CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 02/13/2002

Experimenters: Jason Marshall

ClientType: Electromagnetic Manufacturer

ProjectNumber: Project #3

Substrates: Aluminum

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To identify cleaners for the removal of second lubricant.

Experimental Procedure: Four products were selected from the last project and two were submitted from client. All six products were diluted to 5% using DI water in a 600 ml beaker and heated to 140 F on a hot plate. Each solution was degassed for 5 minutes in a Crest 25 kHz ultrasonic tank.

Eighteen preweighed coupons were coated with the Atofina Copperskin 510 metal working compound (CAS#s: 64742-52-5, 123-95-5, 8016-28-2, 8002-13-9) using a hand held swab. Coupons were then weighed again to determine the amount of contaminant applied. Three coupons were cleaned in each solution for 20 seconds, followed by a 5 second tap water rinse at 140 F and dried for 10 seconds using a Master Appliance heat gun at 500 F. After cooling, coupons were weighed for a final time and efficiencies were calculated.

Results: The four previous products were very successful in removing the lubricant from the aluminum coupons in 20 seconds. . A couple of the coupons had some oil remaining at the very top of the coupon. This was the area that was above the water line during cleaning. If the coupon had been completely submerged, this oil would probably have been removed. The two client supplied cleaners removed less than 86% of the oil. These coupons had substantial amounts of oil remaining. Unlike the previously described coupons, the oil that remained was below the water line. The following table lists the calculated efficiencies for each solution.

Cleaners	Initial wt	Cont. wt	Clean wt.	Initial wt of cont.	Final wt of cont.	%Cont Removed	Observations
	22.4548	22.7403	22.4982	0.2855	0.0434	84.80	Oil residue
BCS Co	22.3480	22.6197	22.3975	0.2717	0.0495	81.78	Oil residue
	22.2537	22.5166	22.2779	0.2629	0.0242	90.79	Oil residue
	22.4405	22.7295	22.4425	0.2890	0.0020	99.31	
Brulin	22.3780	22.5122	22.3869	0.1342	0.0089	93.37	oil at top
	22.3975	22.6192	22.4034	0.2217	0.0059	97.34	
	22.4339	22.7188	22.5429	0.2849	0.1090	61.74	Oil residue
Houghton	22.3998	22.7103	22.5877	0.3105	0.1879	39.48	Oil residue
	22.3953	22.6702	22.4853	0.2749	0.0900	67.26	Oil residue
	22.3636	22.5369	22.3734	0.1733	0.0098	94.35	oil at top
Oakite	22.4025	22.5897	22.4020	0.1872	-0.0005	100.27	
	22.3733	22.5276	22.3733	0.1543	0.0000	100.00	
	22.3588	22.4956	22.3604	0.1368	0.0016	98.83	
Sunshine	22.3947	22.6314	22.3988	0.2367	0.0041	98.27	
	22.4415	22.7275	22.4466	0.2860	0.0051	98.22	
	22.4603	22.7810	22.4619	0.3207	0.0016	99.50	
Today	22.3488	22.4876	22.3498	0.1388	0.0010	99.28	
	22.4391	22.6062	22.4404	0.1671	0.0013	99.22	

Summary:

Substrates:	Aluminum				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
BCS Company	251 SR	5	85.79	☐	
Brulin Corporation	Aquavantage 1400	5	96.67	☑	
	MTC 53	5	56.16		

CLEANING LABORATORY EVALUATION SUMMARY

Houghton International				☐	
Oakite Products	Inproclean 3800	5	98.20	☑	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	5	98.44	☑	
Today & Beyond	Beyond 2005	5	99.33	☑	

Conclusion: The four successful cleaners will be used under the proposed operating conditions of 2, one second cleaning and 1, one second rinsing stages. The supplied silver tape will be lightly coated with the lubricant and analyzed using OSEE.