alloy Steel (~300HB)	高硬度材 Hardened Steel (~50HRC)	ステンレス鋼 Stainless Steel (~200HB)	ねずみ鋳鉄 Gray Cast Iron FC250	ダクタイル鋳鉄 Ductile Cast Iron FCD450	アルミニウム 合金 Aluminum Alloy
~φ4	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
~φ6	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
~φ8	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
~φ10	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
~φ12	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
~φ16	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

下限値—推奨値—上限値
Min. - Optimum - Max.

■ 使用実例 Application Examples

ギア枠部品 (SCM435) Gear Frame component (SCM435)

5.0mm
段差部座ぐり加工
Standard life: Surface roughness

他社品と比較して、寿命4倍
4 times longer tool life compared to competitor's

使用工具: MDF0500S2D (φ5.0)
Tools

切削条件: $v_c=65\text{m/min}$, $f=0.10\text{mm/rev}$,
Cutting Condition
 $v_f=414\text{mm/min}$, $H=5\text{mm}$ (止まり), 外部給油
Blind Hole External Coolant

ギア部品 (SCM415) Gear component (SCM415)

壁面とドリルの間隔 0.1mm
Clearance between Drill and side wall is 0.1mm

非平面に対して安定した穴加工を実現
Stable drilling is achieved for non planer surface

使用工具: MDF0600S2D (φ6.0)
Tools

切削条件: $v_c=65\text{m/min}$, $f=0.04\text{mm/rev} \rightarrow 0.15\text{mm/rev}$,
Cutting Condition
 $v_f=138 \sim 518\text{mm/min}$, $H \sim 15\text{mm}$ (貫通), 外部給油
Through External Coolant

自動車部品 (S35C) Automotive component (S35C)

60° 傾斜
60° Inclination

刃先欠損を抑制し、安定加工を実現
Reduces cutting edge damage to enable stable machining

使用工具: MDF0300S2D (φ3.0)
Tools

切削条件: $v_c=80\text{m/min}$, $f=0.045\text{mm/rev}$
Cutting Condition
 $v_f=370\text{mm/min}$, $H=8\text{mm}$ (貫通), 外部給油
Through External Coolant

治具部品 (SCM材) Jig component (SCM Materials)

加工径拡大代 (mm)
Diameter Expansion (mm)

穴径拡大代少なく良好な穴精度を実現
Low hole diameter expansion allowance and enables good bore accuracy

使用工具: MDF1100S2D (φ11.0)
Tools

切削条件: $v_c=60\text{m/min}$, $f=0.2\text{mm/rev}$
Cutting Condition
 $v_f=347\text{mm/min}$, $H=11\text{mm}$ (止まり), 外部給油
Blind Hole External Coolant

止まり穴加工 (S50C) Blind hole drilling (S50C)

安定した切りくず処理
安定した切りくず処理

切りくず伸びが発生し加工径が大きくなる
切りくず伸びが発生し加工径が大きくなる

他社に対して安定した切りくず処理
Provides excellent chip control compared to competitor's

使用工具: MDF0600H3D (φ6.0)
Tools

切削条件: $v_c=75\text{m/min}$, $f=0.1\text{mm/rev}$, $H=15\text{mm}$ (止まり), 内部給油
Cutting Condition
Blind Hole Internal Coolant

止まり穴加工 (S50C) Blind hole drilling (S50C)

加工径 (mm)
加工径 (mm)

加工数 (穴)
加工数 (穴)

1,247穴加工後に欠損
1,247穴加工後に欠損

ダブルマージン+内部給油で安定した加工穴径かつ長寿命
Provides stable hole diameter and longer tool life by double margin and internal coolant supply

使用工具: MDF0600H5D (φ6.0)
Tools

切削条件: $v_c=140\text{m/min}$, $f=0.15\text{mm/rev}$, $H=30\text{mm}$ (止まり), 内部給油
Cutting Condition
Blind Hole Internal Coolant
(※ 下穴: MDW0600GS2)



●高温の切りくずが飛散したり長く伸びた切りくずが排出されることがありますので、安全カバーや保護メガネ等の保護具を使用し、防災・防火に十分ご配慮ください。

● 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.

●鋭い切れ刃を持っているため取扱いにご注意ください。
●使用方法を誤ったり、使用条件が不適切な場合、工具破損、飛散を招きますので推奨条件の範囲内でご使用ください。

● 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.

●不水溶性の切削液をご使用になる場合は、自動消火装置を設置するなどの対策を講じて頂き、火災にくれぐれもご注意ください。

● 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.

◆安全にお使いいただくために◆

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※営業所移転につき、2016年6月より所在地・電話番号・FAXが変更になりました。