

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001
 DateRun: 02/21/2001
 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: Six 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, 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 MATERIALS: SS (202-410 B85) and SS (302-B86)

CONTAMINANTS:

a. AC-059 adhesive (CAS #: 108-883),

b. Morton 717 adhesive (CAS #: 108-883, 108-05-4, 110-54-3, 142-82-5, 67-63-0)

Results: The efficiency of the aqueous cleaners used on these adhesives in this experiment range from 0.6% to -4.9%, as shown in Table 2. Note that the trial using Savogran on the Morton adhesive failed and will have to be re-tested. As with Trial 1, a visual inspection of the cleaned coupons that yielded a negative efficiency revealed superficial bubble formation, suggesting that the aqueous cleaner was penetrating the contaminant.

Table 2. Cleaning Efficiency (%)

Cleaner	WR Grace	WR Grace	Brulin	Brunlin	Oakite	Oakite
Adhesive	AC-059	Morton	AC-059	Morton	AC-059	Morton
Coupon 1	0.42	-4.49	0.93	-1.04	0.99	-1.65
Coupon 2	0.27	-0.83	0.49	-0.73	0.43	-3.02
Coupon 3	0.02	-1.04	0.45	-1.23	0.39	-1.50
Average	0.24	-2.12	0.62	-1.00	0.60	-2.06

Table 2 (cont.) Cleaning Efficiency

Cleaner	Turco	Turco	Savogran	Savogran	US Poly	US Poly
Adhesive	AC-059	Morton	AC-059	Morton	AC-059	Morton
Coupon 1	1.21	-2.63	-0.99	-126.37	-0.25	-3.59
Coupon 2	-0.08	-1.69	-0.56	-137.07	0.16	-3.75
Coupon 3	0.25	-2.80	-0.96	-160.66	0.03	-4.96
Average	0.46	-2.37	-0.83	-141.36	-0.02	-4.10

Summary:

Substrates:		Stainless Steel				
Contaminants:		Adhesive				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:	
Magnaflux	Daraclean 121	5	0.24	<input type="checkbox"/>		
Brulin Corporation	Compliance	5	0.62	<input type="checkbox"/>		

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Oakite Products	Fisan Versaclean	5	0.60	<input type="checkbox"/>	
Turco Products Inc	Turco 5948 DPM	5	0.45	<input type="checkbox"/>	
Savogran Company	SI #8 Coating Remover	5	-0.83	<input type="checkbox"/>	
US Polychem Corporation	Hydropurge 36	5	-0.02	<input type="checkbox"/>	

Conclusion:

As with Trial 1, these aqueous cleaners performed poorly. These results are not entirely surprising, given the largely non-polar chemistry of the adhesives. Nevertheless, the experiment provides important insight regarding the properties of cleaners that will ultimately be effective for this application. This will become important in the event that this Surface Cleaning Lab begins to formulate its own cleaners. The cleaners that showed the greatest visual effect, US Polychemical and Turco, may be tested at stronger concentrations, and under different parameters, such as in a straight-line washability tester to replicate the effect of manual wiping.