

**TURI SURFACE SOLUTIONS LABORATORY
EVALUATION SUMMARY**

SCL #:
Date Run: 10/09/12
Experimenters: Marshall; Cho; Regis; Le
Client Type: Chemical-Equipment Manufacturer;
Project Number:
Substrates: Stainless steel
Part Type: Coupons;
Contaminants: Carbon Deposits; Greases;
Cleaning Methods: Manual Wipe
Analytical Methods: Gravimetric
Purpose: To evaluate supplied product for grease removal from floor surfaces following CSPA DCC 17
Chemistries Evaluated: Trio (2 scoops of Tarter), Water, Clorox Green works All Purpose cleaner, Clorox 409 All Purpose cleaner
Experimental Procedure: Floor cleaning for the supplied product was tested using the CSPA DCC 17 - Greasy Soil Test Method for Evaluating Spray-and-Wipe Cleaners Used On Hard, Non-Glossy Surfaces standard. A few minor deviations from the standard were incorporated into the test conducted. We used stainless steel coupons instead of masonite. Two sets of 5 cycles was used in the procedure to simulate a cleaner folding and using a clean part of a rag or cloth During cleaning. We also did not use a sponge and dish to apply the cleaner, instead using spray bottles to apply cleaner And Wypal lab towels instead of a sponge.

Experimental Procedure: Surface cleaning for the supplied product was tested using the CSPA DCC 17 - Greasy Soil Test Method for Evaluating Spray-and-Wipe Cleaners Used On Hard, Non-Glossy Surfaces standard. A few minor deviations from the standard were incorporated into the test conducted.

The Greasy Soil Test Method is a standard method that evaluates the cleaning performance of products intended for use on washable walls or other hard, non-glossy surfaces. This method provides instructions for soil application, cleaning and evaluation of spray-and-wipe cleaners under controlled cleaning conditions. This method can be used to assess product performance for cleaning a fabricated greasy soil blend applied to painted wallboard tiles. It is not inclusive of all soil or substrates typically encountered by a consumer while using these products.

Stainless steel coupons were substituted for masonite wallboard tiles. These coupons were soiled with a mixture of melted, oily soils containing a small amount of carbon black. The tiles were dried overnight at room temperature. A measured amount of spray-and-wipe cleaner is applied to a reinforced paper towel was used in place of the sponge. The soaked towels were used to scrub a portion of the soiled substrate using a straight-line washability apparatus. Separate soiled coupons were cleaned with the other products being evaluated instead of using the same soiled coupon with another product. This was done to eliminate any possible cross contamination of the cleaning process. Three coupons were cleaned by each cleaning product being evaluated. Cleaning performance was determined using gravimetric analysis.

Coupon preparation:
Prior to soiling, each coupon was washed with a mild soap and water and dried with compressed air. They were then weighed for initial weight.

Soil Preparation
A mixture of three cooking oils/greases was made fresh. A melted blend of 100g of vegetable shortening, 100g of lard, 100g of vegetable oil and 10g of carbon lampblack was made for the test. Care was taken in the application of the soil onto the coupons so that light and heavy areas were avoided. The soiled coupons were allowed to dry for 24 hours at room temperature. The coupons were then weighed for their dirty weight.

Cleaning Test
A soiled coupon was placed in the tray of the abrasion tester such that the direction of the soiling is perpendicular to the direction of the sponge. In place of using a sponge and pouring solution into dish for application, products were applied to the coated surfaces using a 1 spray on each coupon from manual spray pump and 2 sprays onto the reinforced Wypal X60 paper towel attached to the cleaning instrument. The cleaning was performed using a Gardner Straightline washability unit and conducted for 5 cycles. The cleaned coupons were allowed to dry overnight and final weights were recorded.

After the final weights were measured, the coupons were cleaned a second time (an additional 5 cycles) to establish how much more soil would be removed if we simulated real cleaning of a worker folding a dirty cloth, towel or rag During cleaning to remove all soil from a surface.

Results: During the first 5 cycles Clorox Green Work was effective in removing greater than 88% of the cooking oils/grease soil from the stainless steel coupons, while Clorox 409 was least effective, Trio had an 80%, 409 had an 77% and water had a 79% cleaning efficiency average.

During the second set of 5 cycles of cleaning with a clean towel there was a visible difference in surface cleanliness. All four cleaners removed more than 94% of the soil with Trio being the most effective at 97% and Clorox 409 and Clorox Green Works were the least effective at 95% and water was in the middle with 96%.

Gravimetric Table

<i>Cleaner</i>	<i>Initial wt</i>	<i>Final wt</i>	<i>% Removed</i>	<i>% Average Removed</i>
1. Trio (2 scoops of Tartar)				
	0.41	0.05	88.09	79.76
	0.40	0.07	82.45	
	0.22	0.07	68.74	
1. Clorox Green work All Purpose				
	0.33	0.01	96.87	92.34
	0.12	0.01	88.17	
	0.27	0.02	91.99	
1. Water				
	0.23	0.06	74.31	78.77
	0.26	0.06	75.55	
	0.63	0.08	86.45	
1. Clorox 409				
	0.36	0.09	75.27	76.65
	0.40	0.09	76.30	
	0.61	0.13	78.38	
2. Trio (2 scoops of Tartar)				
	0.41	0.01	97.65	96.63
	0.40	0.01	96.52	
	0.22	0.01	95.73	
2. Clorox Green Works All Purpose				
	0.33	0.01	96.57	95.22
	0.12	0.01	93.83	
	0.27	0.01	95.26	
2. Water				
	0.23	0.01	93.82	95.56
	0.26	0.01	94.84	
	0.63	0.01	98.02	
2. Clorox 409				
	0.36	0.02	93.68	94.69
	0.40	0.03	92.70	
	0.61	0.01	97.69	

<i>CompanyName:</i>	<i>Product Name</i>	<i>Conc.</i>	<i>% Efficiency</i>	<i>Effective</i>	<i>Observations (if any)</i>
Trio	Trio activated water with 1g of Tartar	100	96.63	Yes	
Clorox	Green Work All Purpose Cleaner	100	95.22	Yes	
Water	Water with stainless steel and plastic	100	95.56	Yes	
Clorox	409 All Purpose Cleaner	100	94.69	Yes	

Conclusion: The DCC17 standard greasy soil test was run with some alterations made to the procedure. The method was revised from one set of 5 cycles of cleaning to two sets of 5 cycles of cleaning with clean Wypal towels used for the second set of cleaning. This was done to simulate the real and common practice of folding a rag or towel during janitorial cleaning to utilize all clean surfaces of the towel and also to stop cross contamination of surfaces while cleaning. With this change in the procedure, the Trio was found to have the best cleaning efficiency and more closely represents what is seen in the field with the Trio on greasy soils. The other cleaners also perform well and were effective in removal of the soil with the new procedure.