

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2010

DateRun: 06/04/2010

Experimenters: Jason Marshall, Timothy Weil

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Glass/Quartz, Chrome

PartType: Coupon

Contaminants: Films, Soaps

Cleaning Methods: Manual Wipe

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate possible reformulation products for glass cleaning.

Experimental Procedure: The proposed formulation products were diluted using room temperature water to a concentration (96:1). A conventional product was used at full strength for glass cleaning. In addition, the supplied current formulation was used as a control to determine relative effectiveness of the proposed formulations.

Prewrite weighed chrome, mirror and glass coupons were coated with SSL Soil 2 (Glass soap scum: 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 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.

Three coupons were placed into a Gardner Straight Line Washability unit. A Wypall X60 reinforced wipe 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 solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 5 cycles (~10 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded and efficiencies 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, (i.e., product residues without added soil), according to a scale of "1" to "7", where:

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

Results: The two formulations using Colonial Chemical products removed over 85% of the glass soap scum at the 96-1 dilution which were comparable to the conventional product at 88% removal. The Calsoft L40 and Calsoft AOS 40 removed the same amount as the current formulation product at 84%. The Mirataine H2CA removed less than 80% of the soil. There was no significant difference in the level of streaking and filming. 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 | Streaking | Filming | Ave S | Ave F |
|--------------------------------|------------|----------|-----------|-----------|---------|-------|-------|
| Nutrisol w/ Calsoft L40 Glass | | | | | | | |
| | 0.0984 | 0.0192 | 80.49 | 4 | 2 | 2.2 | 2.2 |
| | 0.1072 | 0.0089 | 91.70 | 2 | 2 | | |
| | 0.1050 | 0.0136 | 87.05 | 1 | 1 | | |
| Nutrisol w/ Calsoft L40 Chrome | | | | | | | |
| | 0.1194 | 0.0080 | 93.30 | | | | |
| | 0.0950 | 0.0123 | 87.05 | | | | |
| | 0.0807 | 0.0144 | 82.16 | | | | |
| Nutrisol w/ Calsoft L40 Mirror | | | | | | | |
| | 0.0922 | 0.0208 | 77.44 | 2 | 3 | | |
| | 0.0957 | 0.0160 | 83.28 | 2 | 2 | | |
| | 0.1337 | 0.0291 | 78.23 | 2 | 3 | | |

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|---|--------|--------|-------|---|---|-----|-----|
| Nutrisol w/ Calsoft AOS40 Glass | | | | | | | |
| | 1.0931 | 0.0165 | 98.49 | 1 | 2 | 1.8 | 2.8 |
| | 0.1468 | 0.0204 | 86.10 | 1 | 2 | | |
| | 0.1577 | 0.0135 | 91.44 | 2 | 3 | | |
| Nutrisol w/ Calsoft AOS40 Chrome | | | | | | | |
| | 0.1406 | 0.0152 | 89.19 | | | | |
| | 0.1362 | 0.0137 | 89.94 | | | | |
| | 1.1235 | 0.0192 | 98.29 | | | | |
| Nutrisol w/ Calsoft AOS40 Mirror | | | | | | | |
| | 0.1228 | 0.0399 | 67.51 | 3 | 4 | | |
| | 0.1382 | 0.0433 | 68.67 | 2 | 3 | | |
| | 0.1111 | 0.0380 | 65.80 | 2 | 3 | | |
| Nutrisol w/ Mirataine H2CA Glass | | | | | | | |
| | 0.1000 | 0.0080 | 92.00 | 2 | 3 | 1.7 | 2.8 |
| | 0.1127 | 0.0121 | 89.26 | 2 | 3 | | |
| | 0.1388 | 0.0265 | 80.91 | 3 | 3 | | |
| Nutrisol w/ Mirataine H2CA Chrome | | | | | | | |
| | 0.1117 | 0.0142 | 87.29 | | | | |
| | 0.1063 | 0.0207 | 80.53 | | | | |
| | 0.1587 | 0.0265 | 83.30 | | | | |
| Nutrisol w/ Mirataine H2CA Mirror | | | | | | | |
| | 0.1340 | 0.0376 | 71.94 | 1 | 3 | | |
| | 0.1443 | 0.0025 | 98.27 | 1 | 2 | | |
| | 0.0810 | 0.0642 | 20.74 | 1 | 3 | | |
| Nutrisol w/ SugaFax D10 Glass | | | | | | | |
| | 0.0569 | 0.0076 | 86.64 | 1 | 2 | 1.7 | 2.5 |
| | 0.0966 | 0.0007 | 99.28 | 1 | 2 | | |
| | 0.1295 | 0.0053 | 95.91 | 2 | 2 | | |
| Nutrisol w/ SugaFax D10 Chrome | | | | | | | |
| | 0.1099 | 0.0420 | 98.28 | | | | |
| | 0.1103 | 0.0019 | 84.26 | | | | |
| | 0.1074 | 0.0169 | 76.75 | | | | |

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|--|--------|--------|-------|---|---|-----|-----|
| Nutrisol w/ SugaFax D10 Mirror | | | | | | | |
| | 0.1329 | 0.0309 | 80.98 | 2 | 3 | | |
| | 0.1176 | 0.0215 | 93.31 | 2 | 3 | | |
| | 0.1199 | 0.0228 | 96.46 | 2 | 3 | | |
| Green Bridge Control 96-1 Glass | | | | | | | |
| | 0.1278 | 0.0045 | 86.92 | 3 | 2 | 2.5 | 2.3 |
| | 0.1084 | 0.0121 | 69.72 | 2 | 2 | | |
| | 0.0665 | 0.0087 | 68.30 | 2 | 2 | | |
| Green Bridge Control 96-1 Chrome | | | | | | | |
| | 0.1004 | 0.0304 | 84.90 | | | | |
| | 0.1022 | 0.0324 | 84.62 | | | | |
| | 0.1424 | 0.0215 | 95.23 | | | | |
| Green Bridge Control 96-1 Mirror | | | | | | | |
| | 0.1547 | 0.0238 | 94.70 | 3 | 3 | | |
| | 0.1634 | 0.0078 | 95.72 | 2 | 2 | | |
| | 0.1679 | 0.0089 | 94.06 | 3 | 3 | | |
| MD Stetson Vision Glass | | | | | | | |
| | 0.1076 | 0.0072 | 76.81 | 3 | 2 | 2.2 | 2.8 |
| | 0.2569 | 0.0091 | 96.48 | 1 | 3 | | |
| | 0.1035 | 0.0240 | 88.84 | 2 | 4 | | |
| MD Stetson Vision Chrome | | | | | | | |
| | 0.1309 | 0.0056 | 85.75 | | | | |
| | 0.1128 | 0.0067 | 84.29 | | | | |
| | 0.1144 | 0.0163 | 74.78 | | | | |
| MD Stetson Vision Mirror | | | | | | | |
| | 0.1184 | 0.0186 | 83.84 | 1 | 3 | | |
| | 0.1336 | 0.0337 | 89.47 | 4 | 3 | | |
| | 0.1318 | 0.0213 | 89.03 | 2 | 2 | | |
| Nutrisol w/ SugaNate 160 Glass | | | | | | | |
| | 0.0114 | 0.0012 | 91.04 | 2 | 1 | 1.5 | 2.0 |
| | 0.0237 | 0.0026 | 88.57 | 1 | 1 | | |
| | 0.0212 | 0.0019 | 98.25 | 1 | 1 | | |
| Nutrisol w/ SugaNate 160 Chrome | | | | | | | |

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|---|--------|--------|-------|---|---|--|--|
| | 0.0280 | 0.0032 | 88.57 | | | | |
| | 0.0229 | 0.0004 | 98.25 | | | | |
| | 0.0219 | 0.0036 | 83.56 | | | | |
| Nutrisol w/ SugaNate 160 Mirror | | | | | | | |
| | 0.0126 | 0.0026 | 79.37 | 2 | 3 | | |
| | 0.0260 | 0.0053 | 79.62 | 1 | 3 | | |
| | 0.0542 | 0.0001 | 99.82 | 2 | 3 | | |

Summary:

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|-----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Glass/Quartz, Chrome | | | | |
| Contaminants: | Films, Soaps | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Next-Gen Supply Group | Vision Glass Cleaner | 100 | 88.11 | <input checked="" type="checkbox"/> | |

Conclusion:

Two formulations removed over 85% of the glass soap scum and compared closely with the conventional product. A second glass cleaning trial will be conducted on another dilution of product.