









279/177/177L/177S/177W/179/179L Recommended Cutting Data - Profile Milling

Inch

279/179/179L series - If axial depth (ap) is less than the ball diameter, the speed is figured using the effective cutting diameter.
See pages 316-317 for 279 series contouring data.

Workpiece Material Group	I S O	Hardness	Coolant ● Preferred ○ Possible x Not Possible			Profiling (ae)				End Mill Diameter								
										1/8"	3/16"	1/4"	5/16	3/8	1/2	5/8	3/4	1
			5%	10%	25%	50%	*Profile Milling at ≥ 50% ap is not recommended for diameters 1/4" and below.											
						2.3	1.8	1.2	1.0	 Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only add chip thinning when roughing or semi-finishing.								
			Max.	Air	MMS	vc - SFM												
Low Carbon Steels 1018, 1020	P	up to 28 Rc	●	●	●	1475	1150	980	500	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	●	●	●	1130	900	840	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Alloy Steels 4140, 4145	P	28 to 44 Rc	●	●	●	1035	840	765	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	●	●	●	900	725	615	200	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Hardened Steels A2, D2	H	45 to 50 Rc	●	○	○	610	495	325	250	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Hardened Steels A2, D2	H	50 to 55 Rc	●	○	○	510	410	280	200	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	●	x	○	675	545	425	360	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	●	x	○	525	430	400	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	●	x	○	410	330	295	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	●	x	○	525	430	395	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Cobalt Chrome Alloys	M		●	x	○	410	325	295	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Duplex (22%)	M		●	x	○	245	195	180	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Super Duplex (25%)	M		●	x	○	245	195	180	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
High Temp Alloys	S	up to 42 Rc	●	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Inconel	S		●	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr-4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	●	x	x	525	425	330	175	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cast-Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	●	○	○	1625	1295	870	350	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	●	○	○	675	540	510	260	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula:
(Calculated Feed x Spindle Maximum)/Calculated Speed