CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 03/31/2021

Experimenters: Nicole Kebler

ClientType: Bolt, Screw & Nut Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum, Copper, Steel

PartType: Part

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate the effectiveness of Mirachem 500 and Dimethyl Glutarate for the removal of black grease on company parts using heated ultrasonics for 15 minutes at 105 and 120 degrees Fahrenheit.

Experimental Procedure: One part per cleaner was previously soiled using company-supplied black grease and was soiled using a swab. The dirty weights were taken for each part. The first test used 15-minute ultrasonics at 105 degrees Fahrenheit and the cleaners were heated up previously, then put into the ultrasonics tank which was also heated. The part was placed in a beaker in the ultrasonics tank and was cleaned for 15 minutes. The second test used 15-minute ultrasonics at 120 degrees Fahrenheit and had the same process as the previous test. Once cleaning was done, the parts were taken out and left to try for 60 minutes. The clean weights were then recorded. After clean weights were recorded, any leftover soil was removed from the part with a paper towel. After all of the soil was removed, the initial weights of the parts were taken.

Cleaners used:

- 2:1 (33%) Mirachem 500
- 100% Dimethyl Glutarate

Results: Gravimetrically, both temperatures were successful for the removal of grease from company parts. Visually though, the 120-degree test was more successful at removing excess grease, the 105 degrees test still had some leftover soil where it had been applied thick. Dimethyl Glutarate did the best at 95% removal at 120 degrees and averaged 83% at 105 degrees. Mirachem 500 did about the same for both temperatures, 93% removal at 105 degrees and 91% removal at 120 degrees; still, visually Mirachem 500 did better at the higher temperature.

105 degrees F

Cleaner	Temperature	Initial wt of cont	Final wt of cont	% Removal
Mirachem 500	105	0.5173	0.0326	93.70
Dimethyl Glutarate	105	1.0364	0.1763	82.99

120 degrees F

Cleaner	Temperature	Initial wt of cont	Final wt of cont	% Removal
Mirachem 500	120	0.2861	0.027	90.56
Dimethyl Glutarate	120	0.3679	0.0179	95.13

Summary:

Substrates:	Aluminum, Copper, Steel
Contaminants:	Greases

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Mirachem Corporation	Mirachem 500	2:1	90.00	☑	Mirachem 500 was successful at removing grease from company parts for both temperatures
Fisher Scientific	Dimethyl glutarate (CAS: 1119-40-0)	100%	95.00	☑	Dimethyl Glutarate was successful at removing grease from company parts at 120 degrees Fahrenheit.

Conclusion:

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Mirachem 500 performed well and was successful for the removal of grease on company parts, visually it did better at the higher temperature, but it could be recommended at both temperatures. Dimethyl Glutarate performed the best at 120 degrees at 95% removal. It would not be recommended to use Dimethyl Glutarate at 105 degrees though because it only removed about 83%. Moving forward, pictures and updates will be sent to the company and a demonstration showing the removal will need to be done.