

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2006
 DateRun: 11/08/2006
 Experimenters: Jason Marshall
 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. Thirteen products were selected for testing based on soil removal. Six products were diluted to ~15% using DI water and one was used at 10%. The other six products were used at full strength in 250 ml beakers. Products were used at room temperature. Thirteen 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. One coupons was cleaned in each solution for 5 minutes using no agitation. 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.

Testing was conducted as a preliminary screening and did not follow the triplicate testing process normally followed.

Results: Five of the thirteen products removed over 65% of the soil mix from the individual coupons. Two products removed just over 40%. These seven products were considered acceptable for continued testing. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|--------------------------|------------|----------|-----------|
| 278 Super Solv | 0.3734 | 0.2160 | 42.15 |
| DS 104 | 0.3992 | 0.0926 | 76.80 |
| D Greeze 500 Lo | 0.2893 | 0.0413 | 85.72 |
| Soy Solv | 0.4111 | 0.3197 | 22.23 |
| Soy Solv II | 0.3262 | 0.2970 | 8.95 |
| Soy Solv II Plus | 0.4247 | 0.4147 | 2.35 |
| Harvest Gold 2002 | 0.3457 | 0.1024 | 70.38 |
| Soy Cleaner Kitchen/Bath | 0.3146 | 0.3236 | -2.86 |
| Cleaner & Degreaser | 0.2783 | 0.2779 | 0.14 |
| Formula T | 0.1094 | 0.0807 | 26.23 |
| SC Maxisolv | 0.1845 | 0.1059 | 42.60 |
| Eliminator | 0.1555 | 0.0418 | 73.12 |
| Sea Wash Blue | 0.4399 | 0.1369 | 68.88 |

Summary:

| Substrates: | | Aluminum | | | |
|-----------------------------|----------------------------|-------------------------------|-------------|-------------------------------------|---------------|
| Contaminants: | | Carbon Deposits, Greases, Oil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| AW Chesterton | 278 Super Solv | 10 | 42.15 | <input checked="" type="checkbox"/> | |
| Dysol | DS 104 Wipe Solvent | 100 | 76.80 | <input checked="" type="checkbox"/> | |
| Transene Company, Inc. | D Greeze 500 LO | 100 | 85.72 | <input checked="" type="checkbox"/> | |
| Soysolv Industrial Products | Soysolv industrial solvent | 17 | 22.23 | <input type="checkbox"/> | |
| Soysolv Industrial Products | Soysolv II solvent | 100 | 8.95 | <input type="checkbox"/> | |

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|-----------------------------------|----------------------------------------|-----|-------|-------------------------------------|--|
| Soysolv Industrial Products | Soysolv II solvent Plus | 17 | 2.35 | <input type="checkbox"/> | |
| United Laboratories International | United 2002 Harvest Gold | 100 | 70.37 | <input checked="" type="checkbox"/> | |
| Bi-O-Kleen Industries | Soy Cream Cleaner | 17 | -2.86 | <input type="checkbox"/> | |
| Bi-O-Kleen Industries | Citrus Soy Solvent Cleaner & Degreaser | 17 | 0.14 | <input type="checkbox"/> | |
| Finger Lakes Chemical | Formula T | 100 | 26.23 | <input type="checkbox"/> | |
| Gemtek Products | Safe Care (SC) Maxi Solv | 100 | 42.60 | <input checked="" type="checkbox"/> | |
| Phase III Inc | Eliminator | 17 | 73.12 | <input checked="" type="checkbox"/> | |
| Warren Chemical Company | Sea Wash Blue | 17 | 68.88 | <input checked="" type="checkbox"/> | |

Conclusion: The products that showed good cleaning abilities in the preliminary testing phase will be evaluated further.