CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 03/24/2021

Experimenters: Nicole Kebler

ClientType: Bolt, Screw & Nut Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum, Copper, Stainless Steel

PartType: Part

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: To test 15 and 30 minute heated ultrasonic for the removal of grease on company parts.

Experimental Procedure: Parts were previously soiled by the company, one part was used per cleaner. The parts were weighed for dirty weights. A 2:1 concentration was created for Water Works and Dimethyl Glutarate was used at 100% concentration. The two cleaners were heated on a hot plate till 105 degrees Fahrenheit then placed in beakers in the ultrasonic tank, which was also set for 105 degrees Fahrenheit. One part per cleaner were immersed in the cleaner. The first test used the heated ultrasonics for 15 minutes and parts were then taken out and left to dry. After drying, they were then weighed again for clean weights. The clean weights of the 15-minute run were used as the dirty weights for the next test that used heated ultrasonics for 30 minutes. After following the same process, the parts were cleaned for 30 minutes. After the 30 minutes, they were taken out and left to dry. Clean weights were taken once the pieces were dry. If the part had soil left on it, the soil was removed with a paper towel till part was completely soil free. The parts were then weighed for initials for both runs.

Results: For the 15-minute run, visually the parts still had soil left on the surface, primarily in places where the soil had been clumped or applied heavily. The clumps were inside the grooves of the part. Water Works averaged about 43% removal and Dimethyl Glutarate averaged about 70%, both cleaners were not effective for the removal of grease.

Cleaner	Initial wt. of cont.	Final wt. of cont.	%cont. removal
Water Works	0.5776	0.3299	42.88
Dimethyl Glutarate	0.6179	0.1848	70.09

For the 30-minute run, visually the parts still had soil in the grooves of the part where they had been on the 15-minute run, the 30-minute run removed some but not all clumps. Water Works averaged at 47% removal and Dimethyl Glutarate averaged at about 41%. Both parts were significantly cleaner than after the 15-minute run, but it was not effective for total removal.

Cleaner	Initial wt. of cont.	Final wt. of cont.	%cont. removal
Water Works	0.3299	0.1755	46.80
Dimethyl Glutarate	0.1848	0.1099	40.53

Summary:

Substrates:	Aluminum, Copper, Stainless Steel
Contaminants:	Greases

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Keteca USA	Water Works Heavy Duty Degreaser	2:1	45.00	☐	Water Works was not fully effective for the removal of grease from company parts.
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100%	41.00	☐	Dimethyl Glutarate was not fully effective for the removal of grease from company parts.

Conclusion: Both Water Works and Dimethyl Glutarate were not fully effective for the removal of grease on company parts. TACT strategies will be added, including adding a brushing step, adding a rinsing step and/or trying a higher temperature. Mirachem 500 will also be added and tested along with the other two cleaners.