

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:

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|-------------------------|------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Aluminum | | | | |
| Contaminants: | 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.