CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	01/24/2017
Experimenters:	Nicholas Landberg
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Ceramics
PartType:	Part
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.

Latex painted ceramic 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. 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. Five coupons were cleaned by each cleaning product being evaluated. Cleaning performance was taken as a linear function of reflectance value, as well as a gravimetric analysis of soil removed by wiping.

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.

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.

Cleaning Test
Soiled tiles were placed in the tray of the abrasion tester such that the direction of the soiling is perpendicular to the direction of the wiper. In place of using a sponge and pouring solution into dish for application, products were applied to the coated surfaces using a 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 20 cycles. Cleaning results were calculated as percent detergency in the following equation using the L values from a colorimeter:

% DET = R(cleaned) - R(soiled) / R(unsoiled) - R(soiled) X 100

In addition, the coupons were weighed before and after soiling and cleaning to record percent removal rates

Results:

All applied degreasers worked to a degree, although there were key differences in the performance of each product. The degreasers provided were visually about the same effectiveness as the all-purpose comparison product. When using the percent detergency calculations based on L value (Light-dark readings), Degreaser 01 was more effective than Degreaser 02 but both were lower than the comparative product.

Cleaner	Coupon	R unsoiled	R Soiled	R Clean	% DET	Overall %DET
AGAE degreaser 01	22	91.80	28.68	46.06	27.53	53.55
	3	92.23	27.86	64.49	56.91	
	31	91.83	29.90	65.20	57.00	
	20	91.94	27.50	68.27	63.27	
	9	91.62	49.33	75.99	63.04	

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AGAE degreaser 02	21	91.87	21.41	42.10	29.36	47.76
	7	92.39	27.13	58.15	47.53	
	12	92.11	26.86	58.51	48.51	
	29	92.00	26.36	62.15	54.52	
	14	92.42	28.29	66.04	58.86	
Formula 409	6	91.88	27.76	68.85	64.08	64.42
	15	92.09	27.34	70.64	66.87	
	19	91.69	27.33	72.00	69.41	
	23	91.58	26.79	62.11	54.51	
	25	91.93	25.40	70.12	67.22	
7th Generation	15	86.01	27.13	63.39	61.58	64.58
	30	86.3	31.91	67.85	66.08	
	4	86.37	27.68	71.53	74.71	
	7	86.39	27.86	60.43	55.65	
	24	86.16	27.46	65.53	64.86	

Gravimetric

Gravimetrically, the provided products performed as well as the Formula 409 and Seventh Generation products. In this assessment method, AGAE degreaser 02 was more effective at removing the contaminant from the substrate. Both supplied products had higher overall efficiency than the comparative product. With standard deviation, the supplied products were comparable to the Formula 409 product.

Cleaner	Initial wt	Final wt	% Removed	Overall Ave
AGAE degreaser 01	0.8274	0.5831	29.53	51.75
	0.7542	0.4347	42.36	
	0.9385	0.5133	45.31	
	0.9312	0.2874	69.14	
	0.9204	0.2538	72.43	
AGAE degreaser 02	1.0189	0.4327	57.53	63.52
	0.8810	0.3812	56.73	
	1.0903	0.3918	64.06	
	1.0296	0.2184	78.79	
	0.8686	0.3433	60.48	
Formula 409	0.9391	0.3603	61.63	50.46
	1.0713	0.4462	58.35	
	0.9393	0.3730	60.29	
	1.1022	0.7806	29.18	
	1.0971	0.6272	42.83	
7th Generation	1.0466	0.2409	76.98	78.84
	0.9037	0.2538	71.92	
	0.9238	0.1769	80.85	
	0.9818	0.122	87.57	
	0.9716	0.2245	76.89	

Summary:

Substrates:	Ceramics				
Contaminants:	Greases, Oil, Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Clorox Company	Formula 409 All Purpose Cleaner	100	50.46	☐	
Seventh Generation	Free & Clear All Purpose	100	78.84	☑	
Fisher Scientific	Absolute Ethanol	100	51.75	☐	
Fisher Scientific	Absolute Ethanol	100	63.52	☐	
AGAE Technologies	AGAE Degreaser 1	100	51.75	☐	
AGAE Technologies	AGAE Degreaser 02	100	63.52	☐	

Conclusion:

The supplied products were found to be as effective as Formula 409 when using to forms of analysis. The Percent Detergency had the comparative product on top followed by Detergent 1. In gravimetric analysis, Detergent 2 had the highest soil removal rate followed by Detergent 1. The standard deviation levels would result in the three products being at the same level of cleaning.