

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 07/12/2004

Experimenters: Jason Marshall, Heidi Wilcox, Andy Harris

ClientType: Metal Finishing

ProjectNumber: Project #2

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate successful cleaners on the third supplied contaminant

Experimental Procedure: Five cleaners were selected from the previous trial. All products were diluted to 5% using DI water in 600 ml beakers. All nine products were heated to 120 F on a hot plate. Fifteen preweighed aluminum coupons were coated with client supplied cutting fluid, WA Wood Co Maxoline 75 grinding oil (64741-97-5, 63449-39-8), using a hand held swab and then weighed a second time to determine the amount of soil added. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. Coupons were rinsed in tap water for 15 seconds at 120 F, followed by air blow off at room temperature. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

Results: All five products removed over 95% of the cutting fluid. The table below lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner     | Initial wt | Final wt | % Removed |
|-------------|------------|----------|-----------|
| Beyond 2004 | 0.8304     | 0.0396   | 95.23     |
|             | 1.1406     | 0.0083   | 99.27     |
|             | 1.1068     | 0.0423   | 96.18     |
| Aeromaster  | 1.0232     | 0.0465   | 95.46     |
|             | 1.1004     | 0.0539   | 95.10     |
|             | 1.0980     | 0.0500   | 95.45     |
| 1400 GD     | 1.0706     | 0.0210   | 98.04     |
|             | 1.1760     | 0.0290   | 97.53     |
|             | 0.9937     | 0.0396   | 96.01     |
| M Aero      | 1.1484     | 0.0070   | 99.39     |
|             | 1.4176     | 0.0153   | 98.92     |
|             | 1.2883     | 0.0404   | 96.86     |
| 815 QR      | 1.5055     | 0.0233   | 98.45     |
|             | 1.2380     | 0.0051   | 99.59     |
|             | 0.9553     | 0.0139   | 98.54     |

Summary:

| <b>Substrates:</b>      |                     | Aluminum               |             |                                     |               |
|-------------------------|---------------------|------------------------|-------------|-------------------------------------|---------------|
| <b>Contaminants:</b>    |                     | Cutting/Tapping Fluids |             |                                     |               |
| Company Name:           | Product Name:       | Conc.:                 | Efficiency: | Effective:                          | Observations: |
| Today & Beyond          | Beyond 2004         | 5                      | 96.89       | <input checked="" type="checkbox"/> |               |
| Buckeye International   | Aeromaster          | 5                      | 95.33       | <input checked="" type="checkbox"/> |               |
| Brulin Corporation      | Aquavantage 1400    | 5                      | 97.20       | <input checked="" type="checkbox"/> |               |
| Church & Dwight Co Inc. | Armakleen M Aero NS | 5                      | 98.39       | <input checked="" type="checkbox"/> |               |
| Brulin Corporation      | 815 QR              | 5                      | 98.86       | <input checked="" type="checkbox"/> |               |

Conclusion: The next step will be to test supplied parts using the successful products in immersion and ultrasonic cleaning.