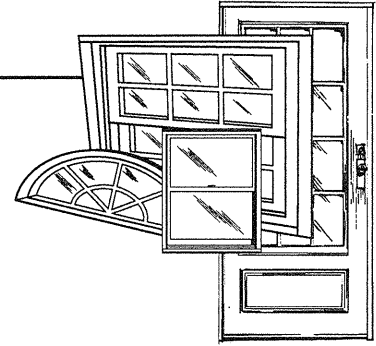


CERTIFIED TESTING LABORATORIES

Architectural Division • 7252 Narcoossee Rd. • Orlando, FL 32822
(407) 384-7744 • Fax (407) 384-7751
Web Site: www.ctlarch.com
E-mail: ctlarch.com



Report Number: CTLA-787W
Report Date: December 6, 2001

STRUCTURAL PERFORMANCE TEST REPORT

Client: M I Home Products, Inc.
4314 Route 209
Elizabrthville, PA 17023-8438

Product Type and Series: Series 165 Aluminum Fin Frame Tilt Single Hung Window H-R35 (52" x 72")

Test Specification: AAMA 101/I.S.2-97 "Voluntary Specification for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors".

Test Specimen

- Frame:** The extruded aluminum fin frame measuring 52" x 72" high. Each corner secured with two (2) # 6 x .750" P.P.H., fasteners. The fixed meeting rail was secured with two (2) # 6 x 1.25" P.P.H., S.M.S fasteners. Main frame sill high measured 1.265" overall.
- Ventilators:** Extruded aluminum operable sash, measuring 51.25" x 39.25". Each corner secured with one (1) # 6 x 1" P.P.H. fasteners. Clear light opening 48.5" x 33.25".
- Glazing:** Material: 3/16" Annealed glass.
- Method:** Interior glazed with silicone back bedding compound and vinyl snap in glazing bead.
- Sealant:** All hairline joinery and mechanical corners were sealed with a small joint sealant.

Weatherstripping:	<u>Quantity</u>	<u>Description</u>	<u>Location</u>
	One (1) strip	.250" high woolpile with integral fin	Fixed meeting rail
	Two (2) strips	.250" high woolpile with integral fin	Operable sash stiles.
	One (1) strip	Vinyl bulb seal	Operable sash bottom rail

<u>Hardware</u>	<u>Quantity</u>	<u>Description</u>	<u>Location</u>
	Two (2)	Spiral balances	One (1) per frame jamb
	Two (2)	Plastic Tilt Latch	Each end of sash top rail
	Two (2)	Metallic Cam Locks	Sash top rail locking into meeting rail
	Two (2)	Plastic Meeting rail caps	Each end of meeting rail
	Two (2)	Metallic Pivot Bars	Each end of sash bottom rail
	Two (2)	Balance shoes	One (1) each frame jamb

Weepholes: Frame sill, sash and screen retaining legs notched .500" x leg height at each corner.

Reinforcements: N/A

Screen: The aluminum screen frame measured 49.5"x 35.75" butt corner construction and fastened with plastic corner keys. Fiberglass mesh, vinyl spline, with two (2) Locking Plungers

Installation: Unit tested in a wooden P.T. 2" x 12" buck with a 2" x 4" sub frame.

Sill: Four (4) #10 x 2" phillips flathead fasteners located 6",24",32",and 50" measuring from left to right.

Head: Four(4) #10 x 2" phillips flathead fasteners located 6",24",32",and 50" measuring from left to right.

Jamb: Five (5) # 10 x 2" phillips flathead fasteners measuring from head to sill 6", 24", 37.5", 56", and 73.5" in each jamb.

Surface Finish: White

Performance Test Results

<u>Paragraph No</u>	<u>Title of Test</u>	<u>Method</u>	<u>Measured</u>	<u>Allowed</u>
2.1.2	Air infiltration @ 1.57 psf	ASTM E283-91	.03cfm/ft ²	.3 cfm/ft ²

The tested specimen meets the performance levels specified in AAMA/NWWDA 101/I.S.2-97.
 Measured air recorded in two (2) decimals at clients request.

2.1.3/4.3	Water Resistance @ 5.0 gph/ft ² WTP = 5.3 psf	ASTM E547-93 Four (4) five (5) minute cycles	No Entry	No Entry
		ASTM E331-93 Fifteen (15) minute duration	No Entry	No Entry

Tested with and without insect screen

Performance Test Results

2.1.4.2/4.4.2	Uniform Load Structural Permanent Deformation @ 52.95 psf Positive @ 64.65 psf Negative	ASTM E330-97 Ten (10) second duration	.022" .114"	.192" .192"
---------------	--	--	----------------	----------------

Measurement taken at mid span of panel interlock stile

2.1.8	Force Entry Resistance	AAMA 1302.5-97		
	Test A		0"	1/2"
	Test B		0"	1/2"
	Test C		0"	1/2"
	Test D ,E and F		0"	1/2"
	Test G		0"	1/2"
2.2.1.6.1	Operating Force	AAMA/NWWDA 101/ I.S.2-97	10 lbs	30 lbs
2.2.1.6.2	Deglazing	AAMA 1302.5-97		
	Top Rail	70 lbs	.021 =	4.2 % <100 %
	Bottom Rail	70 lbs	.015 =	3.0 % <100 %
	Left Stile	50 lbs	.019 =	3.8% <100 %
	Right Stile	50 lbs	.023 =	4.6 % <100 %

Comments: Nominal 2 mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.

Test Date September 5, 2001

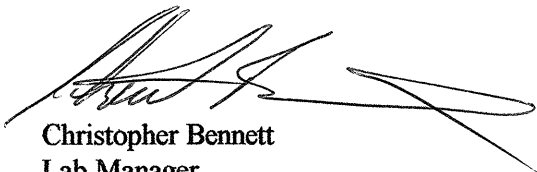
Test Completion Date: September 5, 2001

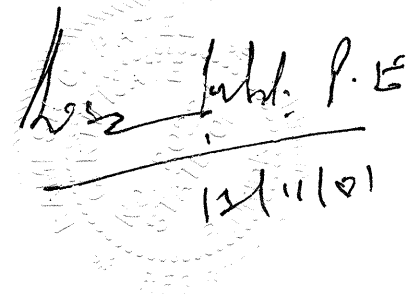
Remarks: Detailed drawings were available for laboratory records and comparison to the test specimen at the time of this report. A copy of this report along with representative sections of the test specimen will be retained by CTL for a period of four (4) years. The results obtained apply only to the specimen tested.

This test report does not constitute certification of this product, but only that the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Certified Testing Laboratories assumes that all information provided by the client is accurate and that the physical and chemical properties of the components are as stated by the manufacturer.

Certified Testing Laboratories, Inc.

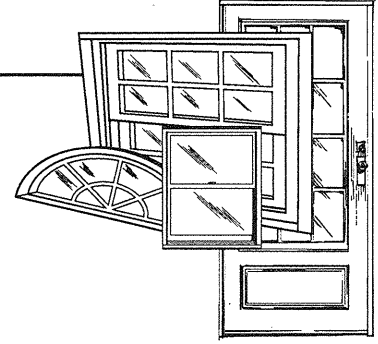

Christopher Bennett
Lab Manager
Architectural Division


12/11/01

MI Home Products, Inc. (2)
ALI (2)
Ramesh Patel (1)
FILE (1)

CERTIFIED TESTING LABORATORIES

Architectural Division • 7252 Narcoossee Rd. • Orlando, FL 32822
(407) 384-7744 • Fax (407) 384-7751
Web Site: www.ctlarch.com
E-mail: ctlarch.com



Report Number: CTLA-787W-1
Report Date: December 6, 2001

STRUCTURAL PERFORMANCE TEST REPORT

Client: M I Home Products, Inc.
4314 Route 209
Elizabrtville, PA 17023-8438

Product Type and Series: Series 165 Aluminum Flange Frame Tilt Single Hung Window H-R35 (53" x 73")

Test Specification: AAMA 101/I.S.2-97 "Voluntary Specification for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors".

Test Specimen

Frame: The extruded aluminum flange frame measuring 53" x 73" high. Each corner secured with two (2) # 6 x .750" P.P.H., fasteners. The fixed meeting rail was secured with two (2) # 6 x 1.25" P.P.H., S.M.S fasteners. Main frame sill high measured 1.265" overall.

Ventilators: Extruded aluminum operable sash, measuring 51.25" x 39.25". Each corner secured with one (1) # 6 x 1" P.P.H. fasteners. Clear light opening 48.5" x 33.25".

Glazing: Material: 3/16" Annealed glass.

Method: Interior glazed with silicone back bedding compound and vinyl snap in glazing bead.

Sealant: All hairline joinery and mechanical corners were sealed with a small joint sealant.

Weatherstripping:	<u>Quantity</u>	<u>Description</u>	<u>Location</u>
	One (1) strip	.250" high woolpile with integral fin	Fixed meeting rail
	Two (2) strips	.250" high woolpile with integral fin	Operable sash stiles.
	One (1) strip	Vinyl bulb seal	Operable sash bottom rail

<u>Hardware</u>	<u>Quantity</u>	<u>Description</u>	<u>Location</u>
	Two (2)	Spiral balances	One (1) per frame jamb
	Two (2)	Plastic Tilt Latch	Each end of sash top rail
	Two (2)	Metallic Cam Locks	Sash top rail locking into meeting rail
	Two (2)	Plastic Meeting rail caps	Each end of meeting rail
	Two (2)	Metallic Pivot Bars	Each end of sash bottom rail
	Two (2)	Balance shoes	One (1) each frame jamb

Weepholes: Frame sill, sash and screen retaining legs notched 1.25"long x leg height at each corner.

Reinforcements: N/A

Screen: The aluminum screen frame measured 49.5"x 35.75" butt corner construction and fastened with plastic corner keys. Fiberglass mesh, vinyl spline, with two (2) Locking Plungers

Installation: Unit tested in a wooden P.T. 2" x 12" buck with a 2" x 4" sub frame.

Sill: Two (2) # 8 x 1.25" phillips flathead fasteners located 2" from each end.

Head: Two(2) # 8 x 1.25" phillips flathead fasteners located 2"from each end..

Jambs: Four (4) # 8 x 1.25" phillips flathead fasteners measuring from head to sill 6", 27", 34", and 67" in each jamb.

urface Finish: White

Performance Test Results

<u>Paragraph No</u>	<u>Title of Test</u>	<u>Method</u>	<u>Measured</u>	<u>Allowed</u>
2.1.2	Air infiltration @ 1.57 psf	ASTM E283-91	.03cfm/ft ²	.3 cfm/ft ²
The tested specimen meets the performance levels specified in AAMA/NWWDA 101/I.S.2-97. Measured air recorded in two (2) decimals at clients request.				
2.1.3/4.3	Water Resistance @ 5.0 gph/ft ² WTP = 5.3 psf	ASTM E547-93 Four (4) five (5) minute cycles	No Entry	No Entry
		ASTM E331-93 Fifteen (15) minute duration	No Entry	No Entry
Tested with and without insect screen				

Performance Test Results

2.1.4.2/4.4.2	Uniform Load Structural Permanent Deformation @ 52.95 psf Positive @ 70.8 psf Negative Measurement taken at mid span of panel interlock stile	ASTM E330-97 Ten (10) second duration	.066" .032"	.192" .192"
---------------	---	--	----------------	----------------

