

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2012
 DateRun: 08/15/2012
 Experimenters: Junhee Cho, Johnny Le
 ClientType: Cleaning Equipment Mfr
 ProjectNumber: Project #1
 Substrates: Ceramics, Plastic, Chrome
 PartType: Coupon
 Contaminants: Films, Soaps
 Cleaning Methods: Manual Wipe
 Analytical Methods: Gravimetric

Purpose: To evaluate the supplied products for bathroom cleaning using manual cleaning

Experimental Procedure: One gram of Tartar was added into 20 fl oz of water (PH 6.5) in supplied spray bottle of Trio then was electronically charged for 3min. after activating, the PH of activated water was changed into 11. The other supplied cleaning products, Clorox Green Work Bathroom Cleaner and Comet Bathroom, were used at the recommended dilution. Pre-weighed chrome, ceramic and polycarbonate coupons were coated with SSL Soil 1 (Bathroom soap scum: All-in-one shampoo and conditioner 28.6%, Dry skin lotion 21.4%, Liquid hand soap 21.4%, Liquid body wash 14.3%, Deodorant bar soap 7.2% and water 7.1%) using a handheld 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 Wypall X60 reinforced wipe was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 2-3 times with the same cleaning solution. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 20 cycles (~33 seconds). Final weights were measured and efficiencies were calculated and recorded.

Chemistries Evaluated: Trio (1g of Tartar, PH 11), Water (PH 6.5), Clorox Green work Bathroom Cleaner, Comet Bathroom Cleaner

Results: The Trio removed the TURI bathroom soil over than 95% on polycarbonate and chrome, but Trio only removed 83% of bathroom soil on ceramic coupon. The other three cleaners also removed the soil over than 85% on all surfaces except water with ceramic. The detail information is below.

| Cleaner | Initial wt | Final wt | % Removed |
|----------------|------------|----------|-----------|
| Trio_ploycarb | | | |
| | 0.1662 | 0.0086 | 94.83 |
| | 0.1062 | 0.0010 | 99.06 |
| | 0.0843 | 0.0075 | 91.10 |
| Trio_ceramic | | | |
| | 0.1041 | 0.0225 | 78.39 |
| | 0.4892 | 0.0513 | 89.51 |
| | 0.1339 | 0.0258 | 80.73 |
| Trio_chrome | | | |
| | 0.0727 | 0.0035 | 95.19 |
| | 0.1158 | 0.0058 | 94.99 |
| | 0.1156 | 0.0043 | 96.28 |
| Water_ploycarb | | | |
| | 0.1196 | 0.0063 | 94.73 |
| | 0.1336 | 0.0019 | 98.58 |
| | 0.1008 | 0.0305 | 69.74 |
| Water_ceramic | | | |
| | 0.1069 | 0.0058 | 94.57 |
| | 0.0848 | 0.0117 | 86.20 |
| | 0.1295 | 0.0405 | 68.73 |
| Water_chrome | | | |
| | 0.0687 | 0.0053 | 92.29 |
| | 0.0729 | 0.0065 | 91.08 |
| | 0.0737 | 0.0043 | 94.17 |

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| Clorox Greenwork Bathroom Cleaner_ploycarb | | | |
| | 0.1284 | 0.0123 | 90.42 |
| | 0.1637 | 0.0048 | 97.07 |
| | 0.1555 | 0.0077 | 95.05 |
| Clorox Greenwork Bathroom Cleaner_ceramic | | | |
| | 0.2309 | 0.0528 | 77.13 |
| | 0.1354 | 0.0146 | 89.22 |
| | 0.0891 | 0.0013 | 98.54 |
| Clorox Greenwork Bathroom Cleaner_chrome | | | |
| | 0.0734 | 0.0073 | 90.05 |
| | 0.0924 | 0.0037 | 96.00 |
| | 0.1352 | 0.0067 | 95.04 |
| Comet Bathroom Cleaner_ploycarb | | | |
| | 0.0612 | 0.0071 | 88.40 |
| | 0.1036 | 0.0061 | 94.11 |
| | 0.1160 | 0.0097 | 91.64 |
| Comet Bathroom Cleaner_ceramic | | | |
| | 0.1779 | 0.0393 | 77.91 |
| | 0.1396 | 0.0010 | 99.28 |
| | 0.1505 | 0.0111 | 92.62 |
| Comet Bathroom Cleaner_chrome | | | |
| | 0.1252 | 0.0061 | 95.13 |
| | 0.1111 | 0.0063 | 94.33 |
| | 0.1053 | 0.0061 | 94.21 |

Summary:

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|----------------------|-----------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Ceramics, Plastic, Chrome | | | | |
| Contaminants: | Films, Soaps | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| GenEon | GenEon Solution | 100 | 91.12 | <input checked="" type="checkbox"/> | |
| Water | Water | 100 | 87.79 | <input checked="" type="checkbox"/> | |
| Clorox Company | Green Works Multi-Surface Cleaner | 100 | 92.06 | <input checked="" type="checkbox"/> | |
| Clorox Company | Formula 409 All Purpose Cleaner | 100 | 91.96 | <input checked="" type="checkbox"/> | |

Conclusion:

The Trio product had an overall average efficiency over 85% and performed similar as the green and conventional cleaning product.