CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 03/04/2021

Experimenters: Zoe Lawson, Nicole Kebler

ClientType: Bolt, Screw & Nut Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric, Visual

Purpose: To test the removal of grease on aluminum coupons using heated ultrasonics for 30 minutes.

Experimental Procedure: A 2:1 (33%) solution was created for Water Works and Dimethyl Glutarate was used at 100%. Three aluminum coupons per cleaner were pre-weighed for initial weights. They were then soiled 1/3 of the way with black grease that was given to us by the company and were weighed for dirty weights. The solutions were all heated on the hot plate till they reached 105 degrees Fahrenheit then placed in the ultrasonic tank which was also heated to 105 degrees Fahrenheit. Three coupons per cleaner were placed in the solutions and immersed with ultrasonics for 30 minutes. They were then left to dry for over an hour and final weights were taken.

Cleaners:

1. 2:1 Water Works
2. 100% Dimethyl Glutarate

Results: Both cleaners were effective at removing grease from the aluminum coupons. Water Works averaged 80%, visually all that was left was patches of grease where the grease had been applied thick. Dimethyl Glutarate was lower at 69% removal, but only clumps of grease were left where the grease was applied thick.

Cleaner	Initial wt of cont	Final wt of cont	% Removal	Average
Water Works	0.2358	0.0520	77.95	80.95
	0.2538	0.0398	84.32	
	0.3703	0.0719	80.58	
Dimethyl Glutarate	0.4545	0.1719	62.18	68.72
	0.4267	0.1297	69.60	
	0.3681	0.0943	74.38	

Summary:

Substrates:	Aluminum				
Contaminants:	Greases				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100	69.00	☑	Dimethyl Glutarate was effective at removing grease from aluminum.
Keteca USA	Water Works Heavy Duty Degreaser	2:1	81.00	☑	Water Works was effective at removing grease from aluminum.

Conclusion: Both cleaners were effective, grease was applied too thick which resulted in small patches left on the coupon. Next steps are to decrease the amount of grease applied and decrease the time immersed in the ultrasonic tank to check effectiveness at a quicker cleaning time.