CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 10/27/2004

Experimenters: Jason Marshall, Lily Xu

ClientType: General

ProjectNumber: Project #1

Substrates: Ceramics, Fiberglass, Chrome

PartType: Coupon

Contaminants: Hucker's Soil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate biobased alternatives for all purpose cleaning.

Experimental Procedure: The cleaning products were used at vendor recommended concentrations. Products that were not at 100% were diluted with DI (deionized) water for all purpose cleaning. Pre-weighed coupons of fiberglass, ceramic and chrome were coated with Hucker's Soil and allowed to dry overnight at ambient temperature. The contaminated coupons were weighed using a Denver Instrument Model A-250 analytical balance to determine the amount of soil added (i.e., initial weight).

The coupons were placed in a Gardner Straight Line Washability unit, as referenced in ASTM International (formerly the American Society for Testing and Materials) standards and by CSPA, the Consumer Specialty Products Association's (formerly CSMA) detergent compendium. A professional painter's rag was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The cleaning unit was run for 20 cycles (approx. 33 seconds). The coupons were wiped once with a dry paper towel. Gravimetric weights were recorded once more, from which the remaining soil (i.e., final weight) can be determined.

Results: All of the products tested removed over 90% of the soil on average from the three surfaces. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

	Fiberglass			Ceramic			Chrome		
Cleaner	Initial wt	Final wt	% Removed	Initial wt	Final wt	% Removed	Initial wt	Final wt	% Removed
Bi-O-Kleen AP	0.1167	0.0030	97.43	0.1276	0.0048	96.24	0.0892	0.0002	99.78
	0.2294	0.0022	99.04	0.1521	0.0012	99.21	0.0747	0.0006	99.20
	0.1596	0.0022	98.62	0.1463	0.0011	99.25	0.0912	0.0012	98.68
VPW SC 1000	0.1448	0.0020	98.62	0.1147	0.0010	99.13	0.0680	0.0000	100.00
	0.2485	0.0020	99.20	0.1752	0.0044	97.49	0.0924	0.0002	99.78
	0.2407	0.0007	99.71	0.1208	0.0028	97.68	0.1041	0.0002	99.81
Eco All Purpose	0.2010	0.0014	99.30	0.1267	0.0024	98.11	0.1089	0.0004	99.63
	0.1875	0.0028	98.51	0.1114	0.0005	99.55	0.1098	0.0001	99.91
	0.2123	0.0007	99.67	0.1648	0.0043	97.39	0.1102	-0.0001	100.09

Overall Average from previous data sent to client on current cleaners
H2Orange2 concentration 2.9% efficiency 91.70%
Grout Safe 0.8% 95.28%

Summary:

Substrates:	Ceramics, Fiberglass, Chrome				
Contaminants:	Hucker's Soil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Bi-O-Kleen Industries	Bi-O-Kleen Cleaner & Degreaser	2	98.61	☑	
Orison Marketing	VPW SC 1000	20	99.05	☑	
Lifetime Solutions Ltd	Eco All Purpose	12	99.13	☑	

Conclusion: The products tested had efficiencies greater than the client's current all purpose cleaner.