CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 03/11/2004

Experimenters: Jason Marshall

ClientType: Manufacturer of Ceramic Capacitors

ProjectNumber: Project #1

Substrates: Ceramics

PartType: Coupon

Contaminants: Waxes

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate successful cleaners on initial wax

Experimental Procedure: Three cleaners were selected from the past trials to be tested on the wax. Two products were used at full strength and one at 10% diluted with DI water in 250 ml beakers. All products were heated to 100 F on a hot plate.
Nine preweighed ceramic coupons were coated with client supplied wax, Zopher Mills Inc No 1563 Wax (mixture of waxes and resins). The wax was first melted using a Master Appliance heat gun in a beaker and applied directly to the coupon surface. The coupons were allowed to cool to room temperature before weighing a second time. Three coupons were cleaned in each solution for 30 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. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

All products were then degassed for 5 minutes in a Branson 3510, 40 kHz ultrasonic tank at 100 F. Twelve preweighed ceramic coupons were coated with client supplied wax, Zopher Mills Inc No 1563 Wax (mixture of waxes and resins). The wax was first melted using a Master Appliance heat gun in a beaker and applied directly to the coupon surface. The coupons were allowed to cool to room temperature before weighing a second time. Three coupons were cleaned in each solution for 15 minutes using ultrasonic energy. Coupons were rinsed in tap water for 15 seconds at 120 F, followed by air blow off at room temperature. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

Results: Neither process worked for any of the products tested on the wax. No removal was over 20% of the wax.

Cleaner	Initial wt	Final wt	% Removed
Micro 90	0.3808	0.3798	0.26
	0.2148	0.2123	1.16
	0.2611	0.2597	0.54
E3HB	0.2197	0.2184	0.59
	0.1634	0.1644	-0.61
	0.3027	0.3038	-0.36
Ink Zapper	0.2980	0.2937	1.44
	0.3852	0.3717	3.50
	0.3456	0.3386	2.03

Ultrasonic

Cleaner	Initial wt	Final wt	% Removed
Micro 90	0.3798	0.3551	6.50
	0.2123	0.1761	17.05
	0.2597	0.2448	5.74
E3HB	0.2184	0.1702	22.07
	0.1644	0.1304	20.68
	0.3038	0.2699	11.16
Ink Zapper	0.2937	0.2545	13.35
	0.3717	0.3243	12.75
	0.3386	0.2744	18.96

Summary:

Substrates:	Ceramics				
Contaminants:	Waxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**

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International Products Corporation	Micro 90 Conc.	10	6.32	☐	
Metabolix Inc	Metabolix E3HB	100	17.97	☐	
Vertec BioSolvents	Ink Zapper	100	15.02	☐	

Conclusion: The three products were found to be ineffective at removing this wax using immersion or ultrasonic agitation.