CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 05/27/2019

Experimenters: Julia Doyle

ClientType: Machinery Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate how well enzymatic and aqueous cleaners remove gundrill oil and coolant from stainless steel alloy.

Experimental Procedure: Initial weights were obtained for 12 stainless steel coupons, three for each cleaner, before soiling with gundrill oil/coolant mixture on half of the coupon on one side. All coupons were weighed again to obtain a dirty weight. Three coupons were immersed in each cleaner for 30 minutes while making observations every five minutes. Coupons were removed from cleaners and allowed to air dry for one hour at room temperature (68 F) before taking final weights.

Chemistries Evaluated:

1. Ozzy Juice SW 3 (No Enzymes) 100%
2. Ozzy Juice SW 4 (No Enzymes) 100%
3. Crystal Simple Green Industrial Cleaner 1:4
4. Buckeye Immersion Cleaner 1:10

Results: Both Ozzy Juice cleaners did well at removing oil/coolant from the coupons and were over 90% removal. Both Crystal and Buckeye were not efficient at cleaning oil/coolant off of the stainless-steel coupons. Clean weights were originally less than initial weights, so initial weights were re-done once all coupons were cleaned. The error in this experiment is due to mechanical error with the scale. Coupons were heated with a heat gun for five minutes. Some coupons still had visible residue on them, so all coupons were wiped with paper towel to remove excess residue.

Cleaner	Initial weight of cont.	Final weight of cont.	% Removal	Average
Ozzy Juice SW-3	0.0124	0.0005	95.96	98.87
	0.0157	0.0004	97.45	
	0.0125	-0.0004	103.20	
Ozzy Juice SW-4	0.0154	0.0001	99.35	104.56
	0.0173	-0.0001	100.57	
	0.0167	-0.0023	113.77	
Crystal Simple Green Industrial cleaner	0.0199	0.0039	80.40	66.53
	0.0192	0.0080	58.33	
	0.0161	0.0063	60.86	
Buckeye Immersion Cleaner	0.0163	0.0039	76.07	75.24
	0.0118	0.0032	72.88	
	0.0155	0.0036	76.77	

Summary:

Substrates:	Stainless Steel
Contaminants:	Oil

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	100%	98.87	☑	Ozzy Juice SW-3 was effective at removing oil/coolant from stainless steel coupons.
Chem Free Corporation	SW-4 Ozzy Juice Degreasing Solution	100%	104.56	☑	Ozzy Juice SW-4 was effective at removing oil/coolant from stainless steel coupons.

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Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	1:4	66.53	☐	Crystal Simple Green was not effective at removing oil/coolant from stainless steel coupons.
Buckeye International	Immersion Cleaner	1:10	75.24	☐	Buckeye Immersion Cleaner was not effective at removing oil/coolant from stainless steel coupons.

Conclusion: Because some cleaners had removal rates of over 100%, results will need to be verified with another experiment due to mechanical error with the scale. Re-run Ozzy Juice SW 3 and 4; run Crystal Simple Green Industrial Cleaner and Buckeye Immersion Cleaner with heated ultrasonic. A rinse and dry step would need to be refined for coupons.