



TEST REPORT

Report No.: A5183.01-109-47

Rendered to:

MI Windows and Doors, Inc.
Gratz, Pennsylvania

PRODUCT TYPE: Single Hung Window
SERIES/MODEL: 3500 (Fin)

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

| Title | Summary of Results |
|--|---|
| Primary Product Designator | Class R-PG35 914 x 1524* (36 x 60*)-H |
| Design Pressure | +1690 Pa (+35.30 psf) |
| Negative Design Pressure | -2260 Pa (-47.20 psf) |
| Air Infiltration | 0.8 L/s/m ² (0.16 cfm/ft ²)* |
| Water Penetration Resistance Test Pressure | 260 Pa (5.43 psf)* |

Test Completion Date: 11/03/2010

Reference must be made to Report No. A5183.01-109-47, dated 12/08/10 for complete test specimen description and detailed test results. Reference Intertek-ATI Report No. A2498.01-109-47, dated 08/30/10 for complete *Gateway* test specimen description and air infiltration and water penetration test results.

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

3.2 Series/Model: 3500 (Fin)

3.2.1 This product also labeled under the following names: 1255 and 3250

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 R-PG35 914 x 1524* (36 x 60*)-H** rating. Reference Intertek-ATI Report No. A2498.01-109-47, dated 08/30/10 for complete *Gateway test specimen description and air infiltration and water penetration 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: 11/03/2010

3.5 Test Location: MI Windows and Doors, Inc. 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".

3.6 Test Sample Source: The test specimen 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.

3.7 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:

3.8 List of Official Observers:

| <u>Name</u> | <u>Company</u> |
|------------------|----------------------------|
| Rick Sawdey | MI Windows and Doors, Inc. |
| Russell W. Clark | 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 | 914 | 36 | 1524 | 60 |
| Interior sash | 865 | 34-1/16 | 746 | 29-3/8 |

5.2 Frame Construction:

| Frame Member | Material | Description |
|----------------------|----------|---|
| Head, sill, jambs | PVC | Extruded |
| Fixed meeting rail | PVC | Extruded |
| Snap-in sill adaptor | PVC | Extruded, sealed to the sill with adhesive tape with silicone at each end |

| | Joinery Type | Detail |
|--------------------|--------------------|--|
| All corners | Mitered and welded | Thermally welded |
| Fixed meeting rail | Coped and butted | Rail ends were secured to jambs with a plastic end clip secured to the fixed meeting rail with three #6 x 1-1/8" long machine screws and secured to the jambs with three #6 x 5/8" long machine screws |

5.0 Test Specimen Description: (Continued)

5.3 Sash Construction:

| Sash Member | Species/Material/ Alloy | Other |
|------------------|----------------------------|----------|
| Rails and stiles | PVC | Extruded |

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

5.4 Weatherstripping:

| Description | Quantity | Location |
|---|----------|---|
| 5/16" diameter offset foam-filled vinyl bulb with fin | 1 Row | Bottom rail |
| 5/32" diameter offset foam-filled vinyl bulb | 1 Row | Fixed meeting rail |
| 0.187" backed by 0.310" high polypile with center fin | 1 Row | Sash stiles |
| 0.187" backed by 0.240" high polypile with center fin | 1 Row | Sash stiles, interior meeting rail and interior vertical sill leg |

5.5 Glazing:

| Glass Type | Spacer Type | Interior Lite | Exterior Lite | Glazing Method |
|------------|---------------------------|----------------------|----------------------|--|
| 3/4" IG | Aluminum reinforced butyl | 3/32" clear annealed | 3/32" clear annealed | Sash was interior glazed onto a bead of silicone and secured with PBC snap-in glazing beads; the fixed lite was interior glazed onto single-sided adhesive glazing tape and secured with PVC snap-in glazing beads |

| Location | Quantity | Daylight Opening | Glass Bite |
|---------------|----------|--------------------|------------|
| Interior sash | 1 | 31-1/4" x 26-1/2" | 1/2" |
| Fixed lite | 1 | 32-1/16" x 26-1/2" | 1/2" |

5.0 Test Specimen Description: (Continued)

5.6 Drainage: A sloped sill was utilized.

| Drainage Method | Size | Quantity | Location |
|-----------------|--------------------------|----------|---|
| Weepslot | 1/8" wide by 1" long | 2 | Sill face; 3" from each end |
| Weepslot | 1/16" wide by 1/2" long | 4 | Bottom rail, two at 2-1/2" from each end |
| Weepslot | 3/16" wide by 1/2" long | 2 | Glazing channel, 1" from each end |
| Weepslot | 3/16" wide by 3/4" long | 2 | Interior sill hollow at ends draining to the intermediate sill hollow |
| Weepslot | 3/16" wide by 3/4" long | 2 | Intermediate sill hollow at ends draining to the exterior sill hollow |
| Weepslot | 3/16" wide by 1/2" long | 2 | Screen track, 2-1/8" from each end |
| Weep notch | 1/8" high by 1-1/2" long | 2 | Exterior screen track leg at each end |
| Weep notch | 3/16" high by 3/8" long | 2 | Interior screen track leg at each end |

5.7 Hardware:

| Description | Quantity | Location |
|------------------------------|----------|--|
| Metal sweep lock with keeper | 2 | Interior sash meeting rail, 7" from each end |
| Coil balance assembly | 2 | One per jamb |
| Recessed vinyl tilt latches | 2 | Interior sash meeting rail at each end |
| Metal pivot bars | 2 | Bottom rail at each end |

5.8 Reinforcement:

| Drawing Number | Location | Material |
|----------------|--------------------|-------------------|
| GVL-451-020 | Sash rails | Roll-formed steel |
| RF-104S-020 | Fixed meeting rail | Roll-formed steel |

5.0 Test Specimen Description: (Continued)

5.9 Screen Construction:

| Frame Material | Corner Construction | Mesh Attachment Method |
|----------------------|---|------------------------|
| Roll-formed aluminum | Square-cut and butted corners secured with an inside plastic corner key | Flexible vinyl spline |

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/16" shim space. The exterior perimeter of the window was sealed with silicone.

| Location | Anchor Description | Anchor Location |
|-------------------|---------------------------------|---|
| Head, sill, jambs | #6 x 1-5/8" long drywall screws | 2" from each corner, spaced 10" on center through the mounting fin into the wood buck |

7.0 Test Results: The temperature during testing was 20°C (68°F). The results are tabulated as follows:

| Title of Test | Results | Allowed | Note |
|---|--|---|------|
| Operating Force, per ASTM E 2068 | Initiate motion: 49 N (11.0 lbf) Maintain motion: 89 N (20.0 lbf) Locks: 13 N (3 lbf) | Report Only 155 N (35 lbf) 100 N (22.5 lbf) | 7 |
| Air Leakage, per ASTM E 283 at 75 Pa (1.6 psf) | 0.8 L/s/m ² (0.16 cfm/ft ²) | 1.5 L/s/m ² (0.3 cfm/ft ²) max. | 1, 7 |
| 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 |

7.0 Test Results: (Continued)

| Title of Test | Results | Allowed | Note |
|--|----------------------------------|--|-------------|
| Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10 | No entry | No entry | 7 |
| Thermoplastic Corner Weld | Meets as stated | Meets as stated | 7 |
| Deglazing, Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf) | Pass Pass | Pass Pass | 7 |
| Optional Performance | | | |
| Water Penetration, per ASTM E 547 at 260 Pa (5.43 psf) | No leakage | No leakage | 2, 7 |
| Uniform Load Deflection, per ASTM E 330 taken at meeting rail +1690 Pa (+35.30 psf) -2260 Pa (-47.20 psf) | 6.4 mm (0.25") 6.9 mm (0.27") | Report Only | 4, 5, 6 |
| Uniform Load Structural, per ASTM E 330 taken at meeting rail +2535 Pa (+52.95 psf) -3390 Pa (-70.80 psf) | 0.5 mm (0.02") 0.8 mm (0.03") | 3.3 mm (0.13") max. 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.

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. A2498.01-109-47, dated 08/30/10 for complete Gateway test specimen test results.



The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made. 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
Lead Technician

Timothy J. McGill
Manager - Product Testing

RWC:dem/asm

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

Appendix-A: Alteration Addendum (1)

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

Revision Log

| <u>Rev. #</u> | <u>Date</u> | <u>Page(s)</u> | <u>Revision(s)</u> |
|---------------|-------------|----------------|--|
| 1 | 12/15/10 | Page 5 | 6.0 Installation - Correction to anchor location, drywall screws spaced 10" on center and not 70". Water penetration results and allowed should be reported as N/A not No Leakage |
| 2 | 01/27/16 | Page 3 | Changed double-sided to single-sided in glazing |

This report produced from controlled document template ATI 00438, issued 08/10/10 (draft).

Appendix A

Alteration Addendum

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

Appendix B

Drawings

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