

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008  
 DateRun: 03/25/2008  
 Experimenters: Jason Marshall, Shweta Bansal  
 ClientType: Electro-Optical Devices  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Fluxes  
 Cleaning Methods: Manual Wipe  
 Analytical Methods: Gravimetric

Purpose: To evaluate top performing products on second supplied contaminant.

Experimental Procedure: Three products plus the current product were all used at full strength and room temperature for removing the supplied flux. Twelve preweighed aluminum coupons were coated with two layers of the RMA flux using a handheld swab. Once dry, coupons were weighed a second time to determine the amount of flux added. Three coupons were manually wiped using the same method as previous trials, soaking the rag and wiping the surface. Coupons were wiped briefly with a dry wipe to remove any residual cleaner. Final weights were recorded, and efficiencies calculated for each coupon cleaned.

Results: All four products removed the flux from the aluminum coupons in under five minutes of manual wiping. The table lists the amount of soil added, the amount remaining after cleaning and the calculated efficiency for each coupon cleaned. The efficiencies that are over 100% can typically be due to residual soils that were on the surface prior to the initial weights or due to the solvents damaging the surface. In this case, there was no apparent visual damage to the aluminum coupons.

| Cleaner     | Initial wt | Final wt | % Removed |
|-------------|------------|----------|-----------|
| SC Actisolv | 0.0228     | -0.0002  | 100.88    |
|             | 0.0311     | -0.0005  | 101.61    |
|             | 0.0245     | 0.0005   | 97.96     |
| Ionox HC 2  | 0.0234     | 0.0010   | 95.73     |
|             | 0.0197     | -0.0003  | 101.52    |
|             | 0.0189     | 0.0008   | 95.77     |
| DS 144      | 0.0263     | -0.0004  | 101.52    |
|             | 0.0232     | -0.0002  | 100.86    |
|             | 0.0182     | -0.0002  | 101.1     |
| IPA         | 0.0258     | -0.0005  | 101.94    |
|             | 0.0315     | -0.0006  | 101.9     |
|             | 0.0367     | -0.0009  | 102.45    |

Summary:

| <b>Substrates:</b>   |  | Aluminum |             |                                     |               |  |
|----------------------|--|----------|-------------|-------------------------------------|---------------|--|
| <b>Contaminants:</b> |  | Fluxes   |             |                                     |               |  |
| Company Name:        | Product Name:                            | Conc.:   | Efficiency: | Effective:                          | Observations: |  |
| Gemtek Products      | SC Actisolv Safety Solvent               | 100      | 100.15      | <input checked="" type="checkbox"/> |               |  |
| Kyzen Corporation    | Ionox HC 2                               | 100      | 97.67       | <input checked="" type="checkbox"/> |               |  |
| Dysol                | DS 144S Wipe Solvent                     | 100      | 101.16      | <input checked="" type="checkbox"/> |               |  |
| Fisher Scientific    | Isopropanol a459-4 70% VV (CAS: 67-63-0) | 100      | 102.10      | <input checked="" type="checkbox"/> |               |  |

Conclusion: All three of the alternatives removed over 97% of the flux from the aluminum coupons and were closely matched to the current cleaning product.