CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2013
DateRun:	05/20/2013
Experimenters:	Jonathan Oljey
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Oil
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate various concentrations of supplied products for Green Seal GS 34 degreasing standard.

Experimental Procedure:

Two types of soils were prepared individually. The first soil, maintenance soil, consisted of 10 grams of carbon black, 10 grams iron oxide, 100 ml WD-40, 100 ml hydraulic oil, and 100 ml gear oil. Each component was placed in a 750 beaker and mixed for 20 minutes at room temperature 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 precleaned and preweighed stainless steel coupon onto one side only with a hand held swab. No soil was applied to the two control coupons. The maintenance soil for all three coupons was baked in an oven for 30 minutes at a temperature of 40° C (105 F). For the production soil, all three coupons were baked in an oven for thirty minutes at 105° C (220 F). The coupons were then allowed to cool to room temperature and weigh a second time (soiled mass = B).

Both cleaning products were diluted to 10:1 (~9.09%). The solution was preheated to 40 C (105 F). Six 600 mL beakers were filled with enough fresh degreaser solution to completely submerge the coupons in the degreasing solution without any overflow. The six beakers were suspended in the heated tank and allowing the temperature in the cleaning bath and beakers to equilibrate.

Coupons were suspended in each beaker, allowing the entire contaminated surface to be submerged in the cleaning solution. The coupons were washed for 20 minutes using immersion cleaning only. The washing was followed by two rinse steps. The coupons were drained for 30 seconds prior to each rinse step. For each rinse step a 20 minute soak 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° C for 30 minutes. The coupons were then cooled to room temperature and final weights were measured (mass of the coupon after cleaning = C).

Chemistries Evaluated: 9.1% Simple Green, 9.1% Super Green, 100% Simple Green, 100% Super Green

Results:

The supplied cleaning product was not successful at removing the Maintenance soil using immersion cleaning at 105F. However, the more than 90% of the Process soil cleaning was removed by both products when used at the diluted level. Full strength products were more effective (>80%) on the maintenance soil.

Cleaner	Initial wt	Final wt	% Removed
Simple Green 9.1% - GS34 S&M			
	0.0797	0.0545	31.62
	0.0914	0.0770	15.75
Simple Green 9.1% - GS34 PROD			
	0.1049	0.0073	93.04
	0.1069	0.0001	99.91
Super Green 9.1% - GS34 S&M			
	0.0917	0.0800	12.76
	0.0941	0.0613	34.86
Super Green 9.1% - GS34 PROD			
	0.1048	0.0050	95.23
	0.1058	0.0159	84.97
Simple Green 100% - GS34 S&M			
	0.0932	0.0193	79.29
	0.0921	0.0011	98.81

CLEANING LABORATORY EVALUATION SUMMARY

Super Green 100% - GS34 S&M			
	0.0897	0.0288	67.89
	0.0864	0.0037	95.72

Summary:

Substrates:	Stainless Steel
Contaminants:	Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	9.1	23.69	☐	maintenance soil
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	100	89.05	☑	maintenance soil
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	9.1	96.47	☑	production soil
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
NuGeneration Technologies, LLC	Super Green Multipurpose Cleaner & Degreaser	9.1	23.81	☐	maintenance soil
NuGeneration Technologies, LLC	Super Green Multipurpose Cleaner & Degreaser	100	81.81	☑	maintenance soil
NuGeneration Technologies, LLC	Super Green Multipurpose Cleaner & Degreaser	9.1	90.10	☑	production soil

Conclusion: The 9.1% dilutions were not effective at removing the maintenance soil from the coupons. The pure dilutions were effective at removing the production and maintenance soil from the coupons.