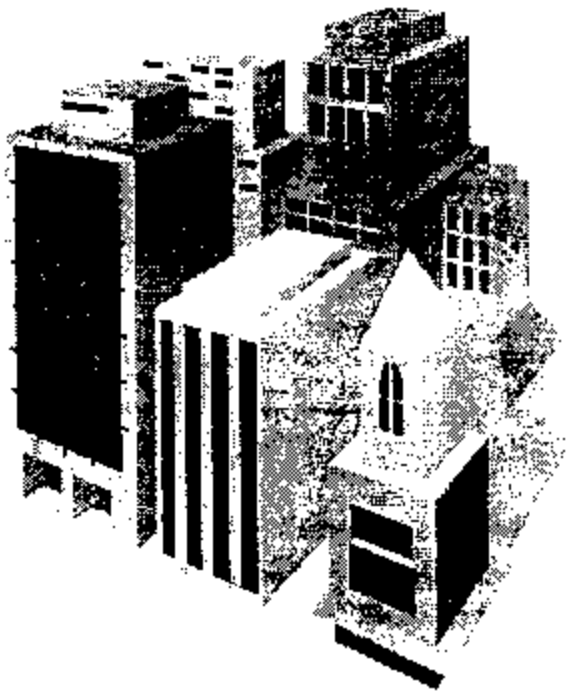


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Report Number ETC-00-552-11347.0

Test Start Date: 11/19/01

Test Finish Date: 11/20/02

Report Date: 02/21/02

Expiration Date: 02/21/06

## Fenestration Structural Test Report

Rendered To

Great Lakes Windows, Inc.  
30499 Tracy Road  
Toledo, OH 43603

### Series/Model

GLW-CF-101 Fixed Casement

**Description:** The product tested was a vinyl Fixed window. The window was glazed with an IG unit with an overall nominal thickness of 7/8 inches and consisting of two lights of double strength annealed 3/16 " glass and a steel channel spacer. The exterior frame dimensions of the window were 76 inches wide by 75 inches high by 3-1/4 inches deep.

**Test Specification:** AAMA/NWWDA 101/I.S.2-97

## Summary of Results

Overall Design Pressure	60.0 psf
Air Leakage Rate	0.01 scfm/ft <sup>2</sup>
Maximum Water Pressure Achieved	9.0 psf
Maximum Structural Pressure Achieved	97.5 psf
Forced Entry Resistance – ASTM F 588	Pass
<b>Overall Product Rating</b>	<b>F –R60 – 76 x 75</b>

### *Accreditations/Recognitions*

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**Specifications:** The test specimen was evaluated in accordance with AAMA/NWWDA 101/I.S.2-97 "Voluntary Specification For Aluminum, Vinyl and Wood Windows and Glass Doors", sections 1,2 and 4 only. All performance specifications in this standard shall be met for full compliance to the standard and for product certification, labeling or represented as conforming to this standard.

**Referenced Test Reports:** None

*Note - The test data in any section below with an "RTR" comment have not been obtained from this specimen but from the Referenced Test Report with a specimen of the same or larger size and identical construction.*

**Design Pressure (DP)** - The product tested herein has been first evaluated to the Gateway pressure in the referenced specification for the performance class rating achieved.

## Gateway Performance Tests

Specification Paragraph	Title of Test	Results	Allowed
2.1.2	<u>Air Infiltration - ASTM E283-91</u> Test Pressure - 1.57 psf The tested specimen exceeds the performance levels specified in AAMA/NWWDA 101/I.S.2-97 for air infiltration.	0.01 scfm/ft <sup>2</sup>	0.3 scfm/ft <sup>2</sup>
2.1.3	<u>Water Resistance - ASTM E547</u> 5 gal/hr-ft <sup>2</sup> - 4 Test cycles - 24 Minutes Design Pressure - 15.0 psf Test Pressure - 2.86 psf With Screen Without Screen	N/A Pass	No Leakage No Leakage
2.1.4.2	<u>Uniform Structural Load - ASTM E 330</u> Design Pressure - 15.0 psf Test Pressure Positive Load - 22.5 psf (150% x DP) Negative Load - 22.5 psf (150% x DP)	Pass Pass	No Damage No Damage
2.1.7	<u>Welded Corner Test</u> Load corner weld to failure	Pass	<100%
2.1.8	<u>Forced Entry Resistance</u> ASTM F588-97 Lock Manipulation Test	Pass	No Entry

### Accreditations/Recognitions

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## Optional Performance Tests

The manufacturer specified herein has successfully achieved all the required criteria in section 2 of the referenced specification for the Gateway size of the achieved Performance Rating and has further successfully tested the product to higher performance levels as indicated below.

**Design Pressure (DP)** – The product tested herein has been additionally evaluated to the Design Pressure referenced below.

### Specification

<u>Paragraph</u>	<u>Title of Test</u>	<u>Results</u>	<u>Allowed</u>
4.3	<i>Water Resistance - ASTM E 547</i> 5 gal/hr-ft <sup>2</sup> – 4 Test cycles – 24 Minutes <b>Design Pressure - 60.0 psf</b> <b>Test Pressure – 9.0 psf (15% x DP)</b> With Screen Without Screen	N/A Pass	No Leakage No Leakage
4.4.2	<i>Uniform Structural Load - ASTM E 330</i> <b>Design Pressure - 65.0 psf</b> <b>Test Pressure</b> <b>Positive Load – 97.5 psf (150% x DP)</b> <b>Negative Load – 97.5 psf (150% x DP)</b>	Pass Pass	No Damage No Damage

### *Accreditations/Recognitions*

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## Product Description of Test Specimen

### Glazing:

Overall Thickness	7/8 nominal (0.843 in.)
Thickness of Glass(s)	3/16 inch (0.186/.0185) - annealed
Number of Lights	Two
Laminate Thickness	NA
Sealant Material(s)	PIB
Spacer Material	Steel channel (0.485 in. W x 0.325 in. H)

### Frame:

Width, Height, Depth	76 in. W x 75 in. H x 3-1/4 in. Deep
Material	Vinyl
Corner Construction	Mitered
Corner Fastening	Welded
Corner Sealing	None
Cladding	None
Method of Glazing	Interior drop in
Exterior	Dual-durometer lip on glazing leg of frame and wet glazed with silicone
Interior	Snap-in vinyl glazing bead

### Weather-stripping

Frame	
Head	None
Sill	None
Jambs	None

### Drainage:

Type	Weep slots
Quantity	4 slots
Size:	0.4 in. W x 0.115 in. H slots
Location:	Two from glazing pocket to sill cavity and two from sill cavity to the exterior

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## Product Description of Test Specimen (con't)

### Anchorage of Frame to Test Buck:

Type	Screws
Material	Steel
Size	#8 x 2-1/2 in. long
Quantity	20
Location	Five per side 4 and 17 inches from the corners and centered on the head and sill, 4 and 19-1/2 inches from the corners and centered on the jambs.

### Test Buck:

Mounting Gap	1/8 in.
Shims-Qty./Location	15 shims at the fastener locations on the jambs and head
Stops: size, Qtn., Loc.	None
Sealant	Silicone
Buck Size	Double bucked, 2 x 8 used for the outside buck, 2 x 6 used for the inside buck
Material	Pine
Grade	#2

Review of Bill of Materials – Reviewed as supplied

Review of Assembly and Detail Drawings – Reviewed as supplied – FIXED  
CASEMENT SECTION, EV00739, EV00578

Components changed or altered during testing to achieve stated results – None

*This report, in its original form contains product drawings and a Bill of Materials.*

### Product Description Approval

Clients Representative Signature on File

Date: 03/09/00

### Product Description Analysis

\_\_\_\_\_  
William Yanda  
Laboratory Representative

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## Conditions, Terms, and General Notes Regarding These Tests

The product tested has been compared to the detailed drawings, bill of materials and fabrication information supplied by the client so named herein. Our analysis, which includes dimensional and component description comparisons, indicate the tested product and engineering information supplied by the client "**Are Equivalent**". The report and representative samples will be retained for four years from the date of initial test.

These test results were obtained by employing all requirements of the designated test methods with no deviations. The test results and specimen supplied for testing are in compliance with the referenced specifications.

The test results are specific to the product tested by this laboratory and of the sample supplied by the client named herein, and they relate to no other product either manufactured by the client, a Fabricator of the client or of installed field performance.

This report does not constitute an AAMA or NWWDA certified product under the certification programs of these organizations. The program administrator of these programs and organizations may only grant product certification.

ETC Laboratories makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of ETC Laboratories.

No conclusions of any kind regarding the adequacy of the glass in the test specimen may be drawn from the test. Procedure "A" in ASTM E330 was used for this test.


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**Limitation of Liability:** Due diligence was used in rendering this professional opinion. By acceptance of this report, this client agrees to hold harmless and indemnify ETC Laboratories, it's employees and offices and owners against all claims and demands of any kind whatsoever, which arise out of or in any manner connected with the performance of work referred to herein. ETC laboratories reserves the right to subcontract any and all work for its clients in order to fulfill its contractual obligations for testing to these standards.

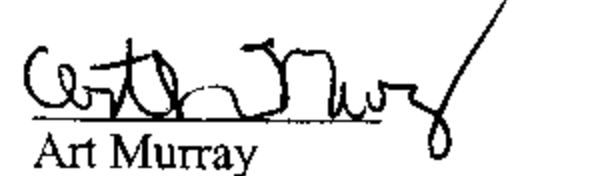


VPTS Approval

**For ETC Laboratories**



William Yanda  
Test Technician



Art Murray  
Manager, Wind Engineering  
Laboratory

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