CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2016
DateRun:	08/24/2016
Experimenters:	George Liang, Vinh Tran
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate supplied products for Green Seal GS 34 soil removal at a higher concentration of cleaning product.

Experimental Procedure:

There are two types of Green Seal GS 34 soil; one being maintenance soil and the second being production soil. The two types of soils were prepared individually. The first soil, maintenance soil, consisted of 10 grams of carbon black, 10 grams of iron oxide, 100 mL WD-40, 100 mL hydraulic oil, and 100 mL gear oil. Each component was placed in a 750 mL beaker and mixed for 20 minutes at room temperate using a magnetic stirrer. The second soil, production soil, was made by mixing 200 mL Quench Oil and 200 mL cutting oil for 20 minutes at room temperature using a magnetic stirrer in a second 750 mL beaker.

Approximately 100 mg of each soil was applied to a pre-cleaned and pre-weighed stainless steel coupon onto one side only with a hand held swab. The maintenance soils for all three coupons were baked in an oven for 30 minutes at a temperature of 40oC (105F). For the production soil, three coupons were baked in an oven for 30 minutes at a temperature of 105 oC (220F). The coupons were then allowed to cool to room temperature and weighed a second time. A 10% diluted cleaning solution was prepared in a 600 mL beaker to make a total of 500mL of cleaning solution; the solution consisted of 450 mL of water and 50mL of the corresponding cleaning product. A 20% diluted cleaning solution was prepared in a 600 mL beaker to make a total of 500 mL of cleaning solution; the solution consisted of 400 mL of water and 100 mL of the corresponding cleaning product.
The following cleaning procedure was used for the 10% and 20% diluted cleaning products. Three stainless steel coupons were suspended into each 500mL diluted cleaning product solution, allowing the entire contaminated surface to be submerged in the cleaning solution. The coupons were washed for 20 minutes using immersion cleaning only at room temperature.

The washing was followed by two rinse steps. The coupons were drained for 30 seconds prior to each rinse step, for reach rinse step a 20 minute soak in water was utilized. After the two rinse steps, all coupons were first allowed to air dry for 30 minutes and then dried in an oven at 105 oC for 30 minutes. The coupons were then cooled to room temperature and final weights were measured.

Results:

At 10% Dilution Cleaning Solution:						
Contaminants	Cleaner	Initial wt	Final wt	% Removal	% Avg	% Overall
Production Soil	Logos	62.8580	62.8913	66.57		
		62.6971	62.7434	47.51		
		62.6148	62.6617	47.66	53.91	
Maintenance Soil	Logos	62.1318	62.2209	10.00		
		62.6390	62.7297	10.02		
		62.7564	62.8439	10.16	10.06	31.99
Production Soil	Simple Green	64.2918	64.3145	62.42		
		63.9835	64.0232	60.02		
		62.8308	62.8554	65.16	62.53	
Maintenance Soil	Simple Green	62.6179	62.7087	10.19		
		62.3932	62.4821	10.11		
		62.6750	62.7652	10.52	10.27	36.40
At 20% Dilution Cleaning Solution:						
Contaminants	Cleaner	Initial wt	Final wt	% Removal	% Avg	% Overall
	Logos	60.8405	60.8961	45.44		

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Production Soil						
		60.9246	60.9735	47.70		
		60.4788	60.5264	52.16	48.43	
Maintenance Soil	Logos	60.7493	60.8299	12.01		
		60.4771	60.5647	9.88		
		60.6745	60.7613	3.98	8.62	28.53
Production Soil	Simple Green	60.5426	60.5662	75.05		
		61.0394	61.0795	48.52		
		59.3723	59.4125	59.27	60.95	
Maintenance Soil	Simple Green	60.3495	60.4338	13.54		
		60.8348	60.9225	10.78		
		60.5609	60.6463	11.23	11.85	36.40

Summary:

Substrates:	Stainless Steel
Contaminants:	Oil

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Logos Technologies	NatSurFact A	10	31.99	☐	
Logos Technologies	NatSurFact A	20	28.53	☐	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	10	36.40	☐	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	20	36.40	☐	

Conclusion:

Both cleaning products were not effective at removing the maintenance and production soil at 10% and 20% dilution of the cleaning product, because a typical effective cleaning product would have a percent removal of 85% or higher. There was not a noticeable amount of percent removal difference with an increase of the cleaning product concentration from 10% to 20%. However, the cleaning product Simple Green GS was slightly more effective at removing the soil compared to the cleaning product from Logos. In addition, both cleaning products were more effective at removing production soil than maintenance soil. There are no signs of corrosion on the substrates.