

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999  
 DateRun: 10/29/1999  
 Experimenters: Jason Marshall  
 ClientType: Bellows Mfr  
 ProjectNumber: Project #1  
 Substrates: Brass  
 PartType: Coupon  
 Contaminants: Fluxes, Resins/Rosins  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To identify cleaning alternative to replace TCE and methylene chloride. Cleaners should be usable in ultrasonic equipment.

**Experimental Procedure:** Seven cleaning chemistries were selected based on vendor supplied information and searching the lab's Effective Test Conditions Database. The cleaners were diluted to 5% by volume in 400 mL glass beakers and then heated to 130 F on a hot plate. The chemistries used are listed in Table 1.

Twenty-one preweighed brass coupons were coated with the flux and placed into an oven and dried for one hour at 100oF. After cooling to room temperature coupons were weighed again. Three coupons were cleaned for 5 minutes in a beaker using stir bar agitation. Coupons were rinsed in DI water at 130 F for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. After the coupons cooled to room temperature, a final clean weight was recorded and cleaning efficiencies were calculated.

**SUBSTRATE MATERIAL:** Brass Coupons 260

**CONTAMINANTS:** Kester Solder 1544 Rosin Flux-(Ethanol CAS#64-17-5;2-Butanol CAS#78-92-2\*;Modified Rosin CAS#8050-09-7)

**CONTAMINATING PROCESS USED:** Coupons coated using hand-held swab and then dried in an oven at 100 F for one hour.

**Results:** At the concentration used, only one product, Armakleen 2002, was moderately successful in removing the flux from the coupons. Only one other aqueous product, Safety Wash CRC, was partially capable of removing the flux. The two semi-aqueous cleaners, Bio T 300B and Inproclean 4000 T, despite having low efficiencies, appeared to have some effect on the flux. Table 2 lists the efficiencies of all seven cleaners.

Table 2. Cleaning Results

Product	Armakleen	SC 1000	Safety Wash	Luminox	Dirtex	Bio-T 300B	4000 T
Coupon 1	63.56	15.4	32.47	0.35	16.35	2.95	-11.24
Coupon 2	82.34	3.69	31.82	5.77	14.99	6.75	23.44
Coupon 3	92.81	18.24	39.99	7.94	74.65	6.73	-12.51
Average	79.57	12.44	34.76	4.69	35.33	5.48	-0.1

**Summary:**

<b>Substrates:</b>	Brass				
<b>Contaminants:</b>	Fluxes, Resins/Rosins				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
Church & Dwight Co Inc.	Armakleen E 2002	5	79.57	<input checked="" type="checkbox"/>	
Gemtek Products	SC 1000 Aqueous Cleaner Concentrate	5	12.44	<input type="checkbox"/>	
Emkay Chemical Company	Safety Wash CRC	5	34.76	<input type="checkbox"/>	
Alconox Inc	Luminox	5	4.69	<input type="checkbox"/>	
Savogran Company	Dirtex Prepaint Cleaner	5	35.33	<input type="checkbox"/>	
Bio Chem Systems	Bio T 300 B	5	5.48	<input type="checkbox"/>	
Oakite Products	Inproclean 4000 T	5	-0.10	<input type="checkbox"/>	

**Conclusion:** From the data obtained, Armakleen 2002 will be evaluated using ultrasonic cleaning as well as the Safety Wash. Bio-T 300 B and Inproclean 4000 T will be evaluated at full strength and room temperature.

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