

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2005

DateRun: 07/28/2005

Experimenters: Jason Marshall

ClientType: Metal

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Mold Releases, Graphite

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate selected cleaners for the removal of graphite based colloidal mold release agent.

Experimental Procedure: Seven products were selected based on similar testing from the laboratory's database of test results. Five alkaline products were diluted to 5% using DI water in 600 ml beakers. Two acidic products were also selected. One product was diluted to 6% and the second was diluted to 20% based on vendor recommended concentrations. Water was also evaluated. All eight beakers were heated to 130 F on a hot plate.

Eighteen preweighed aluminum coupons were coated with the Acheson Colloids Co Aquadag M mold release agent (CAS#: 7782-42-5, 84122-50-6, 70131-67-8, 1333-86-4, 107-21-1, 9002-84-0). The mold release was initially dried for 5 minutes using a Master Appliance Heat Gun at 500 F. The coupons were then subjected to another 10 minutes of drying. Coupons were allowed to sit overnight, followed by 2 hours of drying in an oven at 500 F. After the drying, coupons were allowed to cool to room temperature and weighed a second time to determine the amount of soil added to the coupons.

Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. Coupons were rinsed in a tap water bath for 15 seconds at 120 F and dried using compressed air blow off at room temperature for 30 seconds. Final weights were recorded and efficiencies were calculated.

Results: A couple of products removed over 50% of the soil and another three removed over 20%. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon.

| Cleaner             | Initial wt | Final wt | % Removed |
|---------------------|------------|----------|-----------|
| 815 GD              | 0.0014     | 0.0014   | 0.00      |
|                     | 0.0030     | 0.0021   | 30.00     |
|                     | 0.0014     | 0.0009   | 35.71     |
| SC Aircraft & Metal | 0.0027     | 0.0027   | 0.00      |
|                     | 0.0037     | 0.0036   | 2.70      |
|                     | 0.0013     | 0.0013   | 0.00      |
| Micro 90            | 0.0048     | 0.0023   | 52.08     |
|                     | 0.0036     | 0.0031   | 13.89     |
|                     | 0.0063     | 0.0057   | 9.52      |
| Inproclean 3800     | 0.0067     | 0.0030   | 55.22     |
|                     | 0.0078     | 0.0039   | 50.00     |
|                     | 0.0031     | 0.0016   | 48.39     |
| Polyspary Jet 790 P | 0.0112     | 0.0090   | 19.64     |
|                     | 0.0020     | 0.0017   | 15.00     |
|                     | 0.0018     | 0.0017   | 5.56      |
| Citranox            | 0.0125     | 0.0053   | 57.60     |
|                     | 0.0020     | 0.0019   | 5.00      |
|                     | 0.0054     | 0.0047   | 12.96     |
| Coil Bright         | 0.0092     | 0.0027   | 70.65     |
|                     | 0.0027     | 0.0016   | 40.74     |
|                     | 0.0080     | 0.0024   | 70.00     |
| Water               | 0.0049     | 0.0047   | 4.08      |
|                     | 0.0118     | 0.0095   | 19.49     |
|                     | 0.0032     | 0.0031   | 3.12      |

Summary:

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|                                       |  |               |                    |                                     |                      |
|---------------------------------------|--|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>                    | Aluminum   |               |                    |                                     |                      |
| <b>Contaminants:</b>                  | Mold Releases, Graphite                          |               |                    |                                     |                      |
| <b>Company Name:</b>                  | <b>Product Name:</b>                             | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| Brulin Corporation                    | Formula 815 GD                                   | 5             | 21.90              | <input checked="" type="checkbox"/> |                      |
| Gemtek Products                       | SC Aircraft & Metal Cleaner<br>Super Concentrate | 5             | 0.90               | <input type="checkbox"/>            |                      |
| International Products<br>Corporation | Micro 90 Conc.                                   | 5             | 25.17              | <input checked="" type="checkbox"/> |                      |
| Oakite Products                       | Inproclean 3800                                  | 5             | 51.20              | <input checked="" type="checkbox"/> |                      |
| US Polychem<br>Corporation            | Polyspray Jet 790 P                              | 5             | 13.40              | <input type="checkbox"/>            |                      |
| Alconox Inc                           | Citranox   | 6             | 25.19              | <input checked="" type="checkbox"/> |                      |
| Watson Technical<br>Associates        | Coil Bright                                      | 20            | 60.46              | <input checked="" type="checkbox"/> |                      |
| Water                                 | Water  | 100           | 8.90               | <input type="checkbox"/>            |                      |

Conclusion: The five products that showed some cleaning will be retested using ultrasonic cleaning.