CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2018

DateRun: 02/19/2018

Experimenters: Hayley Byra

ClientType: General

ProjectNumber: Project #2

Substrates: Copper

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate the effectiveness of four TCE aqueous alternatives at removing lubricating oils from copper alloys.

Experimental Procedure: Nine copper coupons were tested for each cleaner. Initial weights were recorded, and three coupons were soiled for each contaminant using a handheld swab to cover the bottom third of the substrate. The coupons were then immersed, three at a time, in a beaker with 250ml of the chosen diluted cleaner at room temperature (68 F) for ten minutes. Visual observations were taken during this time, and final weights were recorded after cleaning. This process was repeated for each cleaner on all three contaminants.

Results:

Cleaner	Soil	Initial wt	Final wt	%Removed	Avg %Removed	Overall % Removed
Shopmaster	Oak 15A	0.0333	0.03323	0.30	1.56	8.19
		-0.0262	-0.0269	2.67		
		0.0142	0.0132	7.04		
	Oak 941A	0.0731	0.0505	30.92	15.43	
		0.0478	0.0412	13.81		
		0.0254	0.0250	1.57		
	M4	0.0790	0.0750	5.06	7.58	
		0.1323	0.1107	16.33		
		0.0660	0.0651	1.36		
Solution 2000	Oak 15A	0.0689	0.0698	-1.31	-11.03	-2.50
		0.0359	0.0414	-15.32		
		0.0255	0.0297	-16.47		
	Oak 941A	-0.4644	-0.4668	-0.52	3.19	
		0.0295	0.0270	8.47		
		0.0310	0.0305	1.61		
	M4	0.2118	0.2134	-0.76	0.33	
		0.1250	0.1025	0.00		
		0.1258	0.1236	1.75		
SC Aircraft	Oak 15A	0.0539	0.0495	8.16	4.02	2.69
		0.0365	0.0340	6.85		
		0.0374	0.0385	-2.94		
	Oak Draw 941-A	0.0395	0.0334	15.44	9.09	
		0.0474	0.0467	1.48		
		0.0416	0.0373	10.34		
	M4	0.0406	0.0470	15.76	-5.04	
		0.1497	0.1503	-0.40		
		0.0860	0.0851	1.05		
Amberclean 527 L	Oak 15A	0.0261	0.0261	0.00	-2.15	2.95

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		0.0448	0.0434	3.13		
		0.0292	0.0320	-9.59		
	Oak Draw 941-A	0.0682	0.6630	2.79	10.52	
		0.0568	0.0521	8.27		
		0.0654	0.0520	20.49		
	M4	0.1237	0.1251	1.13	0.48	
		0.0780	0.0779	0.13		
		0.0489	0.0477	2.45		

Summary:

Substrates:	Copper				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Buckeye International	Shopmaster		8.19	☐	
EnviroSan Products Ltd	Solution 2000		-2.50	☐	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate		2.69	☐	
Innovative Organics Inc	Amberclean 527 L		2.95	☐	

Conclusion: