CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998

DateRun: 09/01/1998

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 for the selected aqueous cleaners.

Experimental Procedure: Eighteen preweighed coupons were contaminated with oil using a hand held swab and then weighed. Two cleaning solutions were made into 5% solutions using DI water in a 400 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 30, 60 and 120 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 2 minute cleaning times. The Daraclean was very effective with only 1 minute of cleaning. During experimentation, some of the coupons in each cleaner fell to the bottom of the beakers. This resulted in some of the unexpected cleaning efficiencies for both cleaners. Table 1 list the cleaning efficiencies for both cleaners at the 3 cleaning times.

Table 1. Cleaner Efficiencies at Various Cleaning Times

	Daraclean			AK 6215		
Seconds	30	60	120	30	60	120
Coupon 1	83.33	99.34	98.63	88.58	97.78	95.82
Coupon 2	48.85*	101.20	99.38	90.55	85.73**	96.46
Coupon 3	71.45	99.80	98.90	55.50	37.18**	91.12
Ave	67.88	100.10	98.97	78.21	73.56	94.47
Std Dev	17.52	0.97	0.38	19.69	32.08	2.92

*1 coupon fell during cleaning
**2 coupons fell during cleaning

Summary:

Substrates:	Copper, Nickel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Magnaflux	Daraclean 282	5	100.10	☑	
Calgon Corporation	AK 6215	5	94.47	☑	

Conclusion: Both chemistries were effective in removing most of the contaminant after 2 minutes of cleaning in the 40 kHz ultrasonic tank. The WR Grace Daraclean was able to remove the contaminant in only 1 minute of ultrasonic cleaning.