

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2011

DateRun: 10/26/2011

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ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Steel, Chrome

PartType: Coupon

Contaminants: Greases, Films, Soaps, Hucker's Soil, Food

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric

Purpose: To compare original formulation of product with newer product for all purpose cleaning tasks

Experimental Procedure: The two cleaning products were diluted with tap water at room temperature to vendor recommended concentration for all purpose cleaning (1:8).

Preweighed painted steel coupons were coated with Hucker's Soil Formulation (Jif Creamy Peanut Butter, Salted Butter, Arrowhead Mills stone ground wheat flour, Egg Yolk, Evaporated milk, distilled water, Printer's ink with boiled linseed oil, Shaws saline solution) using a handheld swab and allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added. A second set of painted steel coupons were coated with DCC 17 Greasy Soil (mixture of three cooking oils/greases: 33% vegetable shortening, 33% lard, 33% vegetable oil and 1% carbon lampblack). A final set of preweighed chrome coupons were coated with a SSL Soil 1 Bathroom soap scum (Bathroom soap scum: All-in-one shampoo and conditioner 28.6%, Dry skin lotion 21.4%, Liquid hand soap 21.4%, Liquid body wash 14.3%, Deodorant bar soap 7.2% and water 7.1%).

Three coupons of each soil were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies were calculated and recorded.

Results: Both products were effective at removing the Hucker's soil from the surface using manual wiping. The Original formulation resulted in the lowest efficiency, removing about 80% of the Hucker's soil. The new formulation removed more than 90%. A similar result was found for the DCC 17 Grease Mix, with the new formulation removing more than the original formulations, but both products removed more than 92% of the grease. The bathroom soil resulted in both products removing more than 85% of the bathroom soap scum soil from the surfaces using manual cleaning. For this soil, the original formulation was marginally better than the new formulation.

The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each coupon cleaned.

| Cleaner              | Initial wt | Final wt | % Removed |
|----------------------|------------|----------|-----------|
| PT Original Hucker's |            |          |           |
|                      | 0.0111     | 0.0021   | 81.08     |
|                      | 0.0168     | 0.0023   | 86.31     |
|                      | 0.0141     | 0.0036   | 74.47     |
| PT New Hucker's      |            |          |           |
|                      | 0.0191     | 0.0012   | 93.72     |
|                      | 0.0192     | 0.0016   | 91.67     |
|                      | 0.0172     | 0.0026   | 84.88     |
| PT Original DCC 17   |            |          |           |
|                      | 0.0340     | 0.0027   | 92.06     |
|                      | 0.0167     | 0.0013   | 92.22     |
|                      | 0.0407     | 0.0032   | 92.14     |
| PT New DCC 17        |            |          |           |
|                      | 0.0495     | 0.0026   | 94.75     |
|                      | 0.0706     | 0.0022   | 96.88     |
|                      | 0.0636     | 0.0015   | 97.64     |

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|                      |        |        |       |
|----------------------|--------|--------|-------|
| PT Original Bathroom |        |        |       |
|                      | 0.0500 | 0.0016 | 96.80 |
|                      | 0.0546 | 0.0014 | 97.44 |
|                      | 0.0552 | 0.0029 | 94.75 |
| PT New Bathroom      |        |        |       |
|                      | 0.0375 | 0.0031 | 91.73 |
|                      | 0.0221 | 0.0022 | 90.05 |
|                      | 0.0424 | 0.0014 | 96.70 |

Summary:

|                      |  |               |                    |                                     |                      |
|----------------------|--|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>   | Steel, Chrome                              |               |                    |                                     |                      |
| <b>Contaminants:</b> | Greases, Films, Soaps, Hucker's Soil, Food |               |                    |                                     |                      |
| <b>Company Name:</b> | <b>Product Name:</b>                       | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Chemco               | Purple Tiger All purpose cleaner           | 11            | 89.69              | <input checked="" type="checkbox"/> | Original formulation |
| Chemco               | Purple Tiger All purpose cleaner           | 11            | 93.11              | <input checked="" type="checkbox"/> | New formulation      |

Conclusion:

In two of three soils, the new formulation of the supplied product worked better than the original version of the cleaning product.