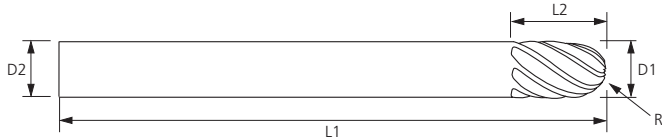




Where **high performance** is the **standard**

TuffCut® 3D Series MFPB



Multi-Flute Parallel Ballnose
Designed for 4 & 5 axis, 3D surfacing applications in aerospace & medical materials

Features

- Multi-flute design
- ALtima® Xtreme coating
- Short & long overall lengths

Benefits

- High feed rates in semi-finishing & finishing applications
- Excellent heat & wear resistance in tough-to-machine materials
- Provides versatility for complex, tough to reach part features

ALtima® Xtreme		Diameter			Shank		OAL		Flute Length		Ball Radius		No. of Flutes
Tool No.	EDP	D1			D2 (h6)		L1		L2		R		
		Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm	Inch	mm	
MFPBM0601AX	03800	-	6	.2362	-	6	-	57	-	9	-	3	6
MFPBM0602AX	03801	-	6	.2362	-	6	-	101	-	9	-	3	6
MFPB25001AX	03802	1/4	-	.2500	1/4	-	2-1/2	-	3/8	-	1/8	-	6
MFPB25002AX	03803	1/4	-	.2500	1/4	-	4	-	3/8	-	1/8	-	6
MFPB31251AX	03804	5/16	-	.3125	5/16	-	2-1/2	-	7/16	-	5/32	-	8
MFPB31252AX	03805	5/16	-	.3125	5/16	-	4	-	7/16	-	5/32	-	8
MFPBM0801AX	03806	-	8	.3150	-	8	-	63	-	12	-	4	8
MFPBM0802AX	03807	-	8	.3150	-	8	-	101	-	12	-	4	8
MFPB37501AX	03808	3/8	-	.3750	3/8	-	3	-	1/2	-	3/16	-	8
MFPB37502AX	03809	3/8	-	.3750	3/8	-	4	-	1/2	-	3/16	-	8
MFPBM1001AX	03810	-	10	.3937	-	10	-	72	-	15	-	5	8
MFPBM1002AX	03811	-	10	.3937	-	10	-	103	-	15	-	5	8
MFPBM1201AX	03812	-	12	.4724	-	12	-	83	-	18	-	6	8
MFPBM1202AX	03813	-	12	.4724	-	12	-	110	-	18	-	6	8
MFPB50001AX	03814	1/2	-	.5000	1/2	-	3	-	5/8	-	1/4	-	8
MFPB50002AX	03815	1/2	-	.5000	1/2	-	4	-	5/8	-	1/4	-	8
MFPB62501AX	03816	5/8	-	.6250	5/8	-	3-1/2	-	3/4	-	5/16	-	8
MFPB62502AX	03817	5/8	-	.6250	5/8	-	5	-	3/4	-	5/16	-	8
MFPBM1601AX	03818	-	16	.6299	-	16	-	92	-	24	-	8	8
MFPBM1602AX	03819	-	16	.6299	-	16	-	110	-	24	-	8	8
MFPB75001AX	03820	3/4	-	.7500	3/4	-	4	-	1	-	3/8	-	10
MFPB75002AX	03821	3/4	-	.7500	3/4	-	6	-	1	-	3/8	-	10
MFPBM2001AX	03822	-	20	.7874	-	20	-	104	-	30	-	10	10
MFPBM2002AX	03823	-	20	.7874	-	20	-	152	-	30	-	10	10



Where **high performance** is the **standard**®

MFPB Series Recommended Cutting Data - Speeds Inch

Recommended Speeds by Material Group						Finishing	Semi-Finishng
Workpiece Material Group	Material Type	Ap				0.01-0.03 x D	0.05-0.1 x D
		Ae				0.02-0.03 x D	0.05-0.1 x D
		Coolant			Vc - SFM		
		Max	Air	MMS			
Steels	P	Low Carbon	●	●	●	1480	1150
		Medium Carbon	●	●	●	1130	900
		Alloy Steels	●	●	●	1030	840
		Die / Tool Steels (≤ 45 HRC)	●	●	●	900	720
Stainless Steels	M	Free Machining	●	X	○	670	540
		Austenitic	●	X	○	520	430
		Difficult Stainless	●	X	○	410	330
		PH Stainless (≤ 45 HRC)	●	X	○	520	430
		Cobalt Chrome Alloys	●	X	○	410	330
		Duplex (22%)	●	X	○	250	200
		Super Duplex (25%)	●	X	○	250	200
Special Alloys	S	High Temp Alloys	●	X	X	180	150
		Titanium Alloys	●	X	X	380	340
Cast Irons	K	Gray Cast Iron	●	○	○	1620	1300
		Ductile Cast Iron	●	○	○	1050	920
		Malleable Iron	●	○	○	670	540
Hardened Steels	H	HRC 45-50	●	○	○	490	410
		HRC 50-55	●	○	○	330	310

● Preferred ○ Possible X Not Possible



Where *high performance* is the *standard*®

MFPB Series Recommended Cutting Data - Feeds Inch

Recommended Feeds by Material Group		Tool Diameter												
Workpiece Material Group	Material Type	1/4		5/16		3/8		1/2		5/8		3/4		
		Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	
		Fz - in/tooth												
Steels	P	Low Carbon	.0075	.0038	.0094	.0047	.0113	.0056	.0150	.0075	.0188	.0094	.0225	.0113
		Medium Carbon	.0075	.0038	.0094	.0047	.0113	.0056	.0150	.0075	.0188	.0094	.0225	.0113
		Alloy Steels	.0075	.0038	.0094	.0047	.0113	.0056	.0150	.0075	.0188	.0094	.0225	.0113
		Die / Tool Steels (≤ 45 HRC)	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
Stainless Steels	M	Free Machining	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
		Austenitic	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
		Difficult Stainless	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
		PH Stainless (≤ 45 HRC)	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
		Cobalt Chrome Alloys	.0045	.0030	.0056	.0038	.0068	.0045	.0090	.0060	.0113	.0075	.0135	.0090
		Duplex (22%)	.0045	.0030	.0056	.0038	.0068	.0045	.0090	.0060	.0113	.0075	.0135	.0090
Special Alloys	S	Super Duplex (25%)	.0043	.0028	.0053	.0034	.0064	.0041	.0085	.0055	.0106	.0069	.0128	.0083
		High Temp Alloys	.0038	.0025	.0047	.0031	.0056	.0038	.0075	.0050	.0094	.0063	.0113	.0075
Cast Irons	K	Titanium Alloys	.0038	.0025	.0047	.0031	.0056	.0038	.0075	.0050	.0094	.0063	.0113	.0075
		Gray Cast Iron	.0075	.0050	.0094	.0063	.0113	.0075	.0150	.0100	.0188	.0125	.0225	.0150
		Ductile Cast Iron	.0063	.0050	.0078	.0063	.0094	.0075	.0125	.0100	.0156	.0125	.0188	.0150
Hardened Steels	H	Malleable Iron	.0050	.0038	.0063	.0047	.0075	.0056	.0100	.0075	.0125	.0094	.0150	.0113
		HRC 45-50	.0038	.0035	.0047	.0044	.0056	.0053	.0075	.0070	.0094	.0088	.0113	.0105
		HRC 50-55	.0031	.0035	.0039	.0044	.0047	.0053	.0063	.0070	.0078	.0088	.0094	.0105

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

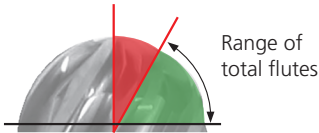
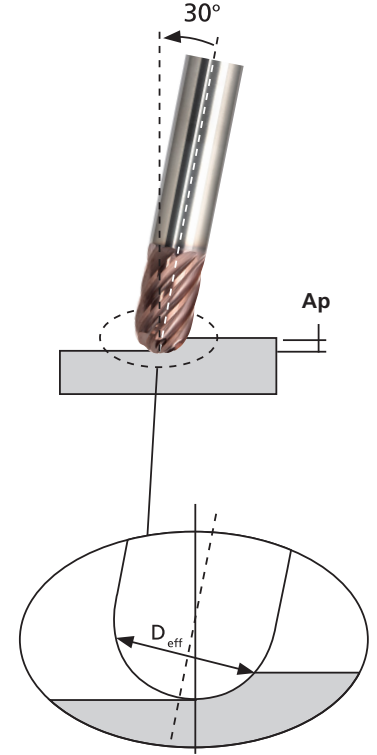


Where **high performance** is the **standard**

MFPB Series Recommended Cutting Data

Inch

Effective Diameter at 30°							
Tool Ø (in)	Axial Depth of Cut (Ap) - inch						
	.008	.016	.024	.031	.039	.059	.079
1/4	.193	.215	.229	.237	.243	-	-
5/16	.234	.260	.276	.287	.296	.309	-
3/8	.273	.303	.322	.335	.347	.365	.373
1/2	.351	.386	.411	.428	.443	.470	.487
5/8	.426	.467	.497	.517	.535	.570	.593
3/4	.500	.547	.580	.603	.624	.666	.695



Tool Ø (in)	Tilt Angle	No. of Flutes
1/4	33°	6
5/16	25°	8
3/8	22°	8
1/2	24°	8
5/8	25°	8
3/4	25°	10

Effective Teeth			
Tool Ø (in)	Tilt Angle		
	20°	25°	33°
1/4	2	4	6
5/16	2	8	8
3/8	2	8	8
1/2	6	8	8
5/8	6	8	8
3/4	6	10	10

Red Area:

Does not have complete effective number of flutes to center of tool.

Green Area:

Programming at the listed tilt angle will utilize the full effective number of flutes.



ISO 9001:2015 Certified

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



Where **high performance** is the **standard**®

MFPB Series Recommended Cutting Data - Speeds Metric

Recommended Speeds by Material Group						Finishing	Semi-Finishing
Workpiece Material Group	Material Type	Ap				0.01-0.03 x D	0.05-0.1 x D
		Ae				0.02-0.03 x D	0.05-0.1 x D
		Coolant			Vc - M/Min		
		Max	Air	MMS			
Steels	P	Low Carbon	●	●	●	450	350
		Medium Carbon	●	●	●	345	275
		Alloy Steels	●	●	●	315	255
		Die / Tool Steels (≤ 45 HRC)	●	●	●	275	220
Stainless Steels	M	Free Machining	●	X	○	205	165
		Austenitic	●	X	○	160	130
		Difficult Stainless	●	X	○	125	100
		PH Stainless (≤ 45 HRC)	●	X	○	160	130
		Cobalt Chrome Alloys	●	X	○	125	100
		Duplex (22%)	●	X	○	75	60
		Super Duplex (25%)	●	X	○	75	60
Special Alloys	S	High Temp Alloys	●	X	X	55	45
		Titanium Alloys	●	X	X	115	105
Cast Irons	K	Gray Cast Iron	●	○	○	495	395
		Ductile Cast Iron	●	○	○	320	280
		Malleable Iron	●	○	○	205	165
Hardened Steels	H	HRC 45-50	●	○	○	150	125
		HRC 50-55	●	○	○	100	95

● Preferred ○ Possible X Not Possible



Where *high performance* is the *standard*®

MFPB Series Recommended Cutting Data - Feeds

Metric

Recommended Feeds by Material Group		Tool Diameter												
Workpiece Material Group	Material Type	6		8		10		12		16		20		
		Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	Semi Finish	Finish	
		Fz - mm/tooth												
Steels	P	Low Carbon	0.180	0.090	0.240	0.120	0.300	0.150	0.360	0.180	0.480	0.240	0.600	0.300
		Medium Carbon	0.180	0.090	0.240	0.120	0.300	0.150	0.360	0.180	0.480	0.240	0.600	0.300
		Alloy Steels	0.180	0.090	0.240	0.120	0.300	0.150	0.360	0.180	0.480	0.240	0.600	0.300
		Die / Tool Steels (≤ 45 HRC)	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
Stainless Steels	M	Free Machining	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
		Austenitic	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
		Difficult Stainless	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
		PH Stainless (≤ 45 HRC)	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
		Cobalt Chrome Alloys	0.108	0.072	0.144	0.096	0.180	0.120	0.216	0.144	0.288	0.192	0.360	0.240
		Duplex (22%)	0.108	0.072	0.144	0.096	0.180	0.120	0.216	0.144	0.288	0.192	0.360	0.240
		Super Duplex (25%)	0.102	0.066	0.136	0.088	0.170	0.110	0.204	0.132	0.272	0.176	0.340	0.220
Special Alloys	S	High Temp Alloys	0.090	0.060	0.120	0.080	0.150	0.100	0.180	0.120	0.240	0.160	0.300	0.200
		Titanium Alloys	0.090	0.060	0.120	0.080	0.150	0.100	0.180	0.120	0.240	0.160	0.300	0.200
Cast Irons	K	Gray Cast Iron	0.180	0.120	0.240	0.160	0.300	0.200	0.360	0.240	0.480	0.320	0.600	0.400
		Ductile Cast Iron	0.150	0.120	0.200	0.160	0.250	0.200	0.300	0.240	0.400	0.320	0.500	0.400
		Malleable Iron	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240	0.400	0.300
Hardened Steels	H	HRC 45-50	0.090	0.084	0.120	0.112	0.150	0.140	0.180	0.168	0.240	0.224	0.300	0.280
		HRC 50-55	0.075	0.084	0.100	0.112	0.125	0.140	0.150	0.168	0.200	0.224	0.250	0.280

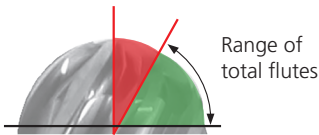
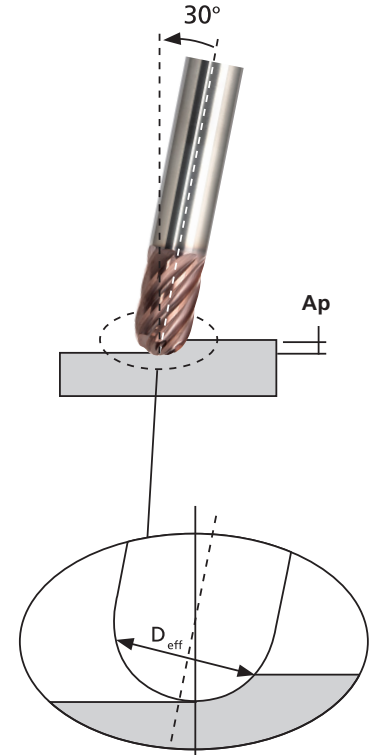
Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



Where **high performance** is the **standard**®

MFPB Series Recommended Cutting Data Metric

Tool Ø (mm)	Effective Diameter at 30°						
	Axial Depth of Cut (Ap) - mm						
	0.2	0.4	0.6	0.8	1	1.5	2
6	4.67	5.19	5.52	5.73	5.87	-	-
8	5.96	6.62	7.05	7.36	7.58	7.91	-
10	7.22	7.99	8.51	8.90	9.20	9.68	9.93
12	8.46	9.33	9.93	10.38	10.74	11.37	11.75
16	10.88	11.93	12.66	13.24	13.71	14.58	15.17
20	13.25	14.45	15.31	15.99	16.55	17.62	18.39



Tool Ø (mm)	Tilt Angle	No. of Flutes
6	33°	6
8	25°	8
10	22°	8
12	24°	8
16	25°	8
20	25°	10

Tool Ø (mm)	Effective Teeth		
	Tilt Angle		
	20°	25°	33°
6	2	4	6
8	2	8	8
10	2	8	8
12	6	8	8
16	6	8	8
20	6	10	10

Red Area:
Does not have complete effective number of flutes to center of tool.

Green Area:
Programming at the listed tilt angle will utilize the full effective number of flutes.

⚠ WARNING: This product can expose you to chemicals including nickel, cobalt, and lead, which are known to the State of California to cause cancer, and chemicals including lead which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



ISO 9001:2015 Certified

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.