CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1998
DateRun:	08/10/1998
Experimenters:	Jason Marshall
ClientType:	Aerospace Industry
ProjectNumber:	Project #2
Substrates:	Copper, Nickel
PartType:	Coupon
Contaminants:	Coatings, Resins/Rosins
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To replace acetone in the coating removal process
Experimental Procedure:	Six chemistries were selected from SCL's previous trials and from vendor supplied information. Four of the six were diluted to 5% in 400 mL beakers using DI water. The remaining two here used at full strength. Five chemistries were heated to 150 F on a hot plate. Preweighed coupons were coated with the supplied lacquer using a handheld swab. The coating was allowed to dry at room temperature. A second weight was recorded. Three coupons were cleaned in each cleaner for a total of 10 minutes. Observations were made at 5, 7.5 and 10 minutes. After the final observations, the coupons were rinsed in tap water at 120 F for 30 seconds. Once the coupons were dry, final weights were determined. Two sets of final weights were performed. One was before the coating was peeled off and the second was after the coating was peeled off. SUBSTRATE MATERIAL: Copper/Nickel (70/30) coupons ---did not have Nickel coupons (100%) CONTAMINANTS: Coating-Styrene Butidiene
Results:	Two types of cleaning were observed during the trial. One cleaning action involved the dissolving of the contaminant and the other method lifted the coating off of the coupon. The 4 aqueous cleaners allowed the coating to be lifted/peeled off of the coupons. The other 2 started to dissolve the contaminant. The results of cleaning with the aqueous cleaners are in Table 1.

Without Peeling	@T = 130	@T = 130	@T = 150	@T = 150	@T = 150
	Luminox	Shopmaster	SWR One	Daraclean	Water
Coupon 1	1.2	1.43	-0.623	-0.288	6.56
Coupon 2	2.27	0.627	0.499	-1.13	
Coupon 3	0.0536	0.728	0.337	1.23	
Ave	1.17	0.928	0.071	-0.0627	6.56
Std Dev	1.11	0.437	0.606	1.2	
With peeling	@T = 150	@T = 150	@T = 150	@T = 150	@T = 150
	Luminox	Shopmaster	SWR One	Daraclean	Water
Coupon 1	100	98.4	100	99.8	99.8
Coupon 2	99.8	100	100	99.8	
Coupon 3	99.9	100	100	99.8	
Ave	99.9	99.5	100	99.8	99.8
Std Dev	0.1	0.924	0	0	

All of the selected cleaners were shown to remove almost all of the contaminant after the coating was peeled off of the substrate. Since this occurred, one coupon was cleaned using hot water only. The hot water proved to be just as effective in lifting the contaminant off of the coupon.

For the other 2 chemistries tested, one showed good removal of the contaminant. Table 2 lists the results of the dissolving cleaners.

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Table 2. Dissolving Chemistries

Product	HTF 50		Resineater	
Time	10 min	30min	10 min	30min
Coupon 1	-6.88	-14.9	-11.4	88.3
Coupon 2	-11.1	-10.3	3.79	90.6
Coupon 3	-11.1	-9.99	-25.6	86
Ave	-9.69	-11.7	-11.1	88.3
Std Dev	2.43	2.75	14.7	2.34

Summary:

Substrates:	Copper, Nickel				
Contaminants:	Coatings, Resins/Rosins				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Luminox	5	1.17	☐	
Buckeye International	Shopmaster	5	0.93	☐	
Magnaflux	Daraclean 232	5	-0.06	☐	
SWR Corporation	SWR One	5	0.67	☐	
Finger Lakes Chemical	FLSC-12 Resineater Sample	100	88.30	☑	
Tarksol Inc	Tarksol HTF-50	100	-9.69	☐	

Conclusion:

Lifting and dissolving mechanisms were compared in the removal of a coating material. It was determined that the lifting action could be done using just hot water. The temperature of the cleaning solution was determined to be the key to the removal of the coating. At 130 F, adequate lifting was not possible with the 2 noted chemicals; However, at 150 F, the coating came off without any problems. The dissolving was completed using Fine Organics' Resineater. Next the sample parts will be cleaned using hot water and Fine Organics' Resineater.