Premium Solid Carbide & Cobalt HSS End Mills, Drills, & Cutting Tools
One of the most well known brand names of end mills in North America, Melin Tool is a family-owned business located in Cleveland, Ohio and has been producing high quality cutting tools for the metalworking industry since 1940. Today, Melin Tool offers one of the widest ranges of solid carbide and high speed steel end mills, drills, thread mills and countersinks in the industry. Utilizing state-of-the-art CNC grinding equipment, measuring and honing systems and in-house coating capabilities, Melin’s manufacturing capabilities provide its customers with the highest quality, consistency and performance of standard and custom designed tooling. With a focus on serving the customer with world class service, Melin provides the ultimate in customer care with outstanding personal, friendly and proficient customer service and technical support.

Exceptional flexibility and responsiveness to the customer’s needs is what really separates Melin from its competition. Whether the issue at hand requires high performance tooling, application optimization, custom designed engineering, or just a bit of help on shortening a scheduled lead time, Melin knows how to respond and is well regarded as one of the very few large solid style cutting tool manufacturers that will truly go out of their way to take care of its customer’s needs.

Melin products and services are available exclusively through a select network of industrial distributors, located throughout North America and in over 25 other countries around the world. Providing technical field support by regional representatives and field engineers, Melin is there when needed... working to make their customers more productive and providing them the competitive edge to achieve success.

PRODUCT PORTFOLIO

SUPPORT SERVICES
- Technical Field Support
- Custom Designed Tooling
- Application Engineering & Optimization
- Coating & Reconditioning Services
- Interactive Online Services & Catalog
  > via internet and mobile access

MELIN TOOLS ARE SOLD EXCLUSIVELY THROUGH INDUSTRIAL DISTRIBUTION.

MADE IN USA
Coating Information

<table>
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<tr>
<th>Material</th>
<th>Hardness</th>
<th>TiN</th>
<th>TiCN</th>
<th>AITiN</th>
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<th>ZrN</th>
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**CONVENTIONAL COATINGS**
- Gold
- Blue-grey
- Black

**SPECIALITY COATINGS**
- White-gold
- Violet-blue
- Grey-black
- Blue-grey

**TARGETED WORK PIECE MATERIALS**
- Range of work piece material hardness

**ISO MATERIAL GROUP**

**MACHINING OPERATIONS**
- SLOT
- PROFILE
- PLUNGING
- RAMPING
- PROFILE CUTTING
- DRILLING
- CHAMFER
- RADIUS
- UNDER CUT
- SLOT W/ RADIUS

**RECONDITIONING**
- Denotes our reconditioning services are available for this series

**COATINGS**
- Icon for series standard coating (additional coatings can be requested).
- Coated icon when a series has a preferred coating (additional coatings can be requested).

**CONVENTIONAL COATINGS**
- TiN - Titanium Nitride
- TiCN - Titanium Carbonitride
- AITiN - Aluminium Nitride

**SPECIALITY COATINGS**
- TiN - Zirconium Nitride
- TiCN - Titanium Carbonitride
- AITiN - Aluminium Nitride
- TiCN - Titanium Carbonitride

**RECONDITIONING**
- Tool substrate for each series
- # of flutes for each series
- Helix angle for each series
- Corner style for each series

**PROFILE**
- Profile of cutting edge

**GROUP MATERIAL SELECTION**

**CODE**
- P
- M
- H
- K
- S
- N

**MATERIAL GROUP**
- Steel
- Stainless
- Hardened Steels
- Cast Iron
- Special Alloys
- Non-Ferrous

**MATERIAL SELECTION**
- Carbon Steel, Alloy Steels, Die Steels 1018, 1045, 4140, D-2...
- Martensitic & Austenitic 304, 316, 312, 316L, 421, 420, 17-4PH
- D-2, 4340, H-13
- Grey-Cast Iron & Ductile Iron
- Inconel 718, Hastelloy B, 6Al-4V
- Inconel 718, Hastelloy B, 6Al-4V
- Aluminium 6060-T6, 7075; Plastics, Delrin, Graphite, Fiberglass,...

**TARGETED WORK PIECE MATERIALS**
- Range of work piece material hardness

**HRC**
- <40
- 40-60
- >52

**ICON GLOSSARY**
- X = For BEST performance
- X = For SPECIFIC applications
- * = Additional recommended coating options
HIGH PERFORMANCE CARBIDE END MILLS

**VARIABLE FLUTE**
4 FLUTE- SQUARE, RADIUS, OR CHAMFER
Series: VXMG4

- For chatter less, universal machining in multiple types of operations on Titanium Alloys, Stainless Steel, Alloyed Steel, & All Ferrous Materials
- Heavy Slotting - can slot up to 1xD axial depth
- Heavy Profiling - up to full flute length and 50% radial depth of cut

**VARIABLE FLUTE**
5 FLUTE- SQUARE OR RADIUS
Series: VXMG5

- For chatter less, universal machining in multiple types of operations on Titanium Alloys, Stainless Steel, Alloyed Steel, & All Ferrous Materials
- Heavy Slotting - can slot up to 1xD axial depth
- Medium Heavy Profiling - at full flute length, high metal removal rates can be achieved with 30% radial depth of cut
- Finishing - The 5th flute enables the tool to provide excellent finishes at high metal removal rates without changing tools

**VARIABLE FLUTE**
7 FLUTE- SQUARE OR RADIUS
Series: VXMG7

- For high-feed and semi-finishing, medium depth profiling applications on Titanium Alloys, Stainless Steel, Alloyed Steel, & All Ferrous Materials
- Enables high feed machining - provides extreme metal removal rates at full flute length with radial depth of 15% of diameter
- Additional flutes enable more metal removal in fewer passes
- Provides over 40% higher metal removal rate than even a 5 flute tool

**VARIABLE FLUTE**
9 FLUTE- SQUARE OR RADIUS
Series: VXMG9

- For fine finish, profiling applications on Titanium Alloys, Stainless Steel, Alloyed Steel, & All Ferrous Materials
- Provides outstanding surface finishes in the shortest amount of time
- Ideal for finishing tight tolerance walls - when trying to hold tight perpendicularity tolerances on your wall, this is the perfect choice to finish the part FAST and keep the straightness
- Takes a radial depth of cut of 5% of diameter at full flute length
- Provides over 40% higher metal removal rate than even a 5 flute tool

**VARIABLE FLUTE**
4 FLUTE- SQUARE, RADIUS OR BALL
Series: VHMG or VHMG-__B

- For chatter less machining of Ferrous Materials in slotting, profiling or pocketing operations
- Helix changes along the flute
- Can run at higher speed & feed rates than conventional geometries
- Corner radius provides added strength

See page 9 for Powdered Metal version

**VARIABLE FLUTE - TITANIUM CUTTING END MILLS**
4 & 5 FLUTE - SQUARE, RADIUS, CHAMFER OR BALL
Series: VXMG4T, VXMG4T-__-B OR VXMG5T

- Specifically designed for aggressive machining in Titanium Alloys
- VXMG5T: Eccentric relief form provides an exceptionally strong cutting edge. Melin’s additional “Feather Edge” Grind Technology substantially increases tool life at elevated speeds & feeds
- VXMG4T-__-B: Unique titanium focused geometry with increased rake into the ball radius reduces cutting forces enabling higher chip loads and freer cutting action
- Unique nACRo coating assists in achieving maximum metal removal rates and extreme production gains
- Available from 1/8” to 1-1/4” in stub, regular, medium, long and extended neck lengths
- Thru-hole coolant style, available upon request
**ALUMINUM CUTTING END MILLS**

### 2 FLUTES

**Series:** AXMG45

- **CARBIDE**
- **35° RADIUS**
- **<40 °N**

> Enhanced productivity in machining Aluminum Alloys
> For aggressive machining on lighter duty CNC machines with 5-20 HP
> Produces superior surface finishes on both walls and floor
> Geometry optimizes chip evacuation and eliminates chip nesting
> Available from 1/8” to 1-1/4” with choices of radii in stub, regular, medium, long, and extended neck lengths
> Recommended coatings are ZrN and TiCN

### 2 FLUTE - FOR HIGH VELOCITY MACHINING

**Series:** HVMG2

- **CARBIDE**
- **35° RADIUS**
- **<40 °N**

> For aggressive machining on high power, high velocity CNC machines with >35 HP
> Reduces cutting pressure and vibration when running at exceptionally high feed rates
> Highly polished OD and flute face, prevents material from sticking to cutting edges
> Provides maximum metal removal rates
> Available from 1/8” to 1-1/4” with choices of radii in stub, regular, medium, long, and extended neck lengths
> Recommended coatings are ZrN and TiCN

### 2 FLUTE WITH CONVENTIONAL & EXTENDED NECK - RADIUS

**Series:** ALMG

- **CARBIDE**
- **35° RADIUS**

> Excellent for slotting and profiling at high speeds
> Used for maximum metal removal rates
> Corner radius for added strength and smoother cutting action
> For use in long reach and deep pocket applications in Aluminum Alloys
> Double hook for better chip removal

### 3 FLUTES

**Series:** EXMG

- **CARBIDE**
- **35° RADIUS**
- **<40 °N**

> Designed to increase metal removal rates when machining Aluminum Alloy materials
> Enables slotting up to 1-1/2 D axial depth
> Outstanding performance in heavy slotting, deep profiling and pocketing operations
> Capable of plunging and ramping operations
> ZrN coating adds lubricity, prevents chips from sticking to flutes

### 3 FLUTE - FOR HIGH VELOCITY MACHINING

**Series:** HVMG3

- **CARBIDE**
- **35° RADIUS**
- **<40 °N**

> For aggressive machining on high power, high velocity CNC machines with >35 HP
> Reduces cutting pressure and vibration when running at exceptionally high feed rates
> Highly polished OD and flute face, prevents material from sticking to cutting edges
> Provides maximum metal removal rates
> Available from 1/8” to 1-1/4” with choices of radii in stub, regular, medium, long, and extended neck lengths
> Recommended coatings are ZrN and TiCN

### 3 FLUTE - RADIUS

**Series:** ELMG

- **CARBIDE**
- **35° RADIUS**

> Excellent for profiling at high speeds
> Small corner radius for added strength and smoother cutting action
> For finishing applications in Aluminum Alloys
> Can be used for roughing and finishing
> Provides higher metal removal rate

* FOR MORE INFORMATION ON OUR COATING & ICONS
PLEASE REFER TO PAGE 1

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### ROUGHING END MILLS
**MULTIPLE FLUTE, CENTER CUTTING**

<table>
<thead>
<tr>
<th>Series: CRMG</th>
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- **35° HELIX END MILLS**
  - **3 FLUTE**
    - Designed for heavy machining operations on Stainless Steels, Nickel Based Alloys, & Exotic Materials
    - Excellent for heavy roughing and finish profiling
    - Excellent performance in slotting applications

- **45° HELIX END MILLS**
  - **5 FLUTES**
    - Provides excellent cutting performance at faster feed rates
    - Used for semi-finishing & finish profiling applications in Stainless Steels, Nickel Based Alloys & other Ferrous Materials
    - Smooth cutting action with excellent chip ejection
    - Available in stub, standard, & extra long lengths

- **60° HELIX END MILLS**
  - **3 FLUTES**
    - For high shear machining of Ferrous Materials
    - Keeps a cutting edge engaged in the material throughout the cutting process
    - Outstanding surface finish

### ROUGHER / FINISHER
**MULTIPLE FLUTES, CENTER CUTTING**

| Series: CRFMG |

- **35° HELIX END MILLS**
  - **3 FLUTE**
    - Designed for heavy machining operations on Stainless Steels, Nickel Based Alloys, & Exotic Materials
    - Excellent for high shear machining of Ferrous Materials
    - Keeps a cutting edge engaged in the material throughout the cutting process
    - Outstanding surface finish

- **45° HELIX END MILLS**
  - **6 FLUTE - RADIUS - FOR HARDENED STEEL**
    - For achieving higher metal removal rates in light finishing applications
    - Increased core diameter for added strength
    - For milling hardened materials over 52 HRe
**DIE & MOLD END MILLS**
2 FLUTE, BALL END - FOR HARDENED STEEL
Series: HMG-__-B

- Short flute length with reduced neck for maximum rigidity
- For Z-axis profiling applications in hardened materials
- Use air mist coolant for materials harder than 40 HRc
- For milling materials, over 52 HRc

**CVD DIAMOND COATED**
2 AND 4 FLUTES - SQUARE & BALL END
Series: AMG-__-DIA, AMG-__-B-DIA, CCMG-__-B-DIA or CCMG-__-DIA

- High performance CVD diamond coated tools are used to machine Graphite, Aluminum with High Silicon content and other Non-ferrous materials
- Typically extends tool life by 10 to 25 times over uncoated tools when cutting various non-metallic materials
- A special carbide substrate is used to insure proper diamond adhesion to the tool

**SINGLE END MILLS**
2, 3, AND 4 FLUTE
Series: AMG, EMG, or CCMG

- Used for general purpose milling in most materials
- Higher helix provides freer cutting
- Enhanced performance in Stainless Steels
- Long reach sizes available
- Available in stub, long, & extra long lengths

**SPHERICAL BALL END MILL**
2 AND 4 FLUTES
Series: VBMG2 or VBMG4

- Designed for use in die & mold applications with a 220° arc cutting capacity for multi axis cavity work
- For material up to 54 HRc
- For undercutting hardened material, when a 5 axis machine is not available
- 4 flute provide a higher metal removal rate

**PVD AMORPHOUS DIAMOND COATED**
2 AND 4 FLUTES - SQUARE & BALL END
Series: AMG-__-DLC, AMG-__-B-DLC, CCMG-__-DLC or CCMG-__-B-DLC

- PVD amorphous diamond coating for enhanced productivity in machining Graphite and other Non-ferrous materials
- Cost effective alternative to CVD diamond

**SINGLE END MILLS - BALL END**
2, 3, AND 4 FLUTE
Series: AMG-__-B, EMG-__-B, or CCMG-__-B

- Used for general purpose milling in most materials
- Higher helix provides freer cutting
- Provides enhanced performance in Stainless Steels
- Long reach sizes available
- Available in stub, long, & extra long lengths

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1

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GENERAL PURPOSE CARBIDE END MILLS

**SINGLE END MILLS WITH CORNER RADIUS** *Available in Metric*

Series: AMG-__-R__ or CCMG-__-R__

- Used for general purpose milling in most materials
- Corner radius provides added strength
- Used when a radius on the finished piece is permissible or required
- Made from premium submicron grain carbide

**DOUBLE END MILLS STUB LENGTH - SQUARE & BALL END**

Series: 2F: BSMG or BSMG-__-B

4F: DDSMG or DDSMG-__-B

- Used for general purpose milling in most materials
- Economical alternative to single end mills
- Used for radius and contouring part surfaces
- Short flute length. High rigidity and minimal tool deflection

**40° HELIX SINGLE END MILLS**

**2, 3, AND 4 FLUTE**

Series: AMG40, EMG40, or CCMG40

- Used for general purpose milling in most materials
- Long reach sizes available
- Available from 1/16 to 1 inch. (In 1/64 increments through 1/2 inch)
- Available in stub, long, & extra long lengths

**NC TOLERANCE - SQUARE & BALL END**

Series: AMG-__-NC or AMG-__-NCB

CCMG-__-NC or CCMG-__-NCB

- Used in applications when cutting compensation is not available
- Special OD tolerance
- Made from premium submicron grain carbide

**DOUBLE END MILLS WITH FLAT - SQUARE & BALL END**

Series: 2F: BMG or BMG-__-B

4F: DDMG or DDMG-__-B

- Used for general purpose milling in most materials
- Economical alternative to single end mills
- Made from premium submicron grain carbide

**40° HELIX SINGLE END MILLS - BALL END**

Series: AMG40-__-B or CCMG40-__-B

- Used for general purpose milling in most materials
- Long reach sizes available
- Available from 1/16 to 1 inch. (In 1/64 increments through 1/2 inch)
- Available in stub, long, & extra long lengths
**MICRO END MILLS - SQUARE & BALL DECIMAL SIZE**

2 AND 4 FLUTE

Series: 2F: AMG- or AMG-.__-B.
4F: CCMG-, CCMG-.__-B, or CCMG-.__-LF

- Available from 0.005 - 0.100 inch
- Length of cut is 3 times the diameter
- All found on a 1/8 shank
- Also available in stub and long lengths
- Made from premium submicron grain carbide

*Available in Metric

**ROUTERS FOR PLASTIC, ALUMINUM, OR WOOD**

SINGLE AND 2 FLUTE

Series: PRMG (Plastic), ARMG (Aluminum)
WRUMG -up (Wood), WRDMG - down (Wood)

- Plastic and Aluminum routers have a unique rake and clearance angles for fast removal rates
- Wood routers have right hand spirals (up cut) or left hand spirals (down cut)
- Made from premium submicron grain carbide

**TAPERED END MILLS - SQUARE & BALL END**

3 FLUTE

Series: EMG-.__-_T or EMG-.__-_TB

- Used in the die and mold industry
- Made from premium submicron grain carbide

**STRAIGHT FLUTE**

2 FLUTE

Series: SAMG

- Used for cutting keyways
- Used on Conventional materials
- Made from premium submicron grain carbide

**DIE SINKING BALL END MILLS**

2 FLUTE

Series: AMGDS-.__-_B

- Straight flute
- Available in 6°, 10°, 14°, and 20° included angles
- Used for reworking die and mold steels
- Made from premium submicron grain carbide

**MELIN MOBILE**

www.melinmobile.com

- Save our mobile site to your smart phone for 24/7 access to Melin Tool
- Search Price and Availability
- Check on current orders
- Request a quote
- Search for Tools

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
**CORNER Rounding DOUBLE END MILLS**  
**2 FLUTE**  
Series: BRMG

- Can provide uniform finish on corners
- Made from premium submicron grain carbide

**CHAMFER MILLS - SINGLE & DOUBLE END**  
**2 AND 4 FLUTE**  
Series: CMG2, CMG4, or DMG2

- Available in a 60° or 90°
- Eliminate hand deburring operations & provides uniform finish
- Also available in M7 HSS, Series AM

**BACK CHAMFER TOOLS**  
**MULTIPLE FLUTE**  
Series: BC or BCL

- Used for front and back chamfering of blind holes
- BC - multiple flute milling cutter
- BCL - Single flute lathe tool
- Solid carbide head brazed to carbide shank
- 1/32 flat with 90° included angle
- Long length option available, necked for reach

**CORNER Rounding**  
**3 AND 4 FLUTE**  
Series: RMG or RCMG

- Can provide uniform finish on corners
- Made from premium submicron grain carbide

**DRILL POINT END MILLS - 60° - 82° - 90°**  
*Available in Metric*  
**2 FLUTE**  
Series: AMG-___DP___ or CCMG-___DP___

- Spotting  
- Countersink  
- Chamfering  
- Drilling  
- Side Milling

See page 12 for M42 Cobalt

**CARBIDE BLANKS - CENTER LESS GROUND**  
**PLAIN, HALF ROUND, SQUARE, BALL, CONICAL, & SPLIT BALL**  
Series: Melin EDP’s

- Single and double end available for engraving blanks
- Available in 30°, 60°, and 90°
- Made from premium submicron grain carbide
PM FINE/COARSE PITCH ROUGHING END MILLS
MULTIPLE FLUTE - CENTER CUT
Series: CCFPM

Fine Pitch
> Fine Pitch roughing end mills have a finer sinusoidal form on cutting edge, finer chips are produced compared to coarse
> Provides longer tool life and enable faster SFM than M42 Cobalt
> For use in profiling cuts and shallow slots (less than 1x diameter axial depth)
> Ideal for stainless & exotic materials

Coarse Pitch
> Coarse Pitch roughing end mills have a sinusoidal form on cutting edge, small chips are produced which allow faster feed rates then conventional end mills with reduced
> For use in all heavy cuts and pocketing
> These tools will plunge out

POWDERED METAL VARIABLE HELIX
4 FLUTE - CENTER CUT
Series: VHPM

> Helix changes along flute
> Increased stability during cutting action
> Small corner radius for added strength and smoother cutting action
> Only available nACo coated for improved tool life and increased production output

See page 2 for Solid Carbide

ROUGHIER-FINISHER - TITANIUM CUTTING END MILLS
MULTI FLUTE
Series: CCRFT

> Full eccentric relief with chip breaker designed for heavy removal titanium cutting. Capable of deep slotting and ramping even with 6 FL series
> Geometry designed to reduce cutting pressure and at the same time produce a chip large enough not to recut in deeper pockets
> Available from 1/2” to 2” with choices of radii in stub, regular, medium, long and extended neck lengths
> Thru-hole coolant style, available upon request

POWDERED METAL FINISHING END MILLS
4 FLUTE - CENTER CUT
Series: CCPM

> Available in stub, medium and long lengths
> Reinforced core geometry provides exceptional rigidity
> Up to 4 times diameter length of cut
> Designed for use in Titanium, Stainless, & Exotic materials

FINISHER - TITANIUM CUTTING END MILLS
MULTI FLUTE
Series: CC35

> Titanium focused geometry, increased rake and cutting edge clearance allow for reduced cutting pressure compared to conventional 30° end mills
> Enhanced heat treatment process reduces premature chipping in Gantry cutting situations
> Compliant with NAS 986 T46 & T66 specifications
> Variable flute technology reduces chatter and allows for heavier chip loads in any machining process

AERO-CUT SERIES TITANIUM ROUGHING END MILLS
4 & 6 FLUTE
Series: CCAC4 or CCAC6

> Designed for high volume removal of Titanium Alloy materials
> Unique sinusoidal wave along flute provides ideal chip evacuation
> Enables heavy cuts at high feed rates while eliminating tendency of chip nesting
> Made from M42 Cobalt and provides outstanding tool life
> Available from 3/4” to 2” diameter in standard, long and extra-long lengths

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
FINE PITCH ROUGHING END MILLS - CC & NCC
MULTIPLE FLUTE
Series: CC = CCFP NCC = CFP

> Due to the finer sinusoidal form ground on profile, finer chips are produced than coarse pitch, which are easier flushed away and reduce re-cutting and packing
> For use in profiling cuts & shallow slots (less than 1 time dia axial depth)
> Ideal for Stainless & Exotic materials
> Standard sizes from 3/16 to 2 inch diameter
> All roughers 5/8 and under are only available center cutting

COARSE PITCH ROUGHING END MILLS - CC & NCC
MULTIPLE FLUTE
Series: HSSCO M42 CC= CRFP NON CC = CRP
HSS: NON CC = CR

> For use in all heavy cuts and pocketing applications
> Designed for maximum metal removal rates in Ferrous materials
> Standard sizes from 3/16 to 2 inch diameter
> Available in stub, regular, and long lengths
> All roughers 5/8 and under are only available center cutting

35° HIGH HELIX FINE & COARSE PITCH ROUGHER - CC
3 FLUTE FOR ALUMINUM
Series: EFP or ERP

> Designed for heavy cuts in Aluminum Alloy materials
> Sinusoidal form is ground on the profile
> 35° Helix provides ideal chip evacuation
> Coarse pitch is designed for deep axial profile or slotting cuts
> Fine pitch enables enhanced chip evacuation in shallow slots and ligh to medium profile cuts

FINE PITCH CENTER CUTTING ROUGHING END MILLS
MULTIPLE FLUTE - BALL END
Series: CCFP-___-B

> For use in profiling cuts and shallow slots (less than 1 time diameter axial depth)
> Ideal for Stainless and Exotic materials
> Provides extended tool life in profiling applications

T-SLOT COURSE PITCH ROUGHER
MULTIPLE FLUTE
Series: CRPN

> Used for roughing out “T” slots
> For machining in Steel and Cast iron materials

COMBINATION ROUGHING/FINISHING END MILLS
MULTIPLE FLUTE
*Available in Metric

For Ferrous Materials: Series: NCC = CRFP CC = CCRFP
For Aluminum: Series: CC = CRFP

> Can remove material at high roughing speeds while producing finishes close to conventional end mills, due to the chip-breaker form
> Can produce a 100-125 RMS surface finish in a single pass
> Available in stub, regular, and long lengths
> CRFP - All roughers 5/8 and under are only available center cutting
**GENERAL PURPOSE COBALT & HSS END MILLS**

**SINGLE END - SQUARE, BALL, & CORNER RADIUS**

*Available in Metric*

2 FLUTE

Series: A, AS, AP, A-___-B, or A-___-R0__

- General purpose milling in most materials
- AS- Series has smaller shank for bridgeport style mills
- Standard, stub, medium, long, and extra long lengths
- Standard sizes range from 1/32 to 2-1/2 inch diameter

**SINGLE END - SQUARE & BALL END**

3 FLUTE

Series: E or E-___-B

- General purpose milling in most materials
- 3 flutes usually enable feed rates at least 50% heavier than 2 flute tools
- Standard, stub, medium, & long lengths

**SINGLE END - SQUARE AND BALL END LONG REACH**

2, 3, & 4 FLUTE - CC & NCC

Series: CC: AN, AN-___-B, EN, CCN, or CCN-___-B
NCC: C

- Short flute & extended neck provide maximum rigidity and reduced deflection
- CN series are Non-Center Cut
- 2 and 4 Flute neck diameter reduced by .020 for clearance

**SINGLE END - KEYWAY TOLERANCES**

*Available in Metric*

2 FLUTE

Series: AK

- General purpose milling in most materials
- Used to mill keyways to close tolerance
- Center cutting
- Tolerance = +0.0000/-0.0015

**SINGLE END - SQUARE, BALL, & CORNER RADIUS**

*Available in Metric*

MULTIPLE FLUTE - CC & NCC

Series: CC: CC, CC-___-R__, CCP , or CC-___-B
NCC: C

- General purpose milling in most materials
- CS- Series has undersized shank for bridgeport style mills
- Standard, stub, medium, long, & extra long lengths
- Standard sizes range from 1/32 to 2-1/2 inch diameter

**SINGLE AND DOUBLE MINIATURE END MILLS**

2 & 4 FLUTE - SQUARE & BALL END

Series: SINGLE: A, C,
DOUBLE: B, B-___-B, or D

- General purpose milling in most materials
- 3/16 shank
- Standard sizes range from 1/32 to 1/4 inch

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
PM COBALT ROUGHER-FOR ALUMINUM
3 FLUTE ROUGHER/FINISHER FOR HEAVY CUTS
Series: ERFPM
> Powder metal roughing tool designed for aggressive roughing in aluminum, while still providing a good finish
> Highly polished cutting geometry eliminates material from sticking to cutting edges
> Truncated, ground profile enables optimum chip evacuation
> Unique geometry enables heavy cuts at high feed rates while eliminating tendency of chip nesting
> Recommended coatings are ZrN and TiCN

DOUBLE END - SQUARE & BALL END
2, 3, AND 4 FLUTE
Series: 2F: B, or B-__-B 3F: F, or F-__-B 4F: D or DD-__-B
NON CC: D
> General purpose milling in most materials
> 3 and 4 flute CC and NCC

60° HELIX SINGLE END MILLS
3 FLUTE
Series: E60
> Used in Stainless Steel, Titanium, Inconel, and High Temperature Alloy materials
> High helix increases length of cutting edge which reduces cutting load variation and provides excellent surface finish

40° HELIX ALUMINUM END MILLS - SQUARE & BALL END
2 FLUTE
Series: AA, or AA-__-B
> Used to machine soft materials such as Aluminum, Plastic, or Zinc Alloys.
> High helix provides positive shearing action and rapid chip removal
> Standard, medium, long, and extra long lengths

DOUBLE END - LEFT HAND SPIRAL, LEFT HAND CUT
2 AND 4 FLUTE
Series: XB or XD
> General purpose milling in most materials
> Can be used in profiling, slotting, keyways, and pockets

CORNER Rounding END MILLS
3 AND 4 FLUTE
Series: R, or RC
> Designed to produce a radius between a horizontal and vertical surface
> Tools are formed-relieved which allows the form to be maintained after resharpening
> Cutters with radius 1/32 to 7/16 are M42 cobalt
> Cutters with radius greater/equal to 15/32 are M7 HSS
**DRILL POINT END MILLS - 60°, 82°, 90°, 100°, & 120°**

*2 FLUTE*

Series: A-__-DP__

- Spotting
- Countersink
- Chamfering
- Drilling
- Side Milling

See page 6 for Solid Carbide

**ANGL**E END MILLS - SINGLE OR DOUBLE END

*2 FLUTE*

Series: AM

- Designed for producing chamfers on an edge of any Ferrous or Non-Ferrous Materials
- 5° Helix provides outstanding edge strength
- Available in standard, medium, long and extra long lengths

**MILLING 60° UN THREAD**

*STRAIGHT OR HELICAL FLUTE*

Series: TM-__-__-S or TM-__-__-H

- Helps to save on tooling costs versus using larger taps
- Faster than tapping with higher quality threads
- All tools AlTiN coated for longer tool life

**NC SPOTTING DRILL**

*2 FLUTE - 80°, 90°, & 120°*

Series: HSSCo M42: HSNC

**CARBIDE:** HDRNC

- > 82°, 90° or 120° drill point
- > General purpose milling in most materials.
- > 3 and 4 flute CC and NCC

**MILLING NPT OR NPTF THREADS**

*STRAIGHT OR HELICAL FLUTE*

Series: TM-__-__NPT-S or TM-__-__NPT-H

- Helps to save on tooling costs versus using larger taps
- All tools AlTiN coated for longer tool life

**SINGLE FORM THREAD MILLS**

*MULTIPLE FLUTE*

Series: TM-

- Designed for milling precision I.D. and O.D. threads in all types of Steels, Non-ferrous Metals, and Exotic metals
- Single form thread can be used for a wide range of thread pitches
- Mill diameter 1/4 to 1 inch
- 60° included angle for UN threadmills

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
HIGH PERFORMANCE COOLANT HOLE DRILLS
2 FLUTE
Series: CDR-__-_X

*Available in Metric

> Available in 3x, 5x, 7x diameter drill depths
> For drilling high alloy steel, stainless steel, and cast iron
> 140° self centering point
> nACo coating for greater wear resistance

HIGH PERFORMANCE NON-COOLANT FED DRILLS
2 FLUTE
Series: MDR

*Available in Metric

> Use in high strength ferrous metals such as Tool Steels, Stainless Steel, Titanium, and Nickel Based Alloys
> Accelerated drill performance at standard costs
> nACo coated to enhance performance
> Special edge preparation for better cutting action and longer tool life with 140° included drill point
> Common shank allows for precise and economical tool holding with fewer tool holders

RECONDITIONING SERVICES

Increase your productivity and profitability tenfold!

Proper Reconditioning CAN Make a “World of Difference”

When you choose to use a high performance cutting tool, you want the superior performance given by the new tool to be delivered after it’s reground. You also want to get as many regrinds per tool as possible. While most end users have their tools reground, many find a reduction in performance compared to a new tool. That’s because their service supplier wasn’t able to match the specific geometries of the original tool, or replicate the particular coating it came with. As a result, the user has to “pull back” on cutting parameters on the spindle when the reground tools are run.

To provide our customers with the optimum performance they expect and need, we are making available reconditioning services for selected series of our High Performance drills & end mills. As the original manufacturer, we can in fact, recondition our tools to their original specifications and with our in-house coating facility, we can re-coat them appropriately, with the EXACT coating recipe.

Reconditioning Services Are Now Available For:

High Performance Drills
- Series CDR (2 flute, 140° point, coolant hole style)
- Series MDR (2 flute, 140° point, non-coolant fed style)

High Performance End Mills
- Series VXMG4, VXMG5, VXMG7, & VXMG9 Variable Flute Carbide End Mills
- Series VXMG4--CHP, VXMG5--CHP Variable Flute with chip breakers
- Series AMMG4 (2 flute, aluminum cutters)
- Series AMMG2 & AMMG3 (2 and 3 flute, aluminum cutters)
- Series EKMG (3 flute, aluminum cutters)
- Series EXMG--CHP with chip breakers (3 flute, aluminum cutters)

All Melin Custom Designed Tools
- When we provide a quote on a special tool, if that tool can be reconditioned, we provide a price for doing so and hold that price throughout the life of the tool

By providing this service, our customers find:

- > 20% better performance over tools reground by local tool & cutter grinders
- 2-3 times the number of regrinds per tool, compared with other service sources
- An ability to use consistent cutting parameters to those used with new tools
- Longer tool life per job and throughout the life of the tool
GENERAL PURPOSE CARBIDE DRILLS
3 FLUTE
Series: LDR

*Available in Metric

> 150° point angle
> Made from premium submicron grain carbide
> Available in fractional, letter, & metric sizes

STUB LENGTH CARBIDE DRILLS
2 FLUTE
Series: IDR

*Available in Metric

> General purpose carbide drill
> Stub length drills are 135° notched point
> Made from premium submicron grain carbide
> Available in fractional, letter, wire & metric sizes

SOLID CARBIDE COMBINED DRILL & COUNTERSINK
2 FLUTE
Series: KDR

For centering and spot drilling applications when high accuracy is necessary
Especially suited for difficult to machine materials.
> 60° included angle

See page 17 for HSSCo M42

JOBSITE LENGTH CARBIDE DRILLS
2 FLUTE
Series: HDR

*Available in Metric

> General purpose carbide drill
> Jobber length drills are 118° notched point
> Made from premium submicron grain carbide
> Available in fractional, letter, wire & metric sizes

STRAIGHT FLUTE CARBIDE DRILLS
2 FLUTE
Series: JDR

*Available in Metric

> 140° point used to drill approximately 3 times the diameter depth
> Made from premium submicron grain carbide
> Available in fractional, letter, wire & metric sizes

NC SPOTTING DRILL - CARBIDE & M42 COBALT
Series: CARBIDE: HDRNC
M42 COBALT: HSNC

> Carbide point angles: 60°, 90°, and 120°
> M42 Cobalt point angles: 82°, 90°, and 120°

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
HSSCo M42 & HSS COUNTERSINKS - SINGLE & DOUBLE
ZERO FLUTE
Series: HSSCo M42: HSP0
HSS: H50

- Designed with a radial relieved single edge for fast removal without chatter
- Higher heat & abrasion resistance for use on High-tensile Alloys, Stainless Steel, & other hard to machine abrasive materials

CARBIDE, HSSCo M42 & HSS COUNTERSINKS
1 FLUTE
Series: CARBIDE: C1 HSSCo M42: HSP1 or HSP1-__-T
HSS: H51 or HS1EL

- Available in extended lengths
- Carbide: For highly abrasive & hard to machine materials. Applications in Cast Iron, Alloy Steel, or Glass Reinforced Plastics
- HSSCo M42: Excellent for countersinking Abrasive, High Strength, Heat Resistant, Exotic, & other difficult to machine materials
- HSS: Radial relief ensures smooth, chatter free cutting without overfeeding and makes the tool self-centering

CARBIDE, HSSCo M42 & HSS COUNTERSINKS
3 FLUTE
Series: CARBIDE: C3 HSSCo M42: HSP3 or HSP3-__-T
HSS: H53

- Carbide: For highly abrasive & hard to machine materials. Applications in Cast Iron, Alloy Steel, or Glass Reinforced Plastics
- Radial relief on the angle contributes to smooth, chatter-free operations
- Used for countersinking holes for centers or enlarging existing holes

CENTER REAMER
MULTIPLE FLUTE
Series: HSS: HSCR

- Used for countersinking holes for centers or enlarging existing holes
- Radial relief on the angle contributes to smooth, chatter-free options

CARBIDE & HSS COUNTERSINKS / DRILL POINTS
4 FLUTE
Series: CARBIDE: C4 HSS: HS4, HS4DP, HSMC

- C4: For highly abrasive and hard to machine materials. Eliminates high cost tool changes.
- HS4: 2+2 staggered flute design for smooth, chatter-free cutting, works well in non-ferrous applications such as Aluminium and Plastic
- HS4DP: Drill and countersink with one tool, geometry allows spot drilling & countersinking in one operation.
- HSMC: radial clearance & added shank length for use in turret lathes and screw machine work

CARBIDE, HSSCo M42 & HSS COUNTERSINKS
6 FLUTE
Series: CARBIDE: C6, C6NC HSSCo M42: HSP6
HSS: H56, H56NC, HSM6L

- C6: For highly abrasive and hard to machine materials
- C6NC: Use on CNC & preset machines
- HSp6: Excellent for countersinking difficult to machine materials
- H56: Flutes are staggered to ensure smoother, chatter-free cutting action. H56EL has extended length for hard to reach applications
**COMBINED DRILL AND COUNTERSINK**

**2 FLUTE**

Series: HSS: HSCD

<table>
<thead>
<tr>
<th>Carbide</th>
<th>HSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC1</td>
<td>DHS1</td>
</tr>
<tr>
<td>DC4</td>
<td>DHS4</td>
</tr>
<tr>
<td>DC6</td>
<td>DHS6</td>
</tr>
</tbody>
</table>

- > Economical alternative to single end
- > 60° included angle
- > For centering & spot drill applications when high accuracy is necessary
- > Available in solid carbide & HSS

See page 15 for Solid Carbide

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**DOUBLE END COUNTERSINKS**

**MULTIPLE FLUTE**

Series: CARBIDE: DC1, DC4, or DC6

HSS: DHS1, DHS4, or DHS6

<table>
<thead>
<tr>
<th>Carbide</th>
<th>HSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC1</td>
<td>DHS1</td>
</tr>
<tr>
<td>DC4</td>
<td>DHS4</td>
</tr>
<tr>
<td>DC6</td>
<td>DHS6</td>
</tr>
</tbody>
</table>

- > Standard angle of 60°, 82°, 90°, 100°, 110°, or 120°
- > Economical alternative to single end
- > Available in solid carbide & HSS

---

**DRILL POINT COUNTERSINKS**

**4 FLUTE - DOUBLE END**

Series: CARBIDE: DC4DP HSS: DHS4DP

<table>
<thead>
<tr>
<th>Carbide</th>
<th>HSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC4DP</td>
<td>DHS4DP</td>
</tr>
</tbody>
</table>

- > Standard angle of 60°, 82°, 90°, 100°, 110°, or 120°
- > Drill & Countersink with one tool
- > Economical alternative to single end.
- > Available in solid carbide & M7 HSS

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**COUNTERSINK SETS**

**1 & 6 FLUTE**

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**SOLID CARBIDE BURS**

**DOUBLE CUT**

- SA CYLINDER WITH NO END CUT
- SB CYLINDER WITH END CUT
- SC RADIUS CYLINDER
- SD BALL SHAPE
- SE OVAL SHAPE
- SF TREE SHAPE
- SG POINTED TREE SHAPE
- SH FLAME SHAPE
- SJ OR SK 60° OR 90° INCLUDED CONE SINGLE CUT
- SL 8° OR 14° INCLUDED CONE
- SM POINTED CONE SHAPE
- SN INVERTED CONE SHAPE

* FOR MORE INFORMATION ON OUR COATING & ICONS PLEASE REFER TO PAGE 1
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