



PROCESS SPECIFICATION

TITLE
Cleaning Procedures for LIGO Optics Other Than Core or IO optics

APPROVALS:	DATE	REV	DCN NO	BY	CHK	DCC	DATE
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Scope:

These cleaning procedures are applicable for all LIGO optics other than the ion-beam coated **core** or **IO** optics.

Note:

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: coat, booties, bonnet, gloves, facial mask. This applies to anyone handling or near any optics being cleaned.

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.
- Berkshire Lenx 90 tissue
- Hot plate
- Ansell Edmont Latex gloves, AccuTech Ultra Clean 91-300
- Liquinox solution prepared as follows:
 To1 liter of filtered DI water; add 10 ml.of Liquinox detergent.
 Place beaker on a hot plate.
 While stirring the solution, increase temperature to 40 degrees C; once the temperature is reached, keep stirring for at least 5 minutes.
 Remove from hot plate - Solution is ready to use.
 Life shelf of the solution is one week while covered.

E-Beam Coated Optics (HR and AR)

If the optics were in close contact with plastic materials, like stored in a plastic container or wrapped with bubble wrap, include, in the cleaning process, steps 1 thorough 3.
 If the optics have not been in close contact with plastic materials, start the cleaning process at step 4.

1. Place parts in a suitable container lined with Lenx 90 tissue.
2. Soak the part in isopropyl alcohol for 10 minutes, agitating regularly.
3. Blow off with dry filtered nitrogen.
4. Rinse optic under running DI water.
5. Clean coated mirrors with Liquinox solution.
6. Thoroughly wet a Lenx 90 tissue with the Liquinox solution.
7. Gently wipe the optic's surface and the edges.



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Repeat this step at least 2 times using a fresh tissue every time.

8. Rinse under running DI water while gently wiping the surface to remove traces of detergent.
9. Allow DI water alone to run on the surface for 10 seconds.
10. Dry by blowing downwards with dry, filtered nitrogen.
11. Inspect optics for streaks. If streaks are observed, wipe them off with Lenx 90 tissue wetted with isopropyl alcohol.

Black glass (coated)

Clean with warm Liquinox solution following steps 4 thorough 11 above.

Silver coated optics

Clean following steps 4 thorough 11.

Calcite prisms

Calcite is a very soft material and scratches easily.

To clean:

1. Blow off optic with dry filtered nitrogen.
2. Cut several pieces of 2"x 2" Lenx 90 tissue.
3. Place a drop of methanol on the center of the tissue.
4. Place the wet portion of the lens tissue on the prism's surface and slowly drag across.
5. Repeat at least 2 times on each surface.
6. Inspect for streaks. If streaks are present, repeat process with a clean tissue every time.