M.A. FORD
High Performance Cutting Tools

*Where **high performance** is the **standard**®*

M.A. FORD High Performance Cutting Tools

APG
ADVANCED PRODUCT GROUP

MADE IN USA

ISO 9001:2015 Certified

# TuffCut® X-AL Series XAL5R

## XTREME ALUMINUM 5-FLUTE ROUGHER

www.maford.com

# TuffCut® X-AL Series XAL5R

## 5-Flute, High Performance, Aluminum Rougher

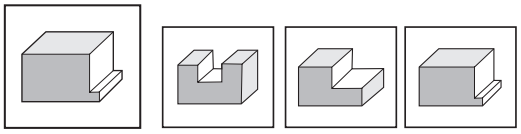
### Product Features

- 5-flute, ripper-style roughing geometry for exceptional chip control and heavy stock removal
- Special geometry ensures stability in long-reach applications
- Engineered to reduce power requirements at high metal removal rates
- Designed to reduce cutting noise compared to standard end mill types
- Through-coolant for improved chip evacuation in deep pockets
- Capable of semi-finishing / finishing at reduced feeds
- Gem+ coated option for excellent wear resistance and lubricity

### Suitable materials


### Applications

The XAL5R, 5-flute end mill is specifically designed for high removal rates in aluminum alloys. Featuring unique characteristics for deep, dynamic milling applications, but with extended capabilities from slotting to semi-finishing operations.



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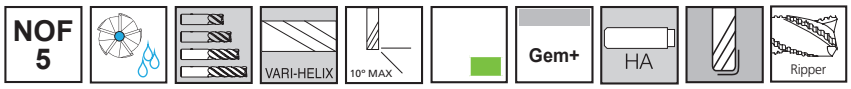
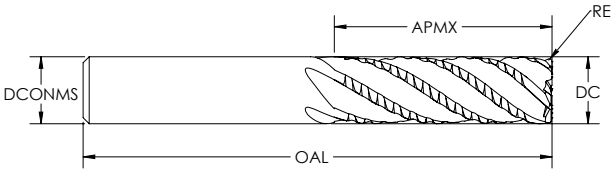
# TuffCut® X-AL Series XAL5R




Non-Center Cutting

| Uncoated | | Gem+ | | DC | | DCONMS | OAL | APMX | RE |
|---|---|---|---|---|---|---|---|---|---|
| Tool No. | EDP | Tool No. | EDP | Inch | Decimal | Inch | Inch | Inch | Inch |
| XAL5R37534 | 28166 | XAL5R37534GP | 28176 | 3/8 | .3750 | 3/8 | 3 | 1-1/4 | .030 |
| XAL5R37544 | 28167 | XAL5R37544GP | 28177 | 3/8 | .3750 | 3/8 | 3-1/2 | 1-5/8 | .030 |
| XAL5R50034 | 28168 | XAL5R50034GP | 28178 | 1/2 | .5000 | 1/2 | 3-1/2 | 1-5/8 | .030 |
| XAL5R50038 | 28169 | XAL5R50038GP | 28179 | 1/2 | .5000 | 1/2 | 3-1/2 | 1-5/8 | .120 |
| XAL5R50044 | 28170 | XAL5R50044GP | 28180 | 1/2 | .5000 | 1/2 | 4 | 2-1/8 | .030 |
| XAL5R50048 | 28171 | XAL5R50048GP | 28181 | 1/2 | .5000 | 1/2 | 4 | 2-1/8 | .120 |
| XAL5R62534 | 28172 | XAL5R62534GP | 28182 | 5/8 | .6250 | 5/8 | 4 | 2-1/8 | .030 |
| XAL5R62538 | 28173 | XAL5R62538GP | 28183 | 5/8 | .6250 | 5/8 | 4 | 2-1/8 | .120 |
| XAL5R75034 | 28174 | XAL5R75034GP | 28184 | 3/4 | .7500 | 3/4 | 5 | 2-1/2 | .030 |
| XAL5R75038 | 28175 | XAL5R75038GP | 28185 | 3/4 | .7500 | 3/4 | 5 | 2-1/2 | .120 |

**Weldon Shanks:**
Weldon Performance Flats offered through our rapid turnaround program by adding a "WP" to the end of the tool number when ordering.

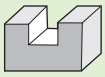
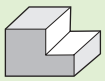
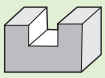
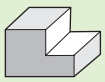
Example: XAL5R*****WP
Example: XAL5R*****GPWP

| Tolerance (inch) | |
|---|---|
| DC | DCONMS |
| +0/-.0005 | h6 |

**Gem+ Coating (GP):**
Recommended for aluminum and aluminum alloys up to 12% Si, non-ferrous metals and composites. Gem+ provides excellent wear resistance and maintains sharp cutting edges.

| Gem+ Coating Properties | | | |
|---|---|---|---|
| Microhardness (HV) | Max. Service Temp. | Friction Coefficient | Tool No. Designation |
| 4710 | 500° C / 932° F | 0.10 | GP |

## XAL5R Series Recommended Cutting Data - 3xD Cutting Length - Inch

| Workpiece Material Group | ISO | Application | Type of cut | | Vc (SFM) | Tool Diameter (inch) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3/8 | 1/2 | 5/8 | 3/4 |
| | | | Radial (Ae) | Axial (Ap) | | fz - in/tooth | | | |
| **Aluminum - Wrought (≤ 10 Si)** | **N** |  Slotting | 1 x D | ≤ 1.5 x D | 980-6500 | .0030 | .0040 | .0050 | .0060 |
| | |  Profiling | ≤ 0.3 x D | ≤ 3 x D | 980-6500 | .0041 | .0055 | .0069 | .0083 |
| **Aluminum - Cast (> 10 Si)** | |  Slotting | 1 x D | ≤ 1.5 x D | 785-5000 | .0030 | .0040 | .0050 | .0060 |
| | |  Profiling | ≤ 0.3 x D | ≤ 3 x D | 785-5000 | .0041 | .0055 | .0069 | .0083 |

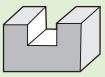
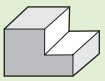
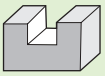
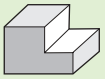
**Notes:**
- Techincal data provided should be considered advisory only. Adjustments may be necessary depending on the application, workpiece rigidity, machine tool, etc.
- The XAL5R should only be used in accurate tool holders with high gripping power. ER collet type holders are not recommended.

**Helical interpolation recommendations:**
- Under optimal conditions, with proper through-coolant flow, up to 10° helical ramp angles are achievable with the XAL5R. Without through-coolant, up to 5° helical ramp angles are recommended.
- A reduction of 30-50% in feed per tooth (fz) are recommended.
- Recommended hole diameter = 1.9 x D

| RWOC (ae) | Chip Thickness Compensation Factor |
|---|---|
| 10% | 1.67 |
| 15% | 1.40 |
| 20% | 1.25 |
| 25% | 1.15 |
| 30% | 1.09 |

During profile milling with a radial width of less than 50% of the cutter diameter, the actual chip thickness at the cutting edge is less than the programmed chipload. The accompanying table shows the increase in chipload by given radial width percentage to adjust for chip thinning. Multiply your recommended chip thickness by the appropriate feed factor to establish the correct feed rate.

## XAL5R Series Recommended Cutting Data - 4xD Cutting Length - Inch

| Workpiece Material Group | ISO | Application | Type of cut | | Vc (SFM) | Tool Diameter (inch) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3/8 | 1/2 | 5/8 | 3/4 |
| | | | Radial (Ae) | Axial (Ap) | | fz - in/tooth | | | |
| **Aluminum - Wrought (≤ 10 Si)** | N |  Slotting | 1 x D | ≤ 1 x D | 980-6500 | .0030 | .0040 | .0050 | .0060 |
| | |  Profiling | ≤ 0.2 x D | ≤ 4 x D | 980-6500 | .0036 | .0048 | .0060 | .0072 |
| **Aluminum - Cast (> 10 Si)** | |  Slotting | 1 x D | ≤ 1 x D | 785-5000 | .0030 | .0040 | .0050 | .0060 |
| | |  Profiling | ≤ 0.2 x D | ≤ 4 x D | 785-5000 | .0036 | .0048 | .0060 | .0072 |

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During profile milling with a radial width of less than 50% of the cutter diameter, the actual chip thickness at the cutting edge is less than the programmed chipload. The accompanying table shows the increase in chipload by given radial width percentage to adjust for chip thinning. Multiply your recommended chip thickness by the appropriate feed factor to establish the correct feed rate.

# Other Milling Solutions for ALUMINUM

## Series 334

**NOF** - 3
**Helix Angle** - 45°
**End Type** - Corner Radius
**DC Range** - 1/4"- 1"

## Series 334N

Neck Relief

**NOF** - 3
**Helix Angle** - 45°
**End Type** - Corner Radius
**DC Range** - 3/8"- 3/4"

## Series 135

**NOF** - 2
**Helix Angle** - 30°
**End Type** - Corner Radius
**DC Range** - 3/16"- 1"
3mm - 25mm

## Series 135N

Neck Relief

**NOF** - 2
**Helix Angle** - 30°
**End Type** - Corner Radius
**DC Range** - 3/16"- 1"
3mm - 25mm

## Series 135B

**NOF** - 2
**Helix Angle** - 37°
**End Type** - Ball Nose
**DC Range** - 1/8"- 1"

## Series 136

**NOF** - 2
**Helix Angle** - 45°
**End Type** - Square End
**DC Range** - 1/8"- 1"
3mm - 20mm

## Series 138

**NOF** - 3
**Helix Angle** - 36°
**End Type** - Square End, Corner Radius
**DC Range** - 1/8"- 1"
3mm - 20mm

## Series 138N

Neck Relief

**NOF** - 3
**Helix Angle** - 36°
**End Type** - Square End, Corner Radius
**DC Range** - 1/8" - 1"

## Series 138CE

**NOF** - 3
**Helix Angle** - 36°
**End Type** - Square End
**DC Range** - 1/8"- 3/4"
6mm - 16mm

## Series 138B

**NOF** - 3
**Helix Angle** - 36°
**End Type** - Ball Nose
**DC Range** - 1/8"- 1"
3mm - 16mm

**To find out more turn to page 78 of the M.A. Ford® Vol:105 Product Catalog**

M.A. FORD
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*Where **high performance** is the **standard***®

Also available:




**Safety Note**
Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded.

⚠ **WARNING:** This product can expose you to chemicals including cobalt, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.


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