

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2007

DateRun: 10/25/2007

Experimenters: Jason Marshall, Shweta Bansal

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 reevaluate supplied products for all purpose cleaning using a newer soil mixture.

Experimental Procedure: Upon review of the previous all purpose cleaning trial, the soil formulation was very old (over 1 year) which may have affected the cleaning performance for the conditions typically used for all purpose cleaning.

The supplied cleaning products were used at full strength.

Prew weighed fiberglass, ceramic and chrome coupons were coated with a fresh batch of SSL Soil 3 (Hucker's Soil: Distilled water 45.8%, Evaporated milk 13.8%, Creamy peanut butter 9.2%, Salted butter 9.2%, Stone ground wheat flour 9.2%, Egg yolk 9.2%, Printer's ink with boiled linseed oil 0.9% and Saline solution 2.7%.) 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 WypAll X60 reinforced wipe 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: The newer mixture of the Hucker's soil yielded efficiencies that were more consistent with previous testing results. Three products were found to remove less than 90%. Two of these products were thicker than typical water spray cleaners and left more residue behind after cleaning and wiping dry. The table lists the amount of soil added, the amount remaining, the efficiency for each coupon cleaned and the average removal from each substrate type.

| Cleaner | Substrate | Initial wt | Final wt | % Removed | Substrate Ave | Product Ave |
|-----------------|---------------|------------|----------|-----------|---------------|-------------|
| Clorox | Painted Steel | 0.5119 | 0.0238 | 95.35 | 95.46 | 93.51 |
| | | 0.1606 | 0.0102 | 93.65 | | |
| | | 0.2188 | 0.0057 | 97.39 | | |
| | Plastic | 0.1923 | 0.0124 | 93.55 | 93.06 | |
| | | 0.1972 | 0.0187 | 90.52 | | |
| | | 0.1823 | 0.0089 | 95.12 | | |
| | Ceramic | 0.2674 | 0.0277 | 89.64 | 91.99 | |
| | | 0.2057 | 0.0129 | 93.73 | | |
| | | 0.2649 | 0.0196 | 92.60 | | |
| Countertop | Painted Steel | 0.2632 | 0.0150 | 94.30 | 95.58 | 93.49 |
| | | 0.2028 | 0.0110 | 94.58 | | |
| | | 0.3424 | 0.0073 | 97.87 | | |
| | Plastic | 0.1415 | 0.0127 | 91.02 | 91.28 | |
| | | 0.2227 | 0.0178 | 92.01 | | |
| | | 0.1709 | 0.0157 | 90.81 | | |
| | Ceramic | 0.3431 | 0.0296 | 91.37 | 93.59 | |
| | | 0.3293 | 0.0159 | 95.17 | | |
| | | 0.2465 | 0.0142 | 94.24 | | |
| Seventh Kitchen | Painted Steel | 0.1956 | 0.0092 | 95.30 | 95.31 | 90.35 |
| | | 0.1471 | 0.0005 | 99.66 | | |
| | | 0.1165 | 0.0105 | 90.99 | | |

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|---------------------|---------------|--------|---------|-------|-------|-------|
| | Plastic | 0.2002 | 0.0224 | 88.81 | 86.11 | |
| | | 0.2959 | 0.0184 | 93.78 | | |
| | | 0.1380 | 0.0335 | 75.72 | | |
| | Ceramic | 0.2667 | 0.0547 | 79.49 | 89.63 | |
| | | 0.1914 | 0.0120 | 93.73 | | |
| | | 0.2515 | 0.0109 | 95.67 | | |
| Soft Scrub | Painted Steel | 0.1668 | 0.0407 | 75.60 | 70.59 | 64.48 |
| | | 0.2295 | 0.0661 | 71.20 | | |
| | | 0.2189 | 0.0767 | 64.96 | | |
| | Plastic | 0.1580 | 0.1063 | 32.72 | 50.35 | |
| | | 0.2024 | 0.0680 | 66.40 | | |
| | | 0.2453 | 0.1179 | 51.94 | | |
| | Ceramic | 0.1355 | 0.0572 | 57.79 | 72.50 | |
| | | 0.2893 | 0.0550 | 80.99 | | |
| | | 0.2632 | 0.0560 | 78.72 | | |
| Formula 409 | Painted Steel | 0.1969 | 0.0060 | 96.95 | 96.75 | 94.32 |
| | | 0.0904 | 0.0041 | 95.46 | | |
| | | 0.3453 | 0.0075 | 97.83 | | |
| | Plastic | 0.2429 | 0.0223 | 90.82 | 92.45 | |
| | | 0.1923 | 0.0116 | 93.97 | | |
| | | 0.2664 | 0.0198 | 92.57 | | |
| | Ceramic | 0.1086 | 0.0042 | 96.13 | 93.76 | |
| | | 0.2270 | 0.0065 | 97.14 | | |
| | | 0.1176 | 0.0141 | 88.01 | | |
| Meyer All Purpose | Painted Steel | 0.1274 | 0.0077 | 93.96 | 95.08 | 92.81 |
| | | 0.1816 | 0.0130 | 92.84 | | |
| | | 0.1812 | 0.0028 | 98.45 | | |
| | Plastic | 0.2305 | 0.0357 | 84.51 | 88.69 | |
| | | 0.1281 | 0.0128 | 90.01 | | |
| | | 0.2836 | 0.0240 | 91.54 | | |
| | Ceramic | 0.3158 | 0.0191 | 93.95 | 94.65 | |
| | | 0.2479 | 0.0191 | 92.30 | | |
| | | 0.2870 | 0.0066 | 97.70 | | |
| Seventh All Purpose | Painted Steel | 0.1482 | 0.0306 | 79.35 | 86.32 | 90.73 |
| | | 0.1935 | 0.0032 | 98.35 | | |
| | | 0.0694 | 0.0130 | 81.27 | | |
| | Plastic | 0.1478 | 0.01881 | 87.27 | 92.29 | |
| | | 0.1420 | 0.0029 | 97.96 | | |
| | | 0.2749 | 0.0230 | 91.63 | | |
| | Ceramic | 0.2727 | 0.0145 | 94.68 | 93.58 | |
| | | 0.1959 | 0.0115 | 94.13 | | |
| | | 0.1807 | 0.0146 | 91.92 | | |
| DFC General Spray | Painted Steel | 0.1938 | 0.0408 | 78.95 | 91.31 | 93.61 |
| | | 0.1888 | 0.0024 | 98.73 | | |
| | | 0.1490 | 0.0056 | 96.24 | | |
| | Plastic | 0.2282 | 0.0050 | 97.81 | 94.45 | |
| | | 0.1478 | 0.0032 | 97.83 | | |
| | | 0.2408 | 0.0296 | 87.71 | | |
| | Ceramic | 0.2281 | 0.0164 | 92.81 | 95.07 | |
| | | 0.2418 | 0.0109 | 95.49 | | |
| | | 0.3986 | 0.0123 | 96.91 | | |
| DFC Kitchen | Painted Steel | 0.2161 | 0.0097 | 95.51 | 95.36 | 90.79 |

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|------------------|---------------|--------|--------|-------|-------|-------|
| | | 0.0977 | 0.0063 | 93.55 | | |
| | | 0.1502 | 0.0045 | 97.00 | | |
| | Plastic | 0.2375 | 0.0324 | 86.36 | 92.55 | |
| | | 0.2251 | 0.0125 | 94.45 | | |
| | | 0.2812 | 0.0089 | 96.83 | | |
| | Ceramic | 0.0648 | 0.0136 | 79.01 | 84.48 | |
| | | 0.1801 | 0.0079 | 95.61 | | |
| | | 0.2568 | 0.0544 | 78.82 | | |
| Comet | Painted Steel | 0.1598 | 0.0616 | 61.45 | 84.60 | 89.60 |
| | | 0.2139 | 0.0063 | 97.05 | | |
| | | 0.2440 | 0.0115 | 95.29 | | |
| | Plastic | 0.2890 | 0.0127 | 95.61 | 95.01 | |
| | | 0.2404 | 0.0110 | 95.42 | | |
| | | 0.1881 | 0.0113 | 93.99 | | |
| | Ceramic | 0.2943 | 0.0300 | 89.81 | 89.19 | |
| | | 0.1624 | 0.0178 | 89.04 | | |
| | | 0.1612 | 0.0182 | 88.71 | | |
| Meyer Shower | Painted Steel | 0.1330 | 0.0073 | 94.51 | 96.27 | 91.37 |
| | | 0.2745 | 0.0057 | 97.92 | | |
| | | 0.1734 | 0.0063 | 96.37 | | |
| | Plastic | 0.2446 | 0.0310 | 87.33 | 90.10 | |
| | | 0.1771 | 0.0048 | 97.29 | | |
| | | 0.1752 | 0.0251 | 85.67 | | |
| | Ceramic | 0.1246 | 0.0106 | 91.49 | 87.74 | |
| | | 0.2003 | 0.0148 | 92.61 | | |
| | | 0.1498 | 0.0313 | 79.11 | | |
| Seventh Bathroom | Painted Steel | 0.1448 | 0.0126 | 91.30 | 94.03 | 94.53 |
| | | 0.2847 | 0.0074 | 97.40 | | |
| | | 0.1994 | 0.0132 | 93.38 | | |
| | Plastic | 0.1305 | 0.0010 | 99.23 | 98.06 | |
| | | 0.1164 | 0.0016 | 98.63 | | |
| | | 0.1761 | 0.0065 | 96.31 | | |
| | Ceramic | 0.2631 | 0.0073 | 97.23 | 91.51 | |
| | | 0.1366 | 0.0240 | 82.43 | | |
| | | 0.2454 | 0.0126 | 94.87 | | |
| DFC Polish | Painted Steel | 0.2495 | 0.0318 | 87.25 | 89.04 | 78.64 |
| | | 0.1572 | 0.0197 | 87.47 | | |
| | | 0.2647 | 0.0201 | 92.41 | | |
| | Plastic | 0.2046 | 0.0368 | 82.01 | 76.41 | |
| | | 0.1821 | 0.0340 | 81.33 | | |
| | | 0.1639 | 0.0559 | 65.89 | | |
| | Ceramic | 0.1371 | 0.0287 | 79.07 | 70.48 | |
| | | 0.1606 | 0.0680 | 57.66 | | |
| | | 0.2040 | 0.0516 | 74.71 | | |

Summary:

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|----------------------|---------------------------------------|--------------------------|--------------------|-------------------------------------|----------------------|--|
| Substrates: | | Ceramics, Plastic, Steel | | | | |
| Contaminants: | | Hucker's Soil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |
| Clorox Company | Clorox Kitchen Cleaner | 100 | 93.51 | <input checked="" type="checkbox"/> | Rank - 5 | |
| Mrs Myers Clean Day | Mrs Meyers Lemon Multisurface Cleaner | 100 | 93.49 | <input checked="" type="checkbox"/> | Rank - 6 | |
| Seventh Generation | Free & Clear Kitchen Cleaner | 100 | 90.35 | <input checked="" type="checkbox"/> | Rank - 10 | |
| Henkel Corporation | Soft Scrub with Bleach | 100 | 64.48 | <input type="checkbox"/> | Rank - 13 | |
| Clorox Company | Formula 409 All Purpose Cleaner | 100 | 94.32 | <input checked="" type="checkbox"/> | Rank - 2 | |

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|--------------------------------|---------------------------------------|-----|-------|-------------------------------------|-----------|
| Mrs Myers Clean Day | Mrs Meyers Lemon Multisurface Cleaner | 100 | 92.81 | <input checked="" type="checkbox"/> | Rank - 7 |
| Seventh Generation | Free & Clear All Purpose | 100 | 93.93 | <input checked="" type="checkbox"/> | Rank - 3 |
| Cogent Environmental Solutions | DFC General Spray | 100 | 93.61 | <input checked="" type="checkbox"/> | Rank - 4 |
| Cogent Environmental Solutions | DFC Kitchen Spray | 100 | 90.79 | <input checked="" type="checkbox"/> | Rank - 9 |
| Prestige Brands Inc | Comet Bathroom Cleaner | 100 | 89.60 | <input checked="" type="checkbox"/> | Rank - 11 |
| Mrs Myers Clean Day | Mrs Meyers Lavender Tub and Tile | 100 | 91.37 | <input checked="" type="checkbox"/> | Rank - 8 |
| Seventh Generation | Disinfecting Bathroom Cleaner | 100 | 94.53 | <input checked="" type="checkbox"/> | Rank - 1 |
| Cogent Environmental Solutions | DFC GPC Polish | 100 | 78.64 | <input type="checkbox"/> | Rank - 12 |

Conclusion: Only the two thicker cleaning solutions removed under the 85% cut off point for effective all purpose cleaning.