CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 11/22/2004

Experimenters: Jason Marshall, Heidi Wilcox

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Ceramics, Glass/Quartz, Plastic

PartType: Coupon

Contaminants: Hucker's Soil

Cleaning Methods: Low Pressure Spray

Analytical Methods: Gravimetric

Purpose: To evaluate products using a home dishwasher in place of an industrial research spray washer

Experimental Procedure: Three substrates were selected to represent possible materials that would be cleaned in a dishwasher. Two cleaning products were tested and compared to each other and to water. One scoop of a product was added to the Maytag home dishwasher. Jet-Dry rinse aid was added to the machine.

Six coupons of each substrate were contaminated with Hucker's soil using a hand held swab and allowed to sit for 24 hours. A second set of weights were recorded to determine the amount of soil added to each coupon. In addition to the six coupons that were contaminated, three uncontaminated coupons were included in the washing cycle as a way to determine redeposition of the contaminant onto the surface of the coupons. Therefore nine coupons per substrate were cleaned in the dishwasher (27 total). The cleaning cycle operated at 160 F and run for 50 minutes. At the end of the cleaning/rinsing, the coupons were removed from the unit and allowed to air dry for 48 hours. At the end of the air drying, final weights were recorded and efficiencies were calculated.

Results: Both dishwashing products worked better than water alone on the Hucker's soil under the cleaning conditions. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon and substrate cleaned.

Cleaner	Initial wt	Final wt	Ceramic %	Initial wt	Final wt	Glass %	Initial wt	Final wt	Plastic%
Water	0.3460	0.0814	76.47	0.1803	0.0004	99.78	0.2474	0.0238	90.38
	0.2251	0.0431	80.85	0.211	0.0015	99.29	0.1375	0.0054	96.07
	2.1914	0.3131	85.71	0.1774	0.0017	99.04	0.3809	0.0153	95.98
	0.6356	0.0725	88.59	0.2527	0.0023	99.09	0.2473	0.0135	94.54
	1.0981	0.2328	78.80	0.1706	0.0008	99.53	0.2994	0.0050	98.33
	0.4674	0.0476	89.82	0.1632	0.0010	99.39	0.2021	0.0085	95.79
Cascade	0.3065	0.0092	97.00	0.2457	0.0003	99.88	0.3112	0.0079	97.46
	0.3138	0.0124	96.05	0.4853	0.0006	99.88	0.0978	0.0058	94.07
	0.8656	0.2287	73.58	0.2321	0.0003	99.87	0.1922	0.0037	98.07
	0.395	0.0292	92.61	0.3312	0.0001	99.97	0.2749	0.0036	98.69
	2.0125	0.2045	89.84	0.2054	0.0007	99.66	0.1877	0.0012	99.36
	0.3751	0.0248	93.39	0.2652	0.0016	99.40	0.9729	0.0010	99.90
Cogent	0.3224	0.0316	90.20	0.3096	0.0000	100.00	0.2464	0.0157	93.63
	0.5518	0.0409	92.59	0.1429	0.0006	99.58	0.2279	0.0021	99.08
	0.4962	0.0297	94.01	0.2544	0.0011	99.57	0.2887	0.0086	97.02
	1.1471	0.286	75.07	0.2722	0.0009	99.67	0.3457	0.0018	99.48
	0.4596	0.0547	88.10	0.2489	0.0004	99.84	0.2337	0.0047	97.99
	1.2510	0.1396	88.84	0.2584	0.0009	99.64	0.2960	0.0077	97.40

Substrate Summary

	Ceramic %	Glass %	Plastic %
Water	83.37	99.35	95.18
Cascade	90.41	99.78	97.93
Cogent	88.13	99.72	97.43

Again the ceramic coupons cleaned with the Cascade were the only control coupons to gain substantial weight during cleaning.

	Ceramic	Glass	Plastic
Water	-0.0562	0.0018	0.0042

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Cascade	0.0283	0.0005	0.0011
Cogent	0.0169	0.0003	0.0017

Summary:

Substrates:	Ceramics, Glass/Quartz, Plastic				
Contaminants:	Hucker's Soil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Water	Water	100	92.64	☑	
Procter & Gamble	Cascade Complete (Dawn)		96.04	☑	1 scoop
Cogent Environmental Solutions	F103		95.09	☑	1 scoop

Conclusion: The Cogent and Cascade products compared very closely to each other when cleaning was performed in the Maytag dishwasher.