CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2013
DateRun:	04/15/2013
Experimenters:	Loc Nguyen, Digvijay Devkota
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 chrome, glass, 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 X60 reinforced wipe was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 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 7 = high filming 7 = high streaking (poor performance) 1 = no visible filming 1 = no visible streaking (excellent performance) Chemistries Evaluated: EnvirOx 117; EnvirOx 118; Product #1; Product #2; Product #3
Results:	All three supplied products removed over 98% of the glass soap scum using manual cleaning. One product had filming and spotting levels below the acceptable level from Green Seal. The other two products had better results than the conventional product for filming and streaking. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed	Average
EnvirOx117_Chrome_Glass	0.1000	0.0100	88.62	
EnvirOx117_Chrome_Glass	0.1400	0.0100	94.59	
EnvirOx117_Chrome_Glass	0.1000	0.0200	84.93	89.38
EnvirOx117_Glass_Glass	0.0500	0.0000	92.60	
EnvirOx117_Glass_Glass	0.0700	0.0100	91.90	
EnvirOx117_Glass_Glass	0.0900	0.0100	93.47	92.66
EnvirOx117_Mirror_Glass	0.0400	0.0100	85.75	
EnvirOx117_Mirror_Glass	0.0600	0.0000	95.53	
EnvirOx117_Mirror_Glass	0.0700	0.0100	82.17	87.82
EnvirOx118_Chrome_Glass	0.0900	0.0300	69.32	
EnvirOx118_Chrome_Glass	0.1100	0.0300	75.13	
EnvirOx118_Chrome_Glass	0.1200	0.0400	66.86	70.44
EnvirOx118_Glass_Glass	0.0700	0.0100	91.62	
EnvirOx118_Glass_Glass	0.0700	0.0100	91.31	
EnvirOx118_Glass_Glass	0.0900	0.0100	85.68	89.54
EnvirOx118_Mirror_Glass	0.0400	0.0000	87.98	
EnvirOx118_Mirror_Glass	0.0700	0.0000	93.63	
EnvirOx118_Mirror_Glass	0.0800	0.0000	94.44	92.01
Product#1_Chrome_Glass	0.1100	0.0400	61.10	

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Product#1_Chrome_Glass	0.1300	0.0400	73.09	
Product#1_Chrome_Glass	0.1500	0.0200	84.91	73.03
Product#1_Glass_Glass	0.0700	0.0000	98.20	
Product#1_Glass_Glass	0.0600	0.0000	103.20	
Product#1_Glass_Glass	0.0900	0.0100	90.23	97.21
Product#1_Mirror_Glass	0.0800	0.0100	86.75	
Product#1_Mirror_Glass	0.0700	0.0000	94.09	
Product#1_Mirror_Glass	0.0600	0.0100	90.90	90.58
Product#2_Chrome_Glass	0.0900	0.0100	86.04	
Product#2_Chrome_Glass	0.1000	0.0200	80.02	
Product#2_Chrome_Glass	0.0700	0.0100	86.59	84.21
Product#2_Glass_Glass	0.0800	0.0100	92.16	
Product#2_Glass_Glass	0.0800	0.0000	99.35	
Product#2_Glass_Glass	0.0600	0.0000	95.68	95.73
Product#2_Mirror_Glass	0.0700	0.0100	78.48	
Product#2_Mirror_Glass	0.0600	0.0000	94.08	
Product#2_Mirror_Glass	0.0600	0.0000	95.48	89.35
Product#3_Chrome_Glass	0.0600	0.0000	93.38	
Product#3_Chrome_Glass	0.1200	0.0100	91.57	
Product#3_Chrome_Glass	0.0600	0.0100	91.24	92.06
Product#3_Glass_Glass	0.0600	0.0000	96.34	
Product#3_Glass_Glass	0.0700	0.0000	94.49	
Product#3_Glass_Glass	0.1100	0.0000	96.19	95.67
Product#3_Mirror_Glass	0.0500	0.0100	88.03	
Product#3_Mirror_Glass	0.0500	0.0100	88.48	
Product#3_Mirror_Glass	0.0700	0.0000	95.17	90.56

Visual Results

Filming

Coupon	TESTER A	B	C	Average
E117C	1	2	1	
	1	2	1	
	3	2	3	
Ave. E117C	1.67	2	1.67	
E117G	2	1	2	
	1	2	1	
	2	1	2	
Ave. E117G	1.67	1.33	1.67	
E117M	1	2	2	
	2	1	2	
	2	1	2	
Ave. E117M	1.67	1.33	2	1.67
E118C	4	3	4	
	4	4	4	
	5	5	5	
Ave. E118C	4.33	4	4.33	
E118G	2	3	2	
	2	3	2	
	4	2	4	
Ave. E118G	2.67	2.67	2.67	
E118M	1	2	2	
	2	1	2	
	2	1	2	
Ave. E118M	1.67	1.33	2	2.85
P1C	4	3	4	
	3	4	3	
	2	2	2	
Ave. P1C	3	3	3	

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P1G	2	2	2	
	1	1	2	
	4	3	4	
Ave. P1G	2.33	2	2.67	
P1M	2	3	2	
	2	3	2	
	3	3	2	
Ave. P1M	2.33	3	2	2.59
P2C	2	3	2	
	3	2	3	
	1	2	2	
Ave. P2C	2	2.33	2.33	
P2G	1	2	1	
	1	2	1	
	2	3	2	
Ave. P2G	1.33	2.33	1.33	
P2M	4	4	3	
	3	3	3	
	3	4	3	
Ave. P2M	3.33	3.67	3	2.41
P3C	1	2	2	
	2	1	2	
	1	1	2	
Ave. P3C	1.33	1.33	2	
P3G	1	1	1	
	2	1	2	
	1	2	1	
Ave. P3G	1.33	1.33	1.33	
P3M	3	2	3	
	3	3	3	
	3	2	3	
Ave. P3M	3	2.33	3	1.89

Streaking

Coupon	TESTER A	TESTER B	TESTER C	Average
E117C	3	4	4	
	4	3	4	
	4	4	3	
Ave. E117C	3.67	3.67	3.67	
E117G	2	3	2	
	3	2	3	
	2	2	2	
Ave. E117G	2.33	2.33	2.33	
E117M	3	4	3	
	3	3	3	
	3	4	3	
Ave. E117M	3	3.67	3	3.07
E118C	3	3	3	
	3	4	3	
	3	3	3	
Ave. E118C	3	3.33	3	
E118G	3	3	3	
	4	3	4	
	2	2	3	
	3	2.67	3.33	

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Ave. E118G				
E118M	3	3	3	
	3	2	3	
	2	3	3	
Ave. E118M	2.67	2.67	3	2.96
P1C	3	3	3	
	3	2	3	
	2	3	3	
Ave. P1C	2.67	2.67	3	
P1G	3	3	3	
	2	2	2	
	2	3	2	
Ave. P1G	2.33	2.67	2.33	
P1M	4	3	4	
	4	4	4	
	4	3	3	
Ave. P1M	4	3.33	3.67	2.96
P2C	2	2	2	
	2	3	2	
	2	2	3	
Ave. P2C	2	2.33	2.33	
P2G	2	2	2	
	2	2	2	
	2	2	2	
Ave. P2G	2	2	2	
P2M	4	4	4	
	4	5	4	
	4	5	4	
Ave. P2M	4	4.67	4	2.81
P3C	2	2	2	
	2	3	2	
	2	2	3	
Ave. P3C	2	2.33	2.33	
P3G	2	2	3	
	2	3	2	
	2	3	2	
Ave. P3G	2	2.67	2.33	
P3M	4	5	4	
	4	4	4	
	4	5	4	
Ave. P3M	4	4.67	4	2.93

Summary:

Substrates:	Glass/Quartz, Chrome				
Contaminants:	Films, Soaps				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
EnvirOx LLC	H2Orange2 Concentrate 117	0.78	90.00	☑	F 1.67; S 3.07
EnvirOx LLC	Envirox Concentrate 118	0.78	84.00	☐	F 2.85; S 2.96

Conclusion: The five products had an overall average removal efficiency greater than 84%. They all had an average streaking and filming level of less than 3 but the lowest score was from product EnvirOx 117.