2.985

feed rate | rough → 0.008" – 0.011"

finishing → 0.003" – 0.005"

Shield – Manufacturing Procedure

WATCH THE VIDEO!

https://youtu.be/3iNqUsG0a0M

1) **Cut a piece of ⌀1.5" ID X ⌀1.75" OD Delrin acetal plastic hollow round bar to a length of 3" on the bandsaw.**
   Tools used: Combination square

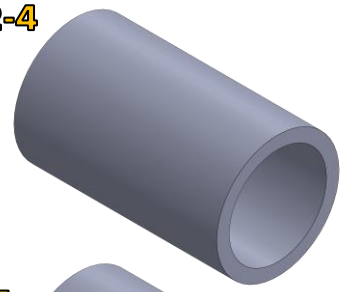
Turning Cut ← Z axis

Facing Cut ↑ X-axis

Lathe Operations:

Mount stock in a 3-jaw chuck on the lathe with 1" stick-out.

#2-4



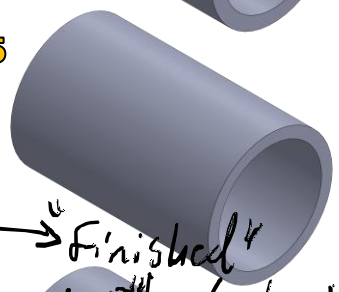
2) **Face one side to clean.** *(7:34)*
   Tools used: 6" rule, HSS turning tool, digital readout

Flip part around and remount with 1" stick-out.

3) **Face opposite side to clean.** *(8:01)*
   Tools used: 6" rule, HSS turning tool, digital readout

Remove part, measure length with dial caliper, remount with 1" stick-out.

#5



4) **Face to 2.88" overall length.** *(8:25)* Face from 3 → 2.88
   Tools used: 6" rule, HSS turning tool, digital readout, dial caliper

X

5) **Bore inside diameter to ⌀.003-.010" clearance fit to OD of tube component.** *(9:16)*
   Tools used: 5/8" boring bar with CCGX-3(2.5)1 (or -2) carbide insert, digital readout, dial caliper

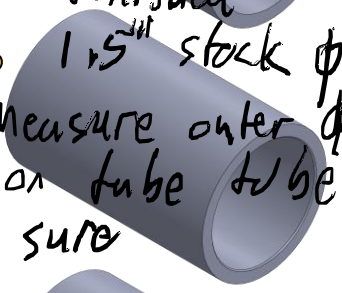
→ Finished

Shield → ID ≈ 1.485 / 1.483?

O

6) **Break inside edge .015" max.** *(11:57)*
   Tools used: HSS chamfering tool, digital readout

#6



1.5" stock ⌀

Measure outer ⌀ of tube to be sure

C

7) **Cut .1" X 45° external chamfer. Cut approx. .010" deeper to account for clean-up cut on OD in final step.** *(12:03)*
   Tools used: HSS chamfering tool, digital readout

1.468 ~~1.473~~

Milling Machine Operations:

Install @ 60° 1.480

#7

1.484

1.487 – 1.494

Install indexing head on table and ensure it is properly aligned to the table travel. Mount part in chuck with OD in jaws and with 1" stick-out.

8) **Using edgefinder, touch both sides of part OD to find center and then touch end of part to find edge.** *(13:46)*
   Tools used: Edgefinder, drill chuck, digital readout

≤ 1000 RPM

9) **Position spindle .375" from end of part.** *(15:49)*
   Tools used: Digital readout

#10

10) **Spot ⌀.150" hole.** *(15:58)*
    Tools used: #3 HSS center drill, drill chuck, digital readout

600 – 1000 RPM

11) **Drill ⌀.150" hole.** *(16:04)*
    Tools used: #25 HSS drill, drill chuck, digital readout

3200 RPM

#11

Index part 120 degrees and repeat steps 10 & 11. Then index part another 120 degrees and repeat steps 10 & 11 one more time.

X → 2133 RPM (≈1500 ish)

C → 457 RPM O → 229 RPM

480 RPM

12) **Countersink all three ⌀.150" holes – indexing 120 degrees each time. Cut approx. .010" deeper to account for clean-up cut on OD in final step. Set quill stop or Z axis digital readout for consistent depth.** *(16:45)*
Tools used: 1/2" X ***100°*** HSS countersink, drill chuck, digital readout

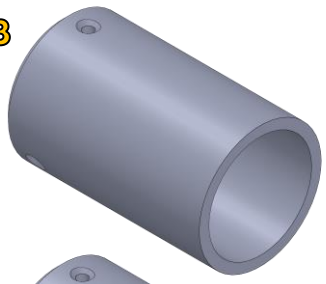
#12

Lathe Operations: No threaded holes → no tapping

Mount shield on tube component. Mount tube in 3-jaw chuck on the lathe with minimal stick-out. *Use copper shims between tube and chuck jaws to protect machined surfaces.*

13) **Turn ⌀1.75" stock OD MINIMUM to 100% clean surface.** *(19:37)* 457 RPM
Tools used: HSS turning tool, digital readout

#13



14) **Break inside and outside edges .015" max.** *(22:06)* 229 RPM
Tools used: HSS chamfering tool, digital readout

#14

D. 900"