

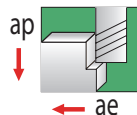
GARR TOOL Milling Guide for TMS / TMR (HIGH EFFICIENCY MILLING)

NOTE - CHIP THINNING CALCULATION ALREADY APPLIED

CHIPLOAD PER TOOTH (Fz) AT 2% RADIAL ENGAGEMENT (USING PROGRAMMED CALCULATION - SEE PAGE 305)

SPINDLE INTERFACE MUST BE SCRUTINIZED WHEN USING 16mm DIAMETER AND LARGER END MILLS

ISO Material	M/Min. (Vc)	CHIPLOAD PER TOOTH (Fz)							
		6.0mm	8.0mm	10.0mm	12.0mm	16.0mm	20.0mm	25.0mm	
S	TITANIUM ALLOYS								
	6Al-4V	98 - 157	.051 - .107	.076 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.132 - .363
	5553	59 - 98	.038 - .071	.046 - .089	.064 - .109	.076 - .140	.089 - .165	.107 - .203	.132 - .241
M	STAINLESS STEELS								
	Free Machining (303)	118 - 157	.051 - .107	.069 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.132 - .363
	Austenitic (304 / 304L)	89 - 138	.043 - .089	.064 - .109	.076 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292
	Martensitic (17-4 / 416)	79 - 98	.038 - .071	.046 - .089	.064 - .109	.076 - .140	.089 - .165	.107 - .203	.132 - .241
P	MEDIUM ALLOY TOOL STEELS								
	8620	98 - 157	.043 - .089	.064 - .109	.076 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292
	4140, D2, S7	98 - 138	.038 - .071	.046 - .089	.064 - .109	.076 - .140	.089 - .165	.107 - .203	.132 - .241
	CARBON STEELS								
	1000 Series, A36, 12L14	118 - 197	.051 - .107	.069 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.203 - .363
	CAST STEELS								
	Steel	98 - 138	.051 - .107	.069 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.203 - .363
K	CAST MATERIAL								
	Ductile Iron	98 - 138	.051 - .107	.069 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.203 - .363
	Gray Iron	98 - 138	.051 - .107	.069 - .132	.089 - .165	.109 - .198	.132 - .241	.165 - .292	.203 - .363
N	NON-FERROUS								
	Aluminum (6061-T6)	90 - 150	.050 - .105	.075 - .130	.090 - .165	.105 - .200	.130 - .240	.165 - .292	.203 - .363
	Copper, Brass	60 - 110	.043 - .105	.064 - .130	.076 - .165	.089 - .200	.109 - .240	.132 - .292	.165 - .363



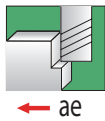
ap = full flute length

ae = 2%

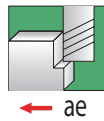
NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

Chip Thinning Calculations for TMS / TMR End Mills

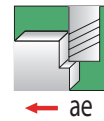
ae = 3%



ae = 2%



ae = 1%



3% Radial Engagement (.03 x d)	
Actual (CPT)	Programmed (CPT)
.0043mm	.0127mm
.0086mm	.0254mm
.0130mm	.0381mm
.0173mm	.0508mm
.0216mm	.0635mm
.0259mm	.0762mm
.0302mm	.0889mm
.0345mm	.1016mm
.0389mm	.1143mm
.0432mm	.1270mm
.0475mm	.1397mm
.0518mm	.1524mm
.0561mm	.1651mm
.0605mm	.1778mm
.0648mm	.1905mm
.0691mm	.2032mm
.0734mm	.2159mm
.0777mm	.2286mm
.0820mm	.2413mm
.0864mm	.2540mm
.0907mm	.2667mm
.0950mm	.2794mm
.0993mm	.2921mm
.1036mm	.3048mm
.1080mm	.3175mm
.1123mm	.3302mm
.1166mm	.3429mm
.1209mm	.3556mm
.1252mm	.3683mm
.1295mm	.3810mm
.1339mm	.3937mm
.1382mm	.4064mm
.1425mm	.4191mm
.1468mm	.4318mm
.1511mm	.4445mm
.1554mm	.4572mm
.1598mm	.4699mm
.1641mm	.4826mm
.1684mm	.4953mm
.1727mm	.5080mm

2% Radial Engagement (.02 x d)	
Actual (CPT)	Programmed (CPT)
.0036mm	.0127mm
.0071mm	.0254mm
.0107mm	.0381mm
.0142mm	.0508mm
.0178mm	.0635mm
.0213mm	.0762mm
.0249mm	.0889mm
.0284mm	.1016mm
.0320mm	.1143mm
.0356mm	.1270mm
.0391mm	.1397mm
.0427mm	.1524mm
.0462mm	.1651mm
.0498mm	.1778mm
.0533mm	.1905mm
.0569mm	.2032mm
.0605mm	.2159mm
.0640mm	.2286mm
.0676mm	.2413mm
.0711mm	.2540mm
.0747mm	.2667mm
.0782mm	.2794mm
.0818mm	.2921mm
.0853mm	.3048mm
.0889mm	.3175mm
.0925mm	.3302mm
.0960mm	.3429mm
.0996mm	.3556mm
.1031mm	.3683mm
.1067mm	.3810mm
.1102mm	.3937mm
.1138mm	.4064mm
.1173mm	.4191mm
.1209mm	.4318mm
.1245mm	.4445mm
.1280mm	.4572mm
.1316mm	.4699mm
.1351mm	.4826mm
.1387mm	.4953mm
.1422mm	.5080mm

1% Radial Engagement (.01 x d)	
Actual (CPT)	Programmed (CPT)
.0025mm	.0127mm
.0051mm	.0254mm
.0076mm	.0381mm
.0102mm	.0508mm
.0127mm	.0635mm
.0152mm	.0762mm
.0178mm	.0889mm
.0203mm	.1016mm
.0229mm	.1143mm
.0254mm	.1270mm
.0279mm	.1397mm
.0305mm	.1524mm
.0330mm	.1651mm
.0356mm	.1778mm
.0381mm	.1905mm
.0406mm	.2032mm
.0432mm	.2159mm
.0457mm	.2286mm
.0483mm	.2413mm
.0508mm	.2540mm
.0533mm	.2667mm
.0559mm	.2794mm
.0584mm	.2921mm
.0610mm	.3048mm
.0635mm	.3175mm
.0660mm	.3302mm
.0686mm	.3429mm
.0711mm	.3556mm
.0737mm	.3683mm
.0762mm	.3810mm
.0787mm	.3937mm
.0813mm	.4064mm
.0838mm	.4191mm
.0864mm	.4318mm
.0889mm	.4445mm
.0914mm	.4572mm
.0940mm	.4699mm
.0965mm	.4826mm
.0991mm	.4953mm
.1016mm	.5080mm