



TEST REPORT

Report No.: E8452.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Casement Window
SERIES/MODEL: EC147

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-PG50 914 x 1829* (36 x 72*)-C
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration	0.56 L/s/m ² (0.11 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)

Test Completion Date: 06/17/15

Reference must be made to Report No. E8452.01-109-47, dated 07/15/15 for complete test specimen description and detailed test results. Reference Intertek-ATI Report No. B2429.02-301-47, dated 03/15/13 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) Casement Window

3.2 Series/Model: EC147

3.2.1 This product also labeled under the following names: EC148, EC149, HM147, MH148, HM149, BB147, BB148, and BB149

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-PG50 914 x 1829* (36 x 72*)-C** rating. Reference Intertek-ATI Report No. B2429.02-301-47, dated 03/15/13 for complete *Gateway* test specimen description and test results.

General Note: *An asterisk (*) next to the size designation indicates that the size tested for optional performance was smaller than the Gateway test size for the product type and class.*

3.4 Test Dates: 06/03/15 - 06/17/15

3.5 Test Record Retention End Date: All test records for this report will be retained until June 17, 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:

<u>Name</u>	<u>Company</u>
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: 1.7 m ² (18.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	914	36	1829	72
Vent	870	34-1/4	1784	70-1/4

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jambs	PVC	Extruded. One internal hollow was filled with Aircell foam.

	Joinery Type	Detail
All corners	Mitered	Thermoplastic weld

5.3 Vent Construction:

Vent Member	Material	Description
Rails and stiles	PVC	Extruded. One internal hollow was filled with Aircell foam.

	Joinery Type	Detail
All corners	Mitered	Thermoplastic weld

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
Foam-filled bulb gasket	2 Rows	All members of the frame
0.187" backed by 0.290" high polypile with center fin	1 Row	All members of the vent

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	Metal-reinforced butyl	1/8" annealed	1/8" annealed	Exterior glazed onto foam glazing tape and secured with PVC snap-in glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Vent daylight opening	1	762 x 1657	30 x 65-1/4	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weepslot with cover	1" wide by 1/8" high	2	Sash face, 2" from the bottom rail ends
Weepslot	1/2" wide by 1/8" high	2	Under glazing, 2" from each jamb at the sill

5.7 Hardware:

Description	Quantity	Location
Dual arm roto operator	1	9-1/2" from the hinge jamb
Friction hinges	2	Located at the head and sill at the hinge jamb
Snubbers with keepers	5	7", 21-1/4", 35-1/4", 49-1/4", and 63-1/4" from the sill on the hinge jamb
Multi point lock and handle assembly	1	Lock jamb with handle located 9" from the sill with four lock points located 3", 22-1/2", 42", and 61-1/2" from the sill

5.0 Test Specimen Description: (Continued)

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 (10.1 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.56 L/s/m ² (0.11 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: 20	Pass	No entry	7
Forced Entry Resistance, per CAWM, Type: II	Pass	No entry	7
Thermoplastic Corner Weld	Pass	Meets as stated	7
Sash Vertical Deflection 270 N (60.7 lbf)	1.3 mm (0.05")	14.8 mm (0.58") max.	7
Distributed Load 300 Pa (6.27 psf)	Pass	No damage	7

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 between locks +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf)	<0.3 mm (<0.01") 1.3 mm (0.05")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken between locks +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf)	<0.3 mm (<0.01") 0.3 mm (0.01")	0.0 mm (0.00") max. 0.0 mm (0.00") 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. B2429.02-301-47, 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.

Jeremy R. Bender
Senior Technician

Timothy J. McGill
Manager – Product Testing

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)

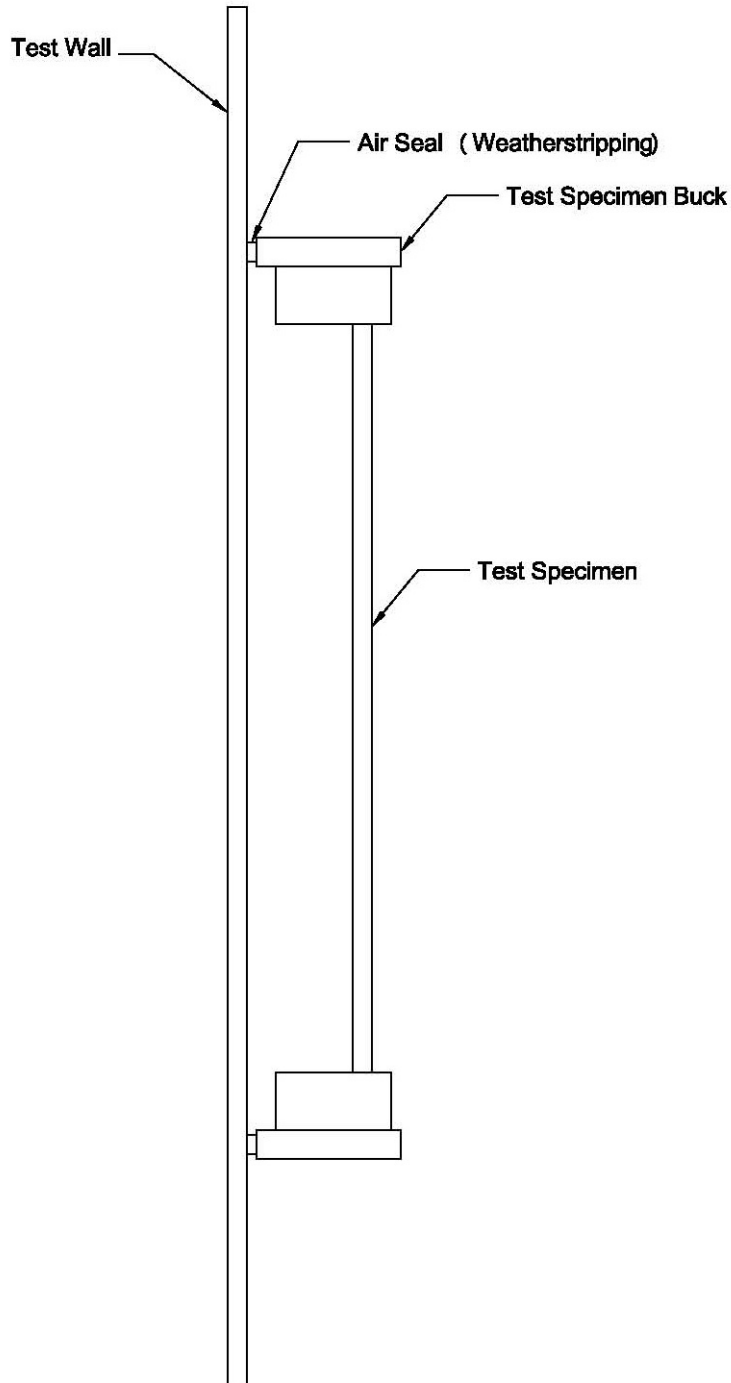
Appendix-C: Complete drawings packet on file with Intertek-ATI.

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.*