CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2020
DateRun:	10/13/2020
Experimenters:	Nicole Kebler
ClientType:	Bolt, Screw & Nut Manufacturer
ProjectNumber:	Project #1
Substrates:	Aluminum
PartType:	Coupon
Contaminants:	Greases
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate the effectiveness of cleaners/solvents for the removal of grease on aluminum substrate for 30 minutes unheated immersion.
Experimental Procedure:	Four of eight cleaning products were diluted with tap water at room temperature to vendor recommended concentration. Three cleaning products were used at the recommended 100% dilution and the solvent option was also used at 100% for industrial testing; all cleaners and solutions were measured for 200 mL. Pre-weighed aluminum coupons were coated over 1/3 of the surface with grease that has been provided by the company by using a metal spatula; three coupons were used for each cleaner/solvent. They were allowed a 24-hour dry time at room temperature; their dirty weights were recorded. The coupons were immersed in the cleaners/solvents at room temperature for 30 minutes then were taken out and placed on trays with paper towels; they were left to dry for 24 hours. Final weights and observations were recorded and evaluated. Cleaners/Solvents used: Liquinox (1%) Dimethyl Glutarate (100%) Mirachem (20%) Metalnox (100%) Micro 90 (1%) Smart Solve (100%) SC-Aircraft (5%) Ozzy Juice 3 (100%)
Results:	The coupons were still wet resulting in higher clean weights. No grease was removed from the coupon evaluated by visual observation.

Solvent/ Cleaner	initial weight of soil	final weight of soil	% Removal	Average
Liquinox 1%	0.5365	0.5234	2.44	1.47
	0.6479	0.6426	0.82	
	0.6797	0.6719	1.15	
Dimethyl Glutarate 100%	0.4352	0.4548	-4.50	-4.41
	0.758	0.8017	-5.77	
	0.5747	0.5917	-2.96	
Mirachem 20%	0.8628	0.8699	-0.82	-0.58
	0.9671	0.973	-0.61	
	0.6095	0.6113	-0.30	
Metalnox 100%	0.3461	0.5268	-52.21	-40.78
	0.8741	1.1302	-29.30	
	0.4841	0.6818	-40.84	
Micro 90 1%	0.6876	0.6699	2.57	2.40
	0.7716	0.7701	0.19	
	0.6219	0.5944	4.42	
Smart Solve 100%	1.0825	1.1647	-7.59	-15.30
	0.552	0.6869	-24.44	
	0.7421	0.8449	-13.85	
	0.5955	0.5931	0.40	0.72

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SC-Aircraft 5%	0.7568	0.7455	1.49	
	0.7058	0.7039	0.27	
Ozzy Juice 3 100%	0.7029	0.7	0.41	0.37
	0.8383	0.8333	0.60	
	0.9868	0.9857	0.11	

Summary:

Substrates:	Aluminum
Contaminants:	Greases

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alconox Inc	Liquinox	1	1.47	☐	
Fisher Scientific	Dimethyl glutarate (CAS: 1119-40-0)	100	-4.41	☐	
Mirachem Corporation	Mirachem 500	20	-0.58	☐	
Kyzen Corporation	Metalnox M6960	100	-40.78	☐	
International Products Corporation	Micro 90 Conc.	1	2.40	☐	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	0.72	☐	
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	100	0.37	☐	

Conclusion: Additional testing is required. The next steps include adding additional time to the unheated immersion and adding agitation with a stir bar. Dry step included during testing when adding stir bar.