CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	04/28/2002
Experimenters:	Jason Marshall
ClientType:	Metal
ProjectNumber:	Project #1
Substrates:	Aluminum
PartType:	Coupon
Contaminants:	Adhesive
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To identify possible alternatives to acetone for adhesive removal
Experimental Procedure:	Nine products were selected from the lab's database of alternative cleaning products based on client input. Six semi-aqueous and three aqueous products were chosen for evaluation. An additional product was supplied by the client. The aqueous products were diluted to 10% using DI water in 600 ml beakers. All ten products were heated to 130 F on a hot plate. Thirty preweighed coupons were coated with Bob Smith Industries Insta-Cure adhesive (7085-85-0) and then sprayed with the Insta-Set (64742-89-8, 99-97-8) and allowed to sit for 10 minutes at room temperature. After drying, the coupons were weighed a second time. Three coupons were placed in each beaker and allowed to sit for 10 minutes, then rinsed in tap water at 120 F for 10 seconds and dried with a Master Appliance heat gun at 500 F for 10 seconds. A third weighing was taken and efficiencies were calculated. The same coupons were placed back into the cleaning products and soaked for an additional 50 minutes. At the end of the hour, coupons were rinsed, dried and weighed again. Final efficiencies were recorded.
Results:	The client supplied product and DuPont's DBE performed similarly, causing the adhesive to become soft and liquefied. Both products are ester based. The International Products Surface Cleanse 930 was found to cause the adhesive to lift off the metal surface in one big stiff piece. The US Polychemical Co Polyspray Jet 790 XS had similar results after the 60 minutes of cleaning. Two products, Westech 1050 and RST-5 attacked the aluminum coupons.

The 10 minute cleaning results are listed in Table 1.

Cleaner	Coupon 1	Coupon 2	Coupon 3	Average	Std Dev	Observations
Bio T Max	-0.33	3.79	1.65	1.70	2.06	
Westec 1050	-93.88	-77.00	-75.24	-82.04	10.29	Attacked aluminum
DBE	-109.73	-174.95	-153.35	-146.01	33.22	sticky/soft
RST-5	-1.48	20.18	15.56	11.42	11.41	
Ionox HC2	28.53	18.93	24.39	23.95	4.81	
Shopmaster LpH	-1.83	1.06	4.30	1.18	3.07	
Surface Cleanse	0.47	-10.35	-17.15	-9.01	8.89	wipe/peel off
Polyspray	41.97	24.67	2.84	23.16	19.61	wipe/peel off
Santosol DME	-146.75	-130.63	-202.49	-159.96	37.71	sticky/soft
Bio T Max	0.61	3.58	0.67	1.62	1.69	

After cleaning for an hour, little improvement was observed for most of the products.

Table 2. Cleaning Efficiencies @ 60 Minutes

Cleaner	Coupon 1	Coupon 2	Coupon 3	Average	Std Dev	Observation
Bio T 200 A	0.04	3.35	1.51	1.63	1.66	
DBE	-237.78	-324.05	-266.71	-276.18	43.90	
RST-5	21.37	109.68	114.16	81.74	52.33	2/3 peeled but attacked metal
Ionox HC2	43.03	37.41	48.90	43.11	5.75	
	0.56	1.87	3.55	1.99	1.50	

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Shopmaster LpH						
Surface Cleanse	92.67	97.18	94.40	94.75	2.27	3/3 peeled
Polyspray	46.10	87.50	95.50	76.37	26.52	2/3 peeled
Santosol DME	-216.06	-203.42	-338.42	-252.63	74.56	
Bio T Max	0.25	4.48	1.55	2.09	2.17	

Summary:

Substrates:	Aluminum
Contaminants:	Adhesive

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Bio Chem Systems	Bio T 200 A	100	1.63	☐	
Chem Tech Solutions	1050 Magic	100	-82.04	☐	attacked aluminum
Invista S.a.r.l	Flexisolv DBE Ester	100	-276.18	☐	sticky/soft
Universal Renigingsmitel - Mulder Hardenberg	RST 5	100	81.74	☐	Attacked metal
Kyzen Corporation	Ionox HC 2	100	43.11	☐	
Buckeye International	Shopmaster LPH	10	1.99	☐	
International Products Corporation	Surface Cleanse Concentrated Neutral 930	10	94.75	☑	adhesive peeled off
US Polychem Corporation	Polyspray Jet 790 XS	10	76.37	☐	Two coupons had adhesive peel off after 60 minutes.
Bio Chem Systems	Bio T Max	100	2.09	☐	
Surface Specialties Inc	Santosol DME	100	-252.63	☐	soft/sticky

Conclusion: Surface Cleanse 930 will be used in attempt to remove the film from the metal part.