

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 05/26/2004
 Experimenters: Jason Marshall
 ClientType: Lab
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: Laboratory evaluations of alternative cleaning products

Experimental Procedure: Basic cleaning performance testing was conducted using ASTM G122 as the bases for cleaning. Each product was used at full strength in a 250 ml beaker and heated to 96 F on a hot plate. Fifteen preweighed aluminum coupons were coated with the Cargill, Inc Canola Oil (120962-03-0) using a handheld swab. Coupons were weighed a second time to determine the amount of soil added to each coupon. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. After cleaning parts were allowed to sit for 10 minutes for drying at room temperature. The coupons were weighed a final time and efficiencies were calculated.

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|----------|-----------|------------|----------|-----------|
| Results: | Cleaner | Initial wt | Final wt | % Removed |
| | Solvon PB | 0.5513 | 0.0031 | 99.44 |
| | | 0.2799 | 0.0026 | 99.07 |
| | | 0.4849 | 0.0018 | 99.63 |
| | Solvon IP | 0.2713 | 0.001 | 99.63 |
| | | 0.2168 | 0.0003 | 99.86 |
| | | 0.2806 | 0.0011 | 99.61 |
| | OS 10 | 0.4924 | 0.0013 | 99.74 |
| | | 0.2903 | 0.0026 | 99.10 |
| | | 0.3817 | 0.0014 | 99.63 |
| | OS 20 | 0.2670 | 0.0027 | 98.99 |
| | | 0.3246 | 0.0006 | 99.82 |
| | | 0.2212 | 0.0025 | 98.87 |
| | OS 30 | 0.1623 | 0.0273 | 83.18 |
| | | 0.1865 | 0.0297 | 84.08 |
| | | 0.2718 | 0.0206 | 92.42 |

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|----------|----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Summary: | Substrates: | Aluminum | | | | |
| | Contaminants: | Oil | | | | |
| | Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| | Poly Systems USA Inc | Solvon Kreussler PB | 100 | 99.38 | <input checked="" type="checkbox"/> | |
| | Poly Systems USA Inc | Solvon Kreussler IP | 100 | 99.70 | <input checked="" type="checkbox"/> | |
| | Dow Chemical Company | OS 10 | 100 | 99.49 | <input checked="" type="checkbox"/> | |
| | Dow Chemical Company | OS 20 | 100 | 99.22 | <input checked="" type="checkbox"/> | |
| | Dow Chemical Company | OS 30 | 100 | 86.56 | <input checked="" type="checkbox"/> | |

Conclusion: All five products removed over 85% of the canola oil.