





















Series Z1MPCR, Z1MPLC Metric	Hardness BRINELL			Vc (m/min)	Diameter (D1) (mm)										
		Ae x D1	Ap x D1		3	6	8	10	12	16	20	25			
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	 ≤ 275		≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	211	316	387	387	369	380	334	264	
		 ≤ 325		1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	168	251	307	307	293	302	265	209	
M	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, Custom 450	< 325	 ≤ 325	≤ 0.5	≤ 1.5	94	RPM	10017	5009	3756	3005	2504	1878	1503	1202
						(76-113)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	192	288	353	353	337	346	305	240	
		 ≤ 325		1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	969
						(61-91)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	155	233	284	284	271	279	246	194	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoly 800, Monel 400	≤ 300	 ≤ 300	≤ 0.5	≤ 1.5	24	RPM	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.004	0.010	0.017	0.021	0.024	0.033	0.037	0.038
						Feed (mm/min)	37	50	66	66	62	65	58	47	
		 ≤ 300		1	≤ 1	20	RPM	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.004	0.010	0.017	0.021	0.024	0.033	0.037	0.038
						Feed (mm/min)	30	40	54	54	50	52	47	38	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, 750X, Incoly 925, Waspaloy, Hastelloy, Rene	> 300	 ≤ 300	≤ 0.5	≤ 1.5	19	RPM	2003	1002	751	601	501	376	301	240
						(15-23)	Fz	0.002	0.007	0.011	0.013	0.017	0.023	0.027	0.028
						Feed (mm/min)	19	29	32	32	34	35	32	26	
		 ≤ 300		1	≤ 1	15	RPM	1616	808	606	485	404	303	242	194
						(12-18)	Fz	0.002	0.007	0.011	0.013	0.017	0.023	0.027	0.028
						Feed (mm/min)	16	23	26	26	27	28	26	21	
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350	 ≤ 350	≤ 0.5	≤ 1.5	66	RPM	6947	3474	2605	2084	1737	1303	1042	834
						(52-79)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	133	167	222	222	217	213	189	150	
		 ≤ 350		1	≤ 1	52	RPM	5493	2747	2060	1648	1373	1030	824	659
						(41-62)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	105	132	176	176	171	169	149	119	
S	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	> 350 ≤ 440	 ≤ 350 ≤ 440	≤ 0.5	≤ 1.5	23	RPM	2424	1212	909	727	606	454	364	291
						(18-27)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	47	58	78	78	76	74	66	52	
		 ≤ 350 ≤ 440		1	≤ 1	18	RPM	1939	969	727	582	485	364	291	233
						(15-22)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	37	47	62	62	60	60	53	42	

rpm = (1000 x m/min) / (3.14 x D₁)

mm / min = (mm / flute) x 4 x rpm

maximum Slotting Ap for Z1PLC / Z1PLB is .25 x D₁maximum Profile Ae for Z1PLC / Z1PLB is .2 x D₁

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 ()