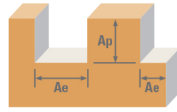










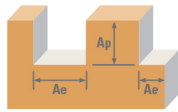


Series
51M, 51MCR,
51ML, 51MLC,
51MB, 51MLB
Metric













Series	Hardness	Ae x DC	Ap x DC	Vc (m/min)	DC • mm							
					6	8	10	12	16	20		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	Profile 	≤ 0.1	≤ 1	219	RPM	11633	8725	6980	5816	4362	3490
					(176-263)	Fz	0.048	0.081	0.101	0.121	0.142	0.158
						Feed (mm/min)	3350	4240	4230	4223	3717	3308
		HSM 	≤ 0.05	≤ 2	279	RPM	14784	11088	8870	7392	5544	4435
					(223-335)	Fz	0.066	0.113	0.141	0.169	0.197	0.220
						Feed (mm/min)	5854	7517	7504	7495	6553	5854
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	Profile 	≤ 0.1	≤ 1	149	RPM	7917	5938	4750	3958	2969	2375
					(119-179)	Fz	0.036	0.061	0.077	0.092	0.107	0.119
						Feed (mm/min)	1710	2173	2195	2185	1906	1696
		HSM 	≤ 0.05	≤ 2	189	RPM	10017	7513	6010	5009	3756	3005
					(151-227)	Fz	0.049	0.083	0.104	0.125	0.146	0.163
						Feed (mm/min)	2945	3741	3750	3756	3291	2939
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	Profile 	≤ 0.1	≤ 1	155	RPM	8240	6180	4944	4120	3090	2472
					(140-171)	Fz	0.035	0.060	0.075	0.090	0.105	0.117
						Feed (mm/min)	1730	2225	2225	2225	1947	1735
		HSM 	≤ 0.05	≤ 2	198	RPM	10502	7877	6301	5251	3938	3151
					(178-218)	Fz	0.048	0.082	0.102	0.122	0.143	0.159
						Feed (mm/min)	3025	3875	3856	3844	3379	3006
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	Profile 	≤ 0.1	≤ 1	107	RPM	5655	4241	3393	2827	2121	1696
					(96-117)	Fz	0.029	0.049	0.061	0.073	0.086	0.096
						Feed (mm/min)	984	1247	1242	1238	1094	977
		HSM 	≤ 0.05	≤ 2	137	RPM	7271	5453	4362	3635	2726	2181
					(123-151)	Fz	0.040	0.069	0.086	0.103	0.120	0.134
						Feed (mm/min)	1745	2258	2251	2247	1963	1754
STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	Profile 	≤ 0.1	≤ 1	99	RPM	5251	3938	3151	2626	1969	1575	
				(89-109)	Fz	0.029	0.049	0.061	0.073	0.086	0.096	
					Feed (mm/min)	914	1158	1153	1150	1016	907	
	HSM 	≤ 0.05	≤ 2	125	RPM	6624	4968	3975	3312	2484	1987	
				(112-137)	Fz	0.040	0.069	0.086	0.103	0.120	0.134	
					Feed (mm/min)	1590	2057	2051	2047	1789	1598	

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Series
51M, 51MCR,
51ML, 51MLC,
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Metric

Hardness	Ae x DC	Ap x DC	Vc (m/min)	DC • mm						
				6	8	10	12	16	20	
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400 Profile  HSM 	≤ 300 Bhn or ≤ 32 HRc	≤ 0.1 ≤ 1	32	RPM	1696	1272	1018	848	636	509
			(26-38)	Fz	0.034	0.057	0.071	0.085	0.100	0.110
				Feed (mm/min)	346	435	434	433	382	336
			40	RPM	2100	1575	1260	1050	788	630
			(32-48)	Fz	0.046	0.077	0.097	0.120	0.140	0.150
				Feed (mm/min)	580	728	733	756	662	567
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene Profile  HSM 	≤ 400 Bhn or ≤ 43 HRc	≤ 0.1 ≤ 1	24	RPM	1293	969	776	646	485	388
			(20-29)	Fz	0.023	0.039	0.049	0.059	0.068	0.077
				Feed (mm/min)	178	227	228	229	198	179
			30	RPM	1616	1212	969	808	606	485
			(24-37)	Fz	0.032	0.054	0.068	0.081	0.095	0.110
				Feed (mm/min)	310	393	396	393	345	320
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si Profile  HSM 	≤ 350 Bhn or ≤ 38 HRc	≤ 0.1 ≤ 1	85	RPM	4524	3393	2714	2262	1696	1357
			(68-102)	Fz	0.023	0.039	0.049	0.059	0.068	0.077
				Feed (mm/min)	624	794	798	801	692	627
			108	RPM	5736	4302	3441	2868	2151	1721
			(87-130)	Fz	0.032	0.054	0.068	0.081	0.095	0.110
				Feed (mm/min)	1101	1394	1404	1394	1226	1136
TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al Profile  HSM 	≤ 440 Bhn or ≤ 47 HRc	≤ 0.1 ≤ 1	47	RPM	2504	1878	1503	1252	939	751
			(38-57)	Fz	0.023	0.039	0.049	0.059	0.068	0.077
				Feed (mm/min)	346	440	442	443	383	347
			61	RPM	3231	2424	1939	1616	1212	969
			(49-73)	Fz	0.032	0.054	0.068	0.081	0.095	0.110
				Feed (mm/min)	620	785	791	785	691	640
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 Profile  HSM 	≤ 375 Bhn or ≤ 40 HRc	≤ 0.1 ≤ 1	73	RPM	3878	2908	2327	1939	1454	1163
			(59-88)	Fz	0.029	0.049	0.061	0.073	0.086	0.096
				Feed (mm/min)	675	855	852	849	750	670
			93	RPM	4928	3696	2957	2464	1848	1478
			(74-112)	Fz	0.040	0.069	0.086	0.103	0.120	0.134
				Feed (mm/min)	1183	1530	1526	1523	1331	1189

T-Carb® Speed & Feed Recommendations

- Note:**
- Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 - rpm = (Vc x 1000) / (DC x 3.14)
 - mm/min = Fz x 6 x rpm
 - reduce speed and feed for materials harder than listed
 - reduce feed and Ae when finish milling (.02 x DC maximum)
 - feed rates listed have chip thinning adjustments included where applicable
 - refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

