

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001  
 DateRun: 06/01/2001  
 Experimenters: Jason Marshall  
 ClientType: Metal  
 ProjectNumber: Project #1  
 Substrates: Steel  
 PartType: Coupon  
 Contaminants: Cutting/Tapping Fluids  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: Gravimetric

Purpose: To evaluate selected cleaners using ultrasonic energy to remove cutting fluid

Experimental Procedure: Four cleaning solutions were chosen from the previous trial based on their effectiveness. The products were diluted to 5% using DI water in 600 ml beakers. The beakers were submersed and were degassed and heated to 130 F in a Crest 40 kHz ultrasonic tank. Fifteen preweighed coupons were coated with the C-Eblis cutting oil using a hand held swab. Once coated, the coupons were weighed again to determine the amount of oil added. Three coupons were immersed into a beaker and cleaned for two minutes using ultrasonic energy. Coupons were rinsed for 30 seconds in a tap water bath at 120 F and dried using the Master Appliance Heat Gun at 500 F for one minute. After cooling to room temperature, final clean weights were recorded and efficiencies calculated.

Results: Initially, the trial was set up to clean for five minutes, however, after the first cleaning solution needed less than two minutes to remove nearly all of the oil, the trial was modified for the remaining solutions. Water was added to the experiment as one of the cleaners to be evaluated since all four aqueous products were very successful in removing the oil in conjunction with ultrasonic energy. Using water as the baseline, it was apparent the cleaning products were required in order to remove the cutting fluid. The following table lists the calculated efficiencies for the four cleaners and tap water.

Cleaner	Inproclean	Daraclean	Green Stuff	Beyond 2001	Water
Coupon 1	98.56	100.02	100.12	99.62	53.11
Coupon 2	98.72	99.24	102.56	100.11	50.08
Coupon 3	98.89	100	100	99.75	62.2
Average	98.72	99.76	100.9	99.83	55.13
Std Dev	0.17	0.45	1.45	0.25	6.31

Summary:

<b>Substrates:</b>		Steel				
<b>Contaminants:</b>		Cutting/Tapping Fluids				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:	
Oakite Products	Inproclean 3800	5	98.72	<input checked="" type="checkbox"/>		
Magnaflux	Daraclean 283	5	99.76	<input checked="" type="checkbox"/>		
Bio Chem Systems	Green Stuff 6325	5	100.90	<input checked="" type="checkbox"/>		
Today & Beyond	Beyond 2001	5	99.83	<input checked="" type="checkbox"/>		
Water	Water	100	55.13	<input type="checkbox"/>		

Conclusion: Ultrasonic energy was determined to significantly improve the cleaning effectiveness of the aqueous products. All four removed over 98% of the oil in less than two minutes. The next set of tests will be to evaluate the four cleaning products on the other supplied contaminants.