CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	11/04/1999
Experimenters:	Jason Marshall
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Ceramics, Alumina
PartType:	Coupon
Contaminants:	Alcohol
Cleaning Methods:	
Analytical Methods:	FTIR
Purpose:	To evaluate previously cleaned coupons with partial contamination remaining to determine trace amounts of contaminants.
Experimental Procedure:	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, an 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. After establishing the background readings, a clean ceramic coupon was scanned and the image was saved. The coupon was then coated with a substantial amount of the Evanol and the coupon was scanned again. The two images were compared to determine if any differences were observed. Once a region of the two samples was identified, additional clean and dirty samples were run to verify the results. Having found an area relating to Evanol amounts, two of the coupons cleaned in previous trials were analyzed and graphed along with the baseline samples. SUBSTRATE MATERIAL: Ceramic-Alumina coupons CONTAMINANTS: DuPont Evanol Concentrated (Vinyl Alcohol Polymers & Copolymers CAS#s: 9002-89-5, 25213-24-5, 54626-91-4; Methanol Bulk/Packaged CAS #: 67-56-1; Sodium Acetate CAS#: 127-09-3)
Results:	Coupons with small amounts of Evanol were found to have slightly higher spectra than the completely clean coupons. Sample measurement was difficult because of the necessity of placing the contaminated spot directly in the laser beam pathway. From Figure 1, coupon number 59 was the clean coupon while the remaining numbered coupons were the samples with small amounts of contaminant.
Summary:	
Conclusion:	FT-IR analysis of the ceramic coupons previously cleaned containing small spots of contamination, revealed that the dirty spots had slightly higher spectra than the base coupon. The scanning of samples was difficult. Aligning the dirty spots directly in the laser path was the major challenge when trying to measure the samples.