CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2019
DateRun:	08/14/2019
Experimenters:	Nicole Kebler, Julie Nguyen
ClientType:	Electroplating Company
ProjectNumber:	Project #1
Substrates:	Aluminum, Ceramics, Copper
PartType:	Part
Contaminants:	Lubricating/Lapping Oils, Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric, Visual
Purpose:	To evaluate the effectiveness of heated dimethyl glutarate (130F) on removing Mystery Oil and Rustlick 50/50 on ceramic, copper, and aluminum coupons.
Experimental Procedure:	Nine pre-weighed coupons, three for each substrate, were used for each contaminant, and the coupons were contaminated halfway on one side using a hand-held swab. Contaminated weights were recorded before immersing three coupons of the same substrate into a beaker with heated (130F) dimethyl glutarate for 15 minutes. Visual observations were documented every five minutes for the complete 15 minutes before taking final weights.

Results:

Soil	Substrate	Initial wt. of cont.	Final wt. cont.	% Cont. Removed	Average
Soluble Oil #35	Ceramic	2.0268	-0.0001	100.00	96.10
		0.0344	0.004	88.37	
		0.9067	0.0008	99.91	
	Copper	0.0207	0.0004	98.07	98.93
		0.0233	0.0003	98.71	
		0.0432	0.0000	100.00	
	Aluminum	0.0067	0.0000	100.00	98.40
		0.0145	0.0007	95.17	
		0.0080	0.0000	100.00	
Rustlick 50/50	Ceramic	-0.7849	0.0088	101.12	101.67
		0.3119	0.0002	99.94	
		0.0456	-0.0018	103.94	
	Copper	0.1686	0.0007	99.58	98.22
		0.0797	0.0031	96.11	
		0.1060	0.0011	98.96	
	Aluminum	0.0922	0.0060	93.49	95.03
		0.1668	0.0048	97.12	
		0.0885	0.0049	94.46	

Visual Observations:

Contaminant: Mystery Oil (Soluble Oil #35)

Substrate	5 Mins	10 Mins	15 Mins
Ceramic	- no visible bubbles - clear dilution	- no visible bubbles - clear dilution	- no change
Copper	- no visible bubbles - clear dilution	- no visible bubbles - clear dilution	- no change
Aluminum	- no visible bubbles	- no visible bubbles	- no change

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	- clear dilution	- clear dilution	

Contaminant: Rustlick 50/50

Cleaner	5 Mins	10 Mins	15 Mins
Ceramic	- soil visibly removing from coupon - soil rising to top of dilution	- soil visible at top of solution	- soil visible at top of solution - solution blue
Copper	- soil rising to top of solution	- soil visible at top of solution	- soil visible at top of solution - solution blue
Aluminum	- soil rising to top of solution	- soil visible at top of solution	- soil visible at top of solution - solution blue

Summary:

Substrates:	Aluminum, Ceramics, Copper				
Contaminants:	Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100%	0.00	☑	

Conclusion: Heated dimethyl glutarate was effective at removing Mystery Oil or Rustlick 50/50. Next step is to test on parts provided by the client.