

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002
 DateRun: 10/08/2002
 Experimenters: Jason Marshall
 ClientType: Electromagnetic Manufacturer
 ProjectNumber: Project #4
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Lubricating/Lapping Oils
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric
 Purpose: To re-evaluate successful products at higher concentration

Experimental Procedure: Three products from the previous trial were diluted to 10% using DI water in 600 ml beakers. Each solution was heated to 130 F on a hot plate, followed by a 5 minute degassing in a Crest 40 kHz ultrasonic tank. Twelve preweighed coupons were coated with Fuchs Lubricants Co Renodraw 12 using a hand held swab. A glass rod was then used to ensure a thin, evenly distributed layer of lubricant, more closely matching actual operating conditions. Coupons were then reweighed using a Denver Instruments A250 Balance.

Three coupons were cleaned for 8 seconds in a cleaning solution, followed by an 8 second ultrasonic tap water bath rinse. Coupons were dried using air blow off at room temperature for 10 seconds. Once coupons were dry, final weights were measured and efficiencies were calculated.

Results: The increase in concentration caused the efficiencies for two of the products to decrease. Surface Cleanse 930 actually gained weight due to the thickness of the cleaning product. Only Inproclean 3800 resulted in an effective removal of the contaminant. Table 1 lists the amount of contaminant added and removed.

Table 1. Cleaning Efficiencies

| Cleaner | Initial wt | Final wt | % Removed |
|-----------------|------------|----------|-----------|
| EXP 1400 | 0.0324 | 0.0079 | 75.62 |
| | 0.0544 | 0.0125 | 77.02 |
| | 0.0632 | 0.0214 | 66.14 |
| Surface Cleanse | 0.1173 | 0.0750 | 36.06 |
| | 0.0533 | 0.0822 | -54.22 |
| | 0.0518 | 0.0809 | -56.18 |
| Inproclean 3800 | 0.0367 | 0.0005 | 98.64 |
| | 0.0258 | 0.0002 | 99.22 |
| | 0.03 | 0.0004 | 98.67 |

Summary:

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|------------------------------------|--|--------------------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Aluminum | | | |
| Contaminants: | | Lubricating/Lapping Oils | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Brulin Corporation | Aquavantage 1400 | 20 | 72.93 | <input type="checkbox"/> | |
| International Products Corporation | Surface Cleanse Concentrated Neutral 930 | 20 | -24.78 | <input type="checkbox"/> | |
| Oakite Products | Inproclean 3800 | 20 | 98.84 | <input checked="" type="checkbox"/> | |

Conclusion: Only Inproclean showed improvements at 20% concentration. The other two products, EXP 1400 and Surface Cleanse, worked better at the 10% concentration, removing over 93% of the lubricant.