

PROJECT NUMBER:180-6106

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DATE: 2/21/00**

**STORK[®] TWIN CITY TESTING
723 S. 72nd AVE STE B
Wausau, WI 54401**

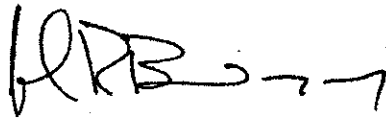
**LABORATORY TESTING OF
MONUMENT VINYL BUILDERS SINGLE HUNG
MANUFACTURED BY
HURD MILLWORK COMPANY**

**Prepared for:
HURD MILLWORK COMPANY
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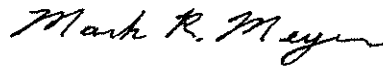
Client Purchase Order Number: Verbal

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The test results contained in this report pertain only to the specimens tested and not necessarily to all similar products.



LABORATORY TESTING OF 4-0 X 6-5 VBSH WINDOW

INTRODUCTION:

This report presents the results of laboratory testing conducted on a Vinyl Builders Single Hung window manufactured by Hurd Millwork Company. This work was requested and authorized by Mr. Bob Fales of Hurd Millwork with testing conducted on February 14, 2000.

The purpose of the testing was to determine the performance of the window for air infiltration, water resistance, and structural integrity when tested in accordance with ASTM procedures included in ANSI/AAMA/WDMA 101/I.S.2-97 "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors".

TEST RESULTS SUMMARY:

The window described herein meets performance specifications for ANSI/AAMA/WDMA 101/I.S.2-97 H-LC35.

Design Pressure Rating: For use in locations adhering to the S.B.C.C.I., S.F.B.C., S.F.B.C. Broward Edition and where the pressure requirements as determined by ASCE 7 minimum design loads for buildings and other structures does not exceed design pressure ratings listed above.

SAMPLE DESCRIPTION:

Overall Size: 47-1/2" wide by 76-1/2" high

Unit Area: 25.23sqft

Finish: White vinyl

Glazing: The window utilized nominal 3/4" insulating glass comprised of two nominal 3mm thick double strength clear annealed sheets. All the glass was set on blocks, closed cell foam tape against the sash on the interior and vinyl glazing beads on the exterior. Silicone was applied at the corners.

SAMPLE DESCRIPTION (CON'T):

Weatherstripping: A 0.250" high woolpile with center fin was applied to the exterior perimeter of the sash..

Hardware: The sash was hung on block & tackle balances. A sweep latch was double screw connected using #6 x 3/4" screws approximately 5" from each end of the active interlock and engaged a full length groove in the fixed interlock.

Drainage: The interior sill pocket was drained through a 1/4" x 5/8" slot approximately 3" from each inside sill corner. Water then drained to the exterior through a 3/8" x 1/4" slot approximately 1-1/2" from each exterior sill corner. The sash bottom rail glazing pocket was drained from a 1/4" x 3/8" slot approximately 3-1/2" from each end, then through the bottom of the extrusion through a notch in the welded corners. Water drained from the fixed lite glazing pocket through the tooling at each end of the fixed interlock.

Frame/Sash Construction: White vinyl extrusions with welded corners. The fixed interlock was fitted, sealed and double screw connected using #6 x 2-3/4" screws to the jambs.

Reinforcement: Aluminum reinforcement was used in the fixed interlock

Screen Construction: The screen Frame was roll-formed aluminum with plastic corner Keys. Fiberglass screen cloth was attached to the frame with a rubber spline.

Installation: The test specimen was installed within a 1 1/2" by 6" wood buck. The window frame was secured to the wood buck by utilizing the vinyl nailing fin with 2" galvanized roofing nails spaced 4" on center and sealed with a quality silicone sealant.

TEST RESULTS:

	<u>ACTUAL</u>	<u>PERFORMANCE REQUIREMENTS</u>
<u>Air Infiltration</u>		
Chamber Pressure, psf	+1.57	+1.57
Unit Area, ft ²	25.16	
Air Infiltration, cfm	2.10	
cfm/ft ²	0.08	0.30 maximum
<u>Static Water Penetration</u>		
<u>With Screens</u>		
Chamber Pressure, psf	5.25	5.25
Water Flow Rate, gal/hr/ft ²	5.00	5.00 minimum
Pressurized Duration, min.	5.0	5.0
Unpressurized Duration, min.	1.0	1.0
Cycles	4	4
Water Penetration	NONE	No water shall flow over the interior face.
<u>Without Screens</u>		
Chamber Pressure, psf	5.25	5.25
Water Flow Rate, gal/hr/ft ²	5.00	5.00 minimum
Pressurized Duration, min.	5.0	5.0
Unpressurized Duration, min.	1.0	1.0
Cycles	4	4
Water Penetration	NONE	No water shall flow over the interior face.
<u>Structural Load Test</u>		
Chamber Pressure, psf	+52.5	+52.5
Duration, sec.	10.00	10.00
Permanent Set, in.	Negligible	<0.4%L = 0.382 maximum
Chamber Pressure, psf	-52.5	-52.5
Duration, sec.	10.00	10.00
Permanent Set, in.	Negligible	<0.4%L = 0.382 maximum
<u>Operating Force</u>		
Opening	24lbs	35lbs
Closing	20lbs	35lbs

TEST RESULTS (CON'T):

Forced Entry Resistance (ASTM F588-97, performance grade 10)

<u>Test</u>	<u>Load (lbs)</u>	<u>Duration (min)</u>	<u>Performance</u>
Lock Manipulation	---	5	Satisfactory (PASS)
A1	75	5	Satisfactory (PASS)
A2	150, 75	5	Satisfactory (PASS)
A3	150, 75	5	Satisfactory (PASS)
A4	150, 75	5	Satisfactory (PASS)
A5	150, 75	5	Satisfactory (PASS)
A7	150, 75, 25	5	Satisfactory (PASS)
Lock Manipulation	---	5	Satisfactory (PASS)

Deglazing

ACTUAL

**PERFORMANCE
REQUIREMENTS**

Deglazing bite @ 70 lbs	0.06"	0.50"
Deglazing bite @ 50 lbs	0.03"	0.50"

Corner Weld Test

Break corners of test unit	Pass	Breakage not to extend along entire weld line
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TEST PROCEDURE:

The tests were conducted in accordance with ASTM and ANSI/AMMA/WDMA 101/I.S.2-97 test procedures and the results were compared to the performance requirements.

Air Infiltration

ASTM:E283-91, Standard Test Methods for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors. Testing was conducted at 1.57psf test chamber static pressure.

Water Penetration

ASTM:E547-96, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference. Testing was conducted at 5.25 psf, test chamber static pressure while water was applied continuously to the entire window at a rate greater than or equal to 5 gal/hr/sq ft for four cycles consisting of 5 minutes pressurized and 1 minute unpressurized.

Physical Load Testing

ASTM:E330-96, Standard Test Methods for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differences. Permanent set measurements were recorded at positive/ negative 52.5 psf test chamber pressure.

Forced Entry Resistance

ASTM: F588-97, Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact. Performed in accordance with Type A (Single Hung) windows.

Deglazing

ASTM: E987-88, Standard Test Methods for Deglazing Force of Fenestration Products

Corner Weld Test

ANSI/AAMA/WDMA 101/I.S.2.97, Section 2.1,7 and APPENDIX A

REMARKS:

The tested window remained in the custody of the manufacturer after testing was completed. Twin City Testing will retain detailed drawings and a copy of this report. The above results were obtained by using the designated test methods and they indicate compliance with the performance requirements of the above referenced guidelines. Certification of this product may only be granted by a certification administrator.