

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 05/14/2004
 Experimenters: Jason Marshall
 ClientType: Capacitor Manufacturer
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Vapor Degreasing
 Analytical Methods: Gravimetric

Purpose: To evaluate one cleaner on all four contaminants using vapor degreasing

Experimental Procedure: One product was selected base on client input from previous testing. The product was heated to boiling (160 F) in a vapor degreasing chamber on a hot plate. Twelve preweighed aluminum coupons were coated four different contaminates, thee coupons per contaminant. Coupons were reweighed to determine the amount of soil added. The coupons were cleaned for 5 minutes in the vapor zone, then removed and allowed to cool to room temperature outside the chamber. Final weights were recorded and efficiencies were calculated.

The contaminants removed were: Soltex Polybutene 32 (9003-29-6)
 Cargill, Inc Canola Oil (120962-03-0)
 Nisseki SAS 40 oil (27776-01-8, 612-00-0, 103-29-7, 101-81-5)
 C.P. Hall Co. Plasthall ESO oil (8013-07-8)

Results: All four contaminants were removed using Ensolv in a vapor degreaser for five minutes. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Contaminant | Initial wt | Final wt | % Removed |
|-------------|------------|----------|-----------|
| Soltex | 0.7328 | 0.0000 | 100.00 |
| | 0.6829 | 0.0003 | 99.96 |
| | 0.8973 | 0.0001 | 99.99 |
| Cargill | 0.1078 | -0.0002 | 100.19 |
| | 0.1655 | 0.0010 | 99.40 |
| | 0.1887 | -0.0001 | 100.05 |
| Nisseki | 0.0501 | 0.0008 | 98.40 |
| | 0.0873 | 0.0002 | 99.77 |
| | 0.0968 | -0.0001 | 100.10 |
| CP Hall | 0.4715 | -0.0001 | 100.02 |
| | 0.5001 | 0.0002 | 99.96 |
| | 0.2575 | 0.0001 | 99.96 |

Summary:

| Substrates: | Aluminum | | | | |
|-------------------------------|---------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Enviro Tech International Inc | Ensolv | 100 | 99.98 | <input checked="" type="checkbox"/> | Soltex |
| Enviro Tech International Inc | Ensolv | 100 | 99.88 | <input checked="" type="checkbox"/> | Cargill |
| Enviro Tech International Inc | Ensolv | 100 | 99.43 | <input checked="" type="checkbox"/> | Nisseki |
| Enviro Tech International Inc | Ensolv | 100 | 99.98 | <input checked="" type="checkbox"/> | CP Hall |

Conclusion: Vapor degreasing with Ensolv appears to work very well on the four supplied soils. Piloting on actual parts should be performed at this time.