

# GARR TOOL General Purpose Milling Guide

TECHNICAL

	ISO Material	HRC	SFM (Vc)	CHIPLOAD PER TOOTH (Fz)									
				1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
S	<b>COBALT BASE ALLOYS</b>												
	Powdered Metal, Stellite, Hs-21, Haynes 25/188, X-40, L-605	< 40 > 40	60 - 90 50 - 80	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0005" - .0010" .0003" - .0008"	.0008" - .0015" .0005" - .0010"	.0010" - .0018" .0008" - .0015"	.0015" - .0030" .0010" - .0015"	.0020" - .0030" .0015" - .0025"	.0025" - .0035" .0015" - .0020"	.0025" - .0035" .0015" - .0020"
	<b>NICKEL BASE ALLOYS</b>												
	Invar, Kovar, Inconel-625/718, Waspaloy, Rene, Hastelloy, A286	< 40 > 40	55 - 90 45 - 80	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0005" - .0010" .0003" - .0008"	.0008" - .0015" .0005" - .0010"	.0010" - .0018" .0008" - .0015"	.0015" - .0030" .0010" - .0015"	.0020" - .0030" .0015" - .0025"	.0025" - .0035" .0015" - .0020"	.0025" - .0035" .0015" - .0020"
	<b>IRON BASE ALLOYS</b>												
	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	< 40 > 40	55 - 90 50 - 80	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0004" - .0008" .0003" - .0006"	.0005" - .0010" .0003" - .0008"	.0008" - .0015" .0005" - .0010"	.0010" - .0018" .0008" - .0015"	.0015" - .0030" .0010" - .0015"	.0020" - .0030" .0015" - .0025"	.0025" - .0035" .0015" - .0020"	.0025" - .0035" .0015" - .0020"
	<b>MONEL</b>												
	Monel - 65% Nickel		50 - 80	.0003" - .0008"	.0003" - .0008"	.0005" - .0012"	.0005" - .0012"	.0008" - .0015"	.0010" - .0015"	.0013" - .0020"	.0018" - .0025"	.0020" - .0030"	.0025" - .0035"
	<b>TITANIUM ALLOYS</b>												
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		100 - 150	.0003" - .0008"	.0003" - .0008"	.0005" - .0012"	.0005" - .0012"	.0008" - .0015"	.0010" - .0015"	.0013" - .0020"	.0018" - .0025"	.0020" - .0030"	.0025" - .0035"
5553 / Beta Titanium		90 - 120	.0003" - .0008"	.0003" - .0008"	.0004" - .0010"	.0004" - .0010"	.0005" - .0012"	.0008" - .0014"	.0010" - .0016"	.0010" - .0020"	.0015" - .0025"	.0015" - .0025"	
M	<b>STAINLESS STEELS</b>												
	13/8, 15/5, 17-4, pH Types	< 40 > 40	100 - 150 80 - 100	.0002" - .0005" .0002" - .0004"	.0003" - .0006" .0002" - .0004"	.0003" - .0007" .0002" - .0006"	.0006" - .0009" .0003" - .0007"	.0008" - .0012" .0004" - .0008"	.0013" - .0018" .0007" - .0012"	.0010" - .0020" .0008" - .0015"	.0012" - .0025" .0010" - .0016"	.0012" - .0020" .0013" - .0017"	.0020" - .0028" .0015" - .0020"
	200 Series, 300 Series	< 40 > 40	150 - 225 125 - 220	.0002" - .0005" .0002" - .0004"	.0002" - .0006" .0003" - .0005"	.0005" - .0008" .0003" - .0007"	.0008" - .0015" .0005" - .0010"	.0010" - .0018" .0008" - .0012"	.0010" - .0018" .0009" - .0015"	.0015" - .0025" .0013" - .0018"	.0018" - .0028" .0015" - .0023"	.0022" - .0032" .0017" - .0025"	.0025" - .0040" .0022" - .0032"
	304L, 316L, Nitronic 50	< 40 > 40	100 - 150 80 - 100	.0003" - .0006" .0002" - .0004"	.0003" - .0007" .0002" - .0005"	.0005" - .0010" .0004" - .0007"	.0008" - .0015" .0005" - .0010"	.0009" - .0013" .0007" - .0010"	.0010" - .0018" .0009" - .0015"	.0015" - .0020" .0012" - .0018"	.0018" - .0022" .0015" - .0025"	.0018" - .0035" .0015" - .0025"	.0023" - .0036" .0020" - .0030"
	400 Series	< 40 > 40	150 - 200 100 - 150	.0005" - .0008" .0003" - .0007"	.0007" - .0010" .0004" - .0008"	.0009" - .0015" .0006" - .0010"	.0009" - .0014" .0007" - .0011"	.0011" - .0015" .0008" - .0012"	.0013" - .0018" .0009" - .0015"	.0015" - .0025" .0012" - .0020"	.0020" - .0035" .0018" - .0030"	.0022" - .0040" .0020" - .0035"	.0030" - .0046" .0024" - .0042"
	<b>HIGH STRENGTH TOOL STEELS</b>												
A2, D2, P20, H13, S7, O1	< 40 > 40	150 - 200 100 - 150	.0003" - .0008" .0003" - .0005"	.0003" - .0008" .0003" - .0005"	.0005" - .0010" .0003" - .0008"	.0010" - .0015" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0014" - .0024" .0010" - .0015"	.0018" - .0026" .0012" - .0018"	.0020" - .0028" .0014" - .0020"	.0022" - .0030" .0015" - .0022"	
<b>MEDIUM ALLOY TOOL STEELS</b>													
4140, 4340, 52100, 6150, 8620	< 40 > 40	150 - 200 100 - 150	.0003" - .0008" .0003" - .0005"	.0003" - .0008" .0003" - .0005"	.0005" - .0010" .0003" - .0008"	.0010" - .0015" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0014" - .0024" .0010" - .0015"	.0018" - .0026" .0012" - .0018"	.0020" - .0028" .0014" - .0020"	.0022" - .0030" .0015" - .0022"	
<b>CARBON STEELS</b>													
1000's - 1018, 1020, 12L14	< 40 > 40	150 - 200 100 - 150	.0003" - .0008" .0003" - .0005"	.0003" - .0008" .0003" - .0005"	.0005" - .0010" .0003" - .0008"	.0010" - .0015" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0012" - .0020" .0005" - .0010"	.0014" - .0024" .0010" - .0015"	.0018" - .0026" .0012" - .0018"	.0020" - .0028" .0014" - .0020"	.0022" - .0030" .0015" - .0022"	
<b>CAST STEELS</b>													
Steel		125 - 175	.0003" - .0008"	.0003" - .0008"	.0005" - .0010"	.0010" - .0018"	.0010" - .0018"	.0012" - .0020"	.0015" - .0025"	.0024" - .0032"	.0026" - .0034"	.0030" - .0040"	
K	<b>CAST MATERIAL</b>												
	Ductile Iron		175 - 225	.0005" - .0008"	.0008" - .0012"	.0010" - .0015"	.0015" - .0025"	.0015" - .0025"	.0020" - .0030"	.0025" - .0035"	.0035" - .0045"	.0035" - .0045"	.0045" - .0055"
Gray Iron		175 - 225	.0005" - .0008"	.0008" - .0012"	.0010" - .0015"	.0015" - .0025"	.0015" - .0025"	.0020" - .0030"	.0025" - .0035"	.0035" - .0045"	.0035" - .0045"	.0045" - .0055"	
N	<b>NON-FERROUS</b>												
	Aluminum		300 - 500	.0003" - .0005"	.0006" - .0010"	.0008" - .0014"	.0012" - .0020"	.0014" - .0028"	.0020" - .0030"	.0035" - .0048"	.0050" - .0060"	.0058" - .0070"	.0068" - .0090"
	Magnesium		300 - 500	.0003" - .0005"	.0006" - .0010"	.0008" - .0014"	.0012" - .0020"	.0014" - .0028"	.0020" - .0030"	.0035" - .0048"	.0050" - .0060"	.0058" - .0070"	.0068" - .0090"
	Copper		250 - 450	.0003" - .0005"	.0006" - .0010"	.0008" - .0014"	.0012" - .0020"	.0014" - .0028"	.0020" - .0030"	.0035" - .0048"	.0050" - .0060"	.0058" - .0070"	.0068" - .0090"
Brass, Bronze		200 - 400	.0003" - .0005"	.0006" - .0010"	.0008" - .0014"	.0012" - .0020"	.0014" - .0028"	.0020" - .0030"	.0035" - .0048"	.0050" - .0060"	.0058" - .0070"	.0068" - .0090"	
O	<b>COMPOSITE (non-ISO)</b>												
	Fiberglass, Plastics		200 - 400	.0003" - .0005"	.0006" - .0010"	.0008" - .0014"	.0012" - .0020"	.0014" - .0028"	.0020" - .0030"	.0035" - .0048"	.0050" - .0060"	.0058" - .0070"	.0068" - .0090"
Graphite, G10	(See Graphite Chart - page 311)												

When plunging into a solid, drop feed by approximately 50%. 20% of diameter for basic engagement parameters.

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