CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2014
DateRun:	10/01/2014
Experimenters:	Jason Marshall, Junhee Cho
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #4
Substrates:	Vinyl Composite Tiles
PartType:	Coupon
Contaminants:	Greases, Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric
Purpose:	To evaluate supplied product for grease removal from floor surfaces following CSPA DCC 17

Experimental Procedure:

Floor cleaning for the supplied product was tested using the CSPA DCC 17 - Greasy Soil Test Method for Evaluating Spray-and-Wipe Cleaners Used on Hard, Non-Glossy Surfaces standard. A few minor deviations from the standard were incorporated into the test conducted. The Greasy Soil Test Method is a standard method that evaluates the cleaning performance of products intended for use on washable walls or other hard, non-glossy surfaces. This method provides instructions for soil application, cleaning and evaluation of spray-and-wipe cleaners under controlled cleaning conditions. This method can be used to assess product performance for cleaning a fabricated greasy soil blend applied to painted wallboard tiles. It is not inclusive of all soil or substrates typically encountered by a consumer while using these products.

Latex painted vinyl composite tiles were substituted for masonite wallboard tiles. These tiles were soiled with a mixture of melted, oily soils containing a small amount of carbon black. The tiles were dried overnight at room temperature. A measured amount of spray-and-wipe cleaner is applied to a reinforced paper towel was used in place of the sponge. The soaked towels were used to scrub a portion of the soiled substrate using a straight-line washability apparatus. The tile was rinsed after cleaning to remove loosened soil. Separate soiled coupons were cleaned with the other products being evaluated instead of using the same soiled coupon as another product. This was done to eliminate any possible cross contamination of the cleaning process. Three coupons were cleaned by each cleaning product being evaluated. Cleaning performance was taken as a linear function of reflectance value, and visually evaluated by a panel of judges.

Coupon preparation:
Two coats of white paint solution were applied to the slightly rough side of the tiles, waiting 15 minutes between each coat. Coupons were allowed to dry overnight at room temperature, and then cure them at 50°C and 50% humidity for 24 hours. Five reflectance readings were taken for each of three separate tiles to obtain a baseline value.

Soil Preparation
A mixture of three cooking oils/greases was made. A melt blend of 33% vegetable shortening, 33% lard, 33% vegetable oil and 1% carbon lampblack was made up fresh for the testing. Care was taken in the application of the soil onto the coupons so that light and heavy areas were avoided. Allow the soiled tiles to dry for 24 hours at room temperature. Five reflectance readings were made for each of three soiled tiles to obtain a soiled reference value.

Cleaning Test
Place a soiled tile in the tray of the abrasion tester such that the direction of the soiling is perpendicular to the direction of the sponge. In place of using a sponge and pouring solution into dish for application, products were applied to the coated surfaces using 3-5 sprays from manual spray pump and 4-7 sprays onto the reinforced Wypal X60 paper towel attached to the cleaning instrument. The cleaning was performed using Gardner Straightline washability unit and conducted for the prescribed 5 cycles (10 strokes). Following the initial cycle, there was no discernable difference between the products and an additional 15 cycles were run. The coupons were immediately rinse with tap water only the surface which was scrubbed.

Panel Data
Data was also generated by a group of four respondents. Respondents first observed one unsoiled, white-painted tile. Next, respondents observed a soiled tile. After establishing the standards, the respondents rated each coupon cleaned tile from best to worst.
Cleaning data can be calculated as percent detergency in the following equation:
% DET = R(cleaned) - R(soiled) / R(unsoiled) - R(soiled) X 100

Chemistries Evaluated: Neutral Floor 0.39%, Neutral Floor 0.145%

Results:

Cleaner	In wt	F wt	%Removed	L*	G	L*	G	L*	G	% Delta L	%Delta G
	0.4799	0.3554	25.94	88.36	1.9	51.39	13.6	77.4	2.1	70.35	98.29

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Neutral Floor 0.39%											
	0.6106	0.3676	39.8	86.98	2.0	49.18	15.5	76.49	2.6	72.25	95.56
	0.5199	0.4214	18.95	88.55	1.9	46.28	12.0	73.62	2.8	64.68	91.09
Neutral Floor 0.145%	0.744	0.6117	17.78	88.24	2.0	48.22	7.1	74.06	2.0	64.57	100.00
	0.7429	0.4837	34.89	85.56	2.1	45.11	8.1	74.48	1.8	72.61	105.00
	0.6482	0.5245	19.08	86.69	2.0	50.48	5.2	70.07	2.1	54.10	96.88

Summary:

Substrates:	Vinyl Composite Tiles				
Contaminants:	Greases, Oil, Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
EnvirOx LLC	Green Certified Neutral Floor Cleaner Hyper Concentrated	0.39	0.00	☑	

Conclusion:

The higher concentration for the Neutral Floor Cleaner outperformed the lower concentration in both L readings and cleaning percent. It is important to note that the effectiveness increased by 5% for an increase of 0.245% concentration. Based on this result, you would need close to a 4% concentration for effective levels of cleaning.