CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 08/14/2001

Experimenters: Jason Marshall

ClientType: Electronics Manufacturer

ProjectNumber: Project #1

Substrates: Ceramics

PartType: Coupon

Contaminants: Coatings

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: Further evaluation of replacements in removing the 509 crystalbond.

Experimental Procedure: Four cleaners from the previous trial were made into 30% solutions using DI water in 250 ml beakers. The cleaners were heated to 140 F on a hot plate. An additional four products were selected from vendor information. These solutions were used at 100% also at 140 F (except DS-108 which was at 90 F). Twenty-four preweighed coupons were coated with Cyrstalbond 509 and weighed again. Three coupons were cleaned in each solution for 10, 30 and 20 minutes. Observations were made after each time period. Following the final cleaning, coupons were rinsed in DI water at room temperature and dried using air blow off. Clean weights were recorded and efficiencies were calculated.

Results: Only one of the previous cleaners was very successful in removing the Crystalbond after the full cleaning cycle (60 minutes). Alconox Luminox removed over 70% and with an additional 20 minutes of soaking the efficiency jumped to 97%. The other three products had lower efficiencies than the previous trial. Three of the four new cleaners which were evaluated produced the best cleaning efficiencies. DuPont's DBE-4 removed 99.6%, Ecolink Safe Strip cleaned 98.97% and Shopmaster Buckeye had an efficiency of 94.83%. These three products required less than the 60 minutes to achieve these efficiencies. DuPont and Ecolink only needed 30 minutes and Buckeye required 35 minutes. The following table lists the efficiencies for each product and the observations made at each cleaning period.

Table 1 Results

Cleaner	Coupon 1	Coupon 2	Coupon 3	Average	10	30	20
Gemtek	-7.07	-9.12	7.59	-2.86	F	G	G
Polychem	24.99	14.62	16.79	18.8	F	G	G
Amax	10.78	42.75	11.51	21.68	F/P	OK	OK
DuPont	99.32	99.43	100.1	99.61	G/E	all clean	
Alconox	69.71	80.45	64.31	71.49	F	G	G/E
Dynamold	50.12	81.63	62.6	64.78	OK	G	G
Ecolink	99.92	99.38	97.62	98.97	OK/G	all clean	
Buckeye	100.06	86.91	97.53	94.83	G/E	all clean	
Alconox+10	85.17	84.94	73.69	81.27			
Alconox+20	94.22	100.07	98.19	97.49			
E = Excellent	G = Good	OK = Okay	F = Fair	P = Poor			

Summary:

Substrates:	Ceramics				
Contaminants:	Coatings				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Gemtek Products	SC Supersolve Safety Solvent	30	-2.86	☐	
US Polychem Corporation	Polyspray Jet 790 XS	30	18.80	☐	
Amax Corporation	Safety First	30	21.68	☐	
Alconox Inc	Luminox	30	71.49	☑	

CLEANING LABORATORY EVALUATION SUMMARY

					97% after additional 20 minutes
Dysol	DS 108 Wipe Solvent	100	64.78	☐	
Buckeye International	Shopmaster RC	100	94.83	☑	
EcoLink	Safe Strip	100	98.97	☑	
Invista S.a.r.l	Flexisolv DBE 4 ester	100	99.61	☑	

Conclusion: The four products that were successful (Luminox, DBE-4, Safe Strip and Shopmaster RC) will be used in the next trial to clean Crystalbond 590 under similar conditions.