

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 04/30/2004
 Experimenters: Jason Marshall
 ClientType: Capacitor Manufacturer
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To evaluate five new products on the third supplied contaminant

Experimental Procedure: Five products were selected based on client request for vapor degreasing solvents. 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 Nisseki SAS 40 oil (27776-01-8, 612-00-0, 103-29-7, 101-81-5) using a hand held 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.

Results: All five products removed over 95% of the second soil. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|-----------------------|------------|----------|-----------|
| Ensolv | 0.0569 | 0.0006 | 98.95 |
| | 0.1059 | -0.0001 | 100.09 |
| | 0.0999 | 0.0014 | 98.60 |
| Ensolv A | 0.1933 | 0.0013 | 99.33 |
| | 0.0908 | 0.0012 | 98.68 |
| | 0.1631 | 0.0009 | 99.45 |
| Metalnox M6960 | 0.0996 | 0.0001 | 99.90 |
| | 0.0965 | -0.0004 | 100.41 |
| | 0.2437 | 0.0003 | 99.88 |
| Flux Remover | 0.1656 | 0.0024 | 98.55 |
| | 0.2004 | 0.0026 | 98.70 |
| | 0.1183 | 0.0058 | 95.10 |
| Heavy DutyDegreaser C | 0.1073 | 0.0030 | 97.20 |
| | 0.0833 | 0.0031 | 96.28 |
| | 0.0749 | 0.0048 | 93.59 |

Summary:

| Substrates: | Aluminum | | | | |
|-------------------------------|------------------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Enviro Tech International Inc | Ensolv | 100 | 99.21 | <input checked="" type="checkbox"/> | |
| Enviro Tech International Inc | Ensolv A | 100 | 99.15 | <input checked="" type="checkbox"/> | |
| Kyzen Corporation | Metalnox M6960 | 100 | 100.06 | <input checked="" type="checkbox"/> | |
| Micro Care | Flux Remover C | 100 | 97.45 | <input checked="" type="checkbox"/> | |
| Micro Care | Heavy Duty Degreaser C | 100 | 95.69 | <input checked="" type="checkbox"/> | |

Conclusion: All five products will be tested on the final supplied soil.