CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 06/17/1999

Experimenters: Jason Marshall

ClientType: Microelectronics Mfr

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Fluxes, Resins/Rosins

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Wipe

Purpose: To determine if a longer soak and increase concentrations would aid in the removal of the contaminant.

Experimental Procedure: Three of the cleaners from the previous trials were were selected for testing. The temperature was at ambient conditions and the cleaning times were 10 minutes and 2 hours. Nine coupons were contaminated with an excess amount of the negative photoresist and weighed again. Three coupons were placed into a beaker and cleaned for ten minutes with no agitation. At the end of the cleaning, coupons were rinsed in a tap water bath for 30 seconds at 120 F. Coupons were wiped with a paper towel to determine if the cleaning solutions had any effect on the contaminant. The coupons were allowed to air dry for one hour. Final weights were recorded and cleaning efficiencies determined. A second set of coupons were cleaned for two hours under the same conditions. Rinsing and drying were also the held constant from the first part of the experiment.

SUBSTRATE MATERIAL: Aluminum Coupons (202-1100 H-14)
CONTAMINANTS: Olin HNR 120 Negative Photoresist (CAS#s: 1330-20-7 [65-70%]; 100-41-4 [15-18%]; 68441-13-4 [9-15%]; 5284-79-7 [0.1-0.6%])
CONTAMINATING PROCESS USED: Coupons were coated with contaminant using a hand held swab and allowed to sit for one hour.

Results: After the ten minute cleaning cycle, the Envirosolutions' product was easily wiped from the coupons. The other two cleaners had moderate success in removing the contaminant, but nothing was wiped off with the paper towel. Table 2 lists the results for each cleaner.

Table 2. Ten Minute Results

Cleaner	Brulin	Envirosolutions*	Oakite
10 min	71.3	99.74	74.35
*wipe	74.61	99.9	76.53
	75.08	97.3	75.79
Average	73.66	98.98	75.56

Since the Envirosolutions' product worked so well after 10 minutes, it was not tested for the two hour cleaning time. At the end of the cleaning, the two cleaners did not dissolve any more of the contaminant. However, the contaminant could be easily peeled off of the coupons. Table 3 lists the calculated efficiencies for the two products tested.

Table 3. Two Hour Results

Cleaner	Brulin*	Oakite*
120 min	91.33	99.25
*peel	95.73	99.69
	95.30	99.26
Average	94.12	99.40

Summary:

Substrates:	Aluminum				
Contaminants:	Fluxes, Resins/Rosins				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Brulin Corporation	Compliance	100	73.66	☐	
Bio Chem Systems	Bio T Max	100	98.98	☑	
Oakite Products	Inproclean 4000 T	100	75.56	☐	

Conclusion: The Envirosolutions' Bio-T Max was very successful in dissolving the negative photoresist in about 10 minutes when used at full strength. Brulin's Compliance and Oakite's Inproclean 4000 T allowed the negative photoresist to be easily peeled from the surface after soaking for two hours at room temperature. MSDSs have been included with this report.

CLEANING LABORATORY EVALUATION SUMMARY