

# GARR TOOL High Performance Drilling Guide

## Fractional

| Type                                                             | Rc<br>Hardness | Recommended SFM          |                                                | CHIPLOAD PER FLUTE (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"     |
|                                                                  |                | 1580H<br>1280H<br>1580HD | 1580KH<br>1280KH<br>1880KH<br>1580KD<br>1280KD |                         |                 |                 |                 |                 |
| COBALT BASE ALLOYS                                               |                |                          |                                                |                         |                 |                 |                 |                 |
| Powdered Metal, Stellite, Hs-21, Haynes 25/188, X-40, L-605      | < 35           | 185                      | 225                                            | .0010" - .0020"         | .0020" - .0030" | .0025" - .0035" | .0030" - .0040" | .0035" - .0055" |
|                                                                  | > 35           | 125                      | 180                                            | .0005" - .0015"         | .0015" - .0025" | .0020" - .0030" | .0025" - .0035" | .0030" - .0045" |
| NICKEL BASE ALLOYS                                               |                |                          |                                                |                         |                 |                 |                 |                 |
| Invar, Kovar, Inconel-625/718, Waspalloy, Rene, Hastalloy, A286  | < 35           | 150                      | 225                                            | .0010" - .0020"         | .0020" - .0030" | .0025" - .0035" | .0030" - .0040" | .0035" - .0055" |
|                                                                  | > 35           | 125                      | 180                                            | .0005" - .0015"         | .0015" - .0025" | .0020" - .0030" | .0025" - .0035" | .0030" - .0045" |
| IRON BASE ALLOYS                                                 |                |                          |                                                |                         |                 |                 |                 |                 |
| Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3 | < 35           | 200                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0025" - .0035" | .0035" - .0045" | .0035" - .0055" |
|                                                                  | > 35           | 150                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0030" - .0045" |
| MONEL                                                            |                |                          |                                                |                         |                 |                 |                 |                 |
| Monel - 65% Nickel                                               |                | 150                      | 225                                            | .0010" - .0020"         | .0015" - .0025" | .0020" - .0030" | .0025" - .0035" | .0035" - .0055" |
| TITANIUM ALLOYS                                                  |                |                          |                                                |                         |                 |                 |                 |                 |
| Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si        |                | 225                      | 350                                            | .0010" - .0020"         | .0020" - .0030" | .0025" - .0035" | .0030" - .0040" | .0035" - .0055" |
| STAINLESS STEELS                                                 |                |                          |                                                |                         |                 |                 |                 |                 |
| (Precipitation)                                                  | < 35           | 225                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0040" - .0055" |
| 13/8, 15/5, 17-4, pH Types                                       | > 35           | 175                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" |
| (Austentic)                                                      | < 35           | 225                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0040" - .0055" |
| Inox, 200 Series, 300 Series                                     | > 35           | 175                      | 225                                            | .0010" - .0015"         | .0015" - .0020" | .0020" - .0025" | .0025" - .0035" | .0035" - .0045" |
| (Austentic)                                                      | < 35           | 125                      | 175                                            | .0010" - .0015"         | .0015" - .0020" | .0020" - .0030" | .0030" - .0040" | .0025" - .0040" |
| 304L, 316L, Nitronic 50, Inox                                    | > 35           | 80                       | 100                                            | .0003" - .0010"         | .0010" - .0015" | .0015" - .0025" | .0025" - .0035" | .0020" - .0040" |
| (Martensitic)                                                    | < 35           | 225                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0040" - .0055" |
| 400 Series                                                       | > 35           | 175                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" |
| HIGH STRENGTH TOOL STEELS                                        |                |                          |                                                |                         |                 |                 |                 |                 |
| 4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1            | < 35           | 200                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0045" - .0055" |
|                                                                  | > 35           | 175                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" |
| MEDIUM ALLOY TOOL STEELS                                         |                |                          |                                                |                         |                 |                 |                 |                 |
| 200, 250, 300, 8620                                              | < 35           | 200                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0045" - .0065" |
|                                                                  | > 35           | 175                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" |
| CARBON STEELS                                                    |                |                          |                                                |                         |                 |                 |                 |                 |
| Platinum, A36, 12L14, 1000's, 1100's, 1300's                     | < 35           | 200                      | 300                                            | .0015" - .0025"         | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" | .0045" - .0065" |
|                                                                  | > 35           | 175                      | 240                                            | .0005" - .0015"         | .0015" - .0025" | .0025" - .0030" | .0030" - .0035" | .0035" - .0045" |
| CAST MATERIAL                                                    |                |                          |                                                |                         |                 |                 |                 |                 |
| Steel                                                            |                | 200                      | 300                                            | .0025" - .0035"         | .0035" - .0045" | .0035" - .0045" | .0045" - .0055" | .0065" - .0075" |
| Ductile Iron                                                     |                | 250                      | 350                                            | .0025" - .0035"         | .0035" - .0045" | .0035" - .0045" | .0045" - .0055" | .0065" - .0075" |
| Gray Iron                                                        |                | 250                      | 400                                            | .0025" - .0035"         | .0035" - .0045" | .0035" - .0045" | .0045" - .0055" | .0065" - .0075" |
| ALUMINUM                                                         |                |                          |                                                |                         |                 |                 |                 |                 |
| 2014, 2024, 6061-(T1-T6), 7075                                   |                | 300 - 400                | 300 - 500                                      | .0035" - .0045"         | .0045" - .0055" | .0065" - .0075" | .0085" - .0095" | .0085" - .0095" |
| Die Cast, Extruded                                               |                | 250 - 300                | 300 - 400                                      | .0025" - .0035"         | .0035" - .0045" | .0055" - .0065" | .0075" - .0085" | .0075" - .0085" |
| MAGNESIUM                                                        |                |                          |                                                |                         |                 |                 |                 |                 |
|                                                                  |                | 300                      | 400                                            | .0035" - .0045"         | .0045" - .0055" | .0065" - .0075" | .0085" - .0095" | .0085" - .0095" |
| COPPER                                                           |                |                          |                                                |                         |                 |                 |                 |                 |
| Copper Alloys                                                    |                | 300                      | 400                                            | .0025" - .0035"         | .0035" - .0045" | .0035" - .0045" | .0045" - .0055" | .0065" - .0075" |
| BRASS                                                            |                |                          |                                                |                         |                 |                 |                 |                 |
| Short Chips                                                      |                | 300                      | 400                                            | .0035" - .0045"         | .0045" - .0055" | .0065" - .0075" | .0085" - .0095" | .0085" - .0095" |
| Long Chips                                                       |                | 200                      | 300                                            | .0025" - .0035"         | .0035" - .0045" | .0055" - .0065" | .0075" - .0085" | .0075" - .0085" |
| BRONZE                                                           |                |                          |                                                |                         |                 |                 |                 |                 |
| Short Chips                                                      |                | 200                      | 300                                            | .0025" - .0035"         | .0035" - .0045" | .0035" - .0045" | .0055" - .0065" | .0075" - .0085" |
| Long Chips                                                       |                | 150                      | 250                                            | .0015" - .0025"         | .0025" - .0035" | .0025" - .0035" | .0045" - .0055" | .0065" - .0075" |

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