

# GARR TOOL General Purpose Drilling Guide (Bright Finish)

	ISO Material	HRC	SFM (by Series)			
			1100	1200, 1205, 1520	1500, 1510	1600
<b>S</b>	<b>COBALT BASE ALLOYS</b>					
	Haynes 25/188, Stellite 21, Cobalt Chrome	< 40 > 40	- -	45 - 70 35 - 60	45 - 70 35 - 60	30 - 55 20 - 45
	<b>NICKEL BASE ALLOYS</b>					
	Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel	< 40 > 40	- -	45 - 70 35 - 60	45 - 70 35 - 60	30 - 55 20 - 45
	<b>IRON BASE ALLOYS</b>					
	A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascology	< 40 > 40	- -	45 - 70 35 - 60	45 - 70 35 - 60	30 - 55 20 - 45
	<b>TITANIUM ALLOYS</b>					
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		-	60 - 90	60 - 90	45 - 75
	5553 / Beta Titanium		-	45 - 65	45 - 65	30 - 50
	<b>M</b>	<b>STAINLESS STEELS</b>				
13/8, 15/5, 17-4, pH Types		< 40 > 40	- -	50 - 80 35 - 60	50 - 80 35 - 60	35 - 65 20 - 45
300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic		< 40 > 40	- -	45 - 75 35 - 55	45 - 75 35 - 55	30 - 60 20 - 40
400 Series - 403, 405, 420, 455		< 40 > 40	- -	60 - 90 40 - 65	60 - 90 40 - 65	45 - 75 25 - 50
<b>HIGH STRENGTH TOOL STEELS</b>						
A2, D2, P20, H13, S7, O1	< 40 > 40	- -	80 - 130 60 - 110	80 - 130 60 - 110	65 - 110 45 - 90	
Thompson Shaft, Armor Plate (Class 1)	> 50	-	-	45 - 80	30 - 60	
<b>P</b>	<b>MEDIUM ALLOY TOOL STEELS</b>					
	4140, 4340, 52100, 6150, 8620	< 40 > 40	- -	100 - 140 70 - 120	100 - 140 70 - 120	65 - 120 55 - 100
	<b>CARBON STEELS</b>					
	1000's - 1018, 1020, 12L14	< 40	-	120 - 170	120 - 170	105 - 150
<b>K</b>	<b>CAST MATERIAL</b>					
	Ductile Iron		70 - 140	120 - 170	120 - 170	105 - 150
	Gray Iron		70 - 165	120 - 190	120 - 190	105 - 170
<b>N</b>	<b>NON-FERROUS</b>					
	Aluminum (6061, 7075)		-	200 - 300	-	160 - 250
	Magnesium		-	120 - 215	-	80 - 165
	Copper		-	100 - 165	-	60 - 125
	Brass, Bronze		-	120 - 215	-	80 - 165
<b>O</b>	<b>COMPOSITE (non-ISO)</b>					
	Glass Epoxy, Fiberglass, Plastics, Graphite, G10		140	100 - 230	105 - 230	-

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

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	ISO Material	HRC	CHIPLOAD PER TOOTH (Fz)				
			1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
S	<b>COBALT BASE ALLOYS</b>						
	Haynes 25/188, Stellite 21, Cobalt Chrome	< 40 > 40	.0003" - .0008" .0002" - .0006"	.0006" - .0011" .0004" - .0009"	.0010" - .0017" .0008" - .0015"	.0014" - .0024" .0012" - .0022"	.0019" - .0032" .0017" - .0030"
	<b>NICKEL BASE ALLOYS</b>						
	Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel	< 40 > 40	.0003" - .0008" .0002" - .0006"	.0006" - .0011" .0004" - .0009"	.0010" - .0017" .0008" - .0015"	.0014" - .0024" .0012" - .0022"	.0019" - .0032" .0017" - .0030"
	<b>IRON BASE ALLOYS</b>						
	A286, Dicaloy, Haynes 556, Carpenter 22, Greek Ascology	< 40 > 40	.0003" - .0008" .0002" - .0006"	.0006" - .0011" .0004" - .0009"	.0010" - .0017" .0008" - .0015"	.0014" - .0024" .0012" - .0022"	.0019" - .0032" .0017" - .0030"
	<b>TITANIUM ALLOYS</b>						
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		.0004" - .0009"	.0008" - .0014"	.0012" - .0020"	.0016" - .0027"	.0021" - .0033"
	5553 / Beta Titanium		.0003" - .0007"	.0006" - .0011"	.0010" - .0017"	.0014" - .0024"	.0019" - .0030"
	M	<b>STAINLESS STEELS</b>					
13/8, 15/5, 17-4, pH Types		< 40 > 40	.0004" - .0009" .0003" - .0007"	.0007" - .0013" .0006" - .0011"	.0011" - .0019" .0010" - .0017"	.0015" - .0026" .0014" - .0024"	.0020" - .0032" .0019" - .0030"
300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic		< 40 > 40	.0004" - .0009" .0003" - .0007"	.0007" - .0013" .0006" - .0011"	.0011" - .0019" .0010" - .0017"	.0015" - .0026" .0014" - .0024"	.0020" - .0032" .0019" - .0030"
400 Series - 403, 405, 420, 455		< 40 > 40	.0004" - .0009" .0003" - .0007"	.0007" - .0013" .0006" - .0011"	.0011" - .0019" .0010" - .0017"	.0015" - .0026" .0014" - .0024"	.0020" - .0032" .0019" - .0030"
<b>HIGH STRENGTH TOOL STEELS</b>							
A2, D2, P20, H13, S7, O1	< 40 > 40	.0004" - .0009" .0003" - .0007"	.0007" - .0013" .0006" - .0011"	.0011" - .0019" .0010" - .0017"	.0015" - .0026" .0014" - .0024"	.0020" - .0032" .0019" - .0030"	
Thompson Shaft, Armor Plate (Class 1)	> 50	.0002" - .0006"	.0005" - .0009"	.0009" - .0015"	.0013" - .0022"	.0018" - .0028"	
P	<b>MEDIUM ALLOY TOOL STEELS</b>						
	4140, 4340, 52100, 6150, 8620	< 40 > 40	.0004" - .0009" .0003" - .0007"	.0007" - .0013" .0006" - .0011"	.0011" - .0019" .0010" - .0017"	.0015" - .0026" .0014" - .0024"	.0020" - .0032" .0019" - .0030"
	<b>CARBON STEELS</b>						
	1000's - 1018, 1020, 12L14	< 40	.0005" - .0010"	.0008" - .0014"	.0012" - .0020"	.0016" - .0027"	.0021" - .0033"
K	<b>CAST MATERIAL</b>						
	Ductile Iron		.0005" - .0010"	.0008" - .0014"	.0012" - .0020"	.0016" - .0027"	.0021" - .0033"
	Gray Iron		.0005" - .0010"	.0008" - .0014"	.0012" - .0020"	.0016" - .0027"	.0021" - .0033"
N	<b>NON-FERROUS</b>						
	Aluminum (6061, 7075)		.0006" - .0011"	.0009" - .0015"	.0013" - .0021"	.0017" - .0028"	.0022" - .0034"
	Magnesium		.0005" - .0010"	.0009" - .0014"	.0013" - .0020"	.0017" - .0027"	.0022" - .0033"
	Copper		.0004" - .0008"	.0008" - .0012"	.0012" - .0018"	.0016" - .0025"	.0021" - .0031"
	Brass, Bronze		.0005" - .0009"	.0009" - .0013"	.0013" - .0019"	.0017" - .0026"	.0022" - .0032"
O	<b>COMPOSITE (non-ISO)</b>						
	Glass Epoxy, Fiberglass, Plastics, Graphite, G10		.0003" - .0008"	.0007" - .0012"	.0011" - .0018"	.0015" - .0025"	.0020" - .0031"

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