

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2011  
 DateRun: 03/07/2011  
 Experimenters: Heidi Wilcox, Junhee Cho, Johnny Le  
 ClientType: Optical Manufacturer  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Coatings  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: Gravimetric  
 Purpose: To find a substitute for Acetone

**Experimental Procedure:** Four products were selected from the lab's on-line database, [www.cleansolutions.org](http://www.cleansolutions.org), based on past testing results matching client supplied information. All products were used at full strength in 600 ml beakers. Each solution used at room temperature in a Crest 40 kHz ultrasonic tank filled with water and degassed for 5 minutes prior to cleaning.

Sixteen pre-weighted coupons were coated with supplied photo resist from company using a hand held swap. Each coupon was coated 3 times manually.

Coupons were allowed to sit overnight and reweighed to determine the amount of resin applied. Three coupons were immersed into each solution at room temperature for 5 minutes using ultrasonic energy. Following cleaning, coupons were rinsed in a tap water bath for 15 seconds then dried using compressed air at room temperature for 60 seconds. Final clean weights were recorded and cleaning efficiencies were calculated for each product.

**Results:** Two cleaners resulted in more than 90% removal of the contaminant. The table below shows the amounts of soil added and removed by each cleaning solution.

Gravimetric Table

| Cleaner     | Initial wt | Final wt | % Removed |
|-------------|------------|----------|-----------|
| Bio T Max   |            |          |           |
|             | 0.1532     | 0.1272   | 16.97     |
|             | 0.1663     | 0.1428   | 14.13     |
|             | 0.1682     | 0.1027   | 38.94     |
| Solsafe 245 |            |          |           |
|             | 0.2324     | 0.0491   | 78.87     |
|             | 0.1931     | 0.0411   | 78.72     |
|             | 0.1586     | 0.0336   | 78.81     |
| Ez Solv     |            |          |           |
|             | 0.2522     | 0.0186   | 92.62     |
|             | 0.2052     | 0.0147   | 92.84     |
|             | 0.1675     | 0.0098   | 94.15     |
| Biosolv     |            |          |           |
|             | 0.1384     | 0.0008   | 99.42     |
|             | 0.1935     | 0.0203   | 89.51     |
|             | 0.2229     | 0.0084   | 96.23     |

**Summary:**

|                      |                           |               |                    |                                     |                      |
|----------------------|---------------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>   | Aluminum                  |               |                    |                                     |                      |
| <b>Contaminants:</b> | Coatings                  |               |                    |                                     |                      |
| <b>Company Name:</b> | <b>Product Name:</b>      | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Bio Chem Systems     | Bio T Max                 | 100           | 23.35              | <input type="checkbox"/>            |                      |
| Bio Chem Systems     | Solsafe 245               | 100           | 78.80              | <input type="checkbox"/>            |                      |
| Gemtek Products      | SC EZ Solv Safety Solvent | 100           | 93.20              | <input checked="" type="checkbox"/> |                      |
| Phoenix Resins Inc   | BioSolv                   | 100           | 95.05              | <input checked="" type="checkbox"/> |                      |

**Conclusion:** Ez Solv and Bio Solv products were successful in removing the photo resist in five minutes of ultrasonic cleaning.