CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2014
DateRun:	07/21/2014
Experimenters:	Loc Nguyen, Jonathan Oljey, George Liang, Digvijay Devkota, Allison Leader
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
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, Chorme, and 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 ttached 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" where:

Filming Streaking
1 = high filming 1 = high streaking (poor performance)
7 = no visible filming 7 = no visible streaking (excellent performance)

Chemistries Evaluated: Windex; Hydrolysis Orange;

Results:

Cleaner	Initial wt	Final wt	% Removed	Avg % Removal
Windex_Mirror	0.0576	0.0115	80.03	91.98
	0.1152	0.0033	97.14	
	0.1055	0.0013	98.77	
Windex_Glass	0.0515	0.0070	86.41	93.58
	0.0715	0.0031	95.66	
	0.0906	0.0012	98.68	
Windex_Chrome	0.1307	0.0509	61.06	64.12
	0.1840	0.0565	69.29	
	0.1880	0.0714	62.02	
HydrysOrange_Mirror	0.0537	0.0086	83.99	89.80
	0.0906	0.0066	92.72	
	0.0562	0.0041	92.70	
Hydrys Orange_Glass	0.0722	0.0126	82.55	90.41
	0.1272	0.0088	93.08	
	0.0911	0.0040	95.61	
Hydrys Orange_Chrome	0.1101	0.0743	32.5200	62.30
	0.1688	0.0363	78.50	
	0.1564	0.0377	75.90	

From the above gravimetric analysis, we can see that Windex performed better than Hydrolysis Orange at 83.23% compared to 80.84%.

Cleaners	Substrate	S1	F1	S2	F2	S3	F3	S4	F4	S5	F5

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Windex Glass	Mirror	2	3	3	2	2	2	3	3	2	3
Windex Glass	Mirror	3	4	3	4	2	3	3	4	4	4
Windex Glass	Mirror	4.5	3	5	4	3	2	3	3	3	4
Windex Glass	Glass	4	5	5	4	4	5	4	5	5	5
Windex Glass	Glass	5	6	5	5	5	5	5	6	6	6
Windex Glass	Glass	5	6	6	6	4	4	6	4	5	4
Hydrolysis Orange	Mirror	2	3	2	2	2	3	3	3	4	3
Hydrolysis Orange	Mirror	2.5	3	3	3	3	3	3	2	3	3
Hydrolysis Orange	Mirror	3	3	3	3	2	2	3	2	4	3
Hydrolysis Orange	Glass	3.5	3	3	3	3	4	3	3	4	4
Hydrolysis Orange	Glass	4.5	4	4	4	4	4	4	4.5	4	5
Hydrolysis Orange	Glass	5	3	5	3	4	4	5	4	4	5

Summary

Cleaners	Substrate	Streaking Average	Filming Average
Windex	Mirror	3.2	3.3
Windex	Glass	4.7	5.7
Hydrolysis Orange	Mirror	2.5	3.0
Hydrolysis Orange	Glass	4.3	3.3

Summary:

Substrates:	Glass/Quartz, Chrome				
Contaminants:	Films, Soaps				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
SC Johnson & Son Inc	Windex Glass & More Cleaner (Spray)	100	83.23	☑	
EcoLab	Hydris Orange	100	80.83	☑	

Conclusion:

Windex and Hydrolysis Orange were both effective in removal of soil from mirror and glass. Both had removal of above 85%. Both cleaners were ineffective in removal of soil from chrome surfaces. Windex had a higher effective removal on all three surfaces compared to Hydrolysis Orange and also had less amount of surface residuals as shown on the visual analysis.