CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 07/18/2021

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 with an added deionized water rinse step.

Experimental Procedure: Cleaners were prepared to the following concentrations: Citranox 2%, Mirachem 500 20%, Water Works Heavy Duty Degreaser 7:1, SC Aircraft & Metal 20%, Aquaease 732 5%, Aquavantage 3800 GD 5%. Three stainless steel coupons were obtained and weighed for each of the cleaners being tested. Coupons were then soiled with an 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 for 30 seconds. Coupons were allowed to dry in air for 24 hours. Following the drying process, coupons were weighed again 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
Citranox	0.0135	0.0111	17.78	11.05
	0.0102	0.0152	-49.02	
	0.0472	0.0168	64.41	
Mirachem 500	0.0468	0.0173	63.03	68.38
	0.0631	0.0168	73.38	
	0.0550	0.0172	68.73	
Water Works	0.0435	0.0210	51.72	53.25
	0.0349	0.0195	44.13	
	0.0565	0.0204	63.89	
SC Aircraft & Metal	0.0904	0.0172	80.97	67.42
	0.0481	0.0162	66.32	
	0.0353	0.0159	54.96	
Aquaease 732	0.0777	0.0191	75.42	51.59
	0.0494	0.0184	62.75	
	0.0235	0.0196	16.60	
Aquavantage 3800 GD	0.0913	0.0154	83.13	70.57
	0.0370	0.0179	51.62	
	0.0755	0.0174	76.95	

All cleaners, with the exception of SC Aircraft & Metal, performed significantly worse with the added deionized water rinse step. Oil residues were visibly present on all coupons following the cleaning process. The decreased performance could be attributed to oil re-coating the coupon as they were being pulled from the water bath. Next steps would be to progress all cleaners to heated immersion and remove the deionized water bath for all cleaners except SC Aircraft & Metal.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Citranox	2%	11.05	☐	
Mirachem Corporation	Mirachem 500	20%	68.38	☐	
Keteca USA		7:1	53.25	☐	

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	Water Works Heavy Duty Degreaser				
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	67.42	☐	Only cleaner to improve with deionized water rinse
Hubbard Hall Inc	Aquaease PL 732	5%	51.59	☐	
Brulin Corporation	Aquavantage 3800 GD	5%	70.57	☐	

Conclusion: Upon completion of testing, it was determined that almost all cleaners performed worse with the added deionized water rinse. The only cleaner to show improvements with the rinse was SC Aircraft & Metal. Next steps would be to progress all cleaners to heated immersion trials and remove the rinse step for all except SC Aircraft & Metal.