Architectural Testing

TEST REPORT

Report No.: C6950.01-301-47

Rendered to:

MI WINDOWS AND DOORS, LLC.
Prescott Valley, Arizona

PRODUCT TYPE: Polyvinyl Chloride (PVC) Casement over Fixed Window
SERIES/MODEL: EC 147 XP

SPECIFICATIONS: AAMA/WDMA/CSA 101/I.S.2/A440-05, *Standard/Specification for Windows, Doors, and Unit Skylights.*

CAWM 301, *Forced Entry Resistance Test for Windows.*

Title	Summary of Results
Primary Product Designator	C-C40 1066 x 2281 (42 x 90)
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration	0.10 L/s/m^2 (0.02 cfm/ft^2)
Water Penetration Resistance Test Pressure	330 Pa (6.89 psf)

Test Completion Date: 04/18/2013

Reference must be made to Report No. C6950.01-301-47 dated 06/25/13 for complete test specimen description and detailed test results.

A·L·I

(Validator / Operations Administrator)

AAMA
CERTIFICATION PROGRAM

AUTHORIZATION FOR PRODUCT CERTIFICATION

MI Windows & Doors, LLC
P.O. Box 370
Gratz, PA 17030-0370

Attn: Rick Sawdey

The product described below is hereby approved for listing in the next issue of the AAMA Certified Products Directory. The approval is based on successful completion of tests, and the reporting to the Administrator of the results of tests, accompanied by related drawings, by an AAMA Accredited Laboratory.

1. The listing below will be added to the next published AAMA Certified Products Directory.

SPECIFICATION	RECORD OF PRODUCT TESTED			
AAMA/WDMA/CSA 101/I.S.2/A440-08 LC-PG40-1066x1676 (42x66)-C				
COMPANY AND CODE	**CPD NO.**	**SERIES MODEL & PRODUCT DESCRIPTION**	**MAXIMUM SIZE TESTED**	
MI Windows & Doors, LLC Code: MTL	**13700**	**EC147 CASEMENT (FIN) (PVC)(X)(OG)(INS GL) (MODIF)(REINF)(ASTM) (CMBSO)**	**FRAME 1066 mm x 1676 mm (3'6" x 5'6")**	**VENT 1017 mm x 1627 mm (3'4" x 5'4")**

2. This Certification will expire **April 18, 2017** and requires validation until then by continued listing in the current AAMA Certified Products Directory.

3. Product Tested and Reported by: **Architectural Testing, Inc.**

Report No.: **C6950.01-301-47**

Date of Report: **June 25, 2013**

Validated for Certification

Associated Laboratories, Inc.

Date: **February 12, 2015**

Authorized for Certification

American Architectural Manufacturers Association

Cc: AAMA
JGS
ACP-04 (Rev. 1/11)

1.0 Report Issued To: MI Windows and Doors, LLC.
7555 East State Route 69
Prescott Valley, Arizona 86314

2.0 Test Laboratory: Architectural Testing, Inc.
2524 East Jensen Avenue
Fresno, California 93706
(559) 233 - 8705

3.0 Project Summary:

3.1 Product Type: Polyvinyl Chloride (PVC) Casement over Fixed Window

3.2 Series/Model: EC 147 XP

This product also labeled under the following names:

EC147(X,O)	HM147(X,O)	BB147(X,O)
EC148(X,O)	HM148(X,O)	BB148(X,O)
EC149(X,O)	HM149(X,O)	BB149(X,O)
EC140(O)	HM140(O)	BB140(O)
EC142(O)	HM142(O)	BB142(O)
EC145(O)	HM145(O)	BB145(O)

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test methods. The specimen tested successfully met the performance requirements for a **C-C40 1066 x 2281 (42 x 90)** rating.

3.4 Test Dates: 03/13/2013 - 04/18/2013

3.5 Test Record Retention End Date: All test records for this report will be retained until June 25, 2017.

3.6 Test Location: Architectural Testing, Inc. test facility in Fresno, California and MI Windows and Doors, LLC. test facility in Prescott Valley, Arizona. Calibration of test equipment was performed by Architectural Testing in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

3.0 Project Summary: (Continued)

3.9 List of Official Observers:

Name	Company
Jim Liapple	MI Windows and Doors, LLC.
Mike Maystadt	MI Windows and Doors, LLC.
David Douglass	Architectural Testing, Inc.
Jarod Hardman	Architectural Testing, Inc.
Jeffrey Osugi	Architectural Testing, Inc.

4.0 Test Specifications:

AAMA/WDMA/CSA 101/I.S.2/A440-05, *Standard/Specification for Windows, Doors, and Unit Skylights.*

CAWM 301, *Forced Entry Resistance Test for Windows.*

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 2.43 m^2 (26.17 ft^2)	**Width**		**Height**	
	millimeters	**inches**	**millimeters**	**inches**
Overall size	1066	41-15/16	2281	89-3/4
Vent	1017	40-1/16	1627	64-1/16
Fixed panel	1016	40	585	23-1/16

5.2 Frame Construction:

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

	Joinery Type	Detail
Head, sill and jambs	Mitered	Fully welded.
Horizontal impost	Coped	Secured through the frame with three #8 x 2" Phillips pan head screws with washers and rubber gaskets. The horizontal impost was sealed to the frame.

5.0 Test Specimen Description: (Continued)

5.3 Vent/Panel Construction:

Vent/Panel Member	Material	Description
Top rail, bottom rail and each stile	PVC	Two internal hollows were filled with Aircell foam.

	Joinery Type	Detail
All corners	Mitered	Fully welded. The fixed panel was secured to the frame using #8 x 2" Phillips pan head screws. The screws were located 1 – 3" from each corner and 8 – 9" on center. The clearance hole was capped. The corners were sealed to the frame. Setting block was located at each screw and secured with one #6 x 3/4" Phillips flat head self-drilling screws.

5.4 Weatherstripping:

Description	Quantity	Location
Wrapped foam gasket	2 Rows	All members of frame.
Wrapped foam gasket	4 Rows	Horizontal mullion.
0.290" high polypile	1 Row	All members of vent and panel.

5.0 Test Specimen Description: (Continued)

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	The vent was exterior glazed onto a 3/8" wide x 1/16" high glazing tape and secured with a snap in PVC glazing bead. The corners of the glazing tape were sealed.
3/4" IG	U shaped coated steel	1/8" Annealed	1/8" Annealed	The fixed panel was exterior glazed onto a 3/8" wide x 1/16" high glazing tape and secured with a snap in PVC glazing bead. The corners of the glazing tape were sealed.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Vent	1	894 x 1504	35-3/16 x 59-3/16	1/2"
Fixed panel	1	893 x 462	35-3/16 x 18-3/16	1/2"

5.6 Drainage: No drainage was utilized.

Drainage Method	Size	Quantity	Location
Weephole with cover	1" x 1/4" (13/16" x 1/8")	4	1-7/8" from each end on bottom rail of vent and panel.
Weephole	1/2" x 1/8" oval	4	2-1/2" from each end on bottom rail of vent and panel through glazing track.
Weep notch	1/2" x 1/8"	4	2-1/2" from each end on bottom rail glazing beads.

5.0 Test Specimen Description: (Continued)

5.7 Hardware: No hardware was utilized.

Description	Quantity	Location
Hinges	2	Located at jamb of head and horizontal impost with four #6 x 1/2" Phillips flat head screws and to the vent with four #8 x 3/4" Phillips flat head screws.
Roto operator	1	10-1/2" from hinge jamb secured to horizontal impost with six #8 x 1" Phillips flat head screws. Secured to vent with three #6 x 3/4" Phillips flat head self-drilling screws, one was into reinforcement, three #8 x 1" Phillips flat head screws into reinforcement and one #6 x 5/8" Phillips flat head screw.
Three point lock	1	The handle assembly was located 33-1/4" from the bottom rail and secured through the jamb and backing plate with two 10-24 x 1/2" Phillips pan head screws. One plastic lock retainer was employed at each locking point and secured with two #8 x 1" Phillips flat head screws.
Keeper	3	3-1/4" and 31" from bottom rail. 6" from top rail secured with three #8 x 1" Phillips flat head screws.
Snubbers	10	3-3/4", 17-3/4" from each end and midspan secured the vent with two #6 x 5/8" Phillips flat head screws into reinforcement. Opposite on frame secured with two #6 x 5/8" Phillips flat head screws.

5.8 Reinforcement: No reinforcement was utilized.

Drawing Number	Location	Material
M-9263	Vent stiles	Extruded aluminum
SECT8207	7" long at bottom rail of vent	Extruded aluminum

5.0 Test Specimen Description: (Continued)

5.9 Screen Construction: No screen 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 silicone.

Location	Anchor Description	Anchor Location
Head, sill and jambs	1-5/8" drywall screws	8" on center through the mounting fin

7.0 Test Results: The temperature during testing was 18 - 26°C (65 - 78°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 31 N (7.0 lbf) Maintain motion: 31 N (7.0 lbf) Locks: 47 N (10.5 lbf)	Report Only. 45 N (10.1 lbf) max. 100 N (22.5lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.10 L/s/m² (0.02 cfm/ft²)	1.5 L/s/m² (0.3 cfm/ft²) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	2
Uniform Load Deflection, per ASTM E 330 taken at top rail of vent +1440 Pa (+30.08 psf) -1440 Pa (-30.08 psf)	 2.5 mm (0.10") 11.5 mm (0.45")	 Report Only	 3, 4, 5
Uniform Load Deflection, per ASTM E 330 taken at horizontal impost +1440 Pa (+30.08 psf) -1440 Pa (-30.08 psf)	 4.5 mm (0.18") 5.5 mm (0.22")	 Report Only	 3, 4, 5

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Uniform Load Structural, per ASTM E 330 taken at top rail of vent +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	 0.0 mm (0.00") 0.0 mm (0.00")	 3.1 mm (0.12") max.	 4, 5
Uniform Load Structural, per ASTM E 330 taken at horizontal impost +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	 0.0 mm (0.00") 0.3 mm (0.01")	 3.1 mm (0.12") max.	 4, 5
Forced Entry Resistance, per ASTM F 588, Type: B / D - Grade: 10	Pass	No entry	
Forced Entry Resistance, per CAWM 301, Type: II / V	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	
Sash Vertical Deflection 270 N (60.7 lbf)	2.3 mm (0.09")	20.3 mm (0.80") max.	
Distributed Load 300 Pa (6.27 psf)	Pass	No damage	
Optional Performance			
Water Penetration, per ASTM E 547 at 330 Pa (6.89 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E 330 taken at top rail of vent +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	 3.0 mm (0.12") 18.0 mm (0.71")	 Report Only	 3, 4, 5
Uniform Load Deflection, per ASTM E 330 taken at horizontal impost +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	 6.3 mm (0.25") 7.8 mm (0.31")	 Report Only	 3, 4, 5

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Uniform Load Structural, per ASTM E 330 taken at top rail of vent +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	 0.0 mm (0.00") 0.3 mm (0.01")	 3.1 mm (0.12") max.	 4, 5
Uniform Load Structural, per ASTM E 330 taken at horizontal impost +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	 0.0 mm (0.00") 0.3 mm (0.01")	 3.1 mm (0.12") max.	 4, 5

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

Note 3: 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 4: Loads were held for 10 seconds.

Note 5: 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.

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

For ARCHITECTURAL TESTING, Inc.

David Douglass/ m.s.

Digitally Signed for: David Douglass by Marisela Saavedra

David Douglass
Project Manager

Digitally Signed by:Leaton Kirk

Leaton Kirk
Director - Regional Operations

JO: ms

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Alteration Addendum (1)
Appendix-B: Drawings (11) Complete drawings packet on file with Architectural Testing, Inc.

Appendix A

Alteration Addendum

Alteration #1: Date – 03/13/13
Cause for alteration – Failed water penetration test.
Remedial action taken – Re-glazed. Installed 13" long hinge track.

Alteration #2: Date – 03/15/13
Cause for alteration - Failed water penetration test.
Remedial action taken – Sealed horizontal impost to frame.

Alteration #3: Date – 03/15/13
Cause for alteration – Failed structural load test.
Remedial action taken – Re-glazed.

Appendix B

Drawings

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