

TEST REPORT

Report No.: C3776.01-301-47

Rendered to:

MI WINDOWS AND DOORS, INC.
Prescott Valley, Arizona

PRODUCT TYPE: Polyvinyl Chloride (PVC) Single Hung Window
SERIES/MODEL: Homemaker III 150

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	
	Test Specimen #1	Test Specimen #2
Primary Product Designator	H-R30 1218 x 2437 (48 x 96)	H-R45 911 x 1548 (36 x 61)
Design Pressure	±1440 Pa (±30.08 psf)	±2160 Pa (±45.11 psf)
Air Infiltration	0.30 L/s/m ² (0.06 cfm/ft ²)	
Water Penetration Resistance Test Pressure	220 Pa (4.59 psf)	330 Pa (6.89 psf)

Test Completion Date: 12/17/2012

Reference must be made to Report No. C3776.01-301-47 dated 01/23/13 for complete test specimen description and detailed test results.

1.0 Report Issued To: MI Windows and Doors, Inc.
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) Single Hung Window

3.2 Series/Model: Homemaker III 150

This product also labeled under the following names: BB 150 and EC 150

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimens tested successfully met the performance requirements for the following ratings: Test Specimen #1: **H-R30 1218 x 2437 (48 x 96)**; Test Specimen #2: **H-R45 911 x 1548 (36 x 61)**.

3.4 Test Dates: 11/06/2012 - 12/17/2012

3.5 Test Record Retention End Date: All test records for this report will be retained until December 17, 2016.

3.6 Test Location: MI Windows and Doors, Inc. 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 specimens were provided by the client. Representative samples of the test specimens 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 specimens 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.

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Mike Maystadt	MI Windows and Doors, Inc.
Jim Liapple	MI Windows and Doors, Inc.
David Douglass	Architectural Testing, Inc.
Jeffrey Osugi	Architectural Testing, Inc.

4.0 Test Specification(s):

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:

Test Specimen #1:

Overall Area: 2.97 m ² (32.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1218	47-15/16	2437	96
Interior sash	1146	45-1/8	910	35-13/16
Screen	1144	45-1/16	856	33-11/16

Test Specimen #2:

Overall Area: 1.41 m ² (15.2 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	911	35-7/8	1548	60-15/16
Interior sash	842	33-1/8	769	30-1/4
Screen	840	33-1/16	715	28-1/8

The following descriptions apply to all specimens except where noted.

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill and jambs	PVC	
Exterior meeting rail	PVC	
Stucco key	PVC	Test Specimen #1 only.
Sash stop	PVC	24-3/4" long snap fit to jambs.

	Joinery Type	Detail
Head, sill and jambs	Mitered	Fully welded.
Exterior meeting rail	Coped	Secured at each end through the frame with two #8 x 3" Phillips pan head screws with washers and rubber gaskets.

5.3 Sash Construction:

Sash Member	Material	Description
Top rail, bottom rail and each stile	PVC	The interlock was notched 1-1/4" from each end and 2" for the lock. A 0.070" lip was utilized at the lock.

	Joinery Type	Detail
All corners	Mitered	Fully welded.

5.4 Weatherstripping:

Description	Quantity	Location
Wrapped hollow foam bulb gasket	1 Row	Exterior meeting rail.
0.260" high polypile with triple center fin	1 Row	All members of frame. Bottom rail and each stile of interior sash.
0.450" high polypile with center fin	1 Row	Interior meeting stile.

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.*

Test Specimen #1:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	U shaped coated steel	1/8" Annealed	1/8" Annealed	Exterior glazed onto a 3/8" wide x 1/16" high glazed tape and secured with a snap in PVC glazing bead. The corners of the glazing tape were sealed.

Test Specimen #1:

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed lite	1	1110 x 1443	43-11/16 x 56-13/16	5/8 - 1/2"
Interior sash	1	1058 x 822	41-5/8 x 32-3/8	1/2"

Test Specimen #2:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	U shaped coated steel	3/32" Annealed	3/32" Annealed	Exterior glazed onto a 3/8" wide x 1/16" high glazed tape and secured with a snap in PVC glazing bead. The corners of the glazing tape were sealed.

Test Specimen #2:

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed lite	1	805 x 688	31-11/16 x 27-1/16	5/8 - 1/2"
Interior sash	1	752 x 681	29-5/8 x 26-13/16	5/8 - 1/2"

5.0 Test Specimen Description: (Continued)

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole with cover	1-5/8" x 5/16" (1-1/16" x 3/16" effective)	2	2-7/8" from each end through exterior sill face.
Weephole	1" x 3/16" oval	2	1-1/2" from each end through center sill leg.
Weephole	1-3/8" x 1/4"	2	Each end through first layer of internal webbing.
Weephole	1/2" x 1/8" oval	4	1/4" from each end through bottom rail. 2-5/8" from each end on bottom rail through snap in glazing bead track.
Weep notch	3/4" x 1/8"	2	2-1/2" from each end through exterior meeting stile glazing bead.

5.7 Hardware:

Description	Quantity	Location
Cam lock	1	Mid-span on interior meeting rail secured with two #6 x 1" Phillips flat head self-drilling screws into reinforcement.
Keeper	1	Mid-span on exterior meeting rail secured with two #6 x 1" Phillips flat head self-drilling screws into reinforcement.
Block and tackle balance	2	Each jamb.
Balance shoe	2	Top of each stile secured with two #8 x 1/2" Phillips pan head screws.

5.8 Reinforcement:

Drawing Number	Location	Material
M-9265	Exterior meeting rail	Extruded aluminum
M-9264	Interior meeting rail	Extruded aluminum

5.0 Test Specimen Description: (Continued)

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Roll formed aluminum	Square cut with corner key	Fiberglass	Hollow spline

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/4 – 1/2" 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	3" from each corner and 6-1/2 – 9" on center through the mounting fin.

7.0 Test Results: The temperature during testing was 18 - 23°C (64 - 74°F). The results are tabulated as follows:

Test Specimen #1:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 79 N (17.8 lbf) Maintain motion: 144 N (32.3 lbf) Locks: 9 N (2.0 lbf)	Report Only 155 N (34.8 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.30 L/s/m ² (0.06 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 taken at exterior meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	7.6 mm (0.30") 7.6 mm (0.30")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at exterior meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	0.3 mm (0.01") 0.5 mm (0.02")	4.5 mm (0.18") max.	5, 6
Forced Entry Resistance, per ASTM F 58, Type: A - Grade: 10	Pass	No entry	
Forced Entry Resistance, per CAWM 301, Type: I	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	

7.0 Test Results: (Continued)

Test Specimen #1: (Continued)

Title of Test	Results	Allowed	Note
Deglazing, per ASTM E 987 Operating direction, 320 N (71.9 lbf) Remaining direction, 230 N (51.7 lbf)	Pass	Meets as stated	
	Pass	Meets as stated	
Optional Performance			
Water Penetration, per ASTM E 547 at 220 Pa (4.59 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E 330 taken at exterior meeting rail +1440 Pa (+30.08 psf) -1440 Pa (-30.08 psf)	8.8 mm (0.35") 8.8 mm (0.35")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at exterior meeting rail +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	0.5 mm (0.02") 0.5 mm (0.02")	4.5 mm (0.18") max.	5, 6

Test Specimen #2:

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 330 Pa (6.89 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken at exterior meeting rail +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	4.0 mm (0.16") 2.8 mm (0.11")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at exterior meeting rail +3240 Pa (+67.67 psf) -3240 Pa (-67.67 psf)	0.3 mm (0.01") 0.3 mm (0.01")	3.3 mm (0.13") max.	5, 6

7.0 Test Results: (Continued)

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.

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
Project Manager

Kenny C. White
Laboratory Manager

JO: ms

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Drawings (15) Complete drawings packet on file with Architectural Testing, Inc.

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
1	1/9/13	Cover, 1	Revised Test Specimen #2 rating from LC 30 to LC 45.
2	1/23/13	Cover, 1	Revised rating from LC to R class.



Test Report No.: C3776.01-301-47
Report Date: 12/31/12
Revision 2 Date: 01/23/13
Record Retention End Date: 12/17/16

Appendix A

Alteration Addendum

Alteration #1: Date - 11/06/12
Cause for alteration - Failed operating force.
Remedial action taken - Replaced balances with Caldwell 32-9 balances.



Test Report No.: C3776.01-301-47
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Appendix B

Drawings

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