

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998
 DateRun: 09/10/1998
 Experimenters: Jason Marshall, Shyam Sarda
 ClientType: Electromagnetic Manufacturer
 ProjectNumber: Project #1
 Substrates: Copper, Nickel
 PartType: Coupon
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric

Purpose: To determine the minimum cleaning time at increased concentrations.

Experimental Procedure: Eighteen preweighed coupons were contaminated with oil using a hand held swab and then weighed. Two cleaning solutions were made into 15% solutions using DI water in a 600 mL beaker. The solutions were heated to 130 F on a hot plate. The beakers were then placed into a Crest 40 kHz ultrasonic tank model 4Ht 1014-6 also at 130 F. Three coupons were placed in each cleaner for a set cleaning time. These cleaning times were 15, 30 and 60 seconds. Coupons were rinsed in tap water at 120 F for 30 seconds and air dried. Final weights were taken after drying was complete.

SUBSTRATE MATERIAL: Copper/Nickel 70/30
 CONTAMINANTS: Oil-Castrol 10W-40

Results: Both chemistries had good results for the all cleaning times. Table 1 list the cleaning efficiencies for both cleaners at the 3 cleaning times.

Table 1. Cleaning Efficiencies at Various Intervals

| Time | AK-6215 | | | Daraclean 282 | | |
|----------|---------|-------|--------|---------------|-------|-------|
| | 15 | 30 | 60 | 15 | 30 | 60 |
| Coupon 1 | 87.36 | 89.57 | 93.35 | 92.36 | 95.22 | 90.64 |
| Coupon 2 | 90.27 | 97.45 | 79.11 | 96.52 | 97.43 | 96.15 |
| Coupon 3 | 94.48 | 97.11 | 100.80 | 98.12 | 96.53 | 94.33 |
| Ave | 90.70 | 94.71 | 91.09 | 95.67 | 96.39 | 93.71 |
| Std Dev | 3.58 | 4.45 | 11 | 2.97 | 1.11 | 2.81 |

Summary:

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|----------------------|---|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Copper, Nickel | | | | |
| Contaminants: | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Calgon Corporation | AK 6215 | 15 | 94.71 | <input checked="" type="checkbox"/> | |
| Magnaflux | Daraclean 282 | 15 | 96.39 | <input checked="" type="checkbox"/> | |

Conclusion: The increased concentration has allowed the cleaning times to be decreased to under 1 minute. The next testing will be performed using the second oil supplied by the client.