



Architectural Testing

PERFORMANCE TEST REPORT

Rendered to:

AMERICAN BUILDING TECHNOLOGIES, INC.

**PRODUCT: 4mm Alubond u.s.a. FR
Aluminum Composite Panel**

Report No: 01-45686.02
Report Date: 08/22/03
Expiration Date: 08/21/07

130 Derry Court
York, PA 17402-9405
phone: 717.764.7700
fax: 717.764.4129
www.archtest.com



PERFORMANCE TEST REPORT

Rendered to:

AMERICAN BUILDING TECHNOLOGIES, INC.
600 17th Street, Suite 2800 South
Denver, Colorado 80202

Report No: 01-45686.02
Test Date: 06/18/03
Through: 08/21/03
Report Date: 08/22/03
Expiration Date: 08/21/07

Product: 4mm Alubond u.s.a. FR Aluminum Composite Panel

Project Summary: Architectural Testing, Inc. (ATI) was contracted by American Building Products, Inc. to perform testing on their Alubond u.s.a. FR Aluminum Composite Panel. ATI personnel conducted testing at the ATI laboratory in York, Pennsylvania. This report details the specimen as tested, test procedure description and results obtained from the tests. The following table summarizes the results obtained.

Test	Result
ASTM C 518 - Thermal Conductance	5.79 Btu/hr·ft ² ·°F (32.9 W/m ² ·°K)
ASTM D 638 - Tensile Strength	5,408 psi (37.3 MPa)
Yield Strength	3,737 psi (25.8 MPa)
Elongation	6.1%
ASTM D 648 - Deflection Temperature Under Load	211°C (411.8°F)
ASTM D 696 - Coefficient of Linear Thermal Expansion	2.02 x 10 ⁻⁵ mm/mm·°C (1.12 x 10 ⁻⁵ in./in.·°F)
ASTM D 732 - Impact Resistance	4092 psi (28.2 MPa)
TCLP Toxicity	Within Acceptable Limits
7 day exposure at -20°C	No Delamination
7 day exposure at 80°C	No Color Change

Test Specification: The test specimen were evaluated in general accordance with the following:

ASTM C 518, Standard Test Method for Steady State Heat Flux Measurement of Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

ASTM D 638, Standard Test Method for Tensile Properties of Plastics.

ASTM D 648, Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.

ASTM D 696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer.

*ASTM D 732, Standard Test Method for Shear Strength of Plastics by Punch Tool
TCLP - Toxicity.*

Test Specimen Description: The sample as provided by the manufacturer to ATI for testing consisted of a 3mm resin type material with a 0.50mm aluminum face on opposite sides.

Test Procedure: Thermal Transmission testing was performed on a heat flow meter. One sample was evaluated over a temperature range of 50 - 100°F. Tensile testing was performed on a SATEC Model MII 50UD Universal Testing Machine. A computer program controlled the rate of speed at 0.2" per minute and calculated tensile properties. An extensometer was utilized to measure sample strain. Five samples of the material were tested. Heat Deflection Temperature testing was performed in a test chamber, by simply supporting the test sample edgewise while applying a calculated load. The chamber is heated at a rate of two degrees C. per minute until the sample deflects 0.010". The time and temperature at which the deflection occurs is recorded. Two specimen of the compound were tested.

Deflection temperature under load was performed on two complete samples, each measuring 0.500" (12.7mm) in depth, 0.165" (4.2mm) in width and 5" (127mm) in length. Individual specimen are installed into a controlled heated chamber and steadily heated at a rate of 4°F (2°C) per minute until the specimen deflects 0.010" (0.25mm). The temperature at which this deflection occurs is recorded as the deflection temperature under load. The samples evaluated in this program were subjected to a load of 1.82 pounds, subsequently causing a maximum stress of 264 psi (1.8 MPa).



Architectural Testing

Test Procedure: (Continued) Coefficient of Linear Thermal Expansion (ATI Equipment #Y002052) was evaluated on two samples. Sample length measurements were taken across a temperature range of -30°C up to 30°C and then returning to -30°C. Shear Strength testing was performed on the SATEC. Ten samples of the material were evaluated. Photographs of the test equipment are available in the appendix.

TCLP / Toxicity analysis was performed by Precision Analytical Laboratories. Results are contained in the case report and can be found included in the appendix of this report.

Color change and delamination evaluation was conducted on two 4" square samples of material. Color readings were taken before and after exposure on a MacBeth Spectrophotometer (ATI Equip. #Y 002672). Delamination was evaluated visually. One sample was exposed in a freezer for 7 days at -20°C. A second sample was exposed in an oven for seven days at 80°C.

Test Results: The following charts contain the average and individual results of testing:

ASTM C 518 - Thermal Transmission
Temperature Range (50 - 100°F)

Specimen #	Thickness	Mean Temperature	Resultant Conductance
1	4mm	75°F (23.9°C)	5.79 Btu/hr-ft ² ·°F (32.9 W/m ² ·°K)

ASTM D 638 - Tensile Properties

Average Thickness		0.160" (4mm)
Yield Strength Method Used	Fy Ave. Offset	3,737 psi (25.7 MPa)
Modulus of Elasticity	Maximum Average	1,959,000 psi (13,506.8 MPa) 1,842,700 psi (12,704.9 MPa)
Ultimate Load	Sample #1 Sample #2 Sample #3 Sample #4 Sample #5 Average	446 lbs (1983 N) 437 lbs (1943 N) 446 lbs (1984 N) 444 lbs (1975 N) 420 lbs (1868 N) 439 lbs (1952 N)
Tensile Strength	Sample #1 Sample #2 Sample #3 Sample #4 Sample #5 Average	5,500 psi (37.9 MPa) 5,417 psi (37.3 MPa) 5,483 psi (37.8 MPa) 5,449 psi (37.5 MPa) 5,192 psi (35.7 MPa) 5,408 psi (37.3 MPa)
Elongation	Sample #1 Sample #2 Sample #3 Sample #4 Sample #5 Average	7.6% 5.8% 8.0% 5.7% 3.2% 6.1%

Test Results: (Continued)

ASTM D 648 - Deflection Temperature of Plastics Under Flexural Load
(1.82 lb applied load¹)

Sample	Time (minutes)	Target Temperature (°C)	Actual Temperature (°C)
1	84	191	192
2	104	231	230
Average	24.5	211	211

ASTM D 696 - Linear Thermal Expansion

Sample	Variability (%)	Expansion/Contraction Coefficient
1	1	2.00 x 10 ⁻⁵ mm/mm·°C (1.11 x 10 ⁻⁵ in./in.·°F)
2	10	2.05 x 10 ⁻⁵ mm/mm·°C (1.13 x 10 ⁻⁵ in./in.·°F)
Average		2.02 x 10⁻⁵ mm/mm·°C (1.12 x 10⁻⁵ in./in.·°F)

ASTM D 732 - Shear Strength
(1" punch diameter)

Thickness: 0.160" (4mm) **Circumference:** 3.140" (79.7mm) **Area:** 0.5024 in.² (324.1mm²)

Sample	Peak Load	Shear Strength
1	2043 lb _f (9087 N)	4067 psi (28.0 MPa)
2	2037 lb _f (9061 N)	4054 psi (27.9 MPa)
3	2042 lb _f (9083 N)	4065 psi (28.0 MPa)
4	2054 lb _f (9136 N)	4088 psi (28.2 MPa)
5	2071 lb _f (9212 N)	4123 psi (28.4 MPa)
6	2043 lb _f (9087 N)	4066 psi (28.0 MPa)
7	2064 lb _f (9181 N)	4107 psi (28.3 MPa)
8	2062 lb _f (9172 N)	4103 psi (28.3 MPa)
9	2079 lb _f (9247 N)	4138 psi (28.5 MPa)
10	2065 lb _f (9185 N)	4110 psi (28.3 MPa)
Average	2056 lb_f (9145 N)	4092 psi (28.2 MPa)

TCLP - Toxicity Summary

Analysis	Result
Leached Mercury	Within allowable limits
Leached Metals	Within allowable limits
Leached Volatiles	Within allowable limits

¹ Applied load calculated per ASTM D 648 Section 7.1.4, using sample dimensions of 0.165" x 0.500", 4.000" support span, and 264 psi fiber stress.



Architectural Testing

Color Change / Delamination Evaluation

7 Days @ -20°C

Change	Value	Description
L = (lightness / darkness)	-0.009	Darker
a = (red / green)	-0.024	More Green
b = (yellow / blue)	0.008	Less Blue
E = (overall change)	0.027	Not visibly detectable

No delamination was observed.

7 Days @ 80°C

Change	Value	Description
L = (lightness / darkness)	-0.002	Darker
a = (red / green)	-0.016	More Green
b = (yellow / blue)	0.049	Less Blue
E = (overall change)	0.051	Not visibly detectable

No delamination was observed.

Representative samples of the test specimen and a copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory. This report may not be reproduced, except in full, without the approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Joseph M. Brickner
Senior Technician - Component/Materials Testing

Todd D. Burroughs
Director - Component/Materials Testing

JMB:jmb/nlb
01-45686.02

Attachments
Test Photographs
Precision Analytical Laboratories Toxicity Report

DOCUMENT CONTROL ADDENDUM #01-45686.00

Current Issue Date: 08/22/03

Report No.: 01-45686.01

Requested by: Robert Gustafson, American Building Technologies Inc.

Purpose: Performance testing of 4mm Alubond u.s.a. FR Aluminum Composite Panel.

Issued Date: 07/23/03

Comments:

Report No.: 01-45686.02

Requested by: Robert Gustafson, American Building Technologies Inc.

Purpose: Inclusion of color change and delamination results.

Issued Date: 08/22/03

Comments:



Architectural Testing

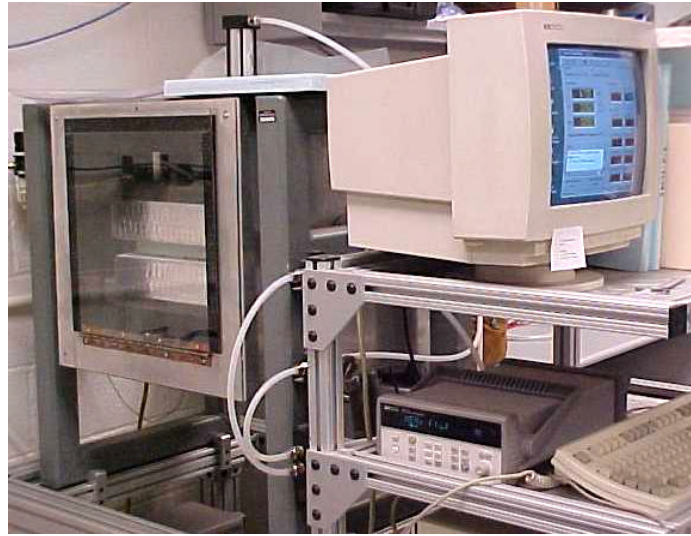


Photo No. 1
Thermal Transmission Apparatus



Photo No. 2
Thermal Transmission - Sample Placement Detail



Architectural Testing

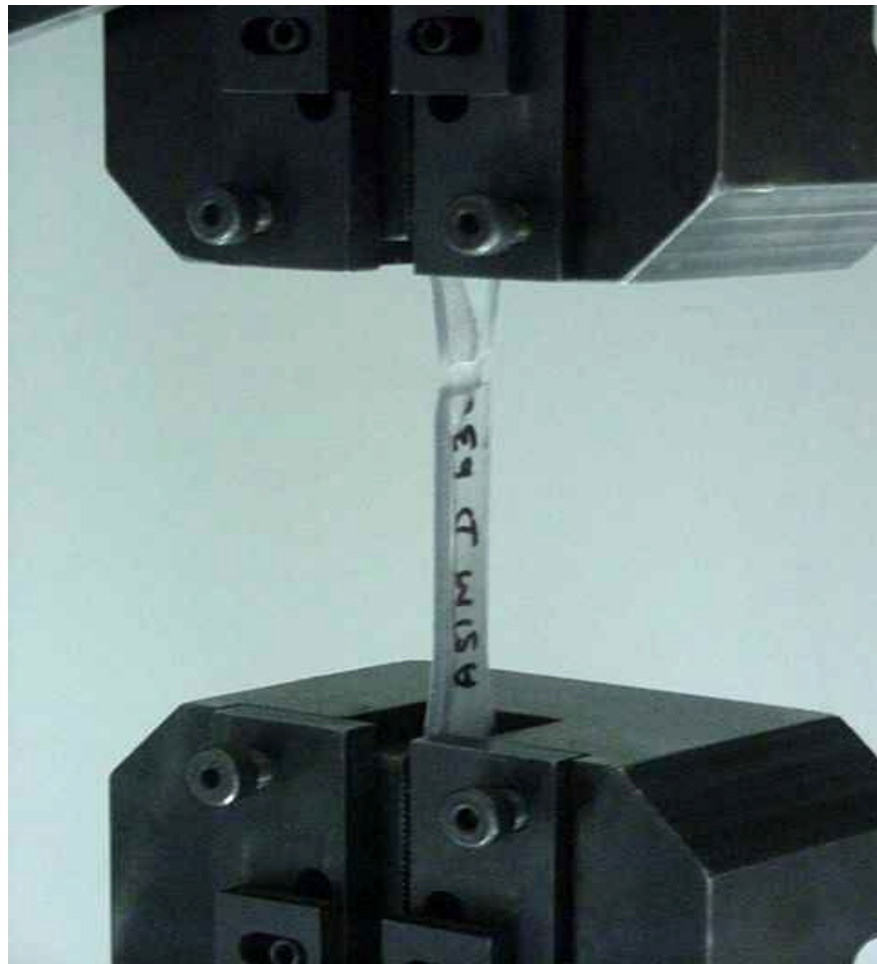


Photo No. 3
Tensile Failure



Photo No. 4
Heat Deflection Temperature Under Load Apparatus



Photo No. 5
Coefficient of Linear Thermal Expansion Apparatus



Architectural Testing

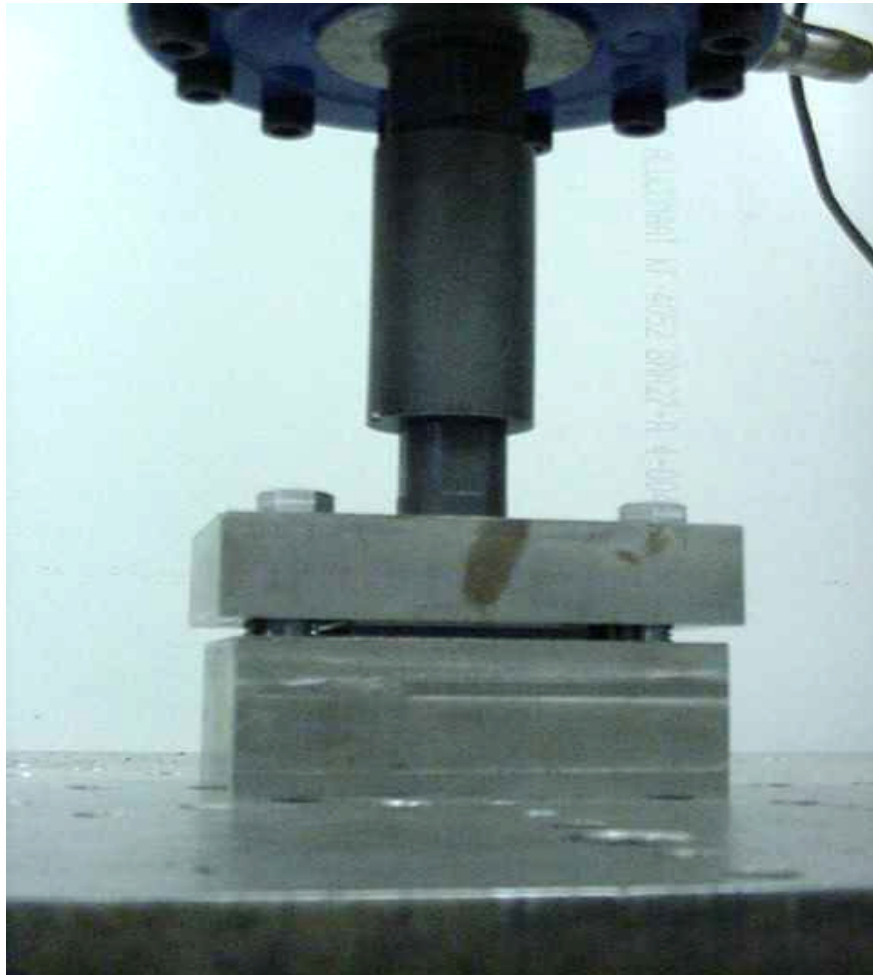


Photo No. 6
Shear Strength Test Detail



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

Precision Analytical Laboratories

Date: 07-Jul-03

CLIENT: Architectural Testing, Inc.
Project: Composite Panel (4mm)
Lab Order: 03061080

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992, and 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1995. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Precision Analytical Laboratories, Inc. (PAL) holds Arizona certification no. AZ0610 and PAL-Tucson holds Arizona certification no. AZ0609.

Aerotech Laboratories, Inc. (PAL division - Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation. PAL participates in the AIHA Environmental Lead Proficiency Analytical Testing (ELPAT) program for lead in soil, paint chips and dust wipes.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

* Value exceeds Maximum Contaminant Level.

D2 Sample required dilution due to high concentration of target analyte.

M7 Matrix spike recovery was low. Data reported per ADEQ policy 0154.000.



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

Precision Analytical Laboratories

Date: 07-Jul-03

CLIENT: Architectural Testing, Inc.
Lab Order: 03061080
Project: Composite Panel (4mm)
Lab ID: 03061080-01A

Client Sample ID: #1 TCLP
Tag Number:
Collection Date:
Matrix: SOLID

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY, TCLP LEACHED		SW1311/7470A		Analyst: CU		
Mercury	< 0.050	0.050		mg/L	1	6/27/2003
ICP METALS, TCLP LEACHED		SW1311/6010B		Analyst: HLO		
Arsenic	< 1.0	1.0		mg/L	1	7/2/2003 12:25:28 PM
Barium	< 5.0	5.0		mg/L	1	7/2/2003 12:25:28 PM
Cadmium	< 0.50	0.50		mg/L	1	7/2/2003 12:25:28 PM
Chromium	< 1.0	1.0		mg/L	1	7/2/2003 12:25:28 PM
Lead	< 1.0	1.0		mg/L	1	7/2/2003 12:25:28 PM
Selenium	< 0.50	0.50		mg/L	1	7/2/2003 12:25:28 PM
Silver	< 0.50	0.50		mg/L	1	7/2/2003 12:25:28 PM
VOLATILES, TCLP LEACHED		SW1311/8260B		Analyst: JG		
1,1-Dichloroethene	< 0.10	0.10		mg/L	1	6/27/2003
1,2-Dichloroethane	< 0.10	0.10		mg/L	1	6/27/2003
1,4-Dichlorobenzene	< 0.10	0.10		mg/L	1	6/27/2003
2-Butanone	< 0.50	0.50		mg/L	1	6/27/2003
Benzene	< 0.10	0.10		mg/L	1	6/27/2003
Carbon tetrachloride	< 0.10	0.10		mg/L	1	6/27/2003
Chlorobenzene	< 0.10	0.10		mg/L	1	6/27/2003
Chloroform	< 0.10	0.10		mg/L	1	6/27/2003
Tetrachloroethene	< 0.10	0.10		mg/L	1	6/27/2003
Trichloroethene	< 0.10	0.10		mg/L	1	6/27/2003
Vinyl chloride	< 0.10	0.10		mg/L	1	6/27/2003
Surr: 4-Bromofluorobenzene	97.9	73-115		%REC	1	6/27/2003
Surr: Dibromofluoromethane	106	79-122		%REC	1	6/27/2003
Surr: Toluene-d8	101	80-117		%REC	1	6/27/2003

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range

* - Value exceeds Maximum Contaminant Level



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

Date: 07-Jul-03

CLIENT: Architectural Testing, Inc.

Work Order: 03061080

Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_HG

Sample ID	MB-14136	SampType:	MBLK	TestCode:	1311_HG	Units:	mg/L	Prep Date:	6/27/2003	Run ID:	FIMS HG_030627D			
Client ID:	ZZZZZ	Batch ID:	14136	TestNo:	SW1311/7470			Analysis Date:	6/27/2003	SeqNo:	423460			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury		< 0.050		0.050										
---------	--	---------	--	-------	--	--	--	--	--	--	--	--	--	--

Sample ID	LCS-14136	SampType:	LCS	TestCode:	1311_HG	Units:	mg/L	Prep Date:	6/27/2003	Run ID:	FIMS HG_030627D			
Client ID:	ZZZZZ	Batch ID:	14136	TestNo:	SW1311/7470			Analysis Date:	6/27/2003	SeqNo:	423461			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury		0.491		0.050	0.5	0		98.2	85	115	0	0		*
---------	--	-------	--	-------	-----	---	--	------	----	-----	---	---	--	---

Sample ID	LCSD-14136	SampType:	LCSD	TestCode:	1311_HG	Units:	mg/L	Prep Date:	6/27/2003	Run ID:	FIMS HG_030627D			
Client ID:	ZZZZZ	Batch ID:	14136	TestNo:	SW1311/7470			Analysis Date:	6/27/2003	SeqNo:	423464			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury		0.52		0.050	0.5	0		104	85	115	0.491	5.74	20	*
---------	--	------	--	-------	-----	---	--	-----	----	-----	-------	------	----	---

Sample ID	03061079-01AMS	SampType:	MS	TestCode:	1311_HG	Units:	mg/L	Prep Date:	6/27/2003	Run ID:	FIMS HG_030627D			
Client ID:	ZZZZZ	Batch ID:	14136	TestNo:	SW1311/7470			Analysis Date:	6/27/2003	SeqNo:	423468			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury		1.28		0.10	0.5	0.764		103	85	115	0	0		D2
---------	--	------	--	------	-----	-------	--	-----	----	-----	---	---	--	----

Sample ID	03061079-01AMSD	SampType:	MSD	TestCode:	1311_HG	Units:	mg/L	Prep Date:	6/27/2003	Run ID:	FIMS HG_030627D			
Client ID:	ZZZZZ	Batch ID:	14136	TestNo:	SW1311/7470			Analysis Date:	6/27/2003	SeqNo:	423469			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury		1.262		0.10	0.5	0.764		99.6	85	115	1.28	1.42	20	D2
---------	--	-------	--	------	-----	-------	--	------	----	-----	------	------	----	----

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Architectural Testing, Inc.
Work Order: 03061080
Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_M

Sample ID	MB-14156	SampType:	MBLK	TestCode:	1311_M	Units:	mg/L	Prep Date:	6/30/2003	Run ID:	ICP001_030702A
Client ID:	ZZZZZ	Batch ID:	14156	TestNo:	SW1311/6010	Analysis Date:	7/2/2003	SeqNo:	425024		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	< 1.0	1.0									
Barium	< 5.0	5.0									
Cadmium	< 0.50	0.50									
Chromium	< 1.0	1.0									
Lead	< 1.0	1.0									
Selenium	< 1.0	1.0									
Silver	< 0.50	0.50									

Sample ID	LCS-14156	SampType:	LCS	TestCode:	1311_M	Units:	mg/L	Prep Date:	6/30/2003	Run ID:	ICP001_030702A
Client ID:	ZZZZZ	Batch ID:	14156	TestNo:	SW1311/6010	Analysis Date:	7/2/2003	SeqNo:	425025		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	5.214	1.0	5	0	104	80	120	0	0		*
Barium	5.121	5.0	5	0	102	80	120	0	0		
Cadmium	5.006	0.50	5	0	100	80	120	0	0		*
Chromium	4.882	1.0	5	0	97.6	80	120	0	0		
Lead	5.02	1.0	5	0	100	80	120	0	0		
Selenium	5.568	1.0	5	0	111	80	120	0	0		*
Silver	5.111	0.50	4.95	0	103	80	120	0	0		*

Sample ID	LCSD-14156	SampType:	LCSD	TestCode:	1311_M	Units:	mg/L	Prep Date:	6/30/2003	Run ID:	ICP001_030702A
Client ID:	ZZZZZ	Batch ID:	14156	TestNo:	SW1311/6010	Analysis Date:	7/2/2003	SeqNo:	425026		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	5.224	1.0	5	0	104	80	120	5.214	0.186	20	*
Barium	5.166	5.0	5	0	103	80	120	5.121	0.892	20	
Cadmium	5.04	0.50	5	0	101	80	120	5.006	0.682	20	*
Chromium	4.933	1.0	5	0	98.7	80	120	4.882	1.04	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Architectural Testing, Inc.

Work Order: 03061080

Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_M

Sample ID	LCSD-14156	SampType: LCSD	TestCode: 1311_M	Units: mg/L	Prep Date: 6/30/2003	Run ID: ICP001_030702A					
Client ID:	ZZZZZ	Batch ID: 14156	TestNo: SW1311/6010	Analysis Date: 7/2/2003	SeqNo: 425026						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead	5.042	1.0	5	0	101	80	120	5.02	0.432	20	
Selenium	5.716	1.0	5	0	114	80	120	5.568	2.62	20	*
Silver	5.194	0.50	4.95	0	105	80	120	5.111	1.61	20	*

Sample ID	03061079-01A MS	SampType: MS	TestCode: 1311_M	Units: mg/L	Prep Date: 6/30/2003	Run ID: ICP001_030702A					
Client ID:	ZZZZZ	Batch ID: 14156	TestNo: SW1311/6010	Analysis Date: 7/2/2003	SeqNo: 425029						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	5.331	1.0	5	0	107	75	125	0	0		*
Barium	5.077	5.0	5	0	102	75	125	0	0		
Cadmium	5.015	0.50	5	0	100	75	125	0	0		*
Chromium	4.882	1.0	5	0	97.6	75	125	0	0		
Lead	5.034	1.0	5	0	101	75	125	0	0		
Selenium	< 1.0	1.0	5	0	0	75	125	0	0		M7
Silver	5.137	0.50	4.95	0	104	75	125	0	0		*

Sample ID	03061079-01A MSD	SampType: MSD	TestCode: 1311_M	Units: mg/L	Prep Date: 6/30/2003	Run ID: ICP001_030702A					
Client ID:	ZZZZZ	Batch ID: 14156	TestNo: SW1311/6010	Analysis Date: 7/2/2003	SeqNo: 425030						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	5.348	1.0	5	0	107	75	125	5.331	0.315	20	*
Barium	5.099	5.0	5	0	102	75	125	5.077	0.424	20	
Cadmium	5.008	0.50	5	0	100	75	125	5.015	0.138	20	*
Chromium	4.868	1.0	5	0	97.4	75	125	4.882	0.290	20	
Lead	5.051	1.0	5	0	101	75	125	5.034	0.343	20	*
Selenium	< 1.0	1.0	5	0	0	75	125	0	0	20	M7
Silver	5.145	0.50	4.95	0	104	75	125	5.137	0.155	20	*

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike Recovery outside accepted recovery limits

B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits

R - RPD outside accepted recovery limits

Page 3 of 7

■ Corporate Address: 1501 W. Knudsen Drive, Phoenix, Arizona 85027 Phone: 623.780.4800 Toll Free: 800.651.4802 Fax: 623.780.7695 www.aerotechlabs.com

■ Main Laboratory: 1725 W. 17th Street Tempe, AZ 85281 Phone: 480.967.1310 Toll Free: 866.772.5227 Fax: 480.967.1019 www.palabs.com

■ Tucson Facility: 4455 S. Park Ave. Ste. 110 Tucson, AZ 85714 Phone: 520.807.3801 Fax: 520.807.3803



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Architectural Testing, Inc.

Work Order: 03061080

Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_V

Sample ID	MB-14133	SampType:	MBLK	TestCode:	1311_V	Units:	mg/L	Prep Date:	6/26/2003	Run ID:	MS01_030627C
Client ID:	ZZZZZ	Batch ID:	14133	TestNo:	SW1311/8260	Analysis Date:	6/27/2003	SeqNo:	423923		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	< 0.10	0.10									
1,2-Dichloroethane	< 0.10	0.10									
1,4-Dichlorobenzene	< 0.10	0.10									
2-Butanone	< 0.50	0.50									
Benzene	< 0.10	0.10									
Carbon tetrachloride	< 0.10	0.10									
Chlorobenzene	< 0.10	0.10									
Chloroform	< 0.10	0.10									
Tetrachloroethene	< 0.10	0.10									
Trichloroethene	< 0.10	0.10									
Vinyl chloride	< 0.10	0.10									
Surr: 4-Bromofluorobenzene	4.954	0	5	0	99.1	73	115	0	0		
Surr: Dibromofluoromethane	5.366	0	5	0	107	79	122	0	0		
Surr: Toluene-d8	5.092	0	5	0	102	80	117	0	0		

Sample ID	LCS-14133	SampType:	LCS	TestCode:	1311_V	Units:	mg/L	Prep Date:	6/26/2003	Run ID:	MS01_030627C
Client ID:	ZZZZZ	Batch ID:	14133	TestNo:	SW1311/8260	Analysis Date:	6/27/2003	SeqNo:	423924		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	5.294	0.10	5	0	106	80	131	0	0		*
1,2-Dichloroethane	5.301	0.10	5	0	106	75	137	0	0		*
1,4-Dichlorobenzene	4.941	0.10	5	0	98.8	77	128	0	0		
2-Butanone	5.714	0.50	5	0	114	10	176	0	0		
Benzene	5.119	0.10	5	0	102	78	130	0	0		*
Carbon tetrachloride	5.158	0.10	5	0	103	80	134	0	0		*
Chlorobenzene	4.901	0.10	5	0	98	79	128	0	0		
Chloroform	5.089	0.10	5	0	102	77	131	0	0		
Tetrachloroethene	5.093	0.10	5	0	102	77	130	0	0		*

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Architectural Testing, Inc.
Work Order: 03061080
Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_V

Sample ID	LCS-14133	SampType: LCS	TestCode: 1311_V	Units: mg/L	Prep Date: 6/26/2003	Run ID: MS01_030627C					
Client ID:	ZZZZZ	Batch ID: 14133	TestNo: SW1311/8260	Analysis Date: 6/27/2003	SeqNo: 423924						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	5.031	0.10	5	0	101	80	129	0	0		*
Vinyl chloride	4.917	0.10	5	0	98.3	76	133	0	0		*
Surr: 4-Bromofluorobenzene	4.715	0	5	0	94.3	73	115	0	0		
Surr: Dibromofluoromethane	5.254	0	5	0	105	79	122	0	0		
Surr: Toluene-d8	5.042	0	5	0	101	80	117	0	0		

Sample ID	LCSD-14133	SampType: LCSD	TestCode: 1311_V	Units: mg/L	Prep Date: 6/26/2003	Run ID: MS01_030627C					
Client ID:	ZZZZZ	Batch ID: 14133	TestNo: SW1311/8260	Analysis Date: 6/27/2003	SeqNo: 423925						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	5.182	0.10	5	0	104	80	131	5.294	2.14	25	*
1,2-Dichloroethane	5.101	0.10	5	0	102	75	137	5.301	3.85	25	*
1,4-Dichlorobenzene	4.932	0.10	5	0	98.6	77	128	4.941	0.182	25	
2-Butanone	5.606	0.50	5	0	112	10	176	5.714	1.91	25	
Benzene	4.976	0.10	5	0	99.5	78	130	5.119	2.83	25	*
Carbon tetrachloride	5.136	0.10	5	0	103	80	134	5.158	0.427	25	*
Chlorobenzene	4.942	0.10	5	0	98.8	79	128	4.901	0.833	25	
Chloroform	4.953	0.10	5	0	99.1	77	131	5.089	2.71	25	
Tetrachloroethene	5.008	0.10	5	0	100	77	130	5.093	1.68	25	*
Trichloroethene	4.987	0.10	5	0	99.7	80	129	5.031	0.878	25	*
Vinyl chloride	4.794	0.10	5	0	95.9	76	133	4.917	2.53	25	*
Surr: 4-Bromofluorobenzene	4.667	0	5	0	93.3	73	115	0	0	0	
Surr: Dibromofluoromethane	4.958	0	5	0	99.2	79	122	0	0	0	
Surr: Toluene-d8	4.833	0	5	0	96.7	80	117	0	0	0	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



CLIENT: Architectural Testing, Inc.
Work Order: 03061080
Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_V

Sample ID	03061080-01A MS	SampType: MS	TestCode: 1311_V	Units: mg/L	Prep Date: 6/26/2003	Run ID: MS01_030627C					
Client ID:	#1 TCLP	Batch ID: 14133	TestNo: SW1311/8260		Analysis Date: 6/27/2003	SeqNo: 423927					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	5.205	0.10	5	0	104	84	127	0	0		*
1,2-Dichloroethane	5.36	0.10	5	0	107	74	139	0	0		*
1,4-Dichlorobenzene	4.965	0.10	5	0	99.3	83	122	0	0		
2-Butanone	5.921	0.50	5	0	118	8	164	0	0		
Benzene	5.131	0.10	5	0	103	81	128	0	0		*
Carbon tetrachloride	5.184	0.10	5	0	104	85	132	0	0		*
Chlorobenzene	4.928	0.10	5	0	98.6	85	123	0	0		
Chloroform	5.188	0.10	5	0	104	82	129	0	0		
Tetrachloroethene	4.958	0.10	5	0	99.2	59	156	0	0		*
Trichloroethene	5.039	0.10	5	0	101	79	134	0	0		*
Vinyl chloride	4.873	0.10	5	0	97.5	82	129	0	0		*
Surr: 4-Bromofluorobenzene	4.946	0	5	0	98.9	73	115	0	0		
Surr: Dibromofluoromethane	5.439	0	5	0	109	79	122	0	0		
Surr: Toluene-d8	5.17	0	5	0	103	80	117	0	0		

Sample ID	03061080-01A MSD	SampType: MSD	TestCode: 1311_V	Units: mg/L	Prep Date: 6/26/2003	Run ID: MS01_030627C					
Client ID:	#1 TCLP	Batch ID: 14133	TestNo: SW1311/8260		Analysis Date: 6/27/2003	SeqNo: 423928					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	5.254	0.10	5	0	105	84	127	5.205	0.937	25	*
1,2-Dichloroethane	5.202	0.10	5	0	104	74	139	5.36	2.99	25	*
1,4-Dichlorobenzene	4.98	0.10	5	0	99.6	83	122	4.965	0.302	25	
2-Butanone	5.655	0.50	5	0	113	8	164	5.921	4.60	25	
Benzene	5.158	0.10	5	0	103	81	128	5.131	0.525	25	*
Carbon tetrachloride	5.229	0.10	5	0	105	85	132	5.184	0.864	25	*
Chlorobenzene	4.945	0.10	5	0	98.9	85	123	4.928	0.344	25	
Chloroform	5.06	0.10	5	0	101	82	129	5.188	2.50	25	
Tetrachloroethene	5.008	0.10	5	0	100	59	156	4.958	1.00	25	*

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits



Precision Analytical Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Architectural Testing, Inc.
Work Order: 03061080
Project: Composite Panel (4mm)

ANALYTICAL QC SUMMARY REPORT

TestCode: 1311_V

Sample ID	03061080-01A MSD	SampType: MSD	TestCode: 1311_V	Units: mg/L	Prep Date: 6/26/2003	Run ID: MS01_030627C					
Client ID:	#1 TCLP	Batch ID: 14133	TestNo: SW1311/8260	Analysis Date: 6/27/2003	SeqNo: 423928						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	5.081	0.10	5	0	102	79	134	5.039	0.830	25	*
Vinyl chloride	4.812	0.10	5	0	96.2	82	129	4.873	1.26	25	*
Surr: 4-Bromofluorobenzene	4.738	0	5	0	94.8	73	115	0	0	0	
Surr: Dibromofluoromethane	5.179	0	5	0	104	79	122	0	0	0	
Surr: Toluene-d8	4.963	0	5	0	99.3	80	117	0	0	0	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits