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

Series A3 End Mills

Fractional

	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
Diameter	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

	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
Diameter	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

	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ .5xD
	SFM = 1500 - 2000	SFM = 750 - 1500	SFM = 1500 - 2000
Diameter	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

	SLOTTING		SIDE MILLING
	Axial = .5xD	Axial = 1xD	Axial ≤ 1xD Radial ≤ 0.5xD
	M/Min. = 450 - 760	M/Min. = 225 - 450	M/Min. = 450 - 760
Diameter	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

Fractional

	SLOTTING		SIDE MILLING
	Axial = .5xD	**Axial = 1xD**	**Axial ≤ 1xD Radial ≤ .5xD**
	SFM = 400 - 600	SFM = 300 - 450	SFM = 500 - 650
Diameter	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

	SLOTTING		SIDE MILLING
	Axial = .5xD	**Axial = 1xD**	**Axial ≤ 1xD Radial ≤ 0.5xD**
	M/Min. = 125 - 180	M/Min. = 90 - 140	M/Min. = 150 - 200
Diameter	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.