# GARR TOOL High Performance Drilling Guide

| ISO Material | | HRC | SFM (Vc) | | CHIPLOAD PER TOOTH (Fz) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | NON-COOLANT | COOLANT FED | 1/8" - 1/4" | 1/4" - 3/8" | 3/8" - 1/2" | 1/2" - 5/8" | 5/8" - 3/4" |
| S | **COBALT BASE ALLOYS** | | | | | | | | |
| | Haynes 25/188, Stellite 21, Cobalt Chrome | < 40<br>> 40 | 80<br>60 | 100<br>75 | .0008" - .0015"<br>.0005" - .0012" | .0012" - .0020"<br>.0009" - .0017" | .0017" - .0026"<br>.0014" - .0023" | .0022" - .0032"<br>.0019" - .0029" | .0027" - .0038"<br>.0024" - .0035" |
| | **NICKEL BASE ALLOYS** | | | | | | | | |
| | Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel | < 40<br>> 40 | 90<br>70 | 110<br>75 | .0008" - .0015"<br>.0005" - .0012" | .0012" - .0020"<br>.0009" - .0017" | .0017" - .0026"<br>.0014" - .0023" | .0022" - .0032"<br>.0019" - .0029" | .0027" - .0038"<br>.0024" - .0035" |
| | **IRON BASE ALLOYS** | | | | | | | | |
| | A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascolloy | < 40<br>> 40 | 90<br>60 | 115<br>75 | .0008" - .0015"<br>.0005" - .0012" | .0012" - .0020"<br>.0009" - .0017" | .0017" - .0026"<br>.0014" - .0023" | .0022" - .0032"<br>.0019" - .0029" | .0027" - .0038"<br>.0024" - .0035" |
| | **TITANIUM ALLOYS** | | | | | | | | |
| | Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si | | 110 | 135 | .0010" - .0018" | .0015" - .0023" | .0020" - .0029" | .0025" - .0035" | .0030" - .0041" |
| | 5553 / Beta Titanium | | 70 | 100 | .0008" - .0015" | .0012" - .0020" | .0017" - .0026" | .0022" - .0032" | .0027" - .0038" |
| M | **STAINLESS STEELS** | | | | | | | | |
| | 13/8, 15/5, 17-4, pH Types | < 40<br>> 40 | 100<br>80 | 120<br>90 | .0010" - .0017"<br>.0007" - .0015" | .0014" - .0022"<br>.0011" - .0020" | .0019" - .0028"<br>.0016" - .0026" | .0024" - .0034"<br>.0021" - .0032" | .0029" - .0040"<br>.0026" - .0038" |
| | 300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic | < 40<br>> 40 | 90<br>70 | 110<br>80 | .0010" - .0017"<br>.0007" - .0015" | .0014" - .0022"<br>.0011" - .0020" | .0019" - .0028"<br>.0016" - .0026" | .0024" - .0034"<br>.0021" - .0032" | .0029" - .0040"<br>.0026" - .0038" |
| | 400 Series - 403, 405, 420, 455 | < 40<br>> 40 | 110<br>80 | 130<br>105 | .0010" - .0017"<br>.0007" - .0015" | .0014" - .0022"<br>.0011" - .0020" | .0019" - .0028"<br>.0016" - .0026" | .0024" - .0034"<br>.0021" - .0032" | .0029" - .0040"<br>.0026" - .0038" |
| P | **HIGH STRENGTH TOOL STEELS** | | | | | | | | |
| | A2, D2, P20, H13, S7, O1 | < 40<br>> 40 | 160<br>130 | 200<br>150 | .0011" - .0020"<br>.0007" - .0014" | .0015" - .0025"<br>.0011" - .0019" | .0020" - .0031"<br>.0016" - .0025" | .0025" - .0037"<br>.0021" - .0031" | .0030" - .0043"<br>.0026" - .0037" |
| | **MEDIUM ALLOY TOOL STEELS** | | | | | | | | |
| | 4140, 4340, 52100, 6150, 8620 | < 40<br>> 40 | 175<br>145 | 215<br>170 | .0011" - .0020"<br>.0007" - .0014" | .0015" - .0025"<br>.0011" - .0019" | .0020" - .0031"<br>.0016" - .0025" | .0025" - .0037"<br>.0021" - .0031" | .0030" - .0043"<br>.0026" - .0037" |
| | **CARBON STEELS** | | | | | | | | |
| | 1000's - 1018, 1020, 12L14 | < 40 | 225 | 275 | .0014" - .0023" | .0018" - .0027" | .0023" - .0033" | .0028" - .0039" | .0033" - .0045" |
| K | **CAST MATERIAL** | | | | | | | | |
| | Ductile Iron | | 250 | 350 | .0015" - .0023" | .0019" - .0028" | .0024" - .0034" | .0029" - .0040" | .0034" - .0046" |
| | Gray Iron | | 275 | 375 | .0016" - .0024" | .0020" - .0029" | .0025" - .0035" | .0030" - .0041" | .0035" - .0047" |
| N | **NON-FERROUS** | | | | | | | | |
| | Aluminum 2014, 2024, 6061-(T1-T6), 7075 | | 350 | 425 | .0023" - .0033" | .0027" - .0038" | .0033" - .0044" | .0038" - .0050" | .0043" - .0056" |
| | Aluminum Die Cast | | 300 | 375 | .0018" - .0028" | .0022" - .0033" | .0027" - .0039" | .0032" - .0045" | .0037" - .0051" |
| | Magnesium | | 275 | 350 | .0020" - .0030" | .0024" - .0035" | .0029" - .0041" | .0034" - .0047" | .0039" - .0053" |
| | Copper | | 200 | 300 | .0017" - .0025" | .0021" - .0030" | .0026" - .0036" | .0031" - .0042" | .0036" - .0048" |
| | Brass | | 250 | 350 | .0020" - .0032" | .0024" - .0037" | .0029" - .0043" | .0034" - .0049" | .0039" - .0055" |
| | Bronze | | 200 | 275 | .0018" - .0025" | .0022" - .0030" | .0027" - .0036" | .0032" - .0042" | .0037" - .0048" |

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