# CLEANING LABORATORY EVALUATION SUMMARY

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|---|---|
| SCL #: | 2012 |
| DateRun: | 08/11/2012 |
| Experimenters: | Junhee Cho, Johnny Le |
| ClientType: | Cleaning Equipment Mfr |
| ProjectNumber: | Project #1 |
| Substrates: | Ceramics, Plastic, Stainless Steel |
| PartType: | Coupon |
| Contaminants: | Hucker's Soil |
| Cleaning Methods: | Manual Wipe |
| Analytical Methods: | Gravimetric |
| Purpose: | To evaluate three supplied products and water for all purpose 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 cleaner was used at full concentration for test.<br>Four sets of twelve ceramic, stainless steel, and polycarbonate coupons were weighed and then coated with Hucker's Soil Formulation (JifCreamy Peanut Butter 9.2%, Salted Butter 9.2%, Arrowhead Mills stone ground wheat flour 9.2%, Egg Yolk<br>9.2%, Evaporated milk 13.8%, Distilled water 45.8%, Printer's ink with boiled linseed oil 0.9%, Shaws saline solution 2.7%) using a hand held swab and allowed to dry for 24 hours at room temperature.<br>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). Final weights were measured, efficiencies were calculated and recorded.<br>Chemistries Evaluated: Trio (1g of Tartar, PH 11), Water (PH 6.5), Clorox Green work All purpose Cleaner, Clorox 409 All purpose Cleaner |
| Results: | Trio and Clorox green work all purpose was effective at removing more than 85% of the Hucker’s soil from three type of surface. However, water and Clorox 409 was effective at removing more than 85% of the Hucker’s soil from two of the surfaces (stainless steel and polycarbonate) using manual wiping. However, visually, over than 85% of the Hucker’s soil on ceramic coupon was removed by Clorox 409 all-purpose cleaner; we suspected that reaming cleaner’s foam affect the gravimetric analysis. The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each of the ceramic, painted steel and polycarbonate coupons cleaned. |

| Cleaner | Initial wt | Final wt | % Removed |
|---|---|---|---|
| Trio Stainless steel | | | |
| | 0.1581 | 0.0109 | 93.11 |
| | 0.1890 | 0.0126 | 93.33 |
| | 0.2224 | 0.0233 | 89.52 |
| Trio Ceramic | | | |
| | 0.1558 | 0.0046 | 97.05 |
| | 0.1725 | 0.0194 | 88.75 |
| | 0.2578 | 0.0093 | 96.39 |
| Trio Plastic | | | |
| | 0.0833 | 0.0117 | 85.95 |
| | 0.1500 | 0.0165 | 89.00 |
| | 0.1479 | 0.0177 | 88.03 |
| Water Stainless steel | | | |
| | 0.2476 | 0.0170 | 93.13 |
| | 0.2461 | 0.0072 | 97.07 |
| | 0.2624 | 0.0122 | 95.35 |
| Water Ceramic | | | |
| | 0.2799 | 0.0765 | 72.67 |
| | 0.2142 | 0.0399 | 81.37 |
| | 0.2443 | 0.0710 | 70.94 |

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| Water Plastic | | | |
| | 0.0798 | 0.0072 | 90.98 |
| | 0.1766 | 0.0326 | 81.54 |
| | 0.1297 | 0.0076 | 94.14 |
| Clorox Stainless steel | | | |
| | 0.2892 | 0.0134 | 95.37 |
| | 0.1699 | 0.0094 | 94.47 |
| | 0.2441 | 0.0323 | 86.77 |
| Clorox Ceramic | | | |
| | 0.2096 | 0.0156 | 92.56 |
| | 0.1653 | 0.0087 | 94.74 |
| | 0.1180 | 0.0070 | 94.07 |
| Clorox Plastic | | | |
| | 0.1182 | 0.0144 | 87.82 |
| | 0.0835 | 0.0093 | 88.86 |
| | 0.2125 | 0.0070 | 96.71 |
| Clorox 409 All Purpose Stainless Steel | | | |
| | 0.1512 | 0.0132 | 91.27 |
| | 0.1895 | 0.0181 | 90.45 |
| | 0.1676 | 0.0206 | 87.71 |
| Clorox 409 All Purpose Ceramic | | | |
| | 0.2551 | 0.0605 | 76.28 |
| | 0.1854 | 0.0231 | 87.54 |
| | 0.1307 | 0.0235 | 82.02 |
| Clorox 409 All Purpose Plastic | | | |
| | 0.2807 | 0.0272 | 90.31 |
| | 0.2647 | 0.0135 | 94.90 |
| | 0.1949 | 0.0167 | 91.43 |

Summary

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|---|---|---|---|---|
| Trio | Trio activated water with 1g of Tartar | 100 | 91.23 | Yes |
| Water | Water with stainless steel and plastic | 100 | 89.74 | Yes |
| Water | Water with Ceramic | 100 | 74.99 | No |
| Clorox | Green Work All Purpose Cleaner | 100 | 92.37 | Yes |
| Clorox | 409 All Purpose Cleaner | 100 | 87.99 | Yes |

Summary:

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| **Substrates:** | Ceramics, Plastic, Stainless Steel |
| **Contaminants:** | Hucker's Soil |

| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|---|---|---|---|---|---|
| GenEon | GenEon Solution | 100 | 91.23 | ☑ | |
| Clorox Company | Green Works Multi-Surface Cleaner | 100 | 92.37 | ☑ | |
| Clorox Company | Formula 409 All Purpose Cleaner | 100 | 87.99 | ☑ | |

Conclusion: Trio Product was found to be effective for removing the Hucker's soil from various surfaces using manual wiping. It compared well to the other cleaning products supplied for testing.