



CUSTOMER MODIFIED ASTM E108 BURNING BRAND TEST RECORD

Record No.: F7936.01-121-24

Test Date: May 5, 2016

Rendered to:

Velux America, LLC
Greenwood, South Carolina

PRODUCT TYPE: Skylight

SERIES/MODELS: Impact-Modified Acrylic (IMA) and Polycarbonate

SPECIFICATION: Customer modified from ASTM E 108-07a, *Standard Test Methods for Fire Tests of Roof Coverings*.

ASTM E108 Burning Brand Summary of Test Results				
Sample	Roof Covering Description	Type of Test	Target Classification	Results
Sample #1	Dynamic 100% IMA Smooth over Dynamic 50% IMA Prismatic	Customer-modified Class B Burning Brand	Customer-modified Class B Burning Brand	Pass
Sample #2	Dynamic Polycarbonate Smooth (0.118) over Dynamic Brite white Polycarbonate Prismatic (0.118)	Customer-modified Class B Burning Brand	Customer-modified Class B Burning Brand	Pass

This report contains in its entirety:

Cover Page: 1 page

Record Body: 5 pages

Test Equipment: 1 page

Photographs: 5 pages

Reference must be made to Record No. F7936.01-121-24, dated 05/18/2016 for complete test specimen description and detailed test results.

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

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

3.0 Project Summary:

3.1 Introduction: This fire test standard aims to measure relative fire characteristics of roof coverings under simulated fire scenarios which originate outside the building. Under controlled laboratory conditions, the behavioral response of materials, products or assemblies as affected by heat and flame are described. The performances of the roof covering systems are described only under specific conditions. Information is not provided by these tests that are applicable to any scenarios other than the specific conditions experienced during testing. Information is not provided by these tests that are applicable to actual fire situations because of the inherent differences between the classes as it pertains to fire source and fire application; no comparison between the classes exist. Results from tests are applicable to the specifics of the test and the aspect in which the tests were conducted, and are not applicable to similar materials or the results of those materials when used in concert with other materials.

3.2 Product Type: Skylight

3.3 Series/Model: (1) Impact-Modified Acrylic (IMA) and (2) Polycarbonate

3.4 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The test method was deviated from per the client's request. This record 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 specimens tested. This record may not be reproduced, except in full, without the written approval of Intertek-ATI.

3.5 Test Date: 05/05/2016

3.6 Test Sample Source: The parts for all specimens were provided by VELUX America, LLC, personnel. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of four years from the test completion date.

3.0 Project Summary: (continued)

3.6 Test Method:

ASTM E108-07a, *Standard Methods for Fire Tests of Roof Coverings modified by the client.*

3.6.1 Class B *Burning Brand* procedures were followed for the testing outlined in this report by direction of the client. The bottom of the Class B burning brand was placed parallel to and 1/2 inch +/- below the top of the dome clamp aluminum angle and in the geometric center of the long edge of the skylight. The brand was held in that position with a section of expanded metal bent at a right angle to form a shelf.

4.0 Test Details:

4.1 Specimen Description: The Class B test decks for the *Burning Brand* test were constructed of 2x4 lumber and as outlined below:

4.1.1 Burning Brand

4.1.1.1 Test Deck – 64-1/4 inches wide by 100 inches long and sloped 4:12. A section of non-combustible gypsum deck board was mounted at the base of the curb.

4.1.1.2 Underlayment – No underlayment was used for this assembly.

4.1.1.3 Roof Covering – The skylight specimens were mounted in a metal frame. The upper frame that included the skylights was approximately 5'-3-3/4" by 8'-3-3/4". The skylights were approximately 21 inches high at the center and were elongated domes (Quonset hut-like) in shape. The surface of the skylight had an embossed pattern. The skylight frames were mounted on a 4 inch high noncombustible metal curb. The skylights were mounted to the test apparatus with the long side oriented perpendicular to the plenum exit of the test apparatus.

4.2 Storage Information: The decks were stored in the fire laboratory prior to testing. Typical laboratory conditions were 60-80°F and 40-65% relative humidity.

4.3 Moisture Content: Moisture content of the lumber was verified prior to testing and was within 8-10%.

4.4 Equipment Calibration: A Fire Test Apparatus as described in ASTM E108 was used to generate 12 ± 0.5 mph air current. Air speed of the Fire Test Apparatus was calibrated prior to testing. A gas burner with a flame temperature of $1630 \pm 50^\circ\text{F}$ was used to ignite the brands for testing. See Section 5.1 for more information on equipment calibration.

4.5 Burning Brand Procedure: The brands were oven conditioned at 105° to 120°F for a minimum of 24 hours prior to testing. The weight of the brands was verified to be within 500 ± 50 grams. Each brand consisted of three layers of six, 1 inch by 1 inch by 6 inch strips of Douglas Fir lumber forming a small crib that was 6 inches square by 2-1/4 inches thick. The brand was ignited by exposing each 6 inch by 6 inch face for 30 seconds, each 2-1/4 inch by 6 inch face for 30 seconds, and the 6 inch by 6 inch faces again for 30 seconds to the gas burner flame. Total duration of ignition exposure was 4 minutes.

4.0 Test Details: (continued)

At the request of the client, the ignited brand was placed onto the brand holder described in Section 3.6.1 at a 4:12 slope.

4.6 List of Official Observers:

<u>Name</u>	<u>Company</u>
Scott Gingrich	Intertek-ATI
Ben Green	Intertek-ATI

5.0 Test Data & Observations:

5.1 Calibration Information:

Date: 05-05-2016
Average Wind Speed: 11.9 mph
Ambient Temperature: 62°F

Burning Brand #1:

Impact-Modified Acrylic (IMA) sample

Time (min:sec)	Event	Observations
00:01	Brand Placed on Deck	Start of test.
09:00	Brand Consumed	Brand consumed.
13:00	End Test	No smoke or evidence of combustion - end test.
After Test	No sustained flaming on the underside of the deck was observed; PASS.	

Burning Brand #2:

Polycarbonate 0.118 / 0.118 sample

Time (min:sec)	Event	Observations
00:01	Brand Placed on Deck	Start of test.
08:36	Brand Consumed	Brand consumed.
13:15	End Test	No smoke or evidence of combustion - end test.
After Test	No sustained flaming on the underside of the deck was observed; PASS.	

6.0 Test Conclusion:

The test specimens provided to Intertek-ATI by VELUX America, LLC and described in this test record met the conditions described in this record and following the procedures requested by the client at a 4:12 slope.

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For INTERTEK-ATI:

Scott Gingrich
Senior Technician - Fire Testing

Karl Houser, P.E.
Sr. Fire Protection Engineer

SDG:ddr

Attachments (pages): This record is complete only when all attachments listed are included.
Appendix-A: Photographs (5)



Test Record No.: F7936.01-121-24
Record Date: 05/26/2016
Test Record Retention End Date: 05/26/2020
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	05/26/2016	N/A	Original record issue



Test Record No.: F7936.01-121-24
Record Date: 05/26/2016
Test Record Retention End Date: 05/26/2020

Appendix A

Photographs



Photo No. 1
Metal Curb Installed to Deck



Photo No. 2
IMA Skylight Installed Pre-test



Photo No. 3
Polycarbonate 0.118 Skylight Installed Pre-test



Photo No. 4
IMA Burning Brand During Test

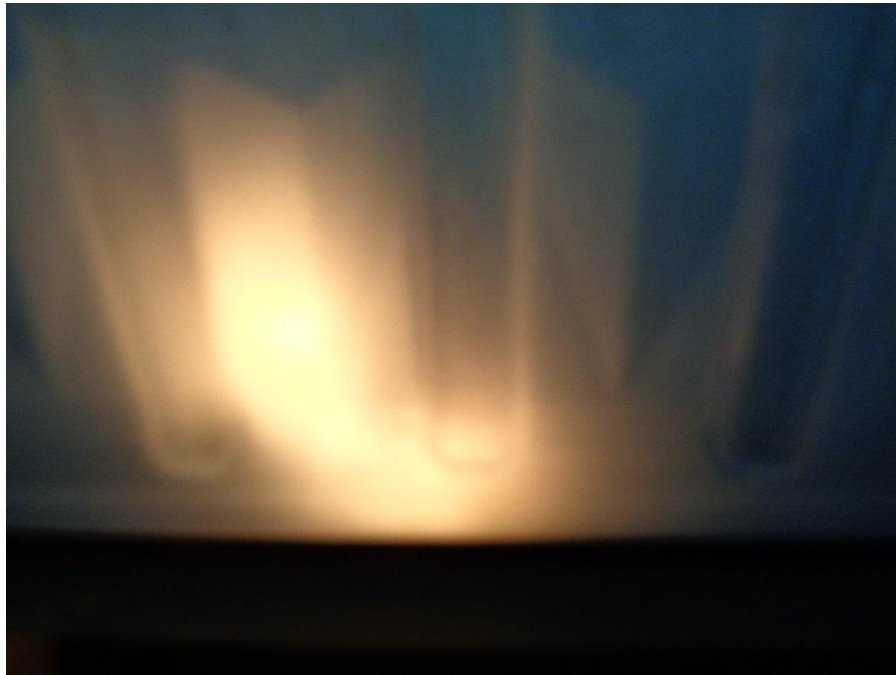


Photo No. 5
IMA Under Deck Burning Brand During Test



Photo No. 6
Polycarbonate 0.118 in. Skylight During Burning Brand Test



Photo No. 7
Polycarbonate 0.118 Skylight UNDER Deck Burning Brand Test

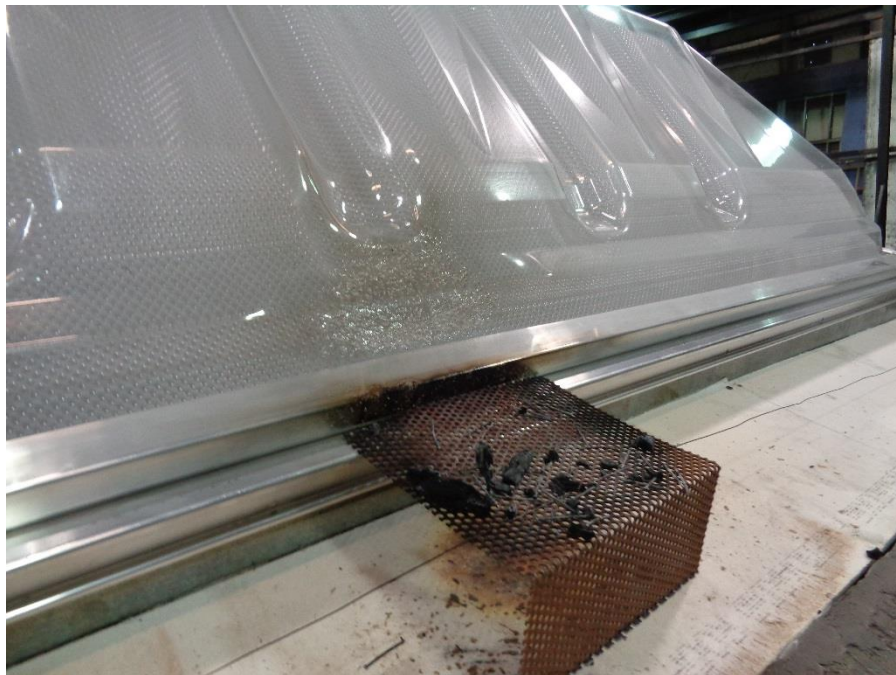


Photo No. 8
Post-Test of the IMA Skylight

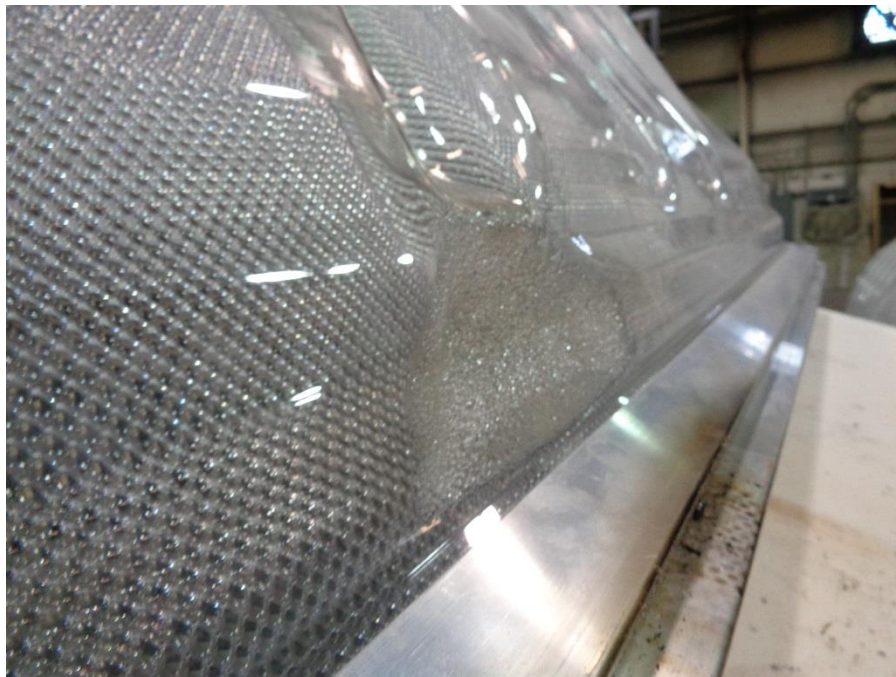


Photo No. 9
Post-Test of the Polycarbonate 0.118 Skylight