

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008  
 DateRun: 04/10/2008  
 Experimenters: Ephraim Massawe  
 ClientType: Lab  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Alcohol  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric

Purpose: removing glycerol off the surfaces of aluminum using non-toxic cleaning products

Experimental Procedure: Basic cleaning performance testing was conducted using ASTM G122 as the bases for cleaning. Products were based on the compatibility of substrate and removal of foreign substance. Used 5% concentration and heated the samples at 135F. The coupons were immersed in a product for 5 minutes, rinsed for 30 seconds in tap water at 120F and dried in 30 seconds.

| Cleaner                       | Initial wt | Final wt | % Removed |
|-------------------------------|------------|----------|-----------|
| aquavantage 1400 GD           |            |          |           |
|                               | 1.2310     | 0.0017   | 99.86     |
|                               | 0.9414     | 0.0201   | 97.86     |
|                               | 0.5861     | 0.0046   | 99.21     |
| amberclean L12                |            |          |           |
|                               | 0.7922     | 0.0041   | 99.48     |
|                               | 1.2298     | 0.0060   | 99.51     |
|                               | 1.3167     | 0.0028   | 99.79     |
| seawash blue                  |            |          |           |
|                               | 1.3125     | 0.0029   | 99.78     |
|                               | 0.9267     | 0.0040   | 99.57     |
|                               | 1.1097     | 0.0016   | 99.86     |
| sc aircraft and metal cleaner |            |          |           |
|                               | 1.4087     | 0.0151   | 98.93     |
|                               | 1.6787     | 0.0356   | 97.88     |
|                               | 1.1869     | 0.0151   | 98.73     |
| NAB 9000                      |            |          |           |
|                               | 1.2635     | 0.0183   | 98.55     |
|                               | 1.2276     | 0.0161   | 98.69     |
|                               | 0.9019     | 0.0110   | 98.78     |
| resineater                    |            |          |           |
|                               | 0.8945     | 0.0365   | 95.92     |
|                               | 1.4951     | 0.0274   | 98.17     |
|                               | 1.2165     | 0.0322   | 97.35     |

|          |                               |   |               |                    |                                     |                      |
|----------|-------------------------------|---|---------------|--------------------|-------------------------------------|----------------------|
| Summary: | <b>Substrates:</b> Aluminum   |   |               |                    |                                     |                      |
|          | <b>Contaminants:</b> Alcohol  |   |               |                    |                                     |                      |
|          | <b>Company Name:</b>          | <b>Product Name:</b>                          | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
|          | Warren Chemical Company       | Sea Wash Blue                                 | 5             | 99.73              | <input checked="" type="checkbox"/> |                      |
|          | Gemtek Products               | SC Aircraft & Metal Cleaner Super Concentrate | 5             | 98.51              | <input checked="" type="checkbox"/> |                      |
|          | North Atlantic Bio Industries | NAB 9000                                      | 5             | 98.67              | <input checked="" type="checkbox"/> |                      |

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|                          |                           |   |       |                                     |  |
|--------------------------|---------------------------|---|-------|-------------------------------------|--|
| Finger Lakes<br>Chemical | FLSC-12 Resineater Sample | 5 | 97.15 | <input checked="" type="checkbox"/> |  |
|--------------------------|---------------------------|---|-------|-------------------------------------|--|

Conclusion: All products passed the passing rate of percentage of contaminant removal of 85% or better.