

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2017  
 DateRun: 07/24/2017  
 Experimenters: Alicia McCarthy, Hayley Byra  
 ClientType: General  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Lubricating/Lapping Oils  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: Gravimetric, Visual

Purpose: To evaluate the effectiveness of seven TCE alternatives at removing lubricant from aluminum alloys.

Experimental Procedure: Preweighed aluminum coupons were tested for each aqueous cleaner. Coupons were soiled with Blasocut 2000 Universal Lubricant (CAS: 64742-52-5; 61790-44-1; 68608-26-4; 63449-39-8; 107-41-5; 770-35-4) using a swab to cover the bottom third of the substrate and dirty weights were recorded. Chemistries were prepared with a five percent dilution except for Micro 90, which had a two percent dilution based on vendor recommendations. Coupons were immersed, three at a time, in a beaker filled with 200ml of the chosen cleaner at room temperature (68 F) for five minutes. Final weights were taken after cleaning.

Results:

| Cleaner                         | Initial wt. | Final wt. | % Removed | Average % |
|---------------------------------|-------------|-----------|-----------|-----------|
| SC Aircraft & Metal Cleaner(5%) | 0.0413      | 0.1333    | -222.76   | -141.9    |
|                                 | 0.0635      | 0.1218    | -91.81    |           |
|                                 | 0.0727      | 0.1535    | -111.14   |           |
| Amberclean 527L (5%)            | 0.0972      | 0.1491    | -53.40    | -20.81    |
|                                 | 0.1293      | 0.1246    | 3.63      |           |
|                                 | 0.1624      | 0.1830    | -12.68    |           |
| Surface Cleanse 930 (2%)        | 0.1228      | 0.2027    | -65.07    | -47.86    |
|                                 | 0.1627      | 0.2314    | -42.22    |           |
|                                 | 0.1397      | 0.1904    | -36.29    |           |
| Micro 90 (2%)                   | 0.1509      | 0.2287    | -51.56    | -49.53    |
|                                 | 0.1844      | 0.2740    | -48.59    |           |
|                                 | 0.1810      | 0.2687    | -48.45    |           |
| Solution 2000 (5%)              | 0.1726      | 0.2784    | -61.30    | -76.37    |
|                                 | 0.1366      | 0.2552    | -86.82    |           |
|                                 | 0.1283      | 0.2322    | -80.98    |           |
| Shopmaster (5%)                 | 0.1744      | 0.2277    | -30.56    | -48.64    |
|                                 | 0.1267      | 0.2300    | -81.53    |           |
|                                 | 0.1614      | 0.2160    | -33.83    |           |
| Crystal Simple Green (5%)       | 0.1419      | 0.1186    | 16.42     | 29.34     |
|                                 | 0.1284      | 0.1079    | 15.97     |           |

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|--|--------|--------|-------|--|
|  | 0.0978 | 0.0434 | 55.62 |  |
|--|--------|--------|-------|--|

The Blasocut 2000 Universal Lubricant looked saturated with the aqueous cleaners which could have led to having negative final weights. Coupons visually looked cleaner, but it was not reflected in gravimetric results.

Summary:

|                                    |   |               |                    |                          |                      |
|------------------------------------|---|---------------|--------------------|--------------------------|----------------------|
| <b>Substrates:</b>                 | Aluminum  |               |                    |                          |                      |
| <b>Contaminants:</b>               | Lubricating/Lapping Oils                            |               |                    |                          |                      |
| <b>Company Name:</b>               | <b>Product Name:</b>                                | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
| Gemtek Products                    | SC Aircraft & Metal Cleaner Super Concentrate       | 5             | -141.90            | <input type="checkbox"/> |                      |
| Innovative Organics Inc            | Amberclean 527 L                                    | 5             | -20.81             | <input type="checkbox"/> |                      |
| International Products Corporation | Surface Cleanse Concentrated Neutral 930            | 5             | -47.86             | <input type="checkbox"/> |                      |
| International Products Corporation | Micro 90 Conc.                                      | 2             | -49.53             | <input type="checkbox"/> |                      |
| EnviroSan Products Ltd             | Solution 2000                                       | 5             | -76.37             | <input type="checkbox"/> |                      |
| Buckeye International              | Shopmaster  | 5             | -48.64             | <input type="checkbox"/> |                      |
| Simple Green                       | Crystal Simple Green Industrial Cleaner & Degreaser | 5             | 29.34              | <input type="checkbox"/> |                      |

Conclusion:

None of the products were very effective at removing Blasocut 2000 Universal gravimetrically, but signs of removal was observed visually. Next step is to try unheated ultrasonics for five minutes to compare with the drop-in solvents.