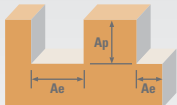


Series 33MCR Metric	Hardness BRINELL			Vc (m/min)	Diameter (D ₁) (mm)								
		Ae x D ₁	Ap x D ₁		3	6	8	10	12	16	20	25	
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	 ≤ 0.5 ≤ 1.5	104 (83-124)	RPM	10987	5493	4120	3296	2747	2060	1648	1318	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	237	316	396	396	395	396	343	277	
		 1 ≤ 1	82 (66-99)	RPM	8725	4362	3272	2617	2181	1636	1309	1047	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	188	251	314	314	314	314	272	220	
M	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, Custom 450	 ≤ 0.5 ≤ 1.5	94 (76-113)	RPM	10017	5009	3756	3005	2504	1878	1503	1202	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	216	288	361	361	361	361	313	252	
		 1 ≤ 1	76 (61-91)	RPM	8078	4039	3029	2424	2020	1515	1212	969	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	174	233	291	291	291	291	252	204	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoly 800, Monel 400	 ≤ 0.5 ≤ 1.5	24 (20-29)	RPM	2585	1293	969	776	646	485	388	310	
				Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059	0.060	
				Feed (mm/min)	48	65	81	65	79	78	68	56	
		 1 ≤ 1	20 (16-24)	RPM	2100	1050	788	630	525	394	315	252	
				Fz	0.006	0.017	0.028	0.035	0.041	0.054	0.059	0.060	
				Feed (mm/min)	39	53	66	66	64	64	55	45	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, 750X, Incoly 925, Waspaloy, Hastelloy, Rene	 ≤ 0.5 ≤ 1.5	19 (15-23)	RPM	2003	1002	751	601	501	376	301	240	
				Fz	0.005	0.012	0.019	0.024	0.029	0.038	0.043	0.043	
				Feed (mm/min)	29	36	43	43	43	43	38	31	
		 1 ≤ 1	15 (12-18)	RPM	11471	5736	4302	3441	2868	2151	1721	1377	
				Fz	0.008	0.026	0.045	0.056	0.067	0.090	0.096	0.098	
				Feed (mm/min)	289	454	578	578	578	578	496	403	
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	 ≤ 0.5 ≤ 1.5	66 (52-79)	RPM	6947	3474	2605	2084	1737	1303	1042	834	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	150	200	250	250	250	217	175		
		 1 ≤ 1	52 (41-62)	RPM	5493	2747	2060	1648	1373	1030	824	659	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	119	158	198	198	198	198	171	138	
S	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	 ≤ 0.5 ≤ 1.5	23 (18-27)	RPM	2424	1212	909	727	606	454	364	291	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	52	70	87	87	87	87	76	61	
		 1 ≤ 1	18 (15-22)	RPM	1939	969	727	582	485	364	291	233	
				Fz	0.007	0.019	0.032	0.040	0.048	0.064	0.069	0.070	
				Feed (mm/min)	42	56	70	70	70	70	60	49	

rpm = (1000 x m/min) / (3.14 x D₁)

mm / min = (mm / 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 ()