CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 10/20/2020

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 for the removal of grease on aluminum coupons using a stir bar at 300 rpm for 15 minutes unheated immersion

Experimental Procedure: Four of six cleaning products were diluted with tap water at room temperature to vendor recommended concentrations. One cleaning product was used at the recommended 100% dilution and the solvent option was also used at 100% concentration for industrial testing; all cleaners and solutions were measured for 200 mL and poured into beakers. 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 72-hour dry time at room temperature; their dirty weights were recorded. A stir bar was added to each beaker and was set to 300 RPM. The coupons were immersed in the cleaners/solvents at room temperature for 15-minutes, then were taken out and placed on trays with paper towels; they were blown dry for 2 minutes and then left to finish drying for 24 hours. Final weights and observations were recorded and evaluated. The removal goal based on client needs is between 70-90%.

Cleaner/Solvents used and their concentration:

1. Liquinox (1%)
2. Dimethyl Glutarate (100%)
3. Mirachem (20%)
4. Micro 90 (1%)
5. SC-Aircraft (5%)
6. Ozzy Juice 3 (100%)

Results: Ozzy Juice 3 was most effective for the removal of grease from aluminum substrates with an average of 27.23% removal; the coupon was still coated 1/3 of the surface with grease but was not as thick as it was before cleaning. Micro 90 had an average removal of 16.12%, and visually a thick coating was left on the coupon. Other cleaners/solvents recorded were below 10% removal and visually did not change. Increasing the concentration for SC-Aircraft and continuing with a stir bar in unheated immersion with more time added are the next steps.

Summary:

Substrates:	Aluminum				
Contaminants:	Greases				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Liquinox	1%	6.30	☐	Was not effective for the removal of grease on aluminum substrate for unheated immersion with stir bar
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100%	2.90	☐	Was not effective for the removal of grease on aluminum coupons for unheated immersion with stir bar
Mirachem Corporation	Mirachem 500	20%	2.70	☐	Was not effective for the removal of grease on aluminum coupons for unheated immersion with stir bar.
International Products Corporation	Micro 90 Conc.	1%	16.10	☐	Was not effective for the removal of grease on aluminum coupons for unheated immersion with stir bar.
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5%	4.20	☐	Was not effective for the removal of grease on aluminum coupons for unheated immersion with stir bar.
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	100%	27.23	☐	Was not effective for the removal of grease on aluminum substrate

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					for unheated immersion with stir bar.

Conclusion: All cleaners and solvents were below the desired percentage removal of 70-90%. Next steps include adding time onto the unheated immersion test with a stir bar and increasing SC-Aircraft to a concentration of 1:1 which is recommended for tough greases by the vendor. Additionally, the product Super Solve will be added to the list of cleaners and will first be tested at 50% concentration.