

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 04/22/2021

Experimenters: Nicole Kebler

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Food

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric, Visual

Purpose: To test and compare oven cleaner alternatives using manual wipe methods with DCC-12 soil on stainless steel coupons.

Experimental Procedure: The soil DCC-12 Oven Soil was made using a formula of 85.4% butter, 6.5% sugar, 4.3% deionized water and 3.4% flour. 15 stainless steel coupons were selected and weighed for initial weights. The soil was then warmed to a liquid/paste like consistency and about 1g (+/- 0.5) was placed on each coupon. The coupons were then baked at 450 degrees Fahrenheit for 60 minutes and were taken out and left to cool for 30 minutes. The dirty weights were then taken and recorded. Five oven cleaners were selected and 4 were created while the coupons were baking. The first cleaner was an already formulated "Subway" cleaner, the other cleaners were created as listed:

- TC OC #8: 88% water, 1% CALSOLV DPNB, 5% MACKAM, 4% Linsurf, 2% Surfox Lo
- TC OC #8 Augeo Alternative 1: 88% water, 1% Augeo, 5% MACKAM, 4% Linsurf, 2% Surfox Lo
- TC OC #8 Augeo Alternative 2: 84% water, 5% Augeo, 5% MACKAM, 4% Linsurf, 2% Surfox Lo
- Alternate Oven Cleaner with Crosolv: 85% water, 5% Crosolv, 5% FBS, 4% Bio-Soft, 1% CALSOLV DPNB

3 coupons for each cleaner were put in the SLW machine, one cleaner at a time. The wipall was sprayed 2 times with the cleaner and then each coupon was individually sprayed 2 times. The cleaner was left to soak for 1 minute, then two 20 cycles of manual wiping (40 wipes) were done, coupons were then placed on trays and left to dry for 30 minutes. Final clean weights were taken after dry time. Pictures were taken prior to cleaning and after cleaning.

Results: None of the oven cleaners had full removal. The cleaner that performed the best was TC OC #8 Alternative 1 which has 1% Augeo, it removed about 85% of the soil and visually still had soil left on the surface. The original "Subway" cleaner performed the second best with removal of 77%, but coupons were still visually dirty. The TC OC #8 with 1% CALSOLV also had 77% removal, but this was due to one of the coupons having a high removal percentage because the soil did not burn to the surface of one coupon, this coupon being the outlier and inflating the total percentage removed. However, it did perform better than the last two cleaners. The cleaner with 5% Augeo had about 64% removal and coupons were noticeably dirtier. Lastly, the 5% Crosolv cleaner did not remove any of the soil on the surface, this may be due to the fact that the 3 coupons used for this cleaner had soil that was noticeably more burnt than the other cleaners.

Cleaner	Initial wt. of cont	Final wt. of cont	% Removal	Average
Red Subway Oven Cleaner	0.5200	0.1607	69.10	76.64
	0.5297	0.1158	78.14	
	0.4711	0.0815	82.70	
1% CalSolv	0.4153	0.0780	81.22	76.91
	0.6516	0.0376	94.23	
	0.2169	0.0970	55.28	
1% Augeo	0.3791	0.0760	79.95	85.83
	0.5031	0.0590	88.27	
	0.5447	0.0585	89.26	
5% Augeo	0.3613	0.1811	49.88	64.30
	0.2716	0.1050	61.34	
	0.4769	0.0873	81.69	
5% Crosolv	0.2594	0.2734	-5.40	-2.99
	0.3689	0.3821	-3.58	

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Summary:

Conclusion:

Overall, most cleaners were able to remove soil that was not completely burnt onto the surface of the coupon. The 1% Augeo cleaner performed better than the others, next best being the original subway oven cleaner. No cleaner was fully effective, and all coupons had soil left on the surface.