CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 09/02/1999

Experimenters: Jason Marshall

ClientType: Consultant

ProjectNumber: Project #1

Substrates: Ceramics, Alumina

PartType: Coupon

Contaminants: Alcohol

Cleaning Methods: Immersion/Soak

Analytical Methods: Black light, Colorimeter, Gravimetric

Purpose: To determine if waste water stream could be reused for cleaning.

Experimental Procedure: The cleaner used was supplied by the client. Sample was taken from the wastewater stream. The concentration of the solution was less than 2% by volume. The solution was heated to 100 F on a hot plate. Five coupons were wiped with Isopropyl Alcohol and air dried. The coupons were weighed to establish a baseline level of cleanliness. All 30 coupons were observed for particulate matter using an UVP Inc. Black light, Model UVL-56 longwave UV-366nm.

The coupons were coated with the Evanol and dried for 25 minutes in an oven at 212 F. Five coupons were cleaned in each solution for five minutes using stir-bar agitation. Parts were rinsed for two minutes in DI water also with stir-bar agitation. Rinsing was performed for two minutes with heated DI water at 100 F. The parts were dried in a convection oven at 212 oF for 15 minutes. After allowing parts to cool to room temperature, final weights were recorded. All coupons were observed again under black light for particulate matter and any remaining Evanol. Visual observations were made on all the coupons for any visible signs of contamination.
The sample was measured for chlorine concentration using LaMotte's Smart Colorimeter. Readings were made before and after cleaning. Two sets of readings were made, one using Micro 90 @ 2% as the blank and the second using DI water to zero the instrument.

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)
CONTAMINATING PROCESS USED: Dip coupons into contaminant solution and dry at 212 F for 25 minutes.

Results: The Micro 90-waste stream mix was moderately successful in removing the contamination from the coupons. Black light fluorescence was inconclusive. Visual inspection was showed that some of the coupons had small amounts of the contaminant on them.
Table 1 lists efficiencies for each coupon and the visual observations at each level of soil loading.
Table 1. Cleaning Results

Analysis	Gravimetric	Visual
Coupon 1	98.94	
Coupon 2	97.26	on side
Coupon 3	98.91	
Coupon 4	96.51	on corner
Coupon 5	94.57	on corner
Average	97.24	

Using the colorimeter data from the previous trial, formulas were calculated for each cleaning solution based on baseline readings made from the three levels of soil loading. Using the resulting graphs, the two readings for the solution were used to determine the concentration of the contaminant in the sample. Both yielded 5% concentration of Evanol.

Summary:

Substrates:	Ceramics, Alumina				
Contaminants:	Alcohol				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
International Products Corporation	Micro 90 Conc.	2	97.24	☑	mirco 90 waste stream

Conclusion: The wastewater stream containing Micro 90 was estimated to have approximately 5% Evanol in solution. The average cleaning efficiencies was determined to be 97%.