



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:

This cleaning procedure is applicable for all LIGO optics other than **Core** or **Input** 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

Pour Liquinox and DI water into a clean Pyrex beaker, using enough of each to create a 1% solution. Mix well with a clean stir rod or equivalent until the solution looks homogeneous by eye, takes 1-2 minutes of mixing. Mix a fresh liquinox solution every time you clean an optic.

If the optics are very dirty or were stored long term in plastic materials that are known to outgass you can soak the optic in spectroscopic isopropyl alcohol for 10 minutes then blow dry with UHP nitrogen before the Liquinox cleaning.

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. Keep a low flow of DI water going in the sink, and keep the optic under the flow of water at any time you are not wiping with Liquinox. Repeat this step at least 2 times using a fresh wipe every time.



PROCESS SPECIFICATION

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3. Rinse under running DI water while gently wiping the surface with a new wipe to remove traces of detergent. Also rinse and check your gloves for 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. Dry for at least a minute.
7. Inspect optics for streaks. If streaks are observed, drag wipe with methanol and blow dry again.

NOTE: It is very useful to have a bright light source during steps 3-7 of this procedure; you will be able to see any streaks caused by liquinox, water, or methanol left on the surface and correct for them.

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

