CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2014
DateRun:	11/16/2014
Experimenters:	Loc Nguyen, Francisco Abreau
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #5
Substrates:	Vinyl Composite Tiles
PartType:	Coupon
Contaminants:	Greases, Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric
Purpose:	To evaluate five supplied products for floor testing following GS 37 requirements

Experimental Procedure:

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.

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 using a BYK-Gardner Spectro Meter to measure L values.

Preweighed Painted VCT coupons were coated with DCC-17 Formulation using a handheld swab and allowed to dry for 2 hours at room temperature. A second gloss reading is done on the dirty coupons for L values. The contaminated coupons were then weighed again in order 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 1 spray of cleaning solution. Each coupon was individually sprayed once 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. The coupons were allowed to air dry and then the final weights as well as the cleaning efficiencies were calculated and recorded. A final gloss reading is done on the coupons for L values.

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: H2 Orange 2 Tile Grout Hyper Concentrated at 1:256, Tile Grout Hyper Concentrated at 1:512, Multipurpose Hyper Concentrated at 1:256, Neutral Floor HC Concentrated at 1:256, and another Neutral Floor HC Concentrated at 1:512.

Results:

Results for Gravimetric:

Cleaner	Initial wt	Final wt	% Removed	%Average Removed
H2O2 Tile G 1:256	0.5285	0.3866	26.85	
H2O2 Tile G 1:256	0.484	0.2761	42.95	
H2O2 Tile G 1:256	0.5466	0.4318	21	30.27
Tile Grout Hyper 1:512	0.4292	0.3528	17.8	
Tile Grout Hyper 1:512	0.4343	0.2764	36.36	
	0.4233	0.3504	17.22	23.79

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Tile Grout Hyper 1:512				
Multi-Purp Hyper 1:256	0.3898	0.3367	13.62	
Multi-Purp Hyper 1:256	0.443	0.3856	12.96	
Multi-Purp Hyper 1:256	0.5154	0.4601	10.73	12.44
Neutral Floor HC 1:256	1.2444	0.4298	65.46	
Neutral Floor HC 1:256	1.1565	0.3396	70.64	
Neutral Floor HC 1:256	1.1504	0.4161	63.83	66.64
Neutral Floor HC 1:512	1.1889	0.3111	73.83	
Neutral Floor HC 1:512	1.3394	0.6562	51.01	
Neutral Floor HC 1:512	1.3254	0.513	61.29	62.05

Summary:

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

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
EnvirOx LLC	Grout Safe	0.4	30.27	☐	
EnvirOx LLC	H2O2 Orange Tile and Grout Renovator	0.2	23.79	☐	
EnvirOx LLC	Multi-Purpose Hyper	0.4	12.44	☐	
EnvirOx LLC	Green Certified Neutral Floor Cleaner Hyper Concentrated	0.4	66.64	☐	
EnvirOx LLC	Green Certified Neutral Floor Cleaner Hyper Concentrated	0.2	62.05	☐	

Conclusion:

The overall results of the cleaners tested were not effective at cleaning the DCC-17 soil. The least effective cleaner was found to be the Multi-Purpose Hyper with a cleaning efficiency of 12.44%. The Tile Grout Hyper cleaner fared a little better but was still pretty low with a cleaning efficiency of 23.79%. The next best cleaner was the H2O2 Tile G with a cleaning efficiency of 30.27%. The neutral floor HC turned out to be the best cleaner with an overall cleaning efficiency of 66.64% at the concentration of 1:256. When the concentration of the Neutral Floor HC was halved to 1:512; it cleaned a little less with an efficiency of 62.05%.

The cleaner Tile Grout Hyper with concentration of 1:512, had the highest % DET at 63.01%. Neutral Floor HC with 1:256 concentration came very close at 58.37%. H2O2 tile G with 1:256 concentration and Multi-Purp Hyper with 1:256 concentration was next with close results of 44.96% and 44.33% respectively. Finally Neutral Floor HC with 1:512 concentration had the lowest %DET. The results from the soil removal efficiency and the result from the DET gave different ranking to the cleaners.

One possible reason can be due to the bulk of the soil being removed from the VCT tile but what remained behind becoming spread throughout the surface of the tile which can result in a lower gloss reading. A second option could be the soil being pushed towards one section of the tile causing higher soil weights. An example of this is with Tile Grout Hyper with 1:512 concentration which results in a 63.01% DET but only 23.79% soil removal efficiency.