

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009
 DateRun: 06/01/2009
 Experimenters: Jason Marshall, Junhee Cho, Timothy Weil
 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 supplied aerosol products for manual all purpose cleaning

Experimental Procedure: Preweighed ceramic, painted steel and plastic coupons were coated with Hucker's Soil Formulation (Jif Creamy Peanut Butter 9.2%, Salted Butter 9.2%, Arrowhead Mills stone ground wheat flour 9.2%, Egg Yolk 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. 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 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 solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded and efficiencies were calculated and recorded.

Results: Each of the supplied products and industry product were effective in removing the Hucker's Soil with a manual wiping action. The table lists the amount of soil initially added and the amount remaining after cleaning and the product efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|------------------------|------------|----------|-----------|
| A00166 Ceramic | 0.1952 | 0.0026 | 98.67 |
| | 0.0928 | 0.0000 | 100.00 |
| | 0.2240 | 0.0172 | 92.32 |
| A00166 Painted Steel | 0.0943 | 0.0142 | 84.94 |
| | 0.0963 | 0.0325 | 66.25 |
| | 0.1284 | 0.0308 | 76.01 |
| A00166 Steel | 0.1064 | 0.0103 | 90.32 |
| | 0.0620 | 0.0053 | 91.45 |
| | 0.0753 | 0.0047 | 93.76 |
| SD-20 Ceramic | 0.0897 | -0.0010 | 101.11 |
| | 0.0558 | 0.0014 | 97.49 |
| | 0.0831 | 0.0064 | 92.30 |
| SD-20 Painted Steel | 0.1034 | 0.0033 | 96.81 |
| | 0.1160 | 0.0047 | 95.95 |
| | 0.1167 | 0.0146 | 87.49 |
| SD-20 Steel | 0.0455 | 0.0020 | 95.60 |
| | 0.1178 | 0.0036 | 96.94 |
| | 0.1113 | 0.0124 | 88.86 |
| Mr. Jinx Ceramic | 0.1126 | 0.0026 | 97.69 |
| | 0.1425 | -0.0013 | 100.91 |
| | 0.0762 | 0.0050 | 93.44 |
| Mr. Jinx Painted Steel | 0.0576 | 0.0063 | 89.06 |
| | 0.0968 | 0.0076 | 92.15 |
| | 0.1271 | 0.0060 | 95.28 |
| Mr. Jinx Steel | 0.1187 | 0.0033 | 97.22 |

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|---------------------|--------|---------|--------|
| | 0.0962 | 0.0034 | 96.47 |
| | 0.0341 | 0.0012 | 96.48 |
| Formula 409 Ceramic | 0.1167 | -0.0073 | 106.26 |
| | 0.1321 | -0.0006 | 100.45 |
| | 0.1817 | 0.0048 | 97.36 |

Summary:

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|--------------------------|-------------------------------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Ceramics, Plastic, Steel | | | | |
| Contaminants: | Hucker's Soil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Amrep Inc | Aspire Heavy Duty Multipurpose Cleaner A00166 Aerosol | 100 | 88.19 | <input checked="" type="checkbox"/> | Rank = 4 |
| Amrep Inc | Misty All Purpose Cleaner A00170 Aerosol | 100 | 94.73 | <input checked="" type="checkbox"/> | Rank = 3 |
| Spartan Chemical Company | SD 20 All Purpose Degreaser Aerosol | 100 | 95.41 | <input checked="" type="checkbox"/> | Rank = 2 |
| Claire Manufacturing | Mr Jinx All Purpose Cleaner Aerosol | 100 | 96.16 | <input checked="" type="checkbox"/> | Rank = 1 |
| Clorox Company | Formula 409 All Purpose Cleaner | 100 | 77.27 | <input type="checkbox"/> | Rank = 5 |

Conclusion:

Five products removed over 85% of the Hucker's soil from the three surfaces using manual wiping. The Amrep Aspire product removed just under 90% and was the fourth best cleaner, outperforming the Amrep Misty product.