CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 07/26/2021

Experimenters: Zoe Lawson, Justin Kiander

ClientType: Metal Finishing

ProjectNumber: Project #3

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 alternatives in removing oil at an increased temperature.

Experimental Procedure: Cleaners were prepared to the following concentrations: Citranox 2%, Mirachem 500 20%, Water Works 7:1, SC Aircraft & Metal 20%, Auqaease 732 5%, Aquavantage 3800 GD 5%. All cleaners were heated to 110°F. Three stainless steel coupons were obtained and weighed for each of the cleaners being tested. Coupons were soiled with a company provided oil and a dirty weight was recorded. Once solutions reached the proper temperature, coupons were submerged into their respective cleaners for 15 minutes. After 15 minutes had passed, coupons cleaned with SC Aircraft & Metal were rinsed in a deionized water bath also at 110°F for 5 minutes. All coupons were then allowed to dry in air for 24 hours. Following the drying period, coupons were weighed again and a clean weight was recorded. Visible residue was still present after the cleaning process, so all coupons were placed into a heated rinse at 110°F for 5 minutes to determine if an additional rinse could remove the soil.

Results:

Cleaner	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG
Citranox	0.0714	0.0124	82.63	86.47
	0.1523	0.0125	91.79	
	0.0899	0.0135	84.98	
Mirachem 500	0.1303	0.0126	90.33	90.67
	0.1600	0.0117	92.69	
	0.1327	0.0146	89.00	
Water Works	0.0980	0.0108	88.98	91.26
	0.1932	0.0126	93.48	
	0.1245	0.0108	91.33	
SC Aircraft & Metal	0.1142	0.0098	91.42	91.00
	0.1122	0.0127	88.68	
	0.1704	0.0121	92.90	
Aquaease 732	0.1553	0.0074	95.24	92.80
	0.1194	0.0118	90.12	
	0.2443	0.0170	93.04	
Aquavantage 3800 GD	0.0933	0.0099	89.39	91.61
	0.1384	0.0099	92.85	
	0.1363	0.0101	92.59	

Aquaease 732 was the most effective cleaner removing an average of 92.80% of oil from stainless steel substrates. However, after the cleaning process there was still visible oil residue on all coupons. A secondary rinse step was performed, but was ineffective at removing the residue. Next steps would be to add agitation to the cleaning process and maintain the increased temperature.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Citranox	2%	86.47	☑	
Mirachem Corporation	Mirachem 500	20%	90.67	☑	
Keteca USA	Water Works Heavy Duty Degreaser	7:1	91.26	☑	

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Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	91.00	☑	
Hubbard Hall Inc	Aquaease PL 732	5%	92.80	☑	
Brulin Corporation	Aquavantage 3800 GD	5%	91.61	☑	

Conclusion: Upon completion of testing, it was determined that Aquaease 732 was the most effective cleaner removing an average of 92.80% of soil from stainless steel substrates. All cleaners showed improvement under increased temperature. However, lingering residue is still present after cleaning. Next steps would be to incorporate agitation into the cleaning process to remove the residue.