

# 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 first supplied soil.

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 Soltex Polybutene 32 (9003-29-6) 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 weighed a final time and efficiencies were calculated.

Results: All five products removed over 90% of the contaminant within five minutes. 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                 | 0.6136     | 0.0022   | 99.64     |
|                        | 0.4494     | 0.0015   | 99.67     |
|                        | 0.7979     | 0.0010   | 99.87     |
| Ensolv A               | 0.3651     | 0.0012   | 99.67     |
|                        | 0.9078     | 0.0012   | 99.87     |
|                        | 0.6264     | 0.0007   | 99.89     |
| Metalnox M6960         | 0.4272     | -0.0001  | 100.02    |
|                        | 0.5370     | 0.0010   | 99.81     |
|                        | 0.4079     | 0.0277   | 93.21     |
| Flux Remover           | 0.5576     | 0.0002   | 99.96     |
|                        | 0.3500     | 0.0000   | 100.00    |
|                        | 0.6874     | 0.0068   | 99.01     |
| Heavy Duty Degreaser C | 0.6942     | 0.0388   | 94.41     |
|                        | 0.3433     | 0.0555   | 83.83     |
|                        | 0.5158     | 0.0378   | 92.67     |

Summary:

| <b>Substrates:</b>            | Aluminum               |        |             |                                     |                         |
|-------------------------------|------------------------|--------|-------------|-------------------------------------|-------------------------|
| <b>Contaminants:</b>          | Oil                    |        |             |                                     |                         |
| Company Name:                 | Product Name:          | Conc.: | Efficiency: | Effective:                          | Observations:           |
| Enviro Tech International Inc | Ensolv                 | 100    | 99.73       | <input checked="" type="checkbox"/> |                         |
| Enviro Tech International Inc | Ensolv A               | 100    | 99.81       | <input checked="" type="checkbox"/> |                         |
| Kyzen Corporation             | Metalnox M6960         | 100    | 97.68       | <input checked="" type="checkbox"/> |                         |
| Micro Care                    | Flux Remover C         | 100    | 99.66       | <input checked="" type="checkbox"/> |                         |
| Micro Care                    | Heavy Duty Degreaser C | 100    | 90.31       | <input checked="" type="checkbox"/> | Resoiling upon drag out |

Conclusion: All five will be tested on the second soil.