CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	10/06/1999
Experimenters:	Jason Marshall
ClientType:	Electronics Manufacturer
ProjectNumber:	Project #2
Substrates:	Plastic, Electronics
PartType:	Coupon
Contaminants:	Fluxes, Salts
Cleaning Methods:	
Analytical Methods:	Black light, OSEE
Purpose:	To determine how clean is clean. Develop method to evaluate cleanliness of parts.
Experimental Procedure:	Both clean and dirty parts were evaluated using a couple of analytical methods. The first method selected was Optically Stimulated Electron Emission (OSEE) or Photo Electron Emission (PEE). This method is based on the principle that metals and certain surfaces emit electrons upon illumination with ultraviolet (UV) light. These electrons can be collected, measured as current, converted to a voltage and digitally displayed. A surface contaminant will either enhance or attenuate this signal, depending on it own photoemissive nature. While OSEE will not identify a contaminant, it is a good comparative tool to determine the degree of contamination. This method is best suited for thin films (oils, etc.) and not particulate matter (dust, for example). The second technique was Fluorescence. Some contaminants, in particular lubricants, naturally fluoresce. Examination under black light reveals the location and extent of this type of surface contamination. Artificial fluorescence is possible with the addition of chemical tags, similar to those used in forensics. This is a limited application, however. The equipment used was an UVP Inc. Black light, Model UVL-56 longwave UV-366nm. SUBSTRATE MATERIAL: Circuit Boards CONTAMINANTS: Flux, salts
Results:	The OSEE readings were inconclusive, with readings that were nearly identical for both the clean and dirty parts. Black light fluorescence did have better results. The parts that were to be cleaned using the aqueous cleaner and IPA had several spots that glowed under the lighting. The parts that had been cleaned did not have any signs of contamination. Despite the success of the black light for these parts, the other set of samples, both to be cleaned and cleaned, did not glow when exposed to the UV light.
Summary:	
Conclusion:	With the inconclusive results for OSEE and the partially inconclusive for black light examination, other methods need to be determined and evaluated.