CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	03/06/2017
Experimenters:	George Liang, Vinh Tran
ClientType:	
ProjectNumber:	Project #1
Substrates:	Vinyl Composite Tiles
PartType:	Coupon
Contaminants:	Greases, Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric, Gloss-Color Meter
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.

Coupon preparation:

Two coats of white latex acrylic flat paint solution were applied to the slightly rough side of the tiles, waiting 15 minutes between each coat. The paint is diluted by adding 20% D.I. water. Coupons were allowed to dry overnight at room temperature, and then cure them at 50°C and 50% humidity for 24-hour. The initial weights and gloss reading of each painted vinyl composite tile was taken after the 24-hour cure at 50 °C.

Soil Preparation/ Contamination of Coupon:

DCC-17 was made by melting and simultaneously blending 33% vegetable shortening, 33% lard, 33% vegetable oil and 1% carbon lampblack. A 2 ½ inch by 2 in piece of folded bounty paper was used to apply the DCC-17 evenly onto the middle of the painted vinyl composite tile surface. The soiled tiles were allowed to dry for 24 hours at room temperature before obtaining the dirty weight and the dirty gloss reading.

Cleaning Test:

Three soiled tiles were placed in a Gardner Straightline washability unit such that the direction of the soiling is perpendicular to the direction of the Gardner Straightline washability unit tester sled. Three sprays of one product was manually applied to the coated surfaces and 4 sprays onto the reinforced Wypal X60 paper towel tester sled attached to the Gardner Straightline washability unit. The cleaning was conducted in intervals of 5 cycles (10 strokes) up to a total of 20 cycles. A percent visual removal was taken for every 5 cycle intervals. The cleaning process was stopped if the percent visual removal is 85% or higher after every 5 cycle intervals. The cleaning process was stopped after 20 cycles; the three tiles were then rinsed with D.I. water on the surfaces that was scrubbed. The final weight and gloss reading for the tiles were obtained the day after.

Percent Detergency Evaluation:

The result of gloss reading is calculated as percent detergency in the following equation:

$$\%DET = L^*(\text{cleaned}) - L^*(\text{soiled}) / L^*(\text{unsoiled}) - L^*(\text{soiled}) * 100$$

The %DET evaluates the performance of cleaner.

Results: Gravimetric Results:

Cleaner	Initial wt. of Contaminant (g)	Final wt. of Contaminant (g)	Contaminant Removed (%)	Avg. Contaminant Removed (%)	Std. Deviation
Bona Super Court Winter	0.5630	0.1662	70.48	63.36	7.03
	0.3986	0.1737	56.42		
	0.5449	0.2006	63.19		

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Bona Super Court	0.4328	0.1640	62.11	64.13	4.51
	0.4472	0.1373	69.30		
	0.4577	0.1786	60.98		
Bona Professional Stone Tile	0.5467	0.1247	77.19	68.50	8.04
	0.4252	0.1644	61.34		
	0.5024	0.1659	66.98		
Mohawk Tile & Grout	0.4858	0.1356	72.09	70.41	1.53
	0.5531	0.1709	69.10		
	0.5222	0.1565	70.03		
Mohawk Hardwood and Laminate	0.4670	0.1317	71.80	76.46	5.33
	0.7369	0.1306	82.28		
	0.6860	0.1694	75.31		

Percent Detergency Results:

Cleaner	Unsoiled L*	Soiled L*	Cleaned L*	DET (%)	Ave. DET (%)
Bona Super Court Winter	91.80	27.72	58.20	47.57	47.49
	91.81	27.63	57.43	46.43	
	92.11	28.08	59.12	48.48	
Bona Super Court	92.18	28.39	60.26	49.96	46.05
	91.81	27.68	55.98	44.13	
	92.05	28.00	56.22	44.06	
Bona Professional Stone Tile	91.59	28.11	59.61	49.62	46.77
	91.82	32.02	59.82	46.49	
	91.69	29.06	56.75	44.21	
Mohawk Tile & Grout	91.97	31.04	57.73	43.80	49.81
	92.11	28.29	62.06	52.91	
	92.26	28.91	62.31	52.72	
Mohawk Hardwood & Laminate	91.65	28.00	52.74	38.87	41.44
	91.62	28.13	54.74	41.91	
	91.58	28.29	55.84	43.53	

Summary:

Substrates:	Vinyl Composite Tiles
Contaminants:	Greases, Oil, Food

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Bona US	Super Court Winter	100	63.36	☐	
Bona US	Super Court	100	64.13	☐	
Bona US	Stone, Tile & Laminate	100	68.50	☐	
Chemspec	Tile and Grout Cleaner	100	70.41	☑	
Chemspec	Mohawk Floorcare Essentials, Hardwood and Laminate Floor Cleaner	100	76.46	☑	

Conclusion:

The objective of the experiment is to compare the effectiveness of the sampled cleaners: Bona Super Court Winter, Bona Super Court and Bona Professional Stone tile with the comparative cleaners: Mohawk Tile & Grout and Mohawk Hardwood & Laminate through gravimetric and percent detergency product efficacy evaluations.

Comparative Analysis

All sample cleaners observed were not significantly less effective in contaminant removal as compared to Mohawk Tile & Grout. However, the samples were not as effective as compared to the percent average contaminant removal to Mohawk Hardwood & Laminate. Furthermore, Bona Professional Stone Tile worked the best in comparison between the three samples. Bona Super Court Winter and Bona Super Court had similar average contaminant removal; with respective efficacy of 63.36% and 64.13%. Whereas, Bona Professional Stone Tile had an efficacy of 68.50%.

All three sample products had similar percent average DET as compared to the comparative Mohawk products; the results are in agreement with the percent average contaminant removal. As a conclusion, the supplied products from Bona were observed to be just as effective in removing carbon deposits; greases; food from painted vinyl composite tiles.