**Here’s are input conditions, from PR’s, drawings, as-founds, e-mails:**

* Schneedle
  + JLAB dwg 200-3000-0219
  + Dimameter 0.742” to 0.744”
* Moly Puck
  + JLAB dwg JL0047248
  + Keith uses drawing as-is
* Indium Foil
  + PR = <https://misportal.jlab.org/reqs/prs/293572#ShowItemsTab>
  + Thickness from PR = 0.002”
  + Keith used thickness = 0.001”
* Wafer (micron)
  + AXT (from PR) = 625 +/- 25
  + SVT (spec) = 625
  + UCSB = 625
  + RIT = 350
  + Keith uses 650 um = 0.026”
* Tantalum cup
  + Drawing JLAB dwg 32709 indicates 0.005” thick
  + Keith uses as-found measurement says 0.004” thick

**Keith created a 3d model of the stackup of a photocathode on a puck with a schneedle with highlighted values above.**

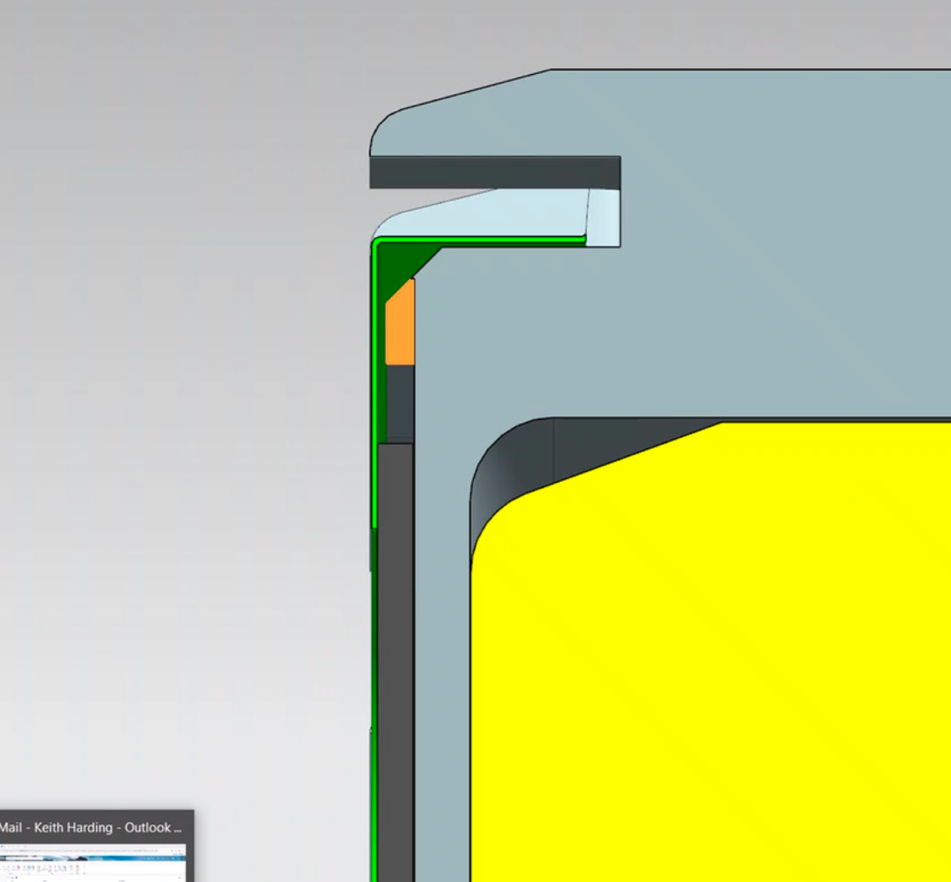
The distance from left face of Ta cup (green) to Puck crown is 0.001”

* Ideally, we’d like this to be close to zero, so pretty close
  + If puck 600 um => gap = 0.003”
  + If puck 625 um => gap = 0.002”
  + If puck 650 um => gap = 0.001”

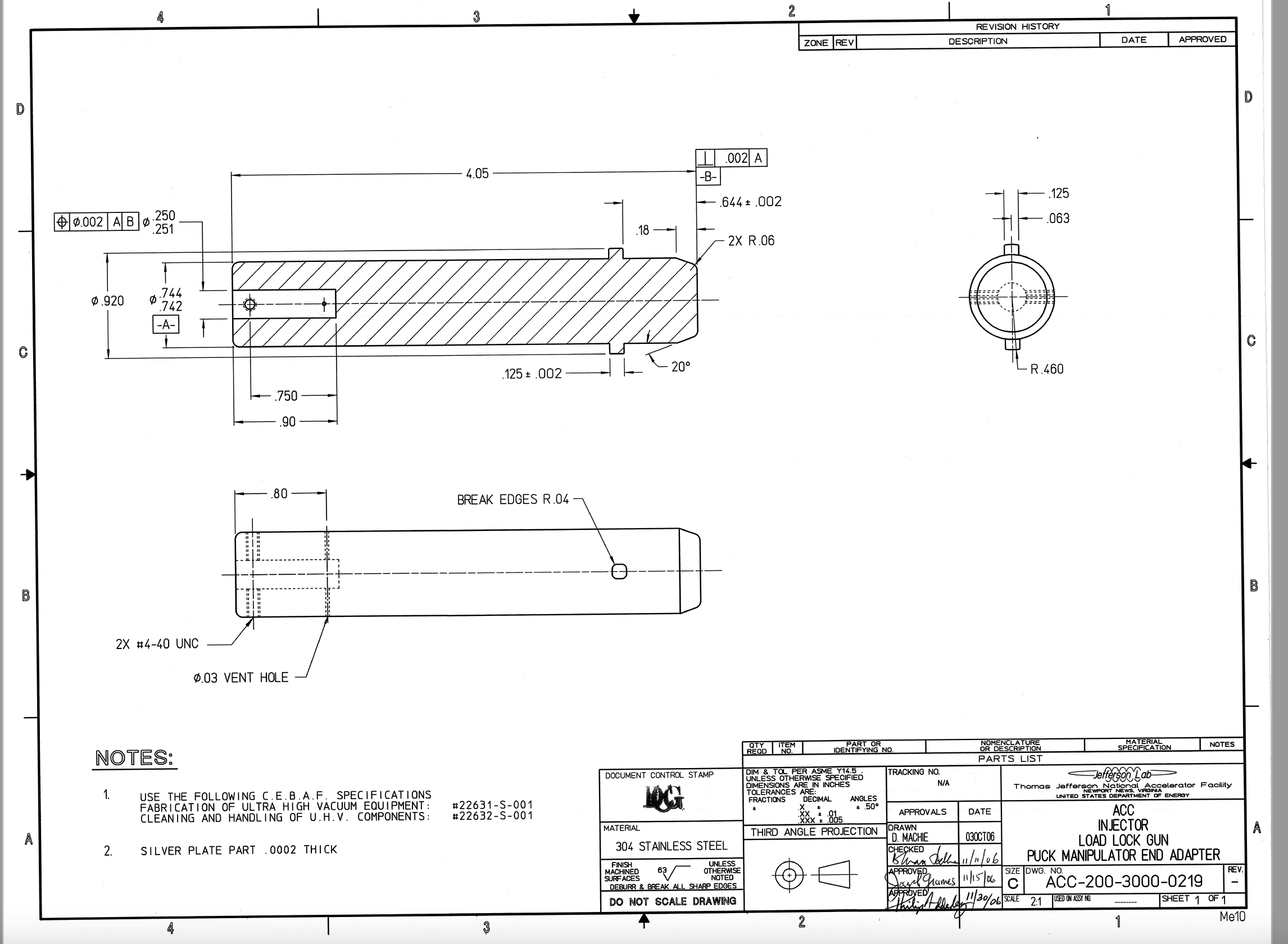
The distance from right face of Ta cup (green) to Puck (orange) is 0.0066” = 168 um, which is greater than any of the stack-up tolerances

* Our wafers sit proud of the orange piece, although too high and this can lead to cracking the wafer.
* Do we recall the design goal?:
* My intuition says make that gap as short as possible given tolerances

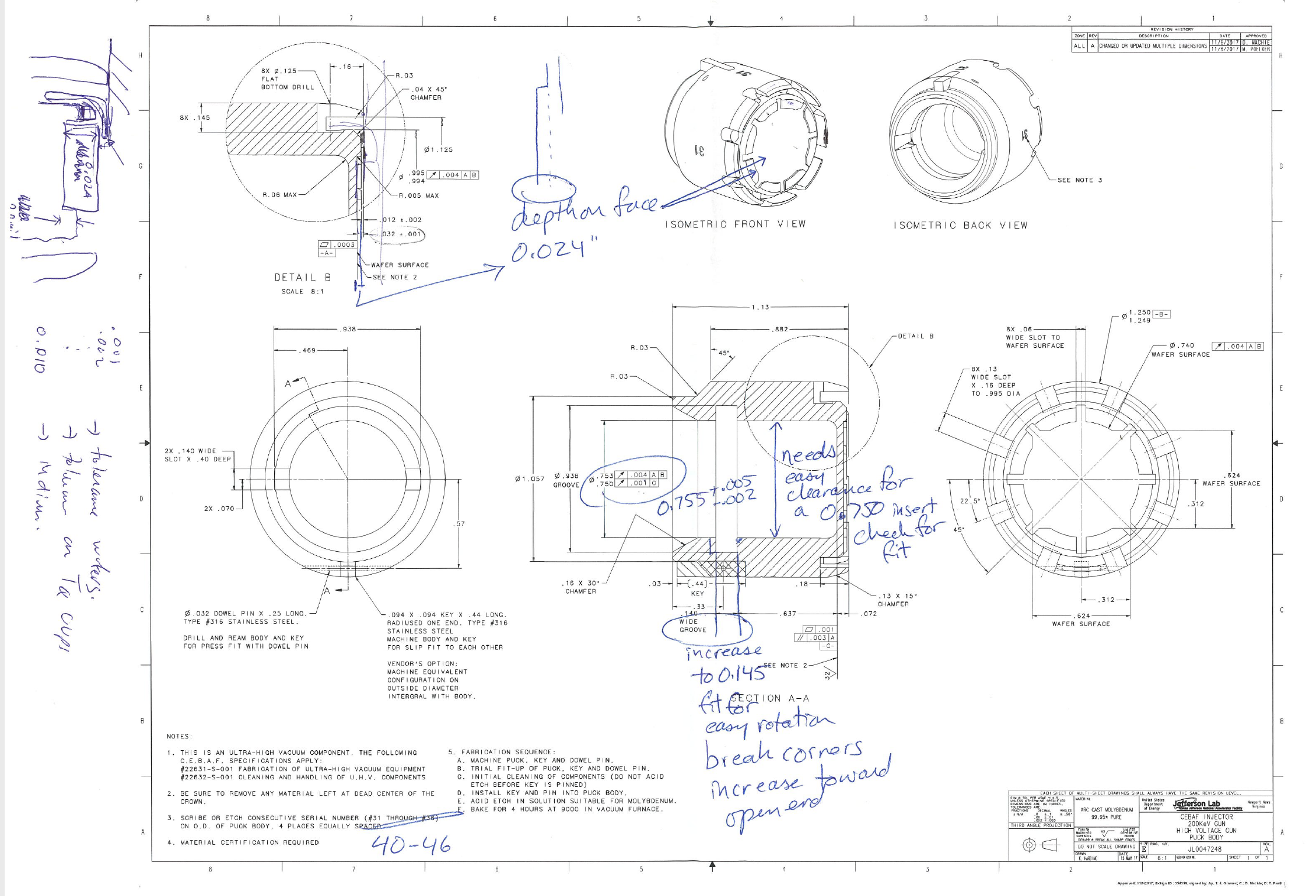
Finally, we should have a design for a “625” and “350” micron thick.

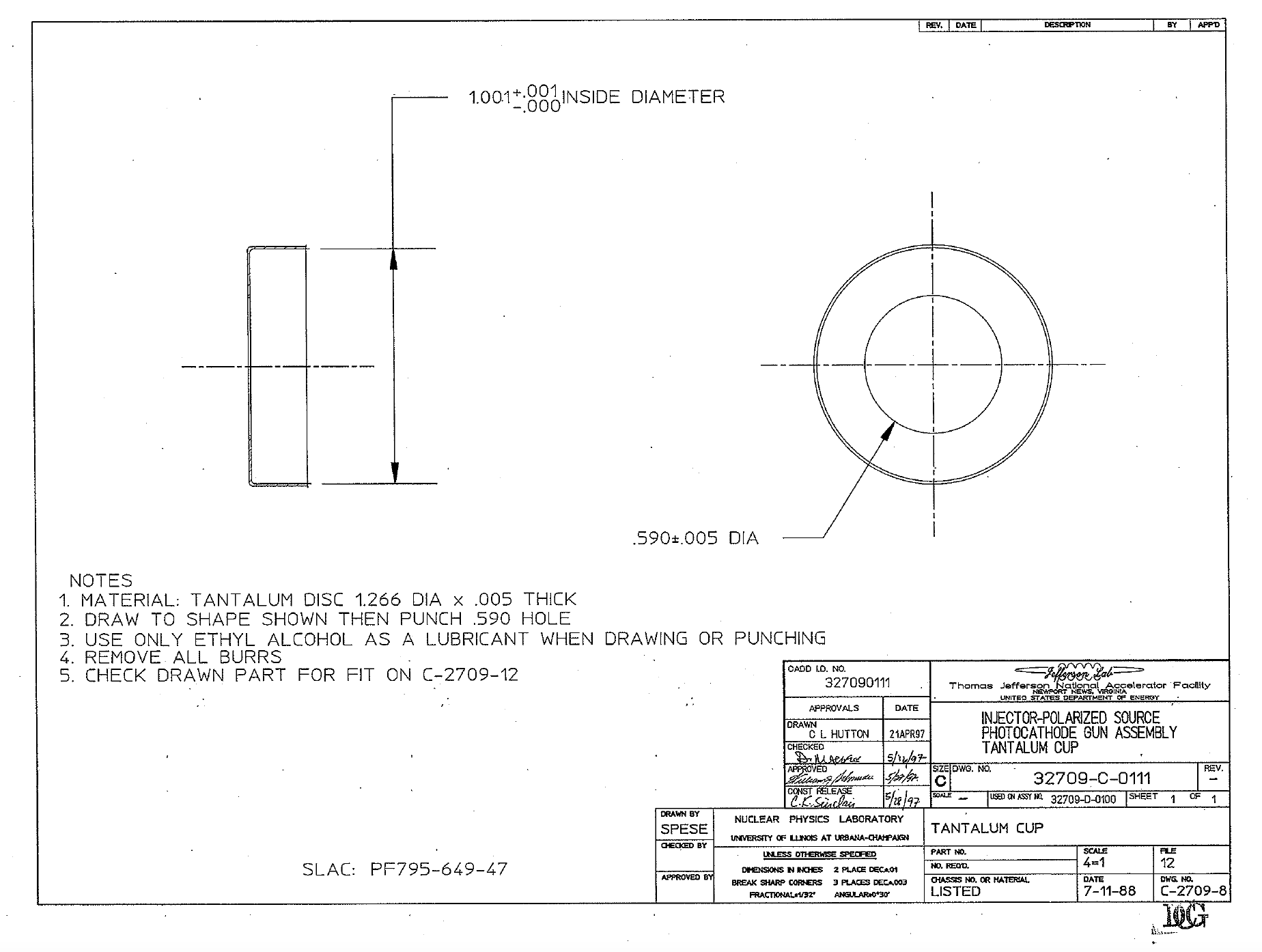


Schneedle



Marcy’s mark-up of Moly puck dwg



Tantalum cup print

CIS-TN-18-01

March 1, 2018



FABRICATION OF MOLYBDENUM PUCK BODY

CIS

Jefferson Lab

This note summarizes the steps for fabricating the molybdenum “PUCK BODY” as described in drawing JL0047248.

1. Machine and Assembly Steps
   1. Machine puck, key and dowel pin
   2. Trial fit-up of puck, key and dowel pin
   3. Initial cleaning of components with micro and acetone rinse (do not acid etch before key is pinned)
   4. Install key and pin into puck body
2. Acid Etch Steps
   1. Remove indium if needed (isopropyl + indium ball to get indium off)
   2. Moly Etch Aqua Regalis (1:3 HCl:Nitric), 10 seconds, rinse, check surface, repeat for 10 more seconds if needed, rinse, check surface
   3. Ultrasonic cleaning in DI water after (USC twice to ensure removal of acid from around ear)
   4. Rinse, air dry in hood, bag for heat treatment
3. Vacuum Bake Steps
   1. Use a vacuum oven to degas puck.
   2. Use a ramp rate of 10-15 degrees Celsius per minute.
   3. Ramp to 900 degrees Celsius.
   4. Soak for 120 minutes, recording pressure every 30 minutes.
   5. Ramp and cool to room temperature
   6. Bag puck, if possible in GN2.