



Series 33CR Fractional	Hardness BRINELL		Ae x D ₁	Ap x D ₁	Vc (SFM)	Diameter (D ₁) (inch)							
						1/8	1/4	3/8	1/2	5/8	3/4	1	
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275	 Profile ≤ 0.5 ≤ 1.5	340	RPM	16808	8404	5603	4202	3362	2801	2101	
				(272-408)	Fz	0.0005	0.0012	0.0023	0.0031	0.0039	0.0040	0.0043	
					Feed (IPM)	25.2	30.3	38.7	39.1	39.3	33.6	27.1	
			 Slot 1 ≤ 1	270	RPM	13446	6723	4482	3362	2689	2241	1681	
				(216-324)	Fz	0.0005	0.0012	0.0023	0.0031	0.0039	0.0040	0.0043	
					Feed (IPM)	20.2	24.2	30.9	31.3	31.5	26.9	21.7	
M	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, Custom 450	< 325	 Profile ≤ 0.5 ≤ 1.5	310	RPM	9626	4813	3209	2407	1925	1604	1203	
				(248-372)	Fz	0.0004	0.0009	0.0017	0.0023	0.0029	0.0030	0.0032	
					Feed (IPM)	11.6	13.0	16.4	16.6	16.7	14.4	11.6	
			 Slot 1 ≤ 1	250	RPM	7640	3820	2547	1910	1528	1273	955	
				(200-300)	Fz	0.0004	0.0009	0.0017	0.0023	0.0029	0.0030	0.0032	
					Feed (IPM)	9.2	10.3	13.0	13.2	13.3	11.5	9.2	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoly 800, Monel 400	≤ 300	 Profile ≤ 0.5 ≤ 1.5	80	RPM	5654	2827	1885	1413	1131	942	707	
				(64-96)	Fz	0.0003	0.0007	0.0014	0.0018	0.0023	0.0024	0.0025	
					Feed (IPM)	5.1	5.9	7.9	7.6	7.8	6.8	5.3	
			 Slot 1 ≤ 1	65	RPM	4431	2216	1477	1108	886	739	554	
				(52-78)	Fz	0.0003	0.0007	0.0014	0.0018	0.0023	0.0024	0.0025	
					Feed (IPM)	4.0	4.7	6.2	6.0	6.1	5.3	4.2	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, 750X, Incoly 925, Waspaloy, Hastelloy, Rene	> 300	 Profile ≤ 0.5 ≤ 1.5	62	RPM	13599	6800	4533	3400	2720	2267	1700	
				(50-74)	Fz	0.0004	0.0011	0.0021	0.0028	0.0035	0.0036	0.0039	
					Feed (IPM)	14.3	22.4	28.6	28.6	28.6	24.5	19.9	
			 Slot 1 ≤ 1	49	RPM	10849	5424	3616	2712	2170	1808	1356	
				(39-59)	Fz	0.0004	0.0011	0.0021	0.0028	0.0035	0.0036	0.0039	
					Feed (IPM)	11.4	17.9	22.8	22.8	22.8	19.5	15.9	
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350	 Profile ≤ 0.5 ≤ 1.5	215	RPM	10390	5195	3463	2598	2078	1732	1299	
				(172-258)	Fz	0.0003	0.0008	0.0016	0.0021	0.0026	0.0027	0.0029	
					Feed (IPM)	9.4	12.5	16.6	16.4	16.2	14.0	11.3	
			 Slot 1 ≤ 1	170	RPM	8251	4126	2750	2063	1650	1375	1031	
				(136-204)	Fz	0.0003	0.0008	0.0016	0.0021	0.0026	0.0027	0.0029	
					Feed (IPM)	7.4	9.9	13.2	13.0	12.9	11.1	9.0	
S	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	> 350 ≤ 440	 Profile ≤ 0.5 ≤ 1.5	75	RPM	14974	7487	4991	3744	2995	2496	1872	
				(60-90)	Fz	0.0004	0.0010	0.0019	0.0025	0.0031	0.0032	0.0035	
					Feed (IPM)	17.1	22.5	28.5	28.1	27.9	24.0	19.7	
			 Slot 1 ≤ 1	60	RPM	11918	5959	3973	2980	2384	1986	1490	
				(48-72)	Fz	0.0004	0.0010	0.0019	0.0025	0.0031	0.0032	0.0035	
					Feed (IPM)	13.6	17.9	22.6	22.3	22.2	19.1	15.6	

rpm = sfm x 3.82 / D₁

ipm = (inch / flute) x 3 x rpm

reduce speed and feed for materials harder than listed

reduce feed and Ae when finish milling (.02 x D₁ maximum)

refer to the SGS Tool Wizard for complete technical information (I)