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EVALUATION OF THE EXTERNAL FIRE RESISTANCE CHARACTERISTICS OF ROOF COVERING SYSTEMS IN GENERAL ACCORDANCE WITH ASTM E 108-10a, *STANDARD TEST METHODS FOR FIRE TESTS OF ROOF COVERINGS:* CLASS B BURNING BRAND TESTING

SAMPLE ID: ***VELUX® VCM / VCE Deck Mounted Skylight***

REVISED FINAL REPORT
Consisting of 13 Pages

SwRI® Project No. 01.15210.01.317g[1]
Test Date: February 3, 2010
Report Date: March 18, 2010

Prepared for:

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1.0 INTRODUCTION

This report presents the results of an investigation of the external fire resistance characteristics of the *VELUX® VCM / VCE Deck Mounted Skylight* roof covering system in general accordance with Class B requirements of ASTM E 108-10a, *Standard Test Methods for Fire Tests of Roof Coverings.* The objective of this standard is to measure the relative fire resistance characteristics of roof coverings under a simulated fire originating outside the building. This standard is used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment that takes into account all of the factors, pertinent to an assessment of the fire hazard of a particular end use. The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials. This report was revised to remove Draft from the cover page.

2.0 CLASSIFICATION CRITERIA

Class B tests are applicable to roof coverings that are effective against moderate test exposure, afford a moderate degree of fire protection to the roof deck, do not slip from position, and do not present a flying brand hazard. To be regarded as Class B, a roofing system shall meet the requirements for a total of six tests: two Burning Brand tests, two Spread of Flame tests, and two Intermittent Flame tests. Each Class B Burning Brand test requires two Class B burning brands to be placed on the test deck. The brands must be positioned at locations considered most vulnerable to fire penetration. Each Class B Intermittent Flame test requires eight 2-min exposures to a 1400 °F ± 50 °F flame with a 2-min interval between each exposure. Each Class B Spread of Flame test requires a single 10-min exposure to a 1400 °F ± 50 °F flame. All tests are performed in the presence of a 1056 ± 44-ft/min air velocity.

In order to meet acceptance criteria in accordance with ASTM E 108-10a, a roof covering material shall meet the following conditions when subjected to the particular class of fire tests:

1. At no time during or after the Intermittent Flame, Spread of Flame, or Burning Brand tests shall:
    - Any portion of the roof covering material be blown or fall off the test deck in the form of flaming or glowing brands that continue to glow after reaching the floor,
    - The roof deck be exposed (except for roof coverings restricted to use over noncombustible deck), or

- Portions of the roof deck fall away in the form of particles that continue to glow after reaching the floor.

2. At no time during the Class A, B, or C Intermittent Flame or Burning Brand tests shall there be sustained flaming of the underside of the deck. If flaming does occur, conduct another series of tests, during which no sustained flaming shall occur.
3. During the Spread of Flame tests, the flaming shall not spread beyond 6 ft (1.8 m) for Class A, 8 ft (2.4 m) for Class B, or 13 ft (4.0 m, the top of the deck) for Class C. There shall be no significant lateral spread of flame from the path directly exposed to the test flame.

3.0 TEST INFORMATION

Client: Architectural Testing, Inc.

SwRI Project No.: 01.15210.01.317g

Test Specimen

Identification:	*VELUX® VCM / VCE Deck Mounted Skylight*
Date Received:	January 14, 2010
Description:	The deck mounted skylight was tested as is with no plywood decking due to its size.
Dimensions:	The glass portion of the skylight exceeded the size of the standard ASTM E 108 roof deck of 40 in. wide × 52 in. long
Surveillance:	N/A
Color:	Grey metal framing with clear glass
Storage Conditions:	Ambient conditions
Exposure:	N/A

Test Details

Test Date:	February 3, 2010
Test Location:	Southwest Research Institute's (SwRI) Fire Technology Department in San Antonio, Texas
Witnesses:	Mr. Eric Miller representing Architectural Testing, Inc.
Calibration Details:	See Appendix A
Tests Conducted:	ASTM E 108-10a: Class B Burning Brand
Slope:	5:12
Observations:	Selected photos taken during the test are presented in Appendix B. Observations made during each test can be found in Appendix C. A schematic of the skylight is shown in Appendix D.
Other Details:	N/A
Deviations:	The test deviated from the standard in that the ambient air temperature recorded was below the minimum allowable temperature during testing.

4.0 RESULTS

Architectural Testing, Inc.'s, *VELUX® VCM / VCE Deck Mounted Skylight* was tested in general accordance with Class B requirements of ASTM E 108-10a. The sample passed the test. Observations made during the test are presented in Appendix C.

5.0 CONCLUSION

SwRI's Fire Technology Department performed testing in general accordance with ASTM E 108-10a on Architectural Testing, Inc.'s, *VELUX® VCM / VCE Deck Mounted Skylight* on February 3, 2010. Based on the test results, the *VELUX® VCM / VCE Deck Mounted Skylight* roof covering system met the acceptance criteria for one Class B Burning Brand test in general accordance with ASTM E 108-10a.

APPENDIX A

CALIBRATION DATA

(Consisting of 1 Page)

Calibration Data

Calibration Date: February 3, 2010

Air Velocity (ft/min):	Right	1049
	Center	1099
	Left	1059
Flame Temperature (°F):	2-min Average	1411

APPENDIX B

SELECTED TEST PHOTOGRAPHS

(Consisting of 2 Pages)

Figure B-1. Skylight at beginning of Test.

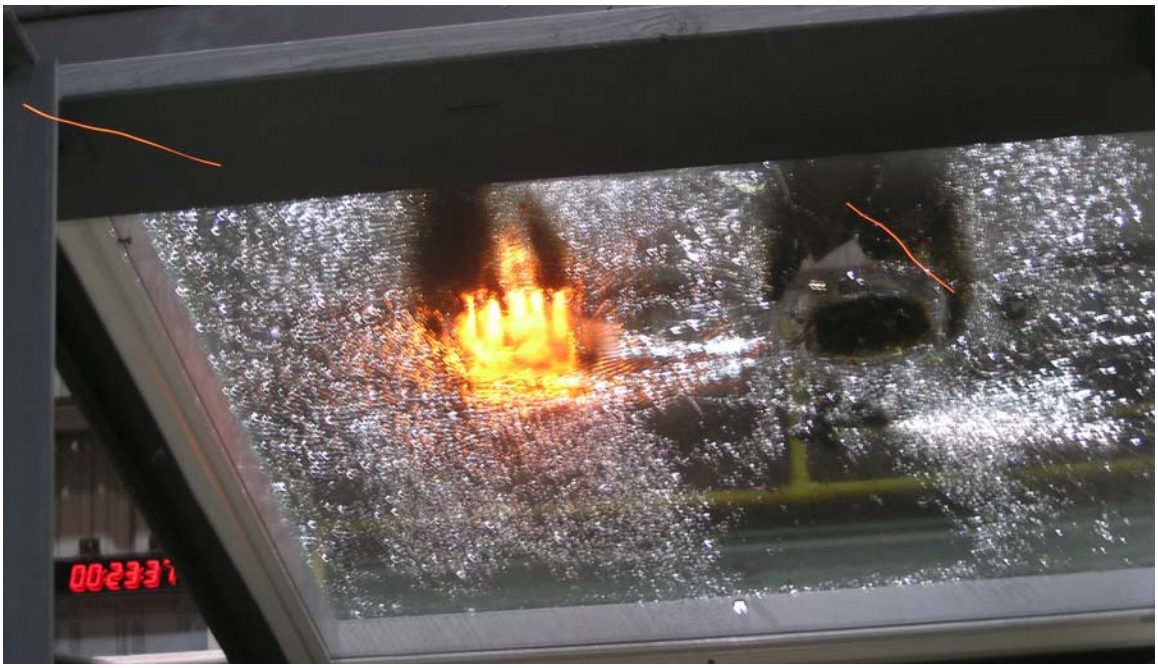

Figure B-2. Underside of Skylight after Placement of Second Brand.

Figure B-3. Condition of Sample at End of Test.

APPENDIX C

TEST OBSERVATIONS

(Consisting of 1 Page)

Class B Burning Brand Test
February 3, 2010

Test ID No.:	BB 7
Specimen ID:	*VELUX® VCM / VCE Deck* Mounted Skylight
Ambient Air Temperature:	51 °F (10.6 °C)
Brand Weights:	1–527 g (1.16 lb) 2–533 g (1.18 lb)

TIME MIN:S	OBSERVATIONS
00:00	Start of test; brand No. 1 placed on skylight.
03:20	Cracking on top layer of glass.
04:45	"Foggy" layer between glass layers.
06:00	Shattering of top surface glass.
08:20	Puff of smoke causes top layer to fall onto bottom layer.
13:00	All signs of glowing ceased.
20:07	Brand No. 2 placed onto skylight.
25:00	Top glass layer collapsing onto bottom layer.
35:00	Test stopped. No failure conditions exist. **PASS**

APPENDIX D

SCHEMATIC OF SKYLIGHT

(Consisting of 1 Page)

VELUX®

VCM/VCE

ENGLISH: VCM/VCE Curb Mounted Skylight Installation Instructions

ESPAÑOL: VCM/VCE tragaluz montado en brocal - Instrucciones de instalación

FRANÇAIS : Instruction d'installation du puits de lumière VCM/VCE monté sur cadre