Architectural Testing

AAMA/WDMA/CSA TEST REPORT
TEST REPORT

Rendered to:

MASTER WINDOW SYSTEMS, INC.

SERIES/MODEL: Master 1000 Single Hung Window
PROJECT TYPE: PVC Single Hung Window

Title	Summary of Results
Primary Product Designator	H-R50 1118 x 1676 (44 x 66)
Design Pressure*	2400 Pa (50.0 psf)
Negative Design Pressure*	2400 Pa (50.0 psf)
Operating Force (in motion)	81 N (18.0 lbf)
Air Infiltration	1.4 L/s/m^2 (0.27 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level*	N/A
Water Penetration Resistance Test Pressure*	360 Pa (7.5 psf)
Uniform Load Structural Test Pressure	±3600 Pa (±75.0 psf)
Forced Entry Resistance	Grade 10

*-Optional Secondary Designators

Test Completion Date: 08/04/06

Reference must be made to Report No. 67010.02-501-47, dated 09/13/07 for complete test specimen description and data.

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Architectural Testing

AAMA/WDMA/CSA TEST REPORT

Rendered to:

MASTER WINDOW SYSTEMS, INC.
2060 DeFoor Hills Road, N.W.
Atlanta, Georgia 30318

Report No.:	67010.02-501-47
Test Dates:	08/02/06
Through:	08/04/06
Report Date:	09/13/07
Expiration Date:	08/04/10

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Veka, Inc. to witness testing on a Series/Model SH27WW, PVC single hung window at their test facility in Fombell, Pennsylvania. The sample tested successfully met the performance requirements for an H-R50 1118 x 1676 (44 x 66) rating. This report is a reissue of the original Report No. 67010.01-501-47. This report is reissued in the name of Master Window Systems, Inc. through written authorization of Veka, Inc. Test specimen description and results are reported herein.

Test Specifications: The test specimen was evaluated in accordance with the following:

ANSI/AAMA/NWWDA 101/I.S.2-97, *Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors*.

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

Test Specimen Description:

Series/Model: Master 1000 Single Hung Window

Product Type: Poly Vinyl Chloride (PVC) Single Hung Window

Overall Size: 1118 mm (44") wide by 1676 mm (66") high

Sash Size: 1046 mm (41-1/8") wide by 819 mm (32-1/4") high

Daylight Opening Size: 984 mm (38-3/4") wide by 733 mm (28-7/8") high

Screen Size: 1013 mm (39-7/8") wide by 800 mm (31-1/2") high

Overall Area: 1.9 m^2 (20.2 ft^2)

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Test Specimen Description: (Continued)

Finish: All vinyl was white.

Glazing Details: The sash was exterior glazed and the fixed lite was interior glazed with 19 mm (3/4") thick, sealed insulating glass fabricated from two sheets of 3.0 mm (1/8") thick, clear annealed glass and a butyl spacer material with stainless steel substrate, single sealed. Each insulating glass unit was set against a double-sided adhesive tape, and secured with rigid vinyl glazing beads. A cap bead of silicone sealant was located at the exterior perimeter of the fixed lite.

Frame Construction: The PVC frame was constructed using mitered and welded corner construction. The fixed meeting rail was coped and fastened with two screws at each end.

Sash Construction: The PVC sash was assembled using mitered and welded corner construction.

Screen Construction: The screens were constructed from formed aluminum. The corners were square-cut and secured with plastic corner keys. Fiberglass mesh screen cloth was held-in-place with a flexible spline.

Weatherstripping:

Description	Quantity	Location
4.7 mm (0.187") backed by 8.1 mm (0.320") high pile with center fin	1 Row	Sill
4.7 mm (0.187") backed by 7.6 mm (0.300") high pile with center fin	1 Row	Lock rail
4.7 mm (0.187") backed by 7.6 mm (0.300") high pile with center fin	2 Rows	Sash stiles
4.7 mm (0.187") backed by 7.6 mm (0.300") diameter vinyl jacket/foam filled bulb	1 Row	Bottom rail

Test Specimen Description: (Continued)

Hardware:

Description	Quantity	Location
Locking metal cam lock and keeper	2	Lock rail, one 203 mm (8") in from each end, corresponding keeper on the fixed rail
Constant force balance system with locking tilt shoe	2	Jambs, one at each side
Plastic tilt latches	2	Lock rail, one at each end
Metal pivot bars	2	Bottom rail, one at each end

Drainage:

Description	Quantity	Location
25.4 mm (1") wide by 4.7 mm (3/16") high weepslot (with flap)	2	Sill exterior face, one at each end
25.4 mm (1") wide by 6.4 mm (1/4") high weepslot	2	Intermediate sill wall, one at each end
31.8 mm (1-1/4") wide by 25.4 mm (1") deep weepslot	2	Sill/jamb intersection, one at each end
12.7 mm (1/2") wide by leg height weep notch	4	Sill screen legs, two at each end

Reinforcement: The lock rail and bottom rail contained a custom shaped extruded aluminum reinforcement measuring 22.1 mm by 21.5 mm by 2.4 mm (0.870" by 0.846" by 0.095"), reference Drawing No. 1347AOM. The fixed meeting rail contained a custom shaped extruded aluminum measuring 25.4 mm by 23.5 mm by 2.4 mm (1.000" by 0.924" by 0.095"), reference Drawing No. RFSH204AOM. The sash stiles contained a custom shaped extruded aluminum measuring 18.3 mm by 21.5 mm by 2.6 mm (0.720" by 0.846" by 0.102"), reference Drawing No. RFSE1344.

Test Specimen Description: (Continued)

Installation: The unit was installed in a wood buck constructed of Spruce-Pine-Fir construction lumber and sealed at the exterior perimeter with a silicone sealant. Wood stops measuring 19 mm by 19 mm (3/4" x 3/4") were applied to the interior and exterior perimeter and fastened with 24 (interior and exterior) #8 x 51 mm (2") long screws, five each at the head and sill, and seven at each jamb, evenly spaced. A nominal 5 mm (3/16") gap was maintained at the perimeter between the buck and window frame.

Test Results: The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
2.2.1.6.1 5.3.1.1	Operating Force per ASTM 2068		
	Bottom Sash		
	Open		
	Breakaway	90 N (20 lbs)	N/A
	Maintain motion	81 N (18 lbs)	135 N (30 lbs)
	Close		
	Breakaway	68 N (15 lbs)	N/A
	Maintain motion	45 N (10 lbs)	135 N (30 lbs)
	Locks		
	Open	14 N (3 lbs)	100 N (22.5 lbs)
	Close	14 N (3 lbs)	100 N (22.5 lbs)
	Latches		
	Open	5 N (1 lb)	100 N (22.5 lbs)
2.1.2	Air Infiltration per ASTM E 283 (See Note #1)		
5.3.2	75 Pa (1.57 psf, 25 mph)	1.4 L/s/m^2 (0.27 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2) max.
2.1.3 5.3.3	Water Resistance per ASTM E 547 (with and without screen) 140 Pa (2.9 psf)	No leakage	No leakage

***Note #1**: The tested specimen meets (or exceeds) the performance levels specified in ANSI/AAMA/NWWDA 101/I.S.2-97, AAMA/WDMA/CSA 101/I.S. 2/A440-05 for air infiltration.*

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
2.1.4.1 5.3.4.2	Uniform Load Deflection per ASTM E 330 (Deflections reported were taken on the fixed meeting rail) (Loads were held for 10 seconds)		
	720 Pa (15.0 psf) (positive)	1.5 mm (0.06")	See Note #2
	720 Pa (15.0 psf) (negative)	5.8 mm (0.23")	See Note #2

***Note #2**: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

2.1.4.2 5.3.4.3	Uniform Load Structural per ASTM E 330 (Permanent sets reported were taken on the fixed meeting rail) (Loads were held for 10 seconds)		
	1080 Pa (22.5 psf) (positive)	<0.3 mm (<0.01")	4.3 mm (0.17") max.
	1080 Pa (22.5 psf) (negative)	1.3 mm (0.05")	4.3 mm (0.17") max.
2.1.8 5.3.5	Forced Entry Resistance per ASTM F 588 Type: A	Grade: 10	
	Hand Tool Manipulation	No entry	No entry
	Tests A1 through A7	No entry	No entry
	Hand Tool Manipulation	No entry	No entry
5.3.6.2	Thermoplastic Corner Weld Test	Meets as stated	Meets as stated
2.2.1.6.2 5.3.6.3	Deglazing Test per ASTM E 987		
	Bottom Sash		
	In operating direction - 320 N (70 lbs)		
	Meeting rail	2.5 mm (0.10")	11.4 mm (0.45")
	Bottom rail	3.8 mm (0.15")	11.4 mm (0.45")
	In remaining direction - 230 N (50 lbs)		
	Left stile	2.5 mm (0.10")	11.4 mm (0.45")
	Right stile	2.5 mm (0.10")	11.4 mm (0.45")

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
4.3 4.4.2.6	Water Resistance per ASTM E 547 (with and without screen)		
	360 Pa (7.5 psf)	No leakage	No leakage
4.4.1 4.4.2.6	Uniform Load Deflection per ASTM E 330 (Deflections reported were taken on the fixed meeting rail) (Loads were held for 10 seconds)		
	2400 Pa (50.0 psf) (positive)	10.4 mm (0.41")	See Note #2
	2400 Pa (50.0 psf) (negative)	14.0 mm (0.55")	See Note #2
4.4.2 4.4.2.6	Uniform Load Structural per ASTM E 330 (Permanent sets reported were taken on the fixed meeting rail) (Loads were held for 10 seconds)		
	3600 Pa (75.0 psf) (positive)	0.8 mm (0.03")	4.3 mm (0.17") max.
	3600 Pa (75.0 psf) (negative)	0.5 mm (0.02")	4.3 mm (0.17") max.

Drawing Reference: The test specimen drawings have been reviewed by ATI and match the test specimen reported herein.

This report is reissued in the name of Master Window Systems, Inc. through written authorization of Veka, Inc. to whom the original report was rendered. The original Veka, Inc. Report No. is 67010.01-501-47.

Detailed drawings, representative samples of the test specimen, and a copy of this report will be retained by ATI for a period of four years from the original test date. The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the above referenced specification. This report does not constitute certification of this product, which may only be granted by the certification program administrator. This report may not be reproduced, except in full, without the approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Lynn George
Digitally Signed by: Lynn George

Lynn George
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Attachments (pages):
Appendix-A: Alteration Addendum (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	09/13/07	N/A	Original report issue - Reissue of Report No. 67010.01-501-47 in the name of Master Window Systems, Inc.

Appendix A

Alteration Addendum

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