CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	10/07/1999
Experimenters:	Jason Marshall, Nicole Vayo
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Ceramics, Alumina
PartType:	Coupon
Contaminants:	Alcohol
Cleaning Methods:	Ultrasonics
Analytical Methods:	Gravimetric, Visual
Purpose:	To evaluate cleaning at 85 and 100 F using ultrasonic cleaning.

Experimental Procedure:

Two 0.5% solution were made of the cleaner using DI water in 600 mL beakers. Beakers were heated to 85 and 100 F on hot plates. Fifteen coupons were cleaned in Micro 90 at 2% using ultrasonic energy for 10 minutes. The coupons were weighed to establish a baseline level of cleanliness. The coupons were coated with the Evanol and dried overnight at room temperature. Five coupons were cleaned in the solutions for five minutes using ultrasonic cleaning at 40 kHz using a Crest ultrasonic tank model 4Ht 1014-6. Three different rinsing temperatures were used for the two different cleaning temperatures. Parts were rinsed for two minutes in DI water at 75, 85 and 100 F. The parts were dried in a convection oven at 212 F for 15 minutes. After allowing parts to cool to room temperature, final weights were recorded. Solutions examined are listed in Table 1.

Table 1. Cleaning and Rinsing Matrix
Micro 90 @ 0.5% at 85 with rinse temp of 75
Micro 90 @ 0.5% at 85 with rinse temp of 85
Micro 90 @ 0.5% at 85 with rinse temp of 100
Micro 90 @ 0.5% at 100 with rinse temp of 75
Micro 90 @ 0.5% at 100 with rinse temp of 85
Micro 90 @ 0.5% at 100 with rinse temp of 100

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 overnight at room temp.

Results:

Both cleaning temperatures and all three rinse temperatures resulted in complete cleaning of the coupons. Table 2 list the calculated results.

Table 2. Cleaning Results

Temp	85			100		
Rinse	75	85	100	75	85	100
	100.11	100	100.11	100.17	100.09	100.12
	99.95	99.84*	100.23	100.13	100.13	100.15
	100.18	100.1	100	100.18	100.34	100.11
	100.18	100.06	99.95	100.28	100.2	100.29
	99.90*	100.15	100.3	100.21	100.19	100.11
Ave	100.07	100.03	100.12	100.19	100.19	100.16
*Only two coupons had visible traces of contamination remaining after cleaning.						

Summary:

Substrates:	Ceramics, Alumina				
Contaminants:	Alcohol				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
International Products Corporation	Micro 90 Conc.	2	100.07	☑	DI rinse at 75

Conclusion:

There was no difference in efficiencies when the temperature of cleaning and rinsing were altered using ultrasonic cleaning and Micro 90 at 0.5%.