CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 04/08/2002

Experimenters: Jason Marshall

ClientType: Optical Manufacturer

ProjectNumber: Project #1

Substrates: Glass/Quartz

PartType: Coupon

Contaminants: Waxes

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To evaluate cleaners for wax removal from glass coupons

Experimental Procedure: Five cleaners were selected from the previous trial based on effective cleaning of the wax. Two aqueous cleaners were diluted to 10% using DI water in 600 ml beakers. Three terpenes were used at full strength. All five cleaners were heated to 110 F in a Crest 40 kHz Ultrasonic tank filled with water. The products were degassed for 5 minutes. Fifteen preweighed glass coupons were coated with beeswax by heating the coupons with a Master Appliance heat gun and wiping solid wax across the surface. Once coupons were cooled, a second weight was recorded. Three coupons were cleaned in each solution. The aqueous cleaners were used for 10 minutes while the terpenes were only used for 5 minutes. Following cleaning, the coupons were rinsed in a DI water spray at 60 F for 15 seconds and dried with the heat gun at 300 F for 30 seconds. Final weights were recorded and efficiencies were calculated.

Results: Only one product, Texolite 1734 XL, removed less than 99% of the wax from the glass coupons. The following table lists the efficiencies for each coupon. Most of the coupons appeared to water spots remaining on them except for the Opti Clear product.

Cleaner	Coupon 1	Coupon 2	Coupon 3	Average	Std Dev
Inproclean	100.54	100.41	99.51	100.15	0.56
Texolite	86.20	92.12	99.66	92.66	6.75
Bio T 200A	100.14	100.00	100.34	100.16	0.17
Histo Clear	99.54	100.00	99.85	99.80	0.24
Opti Clear	100.11	100.36	100.12	100.20	0.14

Summary:

Substrates:	Glass/Quartz				
Contaminants:	Waxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Oakite Products	Inproclean 3800	10	100.15	☑	
Texo Corporation	Texolite 1734 XL	10	92.66	☑	
Bio Chem Systems	Bio T 200 A	100	100.16	☑	
National Diagnostic	Histo Clear	100	99.80	☑	
National Diagnostic	Opti Clear	100	100.20	☑	

Conclusion: The water spots could be eliminated by improving the drying phase. Air blow off using air knives, followed by longer heated drying cycle would aid in the removal of water spots.