CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2012
DateRun:	08/12/2012
Experimenters:	Junhee Cho, Johnny Le
ClientType:	Cleaning Equipment Mfr
ProjectNumber:	Project #1
Substrates:	Ceramics, Plastic, Stainless Steel
PartType:	Coupon
Contaminants:	Oil, Food
Cleaning Methods:	Manual Wipe
Analytical Methods:	Gravimetric
Purpose:	To evaluate three supplied products and water for all purpose cleaning
Experimental Procedure:	One gram of Tartar was added into 20 fl oz of water (PH 6.5) in supplied spray bottle of Trio then was electronically charged for 3min. after activating, the PH of activated water was changed into 11. The other cleaner was used at full concentration for test. Four sets of twelve ceramic, stainless steel, and polycarbonate coupons were weighed and then coated with vegetable oil (soybean oil) 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 Kimberly-Clark Wypal reinforced paper towel 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 cleaning unit was run for 20 cycles (~33 seconds). Final weights were recorded, efficiencies were calculated and recorded. Chemistries Evaluated: Trio (1g of Tartar, PH 11), Water (PH 6.5), Clorox Green work All-purpose Cleaner, Clorox 409 All-purpose Cleaner
Results:	Trio and Clorox green work all purpose was effective at removing more than 85% of the vegetable oil from three type of surface. However, water and Clorox 409 was effective at removing more than 85% of the vegetable oil from two of the surfaces (stainless steel and polycarbonate) using manual wiping. However, visually, over than 85% of the vegetable oil on ceramic coupon was removed by Clorox 409 all-purpose cleaner; we suspected that reaming cleaner's foam affect the gravimetric analysis. The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each of the ceramic, painted steel and polycarbonate coupons cleaned.

Cleaner	Initial wt	Final wt	% Removed
Trio_Stainless Steel			
	0.1334	0.0043	96.78
	0.2550	0.0052	97.96
	0.2238	0.0114	94.91
Trio_Ceramic			
	0.6761	0.0399	94.10
	0.4530	0.0099	97.81
	0.6148	0.0135	97.80
Trio_Plastic			
	0.0973	0.0044	95.48
	0.1090	0.0041	96.24
	0.1868	0.0050	97.32
Water_Stainless Steel			
	0.2993	0.0100	96.66
	0.1995	0.0074	96.29
	0.2184	0.0147	93.27
Water_Ceramic			
	0.5204	0.0046	99.12
	0.3920	0.0078	98.01
	0.0928	0.0064	93.10
Water_Plastic			
	0.0414	0.0062	85.02
	0.1153	0.0063	94.54

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	0.0701	0.0074	89.44
Clorox Green Work_Stainless Steel			
	0.1956	0.0017	99.13
	0.2644	0.0007	99.74
	0.2150	0.0015	99.30
Clorox Green Work_Ceramic			
	0.2482	0.0015	99.40
	0.5079	0.0169	96.67
	0.3819	0.0136	96.44
Clorox Green Work_Plastic			
	0.1477	0.0046	96.89
	0.0857	0.0039	95.45
	0.0855	0.0025	97.08
409 All Purpose_Stainless Steel			
	0.2307	0.0070	96.97
	0.1386	0.0084	93.94
	0.1968	0.0257	86.94
409_Ceramic			
	0.3847	0.0081	97.89
	0.2287	0.0052	97.73
	0.4291	0.0174	95.95
409_Plastic			
	0.0934	0.0030	96.79
	0.0982	0.0024	97.56
	0.1031	0.0027	97.38

Summary

Company	Product Name	Conc.	Efficiency	Effective
GenEon	Trio activated water with 1g of Tartar	100	96.49	Yes
Water	Water	100	93.94	Yes
Clorox	Green Work All Purpose Cleaner	100	97.79	Yes
Clorox	409 All Purpose Cleaner	100	95.68	Yes

Summary:

Substrates:	Ceramics, Plastic, Stainless Steel				
Contaminants:	Oil, Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
GenEon	GenEon Solution	100	96.49	☑	
Water	Water	100	93.94	☑	
Clorox Company	Green Works Multi-Surface Cleaner	100	97.79	☑	
Clorox Company	Formula 409 All Purpose Cleaner	100	95.68	☑	

Conclusion: Trio Product was found to be effective for removing the vegetable oil from various surfaces using manual wiping. It compared well to the other cleaning products supplied for testing.