CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 03/30/2001

Experimenters: Jason Marshall

ClientType: Adhesive Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Adhesive

Cleaning Methods: Manual Wipe

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: In this trial, the coupons were tested “wet,” only 30 minutes after they were contaminated. The procedure was the same as that for Trial 5: The BYK-Gardner Abrasion Tester was used with a stiff nylon brush. Dry, clean stainless steel coupons were weighed, then contaminated with one of the two adhesives identified above. Coupons were secured two at a time length-wise, end-to-end into the Abrasion Tester holding tray. The nylon brush was dipped in the respective cleaning solution for several seconds, inserted into the Abrasion Tester, and the machine was turned on and run for 10 cycles. The coupons were then immediately rinsed by immersion into warm (130 F) water for 30 seconds, hung to dry, and then re-weighed to determine the cleaning efficiency.

SUBSTRATE MATERIAL: SS (202-410 B85) and SS (302-B86)
CONTAMINANTS:
a. Solutia 1151 Adhesive (50601-74-6, 141-78-6, 110-54-3, 103-54-3)
b. Ashland Chemical Adhesive PS8034 (141-78-6, 108-88-3, 67-63-0)

Results: Table 2 highlights the cleaning efficiencies of this experiment.

Table 2. Cleaning Efficiencies

	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b
Coupon 1	53.76	81.45	9.2	50.01	28.08	45.66	15.11	25.27	16.54	46.53
Coupon 2	46.79	70.92	14.71	30.79	23.49	67.73	42.33	42.12	9.81	20.84
Coupon 3	51.09	71.41	15.75	53.74	7.14	23.10	31.69	16.20	14.65	26.45
Average	50.55	74.59	13.22	44.85	19.57	45.5	29.71	27.86	13.67	31.27

Observations: In general, the cleaners performed better on the Ashland Chemical adhesive than on the Solutia adhesive. The Dynamold 104 appears to be the most effective cleaner for the two adhesives, with efficiencies of 75% and 50%, respectively.

The worst efficiency measures were 13.2%, 13.7%, and 19.6% for trial numbers 2a, 5a, and 3a, respectively, which is an improvement from Trial 5, in which efficiency readings of about 2,4, and 14% were noted. This suggests that the adhesives tested in this trial are not as persistent as the two tested in previous trials.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Adhesive				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Dysol	DS 104 Wipe Solvent	100	74.59	☑	
Savogran Company	SI #4 Coating Remover	100	44.85	☐	
Transene Company, Inc.	D Greeze 500 LO	100	45.50	☐	
Today & Beyond	Beyond 2009	100	27.86	☐	
Bio Chem Systems	Bio T Max	100	31.27	☐	

Conclusion: Based on the results from this trial, it appears that Dynamold DS-104 is a relatively effective cleaner for this application. This is, however, a petroleum distillate formulation, which makes it less attractive from a health, safety and environmental standpoint. Nevertheless, it is rated as a 1 for health, and 2 for fire, meaning slight and moderate risk, respectively. Compared to toluene, rated at 2 and 3 (moderate and

high) respectively, this is ostensibly an improvement. The next series of tests will incorporate actual hand wiping for clean up after abrasion testing is complete.