

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2018

DateRun: 12/03/2018

Experimenters: Ted Kearney

ClientType: Cleaner Manufacturer

ProjectNumber: Project #14

Substrates: Ceramics, Glass/Quartz

PartType: Part

Contaminants: Stickies, Soaps

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate supplied glass cleaning products for level of effectiveness while using manual cleaning methods.

Experimental Procedure: Pre-weighed, glass, and chrome coupons were coated with SCL Soil #2 (glass soap scum) which was made of water 51.5%, hair gel 25.6%, Toothpaste 10.4%, Shaving Cream 5.3%, Hair Spray 3.7% and Spray Deodorant 3.5% 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 Wypall L60 reinforced wipe was attached to the cleaning sled and soaked with 1 spray of cleaning solutions. 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 5 cycles (~10 seconds). Coupons were left to dry overnight before final weights and efficiencies were recorded.

Visual observations were made on the coupons for spotting and filming following the general guidelines set forth in the CSPA DCC 09A. Filming is best recognized as "haziness" or overall "miliness", while streaking is best identified as dried droplets or "spotting", usually found strung together into thin white lines. Each coupon was evaluated separately for filming and streaking, according to a scale of "1" to "7" with:

| Filming | Streaking |
|------------------------|--|
| 7 = high filming | 7 = high streaking (poor performance) |
| 1 = no visible filming | 1 = no visible streaking (excellent performance) |

Results:

| Cleaner | Substrate | Coupon | Initial Wt. Cont. | Final Wt. Cont. | % Cont Removed | % Avg Removed |
|---------|-----------|--------|-------------------|-----------------|----------------|---------------|
| 1 | A | 34 | 0.0633 | 0.0015 | 97.63 | 99.16 |
| | | 81 | 0.0685 | 0.0000 | 100.0 | |
| | | 45 | 0.0677 | 0.0001 | 99.85 | |
| | B | 17 | 0.0700 | 0.0136 | 80.57 | 89.73 |
| | | 7 | 0.0737 | 0.0033 | 95.52 | |
| | | 11 | 0.0796 | 0.0055 | 93.09 | |
| 2 | A | 8 | 0.0763 | 0.0012 | 98.43 | 99.22 |
| | | 14 | 0.0694 | 0.0001 | 99.86 | |
| | | 16 | 0.0635 | 0.0004 | 99.37 | |
| | B | 28 | 0.0842 | 0.0181 | 78.50 | 90.24 |
| | | 24 | 0.0683 | 0.0031 | 95.46 | |
| | | 18 | 0.0711 | 0.0023 | 96.77 | |

Visual Analysis:

| Cleaner | Substrate | Streaking Score | Filming Score | Avg. Streaking Score | Avg. Filming Score |
|---------------------|-----------|-----------------|---------------|----------------------|--------------------|
| Jenny Glass Cleaner | Glass | 3.5 | 2 | 2.3 | 1.5 |
| | | 2 | 1.5 | | |
| | | 1.5 | 1 | | |
| | Chrome | 4 | 4 | 2.8 | 3.7 |
| | | 2.5 | 4.5 | | |

CLEANING LABORATORY EVALUATION SUMMARY

| | | | | | |
|-----------------------|--------|-----|-----|-----|-----|
| | | 2 | 2.5 | | |
| Rejoice Glass Cleaner | Glass | 2 | 2.5 | 2.5 | 2 |
| | | 3.5 | 2 | | |
| | | 2 | 1.5 | | |
| | Chrome | 3 | 2 | 2.7 | 2.3 |
| | | 3.5 | 3 | | |
| | | 1.5 | 2 | | |

Overall Average Streaking and Filming

| Cleaner - Substrate | Substrate | Average Streaking Score | Average Filming Score |
|-----------------------|-----------|-------------------------|-----------------------|
| Jenny Glass Cleaner | Glass | 2.3 | 1.5 |
| | Chrome | 2.8 | 3.7 |
| Rejoice Glass Cleaner | Glass | 2.5 | 2 |
| | Chrome | 2.7 | 2.3 |

Summary:

| | | | | | |
|----------------------|----------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Ceramics, Glass/Quartz | | | | |
| Contaminants: | Stickies, Soaps | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Brand Buzz | Brand Buzz Jenny Glass Cleaner | 100% | 94.44 | <input checked="" type="checkbox"/> | |
| Brand Buzz | Brand Buzz Rejoice Glass Cleaner | 100% | 94.73 | <input checked="" type="checkbox"/> | |

Conclusion:

Each of the cleaners was effective in soil removal of above 89% for each surface tested (glass & chrome). The lowest soil removal efficiency was Jenny Glass Cleaner used on the chrome substrate. The highest soil removal efficiency of the cleaners tested was Rejoice Glass Cleaner on the glass substrate. The cleaner which cleaned and removed the most soil from the chrome substrate was Rejoice Glass Cleaner which had a 90.24% removal efficiency. Based on the streaking and filming table, overall Jenny Glass Cleaner was the highest performing glass cleaner, followed by Rejoice Glass Cleaner. The highest performing cleaner for chrome, it was Rejoice Glass Cleaner, followed by Jenny Glass Cleaner.