CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2007
DateRun:	10/25/2007
Experimenters:	Jason Marshall, Shweta Bansal
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Glass/Quartz, Plastic, Stainless Steel
PartType:	Coupon
Contaminants:	Greases, Dirt, Hucker's Soil
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Gravimetric
Purpose:	To evaluate requested products for automatic dish washing.
Experimental Procedure:	Three substrates, stainless steel, plastic and glass, were selected to represent possible materials that would be cleaned in a dishwasher. Three cleaning products were tested and compared to each other and to water. Each product was added to the Maytag home dishwasher so that the dispenser was half full. Each substrate was contaminated with a 50:50 mix of Hucker's soil and SSL's kitchen 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 coated coupons, three uncontaminated coupons were included in the washing cycle as a way to determine re-deposition of the contaminant onto the surface of the coupons. The cleaning cycle operated at 160 F and run for hour and half. At the end of the cleaning/ rinsing/ drying, the coupons were removed from the unit, final weights were recorded and efficiencies calculated.
Results:	Two of the products were successful in removing the hucker-kitchen soil mix from the three substrates. When tested with water alone, only 60% of the soil was removed. In addition, the plastic coupons, when washed with water alone came out looking grey and were coated on both sides with a thin layer of the soil mix. The table lists the amount of soil added, the amount remaining, the efficiency for each coupon cleaned and the average removal from each substrate type.

Cleaner	Initial wt	Final wt	% Removed	Substrate Ave	Product Average
Cascade gl	0.1431	-0.0011	100.77	100.74	96.48
	0.1830	0.0042	97.70		
	0.1011	-0.0038	103.76		
Cascade pl	0.1644	0.0107	93.49	89.22	
	0.1204	0.0220	81.73		
	0.2371	0.0179	92.45		
Cascade ss	0.4048	-0.0005	100.12	99.46	
	0.3528	0.0000	100.00		
	0.4298	0.0075	98.26		
Seventh gl	0.2876	0.0001	99.97	100.48	83.57
	0.1273	-0.0013	101.02		
	0.0891	-0.0004	100.45		
Seventh pl	0.1640	0.0181	88.96	57.51	
	0.1468	0.0814	44.55		
	0.1305	0.0796	39.00		
Seventh ss	0.2521	0.0412	83.66	92.74	
	0.1269	0.0003	99.76		
	0.1440	0.0075	94.79		
DFC gl	0.1574	-0.0006	100.38	96.99	88.42
	0.1219	0.0123	89.91		
	0.1199	-0.0008	100.67		
DFC pl	0.0975	0.0334	65.74	68.95	

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	0.1131	0.0552	51.19		
	0.1408	0.0142	89.91		
DFC ss	0.1747	0.0017	99.03	99.33	
	0.2520	0.0009	99.64		
	0.1351	0.0009	99.33		
	0.1800	0.0977	45.72	46.12	61.71
	0.1301	0.0973	25.21		
	0.3624	0.1180	67.44		
	0.2284	0.0102	95.53	80.68	
	0.3432	0.1572	54.20		
	0.2505	0.0193	92.30		

Blank samples weight changes were measured using a unsoiled coupon cleaned along with the contaminated coupons. Only the plastic coupons had an noticeable increase in weights. The weight change and percent change are listed in the table below.

water pl	0.1800	0.0977	45.72	46.12	61.71
	0.1301	0.0973	25.21		
	0.3624	0.1180	67.44		
water gl	0.2284	0.0102	95.53	80.68	
	0.3432	0.1572	54.20		
	0.2505	0.0193	92.30		
water ss	0.2041	0.0940	53.94	58.32	
	0.1435	0.0594	58.61		
	0.1916	0.0720	62.42		

Summary:

Substrates:	Glass/Quartz, Plastic, Stainless Steel
Contaminants:	Greases, Dirt, Hucker's Soil

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Procter & Gamble	Cascade Complete (Dawn)		96.48	☑	
Seventh Generation	Free & Clear Automatic Dish Gel		83.57	☐	
Cogent Environmental Solutions	DFC GPC Polish		88.42	☑	
Water	Water	100	61.71	☐	

Conclusion:

Cascade and DFC GPC Polish removed over 85% of the soil mix using spray washing and did not resoil the coupons during the washing process. Water alone resulted in the plastic coupons becoming resoiled.