

# TURI SURFACE SOLUTIONS LABORATORY EVALUATION SUMMARY

**SCL #:**  
**Date Run:** 08/12/201  
**Experimenters:** Cho; Le  
**Client Type:** Chemical-Equipment Manufacturer;  
**Project Number:** 1  
**Substrates:** Ceramic, Stainless steel, Polycarbonate  
**Part Type:** Coupons;  
**Contaminants:** Hucker's Soil;  
**Cleaning Methods:** Manual Wipe (SLWU);  
**Analytical Methods:** Gravimetric; Visual;  
**Purpose:** To evaluate three supplied products and water for all purpose cleaning  
**Chemistries Evaluated:** Trio (1g of Tartar, pH 11), Water (pH 6.5), Clorox Green work All purpose Cleaner, Clorox 409 All purpose Cleaner

**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 activation, the pH of the activated water/tarter solution increased to 11. The other cleaners were used at full concentration, or as bought (RTU), for testing.

Four sets of twelve ceramic, stainless steel, and polycarbonate coupons were weighed and then coated with the Hucker's Soil Formulation (Jif Creamy 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%, 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 3-5 sprays of cleaning solution. Each coupon was sprayed 3-5 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.

**Results:** The Trio tarter solution and Clorox Green Works all purpose cleaners were effective at removing more than 85% of the Hucker's soil from three type of surface. Water and Clorox 409 were effective at removing more than 85% of the Hucker's soil from two of the surfaces (stainless steel and polycarbonate) using manual wiping. 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	Average
Trio stainless steel	0.1581	0.0109	93.11	
	0.1890	0.0126	93.33	
	0.2224	0.0233	89.52	91.99
Water stainless steel	0.2476	0.0170	93.13	
	0.2461	0.0072	97.07	
	0.2624	0.0122	95.35	95.19
Clorox Green Works stainless steel	0.2892	0.0134	95.37	
	0.1699	0.0094	94.47	
	0.2441	0.0323	86.77	92.20
409 Clorox All Purpose stainless steel	0.1512	0.0132	91.27	
	0.1895	0.0181	90.45	
	0.1676	0.0206	87.71	89.81
Trio Ceramic	0.1558	0.0046	97.05	
	0.1725	0.0194	88.75	
	0.2578	0.0093	96.39	94.06
Water Ceramic	0.2799	0.0765	72.67	
	0.2142	0.0399	81.37	
	0.2443	0.0710	70.94	74.99
Clorox Green Works Ceramic	0.2096	0.0156	92.56	
	0.1653	0.0087	94.74	

409 Clorox All Purpose Ceramic	0.1180	0.0070	94.07	93.79
	0.2551	0.0605	76.28	
	0.1854	0.0231	87.54	
Trio Plastic	0.1307	0.0235	82.02	81.95
	0.0833	0.0117	85.95	
	0.1500	0.0165	89.00	
Water Plastic	0.1479	0.0177	88.03	87.66
	0.0798	0.0072	90.98	
	0.1766	0.0326	81.54	
Clorox Green Works Plastic	0.1297	0.0076	94.14	88.89
	0.1182	0.0144	87.82	
	0.0835	0.0093	88.86	
409 Clorox All Purpose Plastic	0.2125	0.0070	96.71	91.13
	0.2807	0.0272	90.31	
	0.2647	0.0135	94.90	
	0.1949	0.0167	91.43	92.21

**Summary**

*Substrates:* Stainless steel, Ceramic, Plastic

*Contaminants:* Hucker's Soil

<i>Company Name:</i>	<i>Product Name / substrates</i>	<i>Conc.</i>	<i>Efficiency (Ave all substrates)</i>	<i>Effective</i>
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

**Conclusion:** The Trio cleaning solution was found to be effective for removing the Hucker's soil from various surfaces using manual wiping.