
DFAS / MINI-MFE

SOLID CARBIDE FLAT BOTTOM DRILLS FOR
HIGH EFFICIENCY DRILLING OF VARIOUS APPLICATIONS



NEW

DFAS

FOR MACHINING STAINLESS STEEL AND TITANIUM



OPTIMISED CHIP CONTROL AND LOAD REDUCTION

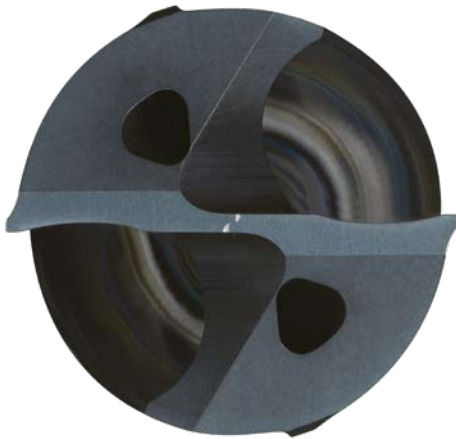
The thinned centre cutting edge generates a low resistance and thereby creates an optimum chip geometry for a smoother chip flow.

TRI-COOLING TECHNOLOGY FOR ALL DIAMETERS

Coolant flow is increased without reducing the rigidity of the drill. The extra coolant flow dramatically improves chip evacuation and dissipates cutting heat. This enables stable machining of stainless steel and titanium alloys.

ORIGINAL SHARP CUTTING EDGE SHAPE

Strength is ensured by providing a flat land (gash) at the corner of the cutting edge, and by adopting a sharp cutting edge over the cutting edge, burrs are suppressed.



DFAS



Conventional

COATED GRADE DP102A

DP102A is a PVD coated cemented carbide grade specialized for drills. The coating has high adhesion and stability even on a sharp cutting edge. This greatly improves wear resistance and is ideal for drilling small diameter holes at low speed and feed conditions.

SHARP CUTTING EDGES WITH LONG TOOL LIFE



Al-Cr-N Based PVD Coating

Material	X5CrNi189
Tool/Drill	MFE0100X02S030
L/D (mm)	2
Vc (m/min)	25
fr (mm/rev.)	0.007
Machine	Vertical MC (BT40)

100 holes



DFAS



Conventional

500 holes



DFAS



Conventional

MINI-MFE

SMALL DIAMETER SOLID CARBIDE FLAT BOTTOM DRILLS DC 0.75 – 2.95

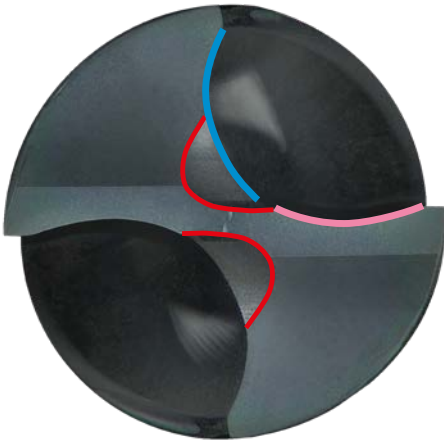


UNIQUE SHARP CUTTING EDGES

The flat lands on the corners provide greater strength and sharpness for substantial reduction of burrs.

EXCELLENT CHIP CONTROL

End geometry that combines different radii forms a strong cutting edge and provides excellent chip control.



POINT THINNING FOR LOWER THRUST FORCE

The mutli radius point geometry in combination with the thinned point forms the ideal chip shape, thereby dramatically reducing cutting resistance.

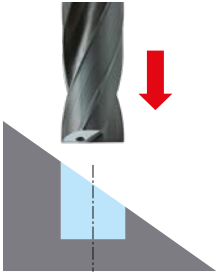
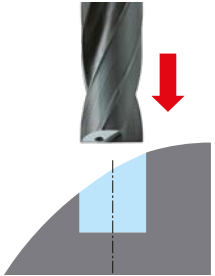
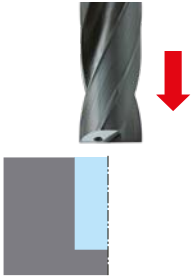


MFE

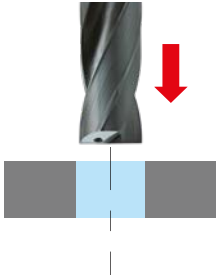
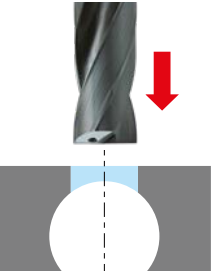
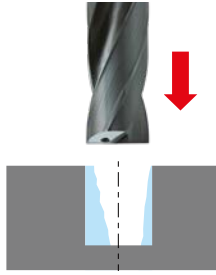


Conventional

HIGH EFFICIENCY OVER A WIDE APPLICATION RANGE

Spot facing		
Angled surface	Offset circular surface	Shoulder
		

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

Drilling	Reform	
Thin plate	Intersecting hole	Eccentric and cast holes
		

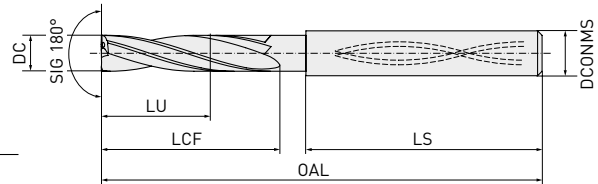
Low cutting force provides less burrs.
Excellent performance on eccentric and cast holes.

DFAS



SOLID CARBIDE FLAT BOTTOM DRILLS

P M K N



	DC=3	3 < DC<6	6 < DC<10	10 < DC<14
	0 - 0.014	0 - 0.018	0 - 0.022	0 - 0.027
	4 < DCON<6	6 < DCON<10	10 < DCON<14	
	0 - 0.008	0 - 0.009	0 - 0.011	

Order number	DP102A	DC	L/D	LU	LCF	LS	OAL	DCON
DFAS0300X03S040	●	3.0	3	9.0	14	39.0	55	4
DFAS0310X03S040	★	3.1	3	9.3	16	37.0	55	4
DFAS0320X03S040	★	3.2	3	9.6	16	37.0	55	4
DFAS0330X03S040	●	3.3	3	9.9	16	37.0	55	4
DFAS0340X03S040	★	3.4	3	10.2	16	37.0	55	4
DFAS0350X03S040	●	3.5	3	10.5	16	37.0	55	4
DFAS0360X03S040	★	3.6	3	10.8	18	35.0	55	4
DFAS0370X03S040	★	3.7	3	11.1	18	35.0	55	4
DFAS0380X03S040	★	3.8	3	11.4	18	35.0	55	4
DFAS0390X03S040	★	3.9	3	11.7	18	35.0	55	4
DFAS0400X03S040	●	4.0	3	12.0	18	35.0	55	4
DFAS0410X03S050	★	4.1	3	12.3	20	40.0	62	5
DFAS0420X03S050	●	4.2	3	12.6	20	40.0	62	5
DFAS0430X03S050	★	4.3	3	12.9	20	40.0	62	5
DFAS0440X03S050	★	4.4	3	13.2	20	40.0	62	5
DFAS0450X03S050	●	4.5	3	13.5	20	40.0	62	5
DFAS0460X03S050	★	4.6	3	13.8	23	37.0	62	5
DFAS0470X03S050	★	4.7	3	14.1	23	37.0	62	5
DFAS0480X03S050	★	4.8	3	14.4	23	37.0	62	5
DFAS0490X03S050	★	4.9	3	14.7	23	37.0	62	5
DFAS0500X03S050	●	5.0	3	15.0	23	37.0	62	5
DFAS0510X03S060	★	5.1	3	15.3	25	39.0	66	6
DFAS0520X03S060	★	5.2	3	15.6	25	39.0	66	6
DFAS0530X03S060	●	5.3	3	15.9	25	39.0	66	6
DFAS0540X03S060	★	5.4	3	16.2	25	39.0	66	6
DFAS0550X03S060	●	5.5	3	16.5	25	39.0	66	6
DFAS0560X03S060	★	5.6	3	16.8	27	37.0	66	6
DFAS0570X03S060	★	5.7	3	17.1	27	37.0	66	6
DFAS0580X03S060	★	5.8	3	17.4	27	37.0	66	6
DFAS0590X03S060	★	5.9	3	17.7	27	37.0	66	6
DFAS0600X03S060	●	6.0	3	18.0	27	37.0	66	6

● : Inventory maintained. ★ : Inventory maintained in Japan.

DFAS – SOLID CARBIDE FLAT BOTTOM DRILLS

Order number	DP102A	DC	L/D	LU	LCF	LS	OAL	DCON
DFAS0610X03S070	★	6.1	3	18.3	29	44.0	75	7
DFAS0620X03S070	★	6.2	3	18.6	29	44.0	75	7
DFAS0630X03S070	★	6.3	3	18.9	29	44.0	75	7
DFAS0640X03S070	★	6.4	3	19.2	29	44.0	75	7
DFAS0650X03S070	●	6.5	3	19.5	29	44.0	75	7
DFAS0660X03S070	★	6.6	3	19.8	32	41.0	75	7
DFAS0670X03S070	★	6.7	3	20.1	32	41.0	75	7
DFAS0680X03S070	●	6.8	3	20.4	32	41.0	75	7
DFAS0690X03S070	★	6.9	3	20.7	32	41.0	75	7
DFAS0700X03S070	●	7.0	3	21.0	32	41.0	75	7
DFAS0710X03S080	★	7.1	3	21.3	34	44.0	80	8
DFAS0720X03S080	★	7.2	3	21.6	34	44.0	80	8
DFAS0730X03S080	★	7.3	3	21.9	34	44.0	80	8
DFAS0740X03S080	★	7.4	3	22.2	34	44.0	80	8
DFAS0750X03S080	●	7.5	3	22.5	34	44.0	80	8
DFAS0760X03S080	★	7.6	3	22.8	36	42.0	80	8
DFAS0770X03S080	★	7.7	3	23.1	36	42.0	80	8
DFAS0780X03S080	★	7.8	3	23.4	36	42.0	80	8
DFAS0790X03S080	★	7.9	3	23.7	36	42.0	80	8
DFAS0800X03S080	●	8.0	3	24.0	36	42.0	80	8
DFAS0810X03S090	★	8.1	3	24.3	38	45.0	85	9
DFAS0820X03S090	●	8.2	3	24.6	38	45.0	85	9
DFAS0830X03S090	★	8.3	3	24.9	38	45.0	85	9
DFAS0840X03S090	★	8.4	3	25.2	38	45.0	85	9
DFAS0850X03S090	●	8.5	3	25.5	38	45.0	85	9
DFAS0860X03S090	★	8.6	3	25.8	41	42.0	85	9
DFAS0870X03S090	★	8.7	3	26.1	41	42.0	85	9
DFAS0880X03S090	●	8.8	3	26.4	41	42.0	85	9
DFAS0890X03S090	★	8.9	3	26.7	41	42.0	85	9
DFAS0900X03S090	●	9.0	3	27.0	41	42.0	85	9
DFAS0910X03S100	★	9.1	3	27.3	43	45.0	90	10
DFAS0920X03S100	★	9.2	3	27.6	43	45.0	90	10
DFAS0930X03S100	★	9.3	3	27.9	43	45.0	90	10
DFAS0940X03S100	★	9.4	3	28.2	43	45.0	90	10
DFAS0950X03S100	●	9.5	3	28.5	43	45.0	90	10
DFAS0960X03S100	★	9.6	3	28.8	45	43.0	90	10
DFAS0970X03S100	●	9.7	3	29.1	45	43.0	90	10
DFAS0980X03S100	★	9.8	3	29.4	45	43.0	90	10
DFAS0990X03S100	★	9.9	3	29.7	45	43.0	90	10
DFAS1000X03S100	●	10.0	3	30.0	45	43.0	90	10
DFAS1010X03S110	★	10.1	3	30.3	47	52.0	101	11
DFAS1020X03S110	●	10.2	3	30.6	47	52.0	101	11
DFAS1030X03S110	★	10.3	3	30.9	47	52.0	101	11
DFAS1040X03S110	★	10.4	3	31.2	47	52.0	101	11
DFAS1050X03S110	●	10.5	3	31.5	47	52.0	101	11
DFAS1060X03S110	★	10.6	3	31.8	50	49.0	101	11
DFAS1070X03S110	★	10.7	3	32.1	50	49.0	101	11
DFAS1080X03S110	★	10.8	3	32.4	50	49.0	101	11
DFAS1090X03S110	★	10.9	3	32.7	50	49.0	101	11
DFAS1100X03S110	●	11.0	3	33.0	50	49.0	101	11

DFAS – SOLID CARBIDE FLAT BOTTOM DRILLS

Order number	DP102A	DC	L/D	LU	LCF	LS	OAL	DCON
DFAS1110X03S120	★	11.1	3	33.3	52	51.0	105	12
DFAS1120X03S120	★	11.2	3	33.6	52	51.0	105	12
DFAS1130X03S120	★	11.3	3	33.9	52	51.0	105	12
DFAS1140X03S120	★	11.4	3	34.2	52	51.0	105	12
DFAS1150X03S120	●	11.5	3	34.5	52	51.0	105	12
DFAS1160X03S120	★	11.6	3	34.8	54	49.0	105	12
DFAS1170X03S120	★	11.7	3	35.1	54	49.0	105	12
DFAS1180X03S120	★	11.8	3	35.4	54	49.0	105	12
DFAS1190X03S120	★	11.9	3	35.7	54	49.0	105	12
DFAS1200X03S120	●	12.0	3	36.0	54	49.0	105	12
DFAS1250X03S130	★	12.5	3	37.5	56	52.0	110	13
DFAS1300X03S130	●	13.0	3	39.0	59	49.0	110	13
DFAS1350X03S140	★	13.5	3	40.5	61	51.0	114	14
DFAS1400X03S140	●	14.0	3	42.0	63	49.0	114	14

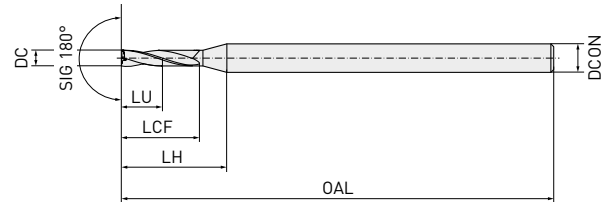


MINI-MFE



FOR SMALL DIAMETER HOLES

P M K N



	0.75 < DC < 2.95	
	0	-0.014
	DCON=3	DCON=4
	0	0
	-0.006	-0.008

Order number	DP102A	DC	L/D	LU	LCF	LH	OAL	DCON
MFE0075X02S030	★	0.75	2	1.5	3	7.7	45	3
MFE0080X02S030	★	0.8	2	1.6	3.2	7.8	45	3
MFE0085X02S030	★	0.85	2	1.7	3.4	7.9	45	3
MFE0090X02S030	★	0.9	2	1.8	3.6	8	45	3
MFE0095X02S030	★	0.95	2	1.9	3.8	8.1	45	3
MFE0100X02S030	★	1	2	2	4	8.2	45	3
MFE0105X02S030	★	1.05	2	2.1	4.2	8.3	45	3
MFE0110X02S030	★	1.1	2	2.2	4.4	8.4	45	3
MFE0115X02S030	★	1.15	2	2.3	4.6	8.6	45	3
MFE0120X02S030	★	1.2	2	2.4	4.8	8.7	45	3
MFE0125X02S030	★	1.25	2	2.5	5	8.8	45	3
MFE0130X02S030	★	1.3	2	2.6	5.2	8.9	45	3
MFE0135X02S030	★	1.35	2	2.7	5.4	9	45	3
MFE0140X02S030	★	1.4	2	2.8	5.6	9.1	45	3
MFE0145X02S030	★	1.45	2	2.9	5.8	9.2	45	3
MFE0150X02S030	★	1.5	2	3	6	9.3	45	3
MFE0155X02S030	★	1.55	2	3.1	6.2	9.4	45	3
MFE0160X02S030	★	1.6	2	3.2	6.4	9.5	45	3
MFE0165X02S030	★	1.65	2	3.3	6.6	9.6	45	3
MFE0170X02S030	★	1.7	2	3.4	6.8	9.7	45	3
MFE0175X02S030	★	1.75	2	3.5	7	9.8	45	3
MFE0180X02S030	★	1.8	2	3.6	7.2	9.9	45	3
MFE0185X02S030	★	1.85	2	3.7	7.4	10	45	3
MFE0190X02S030	★	1.9	2	3.8	7.6	10.2	45	3
MFE0195X02S030	★	1.95	2	3.9	7.8	10.3	45	3

MINI-MFE

Order number	DP102A	DC	L/D	LU	LCF	LH	OAL	DCON
MFE0200X02S040	★	2	2	4	8	12.2	50	4
MFE0205X02S040	★	2.05	2	4.1	8.2	12.3	50	4
MFE0210X02S040	★	2.1	2	4.2	8.4	12.4	50	4
MFE0215X02S040	★	2.15	2	4.3	8.6	12.6	50	4
MFE0220X02S040	★	2.2	2	4.4	8.8	12.7	50	4
MFE0225X02S040	★	2.25	2	4.5	9	12.8	50	4
MFE0230X02S040	★	2.3	2	4.6	9.2	12.9	50	4
MFE0235X02S040	★	2.35	2	4.7	9.4	13	50	4
MFE0240X02S040	★	2.4	2	4.8	9.6	13.1	50	4
MFE0245X02S040	★	2.45	2	4.9	9.8	13.2	50	4
MFE0250X02S040	★	2.5	2	5	10	13.3	50	4
MFE0255X02S040	★	2.55	2	5.1	10.2	13.4	50	4
MFE0260X02S040	★	2.6	2	5.2	10.4	13.5	50	4
MFE0265X02S040	★	2.65	2	5.3	10.6	13.6	50	4
MFE0270X02S040	★	2.7	2	5.4	10.8	13.7	50	4
MFE0275X02S040	★	2.75	2	5.5	11	13.8	50	4
MFE0280X02S040	★	2.8	2	5.6	11.2	13.9	50	4
MFE0285X02S040	★	2.85	2	5.7	11.4	14	50	4
MFE0290X02S040	★	2.9	2	5.8	11.6	14.2	50	4
MFE0295X02S040	★	2.95	2	5.9	11.8	14.3	50	4



DFAS/MINI-MFE

RECOMMENDED CUTTING CONDITIONS

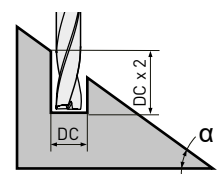
Material	DC	L/D	n	$\alpha = 0^\circ$ fr (Min. - Max.) (mm/rev.)
Mild steels (<180HB) C10E etc.	0.75	≤2	23300	0.030 (0.010–0.050)
	1.0	≤2	17500	0.030 (0.010–0.050)
	1.5	≤2	12200	0.035 (0.015–0.055)
	2.0	≤2	9500	0.040 (0.020–0.060)
	2.5	≤2	7900	0.050 (0.030–0.070)
	3.0	≤2	7900	0.060 (0.040–0.080)
	4.0	≤2	5900	0.080 (0.060–0.100)
	5.0	≤2	4700	0.100 (0.080–0.130)
	6.0	≤2	3900	0.130 (0.100–0.150)
	8.0	≤2	2900	0.150 (0.130–0.170)
	10.0	≤2	2300	0.170 (0.150–0.200)
	12.0	≤2	1900	0.200 (0.170–0.250)
	16.0	≤2	1400	0.250 (0.200–0.300)
Carbon steels, Alloy steels (180–280HB) DIN Ck45, 41CrMo4 etc.	0.75	≤2	19000	0.030 (0.010–0.050)
	1.0	≤2	14300	0.030 (0.010–0.050)
	1.5	≤2	10000	0.035 (0.015–0.055)
	2.0	≤2	7900	0.040 (0.020–0.060)
	2.5	≤2	6600	0.050 (0.030–0.070)
	3.0	≤2	7900	0.060 (0.040–0.080)
	4.0	≤2	5900	0.080 (0.060–0.100)
	5.0	≤2	4700	0.100 (0.080–0.130)
	6.0	≤2	3900	0.130 (0.100–0.150)
	8.0	≤2	2900	0.150 (0.130–0.170)
	10.0	≤2	2300	0.170 (0.150–0.200)
	12.0	≤2	1900	0.200 (0.170–0.250)
	16.0	≤2	1400	0.250 (0.200–0.300)
Carbon steels, Alloy steels (280–350HB) DIN 40CrNiMoA etc.	0.75	≤2	16900	0.030 (0.010–0.050)
	1.0	≤2	12700	0.030 (0.010–0.050)
	1.5	≤2	8400	0.035 (0.015–0.055)
	2.0	≤2	6700	0.040 (0.020–0.060)
	2.5	≤2	5700	0.050 (0.030–0.070)
	3.0	≤2	6800	0.060 (0.040–0.080)
	4.0	≤2	5100	0.080 (0.060–0.100)
	5.0	≤2	4100	0.100 (0.080–0.130)
	6.0	≤2	3400	0.130 (0.100–0.150)
	8.0	≤2	2500	0.150 (0.130–0.170)
	10.0	≤2	2000	0.170 (0.150–0.200)
	12.0	≤2	1700	0.200 (0.170–0.250)
	16.0	≤2	1200	0.250 (0.200–0.300)
Austenitic stainless steels (<200HB) DIN X5CrNi189, X5CrNiMo1810 etc.	0.75	≤2	10600	0.007 (0.003–0.011)
	1.0	≤2	7900	0.007 (0.003–0.011)
	1.5	≤2	5300	0.010 (0.005–0.015)
	2.0	≤2	4700	0.015 (0.010–0.020)
	2.5	≤2	3800	0.015 (0.010–0.020)
	3.0	≤2	3100	0.020 (0.010–0.030)
	4.0	≤2	2300	0.030 (0.020–0.040)
	5.0	≤2	1900	0.040 (0.030–0.050)
	6.0	≤2	1500	0.050 (0.040–0.060)
	8.0	≤2	1100	0.060 (0.050–0.080)
	10.0	≤2	950	0.080 (0.060–0.100)
	12.0	≤2	790	0.100 (0.080–0.120)
	16.0	≤2	590	0.120 (0.100–0.150)
20.0	≤2	470	0.150 (0.120–0.200)	

DFAS/MINI-MFE

RECOMMENDED CUTTING CONDITIONS

Material	DC	L/D	n	$\alpha = 0^\circ$ fr (Min. - Max.) (mm/rev.)
K Gray cast irons (<350MPa) DIN GG30 etc.	0.75	≤ 2	23300	0.030 (0.010–0.050)
	1.0	≤ 2	17500	0.030 (0.010–0.050)
	1.5	≤ 2	12200	0.035 (0.015–0.055)
	2.0	≤ 2	9500	0.040 (0.020–0.060)
	2.5	≤ 2	7900	0.050 (0.030–0.070)
	3.0	≤ 2	7900	0.060 (0.040–0.080)
	4.0	≤ 2	5900	0.030 (0.020–0.040)
	5.0	≤ 2	4700	0.040 (0.030–0.050)
	6.0	≤ 2	3900	0.050 (0.040–0.060)
	8.0	≤ 2	2900	0.060 (0.050–0.080)
	10.0	≤ 2	2300	0.080 (0.060–0.100)
	12.0	≤ 2	1900	0.100 (0.080–0.120)
	16.0	≤ 2	1400	0.120 (0.100–0.150)
	20.0	≤ 2	1100	0.150 (0.120–0.200)
N Ductile cast irons (<450MPa) DIN GGG40.3 etc.	0.75	≤ 2	16900	0.010 (0.005–0.015)
	1.0	≤ 2	12700	0.010 (0.005–0.015)
	1.5	≤ 2	10000	0.020 (0.010–0.030)
	2.0	≤ 2	8700	0.030 (0.015–0.045)
	2.5	≤ 2	7300	0.045 (0.025–0.065)
	3.0	≤ 2	6800	0.050 (0.040–0.060)
	4.0	≤ 2	5500	0.030 (0.020–0.040)
	5.0	≤ 2	4400	0.040 (0.030–0.050)
	6.0	≤ 2	3700	0.050 (0.040–0.060)
	8.0	≤ 2	2700	0.060 (0.050–0.080)
	10.0	≤ 2	2200	0.080 (0.060–0.100)
	12.0	≤ 2	1800	0.100 (0.080–0.120)
	16.0	≤ 2	1300	0.120 (0.100–0.150)
	20.0	≤ 2	1100	0.150 (0.120–0.200)
S Aluminium alloys (Si<5 %) JIS A6061, A7075 etc.	0.75	≤ 2	42400	0.020 (0.010–0.030)
	1.0	≤ 2	31800	0.020 (0.010–0.030)
	1.5	≤ 2	21200	0.020 (0.010–0.030)
	2.0	≤ 2	17500	0.050 (0.030–0.070)
	2.5	≤ 2	14000	0.060 (0.040–0.090)
	3.0	≤ 2	11600	0.060 (0.040–0.090)
	4.0	≤ 2	8700	0.080 (0.060–0.100)
	5.0	≤ 2	7000	0.100 (0.080–0.130)
	6.0	≤ 2	5800	0.130 (0.100–0.160)
	8.0	≤ 2	4300	0.160 (0.130–0.200)
	10.0	≤ 2	3500	0.200 (0.160–0.240)
	12.0	≤ 2	2900	0.240 (0.200–0.280)
	16.0	≤ 2	2100	0.280 (0.240–0.320)
	20.0	≤ 2	1700	0.320 (0.280–0.360)
Titanium alloy (Ti-6Al-4V, Ti-5Al-5V-5Mo-3Cr)	3.0	≤ 3	3710	0.030 (0.010–0.050)
	4.0	≤ 3	2790	0.040 (0.010–0.070)
	5.0	≤ 3	2230	0.050 (0.020–0.080)
	6.0	≤ 3	1860	0.060 (0.020–0.100)
	7.0	≤ 3	1590	0.070 (0.020–0.120)
	8.0	≤ 3	1390	0.080 (0.030–0.130)
	9.0	≤ 3	1240	0.090 (0.030–0.150)
	10.0	≤ 3	1110	0.100 (0.030–0.170)
	11.0	≤ 3	1010	0.110 (0.040–0.180)
	12.0	≤ 3	930	0.120 (0.040–0.200)
	13.0	≤ 3	860	0.130 (0.040–0.220)
	14.0	≤ 3	800	0.140 (0.050–0.230)

1. The recommended hole depth is DCx2. This should be the depth from the uppermost surface of the work material when machining on angled surfaces. [Refer to diagram]
2. The table above assumes drilling on a flat surface. For drilling on angled surfaces, adjust the feed rate accordingly. When the inclination angle α is 30° or less, as a guide adjust the feed rate to 70 % or lower and when the inclination angle α is greater than 30° adjust the feed rate to 50 % or lower.
3. This tool is for hole drilling only. It cannot be used for cross-feed or helical machining.

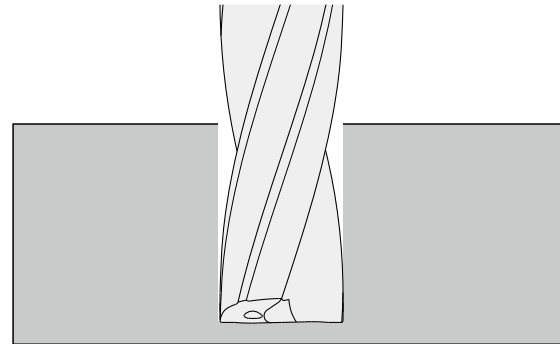
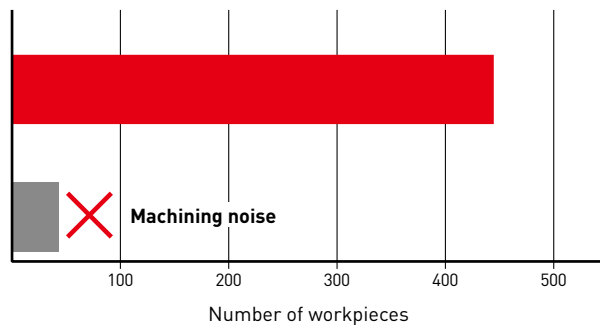


APPLICATION EXAMPLE

Material	DIN 1.1213 / Cf 53
Tool/Drill	DFAS0800X03S080
Component	Machine parts
Vc (m/min)	100
fr (mm/rev.)	0.12
L/D (mm)	4.5
Cutting mode	Wet cutting
Coolant	Internal coolant (Water-soluble)
Machine	MC

Results

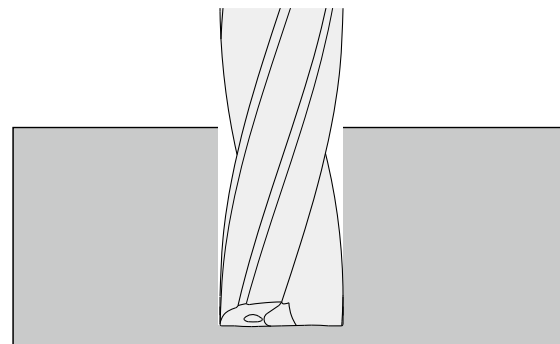
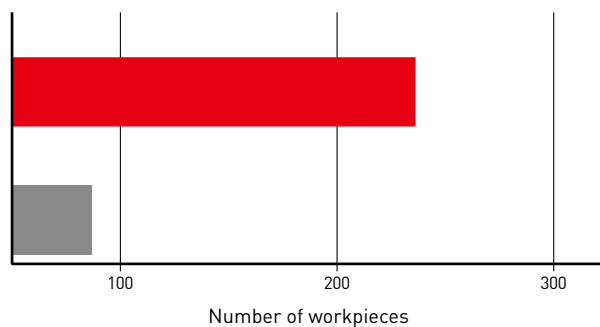
Cutting noise was reduced and the number of holes drilled was increased by 700 % when compared to a conventional product. The quality of the machined surface finish was also improved.



Material	DIN 1.0038 / St 37-2
Tool/Drill	DFAS1100X03S110
Component	Machine parts
Vc (m/min)	104
fr (mm/rev.)	0.12
L/D (mm)	27
Cutting mode	Wet cutting
Coolant	Internal coolant (Water-soluble)
Machine	MC

Results

Cutting noise was reduced and the number of holes drilled was increased by 300 % when compared to a conventional product. The quality of the machined surface finish was also improved.



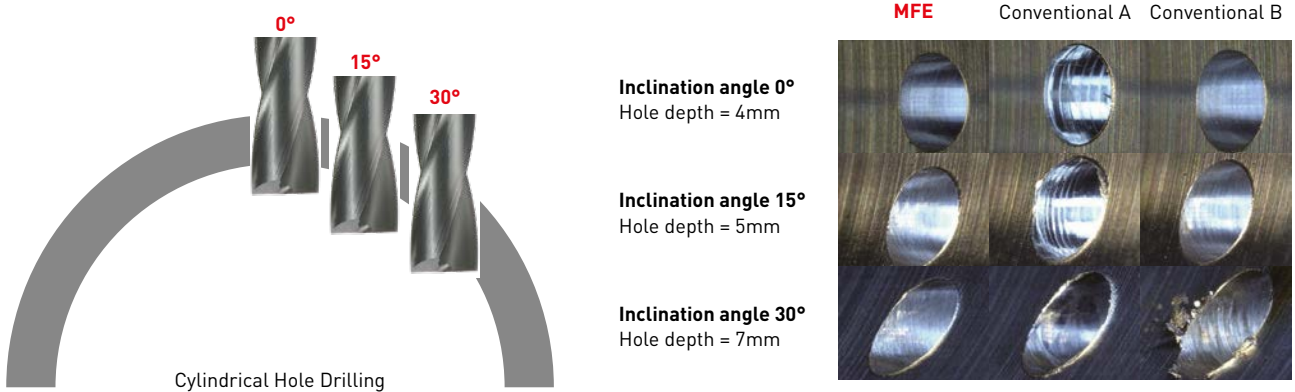
■ DFAS ■ Conventional

CUTTING PERFORMANCE

COMPARISON OF EXIT BURRS GENERATED WHEN DRILLING STAINLESS STEEL

The unique cutting edge shape suppresses the formation of exit burrs.

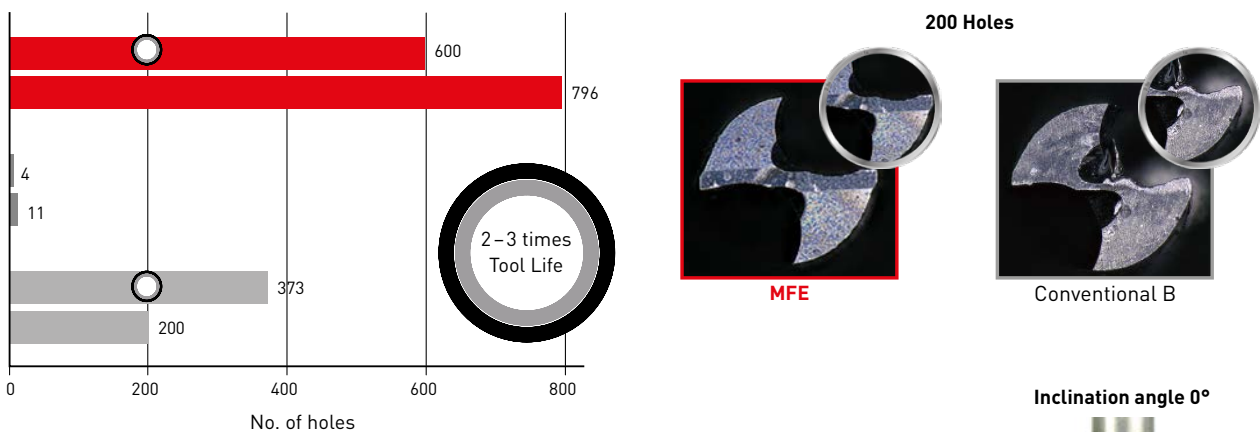
INCLINATION ANGLE



Material	DIN X5CrNi189
Tool/Drill	MFE0200X02S040
Vc (m/min)	30
fr (mm/rev.)	0.01
Cutting mode	Wet cutting
Coolant	External coolant (Water-soluble)
Machine	Vertical MC (BT40)

COMPARISON OF TOOL LIFE WHEN DRILLING STAINLESS STEEL

Excellent fracture resistance is achieved even when drilling cylindrical surfaces on a small automatic lathe.



Material	DIN X5CrNi189
Tool/Drill	MFE0080X02S030
Vc (m/min)	15
fr (mm/rev.)	0.01
Cutting mode	Wet cutting
Coolant	External coolant (Water-insoluble)
Machine	Small automatic lathe

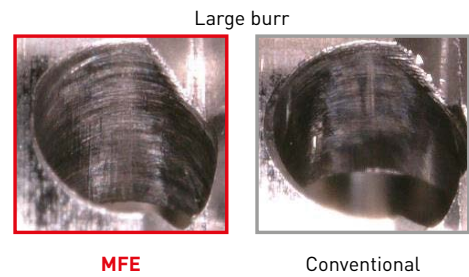
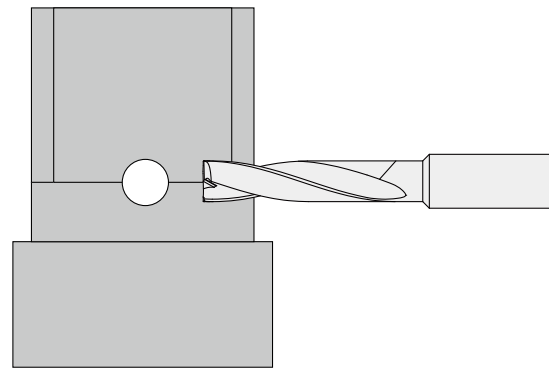
■ **MFE** ■ Conventional A ■ Conventional B

The above examples are actual applications, therefore can differ from the recommended conditions.

APPLICATION EXAMPLE

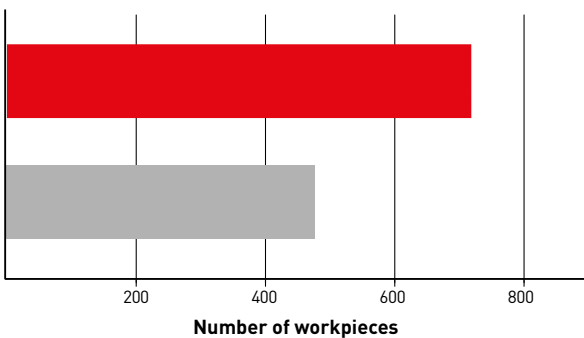
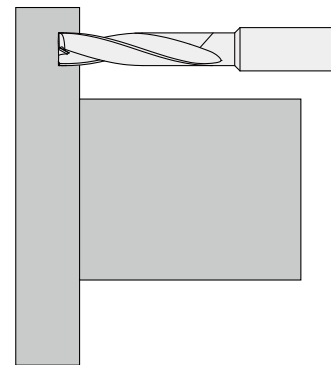
Material	DIN X12CrNiS188
Tool/Drill	MFE0180X02S030
Component	Bolt
Vc (m/min)	22
fr (mm/rev.)	0.015
Cutting mode	Wet cutting
Coolant	External coolant
Machine	Small automatic lathe

Results MFE – No accuracy errors even when used for continuous hole drilling on a small automatic lathe and gave at least double tool life.



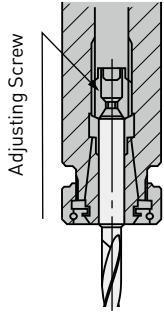
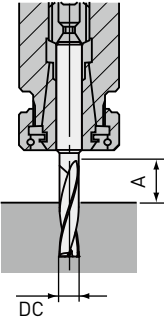
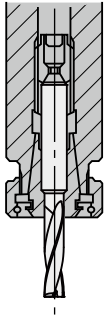
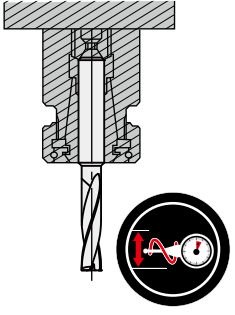
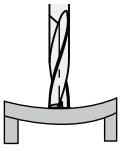
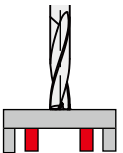
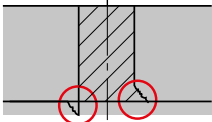
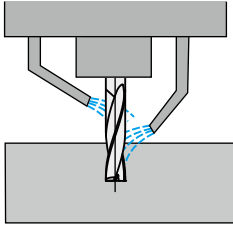
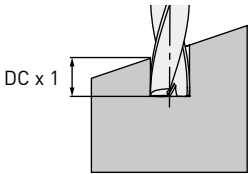
Material	JIS SUS 440 Pilot drilling
Tool/Drill	MFE0160X02S030
Component	Nut
Vc (m/min)	40
fr (mm/rev.)	0.01 – 0.012
Hole depth ap (mm)	5
Cutting mode	Wet cutting
Coolant	External coolant
Machine	Horizontal MC

Results MFE is excellent at maintaining accuracy and the tool life extended by 1.5 times when compared to conventional products.



■ MFE ■ Conventional

OPERATIONAL GUIDANCE

Drill holding	Drill length	Drill installation	Installation tolerance
 <p>Adjusting Screw</p> <p>Thrust bearing type collet chuck holds the drill securely.</p>	 <p>$A > DC \times 1.5$</p>	 <p>NG</p> <p>Do not clamp on the flutes.</p>	 <p>Run-out < 0.03mm</p>
Thin workpiece	Burring and workpiece chipping	Coolant method (MFE)	Inclined face drilling
 <p>NG If bending occurs</p>  <p>OK Support the workpiece</p>	 <p>Lower the feed rate by 50 % at the end of through cutting. Add a chamfer.</p>	 <p>Two coolant positions, at the end and at the centre are ideal.</p>	 <p>DC x 1</p> <p>When machining a deep hole into an inclined surface, use MFE drill (L/D=2) as a drill for a guide hole. Set the drill depth at approx. DC x 1 to obtain an accurate guide hole.</p>

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