

JPL ANALYTICAL CHEMISTRY LABORATORY*Chemical Analysis and Materials Research Group, 3530***K084**

To: Helena Armandula **04/24/2000**
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Subject: Low Volatility Residue LVR Analysis

Purpose:

Mylar film and clean room swabs were analyzed for plasticizer or other non-particulate additives that could transfer to contamination sensitive hardware. In addition, a beveled optical part was submitted for surface residue analysis

Method

The low volatility residue (LVR) was analyzed using Diffuse Reflectance/ Fourier Transform Infrared (DRIFT/FTIR) spectroscopy. FTIR provides chemical functional group information for quantitative analysis and qualitative identification of materials. The analysis followed the ACL-120 procedure that complies with Mil-STD-1246C Notice 3 and is sensitive to the most stringent level (A/100).

Results**Physical Transfer of Residue from Mylar**

The Mylar was rubbed on a test glass surface for 30 seconds. The glass surface was then rinsed with solvent and analyzed by FTIR. The Mylar surface physically transferred ~0.05 micrograms per square centimeter (ug/cm²) of residue. It is relatively clean, but not recommended for direct contact with very sensitive surfaces.

Swab Rinse:

The swabs were rinsed with Freon TF and methanol. This removes both polar and non-polar residue. This is a quick surface rinse and not intended to fully extract the material. The gray swabs extract ~25 micrograms/swab of ester. The blue swab extracted ~4ug/swab of silicone and ester. The swabs are not recommended if used with solvents on very sensitive surfaces.

Optic, Beveled Area:

Residue from the optic surface was removed with a dry Teflon wipe. The residue was an aliphatic ester (~35 micrograms). This could be from fingerprints or a plasticizer.