

Series M105

Series M105	Hardness	Vc (sfm)	DC • in							
			0.004	0.010	0.020	0.040	0.080	0.125		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	130 (104-156)	RPM	124150	49660	24830	12415	6208	3973
				Fr	0.00012	0.00029	0.00058	0.00115	0.00230	0.00360
				Feed (ipm)	14.3	14.3	14.3	14.3	14.3	14.3
				RPM	186225	74490	37245	18623	9311	5959
				Fr	0.00010	0.00026	0.00052	0.00104	0.00208	0.00326
				Feed (ipm)	19.4	19.4	19.4	19.4	19.4	19.4
M	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	195 (156-234)	RPM	62075	24830	12415	6208	3104	1986
				Fr	0.00009	0.00022	0.00043	0.00087	0.00174	0.00272
				Feed (ipm)	5.4	5.4	5.4	5.4	5.4	5.4
				RPM	38200	15280	7640	3820	1910	1222
				Fr	0.0001	0.0002	0.00035	0.00071	0.00141	0.00221
				Feed (ipm)	2.7	2.7	2.7	2.7	2.7	2.7
K	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	65 (52-78)	RPM	267400	106960	53480	26740	13370	8557
				Fr	0.00007	0.00016	0.00033	0.00065	0.00131	0.00205
				Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5
				RPM	267400	106960	53480	26740	13370	8557
				Fr	0.00007	0.00016	0.00033	0.00065	0.00131	0.00205
				Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5
N	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	280 (224-336)	RPM	233975	93590	46795	23398	11699	7487
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	46.1	46.1	46.1	46.1	46.1	46.1
				RPM	171900	68760	34380	17190	8595	5501
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	33.9	33.9	33.9	33.9	33.9	33.9
S	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 7 HRc	245 (196-294)	RPM	233975	93590	46795	23398	11699	7487
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	46.1	46.1	46.1	46.1	46.1	46.1
				RPM	233975	93590	46795	23398	11699	7487
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	46.1	46.1	46.1	46.1	46.1	46.1
H	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	180 (144-216)	RPM	233975	93590	46795	23398	11699	7487
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	46.1	46.1	46.1	46.1	46.1	46.1
				RPM	233975	93590	46795	23398	11699	7487
				Fr	0.00020	0.00049	0.00099	0.00197	0.00394	0.00616
				Feed (ipm)	46.1	46.1	46.1	46.1	46.1	46.1
H	PLASTICS Polycarbonate, PVC	≤ 150 Bhn or ≤ 7 HRc	245 (196-294)	RPM	47750	19100	9550	4775	2388	1528
				Fr	0.00004	0.00011	0.00022	0.00044	0.00088	0.00137
				Feed (ipm)	2.1	2.1	2.1	2.1	2.1	2.1
				RPM	47750	19100	9550	4775	2388	1528
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	2.5	2.5	2.5	2.5	2.5	2.5
H	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 320 Bhn or ≤ 34 HRc	50 (40-60)	RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0
				RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0
H	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	50 (40-60)	RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0
				RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	80 (64-96)	RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0
				RPM	76400	30560	15280	7640	3820	2445
				Fr	0.00005	0.00013	0.00026	0.00052	0.00105	0.00164
				Feed (ipm)	4.0	4.0	4.0	4.0	4.0	4.0

- Note:**
- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 - rpm = Vc x 3.82 / DC
 - ipm = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
 - reduce speed and feed 30% when using uncoated drills
 - reduce speed and feed for materials harder than listed
 - refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Series M105	Hardness	Vc (m/min)	DC • mm							
			0.04	0.25	0.5	1	2	3		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	40 (32-48)	RPM	315060	50410	25205	12602	6301	4201
				Fr	0.0012	0.0072	0.0144	0.0288	0.0576	0.0865
				Feed (mm/min)	363	363	363	363	363	363
				RPM	472590	75614	37807	18904	9452	6301
				Fr	0.0010	0.0065	0.0130	0.0261	0.0521	0.0782
				Feed (mm/min)	493	493	493	493	493	493
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	20 (16-24)	RPM	157530	25205	12602	6301	3151	2100
				Fr	0.0009	0.0054	0.0109	0.0218	0.0435	0.0653
				Feed (mm/min)	137	137	137	137	137	137
				RPM	96942	15511	7755	3878	1939	1293
				Fr	0.0007	0.0044	0.0088	0.0177	0.0354	0.0531
				Feed (mm/min)	69	69	69	69	69	69
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	85 (68-102)	RPM	678591	108575	54287	27144	13572	9048
				Fr	0.0007	0.0041	0.0082	0.0164	0.0328	0.0491
				Feed (mm/min)	445	445	445	445	445	445
				RPM	593768	95003	47501	23751	11875	7917
				Fr	0.0020	0.0123	0.0247	0.0493	0.0986	0.1479
				Feed (mm/min)	1171	1171	1171	1171	1171	1171
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 7 HRc	75 (60-90)	RPM	436237	69798	34899	17449	8725	5816
				Fr	0.0020	0.0123	0.0247	0.0493	0.0987	0.1480
				Feed (mm/min)	861	861	861	861	861	861
				RPM	593768	95003	47501	23751	11875	7917
				Fr	0.0020	0.0123	0.0247	0.0493	0.0986	0.1479
				Feed (mm/min)	1171	1171	1171	1171	1171	1171
S	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	55 (44-66)	RPM	593768	95003	47501	23751	11875	7917
				Fr	0.0020	0.0123	0.0247	0.0493	0.0986	0.1479
				Feed (mm/min)	1171	1171	1171	1171	1171	1171
				RPM	121177	19388	9694	4847	2424	1616
				Fr	0.0004	0.0028	0.0055	0.0110	0.0220	0.0330
				Feed (mm/min)	53	53	53	53	53	53
H	PLASTICS Polycarbonate, PVC	≤ 320 Bhn or ≤ 34 HRc	15 (12-18)	RPM	121177	19388	9694	4847	2424	1616
				Fr	0.0007	0.0042	0.0085	0.0170	0.0339	0.0509
				Feed (mm/min)	82	82	82	82	82	82
				RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102
H	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy	≤ 350 Bhn or ≤ 38 HRc	15 (12-18)	RPM	121177	19388	9694	4847	2424	1616
				Fr	0.0007	0.0042	0.0085	0.0170	0.0339	0.0509
				Feed (mm/min)	82	82	82	82	82	82
				RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102
H	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 475 Bhn or ≤ 50 HRc	24 (20-29)	RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102
				RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	24 (20-29)	RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102
				RPM	193883	31021	15511	7755	3878	2585
				Fr	0.0005	0.0033	0.0066	0.0131	0.0262	0.0393
				Feed (mm/min)	102	102	102	102	102	102

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (DC x 3.14)
- mm/min = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
- reduce speed and feed 30% when using uncoated drills
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)