

GARR TOOL Milling Guide for Aluminum (Machining Centers with High-Range HP/Torque)

Series A3 End Mills

TECHNICAL

Fractional

Diameter	SLOTTING		SIDE MILLING	FINISHING
	Axial = .5xD	Axial = 1xD	Axial = 2xD Radial = 30%-40%xD	Axial = Max LOC Radial = 2.5%xD
	SFM = Maximum RPM	SFM = Maximum RPM	SFM = Maximum RPM	SFM = up to 80% Max RPM
	CPT (Fz) = 1.5% - 3% of diameter	CPT (Fz) = 1% - 2% of diameter	CPT (Fz) = 2% - 3% of diameter	CPT (Fz) = 1% of diameter
3/16"	.0028" - .0056"	.0018" - .0037"	.0037" - .0056"	.0018"
1/4"	.0037" - .0074"	.0025" - .0050"	.0050" - .0075"	.0025"
5/16"	.0052" - .0104"	.0031" - .0062"	.0062" - .0094"	.0031"
3/8"	.0055" - .0110"	.0037" - .0074"	.0075" - .0112"	.0037"
1/2"	.0075" - .0150"	.0050" - .0100"	.0100" - .0150"	.0050"
5/8"	.0093" - .0186"	.0062" - .0125"	.0125" - .0187"	.0062"
3/4"	.0112" - .0224"	.0075" - .0150"	.0150" - .0225"	.0075"
1"	.0150" - .0300"	.0100" - .0200"	.0200" - .0300"	.0100"

Metric

Diameter	SLOTTING		SIDE MILLING	FINISHING
	Axial = .5xD	Axial = 1xD	Axial = 2xD Radial = 30%-40%xD	Axial = Max LOC Radial = 2.5%xD
	M/Min. = Maximum RPM	M/Min. = Maximum RPM	SFM = Maximum RPM	SFM = up to 80% Max RPM
	CPT (Fz) = 1.5% - 3% of diameter	CPT (Fz) = 1% - 2% of diameter	CPT (Fz) = 2% - 3% of diameter	CPT (Fz) = 1% of diameter
4.0	.060 - .120	.040 - .080	.080 - .120	.040
6.0	.090 - .180	.060 - .120	.120 - .180	.060
8.0	.120 - .240	.080 - .160	.160 - .240	.080
10.0	.150 - .300	.100 - .200	.200 - .300	.100
12.0	.180 - .360	.120 - .240	.240 - .360	.120
16.0	.240 - .480	.160 - .320	.320 - .480	.160
20.0	.300 - .600	.200 - .400	.400 - .600	.200
25.0	.375 - .750	.250 - .500	.500 - .750	.250

END MILL NOTES: Climb milling recommended for best finish
 Contact your OEM for your machine's optimal running parameters
 CPT parameters shown are for 2xD LOC tooling and 2.5xD Reach Lengths
 CPT may need to be reduced based on machine/tool holding connection
 Preferred tool holders: Rego Fix powRgrip or Shrink Fit

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

GARR TOOL Milling Guide for Aluminum (Machining Centers with Mid-Range HP/Torque)

Series 142M/143M/A3 End Mills

Fractional

Diameter	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ .5xD
	SFM = 1500 - 2000	SFM = 750 - 1500	SFM = 1500 - 2000
	CPT (Fz) = 1.5% - 2.5% of diameter	CPT (Fz) = 1% - 2% of diameter	CPT (Fz) = 1.5% - 2.5% of diameter
1/8"	.0019" - .0031"	.0013" - .0025"	.0019" - .0031"
3/16"	.0028" - .0047"	.0018" - .0037"	.0028" - .0047"
1/4"	.0037" - .0062"	.0025" - .0050"	.0037" - .0062"
5/16"	.0052" - .0078"	.0031" - .0062"	.0052" - .0078"
3/8"	.0055" - .0094"	.0037" - .0074"	.0055" - .0094"
1/2"	.0075" - .0125"	.0050" - .0100"	.0075" - .0125"
5/8"	.0093" - .0156"	.0062" - .0125"	.0093" - .0156"
3/4"	.0112" - .0188"	.0075" - .0150"	.0112" - .0188"
1"	.0150" - .0250"	.0100" - .0200"	.0150" - .0250"

Metric

Diameter	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ 0.5xD
	M/Min. = 450 - 760	M/Min. = 225 - 450	M/Min. = 450 - 760
	CPT (Fz) = 1.5% - 2.5% of diameter	CPT (Fz) = 1% - 2% of diameter	CPT (Fz) = 1.5% - 2.5% of diameter
3.0	.045 - .075	.030 - .060	.045 - .075
4.0	.060 - .100	.040 - .080	.060 - .100
6.0	.090 - .150	.060 - .120	.090 - .150
8.0	.120 - .200	.080 - .160	.120 - .200
10.0	.150 - .250	.100 - .200	.150 - .250
12.0	.180 - .300	.120 - .240	.180 - .300
16.0	.240 - .400	.160 - .320	.240 - .400
20.0	.300 - .500	.200 - .400	.300 - .500
25.0	.375 - .625	.250 - .500	.375 - .625

END MILL NOTES: Climb milling recommended for best finish
 Contact your OEM for your machine's optimal running parameters
 Figures shown are based on 6061 / 7075
 CAT 50 Taper holders are recommended for 3/4" and 1" diameter end mills
 In controlled slotting tests, 4000 SFM, 1% diameter Chipload Per Flute, and 50% of Dia. axial depth were obtained
 In cases for tools with slower SFM (M/Min.), reference Series 242M/842M
 For CAT 40 machines using tools over 5/8" diameter, speeds and feeds may need to be reduced by as much as 50%

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

GARR TOOL Milling Guide for Aluminum (Machining Centers with Low-Range HP/Torque)

Series 242M/842M/A3 End Mills

TECHNICAL

Fractional

Diameter	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ .5xD
	SFM = 400 - 600	SFM = 300 - 450	SFM = 500 - 650
	CPT (Fz) = .5% - 1.5% of diameter	CPT (Fz) = .5% - 1% of diameter	CPT (Fz) = 1% - 2% of diameter
1/8"	.0006" - .0018"	.0006" - .0012"	.0012" - .0024"
3/16"	.0009" - .0028"	.0009" - .0018"	.0018" - .0036"
1/4"	.0013" - .0038"	.0013" - .0025"	.0025" - .0050"
5/16"	.0016" - .0047"	.0016" - .0031"	.0031" - .0062"
3/8"	.0019" - .0056"	.0019" - .0037"	.0037" - .0074"
1/2"	.0025" - .0075"	.0025" - .0050"	.0050" - .0100"
5/8"	.0031" - .0094"	.0031" - .0062"	.0062" - .0120"
3/4"	.0038" - .0110"	.0038" - .0075"	.0075" - .0150"
1"	.0050" - .0150"	.0050" - .0100"	.0100" - .0200"

Metric

Diameter	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ 0.5xD
	M/Min. = 125 - 180	M/Min. = 90 - 140	M/Min. = 150 - 200
	CPT (Fz) = .5% - 1.5% of diameter	CPT (Fz) = .5% - 1% of diameter	CPT (Fz) = 1% - 2% of diameter
3.0	.015 - .045	.015 - .030	.030 - .060
4.0	.020 - .060	.020 - .040	.040 - .080
6.0	.030 - .090	.030 - .060	.060 - .120
8.0	.040 - .120	.040 - .080	.080 - .160
10.0	.050 - .150	.050 - .100	.100 - .200
12.0	.060 - .180	.060 - .120	.120 - .240
16.0	.080 - .240	.080 - .160	.160 - .320
20.0	.100 - .300	.100 - .200	.200 - .400
25.0	.125 - .375	.125 - .250	.250 - .500

END MILL NOTES: Climb milling recommended for best finish
 Contact your OEM for your machine's optimal running parameters
 Figures shown are based on 6061 / 7075
 CAT 50 Taper holders are recommended for 3/4" and 1" diameter end mills
 For CAT 40 machines using tools over 5/8" diameter, speeds and feeds may need to be reduced by as much as 50%

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