GARR TOOL Milling Guide for 846MA, 853MA, 855MA, 863MA

	ISO Material	HRC	M/Min. (Vc)	CHIPLOAD PER TOOTH (Fz) 3.0mm	5.0mm	6.0mm	8.0mm	10.0mm	12.0mm	16.0mm	20.0mm	25.0mm
S	**COBALT BASE ALLOYS**											
	Haynes 25/188, Stellite 21, Cobalt Chrome	< 40 > 40	28 - 43 20 - 35	.020 - .051 .013 - .038	.010 - .025 .010 - .018	.018 - .030 .013 - .028	.025 - .046 .020 - .036	.025 - .051 .025 - .043	.046 - .071 .038 - .064	.058 - .079 .053 - .071	.069 - .086 .061 - .076	.074 - .091 .064 - .079
	NICKEL BASE ALLOYS											
	Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel	< 40 > 40	26 - 43 22 - 35	.013 - .023 .008 - .020	.013 - .023 .010 - .018	.018 - .033 .018 - .030	.025 - .041 .023 - .038	.025 - .051 .025 - .046	.051 - .071 .038 - .064	.064 - .081 .056 - .076	.074 - .091 .066 - .084	.076 - .097 .074 - .089
	IRON BASE ALLOYS											
	A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascolloy	< 40 > 40	26 - 43 22 - 35	.013 - .025 .008 - .020	.020 - .025 .010 - .020	.015 - .030 .013 - .025	.018 - .038 .015 - .033	.028 - .041 .020 - .036	.046 - .066 .033 - .058	.064 - .076 .056 - .071	.066 - .086 .064 - .079	.081 - .097 .076 - .089
	TITANIUM ALLOYS											
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		49 - 69	.013 - .025	.013 - .030	.020 - .038	.025 - .056	.046 - .069	.058 - .081	.064 - .084	.069 - .089	.071 - .094
	5553 / Beta Titanium		39 - 59	.010 - .025	.010 - .025	.015 - .036	.020 - .041	.038 - .064	.056 - .071	.061 - .076	.066 - .081	.071 - .089
M	**STAINLESS STEELS**											
	13/8, 15/5, 17-4, PH Types	< 40 > 40	69 - 89 53 - 69	.013 - .018 .005 - .010	.010 - .020 .005 - .015	.018 - .025 .007 - .018	.020 - .030 .010 - .020	.033 - .046 .018 - .030	.025 - .051 .020 - .038	.030 - .064 .025 - .041	.030 - .051 .033 - .043	.051 - .071 .038 - .051
	300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic	< 40 > 40	79 - 89 61 - 79	.008 - .018 .005 - .013	.013 - .025 .010 - .018	.020 - .038 .013 - .025	.023 - .033 .013 - .025	.025 - .046 .018 - .025	.038 - .051 .023 - .038	.046 - .056 .030 - .046	.046 - .089 .038 - .064	.058 - .091 .051 - .076
	400 Series - 403, 405, 420, 455	< 40 > 40	79 - 89 59 - 79	.018 - .025 .010 - .020	.023 - .038 .015 - .025	.023 - .036 .018 - .028	.028 - .038 .020 - .030	.033 - .046 .023 - .038	.038 - .064 .030 - .051	.051 - .089 .046 - .076	.056 - .102 .051 - .089	.076 - .117 .061 - .107
P	**HIGH STRENGTH TOOL STEELS**											
	A2, D2, P20, H13, S2, O1	< 40 > 40	89 - 128 59 - 89	.013 - .020 .008 - .013	.020 - .038 .013 - .025	.038 - .051 .020 - .030	.038 - .058 .025 - .038	.038 - .064 .025 - .046	.051 - .076 .038 - .051	.051 - .076 .038 - .051	.064 - .089 .046 - .064	.076 - .102 .051 - .076
	MEDIUM ALLOY TOOL STEELS											
	4140, 4340, 52100, 6150, 8620	< 40 > 40	89 - 128 59 - 89	.013 - .020 .008 - .013	.020 - .038 .013 - .025	.038 - .051 .020 - .030	.038 - .058 .025 - .038	.038 - .064 .025 - .046	.051 - .076 .038 - .051	.051 - .076 .038 - .051	.064 - .089 .046 - .064	.076 - .102 .051 - .076
	CARBON STEELS											
	1000's - 1018, 1020, 12L14	< 40	89 - 128	.013 - .020	.020 - .038	.038 - .051	.038 - .058	.038 - .064	.051 - .076	.051 - .076	.064 - .089	.076 - .102
K	**CAST MATERIAL**											
	Ductile Iron		89 - 128	.025 - .038	.038 - .051	.051 - .076	.064 - .089	.064 - .089	.076 - .114	.102 - .127	.102 - .127	.127 - .152
	Gray Iron		118 - 157	.038 - .064	.051 - .076	.064 - .089	.076 - .102	.076 - .102	.102 - .127	.127 - .152	.152 - .178	.152 - .178
N	**NON-FERROUS**											
	Aluminum		118 - 197	.015 - .025	.020 - .036	.030 - .051	.036 - .071	.051 - .076	.089 - .122	.127 - .152	.147 - .178	.173 - .229
	Magnesium		118 - 197	.015 - .025	.020 - .036	.030 - .051	.036 - .071	.051 - .076	.089 - .122	.127 - .152	.147 - .178	.173 - .229
	Copper		98 - 177	.015 - .025	.020 - .036	.030 - .051	.036 - .071	.051 - .076	.089 - .122	.127 - .152	.147 - .178	.173 - .229
	Brass, Bronze		79 - 157	.015 - .025	.020 - .036	.030 - .051	.036 - .071	.051 - .076	.089 - .122	.127 - .152	.147 - .178	.173 - .229
O	**COMPOSITE (non-ISO)**											
	Fiberglass, Plastics, G10		79 - 157	.015 - .025	.020 - .036	.030 - .051	.036 - .071	.051 - .076	.089 - .122	.127 - .152	.147 - .178	.173 - .229
	Graphite		(See Graphite Chart - page 313)									

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.