CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2014

DateRun: 11/12/2014

Experimenters: Loc Nguyen, George Liang

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate the efficiency of three cleaners on GS 34 Soil-1 and GS 34 Soil- 2 from stainless steel coupons using immersion technique.

Experimental Procedure: Two sets of stainless-steel coupons were weighed. The first set was soiled with GS 34 Soil-1 and the other set was 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 cleaning product was Elevance , which was diluted to 10%, 50%, and 100%. Three coupons were placed in a Gardner Straightline Washability unit and spray with a cleaning solution and allowed to soak for 20 minutes. 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.

A third set of coupons for the maintenance soil was run with no dwell time of the cleaning solution. Product was sprayed on and with 10 seconds rinsed off with tap water.

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

Chemistries Evaluated: Elevance 10%, Elevance 50%, Elevance 100%;

Results:

Cleaner	Initial wt	Final wt	% Removed
ElevanceCleaner_10%			
GS34Production_StainlessSteel	0.1067	0.0044	95.88
	0.1055	0.0015	98.58
	0.0835	0.0021	97.49
ElevanceCleaner_50%			
GS34Production_StainlessSteel	0.0762	0.0072	90.55
	0.1032	0.0031	97
	0.1039	0.0022	97.88
ElevanceCleaner_100%			
GS34Production_StainlessSteel	0.116	0.0182	84.31
	0.111	0.0175	84.23
	0.1077	0.0056	94.8
ElevanceCleaner_10%			
GS34Maintenance_StainlessSteel	0.0796	0.0085	89.32
	0.1211	0.0068	94.38
	0.1123	0.0069	93.86
ElevanceCleaner_50%			
GS34Maintenance_StainlessSteel	0.0958	0.0051	94.68
	0.0972	0.0042	95.68
	0.0907	0.0035	96.14
ElevanceCleaner_100%			
GS34Maintenance_StainlessSteel	0.0995	0.0038	96.18
	0.0962	0.0031	96.78
	0.0958	0.0049	94.89

Summary:

Substrates:	Stainless Steel

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Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Elevance Renewable Sciences Inc	Elevance CleanTM 1200	10	94.92	☑	
Elevance Renewable Sciences Inc	Elevance CleanTM 1200	50	95.30	☑	
Elevance Renewable Sciences Inc	Elevance CleanTM 1200	100	91.87	☑	

Conclusion: When cleaning the production soil, the efficiency decreased with increases in concentration. The highest performing cleaner for the production soil was the 1% dilution, followed closely by the 50% dilution and then the 100% dilution. For the maintenance soil, this trend was reversed, so the highest performing cleaner was the highest dilution. Each concentration was effective in cleaning the coupons. Based on the trends in effectiveness, the 50% dilution is recommended for cleaning applications.