



ISO	MATERIAL	HARDNESS	Vc (SFM)*	DRILL DIAMETER (INCH)						
				≤ 1/16"	1/16"- 1/8"	1/8"- 1/4"	1/4"- 3/8"	3/8"- 1/2"	1/2"- 3/4"	3/4"- 1"
Fz = IPR(INCH PER REVOLUTION)*										
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 BHN or ≤ 28 HRC	210-510	.0008- .0030	.0030- .0055	.0040 - .0085	.0050 - .012	.0070 - .015	.0090 - .0175	.0100 - .0200
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 17-4 PH	≤ 375 BHN or ≤ 40 HRC	170-390	.0006- .0025	.0020- .0045	.0030- .0060	.0045 - .0080	.0060- .0120	.0070- .0145	.0080- .0175
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 BHN or ≤ 28 HRC	95-165	.0005 - .0025	.0020- .0045	.0035- .0060	.0040- .0085	.0055 - .0125	.0070- .0150	.0080- .0170
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 BHN or ≤ 28 HRC	80-140	.0004 - .0018	.0018- .0035	.0022 - .0045	.0033 - .0060	.0055 - .0090	.0060- .0140	.0070 - .0150
K	GRAY IRONS Class 20, 30, 40, 50, 60, G3000, G3500	≤ 220 BHN or ≤ 19 HRC	190-475	.0008 - .0040	.0030 - .0060	.0045- .0080	.0060- .0135	.0070 - .0140	.0010- .0160	.0120- .0200
	DUCTILE IRONS D&M series, 250, 300, 350, 400, 60-40- 18, 65-45-12	"≤ 260 BHN or ≤ 26 HRC"	160-310	.0006 - .0030	.0028 - .0035	.0040- .0070	.0055- .010	.0070 - .0120	.0090- .0140	.0110- .0170
N	NON-FERROUS Aluminum, Aluminum cast, Brass, Copper, Bronze, Non Metallic	"≤ 271 BHN or ≤ 28 HRC"	350-950	.0010 - .0040	.0030- .0060	.0040- .0070	.0060 - .0115	.0075 - .0135	.0090 - .0150	.0100 - .0210
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	"≤ 375 BHN or ≤ 55 HRC"	55-145	.0008- .0030	.0010- .0040	.0017 - .0055	.0030 - .0073	.0055 - .0095	.0060 - .0100	.0070 - .0115
S	HR SUPER ALLOYS Inconel 718, Waspaloy, Hastelloy, Inconel 625, Stellite 31, Haynes 25, Rene 41	"≤ 275 BHN or ≤ 28 HRC"	95 -215	.0007 - .0020	.00012 - .0025	.0018- .0040	.0027- .0075	.0030 - .0075	.0050- .0090	.0060- .0110
	TITANIUM 6AL-4V, ASTM 1, 2, 3, 6AL-2S	"≤ 275 BHN or ≤ 28 HRC"	70-160	.0009 - .0030	.0015 - .0035	.0020- .00550	.0045 - .0100	.0075 - .0120	.0080- .0150	.0095- .0160

Recommendations

Productivity and tooling performance is not only influenced by grade and geometry, but also by clamping the tool securely and accurately as possible.

- It is recommended to use precision holders i.e. hydraulic, shrink fit
- It is recommended to use internal coolant – minimum recommended pressure 145 psi

*Speeds & feeds are starting recommendations only. Factors such as machine type, fixture, tooling rigidity, available horsepower, coolant delivery method and others will affect the performance significantly.