CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2022
DateRun:	07/13/2022
Experimenters:	Zoe Lawson, Tatyanna Moreland Junior, Alexander Symko
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Ceramics, Plastic, Painted metal
PartType:	Coupon
Contaminants:	Hucker's Soil
Cleaning Methods:	Manual Wipe
Analytical Methods:	
Purpose:	To evaluate the effectiveness of three different Ascend formulations (Ware-washing, All Purpose TM09, and Hard Surface) with three different main ingredient variations (EDTA, DS IDA, and NTA) with All Purpose Testing.
Experimental Procedure:	The initial experiment conducted was the warewashing formulation with EDTA, DS IDA, and NTA. The formulation consisted of 5 parts sodium metasilicate, 2.2 parts Sokalan PA, 50 parts (EDTA/DS IDA/NTA), 40 parts sodium hydroxide 50% concentrate, and 2.8 parts water. Nine pre-weighed coupons, three of each substrate per cleaner, were soiled with Hucker's Soil Formulation (Jiff 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%, Shaws saline Solution 2.7%) that was distributed onto each coupon using a swab. Dirty weights were recorded after the coupons had dried for two hours at room temperature (68° F). Three coupons of the same substrate were aligned into a Single Line Washing Unit (SLW) with Wypall X60 attached to the cleaning sled. The Wypall X60 reinforced wipe along with the coupons were all sprayed three times with the cleaner and then allowed to soak for 30 seconds. Afterwards the SLW was activated, and the coupons were cleaned for 20 cycles. Cleaned coupons dried overnight at room temperature before the final weights were recorded.
Results:	Table 1: Warewashing Formulation Results

Product	Substrate	Initial wt of cont.	Final wt of cont.	%Cont Removed	Average	Overall Average
EDTA	Ceramic	0.1602	0.0719	55.12	58.49	32.02
		0.1846	0.0865	53.14		
		0.1995	0.0654	67.22		
	Painted Metal	0.5330	0.3506	34.22	22.68	
		0.3032	0.2218	26.85		
		0.3716	0.3457	6.97		
	Plastic	0.2576	0.2385	7.41	14.88	
		0.3208	0.2439	23.97		
		0.2791	0.2421	13.26		
DS IDA	Ceramic	0.1959	0.1229	37.26	49.32	29.40
		0.2190	0.1113	49.18		
		0.1892	0.0728	61.52		
	Painted Metal	0.2396	0.2279	4.88	22.07	
		0.2995	0.1373	54.16		
		0.2664	0.2473	7.17		
	Plastic	0.1265	0.1078	14.78	16.82	
		0.2109	0.1926	8.68		
		0.2122	0.1549	27.00		
NTA	Ceramic	0.1857	0.0874	52.93	36.36	29.74
		0.1609	0.1366	15.10		
		0.2105	0.1241	41.05		
	Painted Metal	0.2102	0.2003	4.71	16.84	
		0.2031	0.1320	35.01		
		0.1490	0.1329	10.81		
	Plastic	0.2683	0.2491	7.16	36.03	
		0.4610	0.2092	54.62		

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		0.4059	0.2179	46.32		

EDTA was the most successful at removing contaminant from ceramic at 58.49% with DS IDA being slightly less effective at 49.32% and NTA being the least effective at 36.36%. EDTA and DS IDA were on par for contaminant removal on painted metal with average percent removals at 22%. NTA was the least effective at removing the Hucker's soil at 16.84% on painted metal but was the most effective at removing the soil from plastic substrates. EDTA and DS IDA were similar at approximately 15% at removing contaminant on plastic.

Summary:

Conclusion: None of the versions of the warewash formulation were effective at removing the contaminant from ceramic, painted metal, or plastic. Percent content varied greatly and overall removal for all three products averaged at approximately 30%. Since all three products gave similar overall average removals, it is likely that the warewashing formulation itself is not effective.