TEST REPORT

Report No.: E8451.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Awning Window
SERIES/MODEL: EC140

SPECIFICATION(S): AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

Title	Summary of Results
AAMA/WDMA/CSA 101/I.S.2/A440-08	Class LC-PG25 1524 x 914 (60 x 36)-AP
Design Pressure	±1200 Pa (±25.06 psf)
Air Infiltration	0.2 L/s/m^2 (0.03 cfm/ft^2)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)

Test Completion Date: 06/04/15

Reference must be made to Report No. E8451.01-109-47, dated 06/22/15 for complete test specimen description and detailed test results. Reference Intertek-ATI Report No. B2714.02-301-47, dated 03/05/13 for complete *Gateway* test specimen description and test results.

1.0 Report Issued To: MI Windows and Doors, LLC
P.O. Box 370
650 West Market Street
Gratz, Pennsylvania 17030-0370

2.0 Test Laboratory: Architectural Testing, Inc.,
an Intertek company ("Intertek-ATI")
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: Polyvinyl Chloride (PVC) Awning Window

3.2 Series/Model: EC140

3.2.1 This product also labeled under the following names: EC142, EC145, HM140, HM142, HM145, BB140, BB142, and BB145

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimen tested successfully met the performance requirements for a **Class LC-PG25 1524 x 914 (60 x 36)-AP** rating. Reference Intertek-ATI Report No. B2714.02-301-47, dated 03/05/13 for complete *Gateway* test specimen description and test results.

3.4 Test Dates: 06/03/15 - 06/04/15

3.5 Test Record Retention End Date: All test records for this report will be retained until June 4, 2019.

3.6 Test Location: MI Windows and Doors, LLC test facility in Gratz, Pennsylvania. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Specimen Source: The test specimen(s) was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of four years from the test completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings on file with Intertek-ATI. Any deviations are documented herein or on the drawings.

3.0 Project Summary: (Continued)

3.9 List of Official Observers:

Name	Company
Rick Sawdey	MI Windows and Doors, LLC
Jeremy R. Bender	Intertek-ATI

4.0 Test Specification(s):

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 1.4 m^2 (15.0 ft^2)	**Width**		**Height**	
	millimeters	**inches**	**millimeters**	**inches**
Overall size	1524	60	914	36
Vent	1475	58-1/16	865	34-1/16

5.2 Frame Construction:

Frame Member	**Material**	**Description**
Head, sill, and jambs	PVC	Extruded, the interior cavity utilized an air cell foam insulation

	Joinery Type	**Detail**
All corners	Mitered	Thermoplastic weld

5.3 Vent Construction:

Vent Member	**Material**	**Description**
Rails and stiles	PVC	Extruded, the interior cavities utilized an air cell foam insulation

	Joinery Type	**Detail**
All corners	Mitered	Thermoplastic weld

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
0.270" high polypile with center fin	1 Row	All members of the vent
Foam filled vinyl bulb gasket	2 Rows	All members of the frame

5.5 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Silicone foam	1/8" annealed	1/8" annealed	Exterior glazed against foam glazing tape and secured with PVC snap-in glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Vent	1	1353 x 743	53-1/4 x 29-1/4	1/2"

5.6 Drainage: A step-down sill was utilized.

Drainage Method	Size	Quantity	Location
Weepslot with cover	1" wide by 1/8" high	2	Sash face 2-1/2" from the ends of bottom rail, draining glazing

5.7 Hardware:

Description	Quantity	Location
Hinges	2	Top of each jamb
Roto-Operator	1	Midspan of the sill
Lock	2	9" from the sill on each jamb
Snubbers with keepers	3	Top rail/head, 15-1/4" from the jambs and one midspan

5.8 Reinforcement: No reinforcement was utilized.

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the window was sealed with sealant.

Location	Anchor Description	Anchor Location
Head, sill, and jambs	#6 x 1-5/8" long screw	2" from the corners and spaced 8" to 10" on center, through the mounting fin into the wood buck

7.0 Test Results: The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 36 N (8 lbf) Maintain motion: 18 N (4 lbf) Locks: 13 N (3 lbf)	Report Only 45 N (10 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.2 L/s/m^2 (0.03 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	3
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Forced Entry Resistance, per ASTM F 588, Type: B - Grade: 10	Pass	No entry	7
Forced Entry Resistance, per CAWM 301, Type: II	Pass	No entry	7
Thermoplastic Corner Weld	Pass	Meets as stated	7
Awning, Hopper, Projected Hardware Load Test 70 N (15.7 lbf)	0.5 mm (0.02")	Report Only	

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 580 Pa (12.11 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 Deflections taken along bottom rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 2.8 mm (0.11") 11.7 mm (0.46")	 Report Only	 4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken along bottom rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	 0.8 mm (0.03") 1.5 mm (0.06")	 5.8 mm (0.23") max. 5.8 mm (0.23") max.	 5, 6

Note 1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

Note 2: With and without insect screen.

Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.

Note 5: Loads were held for 10 seconds.

Note 6: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 7: Reference Intertek-ATI Report No. B2714.02-301-47, dated 03/05/13 *for complete Gateway test specimen description and test results.*

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

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 Intertek-ATI.

For ARCHITECTURAL TESTING, Inc.

Digitally Signed by: Jeremy R. Bender

Jeremy R. Bender
Senior Technician

Digitally Signed by: Michael D. Stremmel

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

JRB:asm

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Alteration Addendum (1)
Appendix-B: Location of Air Seal (1)
Appendix-C: Complete drawings packet on file with Intertek-ATI.

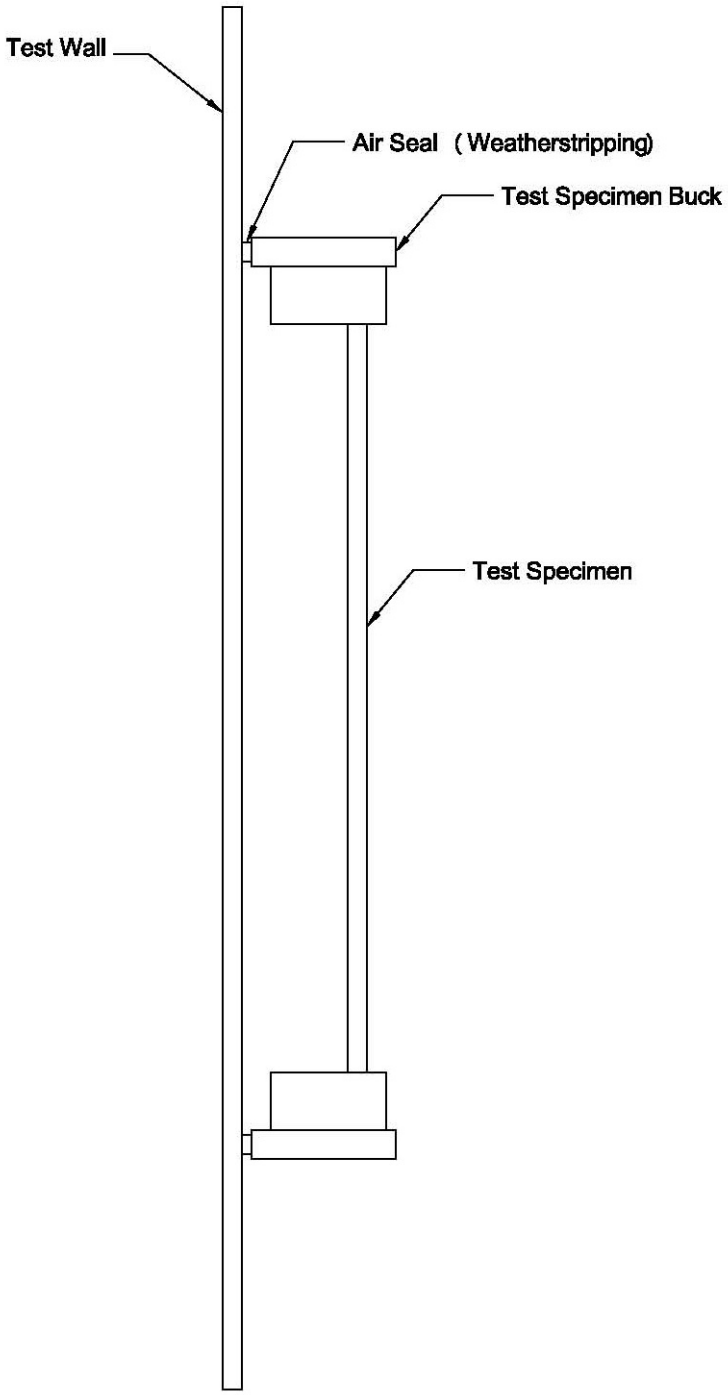
Appendix A

Alteration Addendum

***Note**: No alterations were required.*

Appendix B

Location of Air Seal: The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.



Appendix C

Drawing(s)

***Note**: Complete drawings packet on file with Intertek-ATI.*