# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 10/08/2002

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 diulted to 3% (Citranox) 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:

| **Substrates:** | Aluminum | | | | |
|---|---|---|---|---|---|
| **Contaminants:** | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | | |
| **Company Name:** | **Product Name:** | **Conc.:** | **Efficiency:** | **Effective:** | **Observations:** |
| Alconox Inc | Citranox | 3 | 99.11 | ☑ | |

# CLEANING LABORATORY EVALUATION SUMMARY

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|---|---|---|---|---|---|
| Brulin Corporation | Aquavantage 1400 | 5 | 98.69 | ☑ | |
| Buckeye International | Shopmaster | 5 | 92.80 | ☐ | |
| EcoLink | Bulldog | 5 | 94.68 | ☐ | |
| Gemtek Products | SC Aircraft & Metal Cleaner Super Concentrate | 5 | 97.76 | ☑ | |
| Innovative Organics Inc | Amberclean Q3 | 5 | 96.01 | ☐ | |
| Magnaflux | Daraclean 282 | 5 | 97.06 | ☑ | |
| Oakite Products | Inproclean 3800 | 5 | 95.76 | ☐ | |

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