

# 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: Hucker's Soil  
 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 Hucker's Soil Formulation (JifCreamy Peanut Butter 9.2%, Salted Butter 9.2%, Arrowhead Mills stone ground wheat flour 9.2%, Egg Yolk 9.2%, Evaporated milk 13.8%, Distilled water 45.8%, Printer's ink with boiled linseed oil 0.9%, Shaws saline solution 2.7%) using a hand held 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 measured, 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 Hucker's soil from three type of surface. However, water and Clorox 409 was effective at removing more than 85% of the Hucker's soil from two of the surfaces (stainless steel and polycarbonate) using manual wiping. However, visually, over than 85% of the Hucker's soil 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			
	0.1581	0.0109	93.11
	0.1890	0.0126	93.33
	0.2224	0.0233	89.52
Trio Ceramic			
	0.1558	0.0046	97.05
	0.1725	0.0194	88.75
	0.2578	0.0093	96.39
Trio Plastic			
	0.0833	0.0117	85.95
	0.1500	0.0165	89.00
	0.1479	0.0177	88.03
Water Stainless steel			
	0.2476	0.0170	93.13
	0.2461	0.0072	97.07
	0.2624	0.0122	95.35
Water Ceramic			
	0.2799	0.0765	72.67
	0.2142	0.0399	81.37
	0.2443	0.0710	70.94

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Water Plastic			
	0.0798	0.0072	90.98
	0.1766	0.0326	81.54
	0.1297	0.0076	94.14
Clorox Stainless steel			
	0.2892	0.0134	95.37
	0.1699	0.0094	94.47
	0.2441	0.0323	86.77
Clorox Ceramic			
	0.2096	0.0156	92.56
	0.1653	0.0087	94.74
	0.1180	0.0070	94.07
Clorox Plastic			
	0.1182	0.0144	87.82
	0.0835	0.0093	88.86
	0.2125	0.0070	96.71
Clorox 409 All Purpose Stainless Steel			
	0.1512	0.0132	91.27
	0.1895	0.0181	90.45
	0.1676	0.0206	87.71
Clorox 409 All Purpose Ceramic			
	0.2551	0.0605	76.28
	0.1854	0.0231	87.54
	0.1307	0.0235	82.02
Clorox 409 All Purpose Plastic			
	0.2807	0.0272	90.31
	0.2647	0.0135	94.90
	0.1949	0.0167	91.43

### Summary

Trio	Trio activated water with 1g of Tartar	100	91.23	Yes
Water	Water with stainless steel and plastic	100	89.74	Yes
Water	Water with Ceramic	100	74.99	No
Clorox	Green Work All Purpose Cleaner	100	92.37	Yes
Clorox	409 All Purpose Cleaner	100	87.99	Yes

### Summary:

<b>Substrates:</b>	Ceramics, Plastic, Stainless Steel				
<b>Contaminants:</b>	Hucker's Soil				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
GenEon	GenEon Solution	100	91.23	<input checked="" type="checkbox"/>	
Clorox Company	Green Works Multi-Surface Cleaner	100	92.37	<input checked="" type="checkbox"/>	
Clorox Company	Formula 409 All Purpose Cleaner	100	87.99	<input checked="" type="checkbox"/>	

### Conclusion:

Trio Product was found to be effective for removing the Hucker's soil from various surfaces using manual wiping. It compared well to the other cleaning products supplied for testing.