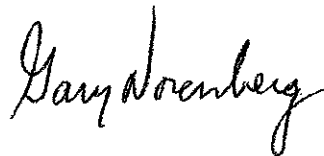


PROJECT NUMBER:180-6129

PAGE:1 OF 6  
DATE: 5/2/00**STORK® TWIN CITY TESTING**  
723 S. 72<sup>nd</sup> AVE STE B  
Wausau, WI 54401**LABORATORY TESTING OF  
MONUMENT VINYL DOUBLE HUNG WINDOW  
MANUFACTURED BY  
HURD MILLWORK COMPANY****Prepared for:**  
**HURD MILLWORK COMPANY**  
Attn: Mr. Art Kuss  
520 South Whelen Street  
Medford, WI 54451Test Date: 03/15/2000  
Expiration Date: 03/15/2004  
Class: H-R15 46x77

Prepared By:

Reviewed By:

John R. Bordagaray  
Office Manager (Wausau)  
Product Testing Department  
Telephone: (715) 848-3935Gary Norenberg  
Engineering Technician  
Product Testing Department  
Telephone: (715) 848-3935

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

**LABORATORY TESTING OF A 46 X 77 VDH WINDOW**

**INTRODUCTION:**

This report presents the results of laboratory testing conducted on a vinyl double hung window manufactured by Hurd Millwork Company. This work was requested and authorized by Mr. Art Kuss of Hurd Millwork with testing conducted on March 15, 2000 and May 1, 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-R15 46x77.

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: | 45-1/2" wide by 76-1/2" high |
| Top Sash:     | 41-7/8" wide by 37-7/8" high |
| Bottom Sash:  | 42-3/4" wide by 37-7/8" high |
| Unit Area:    | 24.17 sqft                   |
| Finish:       | White vinyl                  |

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

**SAMPLE DESCRIPTION (CON'T):****Weatherstripping:**

| <u>Description</u>                   | <u>Quantity</u> | <u>Location</u>        |
|--------------------------------------|-----------------|------------------------|
| .500" Vinyl wrapped Foam hollow bulb | 1 row           | Lower sash bottom rail |
| .250" Pile                           | 2 rows          | Sash stiles            |
| .250" Pile                           | 1 row           | Meeting rails          |

**Frame Construction:** Frame corners were miter cut and welded.

**Sash Construction:** Sash corners were miter cut and welded.

**Hardware:**

| <u>Description</u>             | <u>Quantity</u> | <u>Location</u>                     |
|--------------------------------|-----------------|-------------------------------------|
| Block and tackle balance       | 2               | One per jamb                        |
| Metal lock with keeper         | 2               | Sash meeting rail, 6" from each end |
| Metal tilt pins                | 4               | Bottom sash corners                 |
| Plastic concealed tilt latches | 4               | Top corner of top and bottom sash   |

**Drainage:**

| <u>Description</u>     | <u>Quantity</u> | <u>Location</u>  |
|------------------------|-----------------|--|
| 3/8" by 1/4" weep hole | 4               | Sill exterior and inner cavity leg, 1 1/2" from each end |
| 5/8" by 1/4" weep hole | 2               | Sill to hollow below, 3" from each jamb                  |

**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.

**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.

**TEST RESULTS:**

|   | <b><u>ACTUAL</u></b> | <b><u>PERFORMANCE REQUIREMENTS</u></b>      |
|---|----------------------|---|
| <b><u>Air Infiltration</u></b>          |                      |   |
| Chamber Pressure, psf                   | +1.57                | +1.57                                       |
| Unit Area, ft <sup>2</sup>              | 24.17                |   |
| Air Infiltration, cfm                   | 6                    |   |
| cfm/ft <sup>2</sup>                     | 0.25                 | 0.30 maximum                                |
| <b><u>Static Water Penetration</u></b>  |                      |   |
| <b>With Screens</b>                     |                      |   |
| Chamber Pressure, psf                   | 2.86                 | 2.86  |
| Water Flow Rate, gal/hr/ft <sup>2</sup> | 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. |
| <b>Without Screens</b>                  |                      |   |
| Chamber Pressure, psf                   | 2.86                 | 2.86  |
| Water Flow Rate, gal/hr/ft <sup>2</sup> | 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. |
| <b><u>Structural Load Test</u></b>      |                      |   |
| Chamber Pressure, psf                   | +22.50               | +22.50                                      |
| Duration, sec.                          | 10.00                | 10.00                                       |
| Permanent Set, in.                      | Negligible           | <0.4%L = 0.159 maximum                      |
| Chamber Pressure, psf                   | -22.50               | -22.50                                      |
| Duration, sec.                          | 10.00                | 10.00                                       |
| Permanent Set, in.                      | Negligible           | <0.4%L = 0.159 maximum                      |

**TEST RESULTS (Cont.):**

|                               | <u>ACTUAL</u> | <u>PERFORMANCE REQUIREMENTS</u> |
|-------------------------------|---------------|---------------------------------|
| <b><u>Operating Force</u></b> |               |                                 |
| Top sash Opening              | 28lbs         | 30lbs                           |
| Top sash Closing              | 8lbs          | 30lbs                           |
| Bottom sash Opening           | 25lbs         | 30lbs                           |
| Bottom sash Closing           | 9lbs          | 30lbs                           |

**Forced Entry Resistance (ASTM F842-83, 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) |

**Corner Weld Test**

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

**Deglazing**

| <u>Load (lbs)</u>   | <u>Sash Movement</u> | <u>Requirement</u> |
|---------------------|----------------------|--------------------|
| 70 Horizontal rails | 0.06" or 16%         | < 0.375" or 100%   |
| 50 Other rails      | 0.03" or 8%          | < 0.375" or 100%   |

**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 2.86 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 22.5 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 (Double 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.