CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2012
DateRun:	11/02/2012
Experimenters:	Nathalie Regis, Anni Geng
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Ceramics, Plastic, Steel
PartType:	Coupon
Contaminants:	Greases, Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric
Purpose:	To evaluate three supplied products for all purpose cleaning following EPA DfE requirements

Experimental Procedure:

The four supplied cleaning products were diluted with DI water at room temperature to vendor recommended concentration for all purpose cleaning (32:1, 8:1 and 1:1). The fourth product was used at the RTU concentration.

Preweighed ceramic, plastic and painted steel coupons were coated with a mixture of three cooking oils/ greases. The mix was blend of 33% vegetable shortening, 33% lard, 33% vegetable oil and 1% carbon black. Care was taken in the application of the soil onto the coupons so that light and heavy areas were avoided. The soiled coupons were allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added.

Three coupons were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel 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 (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies were calculated and recorded.

Table Key
Substrate
A Ceramic
B Plastic
C Painted Steel
Product
1 Tub, Basin, Tile
2 Heavy Duty D&C
3 Super Citrus
4 Cycle Degreaser
5 Formula 409

Results:

Two of the three supplied products were effective at removing the all-purpose soil from the three surfaces using manual wiping. Each of these compared closely with the conventional product. Only one product removed less than 85% of the soil. The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
1A			
	0.4597	0.0615	86.62
	0.6314	0.0447	92.92
	0.3191	0.0339	89.38
1B			
	0.0520	0.0001	99.81
	0.0763	0.0073	90.43
	0.0839	0.0059	92.97
1C			
	0.0823	0.0061	92.59
	0.1515	0.0034	97.76
	0.1283	0.0032	97.51
2A			
	0.1832	0.0338	81.55
	0.2276	0.0159	93.01
	0.2435	0.0408	83.24
2B			

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	0.0974	0.0048	95.07
	0.0651	0.0027	95.85
	0.0650	0.0042	93.54
2C			
	0.0740	0.0031	95.81
	0.0704	0.0014	98.01
	0.1124	0.0020	98.22
3A			
	0.1397	0.0091	93.49
	0.3995	0.0048	98.80
	0.3805	0.0123	96.77
3B			
	0.0797	0.0034	95.73
	0.1143	0.0056	95.10
	0.0824	0.0021	97.45
3C			
	0.0783	0.0050	93.61
	0.0929	0.0032	96.56
	0.1206	0.0021	98.26
4A			
	0.0745	0.0129	82.68
	0.0327	0.0070	78.59
	0.0458	0.0080	82.53
4B			
	0.0409	0.0028	93.15
	0.0343	0.0084	75.51
	0.0587	0.0023	96.08
4C			
	0.0458	0.0136	70.31
	0.0472	0.0101	78.60
	0.0367	0.0092	74.93
5A			
	0.2346	0.0082	96.50
	0.2109	0.0113	94.64
	0.3179	0.0063	98.02
5B			
	0.1166	0.0048	95.88
	0.0937	0.0098	89.54
	0.0808	0.0053	93.44
5C			
	0.1107	0.0016	98.55
	0.0949	0.0002	99.79
	0.0992	0.0012	98.79

Summary:

Substrates:	Ceramics, Plastic, Steel				
Contaminants:	Greases, Oil, Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
The Clean Environment Co	Super Citrus Clean N 46	3.125	96.20	☑	
Clorox Company	Formula 409 All Purpose Cleaner	100	96.13	☑	
The Clean Environment Co	N-7 (the Natural) Basin, Tub and Tile Cleaner	50	93.33	☑	
The Clean Environment Co	Natural N-14 Heavy Duty Degreaser and Cleaner	12.5	92.70	☑	
The Clean Environment Co	Cycle Degrease C-2	12.5	81.38	☐	

Conclusion: The Super Citrus product was the most effective of the five products tested for manual all-purpose cleaning.