



# Intertek Testing Services ETL SEMKO

REPORT NO: 281-1328-1  
CLIENT NO: L27655  
DATE: February 6, 2001

DESCRIPTION: **Performance Evaluation of a Vinyl Window**

CLIENT: **Remodelers Supply Center**  
2500 North Pulaski Road, Chicago, IL, 60639

ATTENTION: **Ella Karpowicz**

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## Introduction

This report covers testing carried out on a window submitted January 16, 2001 for performance evaluation. Testing was performed in accordance with ANSI/AAMA/NWDA 101/I.S. 2-97.

## Description

**Designation:** Climateguard 1000 Series Single Hung.

**Type:** Vertically sliding tilt vinyl window, having one operating sash and one fixed lite.

**Condition:** New and undamaged.

**Frame:** Extruded vinyl frame members having welded corners. A horizontal mullion spanned the jambs at the mid point. Ends of the mullion were fastened with three #8 x 2-1/2" (63.5 mm) long pan head screws through each jamb. A vinyl sill pocket cover, complete with upstanding leg, was fitted to the interior sill track. The exterior sill track was also fitted with a vinyl cover complete with the upstanding leg towards the exterior. The upstanding leg of the exterior cover sandwiched three screen shims between itself and the exterior of the frame. Sash travel limiters and balance covers were fitted into the interior jamb tracks. The unit was installed into a wood buck by and captured by wooden 1" (25.4 mm) rounds on the interior and exterior. The rounds were nailed to the buck and sealed.

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**Description (contd) Frame: (contd)**

**Overall Size:** 44" wide by 60" high  
(1117 mm by 1524 mm)

**Sash:** Extruded vinyl sash members having welded corners. A vinyl interlock cover was fitted to the head rail. The all sash member were reinforced across their full lengths with extruded aluminum member fitted into their cavities (see drawing No. RS-SR). Vinyl tilt latches (Ashland Part# WH106-2511) were fastened at the ends of the interlock rail using two #8 by 1" (25.4 mm) pan head screws per latch. Steel pivot bars (Caldwell Part# PB-301) fastened to the ends of the sill rail using two #6 x 1/2" (12.7 mm) long flat head screws per bar, engaged shoes (Caldwell Part # 16H70) operated by spiral balance hardware (Caldwell Part # Aluma Tilt 5/8") installed into the jamb tracks. Two cam type locks (Deco Pr. Part # 677203) fastened using two #7 x 7/8" (22.23 mm) flat head screws, were installed 11-3/4" (298 mm) from the ends of the interior interlock rail engaged keepers (Deco Pr. Part # 677120) installed on the mullion. Each keeper was fastened using two #6 x 1" (25.4 mm) long flat head self-tapping screws.

**Overall Size:** 41-3/16" wide by 29-5/16" high  
(1046 mm by 745 mm)

**Glazing Method:**

**Sash:** Laid in glazed on "V" shaped co-extruded vinyl fins and a bed of silicone on the exterior with rigid vinyl stops complete with a double co-extruded vinyl fin on the interior. Three neoprene setting blocks, measuring 3/4" wide 1" long by 1/8" thick (19.1 mm by 25.4 mm by 3.2 mm), were placed at third points along each sash member.

**Fixed Lite:** Laid in glazed on "V" shaped co-extruded vinyl fins and a bed of silicone on the exterior with rigid vinyl stops complete with a double co-extruded vinyl fin on the interior. Three neoprene setting blocks, measuring 3/4" wide 1" long by 1/8" thick (19.1 mm by 25.4 mm by 3.2 mm), were placed at third points along each sash member.

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CLIENT: Remodelers Supply Center

DATE: February 6, 2001

- 3 of 9 -

REPORT No: 281-1328-1

CLIENT No : L27655

**Description** (contd)

**Glazing:** Factory sealed glazing units having two sheets of 7/64" (3 mm) glass, and a 5/8" (15.9 mm) air space and metal spacer.

**Igmac Identification:** None visible

**Screen:** Extruded aluminum screen members having fiberglass mesh.

**Retention Method:** Screen rails engaged tracks on the frame sill and mullion and two leaf springs at the head rail.

**Overall Size:** 40-3/16" wide by 27-1/8" high  
(1021 mm by 689 mm)

**Weather-stripping:** The horizontal mullion was single weather-stripped with finned woven pile (Schlegel Part # 7924-187). The stiles and sill were double weather-stripped on the interior and exterior edges with finned woven pile (Ultra Fab Part # W33215G). The exterior face of the stiles and sill were single weather-stripped with finned woven pile (Ultra Fab Part # W33215G).. The interlock cover was single weather-stripped with finned woven pile (Schlegel Part # 7924-187).

**Weep Holes:** Two 1/8" (3.2 mm) wide by 3/4" (19.1 mm) long slots drained the sash glazing cavity to the sash sill cavity. Two 1/8" (3.2 mm) wide by 3/4" (19.1 mm) wide slots drained the sash sill cavity to the interior sill cover. The sill cover was drained via the shoe track in the jambs to the sill track. The sill track was drained to the sill frame cavity by two slots measuring 1/2" (12.7 mm) long by 1/4" (6.4 mm) high slots. The sill cavity was drained to the exterior by two slots measuring 1-5/16" (33.3 mm) long by 3/16" (4.8 mm) high. The fixed lite glazing cavity drained to the mullion cavity via two 1/8" (3.2 mm) wide by 3/4" (19.1 mm) slots. The cavity drained to the exterior via two 1/8" (3.2 mm) wide by 3/4" (19.1 mm) slots. The screen track was drained to the frame sill cavity via two 1/8" (3.2 mm) wide by 3/4" (19.1 mm) slots.

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CLIENT: **Remodelers Supply Center**

DATE: February 6, 2001

- 4 of 9 -

REPORT NO: 281-1328-1

CLIENT No : L27655

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**Description (contd) Drawings:**

**Cross Sections:** Dominion Plastics Inc. drawings titled:  
Single Hung/Slider Vertical Section"

**Member Details:** Dominion Plastics Inc. Die Drawings  
Numbered: VS155, VS152, D514, D574,  
D576, D578, D584-VS, D585-VS.

A copy of the above drawings stamped "Intertek Testing Services  
NA Ltd." is enclosed with this report.

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**Testing**

**Operating Force Test**

**Tested: January 19, 2001**

The force required to operate the sash was measured and found to be as follows;

Description of Force	Maximum Measured		Maximum Allowable	
	lbs	(N)	lbs	(N)
Maintain motion Opening/closing	25	(111)	30	(140)

The test specimen meets the performance level specified in H-class for operating force.

**Air Leakage Test**

**Tested: January 18, 2001**

Air infiltration testing was performed at a pressure differential of 1.56 psf (75 Pa) in accordance with the procedure outlined in A.S.T.M. E283. A Meriam Instrument Co. laminar flow element, Model No. 50MW20-2, Serial No. 729710-D1, an Ashcroft 0-5" W.C. to 0-5V DC pressure transducer Model No. XLDP, Serial No. 20227-101, and a calibrated Sciometric Instruments System 200 analog to digital converter, were used to measure the volume of air leakage through the window.

Based on a corrected leakage rate of 2.10 cfm (3.57 m<sup>3</sup>/h), and a product area of 19.04 ft<sup>2</sup> (1.769 m<sup>2</sup>), the air leakage rate was calculated to be 0.110 cfm/ft<sup>2</sup> (2.02 m<sup>3</sup>/h/ m<sup>2</sup>) of product area.

The test specimen exceeds the performance level specified in H-Class for air infiltration, with a specified maximum allowable leakage of 0.3 cfm/ ft<sup>2</sup> (5.41 m<sup>3</sup>/h/ m<sup>2</sup>).

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**Testing (contd)**

**Water Resistance Test**

**Tested: January 19, 2001**

Water resistance testing was performed on the sample in accordance with the procedure outlined in A.S.T.M. E547, using pressure differential of 6.00 psf (290 Pa). A completed test period consisted of four cycles each having 5 minutes with the pressure applied and 1 minute with the pressure released during which the water spray was maintained.

No leakage was observed at the 6.00 psf (290 Pa) pressure level. The test specimen meets the performance level specified in H-R40 for water resistance

**Uniform Load Structural Test**

**Tested: January 19, 2001**

The window unit was subjected to a uniform load structural test in accordance with the procedure outlined in A.S.T.M. E330 using a positive and negative pressure of 90.0 psf (4320 Pa) as specified in the standard for the H-R60 rating level.

Deflections were measured on the interlock.

No breakage or damage that would impair the performance of the window was observed at the 90.0 psf (4320 Pa) pressure level.

The maximum allowable residual deflection was 0.4% of the span (0.157 in, 3.99 mm).

Rating	Test Pressure		Net Mid Span Residual Deflection	
	psf	(Pa)	in	(mm)
H-R60	+90.0	(+4320)	0.023	(0.59)
	-90.0	(-4320)	0.022	(0.57)

Residual deflections were within the maximum allowable at the 90.0 psf (4320 Pa) pressure level.

The test specimen meets the performance level specified in H-R60 for the uniform load structural test.

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**Testing (contd)**

**Deglazing Test**

**Tested: January 19, 2001**

Deglazing tests were carried out on the sash members in accordance with the procedure outlined in A.S.T.M. E987. The maximum allowable degree of deglazing is the original measured glazing bite.

Results were as follows;

Member	Load lbs (N)	Measured Deglazing in (mm)	Maximum Allowable in (mm)
Lift Rail	70 (320)	0.016 (0.41)	0.50 (12.7)
Interlock Rail	70 (320)	0.019 (0.48)	0.50 (12.7)
Stile	50 (230)	0.039 (1.00)	0.50 (12.7)

The test specimen meets the performance level specified for the deglazing test.

**Corner Weld Test**

**Tested: February 6, 2001**

Corner weld tests were carried out on the frame corners and the sash corners in accordance with the procedure outlined in Appendix A of the Standard. When loaded to failure, the break shall not extend along the entire weld line.

**Frame Corners**

When loaded to failure, the break produced in each corner specimen did not extend along the entire weld line.

**Sash Corners**

When loaded to failure, the break produced in each corner specimen did not extend along the entire weld line.

The test specimen meets the performance level specified for the corner weld test.

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Testing (contd)

Forced-Entry Resistance

Tested: February 6, 2001

The window was installed into a wood test buck as supplied by the manufacturer and mounted in a steel test frame. The test unit was subjected to the resistance to forced entry test in accordance with the procedure outlined in A.S.T.M. Standard F588.

1.0 Sample Preparation: During time T1 nothing was removed from the window and entry was not gained.

2.0 Lock Manipulation Test: During time T1 entry was not gained.

3.0 Static Load on Sash and Locking Device Strength Resistance Test

Test	Load Description	Comments
3.1	L1 on lock device(s) in opening direction.	No entry
3.2	L1 on lock device(s) in opening direction. L2 on interlock towards the interior.	No entry
3.3	L1 on lock device(s) in opening direction. L2 on interlock towards the exterior.	No entry
3.4	L1 on lock device(s) in opening direction. L2 on sill rail towards the interior.	No entry
3.5	L1 on lock device(s) in opening direction. L2 on sill rail towards the exterior.	No entry

The sash was pulled horizontally to within the confines of the frame for test 3.6.

Test	Load Description	Comments
3.6	L1 on lock device(s) in opening direction. L2 on interlock towards the interior. L3 on interlock at one stile.	No entry

4.0 Lock Manipulation Test: During time T1 entry was not gained.

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CLIENT: Remodelers Supply Center

DATE: February 6, 2001

- 9 of 9 -

REPORT NO: 281-1328-1

CLIENT NO : L27655

## Testing (contd)

## Forced-Entry Resistance (contd)

Loads: T1 = 5 minutes  
L1 = 666 N (150 lbs)  
L2 = 333 N (75 lbs)  
L3 = 111 N (25 lbs) towards interior.

## Conclusions

The window unit described herein met the air infiltration test H-class rating, water resistance test H-R40 rating, uniform load structural test H-R60 rating, operating force test H-class rating, deglazing test, corner weld test, and forced entry resistance test (Performance Level 10) performance requirements of ANSI/AAMA/NWDA 101/I.S. 2-97. Therefore the overall rating achieved by the single hung window is H-R40, based on the lower of the water resistance and the uniform load structural test.

Tested by: Michael MacDonald and Mustafa Swalah

Reported by: Michael MacDonald

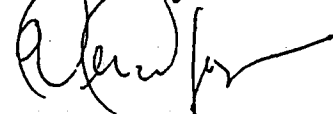
Respectfully submitted,

## Intertek Testing Services NA Ltd.



Michael MacDonald  
Physical Testing Services

Reviewed by:



Vern W. Jones, C.E.T.  
Manager  
Physical Testing Laboratory

MGM:mgm

Encl.

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