



TEST REPORT

Report No.: F4617.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Picture Window
SERIES/MODEL: HM155

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 | |
|--|--|--|
| | Test Specimen #1 | Test Specimen #2 |
| AAMA/WDMA/CSA 101/I.S.2/A440-08 | Class LC-PG50 2438 x 1829 (96 x 72)-FW | Class LC-PG50 2438 x 1829 (96 x 72)-FW |
| Design Pressure | ±2400 Pa (±50.13 psf) | ±2400 Pa (±50.13 psf) |
| Air Infiltration | 0.2 L/s/m ² (0.03 cfm/ft ²) | 0.2 L/s/m ² (0.04 cfm/ft ²) |
| Water Penetration Resistance Test Pressure | 360 Pa (7.52 psf) | 360 Pa (7.52 psf) |

Test Completion Date: 03/25/16

Reference must be made to Report No. F4617.01-109-47, dated 04/15/16 for complete test specimen description and detailed test results.

1.0 Report Issued To: MI Windows and Doors, LLC
650 West Market Street
P.O. Box 370
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) Picture Window

3.2 Series/Model: HM155

3.2.1 This product also labeled under the following names: EC155, EC170, and HM170

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(s) | Title | Summary of Results |
|------------------|-------------------|--|
| 1 (Fin) | 101/I.S.2/A440-08 | Class LC-PG50 2438 x 1829 (96 x 72)-FW |
| 2 (Finless) | 101/I.S.2/A440-08 | Class LC-PG50 2438 x 1829 (96 x 72)-FW |

3.4 Test Dates: 01/12/16 - 03/25/16

3.5 Test Record Retention End Date: All test records for this report will be retained until March 25, 2020.

3.6 Test Location: MI Windows and Doors 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 specimens were 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> |
|-----------------|---------------------------|
| Richie Williard | MI Windows and Doors, LLC |
| Joel Chronister | 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:

Test Specimens #1 and #2:

| Overall Area: 4.6 m ² (48.0 ft ²) | Width | | Height | |
|---|-------------|--------|-------------|--------|
| | millimeters | inches | millimeters | inches |
| Overall size | 2438 | 96 | 1829 | 72 |

The following descriptions apply to all specimens.

5.2 Frame Construction:

| Frame Member | Material | Description |
|-----------------------|----------|---|
| Head, sill, and jambs | PVC | Extruded, two hollows were filled with aircell foam filling |
| Track filler | PVC | Extruded, snap fit to the interior track of the head, sill, and jambs |

| | Joinery Type | Detail |
|-------------|--------------|------------------|
| All corners | Mitered | Thermally welded |

5.3 Weatherstripping: No weatherstripping was utilized.

5.0 Test Specimen Description: (Continued)

5.4 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 | Polycarbonate butyl composite | 3/16" tempered | 3/16" tempered | Exterior glazed onto a bed of sealant and secured with PVC snap-in glazing beads |

| Location | Quantity | Daylight Opening | | Glass Bite |
|------------------------|----------|------------------|-----------------|------------|
| | | millimeters | inches | |
| Fixed daylight opening | 1 | 2330 x 1721 | 91-3/4 x 67-3/4 | 1/2" |

5.5 Drainage:

| Drainage Method | Size | Quantity | Location |
|---------------------|---------------------|----------|--|
| Weephole with cover | 1-1/4" by 1/4" oval | 2 | 3-3/4" from each end, through the exterior sill face |
| Weephole | 5/8" by 1/8" oval | 2 | 3" from each end, through the glazing track |
| Weephole | 3/8" by 3/16" oval | 2 | 1/8" from each end, through the first horizontal layer of internal webbing |

5.6 Hardware: No hardware was utilized.

5.7 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.

Test Specimen #1:

| Location | Anchor Description | Anchor Location |
|-----------------------|----------------------------|--|
| Head, sill, and jambs | #6 x 1-5/8" drywall screws | Located 3" from the corners and spaced 8" to 10" on center, through the mounting fin, and into the wood buck |

Test Specimen #2:

| Location | Anchor Description | Anchor Location |
|----------|------------------------|--|
| Head | #8 x 2" pan head screw | Located 4" from the corner and spaced 24" on center through the frame |
| Jambs | #8 x 2" pan head screw | Located 3-1/2" from the corner and spaced 24" on center through the frame |
| Sill | #8 x 2" pan head screw | Located 24" from the corners and spaced 24" on center, through the accessory clip, and into the buck |

7.0 Test Results: The temperature during testing was 19°C (67°F). The results are tabulated as follows:

Test Specimen #1: Fin

| Title of Test | Results | Allowed | Note |
|---|---|---|------|
| 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 at 360 Pa (7.52 psf) | Pass | No leakage | |
| Uniform Load Deflection, per ASTM E 330 Deflections taken at sill +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf) | 1.8 mm (0.07") 3.0 mm (0.12") | Report only | 2, 3 |
| Uniform Load Structural, per ASTM E 330 Permanent sets taken at sill +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf) | 0.3 mm (0.01") 1.0 mm (0.04") | 7.1 mm (0.28") max. 7.1 mm (0.28") max. | 2, 3 |
| Forced Entry Resistance, per ASTM F 588 , Type: A - Grade: 10 | Pass | No entry | |
| Thermoplastic Corner Weld | Pass | Meets as stated | |

7.0 Test Results: (Continued)**Test Specimen #2:** Finless

| Title of Test | Results | Allowed | Note |
|---|---|---|------|
| Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf) | 0.2 L/s/m ² (0.04 cfm/ft ²) | 1.5 L/s/m ² (0.3 cfm/ft ²) max. | 1 |
| Water Penetration, per ASTM E 547 at 360 Pa (7.52 psf) | Pass | No leakage | |
| Uniform Load Deflection, per ASTM E 330 Deflections taken at sill +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf) | 0.5 mm (0.02") <0.3 mm (<0.01") | Report only | 2, 3 |
| Uniform Load Structural, per ASTM E 330 Permanent sets taken at sill +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf) | 0.3 mm (0.01") 1.5 mm (0.06") | 7.1 mm (0.28") max. 7.1 mm (0.28") max | 2, 3 |
| Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10 | Pass | No entry | |
| Thermoplastic Corner Weld | Pass | Meets as stated | |

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 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 3: Loads were held for 10 seconds.

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.

Joel Chronister
Technician

Timothy J. McGill
Manager - Product Testing

JC: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.

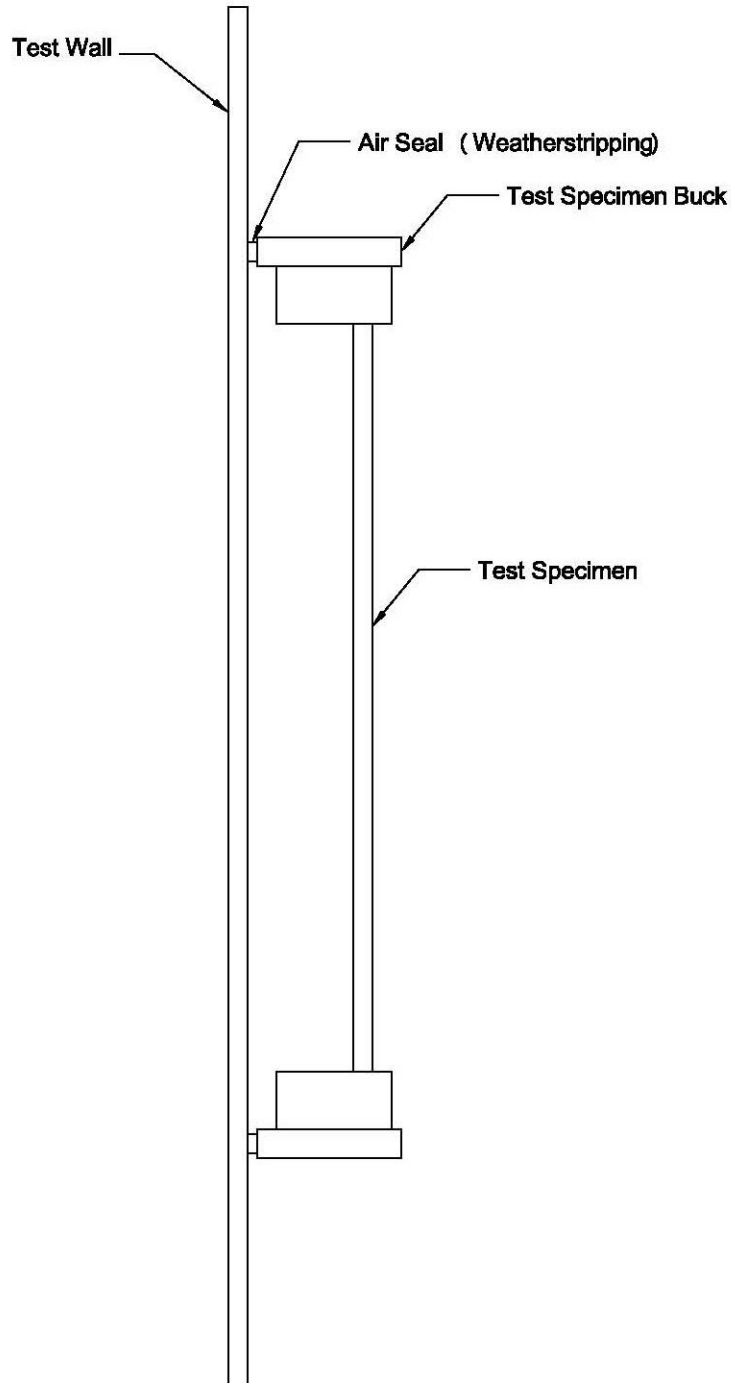
Appendix A

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.