

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 10/09/2024

Experimenters: Tatyanna Moreland Junior, Cindy McClaughlin, Rachael Rososky

ClientType: Cleaner Manufacturer

ProjectNumber: Project #2

Substrates: Vinyl Composite Tiles, Painted metal

PartType: Coupon

Contaminants: DCC-17

Cleaning Methods: Manual Wipe

Analytical Methods: Colorimeter, Gravimetric

Purpose: To test the effectiveness of Green Mountain Ammenities all purpose cleaner against other all purpose cleaners on the market.

Experimental Procedure: Twenty four coupons per cleaner, three of each substrate per cleaner, were used. The initial weights of each coupon were taken. The initial L value (measure of fluroescence) was also taken with the colorimeter. The coupons were contaminated with DCC-17 Formulation using a handheld swab and dried overnight. The contaminated coupons were weighed, and the dirty L value was measured before placing three coupons per cleaner of the same substrate into a Gardner Straight Line Washability (SLW) unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled. The Wypal and each coupon were treated with three sprays and cleaned for 20 cycles (~30 seconds of cleaning). Clean coupons dried for 24 hours before final weights were taken to assess the amount of soil removed. The final L value was taken in order to assess the amount of staining left behind by the soil.

The L values from the colorimeter represent the difference in lightness (higher value) and darkness (lower value). Percent detergency demonstrates the amount of restoration to the original that has occurred after the cleaning test has been performed. A higher average percent detergency indicates that the cleaner has been effective and has restored the dirty substrate and cleaned it so that it now is much closer to how it originally was measured.

Data recorded from the readings can be calculated as percent detergency in the following equation to determine the cleaning efficacy of each formulation:

$$\% DET = L(cleaned) - L(soiled) / L(unsoiled) - L(soiled) \times 100$$

Results:

Gravimetric:

| Cleaner | Coupon Type | Initial wt of cont. | Final wt of cont. | %Cont Removed | % Average | % Overall |
|-------------------|---------------|---------------------|-------------------|---------------|-----------|-----------|
| Ecolab Degreaser | VCT | 0.3799 | 0.1335 | 64.8592 | 64.20 | 71.78 |
| | | 0.4752 | 0.1559 | 67.1928 | | |
| | | 0.5634 | 0.2222 | 60.5609 | | |
| | Painted Metal | 0.3294 | 0.0861 | 73.8616 | 79.35 | |
| | | 0.5225 | 0.0802 | 84.6507 | | |
| | | 0.2856 | 0.0584 | 79.5518 | | |
| Ecolab Citrus 550 | VCT | 0.3545 | 0.2338 | 34.0480 | 57.12 | 65.62 |
| | | 0.4431 | 0.1691 | 61.8371 | | |
| | | 0.4300 | 0.1055 | 75.4651 | | |
| | Painted Metal | 0.4197 | 0.1498 | 64.3078 | 74.12 | |
| | | 0.6484 | 0.0634 | 90.2221 | | |
| | | 0.4357 | 0.1402 | 67.8219 | | |
| GMA | VCT | 0.4251 | 0.1214 | 71.4420 | 69.35 | 66.67 |
| | | 0.4169 | 0.1967 | 52.8184 | | |
| | | 0.6146 | 0.0997 | 83.7781 | | |
| | Painted Metal | 0.5120 | 0.2984 | 41.7187 | 63.99 | |
| | | 0.5052 | 0.1781 | 64.7466 | | |
| | | 0.4938 | 0.0715 | 85.5205 | | |
| Zep Purple | VCT | 0.5102 | 0.1576 | 69.1102 | 72.23 | 71.12 |
| | | 0.5388 | 0.1152 | 78.6192 | | |
| | | 0.4669 | 0.1449 | 68.9655 | | |
| | Painted Metal | 0.5393 | 0.3060 | 43.2598 | 70.01 | |
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| | | 0.6159 | 0.1010 | 83.6012 | | |
| | | 0.5687 | 0.0957 | 83.1721 | | |

Colorimeter:

| Cleaner | Coupon Type | %DET | % Average | % Overall |
|-------------------|---------------|--------|-----------|-----------|
| Ecolab Degreaser | VCT | 46.22 | 46.43 | 63.37 |
| | | 37.6 | | |
| | | 55.46 | | |
| | Painted Metal | 75.19 | 80.30 | |
| | | 84.74 | | |
| | | 80.98 | | |
| Ecolab Citrus 550 | VCT | 19.74 | 30.12 | 51.26 |
| | | 37.96 | | |
| | | 32.66 | | |
| | Painted Metal | 26.6 | 72.4 | |
| | | 91.32 | | |
| | | 99.28 | | |
| GMA | VCT | 41.59 | 29.04 | 52.41 |
| | | 31.75 | | |
| | | 13.78 | | |
| | Painted Metal | 69.12 | 75.78 | |
| | | 96.3 | | |
| | | 61.92 | | |
| Zep Purple | VCT | -88.57 | 13.37 | 40.05 |
| | | 55.58 | | |
| | | 73.1 | | |
| | Painted Metal | 31.22 | 66.73 | |
| | | 86.57 | | |
| | | 82.41 | | |

Summary:

Conclusion:

No meaningful conclusions can be made from this data, as there are far too many outliers. A retest will need to be done