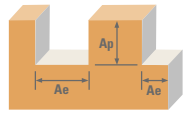


Series	Hardness	Ae x DC	Ap x DC	Vc (sfm)	DC • in									
					1/64	1/8	1/4	3/8	1/2	5/8	3/4	1		
P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	555	RPM	135904	16961	8480	5654	4240	3392	2827	2120
					(444-666)	Fz	0.00005	0.00046	0.0012	0.0023	0.0031	0.0034	0.0037	0.0043
						Feed (ipm)	27.2	31.2	40.7	52.0	52.6	46.1	41.8	36.5
					440	RPM	107744	13446	6723	4482	3362	2689	2241	1681
					(352-528)	Fz	0.00005	0.00046	0.0012	0.0023	0.0031	0.0034	0.0037	0.0043
						Feed (ipm)	21.5	24.7	32.3	41.2	41.7	36.6	33.2	28.9
	≤ 375 Bhn or ≤ 40 HRc	Slot 	1	≤ 1	315	RPM	77135	9626	4813	3209	2407	1925	1604	1203
					(252-378)	Fz	0.00004	0.00034	0.0009	0.0017	0.0023	0.0026	0.0028	0.0032
						Feed (ipm)	12.3	13.1	17.3	21.8	22.1	20.0	18.0	15.4
					250	RPM	61218	7640	3820	2547	1910	1528	1273	955
					(200-300)	Fz	0.00004	0.00034	0.0009	0.0017	0.0023	0.0026	0.0028	0.0032
						Feed (ipm)	9.8	10.4	13.8	17.3	17.6	15.9	14.3	12.2
M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	490	RPM	119987	14974	7487	4991	3744	2995	2496	1872
					(392-588)	Fz	0.00004	0.00034	0.0009	0.0017	0.0023	0.0026	0.0028	0.0032
						Feed (ipm)	19.2	20.4	27.0	33.9	34.4	31.1	28.0	24.0
					390	RPM	95500	11918	5959	3973	2980	2384	1986	1490
					(312-468)	Fz	0.00004	0.00034	0.0009	0.0017	0.0023	0.0026	0.0028	0.0032
						Feed (ipm)	15.3	16.2	21.5	27.0	27.4	24.8	22.2	19.1
	≤ 275 Bhn or ≤ 28 HRc	Slot 	1	≤ 1	340	RPM	83256	10390	5195	3463	2598	2078	1732	1299
					(272-408)	Fz	0.00003	0.00027	0.0007	0.0014	0.0018	0.0020	0.0022	0.0025
						Feed (ipm)	10.0	11.2	14.5	19.4	18.7	16.6	15.2	13.0
					270	RPM	66115	8251	4126	2750	2063	1650	1375	1031
					(216-324)	Fz	0.00003	0.00027	0.0007	0.0014	0.0018	0.0020	0.0022	0.0025
						Feed (ipm)	7.9	8.9	11.6	15.4	14.9	13.2	12.1	10.3
≤ 325 Bhn or ≤ 35 HRc	Profile 	≤ 0.5	≤ 1.5	310	RPM	75910	9474	4737	3158	2368	1895	1579	1184	
				(248-372)	Fz	0.00003	0.00027	0.0007	0.0014	0.0018	0.0020	0.0022	0.0025	
					Feed (ipm)	9.1	10.2	13.3	17.7	17.1	15.2	13.9	11.8	
				250	RPM	61218	7640	3820	2547	1910	1528	1273	955	
				(200-300)	Fz	0.00003	0.00027	0.0007	0.0014	0.0018	0.0020	0.0022	0.0025	
					Feed (ipm)	7.3	8.3	10.7	14.3	13.8	12.2	11.2	9.6	
K CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile 	≤ 0.5	≤ 1.5	445	RPM	108968	13599	6800	4533	3400	2720	2267	1700
					(356-534)	Fz	0.00005	0.00042	0.0011	0.0021	0.0028	0.0031	0.0034	0.0039
						Feed (ipm)	21.8	22.8	29.9	38.1	38.1	33.7	30.8	26.5
					355	RPM	86929	10849	5424	3616	2712	2170	1808	1356
					(284-426)	Fz	0.00005	0.00042	0.0011	0.0021	0.0028	0.0031	0.0034	0.0039
						Feed (ipm)	17.4	18.2	23.9	30.4	30.4	26.9	24.6	21.2

continued on next page

FRACTIONAL Z-Carb-AP



Series	Hardness	Ae x DC	Ap x DC	Vc (sfm)	DC • in													
					1/64	1/8	1/4	3/8	1/2	5/8	3/4	1						
K CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile 	≤ 0.5	≤ 1.5	340	RPM	83256	10390	5195	3463	2598	2078	1732	1299				
					(272-408)	Fz	0.00004	0.00031	0.0008	0.0016	0.0021	0.0023	0.0025	0.0029				
		Slot 	1	≤ 1	270	RPM	66115	8251	4126	2750	2063	1650	1375	1031				
					(216-324)	Fz	0.00004	0.00031	0.0008	0.0016	0.0021	0.0023	0.0025	0.0029				
		S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile 	≤ 0.5	≤ 1.5	80	RPM	19590	2445	1222	815	611	489	407	306		
							(64-96)	Fz	0.00003	0.00025	0.0007	0.0013	0.0017	0.0019	0.0020	0.0024		
				Slot 	1	≤ 1	65	RPM	15917	1986	993	662	497	397	331	248		
							(52-78)	Fz	0.00003	0.00025	0.0007	0.0013	0.0017	0.0019	0.0020	0.0024		
				S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile 	≤ 0.5	≤ 1.5	62	RPM	15182	1895	947	632	474	379	316	237
									(50-74)	Fz	0.00002	0.00018	0.0005	0.0009	0.0012	0.0013	0.0014	0.0017
Slot 	1					≤ 1	50	RPM	12244	1528	764	509	382	306	255	191		
							(40-60)	Fz	0.00002	0.00018	0.0005	0.0009	0.0012	0.0013	0.0014	0.0017		
S TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc					Profile 	≤ 0.5	≤ 1.5	215	RPM	52647	6570	3285	2190	1643	1314	1095	821
									(172-258)	Fz	0.00003	0.0003	0.0008	0.0015	0.0020	0.0022	0.0024	0.0028
		Slot 	1	≤ 1	170	RPM	41628	5195	2598	1732	1299	1039	866	649				
					(136-204)	Fz	0.00003	0.0003	0.0008	0.0015	0.0020	0.0022	0.0024	0.0028				
S TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3Cr3Sn3Al	≤ 440 Bhn or ≤ 47 HRc	Profile 	≤ 0.5	≤ 1.5	75	RPM	18365	2292	1146	764	573	458	382	287				
					(60-90)	Fz	0.00003	0.0003	0.0008	0.0015	0.0020	0.0022	0.0024	0.0028				
		Slot 	1	≤ 1	60	RPM	14692	1834	917	611	458	367	306	229				
					(48-72)	Fz	0.00003	0.0003	0.0008	0.0015	0.0020	0.0022	0.0024	0.0028				
H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile 	≤ 0.5	≤ 1.5	185	RPM	45301	5654	2827	1885	1413	1131	942	707				
					(148-222)	Fz	0.00003	0.00028	0.0007	0.0014	0.0018	0.0020	0.0022	0.0026				
		Slot 	1	≤ 1	145	RPM	35506	4431	2216	1477	1108	886	739	554				
					(116-174)	Fz	0.00003	0.00028	0.0007	0.0014	0.0018	0.0020	0.0022	0.0026				

Bhn (Brinell) HRc (Rockwell C)
 $rpm = Vc \times 3.82 / DC$
 $ipm = Fz \times 4 \times rpm$
 maximum Slotting Ap for Z1PCR <1/8 diameter and all Z1PLC / Z1PLB is .25 x DC
 maximum Profile Ae for Z1PCR <1/8 diameter and all Z1PLC / Z1PLB is .20 x DC
 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)