CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 03/03/2004

Experimenters: Jason Marshall

ClientType: Manufacturer of Ceramic Capacitors

ProjectNumber: Project #1

Substrates: Ceramics

PartType: Coupon

Contaminants: Greases

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate cleaners from previous grease trial using ultrasonic energy

Experimental Procedure: Five cleaners from the previous trial were diluted to 10% in 250 ml beakers. A sixth product was used at full strength. All products were suspended in a Branson 3510 ultrasonic tank (40kHz) filled with water at 130 F and degassed for five minutes. Eighteen preweighed coupons were coated with Hibrenia Way Apiezon M1 grease using a hand held swab. Coupons were then reweighed. Three coupons were cleaned in each product for 5 minutes using ultrasonic energy. At the end of cleaning, coupons were rinsed with tap water at 120 F for 15 seconds and dried using air blow off for 30 seconds at 68 F. Once dry, coupons were weighed a final time and efficiencies were calculated.

Results: All six products removed over 98% of the grease within the five minutes of ultrasonic cleaning. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon.

Cleaner	Initial wt	Final wt	% Removed
Liquinox	0.1311	0.0002	99.85
	0.1182	-0.0002	100.17
	0.1275	0.0017	98.67
SC Aircraft	0.1637	0.0015	99.08
	0.1059	0.0016	98.49
	0.1685	0.0017	98.99
Micro 90	0.1469	-0.0001	100.07
	0.0846	0.0001	99.88
	0.2092	0.0000	100.00
Metalnox M6314	0.1427	-0.0004	100.28
	0.0967	-0.0003	100.31
	0.1604	0.0014	99.13
E3HB	0.1287	-0.0003	100.23
	0.0629	-0.0001	100.16
	0.0668	-0.0003	100.45
Inproclean 3800	0.0615	0.0009	98.54
	0.0713	-0.0001	100.14
	0.1283	-0.0003	100.23

Summary:

Substrates:	Ceramics				
Contaminants:	Greases				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Alconox Inc	Liquinox	10	99.56	☑	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	98.85	☑	
International Products Corporation	Micro 90 Conc.	10	99.98	☑	
Kyzen Corporation	Metalnox M6314 (For Comparison Only)	10	99.91	☑	
Metabolix Inc	Metabolix E3HB	100	100.28	☑	
Oakite Products	Inproclean 3800	10	99.64	☑	

Conclusion: Ultrasonic cleaning has bee shown to be an effective way to remove the M1 grease from ceramic coupons.