TEST REPORT

Report No.: G4124.01-109-44

Rendered to:

VELUX America LLC
Greenwood, South Carolina

PRODUCT TYPE: Sun Tunnel Skylight
SERIES/MODEL: TCC 022

SPECIFICATION(S): Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR) - 1910.23(e) (8)

California Code of Regulations, Title 8, Section 3212

Test Date(s):	10/25/16
Report Date:	11/09/16
Test Record Retention End Date:	10/25/20

1.0 Report Issued To: VELUX America LLC
1418 Evans Pond Road
P.O. Box 5001
Greenwood, South Carolina 29648-5001

2.0 Test Laboratory: Architectural Testing, Inc., an Intertek company ("Intertek-ATI")
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: Sun Tunnel Skylight

3.2 Series/Model: TCC 022

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s).

3.4 Test Date(s): 10/25/16

3.5 Test Record Retention End Date: All test records for this report will be retained until October 25, 2020.

3.6 Test Location: Intertek-ATI test facility in York, Pennsylvania.

3.7 Test Specimen Source: The test specimen(s) was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of two years from the test completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings on file with Interek-ATI. Any deviations are documented herein or on the drawings.

3.9 List of Official Observers:

Name	Company
Tyler Holland	Intertek-ATI
Timothy J. McGill	Intertek-ATI
Kyle Ruth	Intertek-ATI

4.0 Test Specification(s):

Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR) - 1910.23(e) (8)

California Code of Regulations, Title 8, Section 3212

A 400 lb. weight, fabricated from a bag filled with lead shot, was placed on the center of the dome for a minimum of 60 seconds. The bag was removed and the test unit was inspected for any signs of damage or failure.

Additional Loading:

The specimen was loaded every 60 seconds in 100 lb. increments using sandbags placed on the center of the dome. The highest load achieved was recorded.

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 6.7 ft^2	**Width (inches)**	**Length (inches)**	**Height (inches)**
Curb mount flashing	31	31	3

Product	**Diameter (inches)**	**Height (inches)**
Dome	25-1/4	16-1/2

5.2 Unit Construction:

Unit Member	**Material**	**Description**
Flashing	Steel	22 gauge sheet metal that utilized a rigid plastic dome mounting ring
Top collar	Aluminum	0.022" thick, stamped sheet

	Joinery Type	**Detail**
Flashing	Overlapped	All sides of the flashing were bent at 90 degrees creating a 3" return. The corners were then overlapped and secured with two 5/16" rivets per corner located 1-1/2" from the end.

5.0 Test Specimen Description: (Continued)

5.3 Weatherstripping:

Description	Quantity	Location
5/16" wide by 1/8" high foam tape	1 row	Located on the bottom perimeter of the plastic dome mounting ring
2" wide by 1/4" high foam tape	1 row	Located on the underside, interior perimeter of the curb flashing
5/16" wide by 1/4" high foam	1 row	Located on the exterior perimeter of the top collar and secured with adhesive

5.4 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glazing can be made.*

Glazing	Glazing Method
5/32" smooth molded polycarbonate	The glazing was set from the exterior onto the dome mount. The glazing was secured to the exterior of the dome mount using six 1/2" diameter by 3/32" thick washers with rubber gaskets and #8 x 3/4" pan head screws spaced evenly around the exterior of the dome

Location	Quantity	Daylight Opening (diameter)
Dome	1	25-1/4"

5.5 Hardware:

Description	Quantity	Location
Daylight directing device	1	The acrylic device rested on the interior surface of the plastic dome mounting ring

6.0 Installation:

The specimen was installed onto a Spruce-Pine-Fir wood curb. The curb was sized to be tight-fitting to the frame, eliminating the need for shimming.

Location	Anchor Description	Anchor Location
Curb mount flashing	#8 x 1-1/2" self-tapping pan head screws	2-1/8" from each corner

7.0 Test Results: The results are tabulated as follows:

7.1 California (and OSHA) minimum loading:

Test Load	Load Location	Results	Deflection (in.)
400 lb.	Center of dome	Flashing began to bend; no damage to the dome	0.26

***Note**: The 400 lb. weight was applied perpendicular to the center of each dome. After 60 seconds of rest time, there was no visible damage to the exterior glazing.*

7.2 Additional loading (applied on the same unit in the listed order):

Test Load	Load Location	Results	Deflection
500 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.27
600 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.31
700 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.37
800 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.46
900 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.49
1000 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.54
1100 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.60
1200 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.62
1300 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.66
1400 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.73
1500 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.81
1600 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	0.96

7.0 Test Results: (Continued)

7.2 Additional loading (applied on the same unit in the listed order): (Continued)

Test Load	Load Location	Results	Deflection
1700 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.15
1800 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.24
1900 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.34
2000 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.43
2100 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.56
2200 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.61
2300 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.71
2400 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.77
2500 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.85
2600 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.94
2700 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	1.98
2800 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	2.01
2900 lb. at rest	Center of dome	Flashing continued to deflect; no damage to the dome	2.05
3000 lb. at rest	Center of dome	See note #1	2.10

***Note #1**: After the 3000 lb. load, testing was discontinued.*

***General Note:** All of the deflection readings were due to the bending of the flashing with no result of dome failure.*

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

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 Intertek-ATI.

For ARCHITECTURAL TESTING, Inc.

Digitally Signed by: Kyle Ruth

Kyle Ruth
Technician

Digitally Signed by: Timothy J. McGill

Timothy J. McGill
Manager – Product Testing

KR:asm

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photograph(s) (2)
Appendix-B: Drawing(s) (0) Complete drawings packet on file with Intertek-ATI.

Appendix A

Photograph(s)

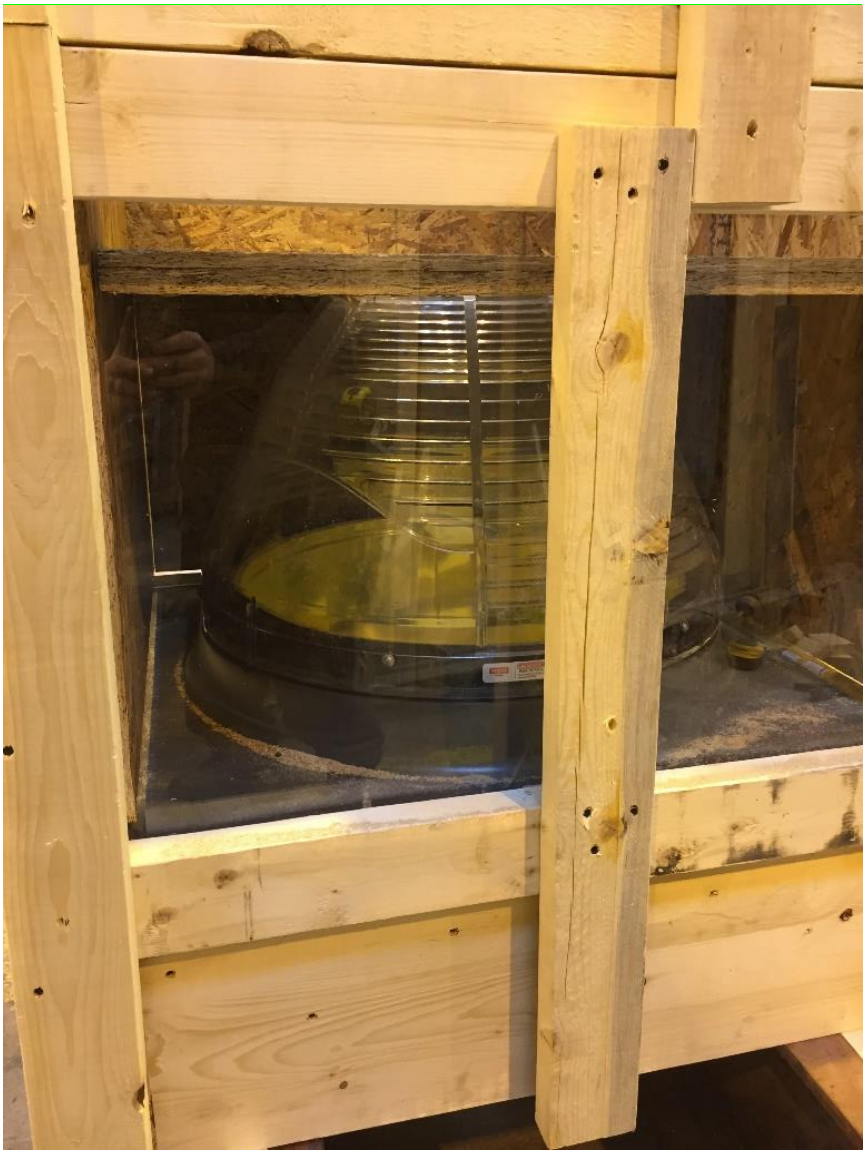

Photo No. 1
The Test Specimen

Photo No. 2
The Test Set-up

Appendix B

Drawing(s)

Note: Complete drawings packet on file with Intertek-ATI.