CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 08/07/2019

Experimenters: Nicole Kebler, Julie Nguyen

ClientType: Electroplating Company

ProjectNumber: Project #1

Substrates: Aluminum, Ceramics, Copper

PartType: Coupon

Contaminants: Lubricating/Lapping Oils, Oil

Cleaning Methods:

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate dimethyl glutarate on removing Mystery Oil and Rustlick 50/50 on aluminum, ceramic, and copper coupons.

Experimental Procedure: Six coupons, three for each contaminant, were pre-weighed for each cleaner before soiling halfway on one side using a hand-held swab. Contaminated weights were recorded before placing three coupons of the same contaminant at a time into a 250 mL beaker of diluted cleaning solution at room temperature (68 F). Coupons were immersed completely for 15 minutes with written observations being made every five minutes. Coupons then air dried for five minutes before a towel wipe test was performed using a clean paper towel to look for residue and final weights were taken.

Results:

Cleaner	Soil	Coupon	Initial wt. of cont.	Final wt. cont.	% Cont. Removed	Average	Overall Average
Ceramic	Mystery Oil	71	0.0064	0.0023	64.06	51.97	68.94
		10	0.0122	0.0032	73.77		
		35	0.0083	0.0068	18.07		
	Rustlick 50/50	5	0.1317	0.0174	86.79	85.90	
		13	0.0904	0.0141	84.40		
		91	0.1091	0.0147	86.53		
Copper	Mystery Oil	5096	0.0197	0.0028	85.79	71.57	81.60
		3357	0.0179	0.0061	65.92		
		4149	0.0073	0.0027	63.01		
	Rustlick 50/50	3988	0.0558	0.0041	92.65	91.62	
		3579	0.0474	0.0032	93.25		
		2954	0.0607	0.0067	88.96		
Aluminum	Mystery Oil	12	0.0141	0.0103	26.95	36.70	58.34
		9	0.0193	0.0138	28.50		
		28	0.0172	0.0078	54.65		
	Rustlick 50/50	11	0.1006	0.0191	81.01	79.99	
		4	0.0771	0.0158	79.51		
		24	0.0603	0.0124	79.44		

Visual Observations:

Contaminant: Mystery Oil

Substrate	5 Mins	10 Mins	15 Mins	Rinse
Ceramic	- no visible bubbles - clear dilution	- no visible bubbles - clear dilution	- no change	- soil still visible on coupon

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Copper	- no visible bubbles - clear dilution	- no visible bubbles - clear dilution	- no change	- soil still visible on coupon
Aluminum	- no visible bubbles - clear dilution	- no visible bubbles - clear dilution	- no change	- soil still visible on coupon

Contaminant: Rustlick 50/50

Cleaner	5 Mins	10 Mins	15 Mins	Rinse
Ceramic	- soil visibly removing from coupon - soil rising to top of dilution	- soil visible at top of dilution	- soil visible at top of dilution	- no color change - soil still visible on coupon
Copper	- soil visible on surface	- soil visible on rim and surface	- soil visible on rim and surface	- no color change - soil still visible on coupon
Aluminum	- soil visible on rim	- soil visibly removing from coupon - soil at surface	- soil visibly removing from coupon - soil at surface	- soil still visible on coupon

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: Dimethyl glutarate was not effective at removing Mystery Oil or Rustlick 50/50. Next step is to repeat the test with added heated agitation.