FALL RESISTANCE TEST REPORT

Rendered to:
VELUX America LLC

SERIES/MODEL: VS S06 2004
PRODUCT TYPE: Venting Deck Mounted Skylight

Report No: 96236.02-109-44
Test Date: 03/15/10
Report Date: 05/03/18
Expiration Date: 03/15/14
FALL RESISTANCE TEST REPORT

Rendered to:
VELUX America LLC
P.O. Box 5001
Greenwood, South Carolina 29648-5001

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Project Summary: Architectural Testing, Inc. was contracted by VELUX America LLC to perform testing on a Series/Model VS S06 2004, venting deck mounted skylight. The test specimen description and results are reported herein. The test sample was provided by the client.

Test Specification: The test specimen was tested to assess compliance with prior Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR)-1910.23(e)(8). A 200 lbf weight, fabricated from a bag filled with sand, was placed on the center of the unit for a minimum of 60 seconds and then dropped from increasing heights above the skylight starting at 2' until permanent visible damage was noted. All impact load drops were noted and the resulting damage was recorded.

NEW EVALUATION SCOPE:
A. Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the OSHA fall protection testing to the most recent referenced document. Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29 – Fall protection systems and falling object protection-criteria and practices. Section 1910.29(e)(1) requires a cover to be capable of supporting without failure at least twice the maximum intended load that may be imposed on the cover at any one time.

B. Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the Cal/OSHA fall protection testing to the most recent referenced document. California Code of Regulations, Title 8, Section 3212 §(b), which states, "covers shall be capable of safely supporting the greater of 400 lbs or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time."
Test Specimen Description:

**Series/Model:** VS S06 2004

**Product Type:** Venting Deck Mounted Skylight

**Overall Size:** 44-1/4" wide by 45-3/4" long

**Fixed Daylight Opening Size:** 40-3/4" by 42-1/4"

**Overall Area:** 14.13 ft²

**Finish:** All wood and aluminum were painted.

**Frame Construction:** All frame members were constructed of wood with mortise joint corner construction, secured with one 1-3/4" long nail. A steel mounting flange was utilized around the exterior perimeter of the frame. The flange was secured to the frame using 3/8" long "T" nails. An extruded aluminum hinge was utilized on the head and was secured using #8 x 1" long Phillips pan head screws. The hinge utilized 5" long molded ASA corner keys.

**Sash Construction:** The sash frame members were constructed of wood with mortise joint corner construction and were secured using one 5/16" by 1/2" crown staple. An extruded aluminum hinge was utilized on the head and was secured using #8 x 1" long Phillips pan head screws. A snap-in roll-formed aluminum cover was utilized on all sides of the sash.

**Weatherstripping:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; diameter Kerf-mounted hollow EPDM bulb</td>
<td>1 Row</td>
<td>Frame, head, and jambs</td>
</tr>
<tr>
<td>Custom shaped EPDM glazing gasket</td>
<td>1 Row</td>
<td>Sash, all members</td>
</tr>
<tr>
<td>Custom TPE frame to sash gasket</td>
<td>1 Row</td>
<td>Frame, sill, and jambs</td>
</tr>
<tr>
<td>Custom molded EPDM gasket</td>
<td>1 Row</td>
<td>Frame, sill</td>
</tr>
</tbody>
</table>
Test Specimen Description: (Continued)

Glazing Details: The sash was glazed with 17.6 mm (0.693”) thick insulating glass, constructed from a sheet of 3 mm (1/8”) thick clear tempered glass outboard, a sheet of 5.8 mm (7/32”) thick laminated glass inboard, and a stainless steel box spacer system. The laminated glass was constructed from two sheets of 2.5 mm (3/32”) thick clear heat-strengthened glass and a 0.030” thick PVB interlayer. The glass was exterior glazed against a custom shaped EPDM glazing gasket and was secured with roll-formed aluminum profiles with silicone against the glass. The top glazing profiles were secured to the frame with #8 x 1-1/4” long pan head screws.

Hardware:

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<th>Location</th>
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<tbody>
<tr>
<td>Metal rotary operator with manual chain drive</td>
<td>1</td>
<td>Midspan of frame sill</td>
</tr>
<tr>
<td>Extruded aluminum hinge</td>
<td>1</td>
<td>Full length of frame and sash heads</td>
</tr>
</tbody>
</table>

Reinforcement: No reinforcement was utilized.

Screen Construction: All screen members were constructed of roll-formed aluminum with corners square-cut and secured using an outside plastic corner key. The fiberglass mesh was secured to the frame using a flexible vinyl spline.

Installation: The unit was installed into a Spruce-Pine-Fir wood buck with a rough opening frame using 2x4 lumber. Nominal 1/2” thick plywood sheathing was secured to the buck frame and the rough opening using #8 x 1-5/8” drywall screws. The flange was secured using 1-1/4” long, 1/8” shank diameter, 3/8” diameter head ring-shank nails, (supplied by the manufacturer) located 3” from each end and spaced about 9” on center. The test specimen was installed in accordance with the installation instructions provided by the manufacturer.
**Test Results:** The results are tabulated as follows:

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<tr>
<th>Method</th>
<th>Load Location</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 lbf at rest</td>
<td>Center of glass</td>
<td>No visible damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Note #1</td>
</tr>
<tr>
<td>400 lbf-ft (2’ drop height)</td>
<td>Center of glass</td>
<td>No visible damage</td>
</tr>
<tr>
<td>800 lbf-ft (4’ drop height)</td>
<td>Center of glass</td>
<td>No visible damage</td>
</tr>
<tr>
<td>1200 lbf-ft (6’ drop height)</td>
<td>Center of glass</td>
<td>No visible damage</td>
</tr>
<tr>
<td>1600 lbf-ft (8’ drop height)</td>
<td>Center of glass</td>
<td>No visible damage</td>
</tr>
<tr>
<td>2000 lbf-ft (10’ drop height)</td>
<td>Center of glass</td>
<td>See Note #2</td>
</tr>
<tr>
<td>2400 lbf-ft (12’ drop height)</td>
<td>Center of glass</td>
<td>See Note #3</td>
</tr>
</tbody>
</table>

**General Note:** The test specimen was supported at the head and tested at a 14° slope (Reference Photo #1).

**Note #1:** The 200 lbf weight was gently applied perpendicular to the center of the skylight. After 60 seconds of rest time, there was no visible damage to the skylight.

**Note #2:** At the 10’ drop height, the bag broke the exterior tempered glass and fractured interior laminate.

**Note #3:** At the 12’ drop height, the interior laminate deglazed in multiple locations.

**CONCLUSION:**
The specimen was evaluated in accordance with Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29(e)(1) and with California Code of Regulations, Title 8, Section 3212 §, and found to be capable of resisting several drops of a 200 lb. weight bag, the highest of which was dropped from 8 feet resulting in resistance without visible damage to 1,600 ft-lbs of energy.
Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:

[Signature]
Eric M. Brennan  
Project Manager

[Signature]
Timothy J. McGill  
Manager – Product Testing

EMB: vlm/abo

Attachments (pages): This report is complete only when all attachments listed are included.
   Appendix-A: Photographs (2)
   Appendix-B: Drawings (2)
# Revision Log

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This report produced from controlled document template ATI 00205, issued 03/05/09.
Appendix A

Photographs

Photo No. 1
Test Set-up

Photo No. 2
Test Set-up and 200 lbf Bag
Photo No. 3
Result from 10' Drop Height

Photo No. 4
Result from 12' Drop Height
Appendix B

Drawings