CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2011
DateRun:	08/14/2011
Experimenters:	Timothy Weil, Johnny Le
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Ceramics
PartType:	Coupon
Contaminants:	Dirt
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gloss-Color Meter
Purpose:	To evaluate the supplied product for all purpose cleaning following ASTM D5343-06 preparation methods.

Experimental Procedure:

To begin, seven coupons were cleaned manually. The coupons were hand-washed and then air-dried for 24 hours. Gloss meter readings for reflectance were then taken of the coupons using a BYK-Gardner spectro-guide 45/0 gloss meter. A Blue M Electric Co. Stabil-Therm gravity oven was turned on and brought up to a temperature range of 70-80 degrees. The coupons were then placed in the oven and heated for one hour. After one hour the coupons were removed from the oven to apply the client provided ASTM 5343 D soil.

Ten minutes prior to removing the coupons from the oven for soiling, the soil preparation was begun. A large beaker was placed on a 120 Mini Hotplate Stirrer, a product of Henry Troeman LLC. The beaker was filled halfway with water and a thermometer was placed in the water. The hotplate was turned on and brought up to 70-80 degrees Celsius. A portion of the ASTM 5343 D soil was placed in a second smaller beaker that was placed inside the beaker of 70-80 Degree Celsius water. The soil was gently stirred until it was time for the soil to be applied to the coupons. The coupons were removed from the oven and placed on a tray. The tray with the coupons was placed on the counter next to the hotplate and an application brush was used to apply the soil. Once the soil was applied, the coupons were placed in the oven for one hour and the temperature was again maintained at 70-80 degrees Celsius. After an hour the coupons were removed from the oven and placed on the tray to cool for 24 hours.

Reflectance readings were taken again for the coupons before cleaning. A single soiled coupon was placed in the inline unit along with two clean coupons, one at either end with the soiled coupon in the center. The coupon received three sprays of the conventional cleaning chemistry on its surface with five sprays on the cleaning pad which was made up of a Wypal X-60 reinforced paper towel and the coupon was sprayed with the conventional cleaning chemistry to maintain cleaning chemistry during cycling. These coupons were cycled until approximately 75% of the soil was removed. The coupons were cycled 50 times.

A set of soiled coupons were then placed in the inline unit, prepared in the same manner and cycled 50 times while having the conventional chemistry applied in the manner previously described and then the coupons were removed from the unit. A second set of soiled coupons were then placed in the inline unit, prepared in the same manner and cycled 50 times while having the Clorox Greenworks Natural Bathroom Cleaner 1:32 chemistry applied in the manner previously described. The coupons were then removed from the inline unit and allowed to dry for 12 hours at which times the visual evaluations were made, and reflectance meter readings taken.

Results:

The Clorox product was as effective as the comparative product at removing the soil from the ceramic surface using manual wiping. The comparative product resulted in the lowest efficiency, removing just over 86% of the ASTM 5343D soil where the Clorox product removed slightly higher than that. The table lists the reflectance prior to adding soil, after soiled and after cleaning and the calculated efficiency for each coupon cleaned based on the ASTM provided formula.

Coupon #	Initial (Ro)	Dirty (Rs)	Clean(Rc)	Rc-Rs	Ru-Rs	[Rc-Rs]*100	Ave %
Clorox Greenworks Natural Bathroom Cleaner 1:32							
Coupon 1	81.28	62.56	81.15	18.59	18.72	99.31	100.38
Coupon 2	81.35	64.61	81.74	17.13	16.74	102.33	
Coupon 3	82.55	59.01	82.43	23.42	23.54	99.49	
Chemco Purple Tiger 1:8							
Coupon 1	81.17	64.54	80.75	16.21	16.63	97.47	90.13
Coupon 2	81.75	57.89	77.31	19.42	23.86	81.39	

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Coupon 3	81.97	65.23	80.55	15.32	16.74	91.52	

Visual Ranking

	Rank 1	Rank 2	Rank 3	Avg
Clorox Greenworks Natural Bathroom Cleaner 1:32	93	83	83	87
3R Ready to Use	90	83	86	86

Summary:

Substrates:	Ceramics
Contaminants:	Dirt

Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Chemco	Purple Tiger All purpose cleaner	12.5	90.13	☑	
Clorox Company	Green Works Natural Toilet Bowl Cleaner	3	100.38	☑	

Conclusion:

The Clorox product performed well, removing nearly all of the soil and having higher reflectance readings after cleaning. Further testing is recommended to evaluate different soil application and cleaning methods.