

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2022

DateRun: 07/15/2022

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:

Analytical Methods: Gravimetric, Visual

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 third experiment conducted was the Hard Surface formulation with EDTA, DS IDA, and NTA. The formulation consisted of 0.8 parts (EDTA/DS IDA/NTA), 0.6 parts Multirope 1620 (substituting Lutensol), 0.8 parts Glucapon 420, 1.85 parts Texapon 842, and 95.95 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: Hard Surface Results

| Product | Substrate | Initial wt of cont. | Final wt of cont. | % Cont Removed | Average | Overall Average |
|---------|------------------|---------------------------|-------------------------|-------------------|---------|--------------------|
| EDTA | Ceramic | 0.0956 | 0.0291 | 69.56 | 67.90 | 71.50 |
| | | 0.1002 | 0.0219 | 78.14 | | |
| | | 0.0841 | 0.0370 | 56.00 | | |
| | Painted Metal | 0.2001 | 0.0412 | 79.41 | 79.58 | |
| | | 0.1667 | 0.0331 | 80.14 | | |
| | | 0.1739 | 0.0362 | 79.18 | | |
| | Plastic | 0.0995 | 0.0113 | 88.64 | 67.02 | |
| | | 0.1467 | 0.0672 | 54.19 | | |
| | | 0.3179 | 0.1328 | 58.23 | | |
| DS IDA | Ceramic | 0.1050 | 0.0222 | 78.86 | 72.96 | 70.08 |
| | | 0.0733 | 0.0220 | 69.99 | | |
| | | 0.0761 | 0.0228 | 70.04 | | |
| | Painted Metal | 0.3173 | 0.0629 | 80.18 | 77.84 | |
| | | 0.0863 | 0.0245 | 71.61 | | |
| | | 0.1380 | 0.0252 | 81.74 | | |
| | Plastic | 0.2853 | 0.1121 | 60.71 | 59.44 | |
| | | 0.1499 | 0.0730 | 51.30 | | |
| | | 0.1363 | 0.0459 | 66.32 | | |
| NTA | Ceramic | 0.0530 | 0.0212 | 60.00 | 60.48 | 69.86 |
| | | 0.0801 | 0.0282 | 64.79 | | |
| | | 0.0616 | 0.0267 | 56.66 | | |
| | Painted Metal | 0.1461 | 0.0378 | 74.13 | 74.71 | |
| | | 0.1933 | 0.0322 | 83.34 | | |
| | | 0.1110 | 0.0370 | 66.67 | | |
| | Plastic | 0.1319 | 0.0291 | 77.94 | 74.38 | |
| 0.1434 | | 0.0230 | 83.96 | | | |

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| | | 0.1360 | 0.0527 | 61.25 | | |
|--|--|--------|--------|-------|--|--|

DS IDA was the most effective at removing the contaminant from ceramic substrates with an average of 72.96% removal, EDTA was slightly less effective at 67.90% removal, followed by NTA at 60.48% as the least effective. EDTA and DS IDA were similar in their removal percentages on painted metal with EDTA being slightly more effective at 79.58% removal and DS IDA at 77.84% removal. NTA was the least effective of the cleaners with an average removal of 74.71% on painted metal but was the most effective at removing the contaminant from plastic. NTA had an average removal percentage of 74.38% with EDTA following with an average removal of 67.02%, and DS IDA at an average removal of 59.44%.

Summary:

Conclusion:

The Hard Surface formulation was less effective than the TM09 All Purpose formulation but much more effective than the Warewashing formulation. EDTA, DS IDA, and NTA all averaged around 70 percent overall removal for this formulation, and the averages compared across substrates varied little. This formulation is somewhat effective and is more improved than the warewashing formulation. However, the TM09 All Purpose formulation remains the most effective across all substrates and EDTA/DS IDA/NTA changes.