

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998  
 DateRun: 08/25/1998  
 Experimenters: Jason Marshall  
 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 identify cleaning equipment that will aid the aqueous cleaners in the removal of oil from metal tape.

Experimental Procedure: Two cleaners were selected from the previous trial. Five percent solutions were made using DI water in 400 mL beakers. The beakers were placed into a 40 kHz Crest ultrasonic unit and heated to 130 F. Six preweighed coupons were contaminated with the oil using hand held swabs. Contaminated weights were recorded for each coupon. Three coupons were placed into each solution and cleaned for 5 minutes using ultrasonic energy. Coupons were rinsed in tap water at 120 F for 30 seconds. Drying was performed using a Master Appliance Heat Gun model HG-301A for about 30 seconds and then air dried for 1 hour. Final clean weights were made and the percent removal of the oil was calculated.

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

Results: Both cleaners had excellent removal of the oil when used with the ultrasonic cleaning equipment. The Daraclean solution had slightly lower efficiency than the AK-6215. During cleaning in the Daraclean, two of the coupons piled up on top of each other, thus lowering the effectiveness of the cleaner. The third coupon had 99.1% of the oil removed where as the other two coupons had 93.4 and 95.5% removal. Table 1 lists the cleaning efficiencies of both cleaning solutions.

Table 1. Cleaning Efficiency

	Ak 6215	Daraclean
Coupon 1	98.5	99.1
Coupon 2	99.8	93.4
Coupon 3	99.4	95.5
Ave	99.2	96
Std Dev	0.666	2.88

Summary:

<b>Substrates:</b>		Copper, Nickel			
<b>Contaminants:</b>		Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil			
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
Calgon Corporation	AK 6215	5	99.20	<input checked="" type="checkbox"/>	
Magnaflux	Daraclean 282	5	96.00	<input checked="" type="checkbox"/>	

Conclusion:

Both cleaning solutions were very effective in removing the oil when used in conjunction with a 40 kHz ultrasonic tank. Further testing of both chemistries will be performed in order to decrease the cleaning time.