CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 06/03/2019

Experimenters: Julia Doyle

ClientType: Machinery Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate how well enzymatic and aqueous cleaners remove gundrill oil and coolant from stainless steel alloy. Re-doing the unheated immersion test for Ozzy Juice SW-3 and Ozzy Juice SW-4 because of scale error in last test. Crystal Simple Green will be tested at room temperature using ultra sonics and Buckeye Immersion Cleaner will be tested at 140F using heated ultra sonics.

Experimental Procedure: Initial weights were obtained for 12 2”x2” stainless steel alloy coupons. All coupons were soiled with gundrill oil/coolant mixture on half of the coupon on one side. All coupons were reweighed to obtain a dirty weight. Three coupons were immersed in both the Ozzy Juice SW 3 and Ozzy Juice SW 4 for 30 minutes while making observations every ten minutes. Three coupons were immersed in both the Crystal Simple Green Industrial Cleaner and Buckeye Immersion Cleaner and both were placed in an ultrasonic machine for 30 minutes; Crystal Simple Green at room temperature (68 F̊) and Buckeye Immersion Cleaner at 140 F̊. Coupons were removed from cleaners and rinsed with DI water by dunking each coupon three times. Coupons were air dried for one hour at room temperature (68 F̊). Clean weights were taken immediately after air drying.

Chemistries Evaluated:

1. Ozzy Juice SW 3 - 100%
2. Ozzy Juice SW 4 - 100%
3. Crystal Simple Green Industrial Cleaner - 1:4
4. Buckeye Immersion Cleaner - 1:10

Results: Visually all cleaners did well for the removal of oil/coolant on stainless steel coupons but gravimetrically were not over 90% efficient. Buckeye immersion cleaner was highest at 86.15% removal and next was Ozzy Juice SW-4 at 85.03% removal. Simple green had an average of 84.64% removal. Lastly, Ozzy Juice SW-3 did the worst with 75.19% removal. All were not effective for the removal of oil/coolant.

Cleaner	Initial weight of cont.	Final weight of cont.	% Removed	Average
Ozzy Juice SW-3	0.0115	0.0022	80.87	75.19
	0.0080	0.0020	75.00	
	0.0066	0.0020	69.70	
Ozzy Juice SW-4	0.0161	0.0018	88.82	85.03
	0.0098	0.0020	79.59	
	0.0105	0.0014	86.67	
Crystal Simple Green	0.0191	0.0018	90.58	84.64
	0.0098	0.0015	84.69	
	0.0103	0.0022	78.64	
Buckeye Immersion Cleaner	0.0128	0.0018	85.94	86.15
	0.0091	0.0012	86.81	
	0.0098	0.0014	85.71	

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%	75.19	☐	Ozzy Juice SW-3 was not effective for the removal of oil/coolant from stainless steel coupons.
		100%	85.03	☐	

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Chem Free Corporation	SW-4 Ozzy Juice Degreasing Solution				Ozzy Juice SW-4 was not effective for the removal of oil/coolant from stainless steel coupons.
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	1:4	84.64	☐	Crystal Simple Green was not effective for the removal of oil/ coolant from stainless steel coupons.
Buckeye International	Immersion Cleaner	1:10	86.15	☐	Buckeye Immersion Cleaner was not effective for the removal of oil/ coolant from stainless steel coupons.

Conclusion: All coupons appeared to be clean when analyzing them visually, but gravimetrically, the cleaners were not effective. Plan to make Crystal Simple Green Industrial Cleaner and Buckeye Immersion Cleaner more concentrated; continue with ultrasonics.