

CERTAINTEED LLC

FIRE TEST REPORT

SCOPE OF WORK

ASTM E108/UL 790 CLASS A TESTING ON ROOF ASSEMBLY CONTAINING PHOTOVOLTAIC
AND ACM PANELS WITH FIRE RESISTENT WOOD SUB-FRAMING

REPORT NUMBER

M9823.02-121-24 R0

TEST DATE(S)

11/18/21 - 11/19/21

ISSUE DATE

08/07/25

RECORD RETENTION END DATE

11/19/25

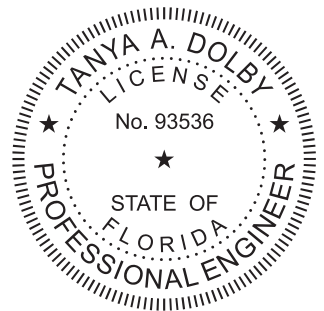
PAGES

37

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TEST REPORT FOR CERTAINTEED LLC

Report No.: M9823.02-121-24 R0

Date: 08/07/25

REPORT ISSUED TO

CertainTeed LLC

18 Moores Road

Malven, Pennsylvania 19355

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by AMYT Energy Holdings LLC dba SunStyle to evaluate the fire performance of the assembly described in Section 5 of this report. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania. This test report is a reissue of the original report No. M9823.01-121-24. This test report is issued in the name of CertainTeed LLC through written authorization of AMYT Energy Holdings LLC dba SunStyle. Results obtained are tested values and were secured by using the designated test method. A summary of test results is reported herein and the complete assembly construction details are included in this report. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

DECK #	TYPE OF TEST	SLOPE	CLASSIFICATION	RESULTS
1	Burning Brand	5:12	Class A	Pass
2	Burning Brand	5:12	Class A	Pass
3	Burning Brand	5:12	Class A	Pass
4	Burning Brand	5:12	Class A	Pass
5	Intermittent Flame	5:12	Class A	Pass
6	Intermittent Flame	5:12	Class A	Pass
7	Spread of Flame	5:12	Class A	Pass
8	Spread of Flame	5:12	Class A	Pass

For INTERTEK B&C:

COMPLETED BY: Timothy Feltman
TITLE: Technician – Fire Testing
SIGNATURE: 
DATE: 08/07/25

Digitally Signed by: Timothy Feltman

REVIEWED BY: Tanya A. Dolby, P.E.
TITLE: Engineering Manager – Engineering Services
SIGNATURE: 
DATE: 08/07/25

Digitally Signed by: Tanya Dolby

TRF:ddr

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SECTION 3

TESTING AND EVALUATION METHODS

The samples were evaluated in accordance with the following:

ASTM E108-20a/UL 790, *Standard Test Methods for Fire Tests of Roof Coverings*

The following test equipment was used to conduct the test.

ROOFING LAB EQUIPMENT	INVENTORY NUMBER	CALIBRATION DUE DATE
Data Acquisition/ Logger	63656	10-26-22
Anemometer	INT02439	06-01-22
Thermocouple	INT01652	10-01-22
Thermocouple Reader	INT243	07-19-22
Tape Measure	65101	08-04-22
Stopwatch	65100	07-31-22
Moisture Meter	INT00962	02-02-22
Benchtop Scale	INT00024	04-01-22
Temp. Transmitter	65411	06-10-22

SECTION 4

MATERIAL SOURCE/INSTALLATION

The test specimen was submitted to Intertek directly from the client. Samples were not independently selected for testing. Intertek has not verified the composition, manufacturing techniques or quality assurance procedures.

SECTION 5

SPECIMEN DESCRIPTION

The plywood decks were constructed by Intertek technicians according to the specifications of test standard ASTM E108, 2020a Edition, *“Standard Test Methods for Fire Tests of Roof Coverings.”*

Moisture Content: Moisture content of the lumber was verified prior to testing to be within the limits of the standard.

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SPECIMEN DESCRIPTION

Framing: SPF wood 2x4's fastened using 3-1/4" framing nails.

Sheathing: Swanson Group® 15/32" AC grade Group 1 exterior plywood

Underlayment: RhinoRoof® U20 synthetic underlayment fastened using 1" plastic cap roofing nails at specified locations as per manufacturer's instructions.

Wood battens: Fire treated wood 2x4's was layered onto the plywood sheathing, counter sunk and fastened using #9x3" Torx head wood screws. **Layer 1** consisted of 2 - 2x4's at the perimeter of the roof deck and 1 - 2x4 centered on the roof deck oriented vertically. **Layer 2** consisted of 2x4's oriented horizontally and spaced as per the manufacturer's installation instructions. **Layer 3** consisted of 1 - 2x4 centered on the structure, oriented vertically and 2 - 2x4's spaced 24" from the center 2x4.

Fire treated 1x4's was placed horizontally at manufacturer's specified locations and fastened using #9 x 1-1/2" Torx head wood screws at each vertical 2 x 4 location. Two rubber gromets were centered to the left and centered to the right of the upper most vertical 2x4 and fastened onto the 1 x 4's using #8 x 3/4" Torx head wood screws.

Panel Mounts: Panel mounts were fastened to the upper most 2x4's using #8 x 1-1/4" low profile cabinet screws. The spacing was determined by using a manufacturer's template according to panel layout.

Roof covering: Each burning brand and intermittent flame deck consisted of one SunStyle/Solvis photovoltaic panel and had various sized Alucobond® ACM panels surrounding the perimeter of the photovoltaic panel. Each spread of flame deck had one additional photovoltaic panel added directly behind the first photovoltaic panel. **SEE PHOTOS SECTION 9 ON PAGE 16**

Storage Information: Decks were stored in the fire laboratory prior to testing. Typical laboratory conditions are 60-80°F and 50-65% relative humidity

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Timothy Feltman	Intertek B&C

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SECTION 7**TEST RESULTS****Calibration Information**

TEST CONDITIONS (CLASS A)	
Test Date	11/18/2021
Air Velocity	1048 average fpm
Slope of Cal. Deck	5:12
Ambient Air Temperature	68°F

TEST CONDITIONS (CLASS A)	
Test Date	11/19/2021
Air Velocity	1055 average fpm
Slope of Cal. Deck	5:12
Average Flame Temperature	1401°F
Ambient Air Temperature	64°F

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SECTION 7 (Continued)

TEST RESULTS

BURNING BRAND TESTS

Test Observations Deck: 1

Test Date	11/18/2021
Ambient Air Temperature	68°F
Brand Type	Class A, 4.5 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
01:00	Sample ignition of PV panel
02:53	Warping of ACM panel at leading edge of brand
03:55	Flaming on underside of PV panel
05:21	Ignition of 1" x4" wood batten
08:31	Ignition of underside of ACM panel at brand placement
10:27	ACM panel and 1" x4" wood batten extinguished
17:46	Reignition of ACM pane and 1" x 4" wood batten
18:58	Brand consumed
25:07	Ignition of underside of PV panel
39:26	Underside extinguished
47:07	No signs of combustion; End of Test

Acceptance Level: Class A – No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)**TEST RESULTS****Test Observations Deck: 2**

Test Date	11/18/2021
Ambient Air Temperature	66°F
Brand Type	Class A, 4.5 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
01:01	Sample ignition of PV panel
01:36	Warping of ACM panel at leading edge of brand
19:25	Brand consumed
36:33	No signs of combustion; End of Test

Acceptance Level: Class A – No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 3

Test Date	11/18/2021
Ambient Air Temperature	70°F
Brand Type	Class A, 4.5 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
01:14	Sample ignition of PV panel
01:40	Warping of ACM panel at leading edge of brand
16:54	Ignition of underside of PV panel
18:02	Ignition of underside of ACM panel and 1" x 4" wood batten
18:57	Dripping of ACM panel onto roof deck
20:59	Brand consumed
30:28	Underside flaming extinguished
45:38	No signs of combustion; End of Test

Acceptance Level: Class A— No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 4

Test Date	11/18/2021
Ambient Air Temperature	71°F
Brand Type	Class A, 4.4 lbs.
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS
00:00	Brand placed on deck.
01:04	Sample ignition of PV panel
01:42	Warping of ACM panel at leading edge of brand
09:18	Ignition of PV panel on underside
09:54	Ignition of 1" x 4" wood batten
13:20	Ignition of underside of ACM panel at 1" x 4" wood batten
14:41	ACM dripping onto roof deck
16:25	Charring of center top 2" x 4" wood support
19:05	Brand consumed
21:34	Flaming on top of roof deck
36:06	Flaming on roof deck and underside of roof covering extinguished
51:02	No signs of combustion; End of Test

Acceptance Level: Class A – No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)

TEST RESULTS

INTERMITTENT FLAME TESTS

Test Observations Deck: 5

Test Date	11/19/2021
Ambient Air Temperature	69
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	01:19	ON	Warping of center ACM panel at the leading edge.
1	01:45	ON	Charring of center ACM panel at the leading edge.
2	02:03	OFF	Smoke emitting from test assembly
3	11:38	OFF	Center ACM at the leading-edge paint peeling
XXX	60:00	XXXXX	All flame cycles complete; start observation period
XXX	72:29	XXXXX	No signs of combustion of the underdeck; End of Test

Acceptance Level: Class A – No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 6

Test Date	11/19/2021
Ambient Air Temperature	65°F
Slope of Test Deck	5:12

CYCLE		Flame	
NO.	TIME.	ON/OFF	OBSERVATIONS/COMMENTS
1	01:16	ON	Warping of center ACM at leading edge
1	01:45	ON	Charring of center ACM at leading edge
2	02:06	OFF	Smoke emitting from test assembly
3	11:56	OFF	Center ACM at the leading-edge paint peeling
XXX	60:00	XXXXX	All flame cycles complete; start observation period
XXX		XXXXX	No signs of combustion of the underdeck; End of Test

Acceptance Level: Class A – No flaming occurred on the underside of the deck.

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SECTION 7 (Continued)

TEST RESULTS

Test Observations Deck: 7

Test Date	11/19/2021
Ambient Air Temperature	66°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
00:00	Burner ignited.
01:02	Warping of center ACM at leading edge
01:33	Charring of center ACM at leading edge
03:13	Smoke emitting from test assembly
05:22	Ignition of rubber gasket at PV panel fastener
07:15	ACM core expanding from panels at leading edge
10:00	Test stop.

Acceptance Level: Class A maximum spread of flames is 0 ft..

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SECTION 7 (Continued)**TEST RESULTS****Test Observations Deck: 8**

Test Date	11/19/2021
Ambient Air Temperature	62°F
Slope of Test Deck	5:12

TIME (min:sec)	OBSERVATIONS/COMMENTS
00:00	Burner ignited.
01:13	Warping of center ACM at leading edge
01:40	Charring of center ACM at leading edge
02:51	Smoke emitting from test assembly
0703	ACM core expanding from panels at leading edge
10:00	Test stop.

Acceptance Level: Class A maximum spread of flames is 0 ft.

SECTION 8**CONCLUSION**

The SunStyle photovoltaic panel assembly in the system described in this test report **met** the criteria of ASTM E108 (2020) for a Class "A" rating at a 5:12 slope.

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SECTION 9

PHOTOGRAPHS



Photo No. 1
Test #1 Pre-test



Photo No. 2
Test #1 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 3
Test #1 During Test



Photo No. 4
Test #1 Flaming of 1 x 4 Batten

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PHOTOGRAPHS



Photo No. 5
Test #1 Post Test



Photo No. 6
Test #1 Underdeck Post Test

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PHOTOGRAPHS



Photo No. 7
Test #2 Pre-test



Photo No. 8
Test #2 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 9
Test #2 During Test



Photo No. 10
Test #2 Warping of Center ACM at Leading Edge

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PHOTOGRAPHS

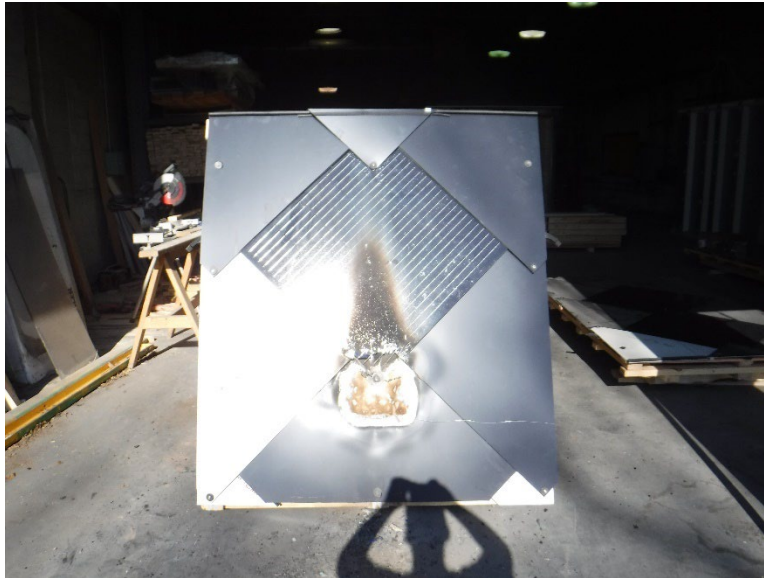


Photo No. 11
Test #2 Post Test



Photo No. 12
Test #2 Underdeck Post Test

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PHOTOGRAPHS



Photo No. 13
Test #3 Pre-test



Photo No. 14
Test #3 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 15
Test #3 During Test



Photo No. 16
Test #3 Flaming Droplets from ACM onto Roof Deck

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PHOTOGRAPHS

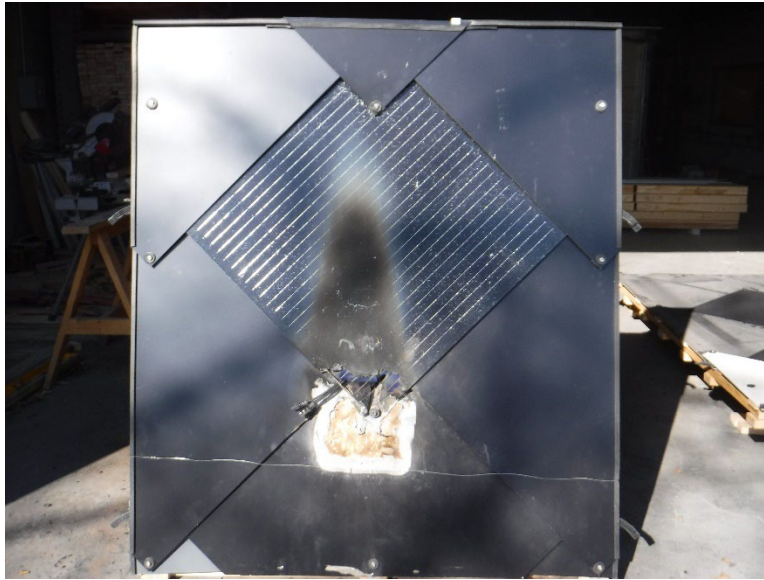


Photo No. 17
Test #3 Post Test



Photo No. 18
Test #8 Underdeck Post Test

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PHOTOGRAPHS

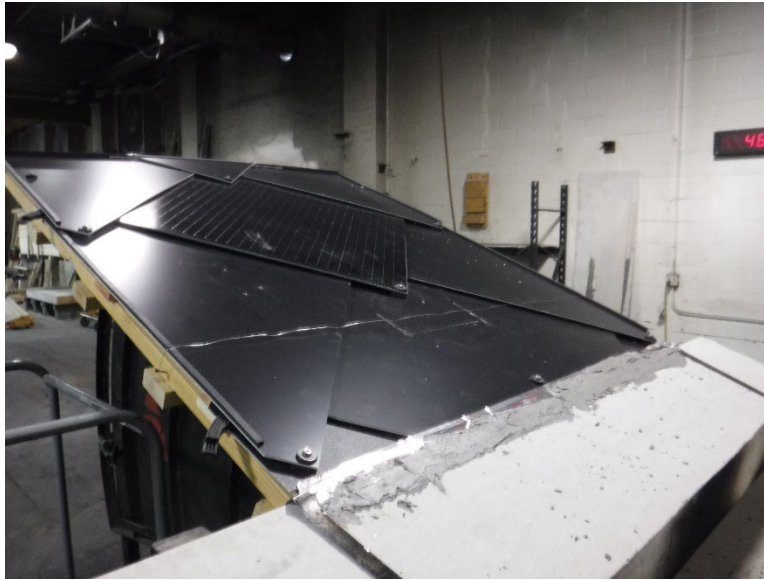


Photo No. 19
Test #4 Pre-test



Photo No. 20
Test #4 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 21
Test #4 During Test



Photo No. 22
Test #4 Flaming of 1 x 4 Batten at Edge of ACM Underside of Panel

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PHOTOGRAPHS



Photo No. 23
Test #4 Post Test



Photo No. 24
Test #4 Underdeck Post Test

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PHOTOGRAPHS

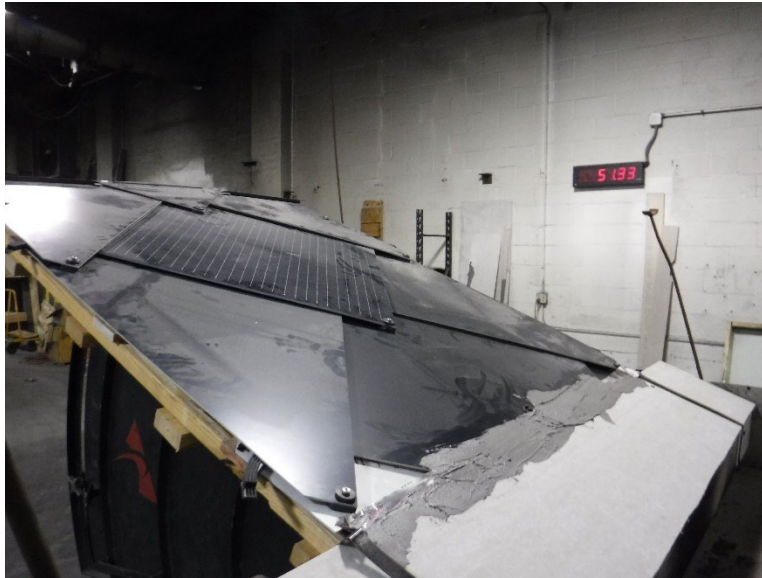


Photo No. 25
Test #5 Pre-test



Photo No. 26
Test #5 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 27
Test #5 During Test



Photo No. 28
Test #5 During Test

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PHOTOGRAPHS

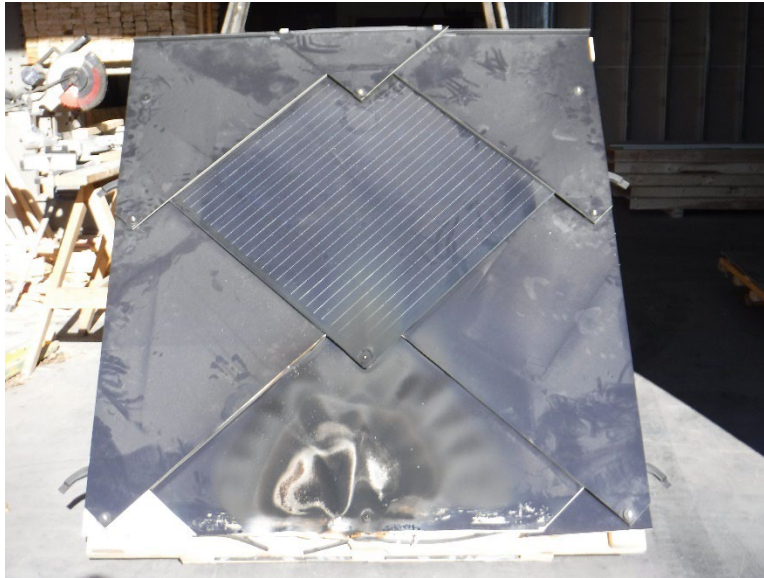


Photo No. 29
Test #5 Post Test



Photo No. 30
Test #5 Underdeck Post Test

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PHOTOGRAPHS



Photo No. 31
Test #6 Pre-test



Photo No. 32
Test #6 Underdeck Pre-test

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PHOTOGRAPHS



Photo No. 33
Test #6 During Test



Photo No. 34
Test #6 During Test

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PHOTOGRAPHS



Photo No. 35
Test #6 Post Test



Photo No. 36
Test #6 Underdeck Post Test

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PHOTOGRAPHS



Photo No. 37
Test #7 Pre-test



Photo No. 38
Test #7 During Test

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PHOTOGRAPHS

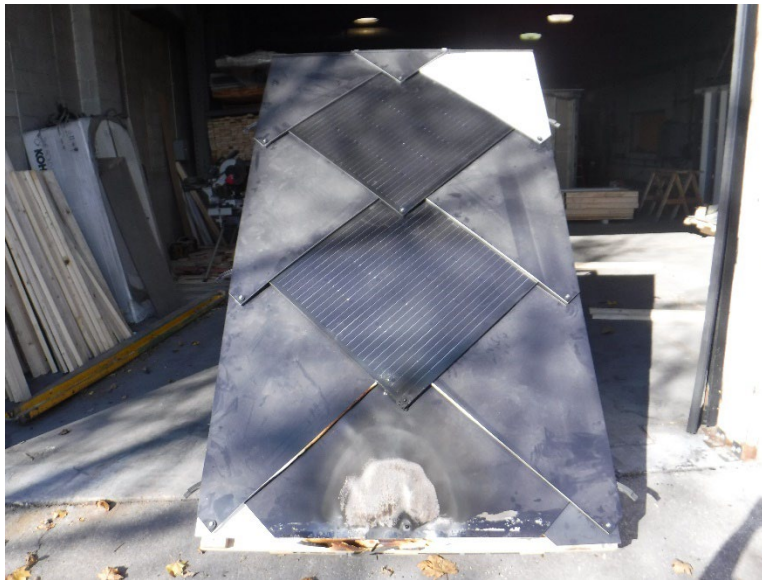


Photo No. 39
Test #7 Post Test



Photo No. 40
Test #8 Pre-test

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PHOTOGRAPHS



Photo No. 41
Test #8 During Test

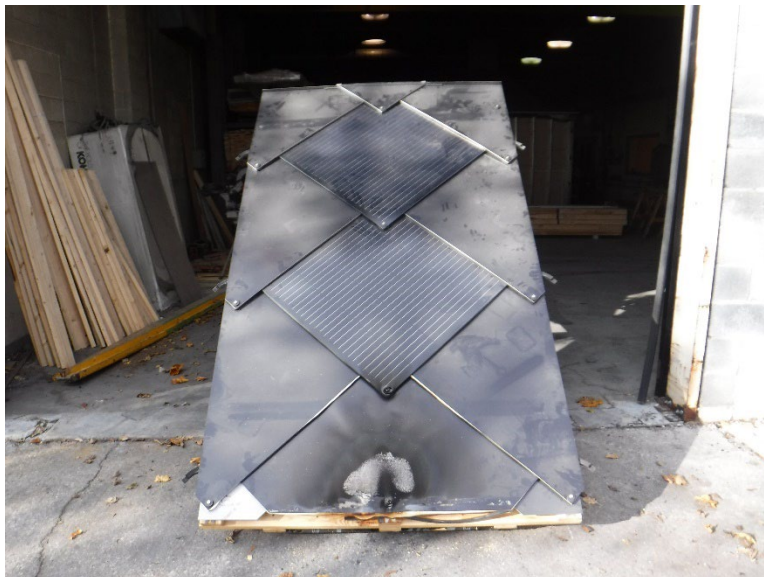


Photo No. 42
Test #8 Post Test

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PHOTOGRAPHS

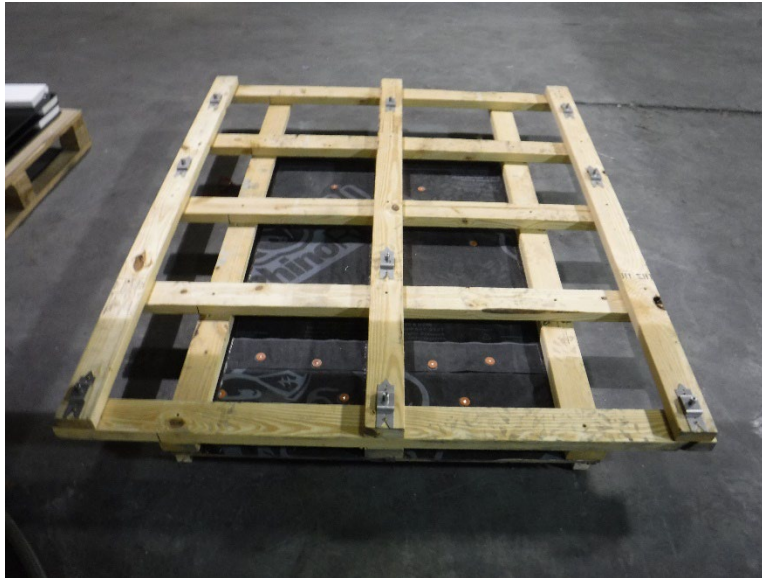


Photo No.43

2 x 4 Wood Sub-framing with Panel Brackets



Photo No. 44

1 x 4 Installation with Rubber Gromets Included

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PHOTOGRAPHS

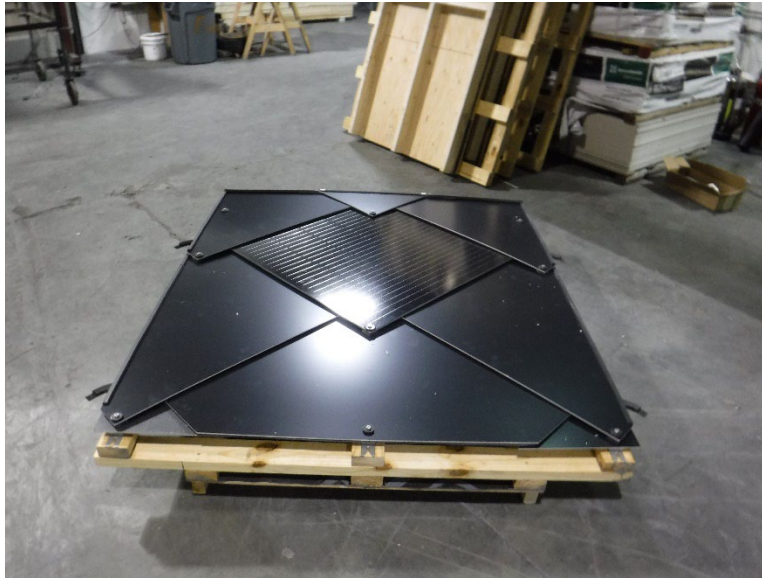


Photo No. 45
Burning Brand Complete Assembly



Total Quality. Assured.

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SECTION 10

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	08/07/25	N/A	Original Report Reissue – Reissued Report No. M9823.01-121-24 in the name of CertainTeed LLC.