CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	06/13/2017
Experimenters:	George Liang, Vinh Tran, Kevin Smith
ClientType:	
ProjectNumber:	Project #1
Substrates:	Glass/Quartz
PartType:	Coupon
Contaminants:	Films, Soaps
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric, Visual
Purpose:	To evaluate supplied product for glass soil removal from glass surfaces.

Experimental Procedure:

The following experimental procedure follows TURI's cleaning standard for SCL 2 glass soap scum.

Soiling Process:
Pre-weighed glass coupons were soiled with SSL Soil 2 glass soap scum using a hand held swab. The glass soap scum is made from a blend of water 51.5%, hair gel 25.6%, Toothpaste 10.4%, shaving cream 5.3%, hair spray 3.7% and spray deodorant 3.5%. The coupons were allowed to dry for 24 hours at room temperature before re-weighing for the amount of contaminated added onto the coupons.

Cleaning Process:
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 1 spray of cleaning solutions. Each coupon was sprayed once with the same cleaning solution. Each cleaning solutions were diluted to the suggested dilution provided by the vendor. The SWR One was diluted to a concentration of 2% (50:1), and the Suma Break-Up HD Degreaser was diluted to a concentration of 5% (20:1). The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 5 cycles (~10 seconds).

Efficacy Rating Process:
The coupons were left to sit at room temperature in time intervals of: 1 hour, 1 day after the cleaning process before re-weighing the coupons for the amount of contaminants removed. Three testers were used to do a visual ranking to measure the efficacy of the cleaning agents. The visual ranking of the cleaned substrates was in accordance to the following ratings:

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)

Results:

Table pertaining to the amount of contaminant added and removed using a gravimetric scale to measure the efficacy of the respective cleaners.

Comparative Analysis
All efficacy rating mentioned in the following comparative analysis is from the overnight sit drying time, because there was no significant increase in glass soap scum removal between the 1 hour drying time and from the overnight sit.

The sample cleaner: SWR One had a similar efficacy rating as the comparative cleaner: Suma Break-Up HD Degreaser when removing glass soap scum from glass coupon; with respective efficacy ratings of: 97.97% and 99.53%. Similarly, the filming on the glass coupons were observed to not be significantly greater than the comparative cleaner; with respective filming ratings of 2.1 in comparison to 1.4. LIkewise, the sampled cleaner was observed to be comparable to the comparative cleaner in terms of the visual streaking rating; with respective streaking ratings of 2.1 as opposed to 1.4.

Gravimetric Result: After Time Interval: 1 hour				
Cleaner	Initial wt. of cont. (g)	Final wt. of cont. (g)	Cont. Removed (g)	Avg. Cont. Removed (%)
SWR One_Glass	0.0939	0.0013	98.62	97.25
	0.0921	0.0029	96.85	
	0.0783	0.0029	96.30	
SWR One_Chrome Plated Aluminum	0.0848	0.0017	98.00	93.89

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	0.0926	0.0024	97.41	
	0.0707	0.0097	86.28	
Suma Break-Up HD Degreaser_Glass	0.0922	0.0016	98.26	98.92
	0.1085	0.0011	98.99	
	0.1025	0.0005	99.51	
Suma Break-Up HD Degreaser_Chrome Plated Aluminum	0.1034	0.0010	99.03	98.06
	0.1064	0.0022	97.93	
	0.1081	0.0030	97.22	
Gravimetric Result: After Time Interval: 24 hour				
Cleaner	Initial wt. of cont. (g)	Final wt. of cont. (g)	Cont. Removed (g)	Avg. Cont. Removed (%)
SWR One_Glass	0.0939	0.0008	99.15	97.97
	0.0921	0.0020	97.83	
	0.0783	0.0024	96.93	
SWR One_Chrome Plated Aluminum	0.0848	0.0013	98.47	94.70
	0.0926	0.0023	97.52	
	0.0707	0.0084	88.12	
Suma Break-Up HD Degreaser_Glass	0.0922	0.0008	99.13	99.53
	0.1085	0.0006	99.45	
	0.1025	0.0000	100.00	
Suma Break-Up HD Degreaser_Chrome Plated Aluminum	0.1034	0.0006	99.42	98.50
	0.1064	0.0018	98.31	
	0.1081	0.0024	97.78	

Filming Visual Results: Table pertaining to visual haziness or milkiness ranking from respective cleaning agents.

Film				
Cleaner	Filming (1)	Filming (2)	Filming (3)	Avg. Filming
SWR One_Glass	2.0	1.5	2.0	2.1
	2.0	3.0	2.0	
	3.0	1.5	1.5	
SWR One_Chrome Plated Aluminum	2.0	1.0	2.5	2.1
	2.0	2.0	2.0	
	2.0	2.5	3.0	
Suma Break-Up HD Degreaser_Glass	3.0	1.5	2.0	1.4
	1.0	1.0	1.5	
	1.0	1.0	1.0	
Suma Break-Up HD Degreaser_Chrome Plated Aluminum	2.0	2.0	1.5	2.3
	4.0	2.5	1.5	
	3.0	2.0	2.0	

Streaking Visual Results: Table pertaining to visual dried droplets or "spotting", usually found strung together into thin white lines ranking from respective cleaning agents.

Cleaner	Spotting (1)	Spotting (2)	Spotting (3)	Avg. Spotting
SWR One_Glass	3.0	1.5	2.5	2.7
	4.0	2.0	5.0	
	2.0	2.0	2.5	
SWR One_Chrome Plated Aluminum	3.0	1.0	3.5	2.6
	3.0	2.0	4.5	
	1.0	1.5	4.0	
Suma Break-Up HD Degreaser_Glass	3.0	1.0	2.5	1.7
	2.0	1.0	1.5	
	1.5	1.0	1.5	
Suma Break-Up HD	2.0	1.5	2.5	2.3

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Degreaser_Chrome Plated Aluminum	2.0	2.0	3.5	
	2.0	2.0	3.5	

Summary:

Substrates:	Glass/Quartz				
Contaminants:	Films, Soaps				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
SWR Corporation	SWR One	2	97.97	☑	F - 2.1; S - 2.7
Diversey Corporation	Suma Break-Up HD Degreaser	5	99.53	☑	F - 1.4; S - 1.7

Conclusion: In conclusion, the sampled cleaner: SWR One was just as effective as the comparative cleaner: Suma Break-Up HD Degreaser.