

R/O SURFACE POLISHING AND ETCHING PROCEDURE

1. Blanchard grind the parts leaving 0.025 inch over finish size on the thickness of the blank.
2. Etch the entire piece in 5-7% hydrofluoric acid for 10 minutes.
3. Block, and then lap grind off 0.011" or until blanchard marks are removed. If an especially coarse blanchard wheel has been used, more stock may need to be left on the part so that all marks can be removed with 0.010 lapping.
4. Pitch polish this first surface flat to 1/10 fringe.
5. After cleaning, make a small but visible mark (about 1/4" long) on the edge of this surface with a fine stoning stick--not a diamond marker--so this surface can be identified after the part is edged in later operations.
6. Contact the parts on the contacting flat and lap grind the thickness of 0.004-0.005" over finish thickness and make parts as parallel as possible by grinding. No blanchard or other marks should be visible in the 9-micron grind.
7. Pitch polish the parts flat and parallel to specification.
8. Protect the contact plate with asphalt paint or beeswax and expose the polished surfaces to HF fumes. The best way to do this is to place the block in a box or tank (approx 4 cubic ft.). Then put a bottle of HF (as purchased) in the box with the block and remove the bottle stopper for 10 minutes with the tank closed. Then replace the bottle stopper and retrieve the block.
9. Inspect the polished surfaces for scratches or other defects.
10. Return the block to pitch polishing for approximately 1/2 hour which should remove any blemishes and leave a good optical polish. If the surface looks good, return the block to the etch procedure except etch for only five minutes and no scratches should be visible. Return the block to polishing.
11. Polish for approximately 1/2 hour, check flatness and parallelism and if surface is good, remove the part from the contact block and carefully clean, inspect, and package the blank.
12. *Stanford* must then inspect and approve the proper surface (the unmarked surface) and send the parts to *Speedring* for their cavitron, spherical hand lapping, edging, and dowel operations. *Speedring* must be notified that the surface without the mark is the one they put the cavity into. *Stanford* must put on the water resistant readout loop protection before tumble lapping. Be sure to use the proper "jig holes" for locating the mask.