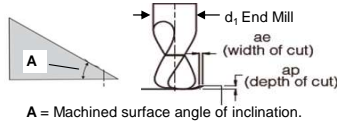


FEEDS & SPEEDS FOR ALL HSC GF500 T & GF300 T Torus

$$RPM = Vc \times 1000 / (3.14 \times d_e)$$

$$mm/min = fz \times z \times RPM$$

- 1 - Roughing = surface milling, machined surface angle A equals 0°.
- 2 - Finishing = contour milling, machined surface angle A between 0° and 90°.
- 3 - Reduce feeds and speeds 20% for tool projection greater than 5xD.
- 4 - ALL VALUES IN METRIC.



Roughing feed / tooth can be increased when ap / radius is less than 25% -
 Example - series 3856 10.000 diameter x 3.00 radius.
 Roughing table ap = .75
 End mill radius = 3.00
 .75 / 3.00 = 25%
 Multiply table roughing feed / tooth by 2.

		d _e End Mill Diameter							
		2	3	4	6	8	10	12	16
Roughing A = 0°	ap	0.14	0.21	0.28	0.42	0.60	0.75	1.00	1.36
	ae	1.16	1.74	2.32	3.48	5.52	6.50	8.52	11.52
Finishing A > 0°	ap	0.05	0.08	0.10	0.15	0.20	0.30	0.40	0.50
	ae	0.04	0.06	0.08	0.12	0.16	0.20	0.24	0.32

Material	Color Code	Hardness	HSC	Type of Cut	Cutting Speed n/min (Vc)	Feed / tooth fz (mm/z)							
						2	3	4	6	8	10	12	16
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	GREEN	up to 28 HRc	GF 500	Roughing	175	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	300	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	GREEN RED	28 to 38 HRc	GF 500	Roughing	150	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	250	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A 128, D2, D3, D4, D5, D7	RED	28 to 44 HRc	GF 500	Roughing	150	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	225	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	H	up to 54 HRc	GF 500	Roughing	125	0.02	0.03	0.04	0.04	0.05	0.07	0.08	0.10
			GF 500	Finishing	150	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
	H	54 to 60 HRc	GF 300	Roughing	75	0.02	0.03	0.04	0.04	0.05	0.07	0.08	0.10
			GF 300	Finishing	110	0.03	0.03	0.04	0.05	0.05	0.07	0.10	0.12
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F	BLUE	up to 28 HRc	GF 500	Roughing	180	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	300	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	BLUE	up to 28 HRc	GF 500	Roughing	110	0.02	0.03	0.04	0.04	0.05	0.07	0.08	0.10
			GF 500	Finishing	150	0.03	0.03	0.04	0.05	0.05	0.07	0.10	0.12
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8MO, Nitronic	BLUE	over 28 HRc	GF 500	Roughing	80	0.02	0.03	0.04	0.04	0.05	0.07	0.08	0.10
			GF 500	Finishing	130	0.03	0.03	0.04	0.05	0.05	0.07	0.10	0.12
High-Temperature Alloys Nimonic, Inconel, Monel, Hastelloy	GRAY	up to 42 HRc	GF 500	Roughing	40	0.01	0.02	0.03	0.04	0.04	0.05	0.07	0.08
			GF 500	Finishing	60	0.02	0.03	0.03	0.04	0.05	0.06	0.08	0.09
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	GRAY	up to 42 HRc	GF 500	Roughing	90	0.02	0.03	0.04	0.04	0.05	0.07	0.08	0.10
			GF 500	Finishing	125	0.03	0.03	0.04	0.05	0.05	0.07	0.10	0.12
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	WHITE	up to 240 HB 30	GF 500	Roughing	200	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	350	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	WHITE	over 240 HB 30	GF 500	Roughing	175	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
			GF 500	Finishing	275	0.03	0.04	0.05	0.05	0.07	0.10	0.12	0.15
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	BLACK	up to 3% Si											
Aluminum-cast alloys High Silicon - A380, A390, Castings, 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9, 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	BLACK	over 3% Si											
Magnesium Alloys	PURPLE												
Non-ferrous Copper Alloys, Brass, Bronze	BROWN	up to 28 HRc											