

# CLEANING LABORATORY EVALUATION SUMMARY

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| SCL #:                  | 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| DateRun:                | 06/10/2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Experimenters:          | Jason Marshall, Timothy Weil, Johnny Le                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ClientType:             | Cleaner Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ProjectNumber:          | Project #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Substrates:             | Vinyl Composite Tiles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PartType:               | Coupon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Contaminants:           | Carbon Deposits, Greases, Oil, Food                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Cleaning Methods:       | Manual Wipe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Analytical Methods:     | Gravimetric, Gloss-Color Meter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Purpose:                | To evaluate supplied product for grease removal from floor surfaces following CSPA DCC 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Experimental Procedure: | <p>The supplied product was tested using the CSPA DCC 17 - Greasy Soil Test Method for Evaluating Spray-and-Wipe Cleaners Used on Hard, Non-Glossy Surfaces standard. A few minor deviations from the standard were incorporated into the test conducted.</p> <p>The Greasy Soil Test Method is a standard method that evaluates the cleaning performance of products intended for use on washable walls or other hard, non-glossy surfaces. This method provides instructions for soil application, cleaning and evaluation of spray-and-wipe cleaners under controlled cleaning conditions. This method can be used to assess product performance for cleaning a fabricated greasy soil blend applied to painted wallboard tiles. It is not inclusive of all soil or substrates typically encountered by a consumer while using these products.</p> <p>Latex painted vinyl composite tiles were substituted for masonite wallboard tiles. These tiles were soiled with a mixture of melted, oily soils containing a small amount of carbon black. The tiles were dried overnight at room temperature. A measured amount of spray-and-wipe cleaner is applied to a reinforced paper towel was used in place of the sponge. The soaked towels were used to scrub a portion of the soiled substrate using a straight-line washability apparatus. The tile was rinsed after cleaning to remove loosened soil. Separate soiled coupons were cleaned with the other products being evaluated instead of using the same soiled coupon as another product.</p> <p>This was done to eliminate any possible cross contamination of the cleaning process. Three coupons were cleaned by each cleaning product being evaluated. Cleaning performance was taken as a linear function of reflectance value, and visually evaluated by a panel of judges.</p> <p><b>Coupon preparation:</b><br/>Two coats of white paint solution were applied to the slightly rough side of the tiles, waiting 15 minutes between each coat. Coupons were allowed to dry overnight at room temperature, and then cure them at 50°C and 50% humidity for 24 hours. Five reflectance readings were taken for each of three separate tiles to obtain a baseline value.</p> <p><b>Soil Preparation</b><br/>A mixture of three cooking oils/greases was made. A melt blend of 33% vegetable shortening, 33% lard, 33% vegetable oil and 1% carbon lampblack was made up fresh for the testing. Care was taken in the application of the soil onto the coupons so that light and heavy areas were avoided. Allow the soiled tiles to dry for 24 hours at room temperature. Five reflectance readings were made for each of three soiled tiles to obtain a soiled reference value.</p> <p><b>Cleaning Test</b><br/>Place a soiled tile in the tray of the abrasion tester such that the direction of the soiling is perpendicular to the direction of the sponge. In place of using a sponge and pouring solution into dish for application, products were applied to the coated surfaces using 3-5 sprays from manual spray pump and 4-7 sprays onto the reinforced Wypal X60 paper towel attached to the cleaning instrument. The cleaning was performed using Gardner Straightline washability unit and conducted for the prescribed 5 cycles (10 strokes). Following the initial cycle, there was no discernable difference between the products and an additional 15 cycles were run. The coupons were immediately rinse with tap water only the surface which was scrubbed.</p> <p>In addition to the L-value readings, gravimetric analysis was conducted to determine soil removal. Weights were taken before soiling, after soiling and after cleaning. Results were based on percent soil removal.</p> <p>Cleaning data can be calculated as percent detergency in the following equation: <math>\% \text{ DET} = \frac{R(\text{cleaned}) - R(\text{soiled})}{R(\text{unsoiled}) - R(\text{soiled})} \times 100</math></p> |
| Results:                | The new formulation performed as well as the existing formulation and the conventional product when analyzed with both the L-values and gravimetric analysis. All three products had %DET between 63 and 65 and soil removal efficiency between 89-91%. In both cases the current product had slightly higher effectiveness.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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The tables list the I-value readings and gravimetric weights for each coupon cleaned.  
L-Value Results

| Cleaner                            | Initial<br>L | Dirty<br>L | Final<br>L | Rc-<br>Rs | Ru-<br>Rs | [Rc-Rs/<br>(Ru-<br>Rs)]*100 | Ave   |
|------------------------------------|--------------|------------|------------|-----------|-----------|-----------------------------|-------|
| Nutrisol-<br>Calsoft<br>L40        |              |            |            |           |           |                             |       |
|                                    | 90.59        | 27.26      | 70.04      | 63.33     | 20.55     | 67.55                       | 63.84 |
|                                    | 90.19        | 37.23      | 67.84      | 52.96     | 22.35     | 57.8                        |       |
|                                    | 88.93        | 30.99      | 69.33      | 57.94     | 19.6      | 66.17                       |       |
| MD<br>Stetson<br>3R                |              |            |            |           |           |                             |       |
|                                    | 88.26        | 26         | 54.27      | 62.26     | 33.99     | 45.41                       | 65.73 |
|                                    | 88.12        | 27.81      | 68.71      | 60.31     | 19.41     | 67.82                       |       |
|                                    | 85.75        | 29.37      | 72.82      | 56.38     | 12.93     | 77.07                       |       |
| Green<br>Bridge<br>Control<br>32-1 |              |            |            |           |           |                             |       |
|                                    | 86.2         | 23.61      | 65.41      | 62.59     | 20.79     | 66.78                       | 63.43 |
|                                    | 85.78        | 24         | 66.29      | 61.78     | 19.49     | 68.45                       |       |
|                                    | 81.27        | 35.02      | 63.67      | 46.25     | 17.6      | 61.95                       |       |

Gravimetric Results

| Cleaner                   | Initial<br>wt | Final wt | %<br>Removed |
|---------------------------|---------------|----------|--------------|
| Nutrisol-Calsoft<br>L40 G |               |          |              |
|                           | 0.5499        | 0.0619   | 88.74        |
|                           | 0.6939        | 0.0674   | 90.29        |
|                           | 0.4194        | 0.0732   | 82.55        |
| Nutrisol-Calsoft<br>L40 G |               |          |              |
|                           | 0.4022        | 0.0318   | 92.09        |
|                           | 0.4446        | 0.0591   | 86.71        |
|                           | 0.3275        | 0.0376   | 88.52        |
| Nutrisol-Calsoft<br>L40   |               |          |              |
|                           | 0.2632        | 0.0272   | 89.67        |
|                           | 0.3071        | 0.0391   | 87.27        |
|                           | 0.4560        | 0.0369   | 91.91        |
| Nutrisol-Calsoft<br>L40 L |               |          |              |
|                           | 62.0000       | 31.8900  | 48.56        |
|                           | 64.1700       | 37.3500  | 41.80        |
|                           | 62.8800       | 32.4800  | 48.35        |
| Nutrisol-Calsoft<br>L40 L |               |          |              |
|                           | 58.9000       | 25.7200  | 56.33        |
|                           | 61.2400       | 21.3600  | 65.12        |
|                           | 63.0100       | 23.1600  | 63.24        |
| Nutrisol-Calsoft<br>L40 L |               |          |              |
|                           | 63.3300       | 20.5500  | 67.55        |
|                           | 52.9600       | 22.3500  | 57.80        |
|                           | 57.9400       | 19.6000  | 66.17        |
| MD Stetson 3R             |               |          |              |
|                           | 0.6017        | 0.0943   | 84.33        |
|                           | 0.7370        | 0.0430   | 94.17        |
|                           | 0.4219        | 0.0284   | 93.27        |

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|                              |        |        |       |
|------------------------------|--------|--------|-------|
| Green Bridge<br>Control 32-1 |        |        |       |
|                              | 0.6481 | 0.0471 | 92.73 |
|                              | 0.3914 | 0.0195 | 95.02 |
|                              | 0.2771 | 0.0381 | 86.25 |

Summary:

|                       |                                     |               |                    |                                     |                      |
|-----------------------|-------------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>    | Vinyl Composite Tiles               |               |                    |                                     |                      |
| <b>Contaminants:</b>  | Carbon Deposits, Greases, Oil, Food |               |                    |                                     |                      |
| <b>Company Name:</b>  | <b>Product Name:</b>                | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Next-Gen Supply Group | 3R All Purpose Cleaner              | 2.1           | 90.59              | <input checked="" type="checkbox"/> |                      |

Conclusion:

The new formulation performed as well as the existing formulation and the conventional product. All three removed over 89% of the grease-soil mixture using manual wiping.