



**PROCESS SPECIFICATION**

TITLE

**Large Optics and COC's Cleaning Procedures**

APPROVALS:	DATE	REV	DCN NO	BY	CHK	DCC	DATE
DRAWN: H.Armandula	12-15-00	C	E000555-00-D	BW	HA		12/15/00
CHECKED: D.Cook	12-15-00						
APPROVED: D.Coyne	12-15-00						
DCC RELEASE:							

**Equipment, Tools and Materials**

- Class 100 laminar flow bench / sink
- Deionized water, 18 Megohms, filtered (0.2 micron filter) at point of use.
- Dry nitrogen cylinder, 99.99% pure
- Ionizing blow-off gun with 0.2 micron filter.
- Cleaning pan (All Stainless Steel roasting pan with handles)
  - A ceramic bowl will also do, however the following procedure will probably have to be adapted if the bowl cannot be directly set on the hot plate.
- PFA 440 Holding fixture (D000256-00-W Part A and D000257-00-W Part B)
- Inspecting fixture
- Hot plate
- Particle free wipes Fastorb 820, Berkshire
- Ansell-Edmont Latex 90-576 Gloves
- Lens tissue "Lens 90", Berkshire
- Storage Optic Holder
- Liquinox solution prepared as follows:
  - To 2 liters of filtered DI water; add 40 ml. of Liquinox detergent.
  - Place beaker on a hot plate.
  - While stirring the solution, increase temperature to 70 degrees C;
  - Once the temperature is reached, keep stirring for at least 15 minutes.
  - Remove from hot plate - Solution is ready to use.
  - Life shelf of the solution is one week while covered.

**Washing and Drying - Coated surfaces 1 and 2 -**

All procedures listed under these Cleaning Procedures must be performed under a Class 100 laminar flow bench, while suited-up in clean room garments including, but not limited to: frock, over-shoe covers, bouffant cap, gloves, facial mask. This applies to anyone handling or near any optics being cleaned.

Clean one coated mirror surface at a time.

1. To clean the upper surface, set the optic into the bottom half of the PFA 440 ring fixture with the HR surface down. Place the other half of the fixture onto the top surface of the optic and screw down the clamping knobs so that the optic is "sandwiched" between the two halves of the fixture. Set the cleaning pan onto the hot plate. Make sure that the bottom of the pan will get uniform heating. Place the optic in the cleaning pan.



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2. Fill the cleaning pan with hot (70 degrees C) Liquinox solution.
3. Set the hot plate temperature controller to keep the water temperature in the pan at 70 deg. C. for an hour or so.
4. Turn the temperature controller off and let the water in the pan cool down to about 40 deg. C.
5. Remove the optic from the pan.
6. Rest the optic on its side on the edges of the holding fixture with the soapy HR surface facing the sink for drain-off. Immediately spray the mirror surface with running DI water taking care no to wet the edge of the mirror.

**Never allow any surface wetted with Liquinox to get dry!!!!**

7. With a fresh tissue, wetted with Liquinox solution, thoroughly and gently, with smooth, soft strokes, scrub the entire mirror surface. Discard tissue.
8. Immediately rinse the mirror under running DI water, gently scrubbing all surfaces with a soft lens tissue. Repeat the above step at least twice using a fresh tissue every time.
9. To final rinse, spray only deionized water over the mirror being cleaned for at **least** 10 seconds. Stop the DI water flow.

*NOTE: If the water does not sheet off the mirror's surface at this time, repeat steps 2 through 9.*

10. Place the holding fixture/mirror resting on its edge over a stack of soft lens tissue (Lens 90).
11. With the ionizing gun, utilizing pure, dry nitrogen and low pressure, (45-50 lbs./in<sup>2</sup>) slowly blow the optic surface starting from the top and working towards the bottom. Ensure that no water remains on the surface.
12. Place the optic on the inspecting fixture with the cleaned surface facing up. Inspect the mirror in a dark room with a high intensity lamp.
13. Repeat all of the above steps on the other surface of the optic. Take care not to get ANY water on the clean surface that is now exposed as the face up side.
14. Once both surfaces are cleaned and inspected, thoroughly clean the edges with isopropyl alcohol and acetone. Place the mirrors in their appropriate holders. Keep in a clean area until ready to use.

NOTE: Always ensure that the surface not being cleaned remains dry!