

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2012

DateRun: 03/28/2012

Experimenters: Jason Marshall, Johnny Le, Loc Nguyen

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Ceramics, Plastic, Steel

PartType: Coupon

Contaminants: Hucker's Soil

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To evaluate two supplied products against a comparative product for all purpose cleaning

Experimental Procedure: The two supplied cleaning products were diluted with DI water at room temperature to vendor recommended concentration for all purpose cleaning (3 oz/gal and 4 oz/gal). The third product was used at provided dilution from vendor.

Prewriteed ceramic, plastic G-10 and painted steel coupons were coated with Hucker's Soil Formulation (Jif Creamy Peanut Butter, Salted Butter, Arrowhead Mills stone ground wheat flour, Egg Yolk, Evaporated milk, Distilled water, Printer's ink with boiled linseed oil, Shaws saline solution) 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 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies were calculated and recorded.

Results: All three products were effective at removing the Hucker's soil from the three surfaces using manual wiping. The comparative product (3R) resulted in the highest efficiency, removing 93% of the Hucker's soil. The Horizon Sparkle was slightly better than the Citrashine product. The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|----------------------------|------------|----------|-----------|
| Sparkle -plastic | | | |
| | 0.0637 | 0.0058 | 90.89 |
| | 0.1198 | 0.0101 | 91.57 |
| | 0.0475 | 0.0087 | 81.68 |
| Sparkle -painted steel | | | |
| | 0.1135 | 0.0036 | 96.83 |
| | 0.0582 | 0.0043 | 92.61 |
| | 0.0474 | 0.0038 | 91.98 |
| Sparkle -ceramic | | | |
| | 0.1007 | 0.008 | 92.06 |
| | 0.0989 | 0.0109 | 88.98 |
| | 0.058 | 0.0038 | 93.45 |
| Citrashine - plastic | | | |
| | 0.0842 | 0.0026 | 96.91 |
| | 0.064 | 0.0103 | 83.91 |
| | 0.0729 | 0.0057 | 92.18 |
| Citrashine - painted steel | | | |
| | 0.0406 | 0.004 | 90.15 |
| | 0.0494 | 0.0032 | 93.52 |
| | 0.1525 | 0.0261 | 82.89 |
| Citrashine - ceramic | | | |
| | 0.0855 | 0.0042 | 95.09 |

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|--------------------|--------|--------|-------|
| | 0.0311 | 0.005 | 83.92 |
| | 0.091 | 0.0239 | 73.74 |
| 3R - plastic | | | |
| | 0.0404 | 0.0015 | 96.29 |
| | 0.0758 | 0.0063 | 91.69 |
| | 0.0426 | 0.0014 | 96.71 |
| 3R - painted steel | | | |
| | 0.0891 | 0.006 | 93.27 |
| | 0.174 | 0.0061 | 96.49 |
| | 0.0855 | 0.0069 | 91.93 |
| 3R - ceramic | | | |
| | 0.0528 | 0.0034 | 93.56 |
| | 0.0613 | 0.0056 | 90.86 |
| | 0.0284 | 0.0015 | 94.72 |

Summary:

| | | | | | |
|-----------------------|--------------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Ceramics, Plastic, Steel | | | | |
| Contaminants: | Hucker's Soil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Next-Gen Supply Group | 3R All Purpose Cleaner | 100 | 93.95 | <input checked="" type="checkbox"/> | |
| U.N.X. Incorporated | Horizon Sparkle Multipurpose Cleaner | 2.3 | 91.12 | <input checked="" type="checkbox"/> | |
| U.N.X. Incorporated | Horizon Citrashine | 3.125 | 88.03 | <input checked="" type="checkbox"/> | |

Conclusion:

Both supplied products performed well using manual cleaning on an all-purpose soil.