# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 03/14/2004

Experimenters: Jason Marshall

ClientType: Aircraft Parts Manufacturer

ProjectNumber: Project #2

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate products using ultrasonic cleaning with rinsing.

Experimental Procedure: Four cleaners were selected from previous trial. Three aqueous based cleaners were diluted to 10% using DI water in 600 ml beakers. One semi-aqueous product was used at 50% diluted with DI water. All of the products were heated to 120 F on a hot plate and then immersed into hot water at 120 in a Branson 3150 40 kHz ultrasonic tank and degassed for five minutes.
Twelve preweighed aluminum coupons were coated with the second client supplied oil, Castrol Moly Dee Tapping Fluid. The oil was applied to coupons using a swab and then heated for 10 minutes using a Master Appliance heat gun. The coupons were allowed to cool to room temperature before weighing a second time.
Three coupons were cleaned in each solution for 10 minutes using ultrasonic cleaning. Coupons were rinsed in tap water at 120 F for 15 seconds and then dried using air blow off at room temperature. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

Results: All four products were successful in removing over 90% of the tapping fluid using ultrasonics with rinsing. The Bio Chem Bio T 300 B was successful in removing over 98% of the soil in only 2 minutes of cleaning. The table lists the amount of soil initially added, the amount remaining after cleaning and the efficiency for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---|---|---|---|
| 815 GD | 0.6043 | 0.0001 | 99.98 |
| | 0.4247 | -0.0001 | 100.02 |
| | 0.5094 | 0.0001 | 99.98 |
| Metalnox M6314 | 0.5104 | 0.0273 | 94.65 |
| | 0.5762 | 0.0126 | 97.81 |
| | 0.6401 | 0.1132 | 82.32 |
| Hurrisafe 9450 | 0.6360 | 0.0155 | 97.56 |
| | 0.8197 | 0.0051 | 99.38 |
| | 0.5099 | 0.0075 | 98.53 |
| Bio T 300 B | 0.6065 | 0.0031 | 99.49 |
| | 0.5907 | 0.0065 | 98.90 |
| | 0.4515 | 0.0071 | 98.43 |

Summary:

| **Substrates:** | Aluminum |
|---|---|
| **Contaminants:** | Cutting/Tapping Fluids |

| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|---|---|---|---|---|---|
| Brulin Corporation | Formula 815 GD | 10 | 100.00 | ☑ | |
| Kyzen Corporation | Metalnox M6314 (For Comparison Only) | 10 | 91.59 | ☑ | |
| PCI of America | Hurrisafe 9450 | 10 | 98.49 | ☑ | |
| Bio Chem Systems | Bio T 300 B | 50 | 98.94 | ☑ | 2 minute cleaning time |

Conclusion: Ultrasonic cleaning improved the aqueous based cleaning products. The Bio T 300 B was found to be as effective at a shorter time also with ultrasonic cleaning.