CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2015

DateRun: 05/04/2015

Experimenters: Loc Nguyen, Digvijay Devkota

ClientType:

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate the efficiency one cleaner on GS 34 Soil-1 and GS 34 Soil- 2 from stainless steel coupons using manual wipe and immersion technique.

Experimental Procedure: Twelve sets of stainless-steel coupons were weighed, each set consist of three coupons. The first six sets were soiled with GS 34 Soil-1 and the other six sets were soiled with GS 34 Soil-2. Both soils were applied at the loading of ~100mg. The soiled coupons were oven dried for 30 minutes with 40 °C for GS 34 Soil-1 and 105 °C for GS 34 Soil-2. Dirty weights were recorded for all of the coupons.

The Naturama Degreaser was supplied ready to use concentration. For manual wipe testing, three coupons were placed in a Gardner Straightline Washability unit and spray with a cleaning solution and allowed to soak for 1 minute. After soaking, the unit was run for 20 cycles (33 seconds) followed by a quick spray rinse using tap water at room temperature. Final weights were recorded the following day. Efficiencies were calculated and recorded. For Immersion testing, three coupons were placed in a 500mL beaker and fully immersed in Naturama Degreaser for 30 minutes. Coupons were placed standing up and soiled side facing away from one another. Coupons were left to dry overnight after the immersion process. Final weights were taken the next day.

Soil 1: Maintenance soil = 10 grams of carbon black, 10 grams iron oxide, 100 ml WD-40, 100 ml hydraulic oil, and 100 ml gear oil.
Soil 2: Production soil = 200 ml Quench Oil and 200 ml cutting oil

Results:

Cleaner	Initial wt	Final wt	% Removed	% Average Removed
Greenlife_Naturama_GS34_1_Soil_ManualWipe_StainlessSteel				
	0.0643	0.0023	96.42	
	0.1599	-0.0008	100.5	
	0.0867	0.0041	95.27	
	0.1230	-0.0002	100.16	
	0.0931	0.0034	96.35	
	0.0518	-0.0005	100.97	
	0.0753	0.0036	95.22	
	0.0800	-0.0026	103.25	
	0.0716	0.0002	99.72	98.65
Greenlife_Naturama_GS34_2_Soil_ManualWipe_StainlessSteel				
	0.1333	0.0026	98.05	
	0.1335	0.0028	97.90	
	0.1464	0.0067	95.42	
	0.1039	0.0038	96.34	
	0.1590	0.0042	97.36	
	0.1355	0.0002	99.85	
	0.1513	0.0072	95.24	
	0.2120	0.0038	98.21	
	0.1979	0.0038	98.08	97.38
Greenlife_Naturama_GS34_1_Soil_Immersion_StainlessSteel				
	0.0329	0.0317	3.65	
	0.0809	0.0809	0.00	
	0.0309	0.0322	-4.21	
	0.0317	0.0352	-11.04	
	0.0632	0.0750	-18.67	
	0.0428	0.0439	-2.57	

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	0.0321	0.0497	-54.83	
	0.0834	0.0577	30.82	
	0.0095	0.0163	-71.58	-14.27
Greenlife_Naturama_GS34_2_Soil_Immersion_StainlessSteel				
	0.1342	0.0150	88.82	
	0.1165	0.0143	87.73	
	0.1244	0.0483	61.17	
	0.1099	0.0114	89.63	
	0.1659	0.0117	92.95	
	0.1322	0.0065	95.08	
	0.2061	0.0799	61.23	
	0.1477	0.0003	99.80	
	0.1998	0.0000	100.00	86.27

Based on our previous result, we conducted a retest of the Naturama Degreaser with maintenance soil (Soil 1) which resulted in the following:

Initial wt	Final wt	% Average	Overall Ave
0.0835	0.0925	-10.78	
0.0924	0.1059	-14.61	
0.0852	0.0976	-14.55	
0.1025	0.1113	-8.59	
0.0917	0.0986	-7.52	
0.0926	0.1062	-14.69	
0.0964	0.1072	-11.2	
0.0813	0.0906	-11.44	
0.0857	0.0955	-11.44	-0.48

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Green Life Development, Inc	Naturama	100	98.65	☑	

Conclusion:

The Naturama Degreaser was very effective in the removal of GS-34 soils during manual wipe testing. The highest removal efficiency was approximately 99% for maintenance soil (soil1) and 97% for production soil (soil 2) on the stainless-steel coupons. During immersion testing, Naturama Degreaser was only effective on soil 2 at 86%. Using immersion testing on soil 1 showed an efficiency of less than 1%. A follow up test showed a similar result of less than 1% removal efficiency for immersion testing of soil 1.