

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 08/05/2008

Experimenters: Jason Marshall, Shweta Bansal

ClientType: Machine Construction Company

ProjectNumber: Project #2

Substrates: Steel

PartType: Coupon

Contaminants: Coatings

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate non-aqueous alternative cleaning products on the first supplied rust preventative

Experimental Procedure: Nine products were selected from the lab's database, www.cleanersolutions.org, based on client supplied information and past testing results. All eight were used at full strength.

Twenty-seven preweighed steel coupons were coated with rust preventative VCI 325 using a hand held swab. Dirty weights were recorded. Three coupons were cleaned in each product for five minutes using minimal agitation. No rinse was used and coupons were air dried at room temperature. Once dry, final weights were recorded and efficiencies calculated.

Results: Of the nine products tested, only one removed more than 80% of the rust preventative and there were three that removed greater than 60%. The table lists the amount of soil added, the amount remaining and the efficiency of each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|--|------------|----------|-----------|
| Smart Solve 605 | | | |
| | 0.0362 | 0.0573 | -58.29 |
| | 0.0740 | 0.0561 | 24.19 |
| | 0.1098 | 0.0572 | 47.91 |
| Citrus Soy Solvent Cleaner & Degreaser | | | |
| | 0.1958 | 0.0778 | 60.27 |
| | 0.2172 | 0.0746 | 65.65 |
| | 0.1915 | 0.0707 | 63.08 |
| BG 617 | | | |
| | 0.1466 | 0.1027 | 29.95 |
| | 0.1726 | 0.1028 | 40.44 |
| | 0.1125 | 0.1078 | 4.18 |
| Bean-e-doo | | | |
| | 0.1592 | 0.0630 | 60.43 |
| | 0.1758 | 0.0688 | 60.86 |
| | 0.1552 | 0.0543 | 65.01 |
| Bio T 300 B | | | |
| | 0.1441 | 0.0603 | 58.15 |
| | 0.1317 | 0.0568 | 56.87 |
| | 0.1636 | 0.0479 | 70.72 |
| Vertec Bio Gold #3 | | | |
| | 0.1537 | 0.0554 | 63.96 |
| | 0.1141 | 0.0675 | 40.84 |
| | 0.1687 | 0.0714 | 57.68 |
| Makisolv | | | |
| | 0.1798 | 0.0288 | 83.98 |
| | 0.1731 | 0.0241 | 86.08 |
| | 0.1645 | 0.0293 | 82.19 |
| Solsafe 245 | | | |
| | 0.0857 | 0.0722 | 15.75 |

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|---------------|--------|--------|-------|
| | 0.1601 | 0.0701 | 56.21 |
| | 0.2142 | 0.0622 | 70.96 |
| Soyclear 1500 | | | |
| | 0.2371 | 0.0988 | 58.33 |
| | 0.1534 | 0.1188 | 22.56 |
| | 0.2646 | 0.1202 | 54.57 |

Summary:

| | | | | | |
|-----------------------------------|--|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Steel | | | | |
| Contaminants: | Coatings | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| United Laboratories International | Smart Solve 605 | 100 | 4.60 | <input type="checkbox"/> | |
| Bi-O-Kleen Industries | Citrus Soy Solvent Cleaner & Degreaser | 100 | 63.00 | <input checked="" type="checkbox"/> | |
| BioGenesis Enterprises Inc | BG Clean 617 | 100 | 24.85 | <input type="checkbox"/> | |
| Franmar Chemical | Bean-e-doo (Parts Washer Solvent) | 100 | 62.10 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Bio T 300 B | 100 | 61.92 | <input checked="" type="checkbox"/> | |
| Vertec BioSolvents | VertecBio Gold 3 | 100 | 54.16 | <input type="checkbox"/> | |
| Gemtek Products | Safe Care (SC) Maxi Solv | 100 | 84.08 | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Solsafe 245 | 100 | 47.64 | <input type="checkbox"/> | |
| AG Environmental Products | Soy Clear 1500 | 100 | 45.15 | <input type="checkbox"/> | |

Conclusion:

The effective non-aqueous based products will be tested along with the effective aqueous products on the first supplied rust preventative using ultrasonic cleaning.