

Series 103 Fractional	Hardness BRINELL	Vc (SFM)	Diameter (D ₁) (inch)							
			1/8	1/4	3/8	1/2	5/8	3/4		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	265	RPM	8098	4049	2699	2025	1620	1350
			(212-318)	Fr	0.0002	0.0004	0.0009	0.0017	0.0034	0.0050
				Feed (IPM)	1.6	1.6	2.4	3.4	5.5	6.7
		≥ 200 ≤ 300	125	RPM	3820	1910	1273	955	764	637
			(100-150)	Fr	0.0002	0.0004	0.0008	0.0016	0.0031	0.0045
				Feed (IPM)	0.8	0.8	1.0	1.5	2.4	2.9
		≥ 300 ≤ 420	85	RPM	2598	1299	866	649	520	433
			(68-102)	Fz	0.0001	0.0002	0.0005	0.0009	0.0018	0.0025
				Feed (IPM)	0.3	0.3	0.4	0.6	0.9	1.1
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275	230	RPM	7029	3514	2343	1757	1406	1171
			(184-276)	Fz	0.0002	0.0004	0.0008	0.0016	0.0031	0.0045
				Feed (IPM)	1.4	1.4	1.9	2.8	4.4	5.3
		≥ 275 ≤ 375	145	RPM	4431	2216	1477	1108	886	739
			(116-174)	Fr	0.0002	0.0004	0.0008	0.0015	0.0030	0.0045
				Feed (IPM)	0.9	0.9	1.2	1.7	2.7	3.3
		≥ 375 ≤ 450	60	RPM	1834	917	611	458	367	306
			(48-72)	Fr	0.0001	0.0002	0.0004	0.0007	0.0013	0.0020
				Feed (IPM)	0.2	0.2	0.2	0.3	0.5	0.6
P	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	85	RPM	2598	1299	866	649	520	433
			(68-102)	Fr	0.0001	0.0002	0.0005	0.0009	0.0018	0.0025
				Feed (IPM)	0.3	0.3	0.4	0.6	0.9	1.1
		≥ 250 ≤ 330	55	RPM	1681	840	560	420	336	280
			(44-66)	Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0010
				Feed (IPM)	0.1	0.1	0.1	0.2	0.3	0.3
		≥ 330 ≤ 450	40	RPM	1222	611	407	306	244	204
			(32-48)	Fr	0.00005	0.0001	0.0002	0.0004	0.0008	0.0010
				Feed (IPM)	0.1	0.1	0.1	0.1	0.2	0.2
K	CAST IRONS Gray, Malleable, Ductile	≤ 200	280	RPM	8557	4278	2852	2139	1711	1426
			(224-336)	Fr	0.00025	0.0005	0.0011	0.0021	0.0041	0.0060
				Feed (IPM)	2.1	2.1	3.1	4.5	7.0	8.6
		≥ 200 ≤ 330	250	RPM	7640	3820	2547	1910	1528	1273
			(200-300)	Fr	0.00025	0.0005	0.0011	0.0021	0.0041	0.0060
				Feed (IPM)	1.9	1.9	2.8	4.0	6.3	7.6
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 280	85	RPM	2598	1299	866	649	520	433
			(68-102)	Fr	0.0002	0.0004	0.0008	0.0016	0.0032	0.0050
				Feed (IPM)	0.5	0.5	0.7	1.0	1.7	2.2
		≥ 280 ≤ 350	65	RPM	1986	993	662	497	397	331
			(52-78)	Fr	0.0001	0.0002	0.0005	0.0009	0.0018	0.0025
				Feed (IPM)	0.2	0.2	0.3	0.4	0.7	0.8
		≥ 350 ≤ 440	55	RPM	1681	840	560	420	336	280
			(44-66)	Fr	0.0001	0.0002	0.0004	0.0008	0.0015	0.0025
				Feed (IPM)	0.2	0.2	0.2	0.3	0.5	0.7
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80	540	RPM	16502	8251	5501	4126	3300	2750
			(432-648)	Fr	0.0003	0.0006	0.0013	0.0025	0.0050	0.0075
				Feed (IPM)	5.0	5.0	7.2	10.3	16.5	20.6
		≥ 80	455	RPM	13905	6952	4635	3476	2781	2317
			(364-546)	Fr	0.0003	0.0006	0.0013	0.0025	0.0050	0.0075
				Feed (IPM)	4.2	4.2	6.0	8.7	13.9	17.4
N	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140	190	RPM	5806	2903	1935	1452	1161	968
			(152-228)	Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0035
				Feed (IPM)	0.9	0.9	1.2	1.7	2.8	3.4
		≥ 140	175	RPM	5348	2674	1783	1337	1070	891
			(140-210)	Fr	0.00015	0.0003	0.0006	0.0012	0.0024	0.0035
				Feed (IPM)	0.8	0.8	1.1	1.6	2.6	3.1

rpm = sfm x 3.82 / D₁

ipm = (inch / revolution) x rpm

reduce speed and feed rates shown by 30 percent when using uncoated drills

reduce speed and feed for materials harder than listed

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

