

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002  
 DateRun: 10/09/2002  
 Experimenters: Jason Marshall  
 ClientType: Manufacturing  
 ProjectNumber: Project #1  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To evaluate selected products for lubricant removal

**Experimental Procedure:** Eight cleaners were selected from the lab's database of effective testing and from clients previous testing based on supplied input. Seven were diluted to 5% and one was diluted to 3% (Citrinox) in 600 ml beakers using DI water. Each solution was heated to 130 F on a hot plate. Twenty-four preweighed coupons were coated with Milacron Marketing Company CIMTECH® 310 metal working fluid concentrate (102-71-6, 78-96-6, 26896-20-8) using a hand held swab. Coupons were then reweighed using a Denver Instruments A250 balance to determine the amount of contaminant added. Three coupons were immersed into each solution and cleaned for 5 minutes using stir bar agitation. Coupons were rinsed for 15 seconds in a tap water bath at 120 F and finally dried using a Master Appliance Hot Air gun at 500 F for 30 seconds. After the coupons were dried, final weights were recorded and efficiencies calculated for each cleaning solution.

**Results:** All eight products removed over 92% of the contaminant from the aluminum coupons after 5 minutes of soaking. Four products removed over 97%. The table below lists the amount of contaminant applied, the amount remaining and the efficiency for each coupon cleaned.

Table 1. Contamination Removal

| Cleaner    | Initial wt | Final wt | % Removed |
|------------|------------|----------|-----------|
| Citrinox   | 0.2207     | 0.0017   | 99.23     |
|            | 0.3195     | 0.0048   | 98.50     |
|            | 0.5490     | 0.0022   | 99.60     |
| Exp 1400   | 0.3752     | 0.0050   | 98.67     |
|            | 0.3514     | 0.0032   | 99.09     |
|            | 0.0836     | 0.0014   | 98.33     |
| Shopmaster | 0.2727     | 0.0104   | 96.19     |
|            | 0.3941     | 0.0124   | 96.85     |
|            | 0.0669     | 0.0098   | 85.35     |
| Bulldog    | 0.0968     | 0.0117   | 87.91     |
|            | 0.2295     | 0.0059   | 97.43     |
|            | 0.2658     | 0.0035   | 98.68     |
| SC A&M     | 0.1045     | 0.0057   | 94.55     |
|            | 0.2312     | 0.0002   | 99.91     |
|            | 0.3328     | 0.0039   | 98.83     |
| Amberclean | 0.0693     | 0.0055   | 92.06     |
|            | 0.2748     | 0.0083   | 96.98     |
|            | 0.3000     | 0.0030   | 99.00     |
| Daraclean  | 0.2124     | 0.0075   | 96.47     |
|            | 0.3733     | 0.0076   | 97.96     |
|            | 0.2425     | 0.0079   | 96.74     |
| Inproclean | 0.0802     | 0.0069   | 91.40     |
|            | 0.5750     | 0.0090   | 98.43     |
|            | 0.5497     | 0.0140   | 97.45     |

Summary:

|                      |   |               |                    |                   |                      |  |
|----------------------|---|---------------|--------------------|-------------------|----------------------|--|
| <b>Substrates:</b>   | Aluminum  |               |                    |                   |                      |  |
| <b>Contaminants:</b> | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil |               |                    |                   |                      |  |
| <b>Company Name:</b> | <b>Product Name:</b>                                  | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b> | <b>Observations:</b> |  |

## CLEANING LABORATORY EVALUATION SUMMARY

|                         |   |   |       |                                     |  |
|-------------------------|---|---|-------|-------------------------------------|--|
| Alconox Inc             | Citranox                                      | 3 | 99.11 | <input checked="" type="checkbox"/> |  |
| Brulin Corporation      | Aquavantage 1400                              | 5 | 98.69 | <input checked="" type="checkbox"/> |  |
| Buckeye International   | Shopmaster                                    | 5 | 92.80 | <input type="checkbox"/>            |  |
| EcoLink                 | Bulldog                                       | 5 | 94.68 | <input type="checkbox"/>            |  |
| Gemtek Products         | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 97.76 | <input checked="" type="checkbox"/> |  |
| Innovative Organics Inc | Amberclean Q3                                 | 5 | 96.01 | <input type="checkbox"/>            |  |
| Magnaflux               | Daraclean 282                                 | 5 | 97.06 | <input checked="" type="checkbox"/> |  |
| Oakite Products         | Inproclean 3800                               | 5 | 95.76 | <input type="checkbox"/>            |  |

Conclusion: The four products that removed over 97% will be used in the next phase of testing using ultrasonic energy.