CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	07/25/2017
Experimenters:	Alicia McCarthy, Hayley Byra
ClientType:	General
ProjectNumber:	Project #1
Substrates:	Aluminum
PartType:	Coupon
Contaminants:	Waxes
Cleaning Methods:	Ultrasonics
Analytical Methods:	Gravimetric
Purpose:	To evaluate the effectiveness of seven TCE alternatives at removing wax from aluminum alloys
Experimental Procedure:	Pre-weighed aluminum coupons were tested for each aqueous cleaner. Coupons were soiled with Lenox Lube Tube Wax (CAS:8002-74-2; 57-11-4; 5989-27-5) using a swab to cover the bottom third of the substrate and dirty weights were recorded. Chemistries were prepared with a five percent dilution except for Micro 90, which had a two percent dilution based on vendor recommendations. Coupons were immersed, three at a time, in a beaker filled with 200ml of the chosen cleaner at room temperature (68 F) and cleaned with ultrasonics for five minutes. Final weights and observations were recorded after cleaning.

Results:

Cleaner	Initial wt.	Final wt.	% Removed	Average % Removed
SC Aircraft & Metal Cleaner	0.0714	0.0054	92.44	96.10
	0.0715	-0.0002	100.28	
	0.0840	0.0037	95.60	
Amberclean 527L	0.0340	0.0139	59.12	49.89
	0.0480	0.0161	66.46	
	0.1170	0.0888	24.10	
Surface Cleanse 930	0.0804	0.0033	95.90	96.11
	0.1153	0.0037	96.79	
	0.0938	0.0041	95.63	
Micro 90	0.0367	0.0169	53.95	51.45
	0.0250	0.0055	78.00	
	0.0451	0.0350	22.39	
Solution 2000	0.0212	0.0201	5.19	15.75
	0.0286	0.0264	7.69	
	0.0582	0.0382	34.36	
Shopmaster	0.0290	0.0115	60.34	65.64
	0.0495	0.0182	63.23	
	0.0270	0.0072	73.33	
Crystal Simple Green	0.0729	0.0427	41.43	39.32
	0.0472	0.0291	38.35	
	0.0822	0.0508	38.20	

The wax was harder to remove compared to the lubricant, and some of the coupons varied in final percent removal. This could be due to the movement and spacing of the coupons in the ultrasonic tank. Retesting of the cleaners that had a wider range in removal for each coupon showed similar results.

Summary:

Substrates:	Aluminum				
Contaminants:	Waxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	96.10	☑	
Innovative Organics Inc	Amberclean 527 L	5	49.89	☐	
International Products Corporation	Surface Cleanse Concentrated Neutral 930	5	96.11	☑	
	Micro 90 Conc.	2	51.45	☐	

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International Products Corporation					
EnviroSan Products Ltd	Solution 2000	5	15.75	☐	
Buckeye International	Shopmaster	5	65.64	☐	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	5	39.32	☐	

Conclusion: SC Aircraft & Metal Cleaner and Surface Cleanse 930 were both very effective at removing Lenox Lube Tube Wax from aluminum coupons. Other cleaners showed an improvement in removal when ultrasonics was introduced. Next step would be to increase the ultrasonics cleaning time.