

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2014
DateRun: 03/11/2014
Experimenters: George Liang, Francisco Abreau
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 products for all purpose cleaning using manual cleaning

Experimental Procedure: Prew weighed ceramic, painted steel, and plastic coupons were coated with hucker soil using a hand held swab and were allowed to dry for 2 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 L30 reinforced wipe was attached to the cleaning sled and soaked with 1 spray of cleaning solutions with a VWR bottle. Each coupon was sprayed 1 time with the same cleaning solution. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 20 cycles (~30 seconds). Efficiency was calculated for each coupon.

Results:

| | Initial wt | Final wt | % Removed | Average |
|--------------------------|------------|----------|-----------|---------|
| Chrisal 1%-Ceramic | | | | |
| | 0.5769 | 0.3632 | 37.04 | |
| | 0.6133 | 0.4229 | 31.05 | |
| | 0.6127 | 0.4257 | 30.52 | 32.87 |
| Chrisal 1%-Painted Steel | | | | |
| | 0.6013 | 0.4078 | 32.18 | |
| | 0.6019 | 0.4095 | 31.97 | |
| | 0.6430 | 0.4096 | 36.30 | 33.48 |
| Chrisal 1%-Plastic | | | | |
| | 0.6972 | 0.2206 | 68.36 | |
| | 0.6469 | 0.5046 | 22.00 | |
| | 0.6740 | 0.4746 | 29.58 | 39.98 |
| Chrisal 2%-Ceramic | | | | |
| | 0.5879 | 0.4007 | 31.84 | |
| | 0.6002 | 0.4374 | 27.12 | |
| | 0.6370 | 0.3907 | 38.67 | 32.54 |
| Chrisal 2%-Painted Steel | | | | |
| | 0.6111 | 0.4222 | 30.91 | |
| | 0.5610 | 0.2430 | 56.68 | |
| | 0.8728 | 0.4521 | 48.20 | 45.27 |
| Chrisal 2%-Plastic | | | | |
| | 0.6396 | 0.3833 | 40.07 | |
| | 0.7112 | 0.4276 | 39.88 | |
| | 0.7179 | 0.3544 | 50.63 | 43.53 |
| Chrisal 3%-Ceramic | | | | |
| | 0.6445 | 0.4623 | 28.27 | |

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|---------------------------------|--------|--------|-------|-------|
| | 0.6535 | 0.4826 | 26.15 | |
| | 0.6193 | 0.4493 | 27.45 | 27.29 |
| Chrisal 3%- Painted Steel | | | | |
| | 0.6377 | 0.3928 | 38.40 | |
| | 0.5900 | 0.4431 | 24.90 | |
| | 0.5476 | 0.3088 | 43.61 | 35.64 |
| Chrisal 3%- Plastic | | | | |
| | 0.3873 | 0.1783 | 53.96 | |
| | 0.4796 | 0.2158 | 55.00 | |
| | 0.6409 | 0.3223 | 49.71 | 52.89 |
| 409-Ceramic | | | | |
| | 0.6435 | 0.3881 | 39.69 | |
| | 0.6196 | 0.4678 | 24.50 | |
| | 0.6305 | 0.5182 | 17.81 | 27.33 |
| 409- Painted Steel | | | | |
| | 0.7698 | 0.1594 | 79.29 | |
| | 0.6756 | 0.2421 | 64.17 | |
| | 0.6840 | 0.6019 | 12.00 | 51.82 |
| 409- Plastic | | | | |
| | 0.6791 | 0.4780 | 29.61 | |
| | 0.6098 | 0.3193 | 47.64 | |
| | 0.6554 | 0.2829 | 56.84 | 44.70 |

Summary:

| | | | | | |
|----------------------|-----------------------------------|---------------|--------------------|--------------------------|----------------------|
| Substrates: | Ceramics, Plastic, Steel | | | | |
| Contaminants: | Hucker's Soil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Chrisal USA Inc | PIP Probiotic All-Purpose Cleaner | 1 | 64.70 | <input type="checkbox"/> | |
| Clorox Company | Formula 409 All Purpose Cleaner | 100 | 72.49 | <input type="checkbox"/> | |

Conclusion:

Each product has shown a similar level of unsatisfactory results. The product with the highest removal efficiency was Clorox 409 at over 41%.