CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2003
DateRun:	03/12/2003
Experimenters:	Jason Marshall
ClientType:	Medical Instrument Mfr
ProjectNumber:	Project #1
Substrates:	Plastic
PartType:	Part
Contaminants:	Hucker's Soil
Cleaning Methods:	
Analytical Methods:	FTIR
Purpose:	To identify components of residual remaining inside pvc tubing
Experimental Procedure:	Background on FT-IR Spectrometry: Fourier Transform Infrared spectroscopy correlates vibrational energy to a compound's molecular signature. Similar to other high-tech methods such as GC (gas chromatography), the curves generated in this analytical technique are both quantitative for species identification (the placement of the curve on the electromagnetic spectrum) and qualitative for amounts (the area under the curve). A relatively expensive instrument, a FT-IR spectrometer requires special training and care in sample preparation. Not all contaminants can be analyzed this way and interpretation of graphs can be difficult due to the presence of interfering peaks. It may be used in cleanrooms or disk drive manufacture where the origins of contamination may be entirely unknown and the amounts of contamination very low. Procedure followed: Initially, a background was run on the FT-IR, followed by a IPA blank. Working with the previously cleaned tubing pieces, several IR cards were made up by wiping the inside of the tubes with a IPA soaked swab. The IPA was used to dissolve and transfer any materials on the surface to the IR cards. After wiping the parts, the dirty swab was used to coat the IR card window. Each card made up was then analyzed in the instrument. The generated spectra were then compared with several other cards that were made up with possible sources of contamination, including supplied Hucker's soil, lab made Hucker's soil, peanut butter, linseed oil, wheat gluten, printer's ink and saline solution. In addition, FT-IR samples were recorded for each cleaning product tested.
Results:	All the tube wipes looked nearly identical, varying only in the area under the created curves. The less area under the curve, corresponds to lower contamination levels. See Figure 1 for comparison of cleaning trials. Comparing the tube wipes to the Hucker's soil was difficult to do directly. The individual components provided more insight into the possible identification of the residue. Upon reviewing the generated spectra, possible components of the residual material are either peanut butter oil, linseed oil or printer's ink. See Figure 2 for components spectra.
Summary:	
Conclusion:	A follow up cleaning trial will be conducted in an attempt to target the oils. Two protocols will be investigated. The first will clean with Micro 90 and rinse with IPA and the second will to clean with a mix of Micro 90 and IPA and rinse with water.