

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
DateRun: 11/18/2004
Experimenters: Jason Marshall, Heidi Wilcox
ClientType: Cleaner Manufacturer
ProjectNumber: Project #1
Substrates: Ceramics, Glass/Quartz, Plastic
PartType: Coupon
Contaminants: Hucker's Soil
Cleaning Methods: Low Pressure Spray
Analytical Methods: Gravimetric
Purpose: To evaluate supplied product in dishwashing and compare to leading industry product.

Experimental Procedure: Three substrates were selected to represent possible materials that would be cleaned in a dishwasher. Two cleaning products were tested and compared to each other and to water. One scoop of a product was added to the Miele Automatic G7735 Spray Wash Unit. Jet-Dry rinse aid was added to the machine. Six coupons of each substrate were contaminated with Hucker's soil using a hand held swab and allowed to sit for 24 hours. A second set of weights were recorded to determine the amount of soil added to each coupon. In addition to the six coupons that were contaminated, three uncontaminated coupons were included in the washing cycle as a way to determine redeposition of the contaminant onto the surface of the coupons. Therefore nine coupons per substrate were cleaned in the Miele unit (27 total). The cleaning cycle operated at 150 F and run for 26 minutes. At the end of the cleaning/rinsing, the coupons were removed from the unit and allowed to air dry for 48 hours. At the end of the air drying, final weights were recorded and efficiencies were calculated.

Results: Both products removed more Hucker's soil than the water alone on all three substrates. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon and substrate cleaned.

| Cleaner | Initial wt | Final wt | Ceramic % | Initial wt | Final wt | Glass % | Initial wt | Final wt | Plastic% |
|---------|------------|----------|-----------|------------|----------|---------|------------|----------|----------|
| Water | 0.0972 | 0.0245 | 74.79 | 0.1590 | 0.0027 | 98.30 | 0.1278 | 0.0086 | 93.27 |
| | 0.5095 | 0.1632 | 67.97 | 0.1101 | 0.0023 | 97.91 | 0.1254 | 0.0043 | 96.57 |
| | 0.2572 | 0.0558 | 78.30 | 0.1431 | 0.0030 | 97.90 | 0.0933 | 0.0067 | 92.82 |
| | 0.1898 | 0.0498 | 73.76 | 0.1544 | 0.0028 | 98.19 | 0.1409 | 0.0039 | 97.23 |
| | 0.5904 | 0.2679 | 54.62 | 0.1601 | 0.0035 | 97.81 | 0.1357 | 0.0037 | 97.27 |
| | 0.6735 | 0.2236 | 66.80 | 0.0892 | 0.0026 | 97.09 | 0.1775 | 0.0147 | 91.72 |
| Cascade | 1.1562 | 0.2827 | 75.55 | 0.1809 | 0.0020 | 98.89 | 0.2226 | 0.0050 | 97.75 |
| | 0.5664 | 0.1183 | 79.11 | 0.1411 | 0.0012 | 99.15 | 0.0774 | 0.0014 | 98.19 |
| | 0.1226 | 0.0258 | 78.96 | 0.1664 | 0.0034 | 97.96 | 0.1300 | 0.0036 | 97.23 |
| | 1.7145 | 0.3298 | 80.76 | 0.1668 | 0.0030 | 98.20 | 0.2131 | 0.0106 | 95.03 |
| | 0.1543 | 0.0355 | 76.99 | 0.1406 | 0.0032 | 97.72 | 0.2545 | 0.0057 | 97.76 |
| | 2.5877 | 0.4597 | 82.24 | 0.1903 | 0.0000 | 100.00 | 0.2490 | 0.0012 | 99.52 |
| Cogent | 0.2088 | 0.0047 | 97.75 | 0.2567 | -0.0005 | 100.19 | 0.1745 | 0.0059 | 96.62 |
| | 0.1760 | 0.0022 | 98.75 | 0.4198 | 0.0007 | 99.83 | 0.2721 | 0.0012 | 99.56 |
| | 0.0833 | 0.0157 | 81.15 | 0.1738 | 0.0001 | 99.94 | 0.1202 | 0.0020 | 98.34 |
| | 0.2882 | 0.0203 | 92.96 | 0.1709 | -0.0004 | 100.23 | 0.1759 | 0.0071 | 95.96 |
| | 0.1562 | 0.0043 | 97.25 | 0.1208 | -0.0002 | 100.17 | 0.1268 | 0.0041 | 96.77 |
| | 0.5788 | 0.0211 | 96.35 | 0.1516 | -0.0003 | 100.20 | 0.1762 | 0.0052 | 97.05 |

Averages by Substrate

| | Ceramic % | Glass % | Plastic % |
|---------|-----------|---------|-----------|
| Water | 69.38 | 97.87 | 94.81 |
| Cascade | 78.94 | 98.65 | 97.58 |
| Cogent | 94.03 | 100.09 | 97.38 |

The only set of uncontaminated control coupons to gain a substantial amount of weight were the Cascade ceramic coupons. The table below lists the average weight change for the control coupons.

| | Ceramic | Glass | Plastic |
|-------|---------|--------|---------|
| Water | 0.053 | 0.0026 | 0.0043 |

CLEANING LABORATORY EVALUATION SUMMARY

| | | | |
|---------|--------|---------|--------|
| Cascade | 0.3982 | 0.0027 | 0.0002 |
| Cogent | 0.0013 | -0.0001 | 0.0006 |

Summary:

| | | | | | |
|--------------------------------|-------------------------|---------------------------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Ceramics, Glass/Quartz, Plastic | | | |
| Contaminants: | | Hucker's Soil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Water | Water | 100 | 87.35 | <input checked="" type="checkbox"/> | |
| Procter & Gamble | Cascade Complete (Dawn) | | 91.70 | <input checked="" type="checkbox"/> | 1 scoop |
| Cogent Environmental Solutions | F103 | | 97.17 | <input checked="" type="checkbox"/> | 1 scoop |

Conclusion:

The Cogent and Cascade products compared fairly closely to each other when cleaning was conducted in the Miele dishwasher. The Cogent product worked slightly better on the ceramic coupons. The same products will be tested under a similar procedure using a Maytag home dishwasher.