

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2006
 DateRun: 10/10/2006
 Experimenters: Jason Marshall, Heidi Wilcox
 ClientType: Lab
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Carbon Deposits, Greases, Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: Laboratory evaluations of alternative aerosol cleaning products

Experimental Procedure: Basic cleaning performance testing was conducted using ASTM G122 as the bases for cleaning. Seven products were selected for testing based on equipment compatibility and soil removal. An eight product previously tested was also included. All eight products were diluted to 25% using DI water in 600 ml beakers. Products were used at room temperature. Twenty-four preweighed aluminum coupons were coated with a collection of brake/engine soil collected from an automobile shop. The coupons were allowed to sit for several days before a second weight was recorded. Three coupons were cleaned in each solution for 5 minutes using minimal agitation from a magnetic stir bar. Coupons were then rinsed in tap water for 15 seconds and dried using air blow off at room temperature for 30 seconds. Following drying, final weights were recorded and cleaning efficiencies were calculated.

Results: The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---------------------|------------|----------|-----------|
| Cal Parts Washer | 0.2295 | 0.1770 | 22.88 |
| | 0.1252 | 0.0825 | 34.11 |
| | 0.2126 | 0.1682 | 20.88 |
| | 0.4560 | 0.1972 | 56.75 |
| Citrus Soy Solvent | 0.2702 | 0.1290 | 52.26 |
| | 0.3649 | 0.1409 | 61.39 |
| | 0.4402 | 0.3522 | 19.99 |
| Micro 90 | 0.4197 | 0.3518 | 16.18 |
| | 0.2134 | 0.1619 | 24.13 |
| | 0.3367 | 0.2568 | 23.73 |
| Surface Cleanse 930 | 0.2962 | 0.2031 | 31.43 |
| | 0.4493 | 0.3188 | 29.05 |
| | 0.3585 | 0.2236 | 37.63 |
| 1400 GD | 0.4040 | 0.1842 | 54.41 |
| | 0.3054 | 0.1892 | 38.05 |
| Daraclean 282 | 0.5271 | 0.3715 | 29.52 |
| | 0.3602 | 0.2733 | 24.13 |
| | 0.1466 | 0.0891 | 39.22 |
| Sea Wash Blue | 0.1770 | 0.1336 | 24.52 |
| | 0.1704 | 0.1304 | 23.47 |
| | 0.1806 | 0.1423 | 21.21 |
| Inproclean 3800 | 0.1270 | 0.0695 | 45.28 |
| | 0.2508 | 0.1377 | 45.10 |
| | 0.2745 | 0.1906 | 30.55 |

Summary:

| | | | | | | |
|----------------------|-------------------------------|---------------|--------------------|-------------------|----------------------|--|
| Substrates: | Aluminum | | | | | |
| Contaminants: | Carbon Deposits, Greases, Oil | | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |

CLEANING LABORATORY EVALUATION SUMMARY

| | | | | | |
|------------------------------------|--|----|-------|-------------------------------------|--|
| Phase III Inc | California Parts Washer Solution | 25 | 25.96 | <input type="checkbox"/> | |
| Bi-O-Kleen Industries | Citrus Soy Solvent Cleaner & Degreaser | 25 | 56.80 | <input checked="" type="checkbox"/> | |
| International Products Corporation | Micro 90 Conc. | 25 | 20.10 | <input type="checkbox"/> | |
| International Products Corporation | Surface Cleanse Concentrated Neutral 930 | 25 | 28.07 | <input type="checkbox"/> | |
| Brulin Corporation | Aquavantage 1400 | 25 | 43.36 | <input checked="" type="checkbox"/> | |
| Magnaflux | Daraclean 282 | 25 | 30.96 | <input checked="" type="checkbox"/> | |
| Warren Chemical Company | Sea Wash Blue | 25 | 23.07 | <input type="checkbox"/> | |
| Oakite Products | Inproclean 3800 | 25 | 40.31 | <input checked="" type="checkbox"/> | |

Conclusion:

Four of the eight products has moderate success under the conditions tested. These four products will be used in the next phase of testing for aerosol alternatives for brake cleaning.