

**Test Specimen Description: (Continued)****Hardware:**

| <u>Description</u>         | <u>Quantity</u> | <u>Location</u>   |
|----------------------------|-----------------|---|
| Metal cam lock with keeper | 1               | Midspan of each active meeting rail with adjacent keepers |
| Plastic tilt latch         | 2               | Each active sash meeting rail ends                        |
| Metal tilt pin             | 2               | Each active sash bottom rail ends                         |
| Balance assembly           | 2               | Each active sash contained one in each jamb               |
| Screen plunger             | 2               | Each screen contained two 4" from rail ends on top rail   |

**Drainage:** Sloped sill

**Reinforcement:** No reinforcement was utilized.

**Installation:** The test specimen was installed into a 2 x 8 #2 Spruce-Pine-Fir wood buck with #8 x 1-5/8" drywall screws every 8" on center around the nail fin. Polyurethane was used as a sealant under the nail fin and around the exterior perimeter.

**Test Results:**

The results are tabulated as follows:

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>                      | <u>Results</u>           | <u>Allowed</u>              |
|------------------|---|--------------------------|-----------------------------|
| 2.2.1.6.1        | Operating Force   | 25 lbs                   | 30 lbs max.                 |
|                  | Air Infiltration (ASTM E 283-91)<br>@ 1.57 psf (25 mph) | 0.16 cfm/ft <sup>2</sup> | 0.3 cfm/ft <sup>2</sup> max |

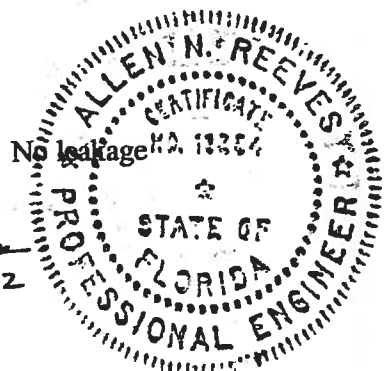
**Note #1:** The tested specimen meets the performance levels specified in AAMA/NWDA 101/I.S. 2-97 for air infiltration.

Water Resistance (ASTM E 547-00)  
(with and without screen)  
WTP = 2.86 psf

No leakage

No leakage

*Allen N. Reeves*  
7 JUNE 2002





**Test Specimen Description: (Continued)**

**Glazing Details:** The active and fixed lites utilized 5/8" thick, sealed insulating glass constructed from two sheets of 1/8" thick, clear annealed glass and a metal reinforced butyl spacer system. The active sash was channel glazed utilizing a flexible vinyl wrap-around gasket. The fixed lite was interior glazed against double-sided adhesive foam tape and secured with PVC snap-in glazing beads.

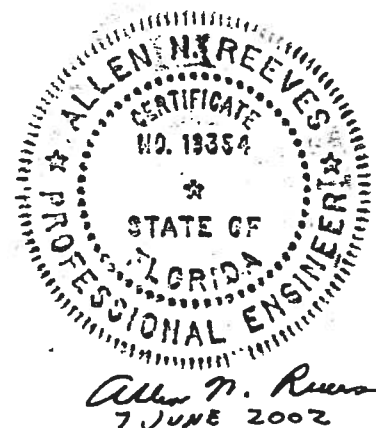
**Weatherstripping:**

| <u>Description</u>                                    | <u>Quantity</u> | <u>Location</u>                       |
|---|-----------------|---------------------------------------|
| 0.230" high by 0.270" backed polypile with center fin | Row             | Fixed meeting rail                    |
| 0.250" high by 0.187" backed polypile with center fin | 2 Rows          | Active sash stiles                    |
| 1/2" by 1/2" dust plug                                | 4 Pieces        | Active sash, top and bottom of stiles |
| 1/4" foam filled vinyl bulb seal                      | 1 Row           | Active sash, bottom rail              |

**Frame Construction:** The frame was constructed of extruded aluminum with coped, butted, and sealed corners fastened with two #8 x 1" screws through the head and sill into each jamb screw boss. End caps were utilized on the ends of the fixed meeting rail and secured with two 1-1/4" screws per cap. The meeting rail was secured to the frame utilizing two 1-1/4" screws. The mullions were secured utilizing four #8 x 1-1/4" screws through the head and sill into the mullion screw boss.

**Sash Construction:** The sash was constructed of extruded aluminum with coped, butted, and sealed corners fastened with two #8 x 1-1/2" screws through the rails into each stiles' screw boss.

**Screen Construction:** The screen was constructed from roll-formed aluminum with keyed corners. The fiberglass mesh was secured with a flexible spline.





Architectural Testing

**AAMA/NWWDA 101/LS.2-97 TEST REPORT**

Rendered to

MI HOME PRODUCTS, INC.  
P.O. Box 370  
650 West Market Street  
Gratz, Pennsylvania 17030-0370

Report No: 01-41641.01

Test Date: 05/13/02

And: 05/16/02

Report Date: 06/05/02

Expiration Date: 05/16/06

**Project Summary:** Architectural Testing, Inc. (ATI) was contracted by MI Home Products, Inc. to witness testing on a Series/Model 650, aluminum triple single hung window at their facility located in Elizabethville, Pennsylvania. The sample tested successfully met the performance requirements for a H-R35 112 x 72 rating.

**Test Specification:** The test specimen was evaluated in accordance with AAMA/NWWDA 101/LS.2-97, *Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors*.

**Test Specimen Description:**

**Series/Model:** 650

**Type:** Aluminum Triple Single Hung Window

**Overall Size:** 9' 3-1/2" wide by 5' 11-11/16" high

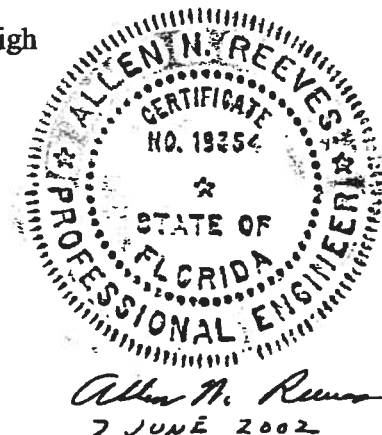
**Active Sash Size (3):** 3' 0-1/4" wide by 2' 10-3/4" high

**Fixed Daylight Opening Size (3):** 2' 8-1/4" wide by 2' 9-1/8" high

**Screen Size (3):** 2' 9-1/8" wide by 2' 11" high

**Finish:** All aluminum was painted white.

130 Derry Court  
York, PA 17402-9405  
phone: 717.764.7700  
fax: 717.764.4129  
www.archtest.com





**AAMA/NWWDA 101/I.S.2-97  
TEST REPORT**

**Rendered to:**

**MI HOME PRODUCTS, INC.**

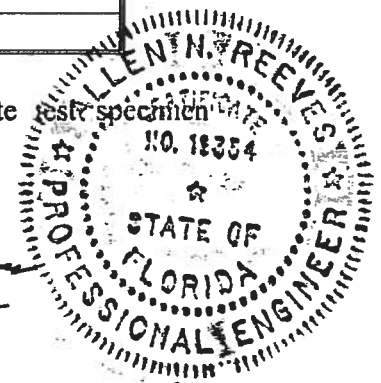
**SERIES/MODEL: 650**

**TYPE: Aluminum Triple Single Hung Window**

| Title of Test                         | Summary of Results       |
|---------------------------------------|--------------------------|
| AAMA Rating                           | H-R35 112 x 72           |
| Uniform Load Deflection Test Pressure | +35.3 psf -47.2 psf      |
| Operating Force                       | 25 lb max.               |
| Air Infiltration                      | 0.16 cfm/ft <sup>2</sup> |
| Water Resistance Test Pressure        | 5.25 psf                 |
| Uniform Load Structural Test Pressure | +53.0 psf -52.5 psf      |
| Deglazing                             | Passed                   |
| Forced Entry Resistance               | Grade 10                 |

Reference should be made to ATI Report No. 01-41641.01 for complete test specimen description and data.

*Allen N. Reeves*  
7 JUNE 2002





**Test Results: (Continued)**

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>      | <u>Results</u> | <u>Allowed</u> |
|------------------|---|----------------|----------------|
|                  | Forced Entry Resistance (ASTM F 588-97) |                |                |
|                  | Type: D                                 |                |                |
|                  | Grade: 10                               |                |                |
|                  | Hand and Tool Manipulation Test         | No entry       | No entry       |

**Optional Performance**

|     |   |            |            |
|-----|---|------------|------------|
| 4.3 | Water Resistance (ASTM E 547-00)<br>WTP = 8.25 psf  | No leakage | No leakage |
|     | Uniform Load Deflection (ASTM E 330-97)<br>(Measurements reported were taken on the jamb)<br>(Loads were held for 33 seconds) |            |            |
|     | @ 45.0 psf (positive)   | 0.02"      | 0.41" max. |
|     | @ 47.2 psf (negative)   | 0.02"      | 0.41" max. |
|     | Uniform Load Structural (ASTM E 330-97)<br>(Measurements reported were taken on the jamb)<br>(Loads were held for 10 seconds) |            |            |
|     | @ 67.5 psf (positive)   | 0.01"      | 0.29" max. |
|     | @ 70.8 psf (negative)   | 0.02"      | 0.29" max. |

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. 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.

For ARCHITECTURAL TESTING, INC.

Mark A. Hess  
Technician

MAH:nlb  
01-41135.01

Allen N. Reeves, P.E.  
Director - Engineering Services  
1 APRIL 2002





### Test Specimen Description: (Continued)

**Frame Construction:** The frame was constructed of extruded aluminum with coped, butted, and sealed corners fastened with two #8 x 1" screws through the head and sill into each jamb screw boss.

**Reinforcement:** No reinforcement was utilized.

**Installation:** The test specimen was installed into a 2 x 8 #2 Spruce-Pine-Fir wood test buck. #8 x 2-1/2" installation screws were utilized 18" on center around the interior perimeter. Polyurethane was utilized to seal the exterior.

### Test Results:

The results are tabulated as follows:

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>                      | <u>Results</u>           | <u>Allowed</u>               |
|------------------|---|--------------------------|------------------------------|
|                  | Air Infiltration (ASTM E 283-91)<br>@ 1.57 psf (25 mph) | 0.04 cfm/ft <sup>2</sup> | 0.3 cfm/ft <sup>2</sup> max. |

*Note #1: The tested specimen meets the performance levels specified in AAMA/NWWDA 101/I.S. 2-97 for air infiltration.*

|         |   |                |                          |
|---------|---|----------------|--------------------------|
|         | Water Resistance (ASTM E 547-00)<br>WTP = 2.86 psf  | No leakage     | No leakage               |
| 2.1.4.1 | Uniform Load Deflection (ASTM E 330-97)<br>(Measurements reported were taken on the jamb)<br>(Loads were held for 33 seconds)<br>@ 25.9 psf (positive)<br>@ 34.7 psf (negative) | 0.01"<br>0.01" | 0.41" max.<br>0.41" max. |
| 2.1.4.2 | Uniform Load Structural (ASTM E 330-97)<br>(Measurements reported were taken on the jamb)<br>(Loads were held for 10 seconds)<br>@ 38.9 psf (positive)<br>@ 52.1 psf (negative) | 0.0"<br>0.01"  | 0.29" max.<br>0.29" max. |



*Allen H. Reeves*  
1 APRIL 2002



## **AAMA/NWWDA 101/I.S.2-97 TEST REPORT**

Rendered to

MI HOME PRODUCTS, INC.  
650 West Market Street  
P.O. Box 370  
Gratz, Pennsylvania 17030-0370

Report No: 01-41135.01  
Test Date: 03/07/02  
Report Date: 03/26/02  
Expiration Date: 03/07/06

**Project Summary:** Architectural Testing, Inc. (ATI) was contracted by MI Home Products, Inc. to perform tests on Series/Model 650, aluminum picture window at their facility located in Elizabethville, Pennsylvania. The samples tested successfully met the performance requirements for a F-R45 60 x 80 rating.

**Test Specification:** The test specimen was evaluated in accordance with AAMA/NWWDA 101/I.S.2-97, *Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors*.

### **Test Specimen Description**

**Series/Model:** 650

**Type:** Aluminum Picture Window

**Overall Size:** 5' 0" wide by 6' 8" high

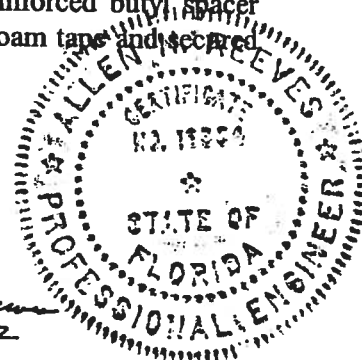
**Daylight Opening Size:** 4' 9-1/4" wide by 6' 5-1/4" high

**Finish** All aluminum was white.

**Glazing Details:** The test specimen utilized 7/8" thick, sealed insulating glass constructed from two sheets of 3/16" thick, clear annealed glass and a metal reinforced butyl spacer system. The glass was interior glazed against double-sided adhesive foam tape and secured with aluminum snap-in glazing beads.

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Allen M. Reeves  
1 APR 12 2002





**AAMA/NWWDA 101/LS.2-97  
TEST REPORT SUMMARY**

**Rendered to:**

**MI HOME PRODUCTS, INC.**

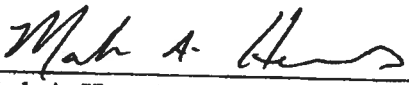
**SERIES/MODEL: 650**

**TYPE: Aluminum Picture Window**

| Title of Test            | Results                  |
|--------------------------|--------------------------|
| Rating                   | F-R45 60 x 80            |
| Overall Design Pressure  | +45.0 psf<br>-47.2 psf   |
| Air Infiltration         | 0.04 cfm/ft <sup>2</sup> |
| Water Resistance         | 8.25 psf                 |
| Structural Test Pressure | +67.5 psf<br>-70.8 psf   |
| Forced Entry Resistance  | Grade 10                 |

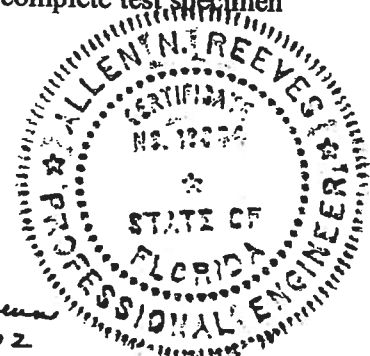
Reference should be made to Report No. 01-41135.01 dated 03/26/02 for complete test specimen description and data.

For ARCHITECTURAL TESTING, INC.

  
Mark A. Hess, Technician

MAH:nlb

*Allen N. Reeves*  
1 APRIL 2002



# 650 SH & PW SERIES - MILE PER HOUR (MPH) MAXIMUM SIZE CHART

PAGE 2 OF 2


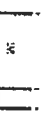
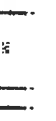




| SERIES/TYPE   | MPH ZONE(S)   | REQUIRED MULLION                    | MAXIMUM SIZES ALLOWED     |                           |                       |
|---|---------------|-------------------------------------|---------------------------|---------------------------|-----------------------|
|   |               |                                     | SINGLE UNIT               | TWIN UNIT                 | TRIPLE UNIT           |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS          | UP TO 120 MPH | HORIZONTAL<br>MULL<br>#5765         | N/A                       | 53-1/8" x 72" w/T RANSOM* | 32" x 72" w/T RANSOM* |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS          | UP TO 140 MPH | HORIZONTAL<br>MULL<br>#5765         | N/A                       | 45" x 72" w/T RANSOM*     | 30" x 72" w/T RANSOM* |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS             | UP TO 110 MPH | SELF-<br>STACKING SILL<br>#CM-45026 | 53-1/8" x 72" w/T RANSOM* | N/A                       | N/A                   |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS             | UP TO 120 MPH | SELF-<br>STACKING SILL<br>#CM-45026 | 48" x 72" w/T RANSOM*     | N/A                       | N/A                   |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS             | UP TO 140 MPH | SELF-<br>STACKING SILL<br>#CM-45026 | 37" x 72" w/T RANSOM*     | N/A                       | N/A                   |
| 650 SH OR PW<br>CONTINUOUS HDR & SILL<br>SNG GLZ OR INS | UP TO 140 MPH | (NO MULLION)                        | N/A                       | 36" x 72"                 | 36" x 72"             |

\*1 All Transoms (1, 2, & 3-Lites) must be continuous frame.

\*2 Transom units must be a minimum of 1/0 tall. The maximum transom height is one half the width of the transom. Both Single Hung & Picture Windows can be used in combination up to the maximum sizes listed above.

# 650 SH & PW SERIES - MILE PER HOUR (MPH) MAXIMUM SIZE CHART

PAGE 1 OF 2

| SERIES/TYPE   | MPH ZONE(S)   | REQUIRED MULLION                | MAXIMUM SIZES ALLOWED   |               |                                  |
|---|---------------|---------------------------------|---|---------------|----------------------------------|
|   |               |                                 | SINGLE UNIT   | TWIN UNIT     | TRIPLE UNIT                      |
| 650 SH OR PW<br>FIN OR FLANGE FRAME<br>SNG GLZ OR INS | UP TO 140 MPH | N/A                             | N/A   | 53-1/8" x 72" | N/A                              |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 130 MPH | VERTICAL<br>MULL<br>#CM-65130   |  | N/A           | 53-1/8" x 72"                    |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 140 MPH | VERTICAL<br>MULL<br>#CM-65130   |  | N/A           | 53-1/8" x 63"<br>OR<br>42" x 72" |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS        | UP TO 130 MPH | VERTICAL<br>MULL<br>#CM-65129   |    | N/A           | 53-1/8" x 72"                    |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS        | UP TO 140 MPH | VERTICAL<br>MULL<br>#CM-65129   |    | N/A           | 53-1/8" x 63"<br>OR<br>42" x 72" |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 120 MPH | HORIZONTAL<br>MULL<br>#CM-65131 |    | N/A           | 53-1/8" x 72" w/T RANSOM*        |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 140 MPH | HORIZONTAL<br>MULL<br>#CM-65131 |    | N/A           | 45" x 72" w/T RANSOM*            |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS        | UP TO 120 MPH | HORIZONTAL<br>MULL<br>#CM-65129 |    | N/A           | 37" x 72" w/T RANSOM*            |
| 650 SH OR PW<br>FLANGE FRAME<br>SNG GLZ OR INS        | UP TO 140 MPH | HORIZONTAL<br>MULL<br>#CM-65129 |    | N/A           | 30" x 72" w/T RANSOM*            |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 120 MPH | HORIZONTAL<br>MULL<br>#5767     |    | N/A           | 53-1/8" x 72" w/T RANSOM*        |
| 650 SH OR PW<br>FIN FRAME<br>SNG GLZ OR INS           | UP TO 140 MPH | HORIZONTAL<br>MULL<br>#5767     |    | N/A           | 45" x 72" w/T RANSOM*            |

\*1 All Transoms (1, 2, & 3-Lites) must be continuous frame.

\*2 Transom units must be a minimum of 1/0 tall. The maximum transom height is one half the width of the transom. Both Single Hung & Picture Windows can be used in combination up to the maximum sizes listed above.



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. 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.

For ARCHITECTURAL TESTING, INC:

Mark A. Hess  
Technician

MAH:nlb  
01-41134.01

Allen N. Reeves, P.E.  
Director - Engineering Services  
1 APRIL 2002





**Test Specimen Description: (Continued)**

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>                              | <u>Results</u> | <u>Allowed</u> |
|------------------|---|----------------|----------------|
| 2.2.1.6.2        | Deglazing Test (ASTM E 987)<br>In operating direction at 70 lbs |                |                |
|                  | Meeting rail  | 0.12"/25%      | 0.50"/100%     |
|                  | Bottom rail   | 0.12"/25%      | 0.50"/100%     |
|                  | In remaining direction at 50 lbs                                |                |                |
|                  | Left stile  | 0.06"/12%      | 0.50"/100%     |
|                  | Right stile   | 0.06"/12%      | 0.50"/100%     |
|                  | Forced Entry Resistance (ASTM F 588-97)                         |                |                |
|                  | Type: A   |                |                |
|                  | Grade: 10   |                |                |
|                  | Lock Manipulation Test  | No entry       | No entry       |
|                  | Tests A1 through A5   | No entry       | No entry       |
|                  | Test A7   | No entry       | No entry       |
|                  | Lock Manipulation Test  | No entry       | No entry       |

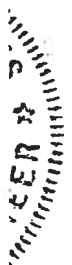
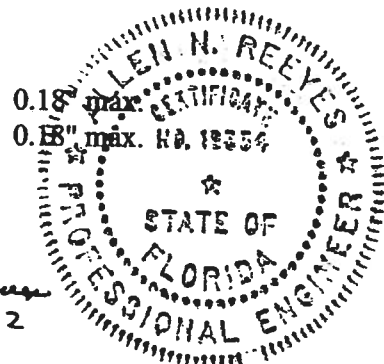
**Optional Performance**

|     |   |            |            |
|-----|---|------------|------------|
| 4.3 | Water Resistance (ASTM E 547-00)<br>(with and without screen)<br>WTP = 6.00 psf   | No leakage | No leakage |
|     | Uniform Load Deflection (ASTM E 330-97)<br>(Measurements reported were taken on the meeting rail)<br>(Loads were held for 33 seconds) |            |            |
|     | @ 45.0 psf (positive)   | 0.47"*     | 0.26" max. |
|     | @ 47.2 psf (negative)   | 0.46"*     | 0.26" max. |

*\*Exceeds L/175 for deflection, but passes all other test requirements.*

|   |       |
|---|-------|
| Uniform Load Structural (ASTM E 330-97)<br>(Measurements reported were taken on the meeting rail)<br>(Loads were held for 10 seconds) |       |
| @ 67.5 psf (positive)   | 0.05" |
| @ 70.8 psf (negative)   | 0.05" |

*Allen N. Reeves*  
1 APRIL 2002





**Test Specimen Description: (Continued)**

**Weatherstripping:**

| <u>Description</u>                                    | <u>Quantity</u> | <u>Location</u>                       |
|---|-----------------|---------------------------------------|
| 0.230" high by 0.270" backed polypile with center fin | 1 Row           | Fixed meeting rail                    |
| 0.250" high by 0.187" backed polypile with center fin | 2 Rows          | Active sash stiles                    |
| 1/2" x 1/2" dust plug                                 | 4 Pieces        | Active sash, top and bottom of stiles |
| 1/4" foam-filled vinyl bulb seal                      | 1 Row           | Active sash, bottom rail              |

**Frame Construction:** The frame was constructed of extruded aluminum with coped, butted, and sealed corners fastened with two #8 x 1" screws through the head and sill into each jamb screw boss. End caps were utilized on the ends of the fixed meeting rail and secured with two 1-1/4" screws per cap. Meeting rail was secured to the frame utilizing two 1-1/4" screws.

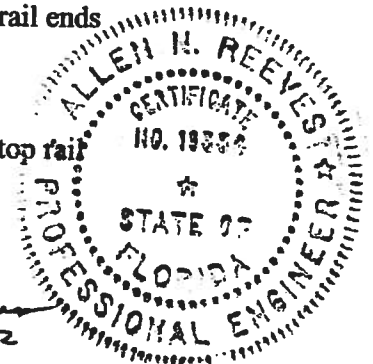
**Sash Construction:** The sash was constructed of extruded aluminum with coped, butted, and sealed corners fastened with two #8 x 1-1/2" screws through the rails into each jamb screw boss.

**Screen Construction:** The screen was constructed from roll-formed aluminum with keyed corners. The fiberglass mesh was secured with a flexible spline.

**Hardware:**

| <u>Description</u>         | <u>Quantity</u> | <u>Location</u>   |
|----------------------------|-----------------|---|
| Metal cam lock with keeper |                 | Midspan, active meeting rail with keeper adjacent on fixed meeting rail |
| Plastic tilt latch         | 2               | Active sash, meeting rail ends  |
| Metal tilt pin             | 2               | Active sash, bottom rail ends   |
| Balance assembly           | 2               | One in each jamb  |
| Screen plunger             | 2               | 4" from rail ends on top rail   |

*Allen H. Reeves*  
1 APRIL 2002





Architectural Testing

**AAMA/NWWDA 101/I.S.2-97 TEST REPORT**

Rendered to

MI HOME PRODUCTS, INC.  
650 West Market Street  
P.O. Box 370  
Gratz, Pennsylvania 17030-0370

Report No: 01-41134.01

Test Date: 03/07/02

Report Date: 03/26/02

Expiration Date: 03/07/06

**Project Summary:** Architectural Testing, Inc. (ATI) was contracted by MI Home Products, Inc. to perform tests on Series/Model 650 Fin, aluminum single hung window at their facility located in Elizabethville, Pennsylvania. The samples tested successfully met the performance requirements for a H-R40 52 x 72 rating.

**Test Specification:** The test specimen was evaluated in accordance with AAMA/NWWDA 101/I.S.2-97, *Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors*.

**Test Specimen Description:**

**Series/Model:** 650 Fin

**Type:** Aluminum Single Hung Window

**Overall Size:** 4' 4-1/4" wide by 6' 0-3/8" high

**Active Sash Size:** 4' 1-3/4" wide by 3' 0-5/8" high

**Daylight Opening Size:** 3' 11-3/8" wide by 2' 9-1/2" high

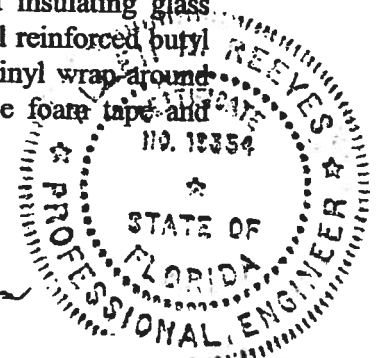
**Screen Size:** 4' 0-1/4" wide by 2' 11-1/8" high

**Finish:** All aluminum was white.

**Glazing Details:** The active and fixed lites utilized 5/8" thick, sealed insulating glass constructed from two sheets of 1/8" thick, clear annealed glass and a metal reinforced butyl spacer system. The active sash was channel glazed utilizing a flexible vinyl wrap around gasket. The fixed lite was interior glazed against double-sided adhesive foam tape and secured with PVC snap-in glazing beads.

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Allen M. Reeves  
1 APRIL 2002





**AAMA/NWDA 101/I.S.2-97  
TEST REPORT SUMMARY**

**Rendered to:**

**MI HOME PRODUCTS, INC.**

**SERIES/MODEL: 650 Fin  
TYPE: Aluminum Single Hung Window**

| Title of Test            | Results                  |
|--------------------------|--------------------------|
| Rating                   | H-R40 52 x 72            |
| Overall Design Pressure  | +45.0 psf<br>-47.2 psf   |
| Operating Force          | 11 lb max.               |
| Air Infiltration         | 0.13 cfm/ft <sup>2</sup> |
| Water Resistance         | 6.00 psf                 |
| Structural Test Pressure | +67.5 psf<br>-70.8 psf   |
| Deglazing                | Passed                   |
| Forced Entry Resistance  | Grade 10                 |

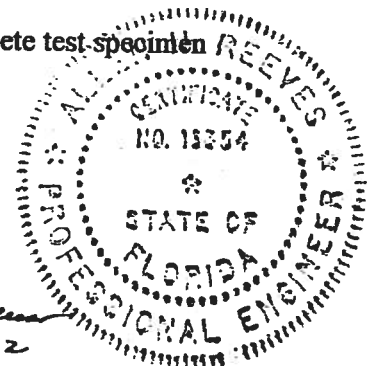
Reference should be made to Report No. 01-41134.01 dated 03/26/02 for complete test specimen description and data.

For ARCHITECTURAL TESTING, INC.

Mark A. Hess, Technician

MAH:nlb

*Allen M. Reeves*  
1 APRIL 2002





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. 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.

For ARCHITECTURAL TESTING, INC.

Bill Thorr  
Technician

BT:tjp  
01-38385.01

Allen N. Reeves, P.E.  
Director – Engineering Services

11 JANUARY 2001





**Test Results: (Continued)**

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>                                | <u>Results</u>  | <u>Allowed</u>  |
|------------------|---|-----------------|-----------------|
| 2.2.1.6.2        | Deglazing Test per ASTM E 987<br>In operating direction at 70 lbs |                 |                 |
|                  | Meeting Rail  | 0.12"/24%       | 0.50"/100%      |
|                  | Bottom Rail   | 0.12"/24%       | 0.50"/100%      |
|                  | In remaining direction at 50 lbs                                  |                 |                 |
|                  | Stile   | 0.09"/19%       | 0.50"/100%      |
|                  | Stile   | 0.09"/19%       | 0.50"/100%      |
| 2.1.7            | Welded Corner Test  | Meets as stated | Meets as stated |
| 2.1.8            | Forced Entry Resistance per ASTM F 588-97                         |                 |                 |
|                  | Type: A   |                 |                 |
|                  | Grade: 10   |                 |                 |
|                  | Lock Manipulation Test  | No entry        | No entry        |
|                  | Test A1 through A5  | No entry        | No entry        |
|                  | Test A7   | No entry        | No entry        |
|                  | Lock Manipulation Test  | No entry        | No entry        |

**Optional Performance**

|       |   |            |            |
|-------|---|------------|------------|
| 4.3   | Water Resistance per ASTM E 547-96 and ASTM E 331-96<br>(with and without screen)<br>WTP = 6.00 psf | No leakage | No leakage |
| 4.4.2 | Uniform Load Structural per ASTM E 330-97<br>(Measurements reported were taken on the bottom rail)  |            |            |
|       | @ 60 psf (exterior)   | 0.06"      | 0.18" max. |
|       | @ 60 psf (interior)   | 0.15"      | 0.18" max. |

**Structural Load Results for the North Carolina State Building Code:**

| <u>Title of Test – Test Method</u>                          | <u>Results</u> |
|---|----------------|
| Design Pressure<br>@ 47 psf (interior) for 33 seconds       | No damage      |
| Design Pressure<br>@ 47 psf (exterior) for 33 seconds       | No damage      |
| Structural Overload<br>@ 64.5 psf (interior) for 10 seconds | No damage      |
| Structural Overload<br>@ 64.5 psf (exterior) for 10 seconds | No damage      |
| Structural Overload<br>@ 70.5 psf (interior) for 10 seconds | No damage      |
| Structural Overload<br>@ 70.5 psf (exterior) for 10 seconds | No damage      |



## Test Specimen Description: (Continued)

### Drainage:

| <u>Description</u>               | <u>Quantity</u> | <u>Location</u>   |
|----------------------------------|-----------------|---|
| 1/2" long by 5/32" wide weepslot | 2               | 1" from each end of glazing channel on bottom rails, draining the glazing channel |
| 1/2" long by 1/16" wide weepslot | 4               | 2-1/2" from each end of bottom rail, draining bottom rail hollow                  |
| 1" wide by 3/32" high weepnotch  | 2               | 2-1/2" from ends of sill, draining sill track                                     |
| 1" wide by 1/8" high weepslot    | 2               | 2-1/2" from ends of sill, draining sill hollow                                    |

**Reinforcement:** The fixed meeting rail included a custom shaped steel reinforcement, RF-104. The sash stiles and top rail included an "H" shaped steel reinforcement, RF-1575. The bottom rail included a custom shaped aluminum reinforcement, M-1575.

**Installation:** The test buck was fabricated from 2" x 8" Spruce-Pine-Fir fastened with 3" screws. The window was installed with 1" galvanized roofing nails in the nail fin 8" apart. Polyurethane was used as a sealant covering the nail heads and around the exterior perimeter.

## Test Results

The results are tabulated as follows:

| <u>Paragraph</u> | <u>Title of Test - Test Method</u>   | <u>Results</u>           | <u>Allowed</u>                                 |
|------------------|--|--------------------------|--|
| 2.2.1.6.1        | Operating Force  | 17 lbs                   | 30 lbs max.                                    |
|                  | Air Infiltration per ASTM E 283 (See Note #1)<br>@ 1.57 psf (25 mph)   | 0.11 cfm/ft <sup>2</sup> | 0.30 cfm/ft <sup>2</sup> max.                  |
|                  | Water Resistance per ASTM E 547-96<br>(with and without screen)<br>WTP = 6.00 psf  | No leakage               | No leakage @ 2.86 psf                          |
| 2.1.4.2          | Uniform Load Structural per ASTM E 330-97<br>(Measurements reported were taken on the bottom rail)<br>@ 60.0 psf (exterior)<br>@ 60.0 psf (interior) | 0.06"<br>0.15"           | 0.18" max. @ 22.5 psf<br>0.18" max. @ 22.5 psf |

**Note #1:** The tested specimen meets (or exceeds) the performance levels specified in AAMA/NWDA 101/I.S. 2-97 for air infiltration.



**Test Specimen Description: (Continued)**

**Glazing Details:** The sash and fixed lite were glazed with a 7/8" thick sealed insulating glass unit fabricated from two sheets of 3/32" clear annealed glass and a metal reinforced butyl spacer system. The insulating glass was interior drop-in glazed with two-sided adhesive foam glazing tape and a snap-in vinyl glazing bead.

**Weatherstripping:**

| <u>Description</u>   | <u>Quantity</u> | <u>Location</u>                 |
|--|-----------------|---------------------------------|
| 0.230" high by 0.187" wide backed polypile with center fin | 2 Rows          | Stiles                          |
| 0.230" high by 0.187" wide backed polypile with center fin | 1 Row           | Meeting rail, sill vertical leg |
| 3/8" diameter vinyl wrapped foam bulb                      | Row             | Bottom rail                     |
| 1/8" diameter vinyl wrapped foam bulb                      | 1 Row           | Interior of fixed meeting rail  |

**Frame Construction:** All frame members were constructed of extruded vinyl with mitered and welded corners. The fixed meeting rail was attached to the jambs with three screws per end.

**Sash Construction:** All sash members were constructed of extruded vinyl with mitered and welded corners.

**Screen Construction:** The screen frame was constructed from rolled aluminum members with keyed corners. The screening consisted of a fiberglass mesh that was secured with a flexible spline.

**Hardware:**

| <u>Description</u>           | <u>Quantity</u> | <u>Location</u>                             |
|------------------------------|-----------------|---|
| Metal sweep lock             | 2               | 6-1/2" from ends of interior meeting rail   |
| Metal keeper                 | 2               | 6-1/2" from ends of fixed meeting rail      |
| Plastic tilt latch           | 2               | Ends of interior meeting rail               |
| Metal pivot bar              | 2               | Ends of bottom rail                         |
| Coil spring balance assembly | 2               | One per jamb                                |
| Screen leaf spring           | 2               | 6" from corners on screen top rail          |
| Screen plunger               | 2               | 2-1/2" from bottom corners on screen stiles |



Architectural Testing

**AAMA/NWWDA 101/I.S.2-97 TEST REPORT**

Rendered to:

MI HOME PRODUCTS, INC.  
650 West Market Street  
Gratz, Pennsylvania 17030-0370

Report No: 01-38385.01  
Test Dates: 11/10/00  
Thru: 12/20/00  
Report Date: 01/10/01  
Expiration Date: 12/20/04

**Project Summary:** Architectural Testing, Inc. (ATI) was contracted to perform tests on a Series/Model 8540, vinyl single hung window at the MI Home Products, Inc. test facility in Elizabethville, Pennsylvania. The sample tested successfully met the performance requirements for an H-R40 48 x 72 rating. Test specimen description and results are reported herein.

**Test Specification:** The test specimen was evaluated in accordance with AAMA/NWWDA 101/I.S.2-97, *Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors*.

**Test Specimen Description**

**Series/Model:** 8540

**Type:** Vinyl Single Hung

**Overall Size:** 3' 11-1/2" wide by 5' 11-1/2" high

**Active Sash Size:** 3' 9-1/6" wide by 2' 10-9/16" high

**Fixed Daylight Opening Size:** 3' 6-1/4" wide by 2' 7-3/8" high

**Screen Size:** 3' 7-9/16" wide by 2' 10" high

**Finish:** All vinyl was white.

130 Derry Court  
York, PA 17402-9405  
phone: 717.764.7700  
fax: 717.764.4129  
www.testati.com



**AAMA/NWWDA 101/I.S.2-97  
TEST REPORT SUMMARY**

**Rendered to:**

**MI HOME PRODUCTS, INC.**

**SERIES/MODEL: 8540**

**TYPE: Vinyl Single Hung Window**

**RATING: H-R40 48 x 72**

| Title of Test            | Results                  |
|--------------------------|--------------------------|
| Overall Design Pressure  | 40 psf                   |
| Operating Force          | 17 lb max.               |
| Air Infiltration         | 0.11 cfm/ft <sup>2</sup> |
| Water Resistance         | 6.0 psf                  |
| Structural Test Pressure | +/- 70.5 psf             |
| Deglazing                | Passed                   |
| Forced Entry Resistance  | Grade 10                 |

Reference should be made to Report No. 01-38385.01 for complete test specimen description and data.

For ARCHITECTURAL TESTING, INC.

  
Bill Thor, Technician

BT:tjp