CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2014
DateRun:	11/20/2014
Experimenters:	Loc Nguyen, George Liang, John Truong
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #5
Substrates:	Glass/Quartz, Chrome
PartType:	Coupon
Contaminants:	Films, Soaps
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric, Visual
Purpose:	To evaluate supplied products for glass cleaning using manual cleaning
Experimental Procedure:	Supplied products were diluted with room temperature water to the requested dilution. Preweighed Glass; Chrome; Mirror coupons were coated with SSL Soil 2 (Glass soap scum: Water 51.5%, Hair gel 25.6%, Toothpaste 10.4%, Shaving cream 5.3%, Hair spray 3.7% and Spray deodorant 3.5%) using a handheld swab and allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added. Three coupons were placed into a Gardner Straight Line Washability unit. A Wypall L20 reinforced wipe was attached to the cleaning sled and soaked with 1 spray of cleaning solutions. Each coupon was sprayed 1-3 times with the same cleaning solution. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 5 cycles (~10 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded and efficiencies recorded. Visual observations were made on the coupons for spotting and filming following the general guidelines set forth in the CSPA DCC 09A. Filming is best recognized as "haziness" or overall "milkiness", while streaking is best identified as dried droplets or "spotting", usually found strung together into thin white lines. Each coupon was evaluated separately for filming and streaking, (i.e., product residues without added soil), according to a scale of "1" to "7" wher: Filming Streaking 1 = no visible filming 1 = no visible streaking (excellent performance) 7 = high filming 7 = high streaking (poor performance) Chemistries Evaluated: H2 Orange 2 Tile 1:256; Tile Grout HC 1:512; Multi-Purp HC 1:256;

Results:

Cleaner	Initial wt	Final wt	%Removed
H2 Orange 2 Tile (1:256) - Glass	0.1095	0.0076	93.06
H2 Orange 2 Tile (1:256) - Glass	0.0453	0.0067	85.21
H2 Orange 2 Tile (1:256) - Glass	0.1181	0.0044	96.27
H2 Orange 2 Tile(1:256) - Chrome	0.1124	0.0342	69.57
H2 Orange 2 Tile(1:256) - Chrome	0.0791	0.0135	82.93
H2 Orange 2 Tile(1:256) - Chrome	0.1030	0.0186	81.94
H2 Orange 2 Tile (1:256) - Mirror	0.1108	0.0176	84.12
H2 Orange 2 Tile (1:256) - Mirror	0.0849	0.0042	95.05
H2 Orange 2 Tile (1:256) - Mirror	0.1246	0.0073	94.14
Tile Grout HC (1:512) - Glass	0.1313	0.0265	79.82
Tile Grout HC (1:512) - Glass	0.1287	0.0343	73.35
Tile Grout HC (1:512) - Glass	0.1266	0.0245	80.65

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Tile Grout HC (1:512) - Chrome	0.1263	0.0431	65.87
Tile Grout HC (1:512) - Chrome	0.1282	0.0303	76.37
Tile Grout HC (1:512) - Chrome	0.1371	0.0206	84.97
Tile Grout HC (1:512) - Mirror	0.1337	0.0115	91.40
Tile Grout HC (1:512) - Mirror	0.1266	0.0140	88.94
Tile Grout HC (1:512) - Mirror	0.1260	0.0070	94.44
Multi-Purp HC (1:256) - Glass	0.1029	0.0034	96.70
Multi-Purp HC (1:256) - Glass	0.1007	0.0050	95.03
Multi-Purp HC (1:256) - Glass	0.1141	0.0089	92.20
Multi-Purp HC (1:256) - Chrome	0.1168	0.0043	96.32
Multi-Purp HC (1:256) – Chrome	0.1186	0.0092	92.24
Multi-Purp HC (1:256) - Chrome	0.1212	0.0153	87.38
Multi-Purp HC (1:256) - Mirror	0.1203	0.0082	93.18
Multi-Purp HC (1:256) - Mirror	0.1262	0.0120	90.49
Multi-Purp HC (1:256) - Mirror	0.1307	0.0090	93.11

Visual Results

Cleaner	Streaking 1	2	3	Avg	Overall % Avg
H2 Orange 2 Tile (1:256) - Glass	4	4	4	4	
H2 Orange 2 Tile (1:256) - Glass	5	4	4	4.3	
H2 Orange 2 Tile (1:256) - Glass	6	5	5	5.3	4.6
H2 Orange 2 Tile (1:256) - Mirror	5	6	6	5.7	
H2 Orange 2 Tile (1:256) - Mirror	3	6	6	5	
H2 Orange 2 Tile (1:256) - Mirror	4	6	6	5.3	5.3
Tile Grout HC (1:512) - Glass	5	4	5	4.7	
Tile Grout HC (1:512) - Glass	6	4	4	4.7	
Tile Grout HC (1:512) - Glass	6	4	4	4.7	4.7
Tile Grout HC (1:512) – Mirror	7	5	6	6	
Tile Grout HC (1:512) - Mirror	7	5	6.5	6.2	
Tile Grout HC (1:512) - Mirror	7	5	6.5	6.2	6.1
Multi-Purp HC (1:256) - Glass	3	4	3	3.3	
Multi-Purp HC (1:256) - Glass	4	4	3	3.7	
Multi-Purp HC (1:256) - Glass	4	4	4	4	3.7
Multi-Purp HC (1:256) - Mirror	6	6	6	6	

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Multi-Purp HC (1:256) - Mirror	7	6	6	6.3	
Multi-Purp HC (1:256) – Mirror	6	6	6	6	6.1
H2 Orange 2 Tile (1:256) – Glass	5	3	4	4	
H2 Orange 2 Tile (1:256) - Glass	2	4	5	3.7	
H2 Orange 2 Tile (1:256) - Glass	4	4	5	4.3	4
H2 Orange 2 Tile (1:256) - Mirror	7	6	5	6	
H2 Orange 2 Tile (1:256) - Mirror	7	6	6	6.3	
H2 Orange 2 Tile (1:256) - Mirror	7	6	6	6.3	6.2

Filming

Cleaner					
	1	2	3	Avg	Overall % Avg
Tile Grout HC (1:512) - Glass	2	2	4	2.7	
Tile Grout HC (1:512) - Glass	4	2	3	3	
Tile Grout HC (1:512) - Glass	3	3	4	3.3	3
Tile Grout HC (1:512) - Mirror	3	3	3	3	
Tile Grout HC (1:512) - Mirror	2	5	3	3.3	
Tile Grout HC (1:512) - Mirror	3	4	3	3.3	3.2
Multi-Purp HC (1:256) - Glass	4	2	4	3.3	
Multi-Purp HC (1:256) - Glass	2	3	3	2.7	
Multi-Purp HC (1:256) - Glass	1	2	3	2	2.7
Multi-Purp HC (1:256) - Mirror	6	4	5	5	
Multi-Purp HC (1:256) - Mirror	2	2	3	2.3	
Multi-Purp HC (1:256) - Mirror	2	4	3	3	3.4

Summary:

Substrates:	Glass/Quartz, Chrome				
Contaminants:	Films, Soaps				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
EnvirOx LLC	H2 Orange 2 Tile	0.4	86.92	☑	
EnvirOx LLC	H2O2 Orange Tile and Grout Renovator	0.2	81.76	☐	
EnvirOx LLC	Multi-Purpose Hyper	0.4	92.96	☑	

Conclusion:

From the above gravimetric analysis, we can see that the Multi-Purpose Hyper Concentrate is more effective on the glass, chrome, and mirror substrates at an average of 92.96% compared to H2 Orange 2 Tile and Tile Grout Hyper Concentrate at 86.92% and 81.76%, respectfully. Only H2 Orange 2 Tile Grout Hyper Concentrated and Multipurpose Hyper Concentrated cleaners are effective at removing glass soil as both cleaners have efficiency above 85%. Standard rating of a cleaner's effectiveness is measured by the effective cleaner's efficiency on the basis of 85% or above would deem a cleaner to be effective at removing that particular soil.

Multi-Purpose Hyper Concentrate had the least streaking on glass compared to the rest of the streaking caused by H2 Orange Tile Grout Hyper Concentrated and Tile Grout Hyper Concentrated. Overall H2 Orange Tile caused less streaking on the mirror with an average of 5.3%. However, it was only slightly better than Tile Grout Hyper Concentrate and Multipurpose Hyper Concentrated by 0.8% on average.

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Multipurpose Hyper Concentrated and Tile Grout Hyper Concentrated caused the less filming on average of 2.7% and 3% on glass respectively. Tile Grout Hyper Concentrated was the second most efficient with 3% on average for filming. Tile Grout Hyper Concentrated and Multipurpose Hyper Concentrated have an average close to 3.2% for causing filming on mirror substrates. However, H2 Orange Tile Grout Hyper Concentrated causes a filming on average of 6.2% on mirror substrates.

Overall Multipurpose is the most effective cleaner at removing glass soil from substrates and causes the less streaking on glass and filming on glass/mirror substrates. Even though Tile Grout Hyper Concentrated is not effective at removing glass soil; it does however cause the fewest filming and streaking on the substrates when cleaned. Although H2 Orange Tile Grout Hyper Concentrated does effectively clean the substrates; it causes a lot of filming and streaking as a result of cleaning.