CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 02/15/2001

Experimenters: Todd MacFadden

ClientType: Adhesive Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Adhesive

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To identify a suitable, non- or less-toxic substitute cleaner for toluene and toluene-based solvents for this industry sector.

Experimental Procedure: Four aqueous chemistries (see below) were selected for testing from the SCL database, based on previous testing and on vendor information. Two 500mL solutions for each cleaner were prepared using DI water in concentrations ranging from 2-10 vol % and then heated to 140 F. Meanwhile, 24 stainless steel coupons were weighed and then contaminated with one of the two adhesives being tested using a handheld swab and allowed to dry for 24 hours. The coupons were weighed again and then immersed in the agitated cleaners, three at a time, for five minutes; rinsed; then air dried. The coupons were then weighed a final time to determine the cleaning efficiency.

SUBSTRATE MATERIAL: SS (202-410 B85)
CONTAMINANTS:
a. AC-059 adhesive (108-883),
b. Morton 717 adhesive (108-883, 108-05-4, 110-54-3, 142-82-5, 67-63-0)

Results: Table 2 highlights the results of this experiment. The greatest efficiency achieved among these cleaners was only 3.0%, with Buckeye Shopmaster. A visual inspection of the Motron- contaminated coupons cleaned with both Safe Science and Valtron revealed that bubbles had formed evenly across the surface of the adhesive layer, whereas there was no visible change in appearance of the other coupons after cleaning from that of the pre-clean.

Table 2. Cleaning Efficiencies

	Buckeye	Buckeye	Calgon	Calgon	Safe Sci.	Safe Sci.	Valtron	Valtron
	AC-059	Morton	AC-059	Morton	AC-059	Morton	AC-059	Morton
Coupon 1	2.84	0.162	3.34	1.19	2.66	-0.64	1.79	-0.10
Coupon 2	3.04	1.318	2.19	1.46	1.51	-0.79	0.76	-0.38
Coupon 3	3.07	0.63	2.62	1.54	2.92	-0.32	2.97	-0.07
Average	2.98	0.703	2.72	1.39	2.36	-0.58	1.84	-0.18

Summary:

Substrates:	Stainless Steel				
Contaminants:	Adhesive				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Buckeye International	Shopmaster	5	2.99	☐	
Calgon Corporation	Geo Guard 2215	5	2.72	☐	
Safe Science Inc	Safe Science All Purpose (Industrial)	5	2.37	☐	
Valtech Corporation	Valtron SP 2250 2LF	5	1.84	☐	

Conclusion: Overall, the cleaners performed quite poorly. It is interesting to note that this cleaner, and in fact all the other cleaners tested in this experiment, were less effective on the Morton 717 adhesive than on the AC-059, suggesting that Morton is a more tenacious contaminant. The last two cleaners yielded a negative effectiveness on this contaminant, coincident with the visual effects noted above, suggesting that the cleaner has actually penetrated the adhesive, possibly beginning to take effect, thereby adding mass to the coupon.