



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: frock, 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 Ultra High Purity nitrogen cylinder, 99.99% pure
- Spectroscopic grade methanol
- Ionizing blow-off gun with 0.2 micron filter.
- TX1010 border sealed Alpha wipes
- Hot plate
- Ansell Edmont Latex gloves, AccuTech Ultra Clean 91-300
- Liquinox solution prepared as follows:
  - 1 liter of filtered DI water
  - 10 ml.of Liquinox detergent(for a 1% Liquinox solution)

**Procedure**

Place beaker on hotplate. While stirring the solution increase the temperature to 35-40 degrees Celsius. Use a magnetic chemical stirrer if possible, it mixes the solution very well. Once mixture is well mixed (5-10 minutes at 35-40 degrees C) remove the solution from the hotplate.

Use a fresh liquinox solution every time you clean an optic.

If the optics were in close contact with plastic materials for long periods of time you can soak the optic in spectroscopic isopropyl alcohol for 10 minutes then blow dry with UHP nitrogen.

**Liquinox Cleaning Steps:**

1. Thoroughly wet an Alpha wipe with the Liquinox solution.
2. Gently wipe the optic's surface and the edges. Take great care NOT to let the liquinox solution dry on the optic. It will be very difficult to get off once dry. If it looks like it is starting to dry add some DI water to the surface. You can keep a low flow of DI water going in the sink for this reason. Repeat this step at least 2 times using a fresh wipe every time.



## PROCESS SPECIFICATION

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### Cleaning Procedures for LIGO Optics Other Than Core or IO Optics

3. Rinse under running DI water while gently wiping the surface to remove traces of detergent.
4. Allow DI water alone to run on the surface for at least 10 seconds. If there is still liquinox on the optic you will feel it, it feels very slippery.
5. Spray spectroscopic methanol all over the optic to drive off the water.
6. Dry by blowing downwards with dry, filtered UHP nitrogen.
7. Inspect optics for streaks. If streaks are observed, drag wipe with a clean wipe and methanol.

Both coated black glass and silver coated optics can be cleaned using this procedure.

