

TEST REPORT

Report No.: C7325.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC Gratz, Pennsylvania

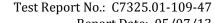
PRODUCT TYPE: PVC Single Hung Window **SERIES/MODEL**: 3540

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

	Summary of Results		
Title	Test Specimen #1	Test Specimen #2	
Primary Product Designator	Class R-PG30 1324 x 1816	Class R-PG30 1324 x 1575*	
Primary Product Designator	(52 x 72)-H	(52 x 62*)-H	
Design Pressure	±1440 Pa (±30.08 psf)	±1440 Pa (±30.08 psf)	
Air Infiltration	0.7 L/s/m ² (0.14 cfm/ft ²)	N/A	
Water Penetration Resistance Test Pressure	260 Pa (5.43 psf)	N/A	

Test Completion Date: 04/12/2013

Reference must be made to Report No. C7325.01-109-47, dated 05/07/13 for complete test specimen description and detailed test results.



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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.

130 Derry Court

York, Pennsylvania 17406-8405

717-764-7700

3.0 Project Summary:

3.1 Product Type: PVC Single Hung Window

3.2 Series/Model: 3540

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: Class R-PG30 1324 x 1816 (52 x 72)-H; Test Specimen #2: Class R-PG30 1324 x 1575* (52 x 62*)-H.

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**: 04/10/2013 04/12/2013
- **3.5 Test Record Retention End Date**: All test records for this report will be retained until May 7, 2017.
- **3.6 Test Location**: MI Windows and Doors, LLC test facility in Gratz, Pennsylvania. 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 specimen(s) will be retained by Architectural Testing for a minimum of four years from the report completion date.
- **3.8 Drawing Reference**: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings on file with Architectural Testing. Any deviations are documented herein or on the drawings.

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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 Architectural Testing, Inc.

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 Specimen #1:

1 est specimen # 1.				
Overall Area:	Width		Height	
2.4 m ² (25.9 ft ²)	millimeters	inches	millimeters	inches
Overall size	1324	52-1/8	1816	71-1/2
Interior sash	1272	50-1/16	892	35-1/8
Screen	1251	49-1/4	870	34-1/4

Test Specimen #2:

Overall Area:	Width		Height	
2.1 m ² (22.4 ft ²)	millimeters	inches	millimeters	inches
Overall size	1324	52-1/8	1575	62
Interior sash	1271	50-1/16	773	30-7/16
Screen	1222	48-1/8	697	27-7/16

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5.0 Test Specimen Description: (Continued)

The following descriptions apply to all specimens.

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, jambs,		Extruded, the sill utilized a snap-in extruded
and fixed	PVC	PVC sill adaptor, sealed with adhesive foam
meeting rail		tape and silicone.

5.2 Frame Construction: (Continued)

	Joinery Type	Detail
Head, sill, and jambs	Mitered	Thermoplastic weld
Fixed meeting rail	Coped and butted	Secured at each end with PVC end caps. The end caps were secured to the fixed meeting rails with three #6 x 1-1/8" long Phillips flat head screws and secured to the jambs using three #6 x 5/8" long screws

5.3 Sash Construction:

Sash Member	Material	Description
Rails and stiles	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermoplastic weld

5.4 Weatherstripping:

Description	Quantity	Location
0.187" backed by 1/8" diameter offset foam-filled vinyl bulb	1 Row	Fixed meeting rail
0.187" backed by 0.240" high polypile with center fin	1 Row	Sash stiles, interior meeting rail, and sill adaptor
0.187" backed by 0.310" high polypile with center fin	1 Row	Sash stiles
0.187" backed by 5/16" diameter offset foam-filled bulb	1 Row	Sash bottom rail



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5.0 Test Specimen Description: (Continued)

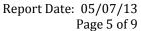
5.5 Glazing: No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal reinforced butyl	1/8" clear annealed	1/8" clear annealed	Interior glazed against a bead of silicone and secured using snap-in PVC glazing beads

Logation	Overtity	Dayli	Daylight Opening	
Location	Quantity	millimeters	Inches	Bite
Fixed daylight opening	1	1224 x 818	48-3/16 x 32-3/16	1/2"
Sash	1	1197 x 821	47-1/8 x 32-5/16	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole	1/2" long by 3/16" wide	2	Glazing channel, 1" from each end, draining to hollow below
Weephole	1/2" long by 1/16" wide	2	Sash bottom rail, 2-1/2" from each end
Weep notch	1-1/16" long by 1/8" high	2	Exterior sill leg ends
Weephole	1" long by 1/8" high	2	Sill face, 3" from each end, draining to exterior sill hollow
Weephole	5/8" long by 1/4" high	2	Sill sash track ends, draining to central hollow
Weephole	5/8" long by 1/4" high	2	Sill central hollow ends, draining to exterior sill hollow
Weephole	1/2" long by 5/32" wide	2	Sill adaptor track, 1" from each end, draining to exterior sill hollow
Weephole	1/2" long by 3/16" wide	2	Sill, 2-1/2" from each end, draining to exterior sill hollow





5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Metal cam lock	2	Interior meeting rail, 7" from each end with keepers aligned opposite on fixed meeting rail
PVC surface mount tilt latch	2	Interior meeting rail ends
Coil balances	2	One in each jamb
Metal pivot bar	2	Bottom rail ends

5.8 Reinforcement:

Drawing Number	Location	Material
GVL-451-020	Sash rails and stiles	Steel
RF-104S-020	Fixed meeting rail	Steel

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Roll-formed	Square-cut and keyed	Fiberglass	Elovible vinyl coline
aluminum	with plastic keys	ribeiglass	Flexible vinyl spline

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
Jambs	#8 x 1-1/4" long pan head screws	3" from head and sill and one at midspan, through the frame into the wood buck

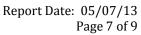


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7.0 Test Results: The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Test Specimen #1:

_	1 est Specimen #1:			
Title of Test	Results	Allowed	Note	
	Initiate motion:			
	31 N (7 lbf)	Report Only		
	Maintain motion:			
Operating Force,	67 N (15 lbf)	135 N (30 lbf) max.		
per ASTM E 2068	Latches:	, ,		
	13 N (3 lbf)	100 N (22.5 lbf) max.		
	Locks:			
	22 N (5 lbf)	100 N (22.5 lbf) max.		
Air Leakage,	,			
Infiltration per ASTM E 283	0.7 L/s/m ²	1.5 L/s/m ²		
at 75 Pa (1.57 psf)	(0.14 cfm/ft^2)	$(0.3 \text{ cfm/ft}^2) \text{ max.}$	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: A - Grade: 10	Pass	No entry		
Thermoplastic Corner Weld	Pass	Meets as stated		
Deglazing,				
per ASTM E 987				
Operating direction,				
320 N (70 lbf)	Pass	Meets as stated		
Remaining direction,				
230 N (50 lbf)	Pass	Meets as stated		





7.0 Test Results: (Continued)

Test Specimen #1: (Continued)

rest specimen #1. (Continued)				
Title of Test	Results	Allowed	Note	
Optional Performance				
Water Penetration,				
per ASTM E 547				
at 260 Pa (5.43 psf)	Pass	No leakage	2	
Uniform Load Deflection,				
per ASTM E 330				
taken at meeting rail				
+1680 Pa (+35.09 psf)	26.7 mm (1.05")			
-1680 Pa (-35.09 psf)	18.8 mm (0.74")	Report Only	4, 5, 6	
Uniform Load Structural,				
per ASTM E 330				
taken at meeting rail				
+2304 Pa (+48.13 psf)	4.6 mm (0.18")	4.8 mm (0.19") max.		
-2304 Pa (-48.13 psf)	3.8 mm (0.15")	4.8 mm (0.19") max.	5, 6	

Test Specimen #2:

rest opecimen #2.				
Title of Test	Results	Allowed	Note	
Optional Performance				
Uniform Load Deflection,				
per ASTM E 330				
taken at meeting rail				
+1440 Pa (+30.08 psf)	19.1 mm (0.75")			
-1440 Pa (-30.08 psf)	16.3 mm (0.64")	Report Only	4, 5, 6	
Uniform Load Structural,				
per ASTM E 330				
taken at meeting rail				
+2304 Pa (+48.13 psf)	2.5 mm (0.10")	4.8 mm (0.19") max.		
-2304 Pa (-48.13 psf)	2.0 mm (0.08")	4.8 mm (0.19") max.	5, 6	



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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.



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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.

Jeremy R Render Michael D Stremmel P F

Jeremy R. Bender Technician Michael D. Stremmel, P.E. Senior Project Engineer

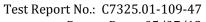
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Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Complete drawings packet on file with Architectural Testing, Inc.

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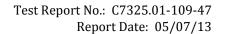
Appendix A

Alteration Addendum

Alteration #1: Date – 04/11/13

Cause for alteration – Test Specimen #1 fixed glass broke at +56.14 psf.

Remedial action taken – Fixed glass was re-glazed and retested at ±48.13 psf.





Appendix B

Drawings

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