CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 10/06/2020

Experimenters: Justin Kiander

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Buffing/Polishing Compounds

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of a new set of cleaners in removing the buffing compound via unheated immersion.

Experimental Procedure: Four cleaning solutions were obtained and prepared to the following concentrations: Metalnox 6396 100%, Emerald ICP 1 5%, SC Aircraft & Metal Cleaner 20%, Mirachem 500 20%, Crystal Simple Green 30 parts water. Three aluminum coupons were obtained for each cleaner being tested. After an initial weight, coupons were soiled with the white buffing compound by rubbing the soil onto the bottom third of the substrate. The white buffing compound was chosen as it was proven to be the hardest of the three to remove. A soiled weight was obtained, and coupons were submerged into their respective cleaners for 15 minutes at room temperature. After 15 minutes, coupons were dried in air for 24 hours and a clean weight was obtained. Effectiveness of the cleaners was determined.

Results:

Cleaner	Initial wt of Cont	Final wt of Cont	%Cont Removed	%AVG
Metalnox 6386	0.0033	0.0031	6.06	9.04%
	0.003	0.0023	23.33	
	0.0044	0.0045	-2.27	
Emerald ICP 1	0.0008	0.0019	-137.5	-50.92%
	0.0049	0.005	-2.04	
	0.0053	0.006	-13.21	
SC Aircraft & Metal Cleaner	0.0061	0.0075	-22.95	-36.74%
	0.0034	0.0041	-20.59	
	0.0015	0.0025	-66.67	
Mirachem 500	0.0016	0.0018	-12.5	-83.31%
	0.0005	0.0018	-260	
	0.0031	0.0024	22.58	
Crystal Simple Green	0.0018	0.0012	33.33	32.32%
	0.0019	0.0016	15.79	
	0.0023	0.0012	47.83	

Summary:

Substrates:	Aluminum				
Contaminants:	Buffing/Polishing Compounds				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Kyzen Corporation	Metalnox M6386	100%	9.04	☐	
Hubbard Hall Inc	Emerald IC P 1	5%	-50.92	☐	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	-36.74	☐	
Mirachem Corporation	Mirachem 500	20%	-83.31	☐	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	30 Parts Water	32.32	☐	

Conclusion: Crystal Simple Green was the most effective of the list removing an average of 32.32% of the white buffing compound from aluminum substrates. In an effort to clean the substrates for further testing, coupons were run through unheated with agitation, heated, and heated with agitation trials, yet soil visibly remained after all trials. Crystal Simple Green was eliminated in this process, as testing needed to go beyond its

temperature range. The company was contacted to verify if the substrates had been cleaned and this visual change was just to be expected from the buffing compound. The company stated that the buffing compound had not been removed but requested that testing proceed to aluminum mirror polish parts they had sent to TURI. Therefore, per the company's request, next steps will be heated immersion on aluminum mirror polish parts.