

# GARR TOOL High Performance Milling Guide for 246MA, 253MA, 255MA, 263MA

TECHNICAL

	ISO Material	HRC	SFM (Vc)	CHIPLOAD PER TOOTH (Fz)									
				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	70 - 110 50 - 90	.0008"-.0020" .0005"-.0015"	.0004"-.0010" .0004"-.0007"	.0007"-.0012" .0005"-.0011"	.0010"-.0018" .0008"-.0014"	.0010"-.0020" .0010"-.0017"	.0018"-.0028" .0015"-.0025"	.0023"-.0031" .0021"-.0028"	.0027"-.0034" .0024"-.0030"	.0029"-.0036" .0025"-.0031"	
	<b>NICKEL BASE ALLOYS</b>												
	Invar, Kovar, Inconel-625/718, Waspaloy, Rene, Hastelloy, A286	<40 >40	65 - 110 55 - 90	.0005"-.0009" .0003"-.0008"	.0005"-.0009" .0004"-.0007"	.0007"-.0013" .0007"-.0012"	.0010"-.0017" .0009"-.0015"	.0010"-.0020" .0010"-.0018"	.0020"-.0028" .0015"-.0025"	.0025"-.0032" .0022"-.0030"	.0029"-.0036" .0026"-.0033"	.0030"-.0038" .0029"-.0035"	
	<b>IRON BASE ALLOYS</b>												
	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	<40 >40	65 - 110 55 - 90	.0005"-.0010" .0003"-.0008"	.0008"-.0010" .0004"-.0008"	.0006"-.0012" .0005"-.0010"	.0007"-.0015" .0006"-.0013"	.0011"-.0016" .0008"-.0014"	.0018"-.0026" .0013"-.0023"	.0025"-.0030" .0022"-.0028"	.0026"-.0034" .0025"-.0031"	.0032"-.0038" .0030"-.0035"	
	<b>MONEL</b>												
	Monel - 65% Nickel		55 - 110	.0004"-.0010"	.0008"-.0012"	.0009"-.0015"	.0010"-.0017"	.0010"-.0020"	.0022"-.0031"	.0026"-.0033"	.0029"-.0036"	.0030"-.0038"	
	<b>TITANIUM ALLOYS</b>												
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si 5553 / Beta Titanium		125 - 175 100 - 150	.0005"-.0010" .0004"-.0010"	.0005"-.0012" .0004"-.0010"	.0008"-.0015" .0006"-.0014"	.0010"-.0022" .0008"-.0017"	.0018"-.0027" .0015"-.0025"	.0023"-.0032" .0022"-.0028"	.0025"-.0033" .0024"-.0030"	.0027"-.0035" .0026"-.0032"	.0028"-.0037" .0028"-.0035"	
M	<b>STAINLESS STEELS</b>												
	13/8, 15/5, 17-4, PH Types	<40 >40	135 - 175 175 - 225	.0005"-.0007" .0002"-.0004"	.0004"-.0008" .0002"-.0006"	.0007"-.0010" .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	80 - 125 175 - 275	.0003"-.0007" .0002"-.0005"	.0005"-.0009" .0004"-.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	200 - 225 155 - 200	.0003"-.0007" .0002"-.0005"	.0005"-.0010" .0004"-.0007"	.0008"-.0015" .0005"-.0010"	.0009"-.0013" .0005"-.0010"	.0010"-.0018" .0007"-.0010"	.0015"-.0020" .0009"-.0015"	.0018"-.0022" .0012"-.0018"	.0018"-.0035" .0015"-.0025"	.0023"-.0036" .0020"-.0030"	
	400 Series	<40 >40	200 - 225 150 - 200	.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, S2, O1	<40 >40	225 - 325 150 - 225	.0005"-.0008" .0003"-.0005"	.0008"-.0015" .0005"-.0010"	.0015"-.0020" .0008"-.0012"	.0015"-.0023" .0010"-.0015"	.0015"-.0025" .0010"-.0018"	.0020"-.0030" .0015"-.0020"	.0020"-.0030" .0015"-.0020"	.0025"-.0035" .0018"-.0025"	.0030"-.0040" .0020"-.0030"		
P	<b>MEDIUM ALLOY TOOL STEELS</b>												
	4140, 4340, 52100, 6150, 8620	<40 >40	225 - 325 150 - 225	.0005"-.0008" .0003"-.0005"	.0008"-.0015" .0005"-.0010"	.0015"-.0020" .0008"-.0012"	.0015"-.0023" .0010"-.0015"	.0015"-.0025" .0010"-.0018"	.0020"-.0030" .0015"-.0020"	.0020"-.0030" .0015"-.0020"	.0025"-.0035" .0018"-.0025"	.0030"-.0040" .0020"-.0030"	
	<b>CARBON STEELS</b>												
	1000's - 1018, 1020, 12L14	<40 >40	225 - 325 150 - 225	.0005"-.0008" .0003"-.0005"	.0008"-.0015" .0005"-.0010"	.0015"-.0020" .0008"-.0012"	.0015"-.0023" .0010"-.0015"	.0015"-.0025" .0010"-.0018"	.0020"-.0030" .0015"-.0020"	.0020"-.0030" .0015"-.0020"	.0025"-.0035" .0018"-.0025"	.0030"-.0040" .0020"-.0030"	
<b>CAST STEELS</b>													
Steel		175 - 275	.0006"-.0010"	.0009"-.0018"	.0012"-.0020"	.0015"-.0023"	.0018"-.0025"	.0020"-.0030"	.0028"-.0036"	.0030"-.0040"	.0035"-.0045"		
K	<b>CAST MATERIAL</b>												
	Ductile Iron Gray Iron		225 - 325 300 - 400	.0010"-.0015" .0015"-.0025"	.0015"-.0020" .0020"-.0030"	.0020"-.0030" .0025"-.0035"	.0025"-.0035" .0030"-.0040"	.0025"-.0035" .0030"-.0040"	.0030"-.0045" .0040"-.0050"	.0040"-.0050" .0050"-.0060"	.0040"-.0050" .0060"-.0070"	.0050"-.0060" .0060"-.0070"	
N	<b>NON-FERROUS</b>												
	Aluminum		300 - 500	.0006"-.0010"	.0008"-.0014"	.0012"-.0020"	.0014"-.0028"	.0020"-.0030"	.0035"-.0048"	.0050"-.0060"	.0058"-.0070"	.0068"-.0090"	
	Magnesium		300 - 500	.0006"-.0010"	.0008"-.0014"	.0012"-.0020"	.0014"-.0028"	.0020"-.0030"	.0035"-.0048"	.0050"-.0060"	.0058"-.0070"	.0068"-.0090"	
	Copper Brass, Bronze		250 - 450 200 - 400	.0006"-.0010" .0006"-.0010"	.0008"-.0014" .0008"-.0014"	.0012"-.0020" .0012"-.0020"	.0014"-.0028" .0014"-.0028"	.0020"-.0030" .0020"-.0030"	.0035"-.0048" .0035"-.0048"	.0050"-.0060" .0050"-.0060"	.0058"-.0070" .0058"-.0070"	.0068"-.0090" .0068"-.0090"	
O	<b>COMPOSITE (non-ISO)</b>												
	Fiberglass, Plastics Graphite, G10		200 - 400	.0006"-.0010" .	.0008"-.0014" .	.0012"-.0020" .	.0014"-.0028" .	.0020"-.0030" .	.0035"-.0048" .	.0050"-.0060" .	.0058"-.0070" .	.0068"-.0090" (See Graphite Chart - page 311)	

Beryllium added to any material adds hardness and some nickel content. If tool displays chatter, increase feed (IPM) up to 30% and reduce speed (RPM) by 10%.  
More detailed information is available on succeeding pages regarding the following materials: Aluminum, High Rockwell Steels, Graphite, and VRX end mills

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