

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 03/02/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Chemical Company

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: The purpose of this experiment was to determine the effectiveness of cleaners in removing the second company soil.

Experimental Procedure: Cleaners were prepared to the following concentrations: Metalnox 6386 100%, 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 metal working 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 dried with a heat gun at the ambient setting to remove excess solution and allowed to finish drying for 24 hours. Following the drying process, coupons were weighed and a clean weight was recorded. Effectiveness of the cleaners was determined.

Results:

Cleaner	Initial wt of cont	Final wt of cont	%Cont Removed	%AVG
Metalnox 6386	0.1243	-0.0009	100.72	101.16%
	0.0654	-0.0011	101.71	
	0.1319	-0.0014	101.06	
Dimethyl Glutarate	0.1985	0.0010	99.50	99.48%
	0.1093	0.0002	99.82	
	0.0691	0.0006	99.13	
Water Works	0.1017	-0.0005	100.49	100.6%
	0.0525	-0.0005	100.95	
	0.1082	-0.0004	100.37	
Mirachem 500	0.0781	0.0004	99.49	99.93%
	0.1140	-0.0002	100.18	
	0.0849	-0.0001	100.12	
Citranox	0.0672	-0.0010	101.49	100.46%
	0.0488	-0.0001	100.20	
	0.0658	0.0002	99.70	

All cleaners were effective at removing the metal working oil from stainless steel substrates. This soil had also quickly evaporated or had been absorbed by the metal as had happened in the previous trial, but enough was pooled onto the coupons for visual proof of soil presence. Throughout the cleaning process, oil droplets formed off the coupons and either fell to the bottom of the beaker, for Metalnox 6386, or rose to the top of the solution, for Dimethyl Glutarate indicating that these cleaners were removing the oil. Water Works had begun to change color throughout the cleaning process. The solution started clear and began to form an opaque light brown color also indicating the removal of soil. Next steps would be to progress testing to the third company soil on stainless steel coupons.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Kyzen Corporation	Metalnox M6386	100%	101.16	<input checked="" type="checkbox"/>	
Fisher Scientific	Dimethyl glutarate (CAS: 1119-40-0)	100%	99.48	<input checked="" type="checkbox"/>	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	100.60	<input checked="" type="checkbox"/>	

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Mirachem Corporation	Mirachem 500	20%	99.93	<input checked="" type="checkbox"/>	
Alconox Inc	Citranox	2%	100.46	<input checked="" type="checkbox"/>	

Conclusion:

Upon completion of testing, it was determined that all cleaners were effective at removing the metal working oil from stainless steel substrates. Next steps would be to progress testing to the third company soil.