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:	Immersion/Soak
Analytical Methods:	Gravimetric
Purpose:	To evaluate cleaners on supplied grease using immersion cleaning
Experimental Procedure:	Eight cleaners were selected from the laboratories database of past testing based on supplied data from client. Six aqueous based cleaners were diluted to 10% using DI water in 250 ml beakers. Tw0 semi-aqueous products were used at full strength also in 250 ml beakers. A ninth product was added as the client's current cleaner and diluted to 10%. All nine products were heated to 130 F on a hot plate. Twenty-seven preweighed ceramic coupons were coated with client supplied grease, Hibrenia Way Apiezon M1 Grease. The grease was applied directly to the coupon surface using a swab and then weighed a second time. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. Coupons were rinsed in tap water for 15 seconds at 120 F, followed by air blow off at room temperature for 30 seconds. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.
Results:	One product, Metabolix E3HB removed over 94% of the grease within 5 minutes of immersion cleaning. Four other products showed signs of starting to remove the grease, removing between 30 and 50% of the grease. The current cleaner was found to have the second lowest grease removal, about 4%. The table lists the amount of soil added, the amount remaining after cleaning and the efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
Liquinox	0.1391	0.1311	5.75
	0.1235	0.1182	4.29
	0.1295	0.1275	1.54
Aquavantage 1400	0.1685	0.1637	2.85
	0.1463	0.1059	27.61
	0.1740	0.1685	3.16
AeroMaster	0.1467	0.1469	-0.14
	0.0845	0.0846	-0.12
	0.2135	0.2092	2.01
DBE 6	0.1434	0.1427	0.49
	0.1256	0.0967	23.01
	0.1624	0.1604	1.23
SC Aircraft	0.1720	0.0115	93.31
	0.1648	0.1287	21.91
	0.0951	0.0629	33.86
Micro 90	0.0890	0.0232	73.93
	0.0772	0.0668	13.47
	0.0728	0.0615	15.52
Metalnox 6314	0.0729	0.0713	2.19
	0.1425	0.1283	9.96
	0.1393	0.0131	90.60
E3HB	0.0746	0.0026	96.51
	0.1284	0.0026	97.98
	0.0558	0.0066	88.17
Inproclean 3800	0.0674	0.0088	86.94
	0.0802	0.0493	38.53
	0.0809	0.0546	32.51

Summary:

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Substrates:	Ceramics
Contaminants:	Greases

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alconox Inc	Liquinox	10	3.86	☐	
Brulin Corporation	Aquavantage 1400	10	11.21	☐	
Buckeye International	Aeromaster	10	0.59	☐	
Invista S.a.r.l	Flexisolv DBE 6 ester	10	8.24	☐	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	49.69	☑	
International Products Corporation	Micro 90 Conc.	10	34.31	☑	
Kyzen Corporation	Metalnox M6314 (For Comparison Only)	10	34.25	☑	
Metabolix Inc	Metabolix E3HB	100	94.22	☑	
Oakite Products	Inproclean 3800	10	52.66	☑	

Conclusion: The five products that removed over 30% of the grease will be retested using ultrasonics. The client's current cleaner will also be tested for comparative measures.