CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2015

DateRun: 04/16/2015

Experimenters: George Liang

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, chrome 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 (SLW) unit. A Wypall L20 reinforced wipe was attached to the cleaning sled and soaked with 1 spray of cleaning solution. 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 measured 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: WC-3, Great Value; Windex

Results:

Cleaner	Initial wt	Final wt	% Removed
WC-3 – Mirror			
	0.0332	0.0016	95.18
	0.0382	0.0011	97.12
	0.0507	0.0020	96.06
WC-3 – Glass			
	0.0263	0.0009	96.58
	0.0574	0.0000	100.00
	0.0547	0.0003	99.45
WC-3 - Chrome			
	0.0479	0.0006	98.75
	0.0387	0.0004	98.97
	0.0322	0.0006	98.14
WC-5 – Mirror			
	0.0367	0.0007	98.09
	0.0213	0.0005	97.65
	0.0347	0.0007	97.98
WC-5 – Glass			
	0.0282	0.0009	96.81
	0.0234	0.0001	99.57
	0.0425	0.0010	97.65
WC-5 – Chrome			
	0.0441	0.0020	95.46
	0.0454	0.0010	97.80

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	0.0442	0.0005	98.87
Great Value – Mirror			
	0.0408	0.0035	91.42
	0.0458	0.0009	98.03
	0.0563	0.0023	95.91
Great Value – Glass			
	0.0580	0.0026	95.52
	0.0488	0.0000	100.00
	0.0507	0.0005	99.01
Great Value – Chrome			
	0.0444	0.0033	92.57
	0.0509	0.0010	98.04
	0.0508	0.0014	97.24
Windex – Mirror			
	0.0402	0.0013	96.77
	0.0420	0.0008	98.10
	0.0377	0.0013	96.55
Windex – Glass			
	0.0522	0.0017	96.74
	0.0405	0.0007	98.27
	0.0373	0.0006	98.39
Windex – Chrome			
	0.0441	0.0010	97.73
	0.0558	0.0008	98.57
	0.0531	0.0012	97.74

Visual Analysis

Cleaner	Coupon	F	S	F	S	F	S
WC-3 - Mirror	18	3	5	3	3	4	4
WC-3 - Mirror	20	4	4	4	5	3	4
WC-3 - Mirror	21	3	2	3	2	3	3
WC-3 - Glass	41	2	2	2	2	2	3
WC-3 - Glass	1	2	2	2	3	2	3
WC-3 - Glass	8	1	2	1	2	2	2
WC-5 - Mirror	2	4	4	4	3	4	4
WC-5 - Mirror	9	3	4	2	3	3	3
WC-5 - Mirror	15	3	3	3	3	2	3
WC-5 - Glass	6	2	2	2	2	1	2
WC-5 - Glass	7	1	2	1	2	1	2
WC-5 - Glass	17	2	1	2	3	2	2
Great Value - Mirror	9	6	7	6	7	6	6
Great Value - Mirror	15	5	6	7	7	6	7
Great Value - Mirror	16	4	4	1	7	5	6
Great Value - Glass	5	4	3	4	6	3	4
Great Value - Glass	35	3	4	2	4	3	3
Great Value - Glass	36	2	2	2	2	3	2
Windex - Mirror	114	6	7	6	6	6	6
Windex - Mirror	2	5	6	3	5	4	5
Windex - Mirror	4	5	6	3	6	5	6
Windex - Glass	16	3	3	3	3	3	4
Windex - Glass	14	4	3	3	2	4	4
Windex - Glass	68	2	3	2	2	2	3

Average Observations

Cleaner - Substrate	Average F	Average S
	3.3	3.6

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WC-3 – Mirror		
WC-3 - Glass	1.8	2.3
WC-5 - Mirror	3.1	3.3
WC-5 - Glass	1.6	2.0
Great Value - Mirror	5.1	6.3
Great Value - Glass	2.9	3.3
Windex - Mirror	4.8	5.9
Windex - Glass	2.9	3.0

Summary:

Substrates:	Glass/Quartz, Chrome
Contaminants:	Films, Soaps

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
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ProNatural Brands LLC	WC 3	100	97.81	☑	
ProNatural Brands LLC	WC 5	100	97.76	☑	
Walmart	Natural Glass & Window Cleaner	100	96.42	☑	
SC Johnson & Son Inc	Windex Glass & More Cleaner (Spray)	100	97.65	☑	

Conclusion:

Each of the cleaners exhibited the same level of soil removal for each surface, requiring a visual analysis to determine the optimal cleaner. Based on the filming and streaking table, we can see that Great Value was the highest performing mirror cleaner, followed by Windex and the WC formulations. For glass, Windex was the highest performing cleaner, followed by Great Value and the WC formulations.