

**Liquinox Cleaning Procedure for aLIGO optics****AUTHOR: Phelps, M.****DATE:01/11/12****Document Change Notice, Release or Approval**

see LIGO DCC record Status

**1 Objective**

This cleaning procedure is applicable to all LIGO optics that have ground glass barrels. This procedure must be performed in a cleanroom while suited up in cleanroom garb (a minimum of boot covers, frock, bouffant cap, facemask, cleanroom gloves).

**2 Applicable Documents**

E1000128 First Contact FTIR, 2010

E1100439 General Optics Cleaning Procedure

E1200010 FTIR Results of Liquinox Cleaning Procedure

**3 Materials**

DI water source

Spectroscopic grade methanol and isopropanol

Ansell Edmont Latex gloves, AccuTech Ultra Clean 91-300

Liquinox

Ion gun AND filter, Terra Universal Part#2005-55 or equivalent

Dry UHP nitrogen cylinder for use with ion gun

Lint-free Berkshire lenswipes, 9''x9''. VWR part number 52847-150

**4 Procedure**

1. Making the Liquinox solution: Make a new solution each time optics are cleaned, base the quantity of solution made on how many optics you have to clean. Assume 500mL is made. Fill a clean glass beaker with DI water and enough Liquinox to make a 1% Liquinox solution.
2. Set optic into an empty clean glass beaker.
3. Cover all ground glass surfaces with isopropanol.
4. Let soak for a minimum of 10 minutes.
5. Gently lift optic out of IPA, transfer to sink and drive off the IPA with DI water.
6. Keep DI water source running at all times.
7. Thoroughly wet a lens tissue with the Liquinox solution.
8. Scrub the ground glass barrel with the lens tissue. Take great care NOT to let the liquinox solution dry on the optical surfaces. It will be very difficult to get off once dry. If it looks like it is starting to dry put it under the water source.



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9. 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 lens tissue every time, for a total of three wipes.
10. Rinse under running DI water while gently wiping the surface with a new lens tissue to remove traces of detergent. Also rinse and check your gloves for detergent.
11. 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.
12. Spray spectroscopic methanol all over the optic to drive off the water.
13. Dry by blowing downwards with dry, filtered UHP nitrogen. Dry for at least a minute.
14. 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. Use a barlight or an LED flashlight.