

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2003  
 DateRun: 01/24/2003  
 Experimenters: Jason Marshall  
 ClientType: Manufactures parts for Semi-Conductor Industry  
 ProjectNumber: Project #1  
 Substrates: Ceramics  
 PartType: Coupon  
 Contaminants: Waxes  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To identify additional products for bee wax removal

**Experimental Procedure:** Six products were selected from the laboratories database of testing results based on client supplied data. One aqueous product was chosen and diluted to 5% using DI water in a 600 ml beaker. A second aqueous based product was used at full strength as recommended by the vendor. In addition, Four semi-aqueous products were used at full strength in 600 ml beakers. The products were heated to 130 F on a hot plate. Eighteen preweighed ceramic coupons were coated with client supplied bees wax. The wax was first melted using a Master Appliance heat gun in a beaker and applied to the coupons using a swab. The coupons were allowed to cool to room temperature before weighing 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. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

**Results:** Two of the six products were found to remove all of the wax. Both were terpene based products. The table below lists the amount of wax applied and removed during the 5 minute immersion cleaning.

Cleaner	Initial wt	Final wt	% Removed
Daraclean 212	0.2568	0.2605	-1.44
	0.1710	0.1760	-2.92
	0.2091	0.2115	-1.15
Workout	0.1779	0.1817	-2.14
	0.2248	0.2343	-4.23
	0.2042	0.2072	-1.47
Safer Stuff	0.2810	0.2814	-0.14
	0.2919	0.2880	1.34
	0.3672	0.3579	2.53
Citriburst 7	0.2556	-0.0006	100.23
	0.2832	-0.0008	100.28
	0.2709	-0.0003	100.11
E3HB	0.2569	0.1882	26.74
	0.3388	0.3198	5.61
	0.2190	0.1983	9.45
Citrikleen XPC	0.3061	-0.0005	100.16
	0.2955	-0.0006	100.20
	0.2887	0.0002	99.93

**Summary:**

<b>Substrates:</b>	Ceramics				
<b>Contaminants:</b>	Waxes				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Magnaflux	Daraclean 212	5	-1.85	<input type="checkbox"/>	
Buckeye International	Work Out	100	-2.61	<input type="checkbox"/>	
Finger Lakes Chemical	Safer Stuff	100	1.24	<input type="checkbox"/>	
Florida Chemical Company	Citrus Burst 7	100	100.21	<input checked="" type="checkbox"/>	
Metabolix Inc	Metabolix E3HB	100	13.93	<input type="checkbox"/>	
Pentone Corporation	Citrikleen XPC	100	100.10	<input checked="" type="checkbox"/>	

**Conclusion:**

## **CLEANING LABORATORY EVALUATION SUMMARY**

The next trial will use the two successful products from this trial, Citraburst 7 and Citrikleen XPC, and the one from the previous trial, Opti Clear, to clean the second supplied wax. Additional products will also be included.