GARR TOOL High Performance Drilling Guide

Metric

Type	Rc Hardness	Recommended M/Min.		CHIPLOAD PER FLUTE (Fz)				
		NON-COOLANT	*COOLANT FED*					
		1580H 1280H 1580HD	1580KH 1280KH 1880KH 1580KD 1280KD	3.0 - 6.0	6.0 - 10.0	10.0 - 13.0	13.0 - 16.0	16.0 - 20.0
COBALT BASE ALLOYS								
Powdered Metal, Stellite, Hs-21, Haynes	< 35	60	70	.035 - .060	.060 - .085	.075 - .100	.085 - .110	.095 - .130
25/188, X-40, L-605	> 35	40	55	.025 - .050	.050 - .075	.060 - .085	.075 - .100	.095 - .110
NICKEL BASE ALLOYS								
Invar, Kovar, Inconel-625/718, Waspaloy,	< 35	40	60	.035 - .060	.060 - .085	.075 - .100	.085 - .125	.085 - .110
Rene, Hastelloy, A286	> 35	20	45	.025 - .050	.050 - .075	.060 - .085	.075 - .100	.085 - .100
IRON BASE ALLOYS								
Incoloy 800-802, Multimet N-155,	< 35	50	75	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.110 - .140
Timkin 16-25-6, Carpenter 22-b3	> 35	40	60	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.095 - .110
MONEL								
Monel - 65% Nickel		45	70	.035 - .060	.050 - .075	.060 - .085	.075 - .100	.085 - .120
TITANIUM ALLOYS								
Commercially Pure, 6Al-4V,		70	90	.035 - .060	.060 - .085	.075 - .100	.085 - .110	.095 - .130
Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si								
STAINLESS STEELS								
(Precipitation)	< 35	70	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .140
13/8, 15/5, 17-4, pH Types	> 35	50	70	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.085 - .110
(Austentic)	< 35	70	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .140
Inox, 200 Series, 300 Series	> 35	50	70	.035 - .050	.050 - .060	.060 - .075	.075 - .100	.075 - .110
(Austentic)	< 35	40	55	.035 - .050	.050 - .060	.060 - .085	.085 - .110	.075 - .110
304L, 316L, Nitronic 50, Inox	> 35	20	30	.025 - .035	.035 - .050	.050 - .075	.075 - .100	.075 - .110
(Martensitic)	< 35	70	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .130
400 Series	> 35	50	70	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.085 - .110
HIGH STRENGTH TOOL STEELS								
4140, 4340, 6150, 5210, A2, D2,	< 35	60	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .130
P20, H11, H13, S2, O1	> 35	50	70	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.085 - .100
MEDIUM ALLOY TOOL STEELS								
200, 250, 300, 8620	< 35	60	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .140
	> 35	50	70	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.085 - .110
CARBON STEELS								
Platinum, A36, 12L14,	< 35	60	90	.050 - .075	.075 - .085	.085 - .100	.100 - .125	.100 - .140
1000's, 1100's, 1300's	> 35	50	70	.025 - .050	.050 - .075	.075 - .085	.085 - .100	.085 - .120
CAST MATERIAL								
Steel		60	90	.060 - .090	.100 - .125	.100 - .125	.125 - .150	.175 - .200
Ductile Iron		75	100	.060 - .090	.100 - .125	.100 - .125	.125 - .150	.175 - .200
Gray Iron		75	120	.060 - .090	.100 - .125	.100 - .125	.125 - .150	.175 - .200
ALUMINUM								
2014, 2024, 6061-(T1-T6), 7075		90 - 120	90 - 150	.090 - .120	.125 - .150	.175 - .200	.225 - .250	.225 - .250
Die Cast, Extruded		75 - 90	90 - 120	.060 - .100	.100 - .120	.150 - .175	.200 - .225	.200 - .225
MAGNESIUM								
		90	120	.080 - .120	.125 - .150	.175 - .200	.225 - .250	.225 - .250
COPPER								
Copper Alloys		90	120	.060 - .100	.100 - .125	.100 - .125	.125 - .150	.175 - .200
BRASS								
Short Chips		90	120	.080 - .120	.125 - .150	.175 - .200	.225 - .250	.225 - .250
Long Chips		60	90	.060 - .090	.100 - .125	.150 - .175	.200 - .225	.200 - .225
BRONZE								
Short Chips		60	90	.060 - .100	.100 - .125	.100 - .125	.150 - .175	.200 - .225
Long Chips		45	70	.040 - .060	.060 - .085	.075 - .100	.125 - .150	.175 - .200

NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.