

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2010

DateRun: 09/20/2010

Experimenters: Jason Marshall, Junhee Cho, Timothy Weil

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Stainless Steel, Wood

PartType: Coupon

Contaminants: Inks, Paints

Cleaning Methods: Manual Wipe

Analytical Methods: Visual

Purpose: To evaluate selected products effectiveness to remove selected soils from selected substrates.

Experimental Procedure: Three products (GPS 1, GPS 2 & GPS 3) that were provided by the client were evaluated for their effectiveness to remove soil from Painted Steel, Wood and Polyurethane coated wood substrates. Using materials provided by the client and in combination with a conventional product chosen by the client to determine the effectiveness of the clients' products to remove soil compared to a conventional product.

For this evaluation a total of 18 Stainless Steel and 18 Wood coupons and 18 wood coupons coated with polyurethane were weighed and coated with the appropriate soil. Nine Stainless Steel, nine wood and nine polyurethane coated wood coupons were contaminated with Bowman Industrial Finish and nine Stainless Steel, nine wood and nine polyurethane coated wood coupons were contaminated with Daye Black Ink. After allowing time to dry, coupons were weighed a second time to determine the amount of soil added. Each set of three coupons were cleaned using abrasion testing using the following application and testing procedure.

First the cleaning solution was applied to the coupon and the cleaning pad and allowed to set for 1 minute (60 seconds) followed by 20 cycles of abrasive cleaning. One minute setting (dwell) time was used while a new cleaning pad was placed in the machine and run for five cycles to simulate removal of the cleaning agent from the surface. Final weights were recorded and efficiencies were calculated.

Results: Few products were very successful using abrasion to remove the soils utilizing client provided cleaning products. The nature of the products led to changes in the weights of the coupons, so a visual ranking was utilized to evaluate the ability of the cleaners provided to achieve a clean surface. Additional testing is recommended to provide more substantial quantitative data for the cleaners. The table lists the perceived ability of the cleaner as observed individually by different members of the SCL Laboratory and as a composite for both substrates.

| | | Cleaner Ranking | | | Wood |
|---------------------------|---|-----------------|---------------|---------------|---------------|
| | | Product | Team Member 1 | Team Member 2 | Team Member 3 |
| Wood uncoated Ink | 1 | GPS1 (100%) | 2 | 1 | 1 |
| | 2 | GPS2 (100%) | 1 | 2 | 2 |
| | 3 | GPS3 (100%) | 2 | 3 | 3 |
| Wood coated Ink | 1 | GPS1 (100%) | 1 | 1 | 1 |
| | 2 | GPS2 (100%) | 2 | 2 | 2 |
| | 3 | GPS3 (100%) | 3 | 3 | 2 |
| Wood uncoated Spray Paint | 1 | GPS1 (100%) | 3 | 1 | 2 |
| | 2 | GPS2 (100%) | 1 | 3 | 1 |
| | 3 | GPS3 (100%) | 2 | 2 | 2 |
| Wood coated Spray paint | 1 | GPS1 (100%) | 1 | 1 | 1 |
| | 2 | GPS2 (100%) | | | |
| | 3 | GPS3 (100%) | | | |

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|---|----------------|---|---|---|-----|
| 2 | GPS2 (100%) | 2 | 2 | 2 | 2 |
| 3 | GPS3 (100%) | 3 | 3 | 2 | 2.7 |

| Cleaner | Initial wt | Final wt | % Removed | Average | Rank |
|---|---------------|-------------|--------------|---------|------|
| Segeit_GPS1_Stainless coupon_Ink | | | | | |
| | 0.3451 | 0.1288 | 62.68 | | 2 |
| | 0.3636 | 0.148 | 59.30 | | |
| | 0.215 | 0.1341 | 37.63 | 53.20 | |
| Segeit_GPS2_Stainless coupon_Ink | | | | | |
| | 0.3432 | 0.0057 | 98.34 | | 1 |
| | 0.3661 | 0.0088 | 97.60 | | |
| | 0.2084 | 0.0141 | 93.23 | 96.39 | |
| Segeit_GPS3_Stainless coupon_Ink | | | | | |
| | 0.3582 | 0.1629 | 54.52 | | 3 |
| | 0.2212 | 0.1372 | 37.97 | | |
| | 0.3272 | 0.2347 | 28.27 | 40.26 | |
| Segeit_GPS1_Stainless coupon_Spray Paint | | | | | 1 |
| | 0.0745 | 0.0231 | 68.99 | | |
| | 0.0602 | 0.0217 | 63.95 | | |
| | 0.0697 | 0.0377 | 45.91 | 59.62 | |
| Segeit_GPS2_Stainless coupon_Spray Paint | | | | | 2 |
| | 0.0729 | 0.0234 | 67.90 | | |
| | 0.0724 | 0.0254 | 64.92 | | |
| | 0.0678 | 0.0415 | 38.79 | 57.20 | |
| Segeit_GPS3_Stainless coupon_Spray Paint | | | | | 3 |
| | 0.0787 | 0.069 | 12.33 | | |
| | 0.0648 | 0.0395 | 39.04 | | |
| | 0.0686 | 0.0459 | 33.09 | 28.15 | |

Summary:

| | | | | | |
|----------------------|-----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Stainless Steel, Wood | | | | |
| Contaminants: | Inks, Paints | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Segetis | Segetis GPS 1 | 100 | | <input checked="" type="checkbox"/> | Rank 1.47 |
| Segetis | Segetis GPS 2 | 100 | | <input checked="" type="checkbox"/> | Rank 1.58 |
| Segetis | Segetis GPS 3 | 100 | | <input type="checkbox"/> | Rank 2.83 |

Conclusion:

GPS 1 and GPS 2 both had a composite score of 1.5 when substrates were measured together while GPS 3 showed a clear inability to meet the same measure of efficiency. The cleaners, GPS 1 & 2 show very similar abilities between the substrates and deserve more attention in testing over a broader range of substrates.