

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1995  
 DateRun: 07/31/1995  
 Experimenters: Jay Jankauskas  
 ClientType: Electro-Optical Devices  
 ProjectNumber: Project #1  
 Substrates: Glass/Quartz  
 PartType: Coupon  
 Contaminants: Waxes  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric, Visual, Waterbreak  
 Purpose: To see if stirbar agitation will be effective

Experimental Procedure: The purpose of this trial is to see if stir-bar agitation would be suitable for Electro-Optical Devices's needs. Four different cleaners will be tested in a stir-bar agitated beaker with and without brushing. Cleaning was done in a stir-bar agitated beaker set at 150 F. Cleaning time will be determined during the trial depending on the cleaner's effectiveness. Two glass samples will be used for each cleaner, one sample will be cleaned solely by the agitation, while the second sample will be brushed for a few seconds. The samples will be rinsed in a tap water bath for 1 minute at 150 F and then in a DI water rinse for 1 minute at room temperature. The parts will then be dried under an air knife for 2 minutes and then in a convection oven set at 120 F for 30 minutes. The samples will be analyzed gravimetrically to get a percent removal. The samples will be observed with a water-break test to detect any residual wax. After drying, the samples will be checked for any water spotting that may occur.

## Trial #1-

SAMPLE NUMBERS: #1, #2(brushed)  
 CLEANING PRODUCT: Alconox Alcojet Detergent  
 CONCENTRATION: 2% solution (20 grams per liter solution)

## Trial #2-

SAMPLE NUMBERS: #3, #4(brushed)  
 CLEANING PRODUCT: International Products Micro  
 CONCENTRATION: 4% by volume

## Trial #3-

SAMPLE NUMBERS: #5, #6(brushed)  
 CLEANING PRODUCT: Oakite Inproclean #3800  
 CONCENTRATION: 10% by volume

## Trial #4-

SAMPLE NUMBERS: #7, #8(brushed)  
 CLEANING PRODUCT: Innovative Organics L-12 cleaner  
 CONCENTRATION: 10% by volume

SUBSTRATE MATERIAL: Soda-Lime Glass

CONTAMINANTS: Blanchard Stacking Wax #5

CONTAMINATING PROCESS USED: melted wax applied on with swab and allowed to set

Results: After cooling down, all the cleaners were ranked in four categories: Percent Removal without brushing, Removal with brushing. Wax separation from cleaner solution, and Spotting. For each category, each cleaner was assigned a number from one to four, one is for the best performer, while four is for the worst.

	Percent Removal	Brushing Removal	Wax Separation	Spotting
Alcojet	1	1	2	1
Micro	3	3	1	3
Inproclean #3800	2	1	3	1
L-12	4	4	4	4

## GRAVIMETRIC ANALYSIS FOR AGITATED IMMERSION

Sample #	Clean mass (g)	Mass with contamination (g)	Mass after cleaning (g)	Contaminant removed (g)	Percent Removal
1	14.8777	15.8713	14.8775	0.9938	100.02%
2	16.5521	19.1277	16.5516	2.5761	100.02%

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<b>3</b>	<b>12.3687</b>	<b>14.1690</b>	<b>12.6813</b>	<b>1.4877</b>	<b>82.64%</b>
<b>4</b>	<b>14.3598</b>	<b>16.6013</b>	<b>14.3642</b>	<b>2.2371</b>	<b>99.80%</b>
<u>5</u>	<u>15.0674</u>	<u>17.3836</u>	<u>15.0732</u>	<u>2.3104</u>	<u>99.75%</u>
<u>6</u>	<u>13.3556</u>	<u>15.6748</u>	<u>13.5559</u>	<u>2.3189</u>	<u>99.99%</u>
7	14.0975	16.1344	15.1696	0.9648	47.37%
8	15.7478	18.6593	15.7907	2.8686	98.53%

1,2 Alconox Alcojet  
 3,4 International Products Group Micro  
 5,6 Oakite Inproclean #3800  
 7,8 Innovative Organics L-12

Summary:

<b>Substrates:</b>	Glass/Quartz				
<b>Contaminants:</b>	Waxes				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
Alconox Inc	Alcojet	2	100.02	<input checked="" type="checkbox"/>	
International Products Corporation	Micro (no longer available)	4	82.64	<input type="checkbox"/>	
Oakite Products	Inproclean 3800	10	99.80	<input type="checkbox"/>	
Innovative Organics Inc	Amberclean L 12	10	47.37	<input type="checkbox"/>	

Conclusion: