Architectural Testing

AAMA/WDMA/CSA TEST REPORT
TEST REPORT

Rendered to:

MGM, INC.

SERIES/MODEL: 6000/6010
PROJECT TYPE: PVC Single Hung Window

Report No.:	**64114.02-501-47**
Test Dates:	**03/31/06**
Through:	**04/14/06**
Report Date:	**07/07/06**
Expiration Date:	**04/14/10**

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SUMMARY OF RESULTS

	Summary of Results	
Title	**Test Specimen #1**	**Test Specimen #2**
Primary Product Designator	H-R30 1118 x 1600 (44 x 63)	H-R40 1118 x 1600 (44 x 63)
Design Pressure*	1440 Pa (30.0 psf)	1920 Pa (40.0 psf)
Negative Design Pressure*	1440 Pa (30.0 psf)	1920 Pa (40.0 psf)
Operating Force (in motion)	135 N (30.0 lbf)	N/A
Air Leakage Resistance	0.6 L/s/m^2 (0.11 cfm/ft^2)	N/A
Canadian Air Infiltration/Exfiltration Level*	N/A	N/A
Water Penetration Resistance Test Pressure*	330 Pa (6.75 psf)	N/A
Uniform Load Structural Test Pressure	±2160 Pa (±45.0 psf)	±2880 Pa (±60.0 psf)
Forced Entry Resistance	Grade 10	N/A

	Summary of Results	
Title	**Test Specimen #3**	**Test Specimen #4**
Primary Product Designator	H-R25 2245 x 1575* (88 x 62*)	H-R35 2248 x 1575* (88 x 62*)
Design Pressure*	1200 Pa (25.0 psf)	1680 Pa (35.0 psf)
Negative Design Pressure*	1200 Pa (25.0 psf)	1680 Pa (35.0 psf)
Operating Force (in motion)	N/A	N/A
Air Leakage Resistance	0.9 L/s/m^2 (0.18 cfm/ft^2)	1.1 L/s/m^2 (0.21 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level*	N/A	N/A
Water Penetration Resistance Test Pressure*	330 Pa (6.75 psf)	330 Pa (6.75 psf)
Uniform Load Structural Test Pressure	±1800 Pa (±37.5 psf)	±2520 Pa (±52.5 psf)
Forced Entry Resistance	N/A	N/A

*-Optional Secondary Designators

Test Completion Date: 03/31/06

Reference must be made to Report No. 64114.02-501-47, dated 07/07/06 for complete test specimen description and data.

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AAMA/WDMA/CSA TEST REPORT

Rendered to:

MGM, INC.
287 Freehill Road
Hendersonville, Tennessee 37075

Report No.:	64114.02-501-47
Test Dates:	03/31/06
Through:	04/14/06
Report Date:	07/07/06
Expiration Date:	04/14/10

Project Summary: Architectural Testing, Inc. (ATI) was contracted by Veka, Inc. to witness testing on three Veka Series/Model 3700, PVC single hung windows at their test facility in Fombell, Pennsylvania. The samples tested successfully met the performance requirements for the following ratings: Test Specimen #1: H-R30 1118 x 1600 (44 x 63); Test Specimen #2: H-R40 1118 x 1600 (44 x 63); Test Specimen #3: H-R25 2245 x 1575* (88 x 62*); Test Specimen #4: H-R35 2248 x 1575* (88 x 62*). This report is a reissue of the original Report No. 64114.01-501-47. This report is reissued in the name of MGM, Inc. through written authorization of Veka, Inc. Test specimen description and results are reported herein.

General Note: *An asterisk (*) next to the performance grade indicates that the size tested for optional performance was smaller than the Gateway test size for the product type and class.*

Test Specifications: The test specimens were 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: 6000/6010

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Test Specimen Description: (Continued)

Test Specimen #1: H-R30 1118 x 1600 (44 x 63)

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

Overall Size: 1118 mm (44") wide by 1600 mm (63") high

Sash Size: 1060 mm (41-3/4") wide by 781 mm (30-3/4") high

Daylight Opening Size: 1000 mm (39-3/8") wide by 718 mm (28-1/4") high

Screen Size: 1029 mm (40-1/2") wide by 768 mm (30-1/4") high

Overall Area: 1.8 m^2 (19.3 ft^2)

Reinforcement: The lock rail contained a custom shaped extruded aluminum reinforcement measuring 20.8 mm x 9.4 mm x 1.3 mm (0.820" x 0.370" x 0.050"), reference Drawing No. S-047. The fixed meeting rail contained a custom shaped extruded aluminum measuring 20.2 mm x 17.5 mm x 2.5 mm (0.795" x 0.690" x 0.100"), reference Drawing No. S-046.

Test Specimen #2: H-R40 1118 x 1600 (44 x 63)

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

Overall Size: 1118 mm (44") wide by 1600 mm (63") high

Sash Size: 1060 mm (41-3/4") wide by 781 mm (30-3/4") high

Daylight Opening Size: 1000 mm (39-3/8") wide by 718 mm (28-1/4") high

Screen Size: 1029 mm (40-1/2") wide by 768 mm (30-1/4") high

Overall Area: 1.8 m^2 (19.3 ft^2)

Reinforcement: The lock rail, bottom rail, and all sash stiles contained a custom shaped extruded aluminum reinforcement measuring 20.8 mm x 9.4 mm x 1.3 mm (0.820" x 0.370" x 0.050"), reference Drawing No. S-047. The fixed meeting rail contained a custom shaped extruded aluminum measuring 20.2 mm x 17.5 mm x 2.5 mm (0.795" x 0.690" x 0.100"), reference Drawing No. S-046.

Test Specimen Description: (Continued)

Test Specimen #3: H-R25 2245 x 1575* (88 x 62*)

Product Type: Poly Vinyl Chloride (PVC) Twin Single Hung Window System with Integral Mullion

Overall Size: 2245 mm (88-3/8") wide by 1575 mm (62") high

Sash Size (2): 1060 mm (41-3/4") wide by 768 mm (30-1/4") high

Daylight Opening Size (2): 1000 mm (39-3/8") wide by 705 mm (27-3/4") high

Screen Size (2): 1035 mm (40-3/4") wide by 756 mm (29-3/4") high

Overall Area: 3.5 m^2 (38.0 ft^2)

Reinforcement: The lock rail, bottom rail, and all sash stiles contained a custom shaped extruded aluminum reinforcement measuring 20.8 mm x 9.4 mm x 1.3 mm (0.820" x 0.370" x 0.050"), reference Drawing No. S-047. The fixed meeting rail contained a custom shaped extruded aluminum measuring 20.2 mm x 17.5 mm x 2.5 mm (0.795" x 0.690" x 0.100"), reference Drawing No. S-046. The integral mullion contained a custom shaped formed steel reinforcement measuring 57.2 mm x 26.0 mm x 0.8 mm (2.250" x 1.025" x 0.030"), reference Drawing No. S515CS-056000.

Test Specimen #4: H-R35 2248 x 1575* (88 x 62*)

Product Type: Poly Vinyl Chloride (PVC) Twin Single Hung Window System with Aluminum "H" Mullion

Overall Size: 2248 mm (88-1/2") wide by 1575 mm (62") high

Sash Size (2): 1060 mm (41-3/4") wide by 768 mm (30-1/4") high

Daylight Opening Size (2): 1000 mm (39-3/8") wide by 705 mm (27-3/4") high

Screen Size (2): 1035 mm (40-3/4") wide by 756 mm (29-3/4") high

Overall Area: 3.5 m^2 (38.1 ft^2)

Reinforcement: The lock rail, bottom rail, and all sash stiles contained a custom shaped extruded aluminum reinforcement measuring 20.8 mm x 9.4 mm x 1.3 mm (0.820" x 0.370" x 0.050"), reference Drawing No. S-047. The fixed meeting rail contained a custom shaped extruded aluminum measuring 20.2 mm x 17.5 mm x 2.5 mm (0.795" x 0.690" x 0.100"), reference Drawing No. S-046.

Test Specimen Description: (Continued)

The following descriptions apply to all specimens.

Finish: All vinyl was white.

Glazing Details: The sash was exterior glazed with 19 mm (3/4") thick, sealed insulating glass fabricated from two sheets of 2.5 mm (3/32") clear annealed glass and "U" shaped steel spacer system embedded in sealant, single sealed. The fixed lite was interior glazed with 19 mm (3/4") thick, sealed insulating glass fabricated from two sheets of 2.5 mm (3/32") clear annealed glass and "U" shaped steel spacer system embedded in sealant, single sealed. The insulating glass was set onto a silicone back-bedding and secured with rigid vinyl glazing beads.

Frame Construction: The PVC frame was constructed using mitered and welded corner construction at the head, and double screw coped, butt type corner construction at the sill. The frame intersections at the sill contained a closed cell foam gasket and were sealed with a silicone sealant. The fixed meeting rail was coped and fastened to the jambs with two #8 x 76 mm (3") screws and to the integral mullion using a metal bracket. The metal bracket was fastened to the integral mullion with two screws and to the fixed rail reinforcement with one screw. The integral mullion was coped and fastened with four #8 x 76 mm (3") long screws at each end. A closed cell foam gasket was located at the sill intersection with the integral mullion.

Mullion Construction: (Test Specimen #4) The extruded aluminum mullion was fastened to the mating jambs with eight #8 x 25 mm (1") long screws, four at each side, evenly spaced, and sealed with a silicone sealant.

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.

Test Specimen Description: (Continued)

Weatherstripping:

Description	Quantity	Location
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 8.9 mm (0.350") diameter vinyl jacket/foam filled bulb	1 Row	Bottom rail (exterior)
4.7 mm (0.187") backed by 6.4 mm (0.250") diameter vinyl jacket/foam filled bulb	1 Row	Bottom rail (interior)

Hardware:

Description	Quantity	Location
Metal cam lock	2 (4)	Lock rail, one 216 mm (8-1/2") in from each end, engaging an extruded slot in the fixed rail
Block and tackle system with locking tilt shoe	2 (4)	Jambs/mullion, one at each side
Plastic tilt latches	2 (4)	Top rail and lock rail, one at each end
Metal pivot bars	2 (4)	Bottom rail and exterior meeting rail, one at each end

Note: Quantity for twin units in parenthesis (*).

Test Specimen Description: (Continued)

Drainage:

Description	Quantity	Location
9.5 mm (3/8") wide by 3.0 mm (1/8") deep weepslot	2 (4)	Bottom sash rail, one at each end
12.7 mm (1/2") wide by leg height weep notch	4 (8)	Sill screen legs, two at each end

Note: Quantity for twin units in parenthesis (*).

Installation: The unit was installed in a wood buck constructed of Spruce-Pine-Fir construction lumber and sealed at the nail fin perimeter with a silicone sealant.

Test Specimens #1 and #2: The unit was fastened through the nail fin with ten #10 x 25 mm (1") long screws two each at the head and sill, and three at each jamb.

Test Specimens #3 and #4: The unit was fastened through the nail fin with #10 x 25 mm (1") long screws spaced approximately 7" on center.

Test Results: The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
Test Specimen #1: H-R30 1118 x 1600 (44 x 63)			
2.2.1.6.1 5.3.1.1	Operating Force per ASTM 2068		
	Open		
	Breakaway	22 N (5 lbs)	N/A
	Maintain motion	67 N (15 lbs)	135 N (30 lbs)
	Close		
	Breakaway	89 N (20 lbs)	N/A
	Maintain motion	135 N (30 lbs)	135 N (30 lbs)
	Locks		
	Open	22 N (5 lbs)	100 N (22.5 lbs)
	Close	27 N (6 lbs)	100 N (22.5 lbs)
	Latches		
	Open	5 N (1 lb)	100 N (22.5 lbs)
2.1.2 5.3.2	Air Infiltration per ASTM E 283 (See Note #1) 75 Pa (1.57 psf, 25 mph)	0.6 L/s/m^2 (0.11 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
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)	5.8 mm (0.23")	See Note #2
	720 Pa (15.0 psf) (negative)	6.4 mm (0.25")	See Note #2

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.*

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.*

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
Test Specimen #1: H-R30 1118 x 1600 (44 x 63) (Continued)			
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)	0.8 mm (0.03")	5.8 mm (0.23") max.
	1080 Pa (22.5 psf) (negative)	0.5 mm (0.02")	5.8 mm (0.23") 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		
	In operating direction - 320 N (70 lbs)		
	Meeting rail	1.5 mm (0.06")	11.4 mm (0.45")
	Bottom rail	1.5 mm (0.06")	11.4 mm (0.45")
	In remaining direction - 230 N (50 lbs)		
	Left stile	0.8 mm (0.03")	11.4 mm (0.45")
	Right stile	0.8 mm (0.03")	11.4 mm (0.45")
Optional Performance			
4.3 4.4.3.4	Water Resistance per ASTM E 547 (with and without screen)		
	330 Pa (6.75 psf)	No leakage	No leakage
4.4.1 4.4.3.2	Uniform Load Deflection per ASTM E 330 (Deflections reported were taken on the fixed meeting rail)		
	(Loads were held for 10 seconds)		
	1440 Pa (30.0 psf) (positive)	11.9 mm (0.47")	See Note #2
	1440 Pa (30.0 psf) (negative)	12.2 mm (0.48")	See Note #2

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed

Test Specimen #1: H-R30 1118 x 1600 (44 x 63) (Continued)

Optional Performance (Continued)

4.4.2	Uniform Load Structural per ASTM E 330		
4.4.3.2	(Permanent sets reported were taken on the fixed meeting rail)		
	(Loads were held for 10 seconds)		
	2160 Pa (45.0 psf) (positive)	1.5 mm (0.06")	4.3 mm (0.17") max.
	2160 Pa (45.0 psf) (negative)	1.0 mm (0.04")	4.3 mm (0.17") max.

Test Specimen #2: H-R40 1118 x 1600 (44 x 63)

Optional Performance

4.4.1	Uniform Load Deflection per ASTM E 330		
4.4.3.2	(Deflections reported were taken on the fixed meeting rail)		
	(Loads were held for 10 seconds)		
	1920 Pa (40.0 psf) (positive)	17.0 mm (0.67")	See Note #2
	1920 Pa (40.0 psf) (negative)	14.2 mm (0.56")	See Note #2
4.4.2	Uniform Load Structural per ASTM E 330		
4.4.3.2	(Permanent sets reported were taken on the fixed meeting rail)		
	(Loads were held for 10 seconds)		
	2880 Pa (60.0 psf) (positive)	1.8 mm (0.07")	4.3 mm (0.17") max.
	2880 Pa (60.0 psf) (negative)	0.8 mm (0.03")	4.3 mm (0.17") max.

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
Test Specimen #3: H-R25 2245 x 1575* (88 x 62*)			
2.1.2	Air Infiltration per ASTM E 283 (See Note #1)		
5.3.2	75 Pa (1.57 psf, 25 mph)	0.9 L/s/m^2 (0.18 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2) max.

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.*

Optional Performance

4.3	Water Resistance per ASTM E 547		
4.4.3.4	(with and without screen)		
	330 Pa (6.75 psf)	No leakage	No leakage
4.4.1	Uniform Load Deflection per ASTM E 330		
4.4.3.2	(Deflections reported were taken on the integral mullion)		
	(Loads were held for 510 seconds)		
	1200 Pa (25.0 psf) (positive)	15.0 mm (0.59")	See Note #2
	1200 Pa (25.0 psf) (negative)	13.5 mm (0.53")	See Note #2
4.4.2	Uniform Load Structural per ASTM E 330		
4.4.3.2	(Permanent sets reported were taken on the integral mullion)		
	(Loads were held for 10 seconds)		
	1800 Pa (37.5 psf) (positive)	2.8 mm (0.11")	6.1 mm (0.24") max.
	1800 Pa (37.5 psf) (negative)	1.5 mm (0.06")	6.1 mm (0.24") max.

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
Test Specimen #4: H-R35 2248 x 1575* (88 x 62*)			
2.1.2	Air Infiltration per ASTM E 283 (See Note #1)		
5.3.2	75 Pa (1.57 psf, 25 mph)	1.1 L/s/m^2 (0.21 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2) max.

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.*

Optional Performance

4.3	Water Resistance per ASTM E 547		
4.4.3.4	(with and without screen)		
	330 Pa (6.75 psf)	No leakage	No leakage
4.4.1	Uniform Load Deflection per ASTM E 330		
4.4.3.2	(Deflections reported were taken on the mullion)		
	(Loads were held for 10 seconds)		
	1680 Pa (35.0 psf) (positive)	6.1 mm (0.24")	See Note #2
	1680 Pa (35.0 psf) (negative)	7.4 mm (0.29")	See Note #2
4.4.2	Uniform Load Structural per ASTM E 330		
4.4.3.2	(Permanent sets reported were taken on the mullion)		
	(Loads were held for 10 seconds)		
	2520 Pa (52.5 psf) (positive)	0.5 mm (0.02")	6.4mm (0.25") max.
	2520 Pa (52.5 psf) (negative)	0.3 mm (0.01")	6.4 mm (0.25") 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 MGM, Inc. through written authorization of Veka, Inc. to whom the original report was rendered. The original Veka, Inc. Report No. is 64114.01-501-47.

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.

Digitally Signed for: Lynn George by Jennifer L. DeVos

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Michael L. Mackereth
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Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	07/07/06	N/A	Original report issue - Reissued Report No. 64114.01-501-47 in the name of MGM, Inc.