Architectural Testing

AAMA 509-09 TEST REPORT

Rendered to:

ALTECH PANEL SYSTEMS, L.L.C.

And

MITSUBISHI PLASTICS COMPOSITES AMERICA, INC.

SERIES/MODEL: Accu-Trac® DS System
PRODUCT TYPE: Rain Screen Wall Cladding System

Report No.:	**A4562.01-109-44**
Test Date:	**10/29/10**
Report Date:	**11/10/10**
Expiration Date:	**10/29/14**

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AAMA 509-09 TEST REPORT

Rendered to:

ALTECH PANEL SYSTEMS, L.L.C.
One Johnson Street, Suite 118
Cartersville, Georgia 30120

And

MITSUBISHI PLASTICS COMPOSITES AMERICA, INC.
401 Volvo Parkway
Chesapeake, Virginia 23320

Report No.:	A4562.01-109-44
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Project Summary: Architectural Testing, Inc. was contracted by Altech Panel Systems, L.L.C. and Mitsubishi Plastics Composites, Inc. to perform validation testing in accordance with AAMA 509-09, *Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems*. General construction details and test results are included herein. The test specimen was provided and installed by the client.

Test Methods:

Air Infiltration: ASTM E 283-04, *Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*. Testing was conducted at 1.57 psf positive static air pressure difference.

Air Flow Analysis: Testing was conducted at 0.55 psf positive static air pressure difference to establish the air flow capabilities of the exterior cladding system. Testing was conducted at 1.57 psf positive static air pressure difference to verify "defective" air-water barrier. Each condition; head, jamb, sill, intermediate vertical and intermediate horizontal were tested by taking the air flow readings of each element to better understand the system's ability to allow for ventilation and the potential for drying.

Static Pressure Water Resistance: ASTM E 331-00, *Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference*. Testing was conducted at both 6.24 psf and 12.0 psf positive static air pressure difference for a 15 minute duration. Water was applied to the mock-up at a minimum rate of 5 gal/ft^2/hr.

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Test Methods: (Continued)

Dynamic Pressure Water Resistance: AAMA 501.1-05, *Standard Test Method for Exterior Windows, Curtain Walls, and Doors for Water Penetration Using Dynamic Pressure*. Testing was conducted with a dynamic pressure equivalent of both 6.24 psf and 12.0 psf for a 15 minute duration. Water was applied to the mock-up at a minimum rate of 5 gal/ft^2/hr.

Test Specimen Description:

Series/Model: Accu-Trac® DS System

Product Type: Rain Screen Wall Cladding System

Overall Size: 96" wide by 96" high

Panel Size (4): 47-1/4" wide by 47-1/4" high

Sill Joint Size: 93-3/4" wide by 0-1/8" high

Horizontal Joint Size: 93-1/2" wide by 0-1/2" high

Vertical Joint Size: 0-1/2" wide by 94-1/2" high

Overall Area: 64.0 ft^2

Finish: Painted

Rain Screen Panel Description: Aluminum composite panels that were 4 mm (0.165") thick. The panels were constructed with a 0.118" thick plastic core and two 0.020" thick aluminum interior and exterior skins, adhered to the plastic core. A 90° bend was utilized on all four sides of the panels. The panel edges were mitered and keyed with an aluminum corner key and secured with silicone. The edges of all panels utilized a perimeter extrusion, secured with 1/8" pop rivets.

Rain Screen Wall Construction Description: The sill utilized a 5-1/4" piece of flashing with a 90° bend. Each panel utilized extruded clips that were slid onto the perimeter extrusion. The sill utilized a "J" shaped starter strip, secured through the sill flashing to the steel studs with #12 x 1" long Tek screws, spaced 16" on center. The bottom panels were slid into the "J" starter and secured to the steel studs through the extruded aluminum clips on the panel edges with one #12 x 1" long Tek screw. The top panels were then slid into the top clips of the bottom panels and fastened to the steel studs through the extruded aluminum clips on the panel edges with one #12 x 1" long Tek screw. Each panel utilized two 1/8" diameter weepholes through the bottom rail. An open cell baffle was used at each weephole. An ACM panel strip was utilized in the vertical and horizontal joints.

Test Specimen Description: (Continued)

Test Set-Up Description:

An 8' wide by 8' high, 2x12, wood stud wall was constructed with 2x6 studs spaced 16" on center. The wall was covered with 1/4" thick clear Lexan, secured to each stud using #8 x 1-5/8" long drywall screws, spaced 16" on center. The Lexan was sealed to the exterior of the wall to simulate an air/water barrier. A formed aluminum gutter was installed at the base of the acrylic sheet for the purpose of collecting, draining, and measuring the water that contacted the air/water barrier. The wall panel system was installed onto the clear polycarbonate in a manner consistent with normal construction procedures for the system.

Test Procedure:

Prior to installation of the test specimen, a chamber tare reading was taken to establish the air flow through the buck/chamber arrangement. The clear polycarbonate was calibrated to a pre-determined air leakage rate by drilling 1/8" diameter holes on the backside in a uniform pattern, making sure to create an even pressure drop and leakage rate across the wall and in each quadrant. The test specimen was installed and an air infiltration reading was taken, subtracting the initial tare and air leakage established through the defect holes to obtain a net air infiltration reading through the cladding assembly.

Upon completion of the initial air measurements through the specimen, the system was prepared to determine air flow through the cladding elements. Each joint (head, jambs, sill, intermediate horizontal(s), and intermediate vertical) was temporarily sealed using foam blocks and tape as required. A tare reading was performed and each joint was subsequently tested to determine the air flow through each of the various joinery elements.

After air flow testing, water penetration testing was initiated. For the water penetration test, the tape was removed from all but the jamb joinery. This process provides for the determination of water penetration through the designed rain screen cladding elements; less the jamb conditions; which were intentionally omitted from the test results as they are considered non-standard conditions. For the purpose of this test, water penetration is considered to be any water that makes contact with the AWB and is either collected in the gutter at the sill, or penetrates the purposely designed defects that were drilled in the AWB. The water was collected, measured by weight, and then converted to a unit of volume in order to draw comparisons between the various pressure levels tested.

After the completion of the water testing protocol, the specimen was allowed to sit for several hours at test lab interior ambient conditions. The specimen was later evaluated to determine the amount of residual water that may have remained on the AWB and/or back of the specimen. The purpose of this was to achieve an understanding of the drying capability of the system.

Test Results: The test results for air infiltration are reported as follows:

Test Method	Title of Test	Results	Allowed
ASTM E 283	Air Infiltration (Initial Tare) 1.57 psf (25 mph)	6.70 cfm 0.10 cfm/ft^2	Report Only
ASTM E 283	Air Infiltration (with Defects) 1.57 psf (25 mph)	14.35 cfm 0.22 cfm/ft^2*	Report Only

***Observations**: The calibrated air leakage was achieved by drilling fifty-seven 1/8" diameter holes through the polycarbonate. These holes represent purposely designed defects in the AWB.*

**Result includes initial wall tare and deflects which resulted in a leakage of 0.12 csm/ft².*

ASTM E 283	Air Infiltration (Total with Cladding) 1.57 psf (25 mph)	14.96 cfm 0.23 cfm/ft^2**	Report Only

***Result includes initial tare, 0.12 cfm/ft² of purposely imposed defects and added leakage from wall system installation.*

Test Results For System Classification: The data compiled during testing for classification purposes is recorded in Tables # 1 and #2.

Test Method	Title of Test	Results	Allowed
ASTM E 283	Air Flow Across Cladding 0.55 psf	See Table 1	Report Only

TABLE #1

TEST RESULTS - AIR FLOW MEASUREMENT ACROSS THE CLADDING ELEMENTS

Data	Head	Sill	Horizontal	Vertical	Sum (cfm)[3]	cfm/ft²[4]
cfm[1]	N/A	21.95	7.64	7.13	36.72	0.57
cfm/ft[2]	N/A	1.87	0.16	0.15	Not Required	Not Required

[1]Data for each element (1) head/sill/horizontal(s)/vertical(s) and expressed as cfm.

[2]Cfm per lineal ft. of each element - head/sill/horizontal(s)/vertical(s) and expressed as cfm/ft.

[3]The sum the total cfm from all of the elements.

[4]The sum total of (3) divided by the square footage and expressed as cfm/ft². Used for classification purposes.

Test Results For System Classification: (Continued)

Test Method	Title of Test	Results	Allowed
ASTM E 331 (Static Pressure)	Water Penetration (6.24 and 12.0 psf)	See Table 2	Report Only
AAMA 501.1 (Dynamic Pressure)	Water Penetration (6.24 and 12.0 psf)	See Table 2	Report Only

TABLE #2

TEST RESULTS - WATER COLLECTED OFF/THROUGH THE AWB

Data	6.24 static	12 static	6.24 dynamic	12 dynamic	TTL oz.[3]	Sum oz/ft²[4]	Avg. fl oz/ft²[5]
fluid oz[1]	41.20	42.30	6.60	13.5	103.6	Not Required	Not Required
fl oz/ft²[2]	0.64	0.66	0.10	0.21	Not Required	1.61	0.40

[1]Results of each water test, expressed as fluid oz (fl oz).

[2]Results of each individual test is divided by the square footage of the specimen and expressed as fl oz/ft².

[3]Sum the results of the four water tests from [1] and express as total ounces.

[4]The sum per ft² of specimen area.

[5]The average fl oz/ft² for all four tests. Used for classification purposes.

***Note**: Water contacted the Lexan after splashing off of the intermediate horizontal members.*

Classification Rating: Based on the results of the air flow across the cladding (Table 1) and the water collected through the AWB (Table 2) the system tested achieved a V1/W1 Classification. Chart 1 shown below is used to plot the results of the test.

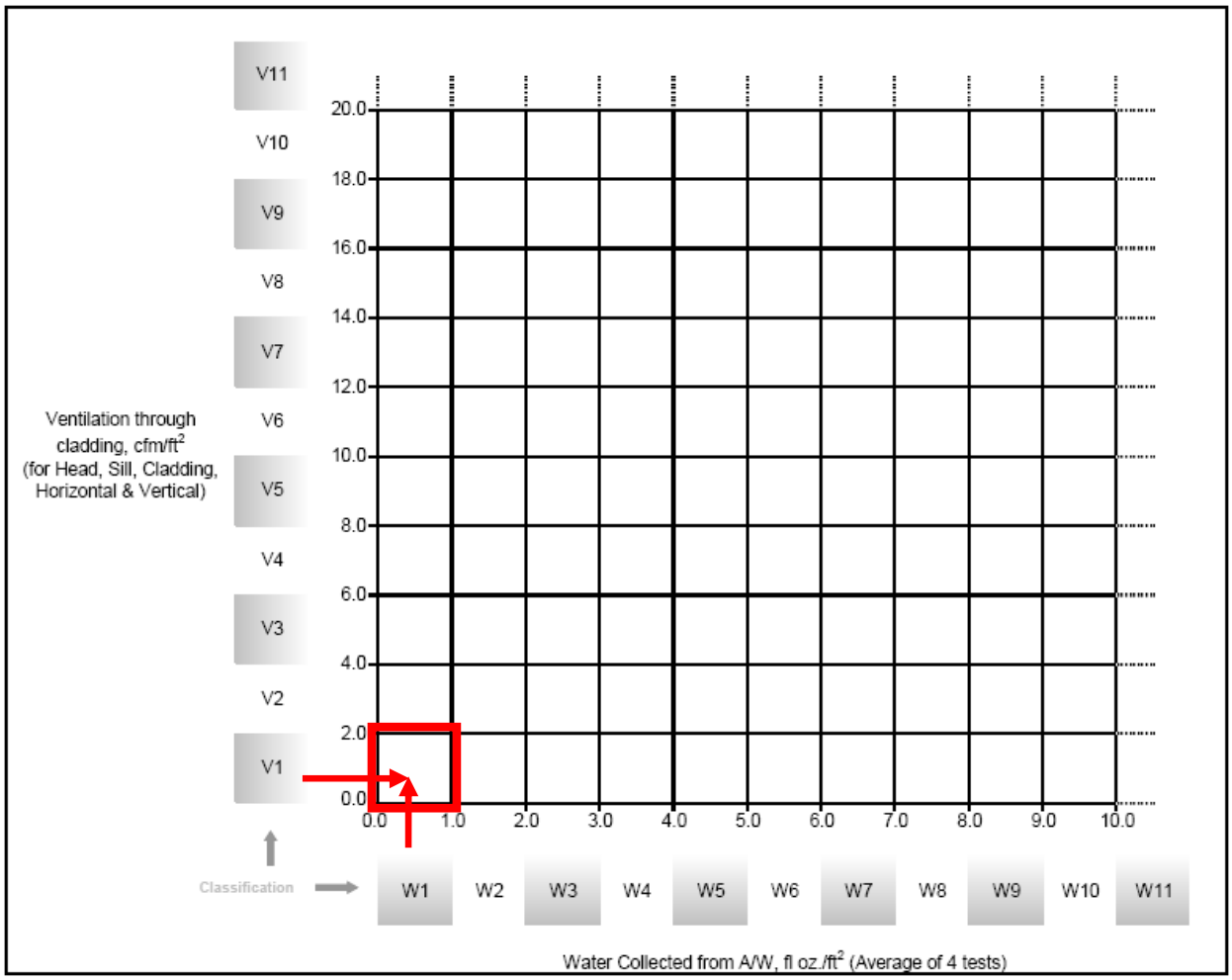


CHART 1: System Classification Chart

***Note**: Upon examination of the specimen several hours after testing, the specimen was found to have allowed for drying and did not trap water.*

***General Note**: This report is not intended as a comprehensive evaluation of the system regarding performance and application to specific buildings. All testing was performed in accordance with the referenced standards.*

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

Witnesses: The following representatives witnessed all or part of the testing.

Name	Company
Jerry L. Radford	Altech Panel Systems, L.L.C.
Larry Creswell	Altech Panel Systems, L.L.C.
William Yannetti	Mitsubishi Plastics Composites America, Inc.
Tom Lawlor	Architectural Testing, Inc.
Michael D. Stremmel, P.E.	Architectural Testing, Inc.
Jeremy R. Bender	Architectural Testing, Inc.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Jeremy R. Bender
Technician

Michael D. Stremmel, P.E.
Senior Project Engineer

JRB:dem

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (3)
Appendix-B: Drawing (1) Complete drawings packet on file with Architectural Testing, Inc.

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	11/10/10	N/A	Original report issue

Appendix A

Photographs

Photo No. 1
Wall Panel System

Photo No. 2
Interior View of Specimen

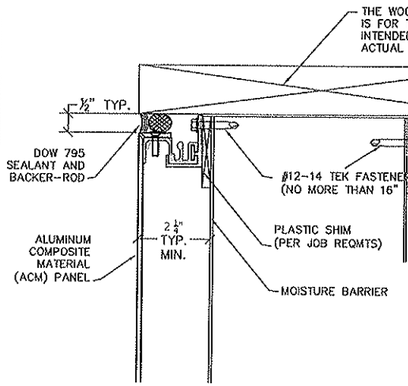
Photo No. 3
Dynamic Water

Photo No. 4
Acrylic Viewport in Gutter System to Observe Water Collection
(Viewport in Each End of Gutter, with Gutter Sloping Toward Ends)

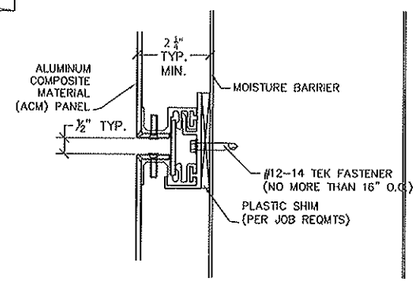
Appendix B

Drawings

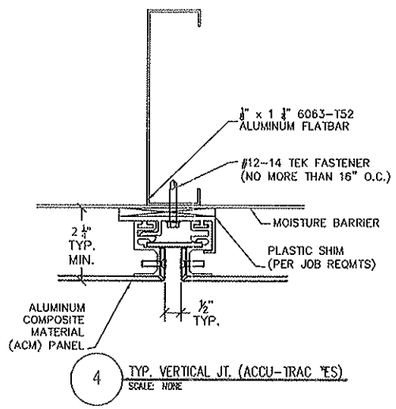
***Note**: Complete drawings packet on file with Architectural Testing, Inc.*



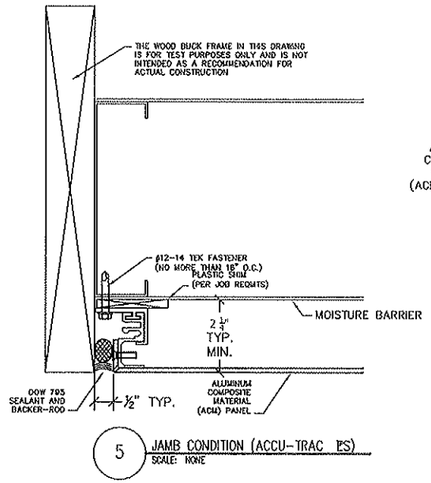
2 HEAD TERMINATION (ACCU-TRAC ES)
SCALE: NONE



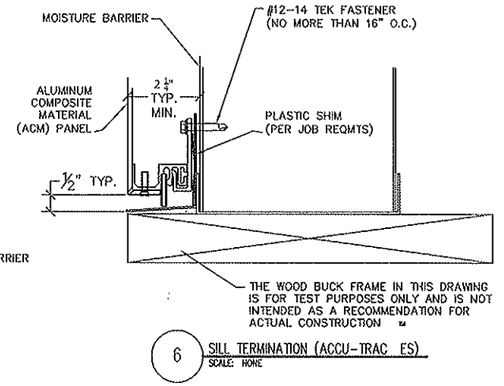
3 TYP. HORIZONTAL JT. (ACCU-TRAC ES)
SCALE: NONE



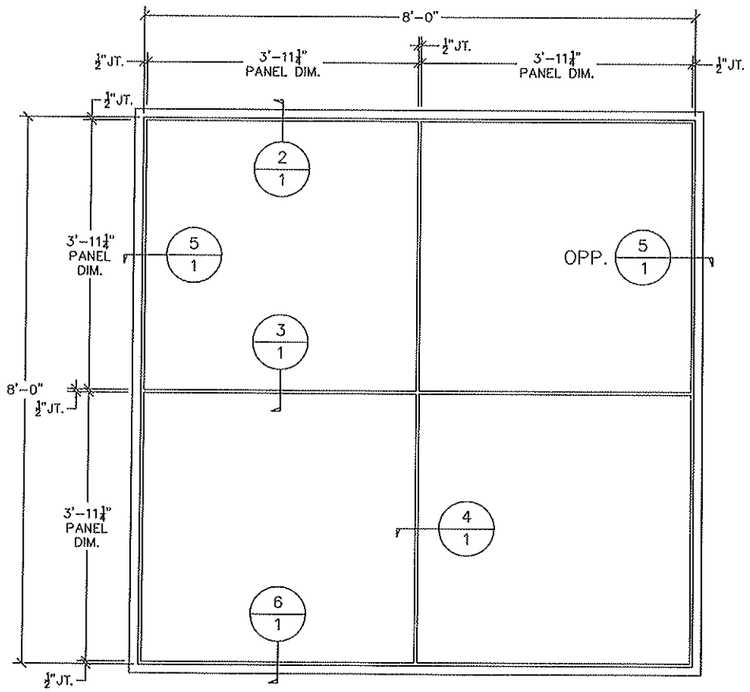
4 TYP. VERTICAL JT. (ACCU-TRAC ES)
SCALE: NONE



5 JAMB CONDITION (ACCU-TRAC ES)
SCALE: NONE



6 SILL TERMINATION (ACCU-TRAC ES)
SCALE: NONE



1/1 STUD FRAMING ELEVATION
SCALE: NONE

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # A4562.01

Date 11-3-10 Tech KB

SIGNATURE	DATE
DRAWN BY JLR	10/8/10
CHECKED BY	
DEPT. MGR.	
PRJ.MGR./T.R.	

DRAWINGS MARKED "APPROVED" OR "APPROVED AS NOTED" SHALL BE INTERPRETED AS AUTHORIZATION FOR FABRICATION

ACCU-TRAC® DS SYSTEM BY ALTECH PANEL SYSTEMS, L.L.C. USING ALPOLIC & ALPOLIC fr

SIZE	JOB NO.	DWG NO.	REV
D	N/A	1	REV

Scale N/A | DO NOT SCALE DRAWING | Sheet 2 of 6