

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2006

DateRun: 10/12/2006

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. The six products were used at full strength in 250 ml beakers, one product was used at 5% and another at 25%. Both dilutions were made with DI water in 600 ml beakers. Products were used at room temperature. Twenty-one 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 |
|---------------------|------------|----------|-----------|
| Solsafe 245 | 0.5652 | 0.0978 | 82.70 |
| | 0.7022 | 0.0628 | 91.06 |
| | 0.6891 | 0.1613 | 76.59 |
| Polyspray Jet 790 P | 0.7052 | 0.6415 | 9.03 |
| | 0.7512 | 0.6341 | 15.59 |
| | 0.7286 | 0.7247 | 0.54 |
| Inproclean 4000 T | 0.6550 | 0.4985 | 23.89 |
| | 0.5046 | 0.3748 | 25.72 |
| | 0.5013 | 0.3329 | 33.59 |
| Soy Gold 2000 | 0.6691 | 0.1737 | 74.04 |
| | 0.6924 | 0.2721 | 60.70 |
| | 0.5639 | 0.2288 | 59.43 |
| Soy Gold 1000 | 0.4381 | 0.1688 | 61.47 |
| | 0.4884 | 0.2542 | 47.95 |
| | 0.5974 | 0.1700 | 71.54 |
| Formula 180 D | 0.7346 | 0.6544 | 10.92 |
| | 0.6540 | 0.4955 | 24.24 |
| | 1.1044 | 0.9722 | 11.97 |
| Actisolv | 0.4437 | 0.3976 | 10.39 |
| | 0.7289 | 0.6769 | 7.13 |
| | 0.9546 | 0.9009 | 5.63 |

Summary:

| | | | | | |
|----------------------|-------------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | Carbon Deposits, Greases, Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Bio Chem Systems | Solsafe 245 | 100 | 83.45 | <input checked="" type="checkbox"/> | |

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|---------------------------|----------------------------|-----|-------|-------------------------------------|--------------------------------|
| US Polychem Corporation | Polyspray Jet 790 P | 25 | 8.39 | <input type="checkbox"/> | |
| Oakite Products | Inproclean 4000 T | 5 | 25.19 | <input type="checkbox"/> | retest at higher concentration |
| AG Environmental Products | Soy Gold 2000 | 100 | 64.72 | <input checked="" type="checkbox"/> | |
| AG Environmental Products | Soy Gold 1000 | 100 | 60.32 | <input checked="" type="checkbox"/> | |
| Sysco Corporation | Soy Cleaner 180 D | 100 | 15.71 | <input type="checkbox"/> | |
| Gemtek Products | SC Actisolv Safety Solvent | 100 | 7.72 | <input type="checkbox"/> | |

Conclusion:

Three products were moderately successful in removing the brake/engine grease-oil mix using immersion cleaning at room temperature and will be used in the next round of aerosol testing.