

Cuttermaster Professional CM01 Endmill Sharpeners

The worlds most popular end
mill sharpener.

Ends made Easy

Tapered Cup wheel 11V9C 115

How to: Grind End Mill Ends (Center Cutting) CM01 or CM01V

4 inch Tapered Cup Wheel 11V9C Resin Bond

By Jeff Toycen

In this short presentation we explain an easy way to produce a beautiful center cutting end on a basic Cuttermaster using the outside of a plated bond wheel.

We are going to grind the secondary then the primary and produce a center gash

Mount 2.5 inch Spindle extension
Tapered cup wheel 115 11V9C preferred
CBN for HSS and Cobalt Diamond for Carbide

Secondary Grind

Primary Grind

Center Gash

Procedure Summary

Air Spindle Positioning

About the resin bond 11V9C wheel

Keeping Track of Center

Setting and Squaring the tool to the machine

How to check and reset Motor angle (initial set up)

The end

Grinding the Secondary Angle

The Secondary angle is a good place to start.

Work your way around the tool until the end looks uniform and ready to accept a primary grind.

Set the motor to minus 3 degrees



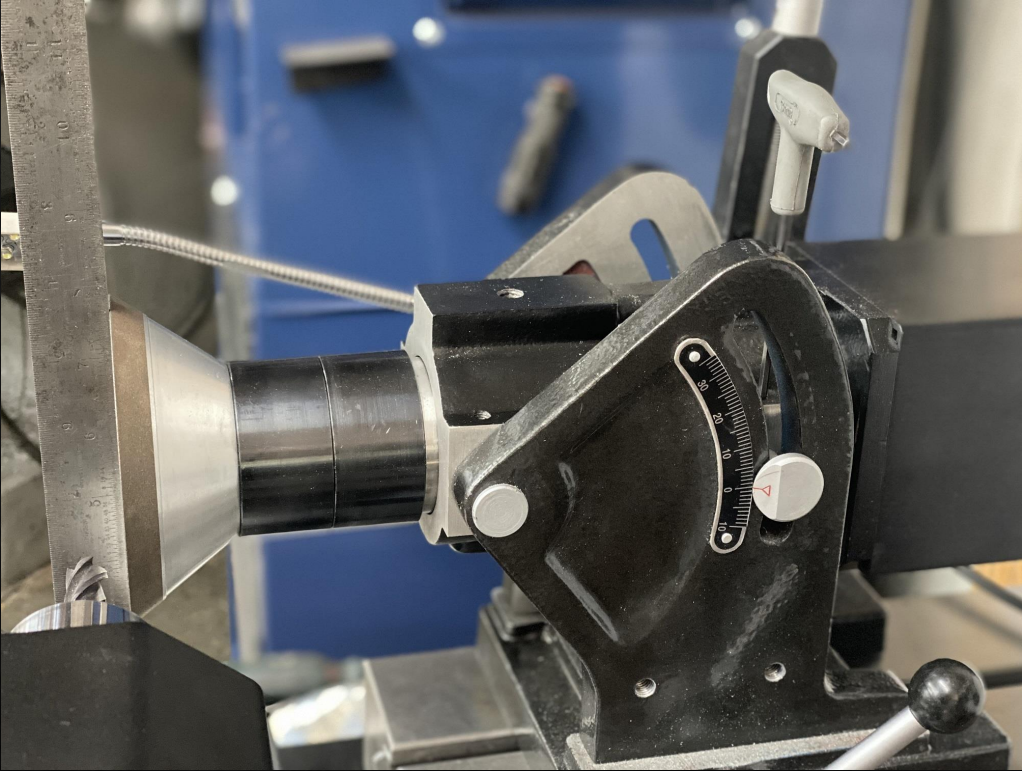
Feed across the tool at a good rpm and an even rate
Stopping just before center.

In this operation is it good stay a few thousands away
from the center .005 .010.

Final center features are done as a last operation.

Grinding the Primary

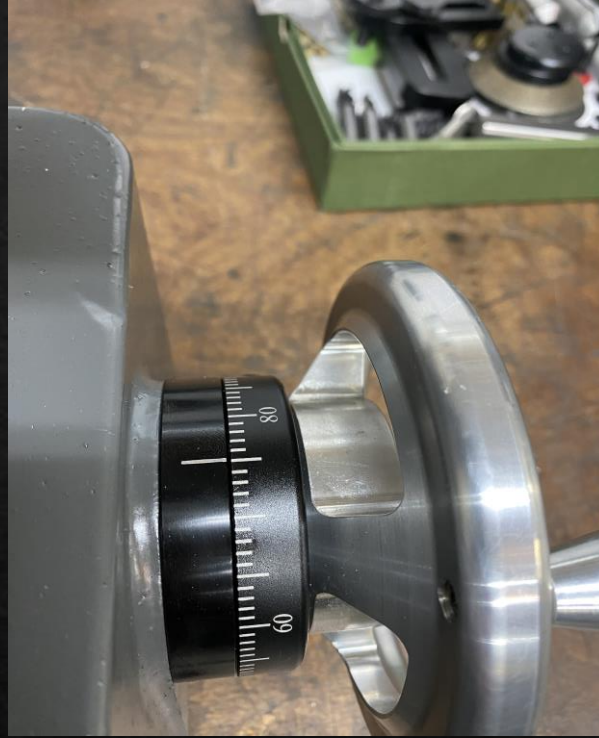
Set the motor to Level (Zero)



Grind the primary angle, watch your indicators. Go as close to center as you can with out taking the tips off the corners



Grinding the Gash Motor to Level (Zero)

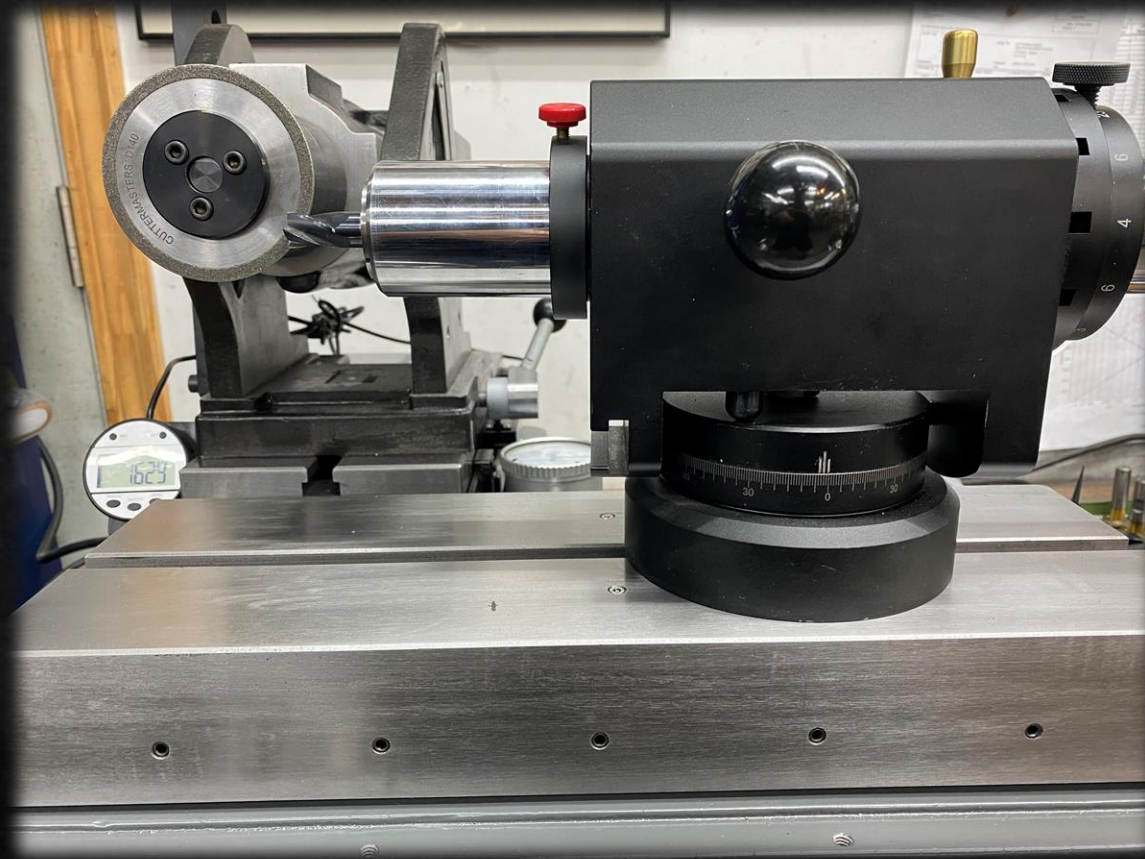


- 1 After you have done the primary, set the X axis handwheel dial to zero (or remember it)
- 2 Feed the grinding wheel in using Y (machine off) until almost touching the flute tip Read the indicator and remember your center. Probably a little less than $\frac{1}{2}$ the tool diameter
- 3 Using X Axis back the tool away from the wheel just far enough that you can index it. Air spindle collars secure.
- 4 Index flutes number 1 and 3 feed in X to .025 back away
- 5 Index flutes number 2 and 4 feed in do not go past zero

Procedure Overview

- ◆ Rotate the air spindle clockwise 2 degrees
- ◆ The wheel Edge (corner) should not be too dull .020 Radius or Chamfer max
- ◆ Check the motor angle with a square to make sure wheel it is level it reads Zero remember where true vertical is. (see the last slide for how to do this)
- ◆ Tool snug in the collet Square to the machine Use a square (the flute tips should be perfectly vertical).
- ◆ Locate and set for center touch off the OD Zero your indicator and machine dial or mark you will be grinding in towards center $\frac{1}{2}$ the tool diameter
- ◆ Secondary angle grind tilt the motor to minus 3 degrees (this is about 19 degrees) , grind secondary grinds all flutes until sharp (feed in using indicator $\frac{1}{2}$ the tool diameter stay off center .01 until finish pass
- ◆ Primary angle grind Tilt the motor to zero (this is about a 8 degree primary, tilt at plus 2 degree is 5 degrees)
- ◆ Gash for center cutting on final primary pass plunge 1 and 3 for center cutting plunge .025 in x axis to produce the gash
- ◆ plunge 2 and 4 not past zero in x
- ◆ Set the motor to level (Zero Degrees) grind primary making sure flutes 1 and 3 almost connect in the center
- ◆ There may be a small protrusion from the .01 wheel rad (don't ruin the flute tips trying to get it)

Tool Spindle / Air Bearing



End mills should cut with the tips of the tool , relief in the center makes this happen
To Produce the Fishtail or dish on the end of the tool rotate 2-3 degrees clockwise
This will create the desired center clearance for your application.

Tapered Cup wheels

Resin Bond Tapered Cup
11V9 compared to a new 11V9C

The original 11V9 was designed in the 30s
it's a good shape but not always best on a
sharpener .

We gave a bit more shape, made it lighter so
it runs better trues up quicker , functions
better for wheel gashing and flutes

Available in 115 - or 125 -mm diameter.
100 120 320 500 grit



Set up and Indicator to keep track of center
This set up will produce an accurate center cutting end on your tool.



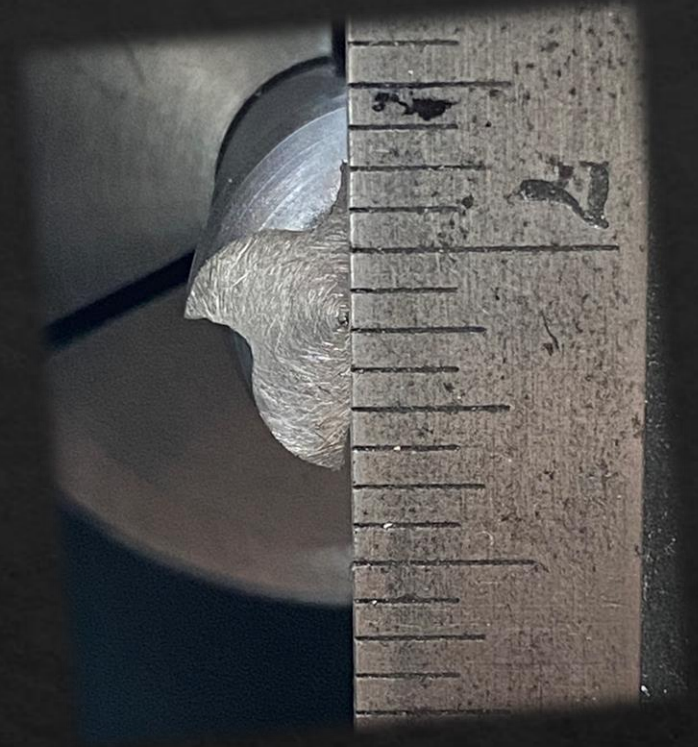
When doing end features, one
needs to keep track of the center
of the tool

This can be done with the Y axis
Dial, Indicator or a DRO is better

Set the tool to the machine - Square

The sharp flute tips are used to determine true vertical or horizontal

It is important to protect the tips through the process



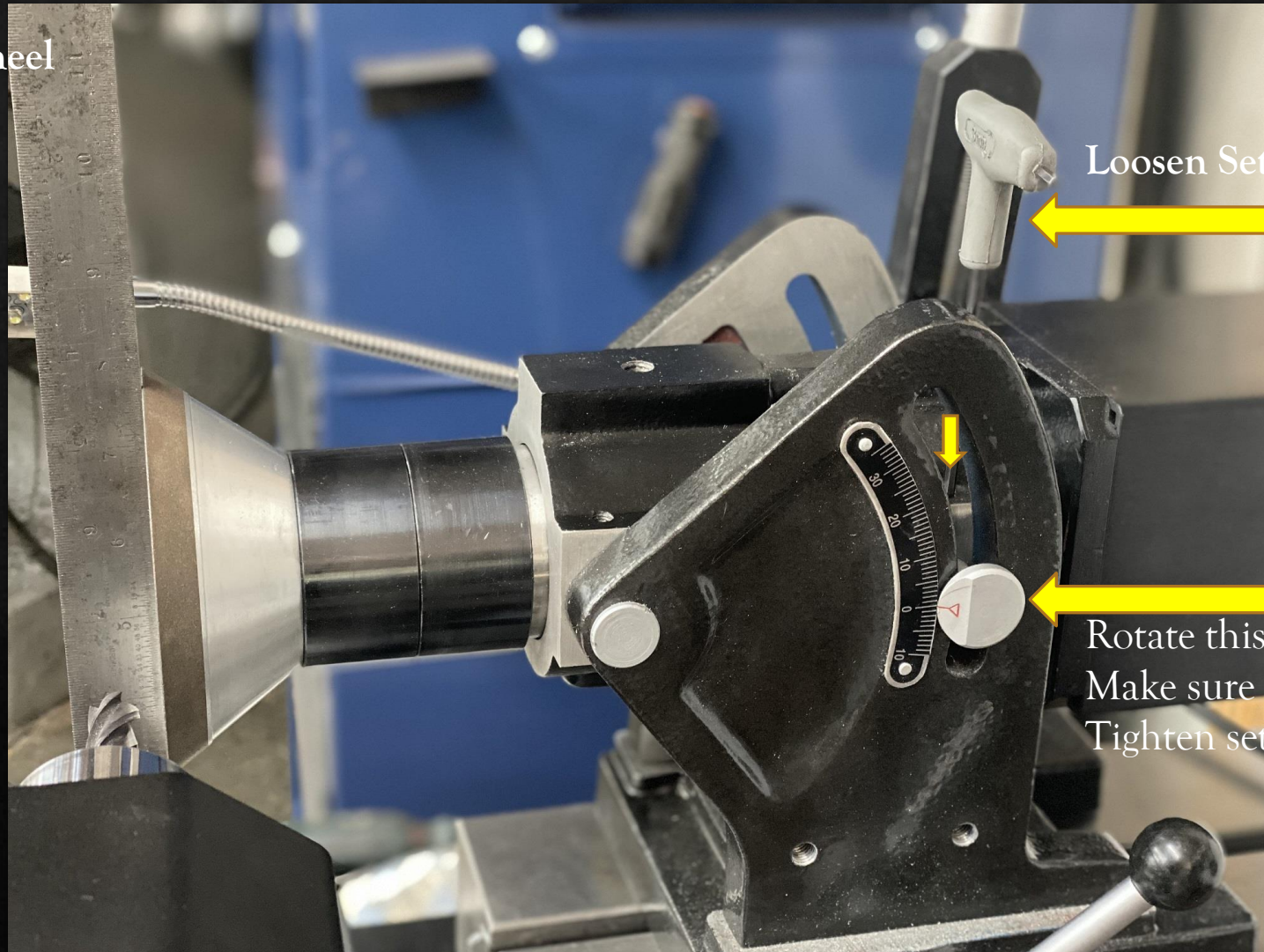
Finding the center

In each operation pick up the outside of the tool to find center when you change motor angle the wheel location will change

Touch the outside set zero, travel in approx $\frac{1}{2}$ the diameter to locate center (always stay away from center .005-.010 until your final passes

Make sure the angle setting is correct before you start

Square the wheel



Loosen Set Screw

Rotate this pin
Make sure this is at 0
Tighten set screw

This only need to
be done once
But it must be
checked

The end ☺

