

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009
 DateRun: 06/04/2009
 Experimenters: Jason Marshall, Junhee Cho, Timothy Weil
 ClientType: Cleaner Manufacturer
 ProjectNumber: Project #1
 Substrates: Plastic
 PartType: Coupon
 Contaminants: Dirt
 Cleaning Methods: Manual Wipe
 Analytical Methods: Visual, Gloss-Color Meter
 Purpose: To evaluate dust mop/cloth treatment aerosol products for dirt removal

Experimental Procedure: Vinyl composite tiles (VCT) were coated with The Clean Environment Co Cycle Finish C-12 (zinc free water base floor finish). Two coats were applied to the VCT with a 30 minutes of drying in-between applications. The coated VCT were weighed and gloss-color readings were made with Spectro Guide. The VCT coupons were coated with an AATCC Synthetic carpet soil and water mixture and dried using a Master Appliance Heat Gun. Dirty weights and gloss-color readings were taken. The aerosol cleaners were sprayed onto a gauze pad and wiped across the surface of the VCT coupons. Final readings were taken and compared to the values obtained when wiping the surface with no cleaner.

Visual observations were made on the condition of the coupons and the gauze pads to determine the qualitative removal rate of each product. A dry gauze pad will be used as a baseline.

Results: Gravimetric analysis resulted in inconclusive results due to the low amount of soil able to be applied to the surfaces. Instead, visual ranking were used as the primary assessment methodology. A Spectro Guide color/gloss meter was used as well to assess cleanliness.

The table below lists the gravimetric analysis.

| Cleaner | Initial wt | Final wt | % Removed |
|---------|------------|----------|-----------|
| A00811 | | | |
| | 0.0427 | 0.0475 | -11.24 |
| | 0.0405 | 0.0444 | -9.63 |
| | 0.0371 | 0.0386 | -4.04 |
| Spartan | | | |
| | 0.0392 | 0.0398 | -1.53 |
| | 1.0365 | 1.0403 | -0.37 |
| | 0.0278 | 0.0297 | -6.83 |
| Claire | | | |
| | 0.039 | 0.0392 | -0.51 |
| | 0.0366 | 0.0385 | -5.19 |
| | 0.038 | 0.0383 | -0.79 |
| Swiffer | | | |
| | 0.0371 | 0.038 | -2.43 |
| | 0.0366 | 0.039 | -6.56 |
| | 0.0379 | 0.0386 | -1.85 |
| Dry | | | |
| | 0.0387 | 0.0382 | 1.29 |
| | 0.0358 | 0.0357 | 0.28 |
| | 0.037 | 0.0365 | 1.35 |
| A00810 | | | |
| | -0.0016 | -0.0342 | -2037.5 |
| | 0.0143 | 0.0203 | -41.96 |
| | -0.0035 | -0.027 | -671.43 |

Visual rankings were made and based on soil loading and darkness of soil on gauze pad. The Amrep Misty product resulted in the best removal of the dust from the coated tile coupons.

Visual Observations

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| Product | Observer 1 | Observer 2 | Observer 3 | Average |
|---------|------------|------------|------------|---------|
| A00811 | 4 | 4 | 4 | 4 |
| A00810 | 1 | 1 | 1 | 1 |
| Spartan | 3 | 3 | 2 | 2.7 |
| Claire | 2 | 2 | 3 | 2.3 |
| Swiffer | 6 | 5 | 5 | 5.3 |
| Dry | 5 | 6 | 6 | 5.7 |

Visual Observations via Spectro Guide Color/gloss meter

Color scale (L*)

| Product | Initial | Average | Dirty | Average | Final | Average |
|---------|---------|---------|-------|---------|-------|---------|
| A00811 | 86.54 | 84.46 | 85.84 | | | |
| | 86.29 | 84.51 | 83.99 | | | |
| | 86.69 | 86.51 | 84.25 | 84.41 | 86.36 | 85.4 |
| A00810 | 84.97 | 80.43 | 81.71 | | | |
| | 84.43 | 84.7 | 78.5 | 79.46 | 85.2 | 83.45 |
| Spartan | 83.49 | 85.59 | | | | |
| 86.54 | | | | | | |
| | 85.15 | 84.85 | 86.04 | | | |
| | 86.44 | 86.04 | 84.5 | 84.28 | 85.82 | 85.82 |
| Claire | 85.92 | 82.79 | 84.19 | | | |
| | 86.5 | 84.39 | 85.41 | | | |
| | 86.4 | 86.27 | 84.1 | 83.76 | 84.71 | 84.77 |
| Swiffer | 84.21 | 83.23 | | | | |
| 86.82 | | | | | | |
| | 86.33 | 84.14 | 84.52 | | | |
| | 86.21 | 86.45 | 81.56 | 83.3 | 83.99 | 83.91 |
| Dry | 85.72 | 82.23 | 81.79 | | | |
| | 85.71 | 77.8 | 84.07 | | | |
| | 86.22 | 85.88 | 78.98 | 79.67 | 81.55 | 82.47 |

The Spartan product resulted in the surface color returning closest to the original level followed by the two Amrep product lines.

Summary:

| | | | | | |
|--------------------------|---|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Plastic | | | | |
| Contaminants: | Dirt | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Amrep Inc | Aspire Dust Mop Treatment A00811 Aerosol | 100 | | <input checked="" type="checkbox"/> | Rank = 3 |
| Amrep Inc | Misty Dust Mop Treatment A00810 Aerosol | 100 | | <input checked="" type="checkbox"/> | Rank = 2 |
| Spartan Chemical Company | Dust Mop-Dust Cloth Treatment Aerosol | 100 | | <input checked="" type="checkbox"/> | Rank = 1 |
| Claire Manufacturing | Dust Up Floor Dressing & Dust Mop Treatment Aerosol | 100 | | <input checked="" type="checkbox"/> | Rank = 4 |
| Procter & Gamble | Swiffer Dust & Shine | 100 | | <input checked="" type="checkbox"/> | Rank = 5 |

Conclusion:

The Aspire product was the fourth best for dust removal based on visual observations and second best using the grey scale measurements.