

Instructions for taking Low Volatility Residue (LVR) Wipe Samples

AUTHOR(S)	DATE	Document Change Notice, Release or Approval
Dennis Coyne, edited by Calum Torrie	10/9/2017	9 th Oct 2017
		see LIGO DCC record Status

1 Scope

The following procedure is for taking FTIR wipe samples for surfaces and holes of parts to be used in the LIGO UHV system. FTIR testing is subsequently performed in accordance with specification LIGO-[E0900480](#). Note that surface sampling methods other than wiping are permitted by LIGO-[E0900480](#).

2 Abbreviations and Acronyms

FTIR Fourier Transform Infrared Transmission
UHV Ultra-High Vacuum

3 Materials/Tools Required

An FTIR sampling kit consisting of: Small vials of solvent (usually now Hexanes and not Freon-TF as before) with solvent soaked fiber-free lens tissue (which has been cleaned by chemical extraction)

4 Procedure

- Work in a ventilated area e.g. in a clean-room with vertical downward flow, on a laminar flow bench with a horizontal flow, or within a fume hood. For clean rooms and laminar flow benches, one should consider the ventilation of the surrounding area, the volume of the sampling being acquired and add (if needed) a portable fume hood system e.g. a Sentry Air portable fume extractor (ss-300) with both HEPA and Carbon filters. The addition of the portable fume extractor is warranted if the surrounding area is small, has workers without respirators and the volume of sampling will be high, so that strong fumes can be detected in the surrounding area.
- Wear a respirator. Users should be fitted with either 1) 3M 6100/07024 respirator with replacement filter cartridges 3M 60923 (Organic Vapors & Acid gas) or 2) 3M 6200 respirator with replacement filter cartridges 3M 6001 (Organic Vapors). Note - The 6100 and 6200 respirators can accept the same filters. For low volume sampling (≤ 10 samples) users can use a 3M Particulate Respirator 8247 instead.
- Refer to MSDS on the solvent used for the FTIR samples. For hexane the MSDS sheet is available at [LIGO-E1700337](#).
- Wear Nitrile (Preferred) or latex gloves
- Open the cap of the bottle containing the moist wipe and place it where it cannot be contaminated. Using the forceps remove the wipe sample from the bottle. Move the wiper across the surface in a raster pattern slow enough so that the solvent dries at the same rate as the motion. The wiper should be moist but not dripping with solvent. A minimum surface area of 4" x 4" is required. The maximum sampled surface area is ~ 600 in² (e.g. 15" x 40"). Use 2 or 3 passes over the surface area. Dip the wipe back into the solvent in the bottle as needed to keep it moist. (Having a ruler is helpful. The more accurate the area, the more accurate the test results.)
- Sample holes separately from surface areas. A minimum of 5 holes is required for sampling. A maximum of 50 holes may be sampled. Use 2 or 3 passes into each hole. Dip the wipe back into the solvent in the bottle as needed to keep it moist.
- Place the wipe back into the bottle from which it was removed and close the cap tightly.
- Mark the bottle with the sample location. Indicate the area of the sample you took, or the number of holes sampled. If the area is restricted to less than 4" x 4", then the analytical method is more complex and this should be noted.
- Use the sample form, [F1000003](#), to record the metadata associated with the sample.
- Using the rinse bottle, rinse the forceps prior to taking your next sample.



Instructions for taking Low Volatility Residue (LVR) Wipe Samples

Important: Do not handle the wipes with your hands. Do not touch the forceps ends with your bare hands or gloves. Be sure that when you lay down the tweezers that you do not contaminate them from another source. It is a good idea to have some Ultra-High Vacuum (UHV) grade aluminum foil (not food grade foil) available on which you can place your tweezers and sample bottle cap.