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TOOLS NEWS
B233G
YOUR GLOBAL CRAFTSMAN STUDIO

Solid Carbide Flat Bottom Drills

MFE Series

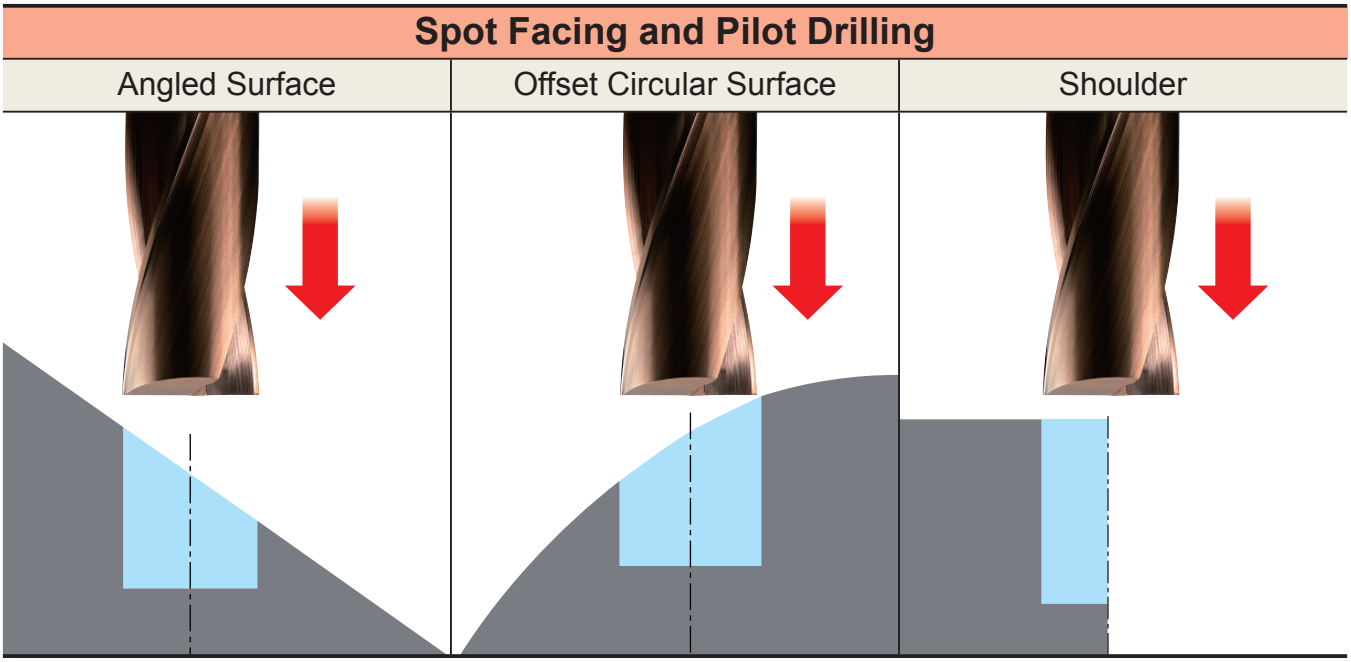
New Product

High Efficiency Drilling in Various Types of Machining

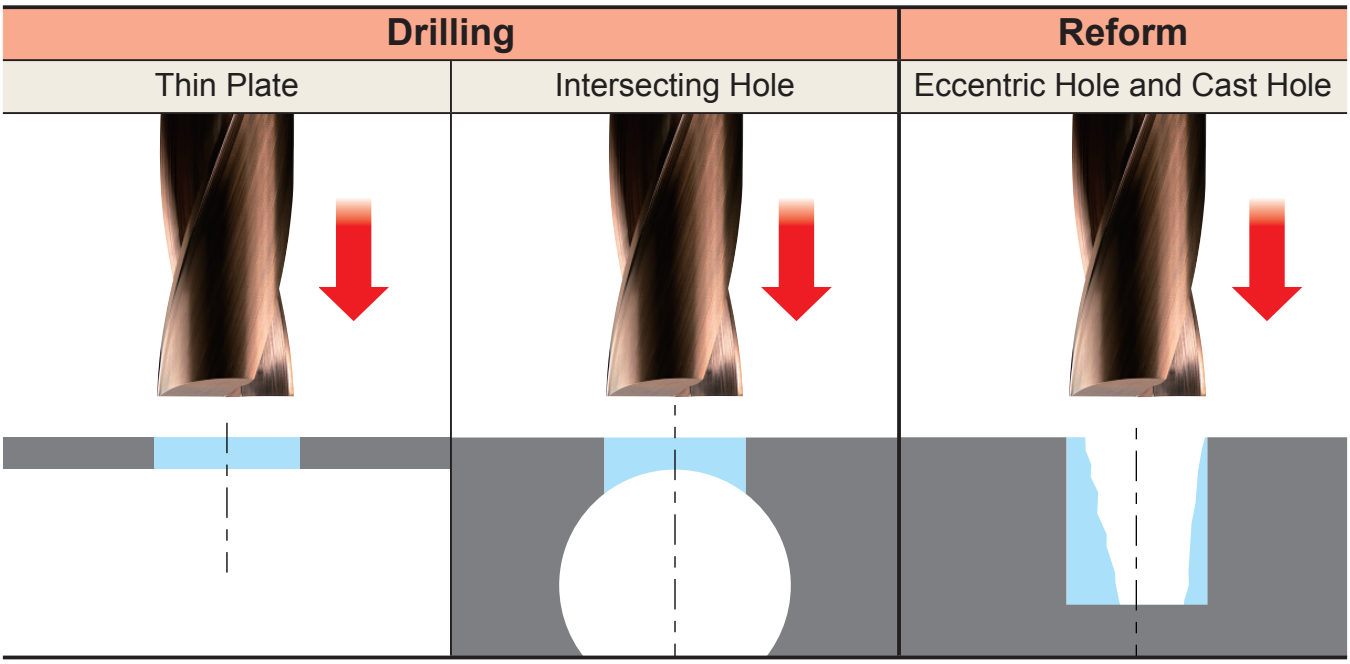
Solid Carbide Flat Bottom Drills

MFE Series

High Efficiency Drilling in Various Types of Machining

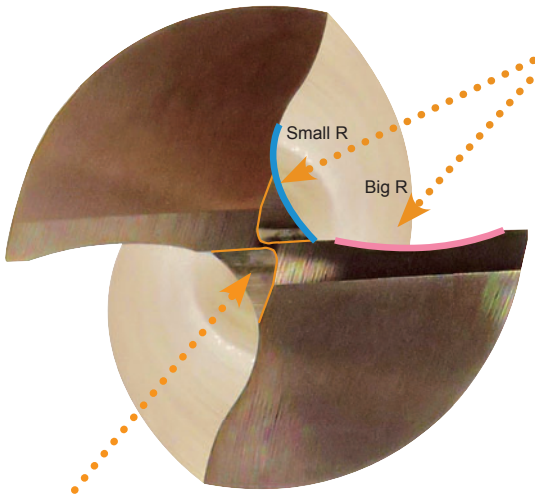


High efficiency counter boring in various types of machining is with excellent chipping resistance.



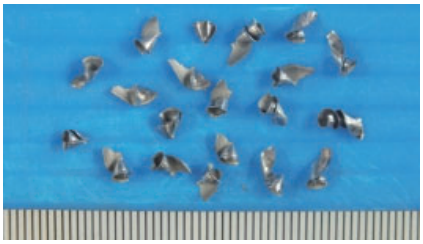
Low cutting force provides less burr.
Excellent performance in correction of eccentric hole and cast hole due to high position accuracy.

Features



Excellent Chip Control

Combination of different radius sizes provides strong cutting edge and excellent chip control.

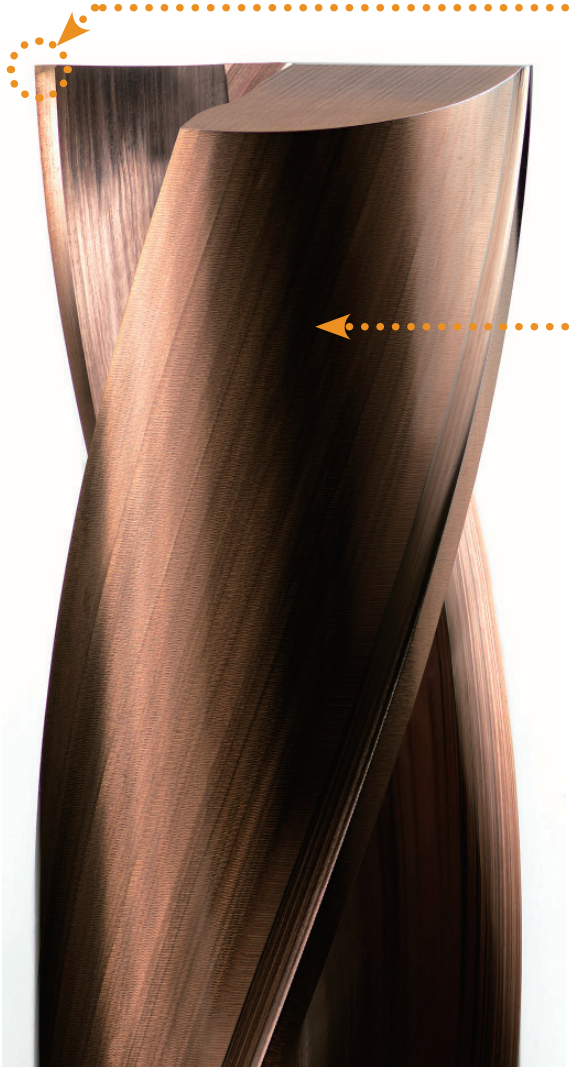


<Cutting Conditions>
Work Material : AISI 1050
Cutting Speed **vc** : 50 m/min
Feed Rate **fr** : 0.07 mm/rev

New “Z” Thinning with Lower Thrust Force

New thinning provides excellent chip evacuation.

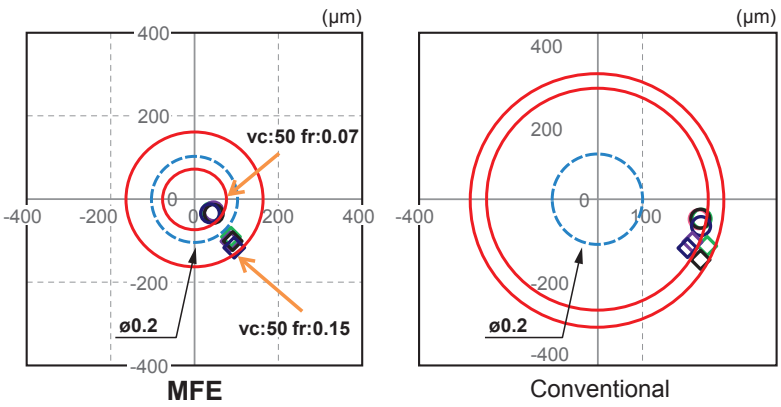
Gash Land for Stronger Corner



Gash land (0 degree rake) provides excellent chipping resistance.

ZERO-μ Surface

Smooth surface clearance provides reduced deflection and excellent position accuracy.

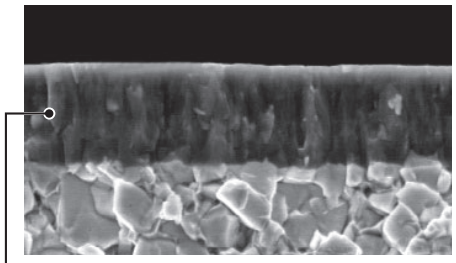


AISI 1050 45° angled surface DC×2

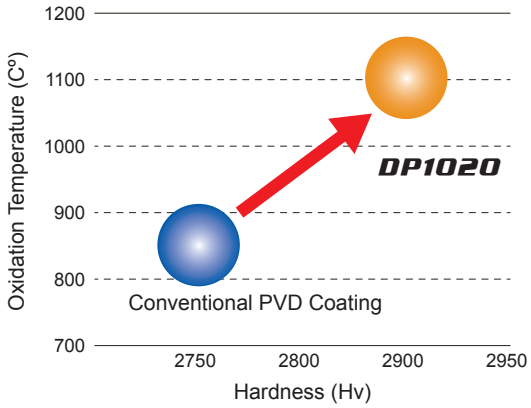
Longer Tool Life with Stable Cutting

Coated Grade DP1020

Newly-developed coating for drills provides excellent wear resistance with low friction property, resulting in excellent versatility and extended tool life.



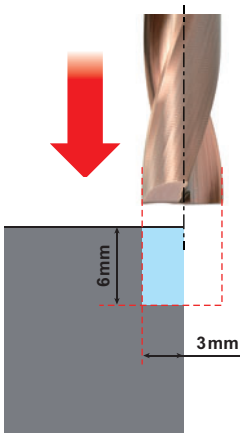
Multi-layer accumulated Al-Ti-Cr-N based PVD coating

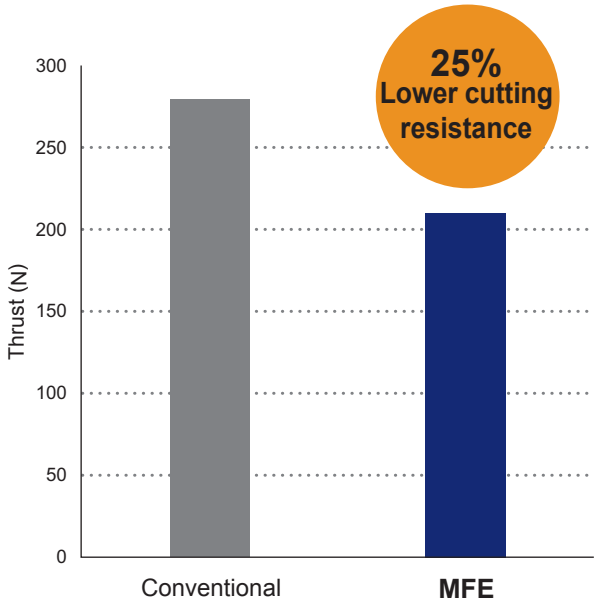


Cutting Performance

Thrust Force Comparison in Shoulder Drilling

New “Z” thinning with lower thrust force.

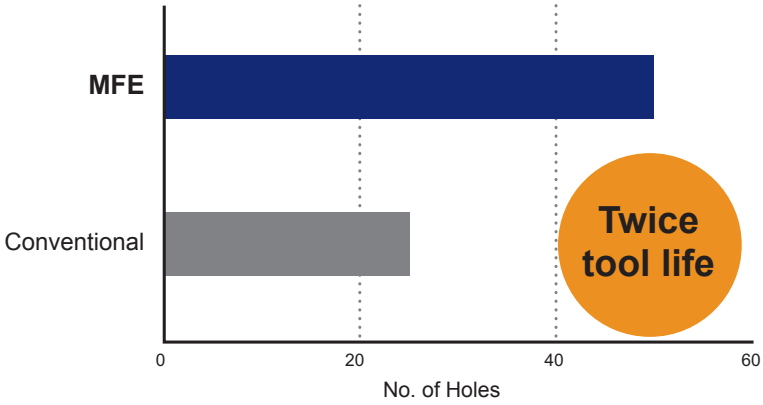




<Cutting Conditions>
Drill : MFE0600X02S060
Work Material : AISI 1050
Hole Depth : 6mm (l=DC×1)
Cutting Speed **vc** : 50m/min
Feed Rate **fr** : 0.07mm/rev

Comparison of Fracture Resistance in AISI 304

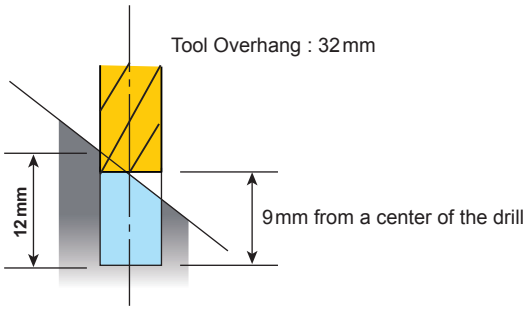
Achieved double tool life compared to conventional products because of the outstanding fracture resistance properties.



<Cutting Conditions>
Drill : MFE0600X02S060
Work Material : AISI 304
Hole Depth : 12mm (l=DC×2)
Cutting Speed **vc** : 35m/min
Feed Rate **fr** : 0.025mm/rev
Cutting Mode : Water Based (External Coolant)
Machine : Machining Center (BT50)

MFE After 50 holes machining

Conventional After 25 holes machining

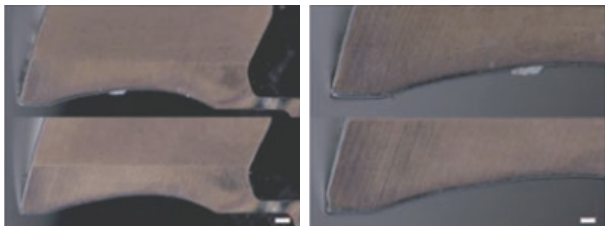


Comparison of Machining for Angled Surface with 45° Angle in AISI 1045

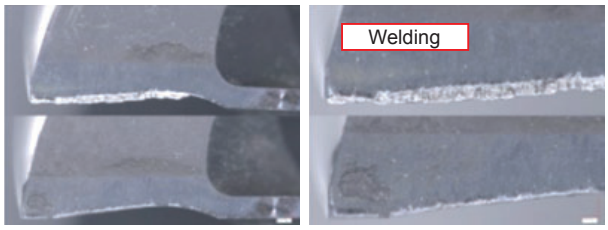
Controlled abnormal fracturing because of the excellent welding resistance properties.

No. of Holes : Comparison of the cutting edge after 200 holes machining.

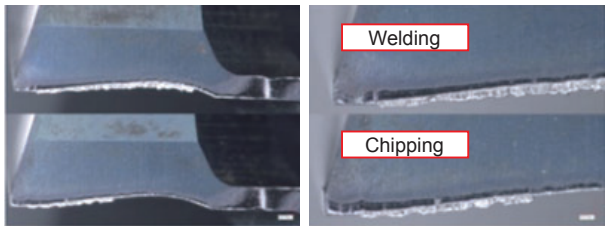
MFE



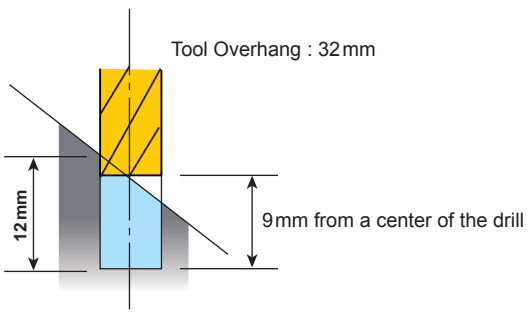
Conventional A



Conventional B



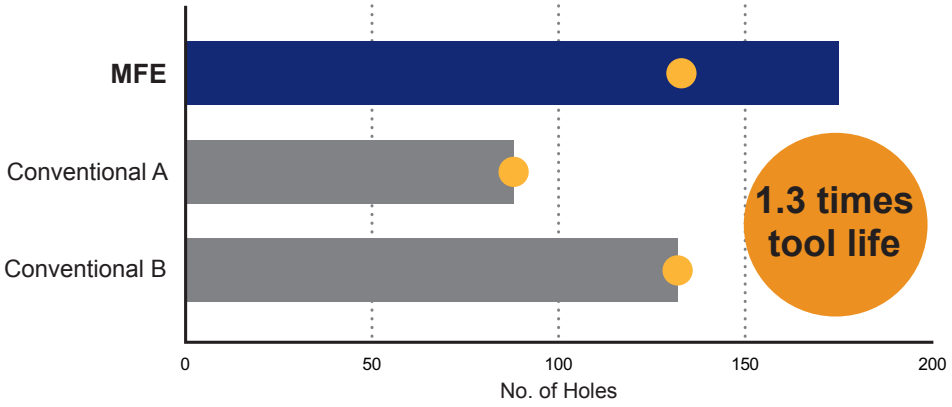
<Cutting Conditions>
Drill : MFE0600X02S060
Work Material : AISI 1045
Hole Depth : 12mm (l=DC×2)
Cutting Speed **vc** : 50m/min
Feed Rate **fr** : 0.07mm/rev
Cutting Mode : Water Based (External Coolant)

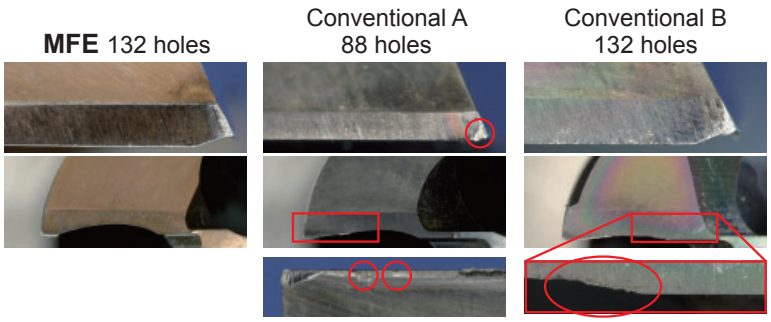


Cutting Performance

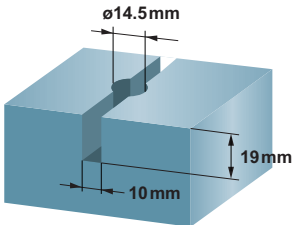
Comparison of Fracture Resistance in AISI 1050

Achieved 1.3 times longer tool life compared to conventional products because of increased stability.





Cutting Mode
Drilling of ø14.5mm in groove with a width of 10mm

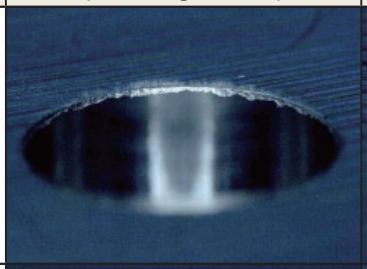
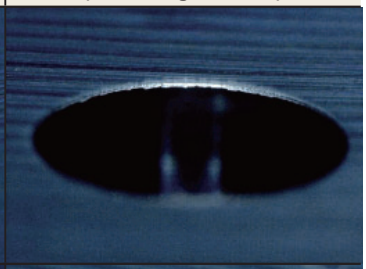
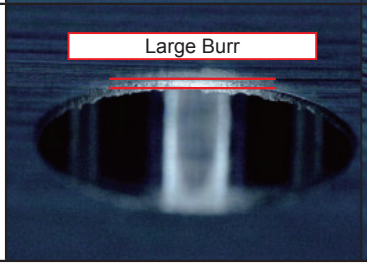
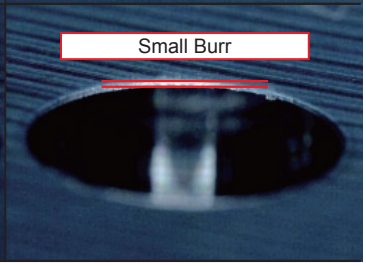


<Cutting Conditions>

Drill	: MFE1450X02S160
Work Material	: AISI 1050
Hole Depth	: 24mm
Cutting Speed **vc**	: 35m/min
Feed Rate **fr**	: 0.025mm/rev
Cutting Mode	: Water Based (External Coolant)
Machine	: Machining Center (BT50)

Comparison of Thin Plate Machining in AISI 4140

Flat tip angle prevents burr formation in various types of applications.

	Conventional (Point Angle = 140°)	MFE (Point Angle = 180°)
vc = 50m/min fr = 0.05mm/rev		
vc = 80m/min fr = 0.15mm/rev		

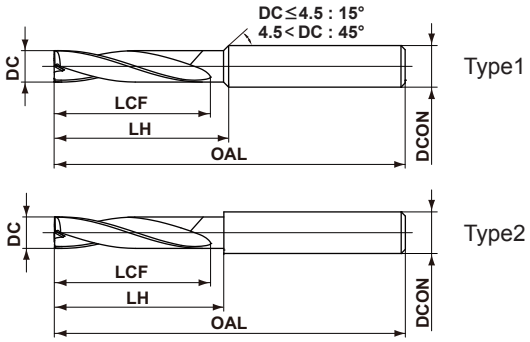
<Cutting Conditions>

Drill	: MFE0600X02S060
Work Material	: AISI 4140
Hole Depth	: 10mm (Thin Plate)
Cutting Mode	: Water Based (External Coolant)
Machine	: Machining Center (BT40)

MFE

●High efficiency drilling in various types of machining.

P M K N S H



(mm)

	3≤DC≤6	6 < DC≤10	10 < DC≤18	18 < DC≤20
	0 −0.012	0 −0.015	0 −0.018	0 −0.021
	DCON=6	DCON=8, 10	DCON=12, 14, 16, 18	DCON=20
h6	0 −0.008	0 −0.009	0 −0.011	0 −0.013

External Coolant

DC	Hole Depth (l/d)	Stock DP1020	Order Number	LCF	LH	OAL	DCON	Type
3.0	2	●	MFE0300X02S060	12.0	19.6	55.0	6	1
3.1	2	○	MFE0310X02S060	14.0	21.4	55.0	6	1
3.2	2	○	MFE0320X02S060	14.0	21.2	55.0	6	1
3.3	2	○	MFE0330X02S060	14.0	21.0	55.0	6	1
3.4	2	●	MFE0340X02S060	14.0	20.9	55.0	6	1
3.5	2	●	MFE0350X02S060	14.0	20.7	55.0	6	1
3.6	2	○	MFE0360X02S060	16.0	22.5	55.0	6	1
3.7	2	○	MFE0370X02S060	16.0	22.3	55.0	6	1
3.8	2	○	MFE0380X02S060	16.0	22.1	55.0	6	1
3.9	2	○	MFE0390X02S060	16.0	21.9	55.0	6	1
4.0	2	●	MFE0400X02S060	16.0	21.7	55.0	6	1
4.1	2	○	MFE0410X02S060	18.0	23.6	62.0	6	1
4.2	2	○	MFE0420X02S060	18.0	23.4	62.0	6	1
4.3	2	●	MFE0430X02S060	18.0	23.2	62.0	6	1
4.4	2	○	MFE0440X02S060	18.0	23.0	62.0	6	1
4.5	2	●	MFE0450X02S060	18.0	22.8	62.0	6	1
4.6	2	○	MFE0460X02S060	20.0	23.7	62.0	6	1
4.7	2	○	MFE0470X02S060	20.0	23.7	62.0	6	1
4.8	2	○	MFE0480X02S060	20.0	23.6	62.0	6	1
4.9	2	○	MFE0490X02S060	20.0	23.6	62.0	6	1
5.0	2	●	MFE0500X02S060	20.0	23.5	62.0	6	1
5.1	2	●	MFE0510X02S060	22.0	25.5	62.0	6	1
5.2	2	○	MFE0520X02S060	22.0	25.4	62.0	6	1
5.3	2	○	MFE0530X02S060	22.0	25.4	62.0	6	1
5.4	2	○	MFE0540X02S060	22.0	25.3	62.0	6	1
5.5	2	●	MFE0550X02S060	22.0	25.3	62.0	6	1
5.6	2	○	MFE0560X02S060	24.0	27.2	62.0	6	1
5.7	2	○	MFE0570X02S060	24.0	27.2	62.0	6	1
5.8	2	○	MFE0580X02S060	24.1	27.2	62.1	6	1
5.9	2	○	MFE0590X02S060	24.1	27.2	62.1	6	1
6.0	2	●	MFE0600X02S060	24.1	27.1	62.1	6	1
6.1	2	○	MFE0610X02S080	26.1	30.1	74.1	8	1
6.2	2	○	MFE0620X02S080	26.1	30.0	74.1	8	1
6.3	2	○	MFE0630X02S080	26.1	30.0	74.1	8	1
6.4	2	○	MFE0640X02S080	26.1	29.9	74.1	8	1

External Coolant

(mm)

DC	Hole Depth (l/d)	Stock DP1020	Order Number	LCF	LH	OAL	DCON	Type
6.5	2	●	MFE0650X02S080	26.1	29.9	74.1	8	1
6.6	2	○	MFE0660X02S080	28.1	31.8	74.1	8	1
6.7	2	○	MFE0670X02S080	28.1	31.8	74.1	8	1
6.8	2	●	MFE0680X02S080	28.1	31.7	74.1	8	1
6.9	2	○	MFE0690X02S080	28.1	31.7	74.1	8	1
7.0	2	●	MFE0700X02S080	28.1	31.6	74.1	8	1
7.1	2	○	MFE0710X02S080	30.1	33.6	74.1	8	1
7.2	2	○	MFE0720X02S080	30.1	33.5	74.1	8	1
7.3	2	○	MFE0730X02S080	30.1	33.5	74.1	8	1
7.4	2	○	MFE0740X02S080	30.1	33.4	74.1	8	1
7.5	2	○	MFE0750X02S080	30.1	33.4	74.1	8	1
7.6	2	○	MFE0760X02S080	32.1	35.3	74.1	8	1
7.7	2	○	MFE0770X02S080	32.1	35.3	74.1	8	1
7.8	2	○	MFE0780X02S080	32.1	35.2	74.1	8	1
7.9	2	○	MFE0790X02S080	32.1	35.2	74.1	8	1
8.0	2	●	MFE0800X02S080	32.1	35.1	74.1	8	1
8.1	2	○	MFE0810X02S100	34.1	38.1	84.1	10	1
8.2	2	○	MFE0820X02S100	34.1	38.0	84.1	10	1
8.3	2	○	MFE0830X02S100	34.1	38.0	84.1	10	1
8.4	2	○	MFE0840X02S100	34.1	37.9	84.1	10	1
8.5	2	●	MFE0850X02S100	34.1	37.9	84.1	10	1
8.6	2	○	MFE0860X02S100	36.1	39.8	84.1	10	1
8.7	2	○	MFE0870X02S100	36.1	39.8	84.1	10	1
8.8	2	○	MFE0880X02S100	36.1	39.7	84.1	10	1
8.9	2	○	MFE0890X02S100	36.1	39.7	84.1	10	1
9.0	2	●	MFE0900X02S100	36.1	39.6	84.1	10	1
9.1	2	○	MFE0910X02S100	38.1	41.6	84.1	10	1
9.2	2	○	MFE0920X02S100	38.1	41.5	84.1	10	1
9.3	2	○	MFE0930X02S100	38.1	41.5	84.1	10	1
9.4	2	○	MFE0940X02S100	38.1	41.4	84.1	10	1
9.5	2	●	MFE0950X02S100	38.1	41.4	84.1	10	1
9.6	2	○	MFE0960X02S100	40.1	43.3	84.1	10	1
9.7	2	○	MFE0970X02S100	40.1	43.3	84.1	10	1
9.8	2	○	MFE0980X02S100	40.1	43.2	84.1	10	1
9.9	2	○	MFE0990X02S100	40.1	43.2	84.1	10	1

● : Inventory maintained in Japan. ○ : Inventory maintained in Japan. (Available January 2017)

MFE

External Coolant (mm)

DC	Hole Depth (l/d)	Stock DP1020	Order Number	LCF	LH	OAL	DCON	Type
10.0	2	●	**MFE1000X02S100**	40.1	43.1	84.1	10	1
10.1	2	○	**MFE1010X02S120**	42.1	46.1	95.1	12	1
10.2	2	○	**MFE1020X02S120**	42.1	46.0	95.1	12	1
10.3	2	●	**MFE1030X02S120**	42.1	46.0	95.1	12	1
10.4	2	○	**MFE1040X02S120**	42.1	45.9	95.1	12	1
10.5	2	○	**MFE1050X02S120**	42.1	45.9	95.1	12	1
10.6	2	○	**MFE1060X02S120**	44.1	47.8	95.1	12	1
10.7	2	○	**MFE1070X02S120**	44.1	47.8	95.1	12	1
10.8	2	○	**MFE1080X02S120**	44.1	47.7	95.1	12	1
10.9	2	○	**MFE1090X02S120**	44.1	47.7	95.1	12	1
11.0	2	●	**MFE1100X02S120**	44.1	47.6	95.1	12	1
11.1	2	●	**MFE1110X02S120**	46.1	49.6	95.1	12	1
11.2	2	○	**MFE1120X02S120**	46.1	49.5	95.1	12	1
11.3	2	○	**MFE1130X02S120**	46.1	49.5	95.1	12	1
11.4	2	○	**MFE1140X02S120**	46.1	49.4	95.1	12	1
11.5	2	○	**MFE1150X02S120**	46.1	49.4	95.1	12	1
11.6	2	○	**MFE1160X02S120**	48.1	51.3	95.1	12	1
11.7	2	○	**MFE1170X02S120**	48.1	51.3	95.1	12	1
11.8	2	○	**MFE1180X02S120**	48.1	51.2	95.1	12	1
11.9	2	○	**MFE1190X02S120**	48.1	51.2	95.1	12	1
12.0	2	●	**MFE1200X02S120**	48.1	51.1	95.1	12	1
12.5	2	○	**MFE1250X02S140**	50.1	53.1	102.1	14	2
13.0	2	●	**MFE1300X02S140**	52.1	55.1	102.1	14	2
13.5	2	○	**MFE1350X02S140**	54.1	57.1	102.1	14	2
14.0	2	●	**MFE1400X02S140**	56.1	59.1	102.1	14	2
14.5	2	○	**MFE1450X02S160**	58.1	61.1	111.1	16	2
15.0	2	●	**MFE1500X02S160**	60.1	63.1	111.1	16	2
15.5	2	○	**MFE1550X02S160**	62.1	65.1	111.1	16	2
16.0	2	●	**MFE1600X02S160**	64.1	67.1	111.1	16	2
16.5	2	○	**MFE1650X02S180**	66.1	69.1	119.1	18	2
17.0	2	●	**MFE1700X02S180**	68.1	71.1	119.1	18	2
17.5	2	●	**MFE1750X02S180**	70.2	73.2	119.2	18	2
18.0	2	●	**MFE1800X02S180**	72.2	75.2	119.2	18	2
18.5	2	○	**MFE1850X02S200**	74.2	77.2	127.2	20	2
19.0	2	●	**MFE1900X02S200**	76.2	79.2	127.2	20	2
19.5	2	○	**MFE1950X02S200**	78.2	81.2	127.2	20	2
20.0	2	●	**MFE2000X02S200**	80.2	83.2	127.2	20	2

DC = Cutting Diameter
LCF = Length Chip Flute
LH = Neck Length
OAL = Overall Length
DCON = Fixing Part Depth

● : Inventory maintained in Japan. ○ : Inventory maintained in Japan. (Available January 2017)

Recommended Cutting Conditions

Cutting of the Flat Surface

(mm)

Work Material	Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180−280HB) AISI 1045, 4140 etc.		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	7460	0.06 (0.04−0.08)	7460	0.06 (0.04−0.08)	6466	0.06 (0.04−0.08)
4.0	5968	0.08 (0.06−0.10)	5968	0.08 (0.06−0.10)	5173	0.08 (0.06−0.10)
5.0	4775	0.10 (0.08−0.13)	4775	0.10 (0.08−0.13)	4138	0.10 (0.08−0.15)
6.3	3789	0.13 (0.10−0.15)	3789	0.13 (0.10−0.15)	3284	0.13 (0.10−0.15)
8.0	2984	0.15 (0.13−0.17)	2984	0.15 (0.13−0.17)	2586	0.15 (0.13−0.20)
10.0	2387	0.17 (0.15−0.20)	2387	0.17 (0.15−0.20)	2069	0.17 (0.15−0.22)
12.0	1984	0.20 (0.17−0.25)	1984	0.20 (0.17−0.25)	1724	0.20 (0.17−0.25)
16.0	1492	0.25 (0.20−0.30)	1492	0.25 (0.20−0.30)	1293	0.25 (0.20−0.30)
20.0	1194	0.30 (0.25−0.35)	1194	0.30 (0.25−0.35)	1035	0.30 (0.25−0.35)

Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-18 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	2984	0.02 (0.01−0.03)	7460	0.06 (0.04−0.08)	6466	0.05 (0.04−0.06)
4.0	2387	0.03 (0.02−0.04)	5968	0.08 (0.06−0.10)	5570	0.06 (0.05−0.08)
5.0	1910	0.04 (0.03−0.05)	4775	0.10 (0.08−0.12)	4456	0.08 (0.06−0.10)
6.3	1516	0.05 (0.04−0.06)	3789	0.12 (0.10−0.14)	3537	0.10 (0.08−0.12)
8.0	1194	0.06 (0.05−0.08)	2984	0.14 (0.12−0.16)	2785	0.12 (0.10−0.15)
10.0	955	0.08 (0.06−0.10)	2387	0.16 (0.14−0.18)	2228	0.15 (0.12−0.18)
12.0	796	0.10 (0.08−0.12)	1984	0.18 (0.16−0.20)	1857	0.18 (0.15−0.20)
16.0	597	0.12 (0.10−0.15)	1492	0.20 (0.18−0.24)	1393	0.20 (0.18−0.25)
20.0	477	0.15 (0.12−0.20)	1194	0.24 (0.20−0.28)	1114	0.25 (0.20−0.30)

Work Material	Aluminum Alloy (Si<5%) ASTM A6061, 7075 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	10942	0.06 (0.04−0.08)
4.0	8754	0.08 (0.06−0.10)
5.0	7003	0.10 (0.08−0.13)
6.3	5558	0.13 (0.10−0.16)
8.0	4377	0.16 (0.13−0.20)
10.0	3501	0.20 (0.16−0.24)
12.0	2918	0.24 (0.20−0.28)
16.0	2188	0.28 (0.24−0.32)
20.0	1750	0.32 (0.28−0.36)

MFE

Recommended Cutting Conditions

Cutting of the < 30° Angled Surface

(mm)

Work Material	Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.	
DC	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)
3.2	7460	0.04 (0.03—0.06)	7460	0.04 (0.03—0.06)	6466	0.04 (0.03—0.06)
4.0	5968	0.06 (0.04—0.07)	5968	0.06 (0.04—0.07)	5173	0.06 (0.04—0.07)
5.0	4775	0.07 (0.06—0.09)	4775	0.07 (0.06—0.09)	4138	0.07 (0.06—0.11)
6.3	3789	0.09 (0.07—0.11)	3789	0.09 (0.07—0.11)	3284	0.09 (0.07—0.11)
8.0	2984	0.11 (0.09—0.12)	2984	0.11 (0.09—0.12)	2586	0.11 (0.09—0.14)
10.0	2387	0.12 (0.11—0.14)	2387	0.12 (0.11—0.14)	2069	0.12 (0.11—0.15)
12.0	1984	0.14 (0.12—0.18)	1984	0.14 (0.12—0.18)	1724	0.14 (0.12—0.18)
16.0	1492	0.18 (0.14—0.21)	1492	0.18 (0.14—0.21)	1293	0.18 (0.14—0.21)
20.0	1194	0.21 (0.18—0.25)	1194	0.21 (0.18—0.25)	1035	0.21 (0.18—0.25)

Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-18 etc.	
DC	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)
3.2	2984	0.01 (0.01—0.02)	7460	0.04 (0.03—0.06)	6466	0.04 (0.03—0.04)
4.0	2387	0.02 (0.01—0.03)	5968	0.06 (0.04—0.07)	5570	0.04 (0.04—0.06)
5.0	1910	0.03 (0.02—0.04)	4775	0.07 (0.06—0.08)	4456	0.06 (0.04—0.07)
6.3	1516	0.04 (0.03—0.04)	3789	0.08 (0.07—0.10)	3537	0.07 (0.06—0.08)
8.0	1194	0.04 (0.04—0.06)	2984	0.10 (0.08—0.11)	2785	0.08 (0.07—0.11)
10.0	955	0.06 (0.04—0.07)	2387	0.11 (0.10—0.13)	2228	0.11 (0.08—0.13)
12.0	796	0.07 (0.06—0.08)	1984	0.13 (0.11—0.14)	1857	0.13 (0.11—0.14)
16.0	597	0.08 (0.07—0.11)	1492	0.14 (0.13—0.17)	1393	0.14 (0.13—0.18)
20.0	477	0.11 (0.08—0.14)	1194	0.17 (0.14—0.20)	1114	0.18 (0.14—0.21)

Work Material	Aluminum Alloy (Si<5%) ASTM A6061, 7075 etc.	
DC	**n** (min^{-1})	**fr** (Min.—Max.) (mm/rev)
3.2	10942	0.04 (0.03—0.06)
4.0	8754	0.06 (0.04—0.07)
5.0	7003	0.07 (0.06—0.09)
6.3	5558	0.09 (0.07—0.11)
8.0	4377	0.11 (0.09—0.14)
10.0	3501	0.14 (0.11—0.17)
12.0	2918	0.17 (0.14—0.20)
16.0	2188	0.20 (0.17—0.22)
20.0	1750	0.22 (0.20—0.25)

Cutting of the > 30° Angled Surface

(mm)

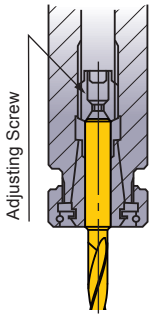
Work Material	Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180−280HB) AISI 1045, 4140 etc.		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	7460	0.03 (0.02−0.04)	7460	0.03 (0.02−0.04)	6466	0.03 (0.02−0.04)
4.0	5968	0.04 (0.03−0.05)	5968	0.04 (0.03−0.05)	5173	0.04 (0.03−0.05)
5.0	4775	0.05 (0.04−0.07)	4775	0.05 (0.04−0.07)	4138	0.05 (0.04−0.07)
6.3	3789	0.07 (0.05−0.08)	3789	0.07 (0.05−0.08)	3284	0.07 (0.05−0.08)
8.0	2984	0.08 (0.07−0.09)	2984	0.08 (0.07−0.09)	2586	0.08 (0.07−0.10)
10.0	2387	0.09 (0.08−0.10)	2387	0.09 (0.08−0.10)	2069	0.09 (0.08−0.11)
12.0	1984	0.10 (0.09−0.13)	1984	0.10 (0.09−0.13)	1724	0.10 (0.09−0.13)
16.0	1492	0.13 (0.10−0.15)	1492	0.13 (0.10−0.15)	1293	0.13 (0.10−0.15)
20.0	1194	0.15 (0.13−0.18)	1194	0.15 (0.13−0.18)	1035	0.15 (0.13−0.18)

Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-18 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	2984	0.01 (0.01−0.02)	7460	0.03 (0.02−0.04)	6466	0.03 (0.02−0.03)
4.0	2387	0.02 (0.01−0.02)	5968	0.04 (0.03−0.05)	5570	0.03 (0.03−0.04)
5.0	1910	0.02 (0.02−0.03)	4775	0.05 (0.04−0.06)	4456	0.04 (0.03−0.05)
6.3	1516	0.03 (0.02−0.03)	3789	0.06 (0.05−0.07)	3537	0.05 (0.04−0.06)
8.0	1194	0.03 (0.03−0.04)	2984	0.07 (0.06−0.08)	2785	0.06 (0.05−0.08)
10.0	955	0.04 (0.03−0.05)	2387	0.08 (0.07−0.09)	2228	0.08 (0.06−0.09)
12.0	796	0.05 (0.04−0.06)	1984	0.09 (0.08−0.10)	1857	0.09 (0.08−0.10)
16.0	597	0.06 (0.05−0.08)	1492	0.10 (0.09−0.12)	1393	0.10 (0.09−0.13)
20.0	477	0.08 (0.06−0.10)	1194	0.12 (0.10−0.14)	1114	0.13 (0.10−0.15)

Work Material	Aluminum Alloy (Si<5%) ASTM A6061, 7075 etc.	
DC	**n** (min^{-1})	**fr** (Min.−Max.) (mm/rev)
3.2	10942	0.03 (0.02−0.04)
4.0	8754	0.04 (0.03−0.05)
5.0	7003	0.05 (0.04−0.07)
6.3	5558	0.07 (0.05−0.08)
8.0	4377	0.08 (0.07−0.10)
10.0	3501	0.10 (0.08−0.12)
12.0	2918	0.12 (0.10−0.14)
16.0	2188	0.14 (0.12−0.16)
20.0	1750	0.16 (0.14−0.18)

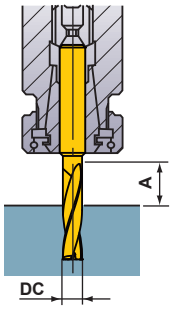
Operational Guidance

Drill Holding



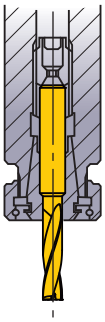
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A > DC x 1.5

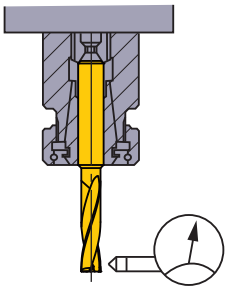
Drill Installation



NG

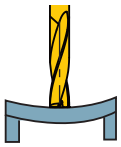
Do not clamp on the flutes.

Installation Tolerance



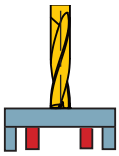
Run-out ≤ 0.03mm

Thin Workpiece



If Bending Occurs

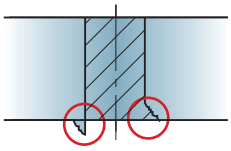
NG



Support the Workpiece

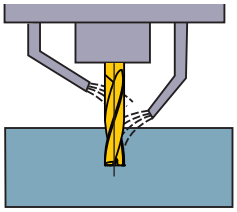
Good

Burring and Workpiece Chipping



①Lower the feed rate by 50% at the end of through cutting.
②Change the point angle.

Coolant Method (*MFE*)



Two coolant positions, at the end and at the center are ideal.

For Your Safety
●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION

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(Tools specifications subject to change without notice.)

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