

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2000
 DateRun: 02/07/2000
 Experimenters: Jason Marshall
 ClientType: Mfr Boating Accessories
 ProjectNumber: Project #3
 Substrates: Plastic, Electronics
 PartType: Coupon
 Contaminants: Fluxes, Solder
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To evaluate selected cleaners for the removal of the solder flux.

Experimental Procedure: Five cleaners were selected from the previous trial. Three solutions were diluted with DI water to five percent by volume in a 600 ml beaker. The other two products were diluted to 10% as suggested by the vendor. All eight solutions were heated to 130 F on a hot plate. Fifteen preweighed coupons were coated with the supplied flux and weighed again. Three coupons were cleaned in a solution for five minutes at room temperature using stir-bar agitation. After cleaning the coupons were rinsed for 15 second in tap water at 120 F and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. Following the drying, final clean weights were recorded and efficiencies were calculated.

SUBSTRATE MATERIAL: Circuit Board coupons

CONTAMINANTS: Flux-Kester Solder 1544 Rosin Solder flux (CAS#s: 64-17-5, 78-92-2, 8050-09-7)

CONTAMINATING PROCESS USED: Coupons were coated with oil using a hand held swab.

Results: Only SWR Corp and Envirosolutions were effective in removing over 85% of the flux from the coupons. Valtech removed just over 75% with the other two cleaners cleaning less than 35%. Table 2 lists the calculated contaminant removal rates for each cleaner tested.

Table 2. Cleaning Efficiencies

| Cleaner | Chrisal | SWR Corp | Valtech | Oakite | Envirosolutions* |
|----------|---------|----------|---------|--------|------------------|
| Coupon 1 | 23.18 | 86.30 | 72.53 | 2.66 | 93.43 |
| Coupon 2 | 45.74 | 83.35 | 80.66 | 10.08 | 99.39 |
| Coupon 3 | 35.45 | 87.81 | 72.57 | 70.95 | 95.99 |
| Average | 34.79 | 85.82 | 75.25 | 27.90 | 96.27 |

As noted in the table, when Envirosolutions Bio-T Max was heated at the 10% dilution, a white particulate matter was formed. Rinsing this white material off the coupons was some what difficult and a second tap water spray was used for 20 seconds.

Summary:

| Substrates: | | Plastic, Electronics | | | |
|----------------------|---------------------|----------------------|-------------|-------------------------------------|---------------|
| Contaminants: | | Fluxes, Solder | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Chrisal USA Inc | Super CMF 240 | 5 | 34.79 | <input type="checkbox"/> | |
| SWR Corporation | SWR One | 5 | 85.82 | <input checked="" type="checkbox"/> | |
| Valtech Corporation | Valtron SP 2250 2LF | 5 | 75.25 | <input type="checkbox"/> | |
| Oakite Products | Inproclean 4000 T | 10 | 27.90 | <input type="checkbox"/> | |
| Bio Chem Systems | Bio T Max | 10 | 96.27 | <input checked="" type="checkbox"/> | |

Conclusion: SWR Corp SWR One and Envirosolutions Bio-T Max were both moderately successful in removing the flux from the circuit board coupons. A follow test will be conducted to evaluate SWR Corp and Valtech at higher concentrations (10%) and Bio-T Max at room temperature.