CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 03/07/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Chemical Company

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of cleaners with the new rinse step added.

Experimental Procedure: Cleaners were prepared to the following concentrations: Dimethyl Glutarate 100%, Water Works Heavy Duty 7:1, Mirachem 500 20%, Citranox 2%. Three stainless steel coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with the lubricating oil provided by the company and a dirty weight was recorded. Coupons were submerged into their respective cleaners for 15 minutes at room temperature. After 15 minutes had passed, coupons were rinsed in a deionized water bath with a stir bar for agitation to reduce the reapplication of lubricant. As coupons were pulled from the rinse bath, a heat gun was used to blow away any potential lubricant upon removal from the water. Following the rinse process, coupons were dried with a heat gun and allowed to finish drying in air for 24 hours. After the drying period, coupons were weighed again and a clean weight was recorded. Effectiveness of the cleaners was then determined.

Results:

Cleaner	Initial wt of cont	Final wt of cont	%Cont Removed	%AVG
Dimethyl Glutarate	0.0123	0.0010	91.87	96.1%
	0.0680	0.0011	98.38	
	0.0774	0.0015	98.06	
Water Works	0.0813	0.0048	94.09	95.15%
	0.0898	0.0040	95.55	
	0.0669	0.0028	95.81	
Mirachem 500	0.0889	0.0082	90.78	91.29%
	0.0762	0.0065	91.47	
	0.1013	0.0085	91.61	
Citranox	0.0974	0.0000	100.00	99.29%
	0.0774	0.0013	98.32	
	0.0891	0.0004	99.55	

Citranox was the most effective cleaner removing an average of 99.29% of the lubricant from stainless steel coupons. Although the rinse step did aid in removal of the lubricant, residue still formed following the cleaning and drying process on coupons cleaned with Water Works and Mirachem 500. As a result, these products will be dropped from further testing. Next steps would be to progress to parts testing with Metalnox 6386, Dimethyl Glutarate, and Citranox.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Dimethyl glutarate (CAS:1119-40-0)	100%	96.10	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	95.15	☐	Residue build-up still occurred, discontinued from testing.
Mirachem Corporation	Mirachem 500	20%	91.29	☐	Residue build-up still occurred, discontinued from testing.
Alconox Inc	Citranox	2%	99.29	☑	

Conclusion: Upon completion of testing, it was determined that the rinse step was effective in improving removal rates for all cleaners. However, residue build-up still occurred on coupons cleaned with Water Works and

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Mirachem 500. Further testing will not be carried out with these products. Next steps will be to progress to parts testing with Metalnox 6386, Dimethyl Glutarate, and Citranox.